# Illinois Municipal Retirement Fund

## Annual Actuarial Valuation Report

## December 31, 2019

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March 13, 2020

Board of Trustees
Illinois Municipal Retirement Fund
Oak Brook, Illinois 60521

**Re: Illinois Municipal Retirement Fund Actuarial Valuation as of December 31, 2019**
**Actuarial Disclosures**

Ladies and Gentlemen:

The results of the **December 31, 2019 Annual Actuarial Valuations** of members covered by the Illinois Municipal Retirement Fund (IMRF) are presented in this report.

The purpose of the valuations, as provided by Article 7 of the Illinois Pension Code, is to measure IMRF's funding progress and to establish contribution rates for the 2021 calendar year. This report should not be relied upon for any other purpose. This report may be distributed to parties other than the Fund only in its entirety and only with the permission of the Board. GRS is not responsible for unauthorized use of this report. Determinations of financial results, associated with the benefits described in this report, for purposes other than those identified above may be significantly different.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period, or additional cost or contribution requirements based on the plan's funded status); and changes in plan provisions or applicable law. The scope of an actuarial valuation does not include an analysis of the potential range of such future measurements.

This valuation assumes the continuing ability of the participating employers to make the contributions necessary to fund this plan. A determination regarding whether or not the participating employers are actually able to do so is outside our scope of expertise. Consequently, we did not perform such an analysis.

The valuation was based upon information, furnished by IMRF staff, concerning Retirement Fund benefits, financial transactions, plan provisions and active members, terminated members, retirees and beneficiaries. We checked for internal reasonability and year-to-year consistency, but did not audit the data. We are not responsible for the accuracy or completeness of the information provided by IMRF Staff.

The valuations are based upon current plan provisions related to Regular Members, Sheriff's Law Enforcement Personnel (SLEP), and Elected County Officials (ECO) employment.

In addition, this report was prepared using certain assumptions approved by the Board as described in the section of this report entitled Actuarial Cost Methods and Assumptions. This report includes certain risk measures but does not include a more robust assessment of the risks of future experience not meeting the actuarial assumptions. Additional assessment of risks was outside the scope of this assignment. A discussion of various risk measures is included on pages A-13 through A-15 of this report.

This report 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 the actuarial position of IMRF as of the valuation date. 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.

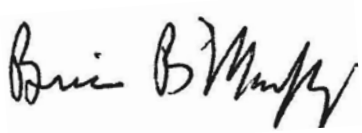
Brian B. Murphy, Mark Buis, and Francois Pieterse are Members of the American Academy of Actuaries (MAAA). These actuaries meet the Academy's Qualification Standards to render the actuarial opinions contained herein.

The signing actuaries are independent of the plan sponsor.

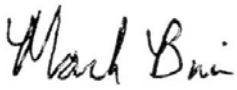
Gabriel, Roeder, Smith & Company will be pleased to review this valuation and report with the Board of Trustees and to answer any questions pertaining to the valuation.

Respectfully submitted,

GABRIEL, ROEDER, SMITH & COMPANY



Brian B. Murphy, FSA, EA, FCA, MAAA, PhD



Mark Buis, FSA, EA, FCA, MAAA

Francois Pieterse, ASA, FCA, MAAA

BBM/MB/FP:sc

# Introduction

IMRF is established under statutes adopted by the Illinois General Assembly. It is an agent multiple employer defined benefit pension plan that, as of December 31, 2019, encompasses 3,361 active plans and serves 461,368 active and inactive members and retired persons. Since IMRF reports information to us by plan, there are cases in which a person with coverage in more than one plan is counted multiple times for census counts. This produces an overstatement in the census when compared with true counts of people. This issue may affect inactive members to a greater extent than it affects others. Liabilities are, however, correctly calculated and apportioned among employers. IMRF is funded by both member and employer contributions. Members contribute at fixed rates determined by statute. Regular members contribute 4.5% of pay; SLEP members contribute 7.5%; ECO members contribute 7.5%. Participating employers make all additional contributions needed to provide benefits. Each employer contributes to a separate account within IMRF which, when combined with member contributions and investment income, will be sufficient to provide future benefits for its own employees. Employer contributions for each plan are computed each year in the actuarial valuation and consist of:

- **Normal Cost Contributions** for normal and early retirement benefits, separation benefits, permanent disability benefits, and annuity type death benefits. These contributions are the same as a percentage of payroll for most employers (larger employers have the option of being individually rated).

- **Contributions for lump sum death-in-service benefits**, which are separately determined for each employer.

- **Contributions for temporary disability benefits**, which are 0.09% of payroll for each employer.

- **Contributions for 13$^{th}$ Payments**, which are 0.62% of covered payroll for each employer.

- **Contributions for Early Retirement Incentive (ERI) unfunded liabilities** which are separately determined for each employer.

- **Contributions for other unfunded liabilities**, which are separately determined for each employer. For employers with taxing authority, unfunded liabilities are being funded over a 22-year closed period. For non-taxing employers the unfunded liabilities are being funded over a 10-year rolling period. Unfunded liabilities associated with benefit changes for SLEP members (Public Act 94-712) are amortized over 17 years for most employers. The amortization policy is described on page D-15.

Employer contributions computed in this valuation compared with those computed in the prior valuation are shown below.

| | Average Employer Contribution Rates Expressed as %'s of Active Member Pays | | | |
|---|---|---|---|---|
| | **Regular** | **SLEP** | **ECO** | **Average/Total** |
| This Valuation | 10.62% | 23.70% | 71.68% | 11.23% |
| Prior Valuation | 10.91% | 24.48% | 72.66% | 11.56% |

This year's valuation results were affected by:

- Favorable investment performance.
- Continued recognition of Tier 2 benefits for new hires.
- ERI liabilities.
- Three employers are individually rated (DuPage County; Union School District 46 and Peoria County). Although these employers will receive separate valuation reports, member counts, assets, and liabilities for these employers are also included in the totals in this valuation report.

A full reconciliation of changes in contribution rates can be found in the Gain/Loss Analysis report. Based upon this year's valuation results, IMRF is 90.7% funded and the average/total employer rate is 11.23% of payroll.

Section A of this report describes this year's valuation results in depth.

**Looking Ahead:** There are forces acting to decrease rates in the future, and, potentially, forces acting to increase rates.

**Among the forces acting to decrease rates are:**

- The percentage of the population covered by Tier 2 will grow for many years.
- The market value of assets is currently higher than the value recognized in this valuation. If all assumptions are met in the future, the gradual recognition of that gap will lead to downward pressure on rates.

**Among the forces acting to increase rates are:**

- Unfavorable investment markets after the measurement date of December 31, 2019.

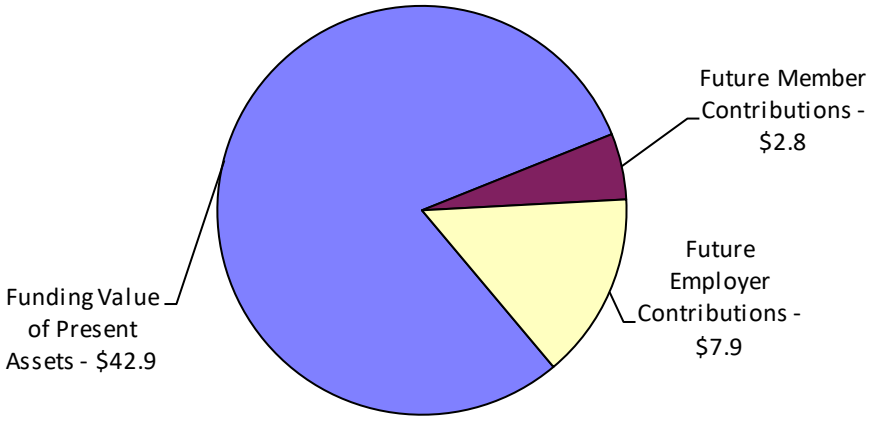
How these forces will interact with each other, and what other forces will emerge, remains to be seen.

# SECTION A

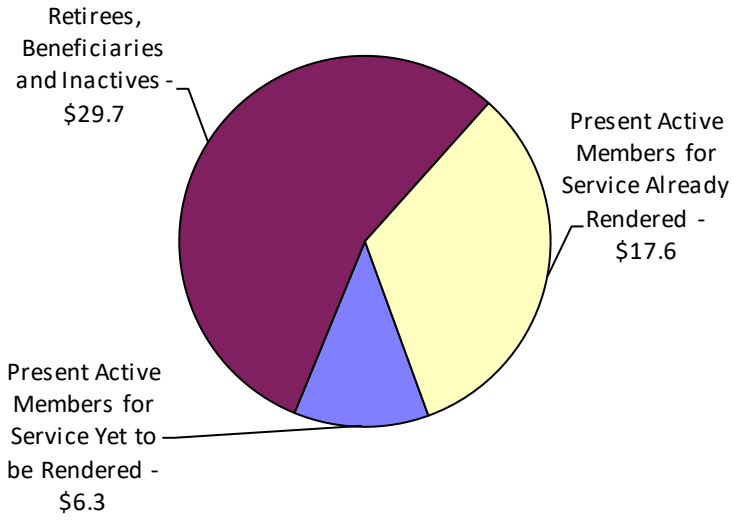
## VALUATION RESULTS

# Financing $53.6 Billion Worth of Benefit Promises to Present Members, Retirees and Beneficiaries December 31, 2019 (Amounts in $Billions)

**Sources of Funds**




**IMRF Obligations**



# Actuarial Balance Sheet
# December 31, 2019

**Funding Sources**

| | Regular | SLEP | ECO | Total |
|---|---|---|---|---|
| **Present Valuation Assets** | | | | |
| Member Contributions | $ 6,651,272,110 | $ 424,960,348 | $ 20,134,915 | $ 7,096,367,373 |
| VA Member Contributions | 251,053,689 | 15,955,117 | 198,678 | 267,207,484 |
| Employer Assets | 11,240,100,009 | 622,417,607 | (2,979,945) | 11,859,537,671 |
| Retired Life Assets | 23,484,426,624 | 1,928,035,088 | 307,083,747 | 25,719,545,459 |
| Market Value Adjustment | (1,877,362,406) | (135,114,979) | (14,720,419) | (2,027,197,804) |
| Death and Disability Reserves | | | | 20,725,755 |
| Total Present Assets | $39,749,490,026 | $2,856,253,181 | $309,716,976 | $42,936,185,938 |
| **Future Assets** | | | | |
| Member Contributions | $ 2,553,199,728 | $ 200,983,822 | $ 2,233,840 | $ 2,756,417,390 |
| Employer Contributions | | | | |
| Normal Costs | 3,224,741,315 | 298,224,893 | 4,232,379 | 3,527,198,587 |
| Unfunded Liability | 3,867,439,072 | 491,943,668 | 62,332,590 | 4,421,715,330 |
| Total Employer | $ 7,092,180,387 | $ 790,168,561 | $ 66,564,969 | $ 7,948,913,917 |
| Total Future Assets | $ 9,645,380,115 | $ 991,152,383 | $ 68,798,809 | $10,705,331,307 |
| **Total Funding Sources** | **$49,394,870,141** | **$3,847,405,564** | **$378,515,785** | **$53,641,517,245** |

**Funding Uses**

| **Funds Needed for** | Regular | SLEP | ECO | Total |
|---|---|---|---|---|
| Active Members | $21,813,889,740 | $1,798,810,852 | $ 43,473,755 | $23,656,174,347 |
| Inactive Members | 3,845,500,088 | 104,604,507 | 27,759,605 | 3,977,864,200 |
| VA Members | 251,053,689 | 15,955,117 | 198,678 | 267,207,484 |
| Retirees and Beneficiaries | 23,484,426,624 | 1,928,035,088 | 307,083,747 | 25,719,545,459 |
| Death and Disability Benefits | | | | 20,725,755 |
| **Total Actuarial Present Value** | **$49,394,870,141** | **$3,847,405,564** | **$378,515,785** | **$53,641,517,245** |

# Development of Average Contribution Rates Applicable to Calendar Year 2021 (Results as of December 31, 2019)

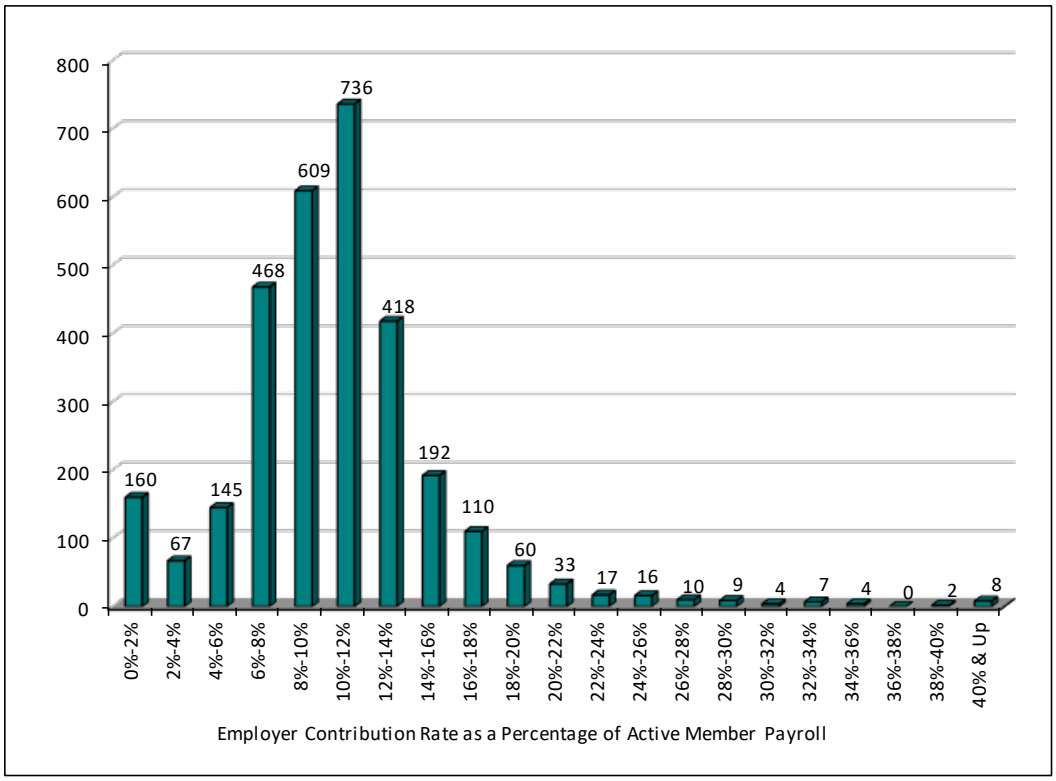
| | % of Active Member Pays | | |
|---|---|---|---|
| | **Regular** | **SLEP** | **ECO** |
| Tier 1 Employer Normal Cost | 6.89 % | 13.23 % | 14.21 % |
| Tier 2 Employer Normal Cost | 4.03 % | 8.51 % | 14.21 % |
| Average Employer Contributions for Normal Cost* | | | |
| Retirement | 5.80 % | 11.60 % | 13.89 % |
| $3,000 Lump Sum Death Benefit | 0.03 % | 0.02 % | 0.04 % |
| Total & Permanent Disability Benefit | 0.03 % | 0.10 % | 0.28 % |
| Total Normal Cost | 5.86 % | 11.72 % | 14.21 % |
| Lump Sum Death-in-Service Benefits | 0.15 % | 0.16 % | 0.19 % |
| Temporary Disability | 0.09 % | 0.09 % | 0.09 % |
| 13th Payments | 0.62 % | 0.62 % | 0.62 % |
| Unfunded (Overfunded) Liabilities (22/10 years) | 3.74 % | 9.03 % | 56.57 % |
| Early Retirement Incentive Liabilities | 0.16 % | 0.09 % | 0.00 % |
| SLEP Supplemental Liabilities | 0.00 % | 1.99 % | 0.00 % |
| **Total Average Employer Rate** | **10.62 %** | **23.70 %** | **71.68 %** |
| Prior Year Averages | 10.91 % | 24.48 % | 72.66 % |

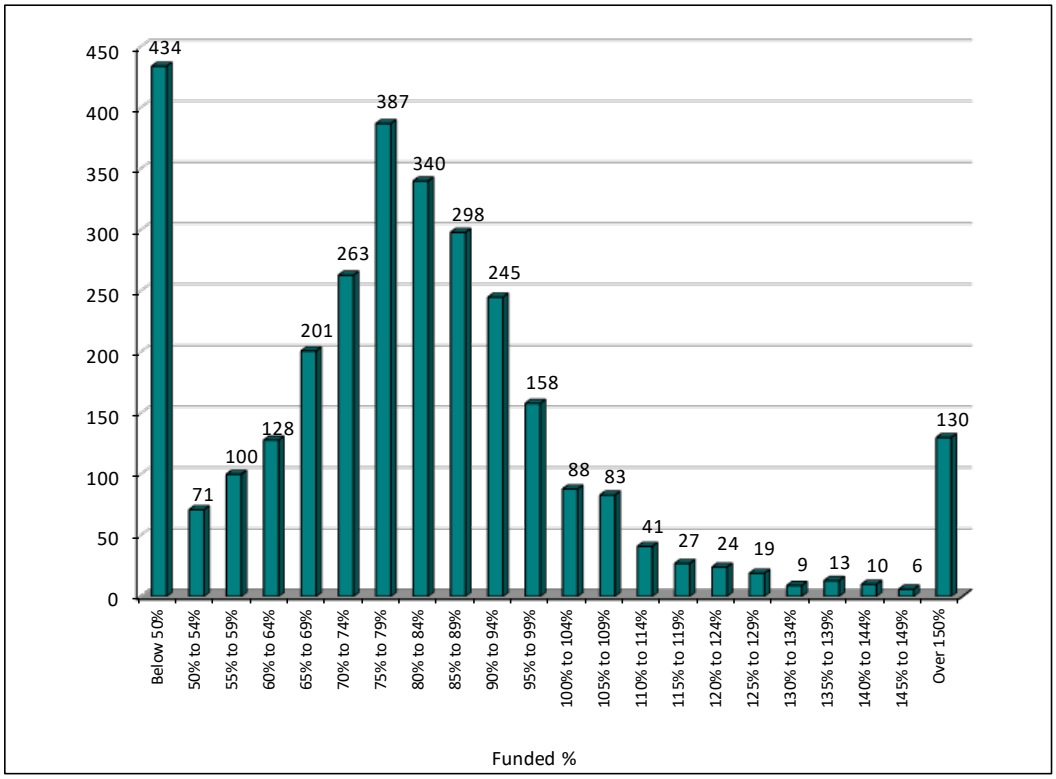
* *Average of Tier 1 and Tier 2 Normal Cost weighted on expected payroll.*

Each employer pays its normal cost in accordance with its mix of Tier 1 and Tier 2 employees and the percentages above (some larger employers have the option of paying an individual normal cost rate) and the same rate for temporary disability benefits and 13th Payments. Rates for lump sum death-in-service benefits, unfunded (overfunded) liabilities, and early retirement incentive liabilities are separately determined for each employer, and can vary widely. Because of this, the average contribution rates tell only part of the story. Pages A-4 through A-7 show the distribution of computed employer contribution rates, funding percents, and rate changes based on the annual required contribution from the prior year among the 3,075 Regular plans, 219 SLEP plans and 67 ECO plans. IMRF staff reviews all of the computed rates and, in some cases, may make adjustments to those rates that are not reflected in this report.

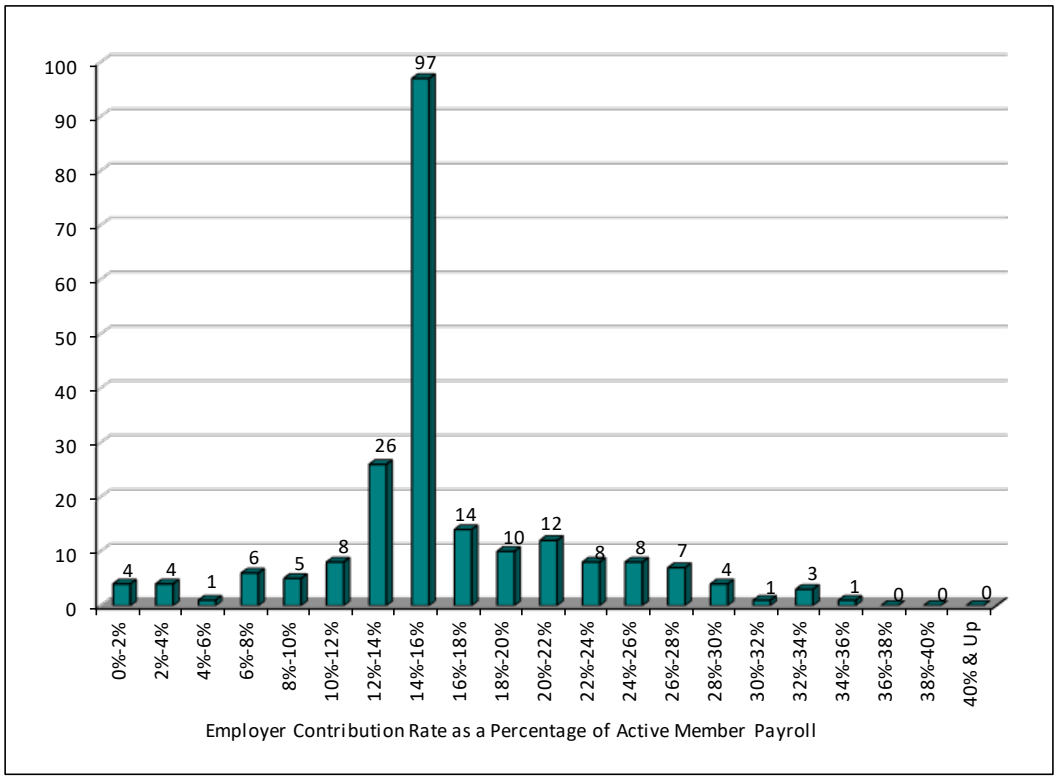
Employer contributions made during calendar year 2019 amounted to $779 million. This compares with $946 million in the previous year.

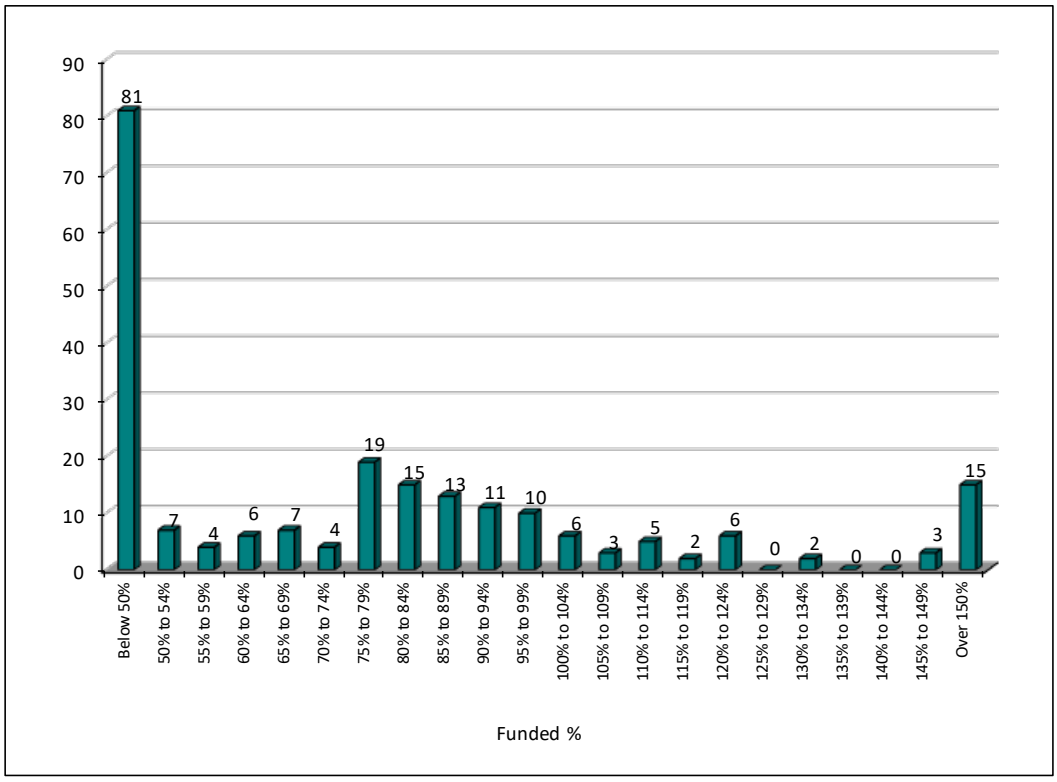
# Employer Contribution Rates and Funded Percents
# 3,075 Regular Employers at December 31, 2019



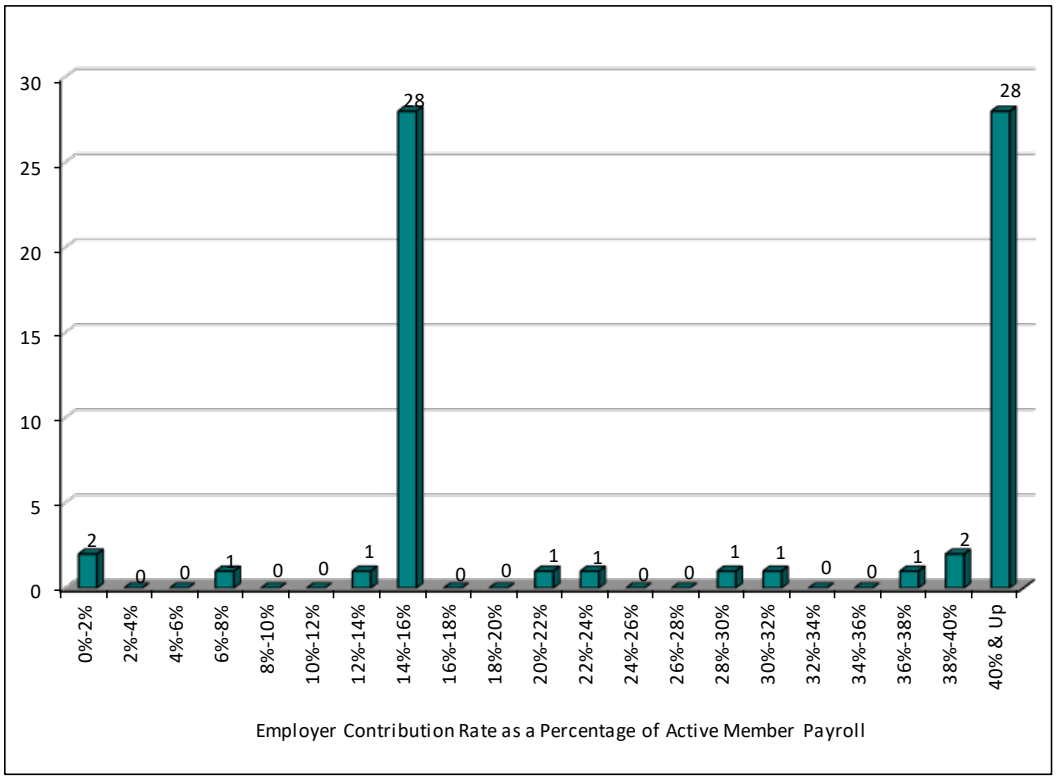



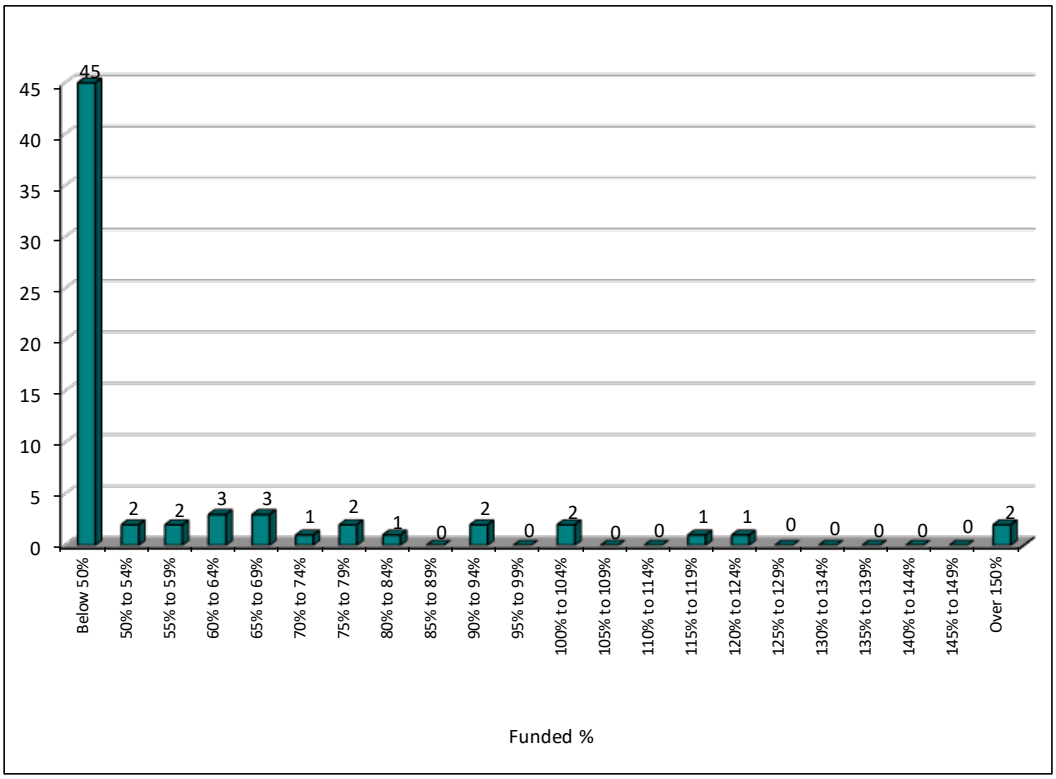
# Employer Contribution Rates and Funded Percents
# 219 SLEP Employers at December 31, 2019



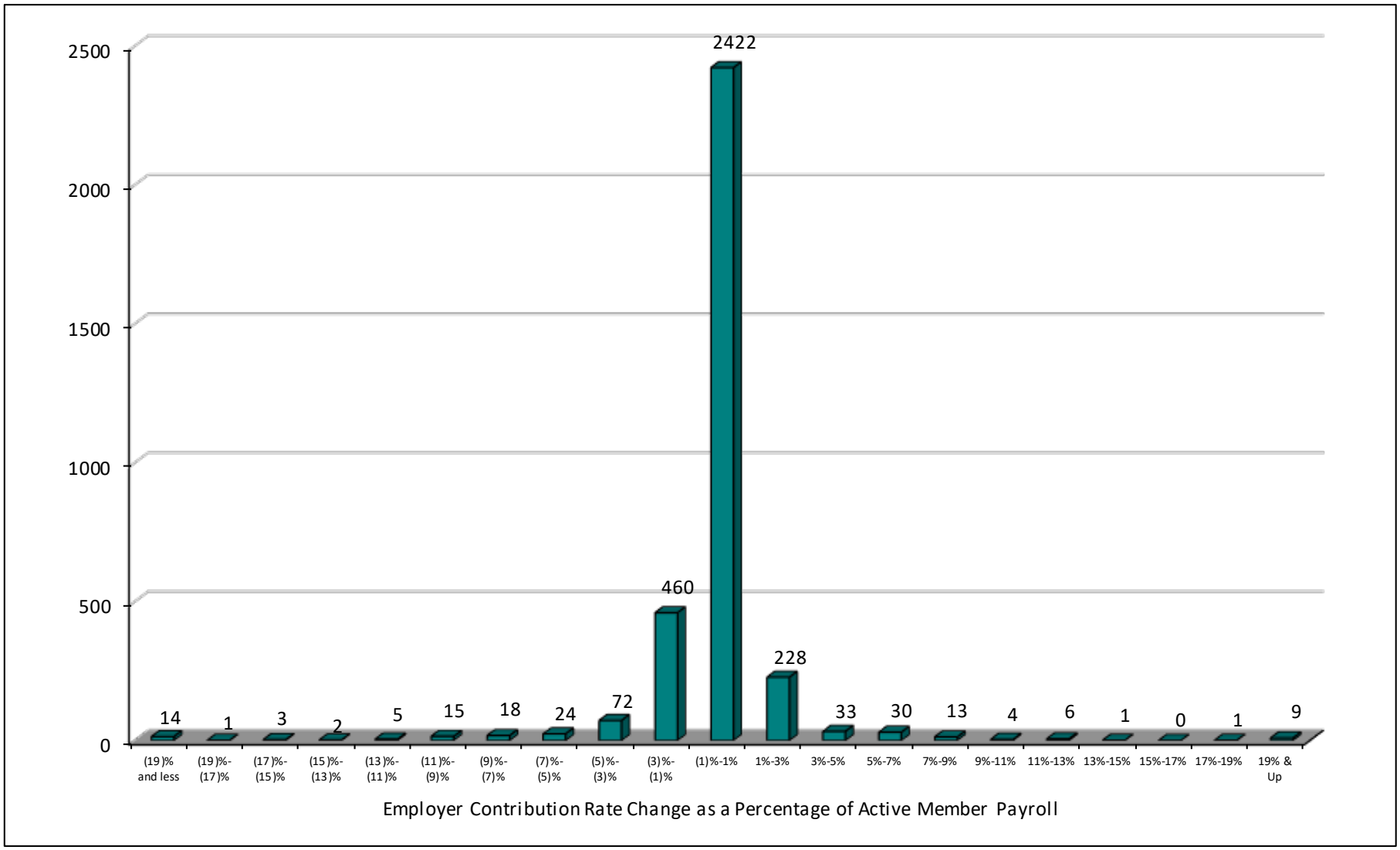



# Employer Contribution Rates and Funded Percents
# 67 ECO Employers at December 31, 2019



# Employer Contribution Rate Changes - 2019 Actuarial Valuations
# 3,361 Employers



# Historical Summary of Employer Rates

| Rate Applies to Calendar Year | Rate Computed as of December 31 | Employer Contribution Rate Expressed as % of Active Member Payroll | | | | | |
|---|---|---|---|---|---|---|---|
| | | Regular Members | | SLEP Members | | ECO Members | |
| | | Normal Cost | Average Total Rate | Normal Cost | Average Total Rate | Normal Cost | Average Total Rate |
| 1997 | 1995 | 7.27% | 9.61% | 9.32% | 11.43% | | |
| 1998 | 1996 [1] | 7.21% | 9.64% | 10.22% | 13.94% | | |
| 1999 | 1997 [3] | 7.23% | 9.03% | 10.62% | 14.65% | 21.48% | 36.14% |
| 2000 | 1998 | 7.17% | 8.16% | 10.42% | 14.28% | 23.39% | 41.38% |
| 2001 | 1999 [1] | 7.41% | 6.64% | 12.02% | 14.86% | 23.85% | 42.58% |
| 2002 | 2000 | 7.62% | 5.87% | 11.94% | 14.13% | 18.05% | 38.46% |
| 2003 | 2001 | 7.66% | 6.22% | 11.96% | 14.04% | 17.95% | 40.37% |
| 2004 | 2002 [1] | 7.60% | 7.82% | 12.47% | 16.29% | 18.18% | 44.90% |
| 2005 | 2003 | 7.61% | 9.25% | 12.48% | 17.15% | 18.07% | 42.66% |
| 2006 | 2004 | 7.64% | 10.04% | 12.56% | 18.25% | 18.01% | 44.90% |
| 2007 | 2005 [1, 2] | 7.43% | 9.72% | 11.66% | 18.42% | 17.52% | 41.30% |
| 2008 | 2006 | 7.42% | 9.47% | 11.63% | 19.33% | 16.96% | 41.80% |
| 2009 | 2007 | 7.42% | 9.27% | 11.63% | 18.65% | 17.08% | 42.77% |
| 2010 | 2008 [1] | 7.58% | 11.89% | 11.97% | 21.63% | 17.24% | 43.57% |
| 2011 | 2009 | 7.58% | 12.14% | 11.97% | 21.76% | 17.20% | 42.72% |
| 2012 | 2010 | 7.58% | 12.42% | 12.01% | 22.48% | 17.22% | 47.15% |
| 2013 | 2011 [1, 2] | 7.77% | 12.85% | 12.74% | 23.40% | 17.63% | 46.85% |
| 2014 | 2012 | 7.64% | 12.58% | 12.61% | 23.20% | 17.59% | 74.52% |
| 2015 | 2013 | 7.51% | 11.69% | 12.42% | 22.33% | 17.73% | 70.37% |
| 2016 | 2014 [1] | 6.84% | 11.73% | 11.95% | 22.71% | 16.49% | 86.07% |
| 2017 | 2015 | 6.71% | 11.34% | 11.77% | 22.39% | 16.83% | 73.50% |
| 2018 | 2016 | 6.61% | 11.24% | 11.63% | 21.49% | 16.85% | 82.72% |
| 2019 | 2017 [1] | 5.61% | 9.06% | 10.98% | 20.50% | 13.21% | 66.43% |
| 2020 | 2018 [1] | 5.98% | 10.91% | 11.94% | 24.48% | 13.79% | 72.66% |
| **2021** | **2019** | **5.86%** | **10.62%** | **11.72%** | **23.70%** | **14.21%** | **71.68%** |

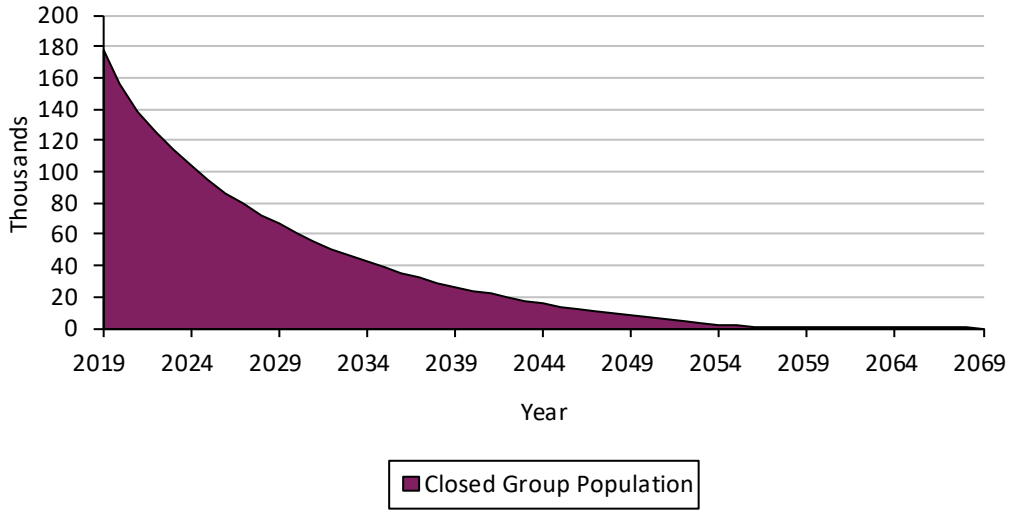
[1] *Assumption change.*
[2] *Benefit change.*
[3] *Changed to payroll weighted average method.*

As shown above, the average employer contribution rates decreased this year for regular, SLEP and ECO employers. The decrease was primarily due to favorable investment performance in 2019. Generally, small fluctuations from year to year should be expected for the average rate and for any large employer's rate. Small and very small employers will experience larger variations.

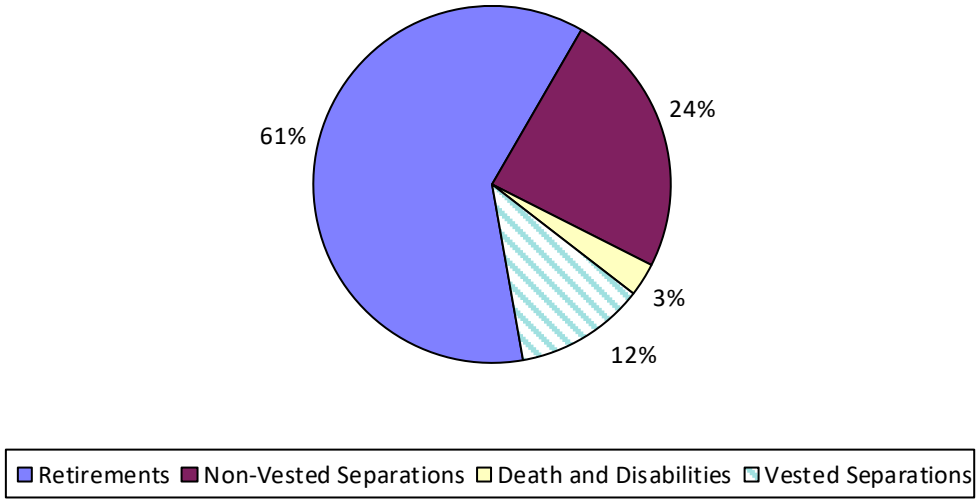
Most of the larger changes were for small employers (often employers covering just a few employees), since the removal or addition of one employee can significantly impact the contribution rate. The actuary and IMRF staff review all of the large rate changes individually in order to determine the reasonableness of the change. In some cases, rates may be adjusted following that review. Also, under certain circumstances employers have been allowed to phase in rate changes. Such adjustments are not reflected in this report.

# Expected Development of Present Population
# December 31, 2019

**Closed Group Population Projection**




**Expected Terminations from Active Employment for Current Active Members**




The charts above show the expected future development of the present population in simplified terms. The retirement system presently covers 177,795 active members. Eventually, 24% of the population is expected to terminate covered employment prior to retirement and forfeit eligibility for a monthly benefit. About 73% of the present population is expected to receive monthly retirement benefits either by retiring directly from active service, or by retiring from vested deferred status. Three percent of the present population is expected to become eligible for death-in-service or disability benefits. **Within seven years, over half of the covered membership is expected to consist of new hires.**

# Unfunded Actuarial Accrued Liabilities

In a retirement system such as IMRF, where unfunded liabilities are being amortized as a level percent of active member payroll, unfunded liabilities are expected to rise in dollar amount for an extended period before finally beginning to decrease. This has to do with inflation and the related fact that the dollar is a yardstick whose length changes every year. The schedule below illustrates the development of the unfunded liability, based upon actuarial value of assets, during the year.

| | Unfunded Liability Development During | |
|---|---|---|
| | **2019** | **2018** |
| Unfunded (Overfunded) Liability January 1 | $4,524,158,460 | $2,991,680,344 |
| Assumed Net (Payments) Credits | (336,629,003) | (212,346,977) |
| Assumed Interest | 326,641,691 | 216,508,988 |
| Expected Unfunded Liability December 31 | 4,514,171,148 | 2,995,842,355 |
| Increase/(Decrease) Due to Change in Assumptions | 0 | 1,190,996,469 |
| Increase/(Decrease) Due to Benefit Changes | 0 | 0 |
| Increase/(Decrease) Due to Data Changes | 0 | 0 |
| Loss/(Gain) Due to Investment Experience | (367,178,690) | 385,776,439 |
| Loss/(Gain) Due to Other Sources | 274,722,872 | (48,456,803) |
| Actual Unfunded Liability December 31 | $4,421,715,330 | $4,524,158,460 |

# Unfunded Actuarial Accrued Liabilities
# Comparative Statement
# (Amounts in $Millions)

| Valuation Date | (1) Actuarial Accrued Liabilities (AAL) | (2) Funding Value of Assets | (3) Unfunded AAL | (4) Valuation Payroll | (5) Funded Ratio (2)/(1) | (6) Liability/ Payroll (1)/(4) | (7) Assets/ Payroll (2)/(4) | (8) Unfunded/ Payroll (3)/(4) |
|---|---|---|---|---|---|---|---|---|
| 1994 | $ 8,126.6 | $ 7,078.9 | $ 1,047.8 | $2,946.5 | 87.1% | 275.8% | 240.2% | 35.6% |
| 1995 | 8,823.7 | 8,034.0 | 789.7 | 3,095.9 | 91.1% | 285.0% | 259.5% | 25.5% |
| 1996* | 9,778.6 | 9,076.3 | 702.3 | 3,084.1 | 92.8% | 317.1% | 294.3% | 22.8% |
| 1997 | 10,808.0 | 10,273.1 | 534.9 | 3,454.6 | 95.1% | 312.9% | 297.4% | 15.5% |
| 1998 | 11,860.9 | 11,636.5 | 224.4 | 3,696.0 | 98.1% | 320.9% | 314.8% | 6.1% |
| 1999* | 13,005.0 | 13,520.2 | (515.2) | 3,952.1 | 104.0% | 329.1% | 342.1% | - |
| 2000 | 14,153.1 | 15,169.4 | (1,016.3) | 4,184.7 | 107.2% | 338.2% | 362.5% | - |
| 2001 | 15,318.5 | 16,305.0 | (986.5) | 4,503.1 | 106.4% | 340.2% | 362.1% | - |
| 2002* | 16,559.9 | 16,800.2 | (240.3) | 4,755.1 | 101.5% | 348.3% | 353.3% | - |
| 2003 | 17,966.1 | 17,529.9 | 436.2 | 4,944.8 | 97.6% | 363.3% | 354.5% | 8.8% |
| 2004 | 19,424.7 | 18,316.0 | 1,108.7 | 5,161.1 | 94.3% | 376.4% | 354.9% | 21.5% |
| 2005 *# | 20,815.1 | 19,698.4 | 1,116.7 | 5,374.6 | 94.6% | 387.3% | 366.5% | 20.8% |
| 2006 | 22,488.2 | 21,427.1 | 1,061.0 | 5,630.7 | 95.3% | 399.4% | 380.5% | 18.8% |
| 2007 | 24,221.5 | 23,274.4 | 947.2 | 5,931.4 | 96.1% | 408.4% | 392.4% | 16.0% |
| 2008 * | 25,611.2 | 21,601.1 | 4,010.1 | 6,259.3 | 84.3% | 409.2% | 345.1% | 64.1% |
| 2009 | 27,345.1 | 22,754.8 | 4,590.3 | 6,461.7 | 83.2% | 423.2% | 352.1% | 71.0% |
| 2010 | 29,129.2 | 24,251.1 | 4,878.1 | 6,391.2 | 83.3% | 455.8% | 379.4% | 76.3% |
| 2011 *# | 30,962.8 | 25,711.3 | 5,251.5 | 6,431.3 | 83.0% | 481.4% | 399.8% | 81.7% |
| 2012 | 32,603.2 | 27,491.8 | 5,111.4 | 6,496.1 | 84.3% | 501.9% | 423.2% | 78.7% |
| 2013 | 34,356.6 | 30,083.0 | 4,273.6 | 6,602.5 | 87.6% | 520.4% | 455.6% | 64.7% |
| 2014 * | 37,465.1 | 32,700.2 | 4,764.9 | 6,732.5 | 87.3% | 556.5% | 485.7% | 70.8% |
| 2015 | 39,486.6 | 34,913.1 | 4,573.5 | 6,919.3 | 88.4% | 570.7% | 504.6% | 66.1% |
| 2016 | 41,358.7 | 36,773.4 | 4,585.3 | 7,006.7 | 88.9% | 590.3% | 524.8% | 65.4% |
| 2017 * | 42,179.5 | 39,187.8 | 2,991.7 | 7,127.5 | 92.9% | 591.8% | 549.8% | 42.0% |
| 2018 * | 45,354.1 | 40,830.0 | 4,524.1 | 7,321.5 | 90.0% | 619.5% | 557.7% | 61.8% |
| **2019** | **47,357.9** | **42,936.2** | **4,421.7** | **7,547.5** | **90.7%** | **627.5%** | **568.9%** | **58.6%** |

* *Assumption change.*
\# *Benefit change.*

While no one or two numeric indices can fully describe the financial condition of a retirement system, trends in both the Funded Ratio (column 5) and the Unfunded/Payroll Ratio (column 8) provide useful information. Unfunded accrued liabilities represent plan debt, while active member payroll represents the plan's capacity to service the debt. In a retirement system that is following the discipline of level percent of payroll financing, the Funded Ratio should gradually move toward 100% and the Unfunded/Payroll ratio should gradually move toward 0%.

# Unfunded Actuarial Accrued Liabilities

## General Implications of Contribution Allocation Procedure or Funding Policy on Future Expected Plan Contributions and Funded Status

Given the plan's contribution allocation procedure, if all actuarial assumptions are met (including the assumption of the plan earning 7.25% on the actuarial value of assets), it is expected that:

1. The employer normal cost as a percentage of pay will decrease to the level of the Tier 2 normal cost as time passes as the majority of the active population will consist of Tier 2 members,
2. The unfunded actuarial accrued liability will increase in dollar amount for several years before it begins to decrease, and
3. The funded status of the plan will increase gradually towards a 100% funded ratio without ever actually reaching it.

When selecting a contribution allocation procedure, the following three items should be considered, including the balance amongst the three items: (1) benefit security, (2) intergenerational equity, and (3) contribution stability and predictability. Generally, given the nature of public employee retirement systems (e.g., level contribution financing objective and perceived ongoing nature of the plan or plan sponsor), intergenerational equity and contribution stability and predictability have received more consideration than benefit security when contribution allocation procedures are selected. However, given the importance of benefit security to any retirement system, we suggest that contributions to the System in excess of those presented in this report be considered.

## Limitations of Funded Status Measurements

Unless otherwise indicated, a funded status measurement presented in this report is based upon the actuarial accrued liability and the actuarial value of assets. Unless otherwise indicated, with regard to any funded status measurements presented in this report:

1. The measurement is inappropriate for assessing the sufficiency of plan assets to cover the estimated cost of settling the plan's benefit obligations, in other words, for transferring the obligations to an unrelated third party (e.g., insurance company) in a market value type transaction. In addition, the measurement is inappropriate for assessing benefit security for the membership.
2. The measurement is dependent upon the actuarial cost method which, in combination with the plan's amortization policy, affects the timing and amounts of future contributions. The amounts of future contributions will most certainly differ from those assumed in this report due to future actual experience differing from assumed experience based upon the actuarial assumptions. A funded status measurement in this report of 100% is not synonymous with no required future contributions. If the funded status were 100%, the plan would still require future normal cost contributions (i.e., contributions to cover the cost of the active membership accruing an additional year of service credit).

The measurement would produce a different result if the market value of assets were used instead of the actuarial value of assets, unless the market value of assets is used in the measurement.

# Risk Measures

## Risks Associated with Measuring the Accrued Liability and Actuarially Determined Contribution

The determination of the accrued liability and the actuarially determined contribution requires the use of assumptions regarding future economic and demographic experience. Risk measures, as illustrated in this report, are intended to aid in the understanding of the effects of future experience differing from the assumptions used in the course of the actuarial valuation. Risk measures may also help with illustrating the potential volatility in the accrued liability and the actuarially determined contribution that result from the differences between actual experience and the actuarial assumptions.

Examples of risks that may reasonably be anticipated to significantly affect the plan's future financial condition include:

1. **Investment risk** – actual investment returns may differ from the expected returns;
2. **Asset/Liability mismatch** – changes in asset values may not match changes in liabilities, thereby altering the gap between the accrued liability and assets and consequently altering the funded status and contribution requirements;
3. **Contribution risk** – actual contributions may differ from expected future contributions. For example, actual contributions may not be made in accordance with the plan's funding policy or material changes may occur in the anticipated number of covered employees, covered payroll, or other relevant contribution base;
4. **Salary and Payroll risk** – actual salaries and total payroll may differ from expected, resulting in actual future accrued liability and contributions differing from expected;
5. **Longevity risk** – members may live longer or shorter than expected and receive pensions for a period of time other than assumed; and
6. **Other demographic risks** – members may terminate, retire or become disabled at times or with benefits other than assumed resulting in actual future accrued liability and contributions differing from expected.

The effects of certain trends in experience can generally be anticipated. For example, if the investment return since the most recent actuarial valuation is less (or more) than the assumed rate, the cost of the plan can be expected to increase (or decrease). Likewise, if longevity is improving (or worsening), increases (or decreases) in cost can be anticipated. If the investment return assumption is on the optimistic end of the spectrum, investment experience may be less favorable than assumed, leading to increases in contribution rates.

The contribution rates developed in connection with this valuation are designed to comply with the Board's funding policy and actuarial standards of practice, but do not set a maximum amount that may be contributed. The timely receipt of the actuarially determined contributions is critical to support the financial health of the plan. Users of this report should be aware that contributions made at the actuarially determined rate do not necessarily guarantee benefit security.

# Risk Measures (Continued)

| $ Millions | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Valuation Date | (1) Accrued Liabilities (AAL) | (2) Market Value of Assets | (3) Unfunded AAL (1)-(2) | (4) Valuation Payroll | (5) Change in Valuation Payroll | (6) Funded Ratio (2)/(1) | (7) Annuitant Liabilities (AnnLiab) | (8) AnnLiab/ AAL (7)/(1) | (9) Liability/ Payroll (1)/(4) |
| 2004 | $19,424.7 | $18,316.0 | $1,108.7 | $5,161.1 | 4.4% | 94.3% | $ 7,332.5 | 37.7% | 376.4% |
| 2005 *# | 20,815.1 | 19,793.5 | 1,021.6 | 5,374.6 | 4.1% | 95.1% | 7,966.1 | 38.3% | 387.3% |
| 2006 | 22,488.2 | 22,452.2 | 36.0 | 5,630.7 | 4.8% | 99.8% | 8,652.3 | 38.5% | 399.4% |
| 2007 | 24,221.5 | 24,211.5 | 10.0 | 5,931.4 | 5.3% | 100.0% | 9,400.8 | 38.8% | 408.4% |
| 2008 * | 25,611.2 | 18,000.9 | 7,610.3 | 6,259.3 | 5.5% | 70.3% | 10,025.6 | 39.1% | 409.2% |
| 2009 | 27,345.1 | 22,282.2 | 5,062.9 | 6,461.7 | 3.2% | 81.5% | 10,903.3 | 39.9% | 423.2% |
| 2010 | 29,129.2 | 25,132.4 | 3,996.8 | 6,391.2 | -1.1% | 86.3% | 12,122.0 | 41.6% | 455.8% |
| 2011 *# | 30,962.8 | 24,833.7 | 6,129.1 | 6,431.3 | 0.6% | 80.2% | 13,388.0 | 43.2% | 481.4% |
| 2012 | 32,603.2 | 27,995.3 | 4,607.9 | 6,496.1 | 1.0% | 85.9% | 14,482.6 | 44.4% | 501.9% |
| 2013 | 34,356.6 | 33,203.0 | 1,153.6 | 6,602.5 | 1.6% | 96.6% | 15,753.1 | 45.9% | 520.4% |
| 2014 * | 37,465.1 | 34,833.1 | 2,632.0 | 6,732.5 | 2.0% | 93.0% | 17,885.0 | 47.7% | 556.5% |
| 2015 | 39,486.6 | 34,461.1 | 5,025.5 | 6,919.3 | 2.8% | 87.3% | 19,471.6 | 49.3% | 570.7% |
| 2016 | 41,358.7 | 36,446.8 | 4,911.9 | 7,006.7 | 1.3% | 88.1% | 21,085.5 | 51.0% | 590.3% |
| 2017* | 42,179.5 | 41,312.7 | 866.8 | 7,127.5 | 1.7% | 97.9% | 22,007.9 | 52.2% | 591.8% |
| 2018 | 45,354.1 | 38,755.6 | 6,598.5 | 7,321.5 | 2.7% | 85.5% | 24,106.3 | 53.2% | 619.5% |
| **2019** | **47,357.9** | **44,923.5** | **2,434.4** | **7,547.5** | **3.1%** | **94.9%** | **25,719.5** | **54.3%** | **627.5%** |

*Beginning in 2018, these Risk Measures were based on 7.25% future investment return.*

Notes:

(*). IMRF had experience studies in these years leading to a change or "true up" in actuarial assumptions. A pattern of periodic studies is a sign of a well run system and suggests the extent to which the liability measures the actuary provides are likely to be realistic.

(#). IMRF had benefit changes in these years. Benefit increases cause liabilities to rise; benefit decreases cause liabilities to fall. In either case, benefit changes affect the year by year comparability of the measures on this page.

(5). When payroll grows at or faster than the assumed rate, funding of unfunded accrued liabilities is likely to proceed at least at the scheduled rate. Payroll growing slower than the assumed rate can lead to underfunding of the plan because expected contributions for unfunded liability may not be received.

(6). The Funded ratio is the most widely known measure of a plan's financial strength, but the trend in the funded ratio is much more important than the absolute ratio. There can be more than one funded ratio measurement. The funded ratio shown on this page is computed on a Market Value basis. The funded ratio should trend to 100%. As it approaches 100%, it is important to re-evaluate the level of investment risk in the portfolio and potentially to re-evaluate the assumed rate of return.

(7) and (8). The ratio of Annuitant liabilities to total accrued liabilities gives an indication of the maturity of the system. As the ratio increases, cash flow needs increase, and the investment policy may need to change. A ratio on the order of 50% indicates a maturing system. A ratio significantly higher than 200% may indicate a closed system or another special situation.

(9). The ratio of liabilities to payroll gives an indication of both maturity and volatility. Many systems have ratios between 500% and 700%. Ratios significantly above that range may indicate difficulty in supporting the benefit level as a level % of payroll.

# Risk Measures (Concluded)

| $ Millions | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Valuation Date | (10) Assets/ Payroll (2)/(4) | (11) Portfolio StdDev | (12) Std Dev % of Pay (10)x(11) | (13) Unfunded/ Payroll (3)/(4) | (14) Net External Cash Flow (NECF) | (15) NECF/ Assets (14)/(2) | (16) Portfolio Rate of Return | (17) 10-Year Trailing Average |
| 2004 | 354.9% | | | 21.5% | $(48.3) | -0.3% | 12.3% | |
| 2005 *# | 368.3% | | | 19.0% | (14.5) | -0.1% | 8.1% | |
| 2006 | 398.7% | | | 0.6% | (10.5) | 0.0% | 13.5% | |
| 2007 | 408.2% | | | 0.2% | (63.2) | -0.3% | 8.1% | |
| 2008 * | 287.6% | | | 121.6% | (84.2) | -0.5% | -25.3% | |
| 2009 | 344.8% | | | 78.4% | (118.7) | -0.5% | 24.5% | |
| 2010 | 393.2% | | | 62.5% | (115.5) | -0.5% | 13.3% | 5.0% |
| 2011 *# | 386.1% | | | 95.3% | (187.3) | -0.8% | -0.4% | 5.7% |
| 2012 | 431.0% | | | 70.9% | (210.9) | -0.8% | 13.6% | 8.1% |
| 2013 | 502.9% | | | 17.5% | (271.9) | -0.8% | 19.7% | 7.8% |
| 2014 * | 517.4% | 13.1% | 67.8% | 39.1% | (391.9) | -1.1% | 6.1% | 7.2% |
| 2015 | 498.0% | 13.9% | 69.2% | 72.6% | (532.8) | -1.5% | 0.5% | 6.4% |
| 2016 | 520.2% | 12.0% | 62.3% | 70.1% | (624.9) | -1.7% | 7.6% | 5.9% |
| 2017* | 579.6% | 13.4% | 77.8% | 12.2% | (789.5) | -1.9% | 15.7% | 6.6% |
| 2018 | 529.3% | 13.1% | 69.4% | 90.1% | (878.2) | -2.3% | -4.1% | 9.3% |
| **2019** | **595.2%** | **13.0%** | **77.4%** | **32.3%** | **(1,178.4)** | **-2.6%** | **19.2%** | **8.8%** |

*Beginning in 2018, these Risk Measures were based on 7.25% future investment return.*

Notes:

(10). The ratio of assets to payroll gives an indication of both maturity and volatility. Many systems have ratios between 500% and 700%. Ratios significantly above that range may indicate difficulty in supporting the benefit level as a level % of payroll.

(11) and(12). The portfolio standard deviation measures the volatility of investment return. When multiplied by the ratio of assets to payroll it gives the effect of a one standard deviation asset move as a percent of payroll. This figure helps users understand the difficulty of dealing with investment volatility and the challenges volatility brings to sustainability.

(13). The ratio of unfunded liability to payroll gives an indication of the plan sponsor's ability to actually pay off the unfunded liability. A ratio above approximately 300% or 400% may indicate difficulty in discharging the unfunded liability within a reasonable time frame.

(14) and (15). The ratio of Net External Cash Flow to assets is an important measure of sustainability. Negative ratios are common and expected for a maturing system. In the longer term, this ratio should be on the order of approximately -4%. A ratio that is significantly more negative than that for an extended period could be a leading indicator of potential exhaustion of assets.

(16) and (17). Investment return is probably the largest single risk that most systems face. The year by year return and the 10-year geometric average give an indicator of the historical performance of the portfolio versus the system's assumed return. The averages are of course affected by the events of 2008.

# Short Condition Test

If the contributions to IMRF are level in concept and soundly executed, the Fund will ***pay all promised benefits when due -- the ultimate test of financial soundness***. Testing for level contribution rates is the ***long-term test.***

***A short condition test*** is one means of checking a system's progress under its funding program. In a short condition test, the plan's present assets (cash and investments) are compared with:

1) Member contributions on deposit;
2) The liabilities for future benefits to present retired lives; and
3) The liabilities for service already rendered by active and inactive members.

In a system that has been following the discipline of level percent of payroll financing, the liabilities for member contributions on deposit (liability 1) and the liabilities for future benefits to present retired lives (liability 2) will be fully covered by present assets (except in rare circumstances). In addition, the liabilities for service already rendered by active and inactive members (liability 3) will be partially covered by the remainder of present assets. The larger the funded portion of liability 3, the stronger the condition of the system.

## Short Condition Test (Regular, SLEP, ECO combined)

| | Aggregate Actuarial Liabilities For | | | | Portion of Actuarial Liabilities Covered by Assets | | |
|---|---|---|---|---|---|---|---|
| Calendar Year | (1) Non-Retired Contributions | (2) Annuitants | (3) Non-Retired Members (Employer Financed Portion) | Funding Value of Assets | (1) | (2) | (3) |
| 2002* | $2,950,041,671 | $ 6,050,882,416 | $ 7,558,983,215 | $ 16,800,195,504 | 100% | 100% | 103.2% |
| 2003 | 3,186,234,066 | 6,674,490,186 | 8,105,379,199 | 17,529,890,818 | 100% | 100% | 94.6% |
| 2004 | 3,423,785,725 | 7,332,542,340 | 8,668,338,951 | 18,315,987,910 | 100% | 100% | 87.2% |
| 2005*# | 3,688,148,208 | 7,966,135,229 | 9,160,777,405 | 19,698,401,285 | 100% | 100% | 87.8% |
| 2006 | 3,960,880,175 | 8,652,328,762 | 9,874,976,094 | 21,427,139,356 | 100% | 100% | 89.3% |
| 2007 | 4,248,399,825 | 9,400,832,984 | 10,572,310,907 | 23,274,361,198 | 100% | 100% | 91.0% |
| 2008* | 4,573,736,116 | 10,025,599,295 | 11,011,863,938 | 21,601,053,512 | 100% | 100% | 63.6% |
| 2009 | 4,893,022,745 | 10,903,323,478 | 11,548,766,993 | 22,754,803,784 | 100% | 100% | 60.3% |
| 2010 | 5,153,902,881 | 12,121,959,266 | 11,853,366,092 | 24,251,136,889 | 100% | 100% | 58.8% |
| 2011 *# | 5,417,822,062 | 13,388,018,799 | 12,156,974,567 | 25,711,287,584 | 100% | 100% | 56.8% |
| 2012 | 5,705,336,025 | 14,482,560,758 | 12,415,347,316 | 27,491,809,785 | 100% | 100% | 58.8% |
| 2013 | 5,957,217,332 | 15,753,071,341 | 12,646,286,800 | 30,083,042,548 | 100% | 100% | 66.2% |
| 2014 * | 6,262,110,058 | 17,885,026,667 | 13,318,010,887 | 32,700,208,537 | 100% | 100% | 64.2% |
| 2015 | 6,488,892,894 | 19,506,345,352 | 13,491,335,644 | 34,913,127,469 | 100% | 100% | 66.1% |
| 2016 | 6,714,120,028 | 21,085,519,077 | 13,559,071,297 | 36,773,397,527 | 100% | 100% | 66.2% |
| 2017 * | 6,924,946,616 | 22,007,921,865 | 13,246,614,175 | 39,187,802,312 | 100% | 100% | 77.4% |
| 2018 * | 7,141,414,323 | 24,106,296,051 | 14,106,400,279 | 40,829,952,193 | 100% | 100% | 67.9% |
| **2019** | **7,372,126,920** | **25,719,545,459** | **14,266,228,889** | **42,936,185,938** | **100%** | **100%** | **69.0%** |

* *Assumption change.*
\# *Benefit change.*

# Short Condition Test

## Regular Members

| Calendar Year | Aggregate Actuarial Liabilities For (1) Non-Retired Contributions | (2) Annuitants | (3) Non-Retired Members (Employer Financed Portion) | Funding Value of Assets | Portion of Actuarial Liabilities Covered by Assets (1) | (2) | (3) |
|---|---|---|---|---|---|---|---|
| 2010 | $4,841,653,264 | $11,047,821,308 | $11,007,557,254 | $22,628,324,412 | 100% | 100% | 61.2% |
| 2011 *# | 5,087,758,544 | 12,189,531,092 | 11,298,603,677 | 23,948,247,636 | 100% | 100% | 59.0% |
| 2012 | 5,350,457,218 | 13,212,926,495 | 11,531,067,293 | 25,599,029,673 | 100% | 100% | 61.0% |
| 2013 | 5,578,881,769 | 14,369,082,490 | 11,726,152,647 | 27,972,103,567 | 100% | 100% | 68.4% |
| 2014 * | 5,864,657,124 | 16,328,679,943 | 12,393,664,527 | 30,402,948,477 | 100% | 100% | 66.2% |
| 2015 | 6,078,358,544 | 17,811,924,086 | 12,534,397,434 | 32,424,981,363 | 100% | 100% | 68.1% |
| 2016 | 6,291,877,038 | 19,261,898,572 | 12,633,562,550 | 34,123,098,220 | 100% | 100% | 67.8% |
| 2017 * | 6,490,226,071 | 20,092,314,923 | 12,298,162,175 | 36,331,479,430 | 100% | 100% | 79.3% |
| 2018 * | 6,695,020,590 | 22,000,474,720 | 13,086,811,427 | 37,838,485,682 | 100% | 100% | 69.9% |
| **2019** | **6,910,342,167** | **23,484,426,624** | **13,241,084,921** | **39,768,414,640** | **100%** | **100%** | **70.8%** |

* *Assumption change.*
\# *Benefit change.*

## SLEP Members

| Calendar Year | Aggregate Actuarial Liabilities For (1) Non-Retired Contributions | (2) Annuitants | (3) Non-Retired Members (Employer Financed Portion) | Funding Value of Assets | Portion of Actuarial Liabilities Covered by Assets (1) | (2) | (3) |
|---|---|---|---|---|---|---|---|
| 2010 | $284,935,047 | $ 868,199,000 | $739,639,201 | $1,410,557,658 | 100% | 100% | 34.8% |
| 2011 *# | 301,264,894 | 976,023,299 | 754,994,446 | 1,533,422,771 | 100% | 100% | 33.9% |
| 2012 | 326,676,260 | 1,025,411,748 | 792,652,347 | 1,644,518,055 | 100% | 100% | 36.9% |
| 2013 | 350,386,522 | 1,151,948,743 | 836,915,042 | 1,870,636,530 | 100% | 100% | 44.0% |
| 2014 * | 370,537,841 | 1,294,788,995 | 850,193,605 | 2,035,365,794 | 100% | 100% | 43.5% |
| 2015 | 383,662,153 | 1,420,665,538 | 888,665,484 | 2,203,555,749 | 100% | 100% | 44.9% |
| 2016 | 397,369,461 | 1,541,181,527 | 864,975,181 | 2,366,215,732 | 100% | 100% | 49.4% |
| 2017 * | 410,693,526 | 1,634,411,371 | 890,594,187 | 2,563,303,924 | 100% | 100% | 58.2% |
| 2018 * | 424,847,491 | 1,803,835,984 | 968,157,159 | 2,689,937,170 | 100% | 100% | 47.6% |
| **2019** | **441,427,545** | **1,928,035,088** | **980,287,898** | **2,857,806,863** | **100%** | **100%** | **49.8%** |

* *Assumption change.*
\# *Benefit change.*

# Short Condition Test

## ECO Members

| Calendar Year | Aggregate Actuarial Liabilities For (1) Non-Retired Contributions | (2) Annuitants | (3) Non-Retired Members (Employer Financed Portion) | Funding Value of Assets | Portion of Actuarial Liabilities Covered by Assets (1) | (2) | (3) |
|---|---|---|---|---|---|---|---|
| 2010 | $27,314,570 | $ 205,938,958 | $106,169,637 | $212,254,819 | 100% | 90% | 0.0% |
| 2011 *# | 28,798,624 | 222,464,408 | 103,376,444 | 229,617,177 | 100% | 90% | 0.0% |
| 2012 | 28,202,547 | 244,222,515 | 91,627,676 | 248,262,057 | 100% | 90% | 0.0% |
| 2013 | 27,949,041 | 232,040,108 | 83,219,111 | 240,302,451 | 100% | 92% | 0.0% |
| 2014 * | 26,915,093 | 261,557,729 | 74,152,755 | 261,894,266 | 100% | 90% | 0.0% |
| 2015 | 26,872,197 | 273,755,728 | 68,272,726 | 284,590,357 | 100% | 94% | 0.0% |
| 2016 | 24,873,529 | 282,438,978 | 60,533,566 | 284,083,575 | 100% | 92% | 0.0% |
| 2017 * | 24,027,019 | 281,195,571 | 57,857,813 | 293,018,958 | 100% | 96% | 0.0% |
| 2018 * | 21,546,242 | 301,985,347 | 51,431,693 | 301,529,341 | 100% | 93% | 0.0% |
| **2019** | **20,357,208** | **307,083,747** | **44,856,070** | **309,964,435** | **100%** | **94%** | **0.0%** |

* *Assumption change.*
\# *Benefit change.*

# SECTION B

## SUMMARY OF BENEFIT PROVISIONS AND VALUATION DATA

# Summary of Benefits and Conditions Evaluated
# December 31, 2019

This is a brief plan description of IMRF benefits. Additional conditions and restrictions may apply. A complete description is found in Article 7 of the Illinois Pension Code. Only the description found in Article 7 can be relied upon.

## Participating Employers

All counties and school districts, plus cities and villages and incorporated towns with a population of 5,000 or more (except certain governmental entities specifically excluded by the Pension Code) are required to participate. Other local government units may elect to participate.

## Membership

All appointed employees of a participating employer who are employed in a position normally requiring 600 hours (1,000 hours for certain employees hired after 1981) or more of work in a year are required to participate. Elected officials and hospital employees who satisfy requirements may also participate.

## Service Credit

Service credit is the total time under IMRF, stated in years and fractions. Service is credited monthly while the member is working, receiving IMRF disability benefits or on IMRF's Benefit Protection Leave. For revised ECO members, the ECO benefit formula is limited to service in an elected office.

Members may qualify for a maximum of one year of additional service credit for unused, unpaid sick leave accumulated with the last employer. Members who retire from a school district may utilize unused sick leave from all school district employers. This additional service credit applies only for members leaving employment for retirement. The service credit is earned at the rate of one month for every 20 days of unused, unpaid sick leave or fraction thereof. It applies to the determination of the amount of an annuity, but not to the minimum service period required for eligibility.

IMRF is a participating plan under the Reciprocal Act, as are all other Illinois public pension systems, except local police and fire pension plans. Under the Reciprocal Act, service credit of at least one year may be considered together at the date of retirement or death for the purpose of determining eligibility for and amount of benefits. However, for teacher aides who meet certain criteria, service credit of less than one year may be considered in determining benefits under the Reciprocal Act.

## Final Rate of Earnings (FRE)

***Retirement and Survivor Annuities***

***Tier 1 Members:*** The final rate of earnings for Regular and SLEP members is the highest total earnings during any 48 consecutive months within the last 10 years of IMRF service divided by 48 or the total lifetime earnings divided by the total lifetime number of months of service. The final rate of earnings for ECO members is the annual salary of the ECO member on the day he or she retires. For revised ECO members who join the plan after January 25, 2000, the final rate of earnings is the highest total earnings during any 48 consecutive months within the last 10 years of IMRF service divided by 48 for each office held.

***Tier 2 Members:*** The final rate of earnings for Regular and SLEP members is the highest total earnings during any 96 consecutive months within the last 10 years of IMRF service divided by 96 for each office held. Pensionable earnings were initially capped at $106,800, increase annually beginning in 2012 by three percent or one-half of the increase of the Consumer Price Index, whichever is less. For SLEP members, overtime compensation is excluded from pensionable earnings.

***Death Benefits:*** *The greater of the above amount or the average of earnings over the last 12 months of service.*

***Disability Benefits:*** The average of earnings over the last 12 months of service (for ECO members, annualized salary on last day of ECO participation).

# Summary of Benefits and Conditions Evaluated
# December 31, 2019

## Normal Retirement Pension Eligibility

***Tier 1 Members:***
Normal retirement for an unreduced pension is:

- Age 60 with eight or more years of service or 35 or more years of service at age 55,
- Age 50 with 20 or more years of SLEP service for members with SLEP service,
- Age 55 with eight or more years of service for members with ECO service, or
- Age 55 with eight or more years of service in the same elected county office for members with Revised ECO service.

***Tier 2 Members:***
Normal retirement for an unreduced pension is:

- Age 67 with ten or more years of service or 35 or more years of service at age 62,
- Age 55 with ten or more years of SLEP service for members with SLEP service, or
- Age 67 with eight or more years of service in the same elected county office for members with Revised ECO service.

## Normal Retirement Pension Amount

***A Regular IMRF pension is:***

- 1-2/3 percent of the final rate of earnings for each of the first 15 years of service credit, plus
- 2 percent for each year of service credit in excess of 15 years.

The maximum pension at retirement cannot exceed 75 percent of the final rate of earnings.

***A SLEP pension is:***

- 2-1/2 percent of the final rate of earnings for each year of service.

The maximum pension at retirement cannot exceed 80 percent (75 percent for Tier 2) of the final rate of earnings.

***An ECO pension is:***

- 3 percent of the final rate of earnings for each of the first eight years of service, plus
- 4 percent for each year of service between eight and 12 years of service, plus
- 5 percent for years of service credit over 12.

The maximum pension at retirement cannot exceed 80 percent of the final rate of earnings.

***A money purchase minimum pension*** is provided if it exceeds the normal formula amount. The money purchase minimum is the amount that may be purchased by 2.4 times the member's applicable accumulated contributions, including interest at the actuarial assumed rate.

***A reversionary pension option*** is provided to members at retirement. This option permits the member to revert a portion of their pension to one other person upon their death. This election is irrevocable. This payment option is often selected by members whose spouses are not eligible for a surviving spouse pension or who have children or other family members with special needs.

Factors for determining reversionary pension options are based on 120% of the current mortality rates (50% unisex) and interest at the actuarial assumed rate.

***An IMRF pension*** is paid for life.

## **Early Retirement** (not applicable to SLEP Tier 1 optional benefits or to ECO service)

***Tier 1 Members:*** Regular members may retire as early as age 55 with a reduced pension. The reduction is the lesser of:

- One-fourth percent for each month the member is under age 60, or
- One-fourth percent for each month of service less than 35 years.

***Tier 2 Members:*** Regular members may retire as early as age 62 with a reduced pension. The reduction is the lesser of:

- One-half percent for each month the member is under age 67, or
- One-half percent for each month of service less than 35 years.

SLEP members may retire as early as age 50 with a reduced pension. The reduction is one-half percent for each month the member is under age 55.

## Early Retirement Incentive Program (ERI)

***Eligibility and Amount:*** IMRF employers may offer an early retirement incentive (ERI) program to their employees who are over 50 (57 for Tier 2 regular and ECO members) years of age and who have at least 20 years of service credit. Eligible members may purchase up to five years of service credit and age. Employers must pay off the additional ERI liability within 10 years. Subsequent ERI programs may be offered once every five years by an employer after the liability for the previous ERI program is paid.
***Member Cost:*** For each year of service credit purchased, members pay the current member contribution rate multiplied by the highest 12 consecutive months of salary (within ERI period).

## Vesting

***Tier 1 Members:*** Members are vested for pension benefits when they have at least eight years of qualifying service credit. SLEP members are vested for a SLEP pension when they have at least 20 years of SLEP service credit. SLEP members with more than eight years of service but less than 20 years of SLEP service will receive a Regular pension. Revised ECO members (those who joined the ECO plan after January 25, 2000) are vested with eight or more years of ECO service credit in the same elected county position. Revised ECO members with eight years of service but less than eight years in the same elected county office will receive a Regular pension. Members can start drawing a benefit when either Normal or Early Retirement Pension Eligibility conditions are met.

***Tier 2 Members:*** Members are vested for pension benefits when they have at least 10 years of qualifying service credit. SLEP members are vested for a SLEP pension when they have at least 10 years of SLEP service credit. Revised ECO members (those who join the ECO plan after January 25, 2000) are vested with ten or more years of ECO service credit in the same elected county position. Revised ECO members with at least 10 years of total service but less than 10 years of service in the same elected county office will receive a Regular pension. Members can start drawing a benefit when either Normal or Early Retirement Pension Eligibility conditions are met.

## Surviving Spouse Pension

***For Regular and SLEP members:*** A surviving spouse's monthly pension is one-half (66-2/3 percent for Tier 2) of the member's pension.

***For ECO members:*** A surviving spouse's monthly pension is 66-2/3 percent of the member's pension. This pension is payable once the surviving spouse becomes 50 years old. If the spouse is caring for the member's minor, unmarried children, the spouse will receive (age 50 requirement does not apply):

- A monthly pension equal to 30 percent of the ECO member's salary at time of death, plus
- 10 percent of the ECO member's salary at time of death for each minor, unmarried child. The maximum total monthly benefit payable to spouse and children cannot exceed 50 percent of the ECO member's salary at time of death, or
- A monthly pension equal to 66-2/3 percent of the pension the member had earned.

Surviving spouse pensions under all plans are increased each January 1. The increase is based on the original amount of the pension. The increase for the first year is prorated for the number of months the surviving spouse or the member received a pension. For Tier 1, the annual increase is three percent. For Tier 2, the annual increase is three percent or one-half the increase in the Consumer Price Index, whichever is less.

# Summary of Benefits and Conditions Evaluated
# December 31, 2019

## Lump Sum Death-In-Service Benefit

***Less than 1 year of service:*** Member contribution.
***More than 1 year of service*** (or death in the line of duty): The sum of one times FRE (limited to pensionable earnings cap for Tier 2 members) and member contributions with interest.
These benefits are payable only if no surviving spouse pension is payable.

## Lump Sum Death after Retirement Benefit

$3,000. If there is no surviving spouse, any remainder of the deceased member's contributions and interest not paid out as a pension is also payable.

## Children's Benefits

***Regular and SLEP***

***Eligibility:*** Death of a member eligible to retire who has no surviving spouse, or death of a surviving spouse's beneficiary.
***Amount:*** Equal to spouse's pension, divided equally among surviving children and payable to age 18.

***ECO***

***Eligibility:*** Death of a member with minor children and no eligible spouse.
***Amount:*** 20% of salary to each child, to a maximum of 50% of salary, payable to age 18.
If death occurs after termination of service, the total payment to the surviving spouse and children is limited to 75% of the member's pension.

## Temporary Disability

***Eligibility:*** Temporary disability for at least 30 days after one year of service and prior to age 70. Pre-existing conditions are excluded if service is under 5 years.
***Amount:*** 50% of FRE less amounts payable from Social Security or Worker's Compensation.
***Duration:*** Period equal to 1/2 credited service, not to exceed 30 months.

## Total and Permanent Disability

***Regular and SLEP***

***Eligibility:*** Payable after temporary disability period to members who are totally and permanently disabled and unable to engage in any gainful occupation.
***Amount:*** 50% of FRE less amounts payable by Social Security.
***Duration:*** To the later of (i) Social Security age, or (ii) age at disability plus 5 years.

***ECO***

***Eligibility:*** Payable to members who are totally and permanently disabled from performing the duties of their office while in service as an elected county officer.
***Amount:*** The greater of 50% of FRE or the alternate formula pension amount earned to date.
***Duration:*** To the later of (i) Social Security age, or (ii) age at disability plus 5 years.

IMRF service is credited during the disability period, except that under the revised ECO plan, the service that will be credited will be Regular or SLEP as appropriate, but not ECO.

# Summary of Benefits and Conditions Evaluated December 31, 2019

## Post-Retirement Increases

**Tier 1 Members:** Members in all plans receive an annual 3% increase based upon the original amount of the annuity. The increase for the first year is pro-rated for the number of months the member was retired.

**Tier 2 Members:** Members in all plans receive an annual increase based upon the original amount of the annuity of 3% or one-half of the increase in the Consumer Price Index whichever is less. For regular and ECO members the annual increases do not begin until the retiree reaches the age of 67 or after 12 months of retirement, whichever is later. For SLEP members the increases begin at age 60 or after 12 months of retirement, whichever is later.

## 13th Payment

A lump sum payment is made to eligible retirees and surviving spouses on July 1st. The amount depends on funds available from a designated employer contribution of 0.62% of payroll. No specific 13th payment amount is promised to any individual.

## Member Contributions

***Regular Members:*** 4 1/2% of earnings (3-3/4% base plus 3/4% for survivor benefits).
***SLEP Members:*** 7 1/2% of earnings (6-3/4% base plus 3/4% for survivor benefits).
***ECO Members:*** 7 1/2% of earnings (6-3/4% base plus 3/4% for survivor benefits).

***Converting past service credit:*** ECO members can convert past regular service by contributing 3% of earnings plus interest for each month of Regular service credit converted. ECO members can convert past SLEP service by contributing 0% to 3% (depending on the original SLEP contribution) of earnings plus interest for each month of SLEP service credit converted. SLEP members can convert past regular service by contributing 3% of earnings plus interest for each month of Regular service credit converted.

***Voluntary Additional:*** Up to 10% of earnings.

***Refunds:*** Non-vested members who stop working for an IMRF employer can receive a lump sum refund of their IMRF member contributions without interest. Vested members can receive a lump sum refund of their IMRF member contributions if they stop working for an IMRF employer prior to age 55 (62 for Tier 2 regular members, 50 for Tier 2 SLEP members). Vested members age 55 or older (62 for Tier 2 regular members, 50 for Tier 2 SLEP members) may receive separation refunds if the member rolls over the refund into another defined benefit retirement plan for the purpose of purchasing service credit.

Members who retire without an eligible spouse (married to or in a civil union with the member at least one year before the member terminates IMRF participation) may receive a refund of their surviving spouse contributions with interest or an annuity.

If, upon death of all persons eligible for benefits upon the member's record, all of the member contributions with interest (at the actuarial assumed rate) were not paid as a refund or pension to either the member or his or her spouse or other beneficiary, any residual balance will be paid out.

## Caps on Reportable Wages

Under Tier 2, a member's wages are capped. No contributions are payable on wages above the cap. The wage cap is also applied when IMRF calculates benefits. The cap increases each year by the lesser of 3% or one-half of the increase in the Consumer Price Index (urban) for the preceding September. If the CPI is zero or negative, the wage cap is not increased. A wage cap of $115,929 was used in the December 31, 2019 valuation.

# Summary of Covered Population Data
# December 31, 2019

Data on persons covered by IMRF were reported to the Actuary as follows:

| Member Status | No. | Valuation Payroll/Benefits | Average Pay/ Benefits | Average Age | Average Service |
|---|---|---|---|---|---|
| Active Members | | | | | |
| Regular Tier 1 | 93,800 | $4,592,918,344 | $48,965 | 53.4 | 15.9 |
| Regular Tier 2 | 79,784 | 2,633,979,516 | 33,014 | 41.3 | 3.2 |
| SLEP Tier 1 | 2,440 | 216,070,535 | 88,553 | 46.2 | 17.9 |
| SLEP Tier 2 | 1,678 | 98,035,237 | 58,424 | 34.2 | 4.3 |
| ECO / ECO SLEP Tier 1 | 93 | 6,528,802 | 70,202 | 57.6 | 18.0 |
| Total Active | 177,795 | $7,547,532,434 | $42,451 | 47.7 | 10.1 |
| Inactive Members | | | | | |
| Regular Tier 1 | 131,524 | | | 49.6 | 6.3 |
| Regular Tier 2 | 54,125 | | | 36.2 | 1.9 |
| SLEP Tier 1 | 855 | | | 47.6 | 11.9 |
| SLEP Tier 2 | 422 | | | 34.0 | 3.3 |
| ECO / ECO SLEP Tier 1 | 133 | | | 57.2 | 13.5 |
| (Inactive and Active) | (40,193) | | | | |
| Total Inactive | 146,866 | | | 45.7 | 5.1 |
| Retirees & Beneficiaries | 200,299 | | | | |
| (Retired in multiple employers) | (63,592) | | | | |
| Total Retired | 136,707 | $2,321,645,712 | $16,983 | 72.1 | |
| **Total Population** | **461,368** | | | | |
| Prior Year Total | 450,303 | | | | |

There are a number of situations where members may be counted more than once. In particular, there are some members who are inactive with at least one employer and active with another employer. In order to avoid counting such individuals more than once, the inactive count is reduced by the number of such people as shown above. Other situations involving people who are inactive or retired with more than one employer can also lead to people being counted more than once in the totals above.

Additional population statistics are presented on the following pages.

# Active Members by Employer Type
# December 31, 2019
# Regular, SLEP, ECO Combined

| Type of Employer | Rate Groups | Members Number | % of Total | Cumulative Percent | Payroll |
|---|---|---|---|---|---|
| School Districts | 850 | 89,022 | 50.1% | 50.1% | $ 2,770,265,247 |
| Counties (Regular, SLEP,ECO) | 269 | 28,785 | 16.2% | 66.3% | 1,512,359,075 |
| Cities | 313 | 18,017 | 10.1% | 76.4% | 1,082,164,530 |
| Villages | 483 | 14,136 | 8.0% | 84.4% | 924,345,077 |
| Park Districts | 204 | 7,736 | 4.4% | 88.8% | 345,203,539 |
| Special Ed Districts | 51 | 4,810 | 2.7% | 91.5% | 147,623,487 |
| Townships | 496 | 3,264 | 1.8% | 93.3% | 145,989,261 |
| Library Districts | 233 | 3,221 | 1.8% | 95.1% | 126,538,452 |
| Sanitary Districts | 39 | 944 | 0.5% | 95.6% | 69,405,456 |
| Forest Preserve Districts | 13 | 870 | 0.5% | 96.1% | 49,630,467 |
| Intergovernmental Coop | 58 | 846 | 0.5% | 96.6% | 61,676,407 |
| County Hospital Districts | 3 | 728 | 0.4% | 97.0% | 37,739,225 |
| Towns | 5 | 725 | 0.4% | 97.4% | 35,987,548 |
| Mass Transit District (Taxing Authority) | 4 | 663 | 0.4% | 97.8% | 37,964,498 |
| Mass Transit Instrumentality | 6 | 615 | 0.3% | 98.1% | 24,960,313 |
| Consolidated Education Service Region | 23 | 511 | 0.3% | 98.4% | 17,464,872 |
| Joint Spec Rec Assns | 18 | 313 | 0.2% | 98.6% | 14,349,230 |
| Misc. Taxing Authority | 8 | 288 | 0.2% | 98.8% | 21,879,309 |
| Airport Authorities | 12 | 281 | 0.2% | 99.0% | 17,244,276 |
| Health Districts | 4 | 204 | 0.1% | 99.1% | 9,821,695 |
| Multi Co/Cons Health Dept. | 3 | 199 | 0.1% | 99.2% | 7,164,258 |
| Fire Protection Districts | 63 | 189 | 0.1% | 99.3% | 12,500,743 |
| Miscellaneous Instrumentality | 18 | 166 | 0.1% | 99.4% | 11,065,788 |
| Vocational System | 40 | 166 | 0.1% | 99.5% | 6,451,979 |
| Public Housing Authority | 11 | 145 | 0.1% | 99.6% | 6,163,357 |
| Public Library System | 2 | 135 | 0.1% | 99.7% | 6,387,518 |
| County Conservation Districts | 5 | 125 | 0.1% | 99.8% | 6,935,910 |
| Educ Serv Centers | 4 | 121 | 0.1% | 99.9% | 5,933,850 |
| Regional Planning Commission | 2 | 110 | 0.1% | 100.0% | 8,186,424 |
| Conservancy Districts | 4 | 72 | 0.0% | 100.0% | 4,114,770 |
| Water District | 13 | 65 | 0.0% | 100.0% | 3,685,453 |
| Special Ed Coop/Districts | 12 | 53 | 0.0% | 100.0% | 4,685,159 |
| County Road District | 33 | 52 | 0.0% | 100.0% | 1,792,187 |
| Public Housing Commission | 6 | 46 | 0.0% | 100.0% | 2,148,169 |
| Water Supply/Sewr Comission | 6 | 37 | 0.0% | 100.0% | 1,967,492 |
| ROE Office | 2 | 37 | 0.0% | 100.0% | 1,438,174 |
| Joint Education Projects | 5 | 33 | 0.0% | 100.0% | 1,148,009 |
| Mosquito Abatement District | 7 | 31 | 0.0% | 100.0% | 2,134,383 |
| Multi Twp Assessment Districts | 18 | 16 | 0.0% | 100.0% | 460,712 |
| Township Cemetary | 12 | 12 | 0.0% | 100.0% | 279,605 |
| Drainage District | 2 | 6 | 0.0% | 100.0% | 276,530 |
| Tuberculosis Sanitarium Districts | 1 | 0 | 0.0% | 100.0% | - |
| Employers with no Active Members or no Asset Information* | 652 | 0 | 0.0% | 100.0% | - |
| **Totals** | **4,013** | **177,795** | **100.0%** | **100.0%** | **$7,547,532,434** |

** This number represents employers with no active members and no asset information. This number also represents employers listed earlier with employees participating in the voluntary additional contribution program.*

# Active Regular Members
# by Attained Age and Years of Service
# December 31, 2019

| Attained Ages | Years of Service to Valuation Date | | | | | | | Totals | |
|---|---|---|---|---|---|---|---|---|---|
| | 0-7 | 8-9 | 10-14 | 15-19 | 20-24 | 25-29 | 30 & Up | No. | Valuation Payroll |
| 15 - 19 | 358 | | | | | | | 358 | $ 5,457,947 |
| 20 - 24 | 5,820 | | | | | | | 5,820 | 144,475,798 |
| 25 - 29 | 12,085 | 134 | 34 | 1 | | | | 12,254 | 407,358,856 |
| 30 - 34 | 11,629 | 1,062 | 1,217 | 31 | | | | 13,939 | 551,529,532 |
| 35 - 39 | 10,679 | 1,206 | 3,346 | 1,139 | 58 | 2 | | 16,430 | 702,214,094 |
| 40 - 44 | 10,294 | 1,105 | 3,000 | 2,649 | 1,056 | 36 | 2 | 18,142 | 795,486,267 |
| 45 - 49 | 10,150 | 1,326 | 3,368 | 2,544 | 2,214 | 756 | 82 | 20,440 | 903,718,316 |
| 50 | 2,120 | 343 | 842 | 628 | 478 | 287 | 84 | 4,782 | 213,090,983 |
| 51 | 1,954 | 298 | 820 | 576 | 507 | 333 | 114 | 4,602 | 205,782,679 |
| 52 | 1,967 | 255 | 875 | 673 | 512 | 367 | 186 | 4,835 | 215,775,501 |
| 53 | 1,881 | 283 | 967 | 743 | 515 | 343 | 258 | 4,990 | 229,113,120 |
| 54 | 1,809 | 296 | 939 | 802 | 546 | 325 | 353 | 5,070 | 225,741,910 |
| 55 | 1,859 | 286 | 1,020 | 890 | 621 | 363 | 401 | 5,440 | 246,281,035 |
| 56 | 1,727 | 296 | 1,013 | 923 | 620 | 313 | 408 | 5,300 | 236,785,731 |
| 57 | 1,769 | 278 | 1,018 | 949 | 717 | 397 | 426 | 5,554 | 249,744,064 |
| 58 | 1,726 | 292 | 969 | 941 | 741 | 353 | 456 | 5,478 | 243,228,255 |
| 59 | 1,632 | 296 | 952 | 992 | 777 | 381 | 437 | 5,467 | 242,151,843 |
| 60 | 1,495 | 254 | 883 | 922 | 765 | 402 | 442 | 5,163 | 229,166,850 |
| 61 | 1,385 | 266 | 825 | 873 | 673 | 371 | 398 | 4,791 | 206,443,773 |
| 62 | 1,208 | 229 | 725 | 803 | 708 | 366 | 388 | 4,427 | 191,884,813 |
| 63 | 1,163 | 204 | 673 | 705 | 638 | 362 | 295 | 4,040 | 168,159,701 |
| 64 | 1,004 | 187 | 558 | 535 | 525 | 294 | 229 | 3,332 | 138,589,188 |
| 65 | 895 | 168 | 448 | 447 | 395 | 257 | 251 | 2,861 | 116,496,278 |
| 66 | 657 | 142 | 306 | 332 | 311 | 158 | 143 | 2,049 | 82,426,134 |
| 67 | 546 | 117 | 306 | 218 | 211 | 111 | 103 | 1,612 | 62,771,955 |
| 68 | 430 | 98 | 224 | 174 | 151 | 93 | 88 | 1,258 | 47,080,800 |
| 69 | 402 | 93 | 170 | 146 | 102 | 58 | 84 | 1,055 | 37,917,365 |
| 70 | 318 | 44 | 153 | 107 | 69 | 59 | 76 | 826 | 29,697,165 |
| Over 70 | 1,311 | 244 | 598 | 440 | 278 | 176 | 222 | 3,269 | 98,327,907 |
| **Totals** | **90,273** | **9,802** | **26,249** | **20,183** | **14,188** | **6,963** | **5,926** | **173,584** | **$7,226,897,860** |

# Active SLEP Members
# by Attained Age and Years of Service
# December 31, 2019

| Attained Ages | Years of Service to Valuation Date | | | | | | | Totals | |
|---|---|---|---|---|---|---|---|---|---|
| | 0-7 | 8-9 | 10-14 | 15-19 | 20-24 | 25-29 | 30 & Up | No. | Valuation Payroll |
| 20 - 24 | 120 | | | | | | | 120 | $ 5,375,315 |
| 25 - 29 | 453 | 8 | | | | | | 461 | 25,038,277 |
| 30 - 34 | 396 | 64 | 71 | 1 | | | | 532 | 33,983,659 |
| 35 - 39 | 225 | 67 | 311 | 101 | | | | 704 | 52,496,094 |
| 40 - 44 | 130 | 32 | 180 | 259 | 74 | 4 | | 679 | 54,408,426 |
| 45 - 49 | 62 | 22 | 96 | 186 | 301 | 74 | 2 | 743 | 66,300,612 |
| 50 | 9 | 3 | 25 | 28 | 41 | 41 | 1 | 148 | 13,736,854 |
| 51 | 14 | 1 | 15 | 33 | 30 | 29 | 2 | 124 | 10,899,043 |
| 52 | 14 | 3 | 10 | 20 | 22 | 25 | 3 | 97 | 8,424,258 |
| 53 | 6 | 3 | 11 | 14 | 16 | 20 | 7 | 77 | 6,808,799 |
| 54 | 6 | 2 | 8 | 17 | 14 | 7 | 6 | 60 | 5,270,461 |
| 55 | 9 | 1 | 10 | 16 | 8 | 5 | 4 | 53 | 4,399,316 |
| 56 | 7 | | 6 | 9 | 13 | 11 | 4 | 50 | 4,199,209 |
| 57 | 7 | 2 | 6 | 9 | 11 | 3 | 4 | 42 | 3,557,104 |
| 58 | 3 | | 4 | 14 | 7 | 4 | 1 | 33 | 2,702,206 |
| 59 | 10 | 2 | 3 | 9 | 6 | 4 | 3 | 37 | 3,231,696 |
| 60 | 6 | 2 | 6 | 10 | 5 | 3 | 6 | 38 | 3,091,767 |
| 61 | 3 | 2 | 5 | 7 | 2 | 5 | 2 | 26 | 2,138,160 |
| 62 | 2 | 3 | 3 | 6 | | 1 | 1 | 16 | 1,363,648 |
| 63 | 3 | 1 | 2 | 2 | 1 | | 4 | 13 | 1,202,521 |
| 64 | 3 | 1 | 3 | 6 | 3 | 1 | 1 | 18 | 1,445,102 |
| 65 | 1 | | 1 | 3 | 4 | 1 | 1 | 11 | 757,951 |
| 66 | 4 | 1 | 4 | 2 | 1 | | 3 | 15 | 1,226,538 |
| 67 | 2 | 1 | 4 | 2 | | | 1 | 10 | 1,183,451 |
| 68 | | | | 1 | | | | 1 | 72,093 |
| 69 | | | | 3 | | | | 3 | 221,510 |
| 70 | | 1 | | 1 | | | | 2 | 183,728 |
| Over 70 | 2 | | | 2 | | 1 | | 5 | 387,974 |
| **Totals** | **1,497** | **222** | **784** | **761** | **559** | **239** | **56** | **4,118** | **$314,105,772** |

# Active ECO Regular Members
# by Attained Age and Years of Service
# December 31, 2019

| Attained Ages | Years of Service to Valuation Date | | | | | | | Totals | |
|---|---|---|---|---|---|---|---|---|---|
| | 0-7 | 8-9 | 10-14 | 15-19 | 20-24 | 25-29 | 30 & Up | No. | Valuation Payroll |
| 40-44 | | 1 | 3 | 1 | | | | 5 | $ 396,282 |
| 45-49 | | 1 | 5 | 1 | | 1 | | 8 | 645,454 |
| 50 | | 1 | 1 | 2 | | | | 4 | 316,049 |
| 51 | | | | | | 1 | | 1 | 50,618 |
| 52 | | | 2 | | 1 | | | 3 | 221,339 |
| 53 | | | | 2 | 1 | 2 | | 5 | 177,339 |
| 54 | | | 2 | 1 | 1 | | | 4 | 434,439 |
| 55 | | | 1 | 3 | | | | 4 | 237,133 |
| 56 | 1 | | | 1 | | | 1 | 3 | 259,267 |
| 57 | | 1 | 2 | 4 | | | 1 | 8 | 629,147 |
| 58 | 1 | 1 | 1 | 2 | | | 1 | 6 | 285,642 |
| 59 | 1 | 1 | | | | | | 2 | 145,600 |
| 60 | 1 | | | 1 | | | 1 | 3 | 266,690 |
| 61 | | 1 | 3 | | | | | 4 | 284,441 |
| 62 | | | | | 3 | | 2 | 5 | 165,956 |
| 63 | | 1 | 1 | | 3 | | 1 | 6 | 412,541 |
| 64 | | | | 1 | 1 | | | 2 | 227,725 |
| 65 | | 1 | 1 | 1 | | | 1 | 4 | 239,447 |
| 66 | | | 1 | | 2 | | | 3 | 117,645 |
| 67 | | | | | | 1 | | 1 | 74,519 |
| 69 | | | | 2 | | | 1 | 3 | 233,779 |
| 70 | | 2 | | | | | | 2 | 99,196 |
| Over 70 | | | | 1 | | | 1 | 2 | 191,989 |
| **Totals** | **4** | **11** | **23** | **23** | **12** | **5** | **10** | **88** | **$6,112,237** |

# Active ECO SLEP Members
# by Attained Age and Years of Service
# December 31, 2019

| Attained | Years of Service to Valuation Date | | | | | | | Totals | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | Valuation |
| Ages | 0-7 | 8-9 | 10-14 | 15-19 | 20-24 | 25-29 | 30 & Up | No. | Payroll |
| 35-39 | | | | | | | | | |
| 40-44 | | | | | | | | | |
| 45-49 | | | | | | | | | |
| 50 | | | | | | | | | |
| 51 | | | | | | | | | |
| 52 | | 1 | | | | | | 1 | $ 64,629 |
| 53 | | | 1 | | | | | 1 | 93,732 |
| 54 | | | | | | | | | |
| 55 | | | | | | | | | |
| 56 | | | | | | | | | |
| 57 | | | | | | | | | |
| 58 | | | | | | | | | |
| 59 | | | | | | | | | |
| 60 | | | | | | | | | |
| 61 | | | | | | | | | |
| 62 | | | | | | | | | |
| 63 | | | | 1 | | | | 1 | 66,866 |
| 64 | | | | | | | | | |
| 65 | | | | | | | | | |
| 66 | | | | | | | | | |
| 67 | | | | | | | | | |
| 68 | | | | | | | | | |
| 69 | | | | | | | 2 | 2 | 191,338 |
| **Totals** | | **1** | **1** | **1** | | | **2** | **5** | **$ 416,565** |

# All Active Members by Years of Service and Gender
# December 31, 2019

| Service | Active Member Count | | | Active Member Pays | |
|---|---|---|---|---|---|
| Years | Males | Females | Total | Total | Average |
| 0-1 | 6,588 | 13,125 | 19,713 | $ 500,292,306 | $ 25,379 |
| 1-2 | 5,573 | 10,926 | 16,499 | 489,323,099 | 29,658 |
| 2-3 | 4,405 | 8,413 | 12,818 | 411,562,829 | 32,108 |
| 3-4 | 3,835 | 6,985 | 10,820 | 374,210,120 | 34,585 |
| 4-5 | 3,594 | 6,189 | 9,783 | 355,053,362 | 36,293 |
| 5-6 | 3,215 | 5,391 | 8,606 | 327,982,663 | 38,111 |
| 6-7 | 2,788 | 4,452 | 7,240 | 289,957,077 | 40,049 |
| 7-8 | 2,420 | 3,878 | 6,298 | 260,012,930 | 41,285 |
| Sub-Total | 32,418 | 59,359 | 91,777 | 3,008,394,386 | 32,779 |
| 8-9 | 2,101 | 3,338 | 5,439 | 230,599,863 | 42,397 |
| 9-10 | 1,759 | 2,836 | 4,595 | 197,880,663 | 43,064 |
| 10-11 | 1,705 | 2,889 | 4,594 | 197,653,195 | 43,024 |
| 11-12 | 2,209 | 3,685 | 5,894 | 271,930,410 | 46,137 |
| 12-13 | 2,049 | 3,952 | 6,001 | 279,316,772 | 46,545 |
| 13-14 | 1,910 | 3,596 | 5,506 | 264,397,534 | 48,020 |
| 14-15 | 1,837 | 3,225 | 5,062 | 250,760,293 | 49,538 |
| 15 & Up | 19,558 | 29,369 | 48,927 | 2,846,599,318 | 58,181 |
| **Totals** | **65,546** | **112,249** | **177,795** | **$7,547,532,434** | **$42,451** |

# Inactive Regular Members
# by Attained Age and Years of Service
# December 31, 2019

| Attained | Years of Service to Valuation Date | | | | | | | Totals |
|---|---|---|---|---|---|---|---|---|
| Ages | 0-4 | 5-9 | 10-14 | 15-19 | 20-24 | 25-29 | 30 & Up | No. |
| 15-19 | 179 | | | | | | | 179 |
| 20-24 | 3,507 | 2 | | | | | | 3,509 |
| 25-29 | 11,900 | 137 | 1 | | | | | 12,038 |
| 30-34 | 17,346 | 884 | 104 | 1 | | | | 18,335 |
| 35-39 | 17,638 | 1,611 | 451 | 45 | | | 1 | 19,746 |
| 40-44 | 15,459 | 1,716 | 732 | 205 | 25 | 5 | 11 | 18,153 |
| 45-49 | 15,897 | 1,995 | 951 | 370 | 131 | 22 | 22 | 19,388 |
| 50 | 3,356 | 472 | 226 | 116 | 35 | 16 | 7 | 4,228 |
| 51 | 3,120 | 478 | 293 | 97 | 54 | 19 | 6 | 4,067 |
| 52 | 2,822 | 505 | 257 | 119 | 44 | 23 | 8 | 3,778 |
| 53 | 2,817 | 597 | 303 | 134 | 46 | 26 | 11 | 3,934 |
| 54 | 2,797 | 567 | 369 | 149 | 71 | 32 | 17 | 4,002 |
| 55 | 2,724 | 550 | 329 | 132 | 61 | 20 | 26 | 3,842 |
| 56 | 2,791 | 409 | 197 | 62 | 24 | 7 | 6 | 3,496 |
| 57 | 2,542 | 391 | 158 | 73 | 20 | 6 | 13 | 3,203 |
| 58 | 2,426 | 391 | 152 | 45 | 21 | 9 | 16 | 3,060 |
| 59 | 2,266 | 363 | 135 | 43 | 21 | 10 | 16 | 2,854 |
| 60 | 2,083 | 329 | 128 | 40 | 18 | 12 | 9 | 2,619 |
| 61 | 1,782 | 263 | 66 | 35 | 12 | 4 | 13 | 2,175 |
| 62 | 1,670 | 228 | 70 | 22 | 11 | 6 | 16 | 2,023 |
| 63 | 1,606 | 192 | 43 | 23 | 6 | 3 | 12 | 1,885 |
| 64 | 1,218 | 158 | 37 | 12 | 15 | 6 | 17 | 1,463 |
| 65 | 1,277 | 152 | 30 | 14 | 12 | 3 | 18 | 1,506 |
| 66 | 1,028 | 126 | 26 | 10 | 4 | 1 | 6 | 1,201 |
| 67 | 805 | 83 | 18 | 4 | 3 | 4 | 4 | 921 |
| 68 | 927 | 86 | 10 | 3 | 1 | 3 | 7 | 1,037 |
| 69 | 673 | 74 | 11 | 9 | 1 | 3 | 7 | 778 |
| 70 | 635 | 64 | 9 | 1 | 3 | | 4 | 716 |
| Over 70 | 1,538 | 148 | 34 | 19 | 6 | 4 | 19 | 1,768 |
| **Totals** | **124,829** | **12,971** | **5,140** | **1,783** | **645** | **244** | **292** | **145,904** |

# Inactive SLEP Members
# by Attained Age and Years of Service
# December 31, 2019

| Attained | Years of Service to Valuation Date | | | | | | | Totals |
|---|---|---|---|---|---|---|---|---|
| Ages | 0-4 | 5-9 | 10-14 | 15-19 | 20-24 | 25-29 | 30 & Up | No. |
| 15-19 | | | | | | | | |
| 20-24 | 9 | | | | | | | 9 |
| 25-29 | 86 | 6 | | | | | | 92 |
| 30-34 | 96 | 23 | 3 | | | | | 122 |
| 35-39 | 83 | 33 | 33 | 1 | | | | 150 |
| 40-44 | 50 | 39 | 22 | 5 | 3 | | 1 | 120 |
| 45-49 | 71 | 33 | 12 | 9 | 26 | 4 | 1 | 156 |
| 50 | 10 | 6 | 6 | 4 | 3 | 2 | 1 | 32 |
| 51 | 9 | 3 | 7 | 2 | 2 | 1 | 1 | 25 |
| 52 | 13 | 7 | 3 | 3 | | | | 26 |
| 53 | 9 | 3 | 4 | 2 | | | | 18 |
| 54 | 5 | 6 | 3 | 3 | | | | 17 |
| 55 | 8 | 2 | 8 | 4 | | 1 | 1 | 24 |
| 56 | 5 | 2 | 1 | | | | 1 | 9 |
| 57 | 5 | 1 | 2 | | | | | 8 |
| 58 | 3 | | 2 | | | | 1 | 6 |
| 59 | 2 | | 1 | | | 1 | | 4 |
| 60 | 5 | 1 | 3 | | | | 1 | 10 |
| 61 | 6 | | | 1 | | | | 7 |
| 62 | 4 | | | 1 | | | | 5 |
| 63 | 2 | 2 | | | | | | 4 |
| 64 | 2 | | | | | | 1 | 3 |
| 65 | 2 | | | | | | | 2 |
| 66 | 7 | 1 | | | | | | 8 |
| 67 | 3 | | | | | | | 3 |
| 68 | 2 | | | | | | | 2 |
| 69 | 2 | | | | | | | 2 |
| 70 | 1 | | | | | | | 1 |
| Over 70 | 4 | | | | | | 1 | 5 |
| **Totals** | **504** | **168** | **110** | **35** | **34** | **9** | **10** | **870** |

# Inactive ECO Members
# by Attained Age and Years of Service
# December 31, 2019

| Attained | Years of Service to Valuation Date | | | | | | | Totals |
|---|---|---|---|---|---|---|---|---|
| Ages | 0-4 | 5-9 | 10-14 | 15-19 | 20-24 | 25-29 | 30 & Up | No. |
| 15-19 | | | | | | | | |
| 20-24 | | | | | | | | |
| 25-29 | | | | | | | | |
| 30-34 | | | | | | | | |
| 35-39 | | 1 | 1 | | | | | 2 |
| 40-44 | | 3 | 3 | | | | | 6 |
| 45-49 | 2 | 9 | 2 | | | | | 13 |
| 50 | 1 | 4 | 1 | 1 | | | | 7 |
| 51 | | 1 | 2 | 1 | | | | 4 |
| 52 | 1 | 3 | 1 | 1 | 1 | | | 7 |
| 53 | 1 | 2 | | 1 | | 2 | | 6 |
| 54 | | 2 | | | | | | 2 |
| 55 | | 1 | 1 | | | | | 2 |
| 56 | 1 | 1 | | | | | | 2 |
| 57 | 1 | 3 | 1 | | | | | 5 |
| 58 | | 1 | 2 | | | | | 3 |
| 59 | 1 | 4 | | | | | | 5 |
| 60 | 1 | 3 | 1 | | | | | 5 |
| 61 | | 2 | | 1 | | | | 3 |
| 62 | 1 | | | 1 | | | | 2 |
| 63 | 1 | 1 | | 1 | | | | 3 |
| 64 | 1 | 3 | 1 | | | | | 5 |
| 65 | 1 | | | | | | | 1 |
| 66 | | | | | 1 | | | 1 |
| 67 | 2 | | | | | | | 2 |
| 68 | | 1 | | | | | | 1 |
| 69 | | | | | | | | |
| 70 | 2 | 1 | | | | | | 3 |
| Over 70 | 2 | | | | | | | 2 |
| **Totals** | **19** | **46** | **16** | **7** | **2** | **2** | | **92** |

# Retirees and Beneficiaries
# December 31, 2019

| | Annual Amounts by Form of Payment | | | | | |
|---|---|---|---|---|---|---|
| | Regular | | Level Payment Option | | Total | |
| **Type of Retirement** | **No.*** | **Amount** | **No.*** | **Amount** | **No.*** | **Amount** |
| Normal or Early | | | | | | |
| Joint and 50% Survivor | 106,808 | $ 1,299,562,728 | 21,853 | $ 317,781,108 | 128,661 | $ 1,617,343,836 |
| Joint and 66% Survivor | 694 | 18,286,452 | 171 | 5,242,968 | 865 | 23,529,420 |
| Straight Life | 35,878 | 431,673,276 | 6,961 | 109,681,872 | 42,839 | 541,355,148 |
| Total | 143,380 | 1,749,522,456 | 28,985 | 432,705,948 | 172,365 | 2,182,228,404 |
| Disability | 268 | 2,771,160 | - | 0 | 268 | 2,771,160 |
| Surviving Beneficiaries | 17,367 | 118,476,108 | 880 | 8,787,408 | 18,247 | 127,263,516 |
| Annuitization of Surviving Spouse and SLEP benefits | 7,905 | 6,114,588 | - | 0 | 7,905 | 6,114,588 |
| Voluntary Contributions | 1,514 | 3,268,044 | - | 0 | 1,514 | 3,268,044 |
| **Grand Total** | **170,434** | **$1,880,152,356** | **29,865** | **$441,493,356** | **200,299** | **$2,321,645,712** |

* *Number of records. There are 136,707 unique retirees.*

Of the 7,905 records listed as receiving "Annuitization of Surviving Spouse and SLEP benefits," 7,885 records are also in receipt of a separate retirement benefit.

Of the 1,514 records listed as receiving "Voluntary Contributions," 1,511 records are also in receipt of a separate retirement benefit.

Thirteenth check payment amounts are not included in the above figures.

In the above chart, "Regular" refers to all forms of payment other than the level payment option. It does not connote "Regular" as opposed to SLEP and ECO.

# Retirees and Beneficiaries by Attained Age December 31, 2019

| Attained Ages | Number* | | | Annual Benefits |
|---|---|---|---|---|
| | Males | Females | Total | |
| Under 20 | 0 | 0 | 0 | $ 0 |
| 20 - 24 | 3 | 12 | 15 | 30,912 |
| 25 - 29 | 7 | 11 | 18 | 37,824 |
| 30 - 34 | 19 | 22 | 41 | 133,932 |
| 35 - 39 | 25 | 31 | 56 | 287,748 |
| 40 - 44 | 21 | 33 | 54 | 321,060 |
| 45 - 49 | 35 | 82 | 117 | 881,508 |
| 50 - 54 | 483 | 263 | 746 | 22,027,932 |
| 55 - 59 | 4,520 | 7,652 | 12,172 | 174,860,136 |
| 60 - 64 | 10,489 | 20,480 | 30,969 | 423,670,008 |
| 65 - 69 | 14,586 | 30,895 | 45,481 | 567,927,312 |
| 70 - 74 | 12,494 | 27,774 | 40,268 | 483,495,828 |
| 75 - 79 | 8,645 | 20,883 | 29,528 | 300,301,308 |
| 80 - 84 | 5,776 | 14,171 | 19,947 | 185,689,164 |
| 85 - 89 | 3,515 | 8,697 | 12,212 | 103,028,892 |
| 90 - 94 | 1,721 | 4,753 | 6,474 | 45,386,508 |
| 95 & Up | 507 | 1,694 | 2,201 | 13,565,640 |
| **Totals** | **62,846** | **137,453** | **200,299** | **$2,321,645,712** |

* *Number of records. There are 136,707 unique retirees.*

# Retirees and Beneficiaries by Year of Retirement
# December 31, 2019

| Year of Retirement | Number* | | | Annual Benefits |
|---|---|---|---|---|
| | Males | Females | Total | |
| 2019 | 4,160 | 7,844 | 12,004 | $ 159,864,108 |
| 2018 | 4,437 | 9,083 | 13,520 | 168,751,236 |
| 2017 | 4,453 | 9,100 | 13,553 | 165,799,416 |
| 2016 | 4,029 | 9,081 | 13,110 | 157,071,180 |
| 2015 | 4,233 | 8,806 | 13,039 | 159,521,748 |
| 2014 | 3,700 | 8,345 | 12,045 | 150,025,812 |
| 2013 | 3,706 | 7,602 | 11,308 | 135,770,364 |
| 2012 | 3,269 | 6,771 | 10,040 | 117,456,444 |
| 2011 | 3,176 | 6,235 | 9,411 | 122,611,296 |
| 2010 | 3,123 | 6,172 | 9,295 | 119,277,624 |
| 2005 - 2009 | 11,038 | 22,159 | 33,197 | 393,999,504 |
| 2000 - 2004 | 7,182 | 16,218 | 23,400 | 246,266,220 |
| 1995 - 1999 | 4,359 | 11,874 | 16,233 | 155,353,212 |
| 1990 - 1994 | 1,442 | 5,142 | 6,584 | 50,909,748 |
| 1985 - 1989 | 422 | 2,219 | 2,641 | 16,051,320 |
| 1980 - 1984 | 99 | 658 | 757 | 2,641,884 |
| 1975 - 1979 | 13 | 125 | 138 | 249,840 |
| 1970 - 1974 | 4 | 19 | 23 | 24,504 |
| Before 1970 | 1 | 0 | 1 | 252 |
| **Total** | **62,846** | **137,453** | **200,299** | **$2,321,645,712** |

* *Number of records. There are 136,707 unique retirees.*

# Data Reported for Actuarial Valuations
# Comparative Summary

| Date December 31 | Total Count | Active Members | | | | | Number | | Ratio: Act/Ret. |
|---|---|---|---|---|---|---|---|---|---|
| | | | Average | | | | | | |
| | | Number | Age | Serv. | Annual Pay | Pay Increase | Inactive | Retired[#] | |
| 1995 | 262,232 | 136,617 | 43.8 | 8.2 | $22,661 | 2.9 % | 65,914 | 59,701 | 2.29 |
| 1996 | 249,291 | 139,525 | 44.0 | 8.3 | 22,104 | 3.5 %* | 48,274 | 61,492 | 2.27 |
| 1997 | 290,804 | 143,999 | 44.1 | 8.2 | 23,991 | 8.5 % | 81,919 | 64,886 | 2.22 |
| 1998 | 303,869 | 148,610 | 44.3 | 8.2 | 24,871 | 3.7 % | 88,173 | 67,086 | 2.22 |
| 1999 | 317,616 | 153,910 | 44.4 | 8.6 | 25,678 | 3.2 % | 94,576 | 69,130 | 2.23 |
| 2000 | 330,313 | 157,836 | 44.6 | 8.2 | 26,514 | 3.4 % | 102,082 | 70,395[+] | 2.24 |
| 2001 | 343,842 | 163,886 | 44.9 | 8.3 | 27,477 | 3.9 % | 108,338 | 71,618 | 2.29 |
| 2002 | 353,897 | 166,365 | 45.3 | 8.5 | 28,582 | 4.0 % | 113,524 | 74,008 | 2.25 |
| 2003 | 361,010 | 166,439 | 45.7 | 8.8 | 29,709 | 3.9 % | 118,093 | 76,478 | 2.18 |
| 2004 | 367,590 | 167,030 | 46.0 | 9.0 | 30,899 | 4.0 % | 121,543 | 79,017 | 2.11 |
| 2005 | 377,251 | 169,867 | 46.3 | 9.1 | 31,640 | 2.4 % | 125,761 | 81,623 | 2.08 |
| 2006 | 387,665 | 173,068 | 46.5 | 9.4 | 32,535 | 2.8 % | 130,239 | 84,358 | 2.05 |
| 2007 | 398,659 | 176,495 | 46.7 | 9.5 | 33,607 | 3.3 % | 134,687 | 87,477 | 2.02 |
| 2008 | 420,632 | 180,615 | 46.8 | 9.6 | 34,655 | 3.1 % | 149,885 | 90,132 | 2.00 |
| 2009 | 412,435 | 180,643 | 47.1 | 9.8 | 35,771 | 3.2 % | 138,530 | 93,262 | 1.94 |
| 2010 | 405,195 | 176,179 | 47.5 | 10.3 | 36,277 | 1.4 % | 131,462 | 97,554 | 1.81 |
| 2011 | 409,415 | 175,233 | 47.7 | 10.4 | 36,701 | 1.2 % | 132,282 | 101,900 | 1.72 |
| 2012 | 415,079 | 174,381 | 47.8 | 10.6 | 37,252 | 1.5 % | 134,293 | 106,405 | 1.64 |
| 2013 | 417,227 | 173,481 | 47.9 | 10.7 | 38,059 | 2.2 % | 136,749 | 106,997 | 1.62 |
| 2014 | 423,509 | 173,579 | 47.9 | 10.6 | 38,786 | 1.9 % | 137,941 | 111,989 | 1.55 |
| 2015 | 432,096 | 173,832 | 47.9 | 10.6 | 39,805 | 2.6 % | 141,236 | 117,028 | 1.49 |
| 2016 | 429,134 | 174,835 | 47.8 | 10.5 | 40,076 | 0.7 % | 132,213 | 122,086 | 1.43 |
| 2017 | 439,021 | 175,566 | 47.8 | 10.4 | 40,597 | 1.3 % | 136,385 | 127,070 | 1.38 |
| 2018 | 450,303 | 176,523 | 47.8 | 10.3 | 41,476 | 2.2 % | 141,817 | 131,963 | 1.34 |
| 2019 | 461,368 | 177,795 | 47.7 | 10.1 | 42,451 | 2.4 % | 146,866 | 136,707 | 1.30 |

* *Changed method of recording earnings for 1996 valuation.*

\+ *Restated subsequent to release of 2000 valuation.*

\# *Number of unique retirees. There are 200,299 retiree records in 2019.*

# SECTION C

## FINANCIAL DATA

# Development of Funding Value of Retirement System Assets

| Year Ended December 31 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 |
|---|---|---|---|---|---|---|
| A. Funding Value Beginning of Year | $39,187,802,312 | $40,829,952,193 | | | | |
| B. Market Value End of Year | 38,755,630,459 | 44,923,481,136 | | | | |
| C. Market Value Beginning of Year | 41,312,666,221 | 38,755,630,459 | | | | |
| D. Non-Investment/Administrative Net Cash Flow | (878,225,401) | (1,178,399,497) | | | | |
| E. Investment Return | | | | | | |
| E1. Market Total: B-C-D | (1,678,810,361) | 7,346,250,174 | | | | |
| E2. Assumed Rate of Return | 7.50% | 7.25% | | | | |
| **E3. Assumed Amount of Return** | **2,906,151,721** | **2,917,454,552** | ----------Scheduled---------- | | | |
| E4. Return Subject to Phase-In: E1-E3 | (4,584,962,082) | 4,428,795,622 | | | | |
| F. Phased-In Recognition of Investment Return | | | | | | |
| F1. Current Year: 0.20 x E4 | (916,992,416) | 885,759,124 | Unknown | Unknown | Unknown | Unknown |
| F2. First Prior Year | 531,215,977 | (518,580,434) | $496,823,800 | Unknown | Unknown | Unknown |
| F3. Second Prior Year | - | - | - | $496,823,800 | Unknown | Unknown |
| F4. Third Prior Year | - | - | - | - | $496,823,800 | Unknown |
| F5. Fourth Prior Year | - | - | - | - | - | $496,823,798 |
| F6. Funding Corridor Adjustment | | | | | | |
| **F7. Total Scheduled Phase-in of gain/(loss)** | **(385,776,439)** | **367,178,690** | 496,823,800 | 496,823,800 | 496,823,800 | 496,823,798 |
| G. Acceptable Phase-in of Investment Return | | | | | | |
| G1. Projected Funding Value without Phase-in: A+D+E3 | **41,215,728,632** | **42,569,007,248** | | | | |
| G2. Limit on Phase-in: B-G1 | (2,460,098,173) | 2,354,473,888 | | | | |
| G3. Acceptable Phase-in Amount | (385,776,439) | 367,178,690 | | | | |
| **H. Funding Value End of Year: A+D+E3+G3** | **$40,829,952,193** | **$42,936,185,938** | | | | |
| I. Difference Between Market and Funding Value | (2,074,321,734) | 1,987,295,198 | 1,490,471,398 | 993,647,598 | 496,823,798 | - |
| J. Recognized Rate of Return (Funding Value) | 6.5% | 8.2% | | | | |
| K. Market Rate of Return | -4.1% | 19.2% | | | | |
| L. Ratio of Funding Value to Market Value | 105.4% | 95.6% | | | | |

The Funding Value of Assets recognizes assumed investment return (line E3) fully each year. Differences between actual and assumed investment return (line E4) are phased-in over a closed 5-year period subject to a 20% corridor. The acceptable phase-in amount (Item G3) is the minimum of Items F7 and G2, if G2 is positive. If G2 is negative, the acceptable phase-in amount is the greater of Items F7 and G2.

# Development of Market Value Adjustment

In a single employer plan, the Market Value Adjustment would normally be the difference between the funding value of assets and the market value of assets. In IMRF, because of the need to allocate the Market Value Adjustment in an equitable manner among participating employers, certain extra steps are taken as shown below.

| | Year Ended December 31 | |
|---|---|---|
| | **2019** | **2018** |
| 1. Funding Value of End of Year | $ 42,936,185,938 | $ 40,829,952,193 |
| 2. Amounts not used in rate calculations | | |
| a. Suspended Annuity Reserve | 46,993,148 | 46,050,831 |
| b. Disability Benefit Reserve | 8,729,758 | 10,793,366 |
| c. Death Benefit Reserve | 11,995,997 | 17,749,639 |
| d. Supplemental Benefit Reserve | 1,722,790 | 1,624,857 |
| e. Cases removed from rate calculations* | 307,995,038 | 241,791,990 |
| f. Estimated pending reserve transfers | - | - |
| g. Total | 377,436,731 | 318,010,683 |
| 3. Remaining amount to allocate: (1)-(2g) | 42,558,749,207 | 40,511,941,510 |
| 4. Total reported negative reserves | (121,781) | (139,435) |
| 5. Amount available to positive reserves: (3)-(4) | 42,558,870,988 | 40,512,080,945 |
| 6. Total Market Value of reported positive reserves | 44,586,068,792 | 38,406,847,080 |
| **7. Market Value Adjustment: (5)-(6)** | **$ (2,027,197,804)** | **$ 2,105,233,865** |

* *Employers that are not included on the asset file submitted to the actuary. In general, these employers have no active members and no employer assets, but may have retired lives and/or inactive members. This amount also includes Voluntary Additional contribution balances.*

The Market Value Adjustment is allocated among all employers that have a positive reserve balance (member plus employer plus retired life reserves), in proportion to each employer's reserve balance.

Even in years when the Funding Value of Assets equals the Market Value of Assets, a market value adjustment can be made due to the following reasons:

- Differences between the earnings and experience reserve and the investment loss reserve from the financial statements.
- Differences between employee contribution amounts in the financial statements versus data tapes.
- Differences between employer contribution amounts in the financial statements versus data tapes.

# Reported Market Values

| | Market Value | | Percentage of Total | |
|---|---|---|---|---|
| | 2019 | 2018 | 2019 | 2018 |
| **Investment Portfolio** | | | | |
| Fixed income | $ 12,406,733,945 | $ 11,339,840,243 | 27.8% | 29.4% |
| Short term | 8,504,567 | 82,328,691 | 0.0% | 0.2% |
| Foreign exchange contracts | (3,032,497) | (1,997,057) | 0.0% | 0.0% |
| Stocks | 19,255,855,248 | 15,465,878,710 | 43.1% | 40.3% |
| Bond funds | - | - | 0.0% | 0.0% |
| Stock funds and index funds | 6,939,493,587 | 6,723,100,443 | 15.5% | 17.4% |
| Options | - | - | 0.0% | 0.0% |
| Real estate | 2,968,417,048 | 2,456,116,381 | 6.6% | 6.4% |
| Alternative investments | 2,439,143,017 | 1,791,029,070 | 5.5% | 4.6% |
| Master trust reserve fund | 635,703,610 | 593,193,989 | 1.4% | 1.5% |
| Cash | - | - | 0.0% | 0.0% |
| Due from brokers | - | 10,092,521 | 0.0% | 0.0% |
| Due (to) brokers | (43,415,627) | - | (0.1)% | 0.0% |
| Accrued investment income | 96,031,831 | 87,316,643 | 0.2% | 0.2% |
| **Total Invested Assets** | **$44,703,434,729** | **$38,546,899,634** | 100.0% | 100.0% |
| **Receivables** | **244,714,408** | **242,169,141** | | |
| **Cash** | **(4,808,260)** | **(4,875,161)** | | |
| **Fixed Assets** | **36,382,602** | **23,932,198** | | |
| **Total Market Value** | **$44,979,723,479** | **$38,808,125,812** | | |
| **Deferred Outflows of Resources** | 101,447 | - | | |
| **Deferred Inflows of Resources** | 488,037 | - | | |
| **Liabilities** | | | | |
| Benefits & vouchers payable | 55,855,753 | 52,495,353 | | |
| Securities lending payable | - | - | | |
| **Total Liabilities** | **55,855,753** | **52,495,353** | | |
| **Nets Assets Available for Benefits** | **$44,923,481,136** | **$38,755,630,459** | | |

Amounts on this page are preliminary year-end numbers and may not agree with final audited numbers reported by IMRF, but are shown for completeness.

# Change in Plan Assets

| | Activity During Year | |
|---|---|---|
| | 2019 | 2018 |
| Additions: | | |
| Contributions: | | |
| Employer Contributions | $ 779,056,083 | $ 946,394,211 |
| Employee Contributions | 437,887,784 | 413,856,331 |
| Total Contributions | 1,216,943,867 | 1,360,250,542 |
| Investment Income: | | |
| Net Appreciation (Depreciation) in Fair Value of Investments | 6,683,902,882 | (2,362,619,982) |
| Interest | 309,836,086 | 359,583,987 |
| Dividends | 376,458,359 | 348,318,812 |
| Securities Lending Income | 7,664,004 | 7,816,430 |
| Other | (366,669) | 241,050 |
| Net Investment Income | 7,377,494,662 | (1,646,659,703) |
| Other Revenues | 76,059 | 56,134 |
| Total Additions | 8,594,514,588 | (286,353,027) |
| Deductions: | | |
| Benefits and Refunds: | | |
| Retirement, Disability, and Beneficiary | 2,279,262,992 | 2,126,520,243 |
| Separation Benefits | 68,324,511 | 66,034,164 |
| Transfers to other Systems | 468,670 | 248,131 |
| Supplemental Benefits | 47,287,193 | 45,673,406 |
| Total Benefits and Refunds | 2,395,343,366 | 2,238,475,944 |
| Administrative Expenses | 31,309,040 | 32,032,871 |
| Other Expenses | 11,505 | 173,920 |
| Total Deductions | 2,426,663,911 | 2,270,682,735 |
| Net Increase (Decrease) | 6,167,850,677 | (2,557,035,762) |
| Net Assets Held in Trust: | | |
| Beginning of Year | $38,755,630,459 | $41,312,666,221 |
| **End of Year** | **$44,923,481,136** | **$38,755,630,459** |

# SECTION D

## ACTUARIAL METHODS AND ASSUMPTIONS

# Summary of Actuarial Methods and Assumptions Used for IMRF Actuarial Valuations Assumptions Adopted by Retirement Board After Consulting with Actuary

Rationale: The rationale for all assumptions is provided in the study of experience during the 2014-2016 period, and dated November 8, 2017.

## Economic Assumptions

The economic assumptions are based upon experience during the 2014-2016 period (please see report dated November 8, 2017), and were first used in the December 31, 2017 valuation. The investment rate of return was changed by the Board in December 2018 from 7.5% per year to 7.25% per year.

***The investment return rate*** assumed in the valuations was 7.25% per year, compounded annually (net after administrative expenses).

**Price Inflation** is assumed to be 2.5%.

**Payroll Growth:** Each employer's payroll was assumed to grow in total at a rate of 2.5% year.

The assumed **real rate of return** was 4.75% -- the difference between the assumed rate of investment return, and the assumed price inflation rate.

The **Active Member Population** is assumed to remain constant.

***Pay increase assumptions*** for individual active members are shown for sample ages on pages D-8 and D-9. Part of the assumption for each age is for merit and/or seniority increase, and the other 3.25% recognizes price inflation, productivity increases, and other macroeconomic forces.

## Non-Economic Assumptions

Non-economic (decrement) assumptions include rates of mortality before and after retirement, rates of disability, rates of retirement, rates of other separation from employment and probabilities of an active member being married. The non-economic assumptions are based upon experience during the 2014-2016 period (please see report dated November 8, 2017), and were first used in the December 31, 2017 valuation. Decrement assumptions are shown for sample ages beginning on page D-3.

# Summary of Actuarial Methods and Assumptions Used for IMRF Actuarial Valuations Assumptions Adopted by Retirement Board After Consulting with Actuary

## Actuarial Valuation Method

***An aggregate entry age actuarial cost method of valuation*** was used in determining most liabilities and normal cost. This means that an individual entry-age employer normal cost was determined for each benefit group (Regular Tier 1, Regular Tier 2, SLEP Tier 1, SLEP Tier 2, ECO Tier 1, ECO Tier 2) as a percent of payroll. The normal cost for each employer was calculated based on the aggregate Tier 1 and Tier 2 normal cost, weighted on the expected payroll of Tier 1 and Tier 2 members for the given employer. Larger employers have the option of an individual normal cost rate. For each Tier the aggregate normal cost rate is multiplied by the present value of future salary of that Tier and then aggregated to determine the present value of future normal cost for each employer. The actuarial accrued liability is then calculated by subtracting the present value of future normal cost and present value of future employee contributions from the present value of future benefits.

Differences in the past between assumed experience and actual experience ("actuarial gains and losses") become part of actuarial accrued liabilities. Unfunded actuarial accrued liabilities are amortized to produce payments (principal & interest) which are level percent of payroll contributions.

Liabilities for lump sum death benefits and temporary disability benefits were determined using a term cost approach. The actual cost of benefits as a percentage of payroll for the year ending on the valuation date is assumed to continue. Under this approach, the funding objective is to receive contributions each year that approximately equal the benefits being paid.

***Employer contributions*** were assumed to be ***paid in equal installments*** throughout the year.

***Present assets (cash & investments) at funding value*** are shown on page C-1.

## Asset Valuation Method

The Funding Value of Assets (developed on page C-1) recognizes assumed investment return fully each year. Differences between actual and assumed investment income are phased-in over a closed 5-year period subject to a 20% corridor. The method also limits the adjustment to the expected actuarial return to the maximum amount of unrecognized gains or losses not yet reflected in the actuarial value of assets. In any year in which the actuarial value minus the market value of assets switches from a positive value to a negative value, or vice-versa, any prior gain/loss bases are eliminated and the smoothing mechanism restarts.

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The actuarial valuation computations were made by or under the supervision of a Member of the American Academy of Actuaries (MAAA).

# Actuarial Assumptions
# December 31, 2019
# Probabilities of Age & Service Retirement

## Tier 1

| Age at Retirement | Regular Reduced Early | | Regular Normal | | SLEP Normal | | ECO-Regular Normal | | ECO-SLEP Normal |
|---|---|---|---|---|---|---|---|---|---|
| | Males | Females | Males | Females | Service less than 32 years | Service 32 years or more | Males | Females | Males & Females |
| 50 | | | | | 27% | 35% | | | 27% |
| 51 | | | | | 27% | 35% | | | 27% |
| 52 | | | | | 23% | 35% | | | 23% |
| 53 | | | | | 14% | 35% | | | 14% |
| 54 | | | | | 26% | 35% | | | 26% |
| 55 | 7.10% | 6.00% | 37% | 26% | 24% | 35% | 25% | 35% | 24% |
| 56 | 7.10% | 6.00% | 28% | 20% | 20% | 35% | 25% | 35% | 20% |
| 57 | 7.10% | 6.00% | 21% | 17% | 23% | 35% | 15% | 20% | 23% |
| 58 | 7.10% | 6.00% | 21% | 17% | 30% | 35% | 15% | 20% | 30% |
| 59 | 7.10% | 6.00% | 23% | 19% | 24% | 35% | 15% | 20% | 24% |
| 60 | | | 13% | 11% | 20% | 35% | 15% | 20% | 20% |
| 61 | | | 13% | 10% | 17% | 35% | 15% | 20% | 17% |
| 62 | | | 21% | 18% | 23% | 35% | 15% | 20% | 23% |
| 63 | | | 19% | 18% | 20% | 35% | 15% | 20% | 20% |
| 64 | | | 18% | 17% | 20% | 35% | 15% | 20% | 20% |
| 65 | | | 25% | 26% | 30% | 35% | 15% | 20% | 30% |
| 66 | | | 31% | 28% | 24% | 35% | 15% | 20% | 24% |
| 67 | | | 26% | 26% | 24% | 35% | 15% | 20% | 24% |
| 68 | | | 24% | 22% | 24% | 35% | 15% | 20% | 24% |
| 69 | | | 22% | 23% | 24% | 35% | 15% | 20% | 24% |
| 70 | | | 22% | 23% | 100% | 100% | 15% | 20% | 100% |
| 71 | | | 22% | 21% | 100% | 100% | 15% | 20% | 100% |
| 72 | | | 19% | 21% | 100% | 100% | 15% | 20% | 100% |
| 73 | | | 20% | 23% | 100% | 100% | 15% | 20% | 100% |
| 74 | | | 21% | 21% | 100% | 100% | 15% | 20% | 100% |
| 75 | | | 21% | 22% | 100% | 100% | 17% | 20% | 100% |
| 76 | | | 21% | 22% | 100% | 100% | 17% | 20% | 100% |
| 77 | | | 21% | 22% | 100% | 100% | 17% | 20% | 100% |
| 78 | | | 21% | 22% | 100% | 100% | 17% | 20% | 100% |
| 79 | | | 21% | 22% | 100% | 100% | 17% | 20% | 100% |
| 80 & Over | | | 100% | 100% | 100% | 100% | 100% | 100% | 100% |

For terminated vested members, members were assumed to retire as follows:

- Regular Tier 1 members were assumed to retire at age 60 or attained age if later;
- Regular Tier 2 members were assumed to retire at age 67 or attained age if later;
- SLEP Tier 1 members with less than 20 years of service were assumed to retire at age 60;
- SLEP Tier 1 members with 20 or more years of service were assumed to retire at age 50;
- SLEP Tier 2 members with less than 10 years of service were assumed to retire at age 67;
- SLEP Tier 2 members with 10 or more years of service were assumed to retire at age 55;
- ECO Tier 1 members were assumed to retire at age 55 or attained age if later; and
- ECO Tier 2 members were assumed to retire at age 62 or attained age if later.

# Actuarial Assumptions
# December 31, 2019
# Probabilities of Age & Service Retirement

## Tier 2

| | Regular | | | | | | | | SLEP | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Male | | | | Female | | | | Male | | | Female | | |
| | Normal | | | Early | Normal | | | Early | Normal | | Early | Normal | | Early |
| Age | Service Less than 30 Years | Service Between 30 and 35 Years | Service 35 Years or More | | Service Less than 30 Years | Service Between 30 and 35 Years | Service 35 Years or more | | Service Less than 30 Years | Service 30 Years or More | | Service Less than 30 Years | Service 30 Years or More | |
| 50 | | | | | | | | | | | 12% | | | 12% |
| 51 | | | | | | | | | | | 9% | | | 9% |
| 52 | | | | | | | | | | | 7% | | | 7% |
| 53 | | | | | | | | | | | 4% | | | 4% |
| 54 | | | | | | | | | | | 12% | | | 12% |
| 55 | | | | | | | | | 60% | 80% | | 60% | 80% | |
| 56 | | | | | | | | | 18% | 55% | | 18% | 55% | |
| 57 | | | | | | | | | 23% | 55% | | 23% | 55% | |
| 58 | | | | | | | | | 33% | 55% | | 33% | 55% | |
| 59 | | | | | | | | | 13% | 55% | | 13% | 55% | |
| 60 | | | | | | | | | 8% | 55% | | 8% | 55% | |
| 61 | | | | | | | | | 8% | 55% | | 8% | 55% | |
| 62 | | | 75% | 15% | | | 75% | 13% | 23% | 55% | | 23% | 55% | |
| 63 | | | 75% | 15% | | | 75% | 13% | 18% | 55% | | 18% | 55% | |
| 64 | | | 75% | 15% | | | 75% | 13% | 18% | 55% | | 18% | 55% | |
| 65 | | | 75% | 15% | | | 75% | 13% | 23% | 55% | | 23% | 55% | |
| 66 | | | 75% | 15% | | | 75% | 13% | 23% | 55% | | 23% | 55% | |
| 67 | 30% | 50% | 75% | | 25% | 50% | 75% | | 23% | 55% | | 23% | 55% | |
| 68 | 30% | 50% | 75% | | 25% | 50% | 75% | | 23% | 55% | | 23% | 55% | |
| 69 | 25% | 50% | 75% | | 20% | 50% | 75% | | 23% | 55% | | 23% | 55% | |
| 70 | 20% | 50% | 75% | | 18% | 50% | 75% | | 100% | 100% | | 100% | 100% | |
| 71 | 20% | 50% | 75% | | 18% | 50% | 75% | | 100% | 100% | | 100% | 100% | |
| 72 | 20% | 50% | 75% | | 18% | 50% | 75% | | 100% | 100% | | 100% | 100% | |
| 73 | 18% | 50% | 75% | | 18% | 50% | 75% | | 100% | 100% | | 100% | 100% | |
| 74 | 18% | 50% | 75% | | 18% | 50% | 75% | | 100% | 100% | | 100% | 100% | |
| 75 | 18% | 50% | 75% | | 18% | 50% | 75% | | 100% | 100% | | 100% | 100% | |
| 76 | 18% | 50% | 75% | | 18% | 50% | 75% | | 100% | 100% | | 100% | 100% | |
| 77 | 18% | 50% | 75% | | 18% | 50% | 75% | | 100% | 100% | | 100% | 100% | |
| 78 | 18% | 50% | 75% | | 18% | 50% | 75% | | 100% | 100% | | 100% | 100% | |
| 79 | 18% | 50% | 75% | | 18% | 50% | 75% | | 100% | 100% | | 100% | 100% | |
| 80+ | 100% | 100% | 100% | | 100% | 100% | 100% | | 100% | 100% | | 100% | 100% | |

# Actuarial Assumptions
# December 31, 2019
# Probabilities of Separation from Active Member Status

## Tier 1 and Tier 2

| | % Separating Next Year | | | | | |
|---|---|---|---|---|---|---|
| | Regular | | ECO | | | |
| Service | Males | Females | Males | Females | SLEP | ECO-SLEP |
| 0 | 24.5% | 28.5% | 40.0% | 40.0% | 17.0% | 17.0% |
| 1 | 19.5% | 22.2% | 20.0% | 20.0% | 10.0% | 10.0% |
| 2 | 15.0% | 17.8% | 15.0% | 15.0% | 6.5% | 6.5% |
| 3 | 13.0% | 14.5% | 14.0% | 14.0% | 6.2% | 6.2% |
| 4 | 10.3% | 11.8% | 13.0% | 13.0% | 5.5% | 5.5% |
| 5 | 8.8% | 10.3% | 12.0% | 12.0% | 4.6% | 4.6% |
| 6 | 7.3% | 8.5% | 11.0% | 11.0% | 3.6% | 3.6% |
| 7 | 7.0% | 8.0% | 10.0% | 10.0% | N/A | N/A |
| Age | 8 or More Years of Service | | 8 or More Years of Service | | 7 or More Years of Service | 7 or More Years of Service |
| 30 | 4.4% | 7.3% | 9.5% | 6.8% | 2.4% | 2.4% |
| 35 | 3.5% | 5.8% | 9.5% | 6.8% | 1.8% | 1.8% |
| 40 | 2.8% | 4.4% | 9.5% | 6.8% | 1.3% | 1.3% |
| 45 | 2.3% | 3.6% | 9.5% | 6.8% | 1.2% | 1.2% |
| 50 | 2.0% | 3.0% | 9.5% | 6.8% | 1.2% | 1.2% |

# Actuarial Assumptions
# December 31, 2019
# Active Member Probabilities of Death and Disability

## Tier 1 and Tier 2

| Sample Attained Ages | % Dying in 2019 | | | |
|---|---|---|---|---|
| | Regular & ECO | | SLEP & ECO-SLEP | |
| | Male | Female | Male | Female |
| 20 | 0.06% | 0.02% | 0.06% | 0.02% |
| 25 | 0.07% | 0.02% | 0.07% | 0.02% |
| 30 | 0.06% | 0.02% | 0.06% | 0.02% |
| 35 | 0.08% | 0.03% | 0.08% | 0.03% |
| 40 | 0.10% | 0.05% | 0.10% | 0.05% |
| 45 | 0.15% | 0.08% | 0.15% | 0.08% |
| 50 | 0.24% | 0.12% | 0.24% | 0.12% |
| 55 | 0.37% | 0.19% | 0.37% | 0.19% |
| 60 | 0.64% | 0.31% | 0.64% | 0.31% |
| 65 | 1.23% | 0.49% | 1.23% | 0.49% |
| 70 | 2.05% | 0.81% | 2.05% | 0.81% |
| 75 | 3.32% | 1.34% | 3.32% | 1.34% |
| 80 | 5.33% | 2.26% | 5.33% | 2.26% |

*Applicable to calendar year 2019. Rates and life expectancies in future years are determined by the fully generational MP-2017 projection scale.*

For active members, the mortality rates are based on the RP-2014 Employee Mortality Table for both males and females with 2-dimensional, fully generational improvements using the MP-2017 Mortality Improvement Scale. For males, 100% of the rates were used; for females, 99% of the rates were used.

| Sample Ages | % Disabled | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Regular | | ECO | | SLEP | | ECO-SLEP | |
| | Male | Female | Male | Female | Male | Female | Male | Female |
| 20 | 0.00% | 0.00% | 0.01% | 0.01% | 0.00% | 0.01% | 0.01% | 0.01% |
| 25 | 0.00% | 0.00% | 0.01% | 0.01% | 0.01% | 0.02% | 0.01% | 0.01% |
| 30 | 0.00% | 0.00% | 0.01% | 0.01% | 0.01% | 0.03% | 0.01% | 0.01% |
| 35 | 0.01% | 0.00% | 0.03% | 0.02% | 0.02% | 0.05% | 0.03% | 0.02% |
| 40 | 0.02% | 0.01% | 0.04% | 0.03% | 0.02% | 0.07% | 0.04% | 0.03% |
| 45 | 0.03% | 0.01% | 0.06% | 0.04% | 0.03% | 0.10% | 0.06% | 0.04% |
| 50 | 0.04% | 0.02% | 0.09% | 0.06% | 0.05% | 0.15% | 0.09% | 0.06% |
| 55 | 0.07% | 0.03% | 0.15% | 0.10% | 0.07% | 0.21% | 0.15% | 0.10% |
| 60 | 0.08% | 0.05% | 0.19% | 0.17% | 0.06% | 0.19% | 0.19% | 0.17% |
| 65 | 0.09% | 0.06% | 0.20% | 0.20% | 0.04% | 0.13% | 0.20% | 0.20% |
| 70 | 0.08% | 0.05% | 0.17% | 0.17% | 0.03% | 0.07% | 0.17% | 0.17% |
| 75 | 0.05% | 0.04% | 0.12% | 0.12% | 0.01% | 0.02% | 0.12% | 0.12% |
| 80 | 0.05% | 0.03% | 0.10% | 0.10% | 0.00% | 0.00% | 0.10% | 0.10% |

# Actuarial Assumptions
# December 31, 2019
# Retiree, Beneficiary, Terminated Vested and Disabled Life Mortality

## Tier 1 and Tier 2

| Sample Attained Ages | % Dying Next Year | | | |
|---|---|---|---|---|
| | Non-Disabled Lives | | Disabled Lives | |
| | Males | Females | Males | Females |
| 40 | 0.2335% | 0.1238% | 1.5613% | 0.6824% |
| 45 | 0.3364% | 0.1873% | 2.0411% | 0.9156% |
| 50 | 0.4553% | 0.2769% | 2.2845% | 1.1683% |
| 55 | 0.6195% | 0.4054% | 2.4133% | 1.4582% |
| 60 | 0.8921% | 0.5873% | 2.8068% | 1.7408% |
| 65 | 1.4489% | 0.8719% | 3.6392% | 2.0844% |
| 70 | 2.3329% | 1.3583% | 4.7809% | 2.7432% |
| 75 | 3.7483% | 2.2300% | 6.4584% | 3.9846% |
| 80 | 6.1444% | 3.7376% | 9.0776% | 5.9776% |

| Sample Attained Ages | Future Life Expectancy (years)* | | | |
|---|---|---|---|---|
| | Non-Disabled Retired Lives | | Disabled Lives | |
| | Males | Females | Males | Females |
| 40 | 42.1 | 47.2 | 29.3 | 37.7 |
| 45 | 37.1 | 42.0 | 26.2 | 33.5 |
| 50 | 32.2 | 37.0 | 23.3 | 29.5 |
| 55 | 27.5 | 32.0 | 20.3 | 25.7 |
| 60 | 23.0 | 27.3 | 17.2 | 22.1 |
| 65 | 18.7 | 22.8 | 14.3 | 18.6 |
| 70 | 14.8 | 18.5 | 11.6 | 15.2 |
| 75 | 11.4 | 14.5 | 9.2 | 12.1 |
| 80 | 8.4 | 11.0 | 7.0 | 9.3 |

* *Applicable to calendar year 2019. Rates and life expectancies in future years are determined by the fully generational MP-2017 projection scale.*

For non-disabled lives, the mortality rates are IMRF specific mortality rates with 2-dimensional, fully generational improvements using the MP-2017 Mortality Improvement Scale (projected from 2015). These rates were developed from the RP-2014 Blue Collar Mortality Table with adjustments to match current IMRF experience. For disabled lives, the mortality rates are IMRF specific mortality rates with 2-dimensional, fully generational improvements using the MP-2017 Mortality Improvement Scale. These rates were developed using the RP-2014 Disabled Mortality Table applying the same adjustments that were applied for non-disabled lives.

# Actuarial Assumptions
# December 31, 2019
# Pay Increases for Regular and ECO Active Members

## Tier 1 and Tier 2

| % Increase in Pay Next Year | | | | | | | |
|---|---|---|---|---|---|---|---|
| 5 or More Years Service | | | | Increase for Those With Less Than 5 Years of Service | | | |
| Age | Merit & Longevity | Economic | Total | Service | Merit & Longevity | Economic | Total |
| 25 | 2.50% | 3.25% | 5.75% | 0 | 7.10% | 3.25% | 10.35% |
| 30 | 2.02% | 3.25% | 5.27% | 1 | 6.40% | 3.25% | 9.65% |
| 35 | 1.34% | 3.25% | 4.59% | 2 | 3.60% | 3.25% | 6.85% |
| 40 | 0.98% | 3.25% | 4.23% | 3 | 2.70% | 3.25% | 5.95% |
| 45 | 0.72% | 3.25% | 3.97% | 4 | 2.20% | 3.25% | 5.45% |
| 50 | 0.48% | 3.25% | 3.73% | | | | |
| 55 | 0.28% | 3.25% | 3.53% | | | | |
| 60 | 0.14% | 3.25% | 3.39% | | | | |

For a person with five or more years of service, the assumed pay increase during the coming year is found in the 5 or more years of service total column. For a person with less than five years of service, the assumed pay increase during the coming year is found in the less than five years of service total column.

# Actuarial Assumptions
# December 31, 2019
# Pay Increases for SLEP and ECO-SLEP Active Members

## Tier 1 and Tier 2

| % Increase in Pay Next Year | | | |
|---|---|---|---|
| Years of Service | | | |
| Service | Economic | Merit & Longevity | % Total Increase |
| 1 | 3.25% | 11.00% | 14.25% |
| 2 | 3.25% | 8.50% | 11.75% |
| 3 | 3.25% | 4.00% | 7.25% |
| 4 | 3.25% | 3.50% | 6.75% |
| 5 | 3.25% | 3.00% | 6.25% |
| 6 | 3.25% | 2.50% | 5.75% |
| 7 | 3.25% | 2.00% | 5.25% |
| 8 | 3.25% | 1.50% | 4.75% |
| 9 | 3.25% | 1.25% | 4.50% |
| 10 | 3.25% | 1.00% | 4.25% |
| 11 | 3.25% | 0.75% | 4.00% |
| 12 | 3.25% | 0.75% | 4.00% |
| 13 | 3.25% | 0.50% | 3.75% |
| 14 | 3.25% | 0.50% | 3.75% |
| 15 | 3.25% | 0.50% | 3.75% |
| 16 | 3.25% | 0.50% | 3.75% |
| 17 | 3.25% | 0.50% | 3.75% |
| 18 | 3.25% | 0.50% | 3.75% |
| 19 | 3.25% | 0.50% | 3.75% |
| 20 | 3.25% | 0.50% | 3.75% |
| 21 | 3.25% | 0.50% | 3.75% |
| 22 | 3.25% | 0.50% | 3.75% |
| 23 | 3.25% | 0.50% | 3.75% |
| 24 | 3.25% | 0.50% | 3.75% |
| 25 | 3.25% | 0.50% | 3.75% |
| 26 | 3.25% | 0.50% | 3.75% |
| 27 | 3.25% | 0.50% | 3.75% |
| 28 | 3.25% | 0.50% | 3.75% |
| 29 | 3.25% | 0.50% | 3.75% |
| 30 | 3.25% | 0.50% | 3.75% |

# Miscellaneous and Technical Assumptions

| | |
|---|---|
| **Expenses:** | Assumed investment return is net of administrative and investment expenses. |
| **Marriage Assumption:** | 75% of male and 70% of female participants are assumed to be married for purposes of death-in-service and death after retirement benefits. Male spouses are assumed to be three years older than female spouses for active member valuation purposes. |
| **Pay Increase Timing:** | Beginning of (Calendar) year. This is equivalent to assuming that reported pays represent amounts paid to members during the year ended on the valuation date. |
| **Decrement Timing:** | Decrements of all types are assumed to occur mid-year. |
| **Eligibility Testing:** | Eligibility for benefits is determined based upon the age nearest birthday and service nearest whole year on the date the decrement is assumed to occur. |
| **Benefit Service:** | Exact fractional service on the decrement date is used to determine the amount of benefit payable. |
| **Decrement Relativity:** | Decrement rates are used directly from the experience study, without adjustment for multiple decrement table effects. |
| **Incidence of Contributions:** | Contributions are assumed to be received continuously throughout the year based upon the computed percent of payroll shown in this report, and the actual payroll payable at the time contributions are made. |
| **Normal Form of Benefit:** | The assumed normal form of benefit is a 50% joint and survivor benefit for Regular and SLEP Tier 1 members and 66 2/3% for Regular and SLEP Tier 2 members and ECO members. Factors for determining optional forms of payment are based on 120% of the current mortality rates (50% unisex) and interest at the valuation rate. |
| **Surviving Spouse Refunds:** | For those individuals who are not assumed to be married at retirement, the surviving spouse contributions are assumed to be refunded. |
| **SLEP Refunds:** | SLEP participants who are assumed to retire with insufficient service to qualify for SLEP benefits are assumed to receive a refund of their SLEP contributions. |
| **SLEP Conversions:** | It was assumed that all active participants in the SLEP program will convert all eligible service (up to 10 years). Additionally, it was assumed that these members would contribute the difference in both member and employer rates for each year converted. |
| **ECO Conversions:** | It is assumed that active participants in the ECO program will convert all eligible service up to the point the maximum ECO benefit would be achieved. |

# Miscellaneous and Technical Assumptions

| | |
|---|---|
| **Final Rate of Earnings (FRE):** | The FRE is determined by projecting the current salary to retirement and averaging the salary over the appropriate number of years. The current FRE is used if this produces a higher value. For Tier 2 members, FRE is capped at $115,929 and increases by the lesser of 3% and one-half of CPI. |
| **Refunds for Terminated Vested Members:** | Members are assumed to elect annuities. |
| **Other:** | Disability decrements operate during retirement eligibility. |
| **Post-Retirement Increases:** | For Tier 2, pensions increase by the lesser of 3% or one-half of the increase in the Consumer Price Index (urban) for the preceding September. If the CPI is zero, pension benefits are not increased. In the December 31, 2019 valuation annual pension increases were assumed to grow at an annual rate of 1.35%. Tier 1 increases are not related to CPI. |
| **Wage Cap Growth:** | Under Tier 2, a member's wages are capped. The wage cap increases each year by the lesser of 3% or one-half of the increase in the Consumer Price Index (urban) for the preceding September. If the CPI is zero, the wage cap is not increased. A wage cap of $115,929 was used for Tier 2 members in the December 31, 2019 valuation. In the December 31, 2019 valuation, the wage cap was assumed to grow at an annual rate of 1.35%. |
| **Sick Leave Load:** | Normal cost and active liabilities for all decrements were increased by 1.25% to account for the inclusion of unused sick leave. |

# Actuarial Funding Policy

## A. Introduction

The purpose of this Actuarial Funding Policy is to record the funding objective and policy set by the Board of Trustees (Board) of the Illinois Municipal Retirement Fund (IMRF). The Board establishes this funding policy to help ensure the systematic accumulation of assets needed to pay future benefits for members of IMRF.

This funding policy shall be reviewed by the Board of Trustees every three years in conjunction with the triennial experience study conducted by IMRF's actuaries.

The actuary shall prepare annual actuarial valuations and calculate future employer contribution rates based upon calendar-year data. As required by statute, it shall conduct a triennial experience study to review actuarial assumptions and to recommend appropriate changes.

**Summary of Key Actuarial Assumptions:**

- Entry-Age Normal Actuarial Cost Method
- Utilize a 5-year Smoothing Period, subject to a 20% Market v. Actual Corridor
- Amortize over/under funding over a rolling period. Working to a rolling 15-year period as of 2029.
- Funding Target of 100%
- Economic Assumptions:

| | |
|---|---|
| Price Inflation: | 2.5% |
| Wage Inflation: | 3.25% |
| Investment Return: | 7.25% |

- Mortality Assumption: RP-2014 projected to current year and MP-2017 projected to current year with administrative factors to be implemented by the actuary when appropriate.

## B. Funding Objectives

1. Maintain adequate assets so that current plan assets plus future contributions and investment earnings will be sufficient to fund all benefits expected to be paid to members and beneficiaries when due.

2. Make consistent progress towards 100% funding and maintain 100% funding once it is obtained. In particular, continue progress of systematic reduction of the Unfunded Actuarial Accrued Liabilities (UAAL) through use of the Actuarial Determined Employer Contribution Rate (ADEC).

3. Maintain stability of employer contribution rates, consistent with other funding objectives, and avoid sharp increases or decreases due to specific events.

4. Maintain public policy goals of accountability and transparency, meaning that each policy element is to be clear in intent and effect, and each should allow an assessment of whether, how and when the funding requirements of the plan will be met.

5. Monitor material risks to assist in any risk management strategies the Board deems appropriate.

6. Promote intergenerational equity. Each generation of members and employers should incur the cost of benefits for the employees who provide services to them, rather than deferring those costs to future members and employers.

7. Provide a reasonable margin for adverse experience to help offset risks.

8. Review investment return assumption in conjunction with the periodic asset liability study and in consideration of the Board's risk profile.

## C. Elements

### 1. Actuarial Cost Method (i.e., Contribution Budgeting)

*An aggregate entry age actuarial cost method of valuation* will be used in determining most liabilities and normal cost. An individual entry-age employer normal cost will be determined for each benefit group (Regular Tier 1, Regular Tier 2, SLEP Tier 1, SLEP Tier 2, ECO Tier 1, ECO Tier 2) as a percent of payroll. The normal cost for each employer will be calculated based on the aggregate Tier 1 and Tier 2 normal cost, weighted on the expected payroll of Tier 1 and Tier 2 members for the given employer. The aggregate normal cost rate is then multiplied by the present value of future salary to determine the present value of future normal cost for each employer. The actuarial accrued liability is then calculated by subtracting the present value of future normal cost and present value of future employee contributions from the present value of future benefits.

Differences in the past between assumed experience and actual experience ("actuarial gains and losses") will become part of actuarial accrued liabilities. Unfunded actuarial accrued liabilities are to be amortized to produce payments (principal & interest) which are level percent of payroll contributions.

Liabilities for lump sum death benefits and temporary disability benefits will be determined using a term cost approach. Under this approach, the funding objective is to receive contributions each year that approximately equal the benefits being paid.

### 2. Asset Smoothing Method

The Funding Value of Assets will recognize assumed investment return fully each year. Differences between actual and assumed investment income are to be phased-in over a closed 5-year period subject to a 20% corridor (intended to prevent excess divergence between actuarial and market values). The method also limits the adjustment to the expected actuarial return to the maximum amount of unrecognized gains or losses not yet reflected in the actuarial value of assets. In any year in which the actuarial value minus the market value of assets switches from a positive value to a negative value, or vice-versa, any prior gain/loss bases are to be eliminated and the smoothing mechanism restarts.

## C. Elements (Continued)

### 3. Amortization Method

#### a. General

**Financing Liabilities and Overfunding**

The following procedures will be applied to financing liabilities.

i. Instrumentalities: 10-year rolling period.
ii. Early Retirement Incentive (ERI) Plan liabilities: a period up to 10 years selected by the Employer upon adoption of ERI.
iii. For taxing bodies (Regular, SLEP and ECO rate Groups): 30-year closed period until the remaining period reaches 15 years. After that point, a single rolling 15-year period shall be used for all unfunded liabilities that develop after that point and the schedule for the pre-existing liabilities shall continue until those liabilities are fully extinguished. In the event that a single rolling 15-year period results in negative amortization, the Board shall select a lesser period such that negative amortization does not occur.

The following procedures will be applied to financing overfunding.

i. Instrumentalities: 10-year rolling period.
ii. For taxing bodies (Regular, SLEP and ECO rate Groups): 30-year closed period until the remaining period reaches 15 years. After that point, a single rolling 15-year period shall be used for all assets exceeding liabilities.
iii. Assets exceeding liabilities can be used to satisfy Early Retirement Incentive (ERI) costs so long as the reserve balance (on an actuarial basis) does not drop below 100%. Those assets shall be applied to the extent they are available only at the employer's request. If those assets are insufficient to satisfy the ERI costs, then the remaining balance will be amortized for a period up to 10 years as selected by the employer.

#### b. SLEP Supplemental Liabilities (Public Act 94-712)

Amortize supplemental liabilities over a closed 30-year period, with an employer option of selecting a period of either 35 or 40 years.

### 4. Assumed Investment Return

The assumed rate of return is 7.25%, net of all administrative and investment expenses.

## C. Elements (Continued)

### 5. Funding Target

The targeted aggregate funded ration shall be 100%.

### 6. Computation of Employer Contribution Rates

The Board shall determine the employer contribution rate annually in consultation with the actuary, based upon the actuarial valuation for the most recent completed calendar year. The rate shall be calculated and communicated to the employer as soon as practical in the following year (known as Preliminary Rate Notice) and finalized by year-end (known as Final Rate Notice). Each rate shall remain in effect for one calendar year.

Annual employer contributions will be calculated utilizing the Actuarially Determined Employer Contribution rate (ADEC). It will be expressed as a percentage of payroll to be calculated so as to include a factor for normal cost for current service for each eligible plan and tier (based upon the benefit provisions in the Illinois Pension Code) and a factor to collect or refund any under or over funded amount.

In situations where the annual contributions based upon the ADEC times employer payroll are deemed insufficient to extinguish an unfunded liability over the course of an amortization period, a minimum contribution will be calculated which will pay down the unfunded liability over a 20-year period.

Economic Assumptions:

- Price Inflation: 2.5%
- Payroll growth: 2.5%
- Investment Return: 7.25%

Non-Economic Assumptions will be based upon the latest applicable triennial experience study and include:

- Rates of separation from active member status
- Rates of disability among actives
- Patterns of merit and longevity increases among actives
- Rates of retirement

Mortality Assumption:

- The RP-2014 mortality tables with adjustments for IMRF experience and the MP-2017 projection scale with administrative factors to be implemented by the actuary when appropriate.

## C. Elements (Continued)

### 7. Risk Management

#### a. Assumption Changes

i. The actuarial assumptions used shall be those last adopted by the Board based on the most recent experience study and upon the advice and recommendation of the actuary. In accordance with 40 ILCS 5/7-213, the actuary shall conduct an experience study at least every three years. The results of the study shall be the basis for the actuarial assumption changes recommended to the Board.

ii. The actuarial assumptions can be updated during the three-year period if significant plan design changes or other significant events occur, as advised by the actuary.

#### b. Amortization Method

The amortization method, Level Percent Closed, will ensure full payment of the UAAL over a finite, systematically decreasing period not to exceed 30 years. Not shorter than a rolling 15-year period.

#### c. Risk Measures

The following risk measures will be annually determined to provide quantifiable measurements of risk and their movement over time.

i. Classic measures currently determined
   A. Funded Ration (assets/liability)
   B. UAAL Amortization Period (years required to pay down the UAAL based on current funding rates)

ii. Dollar Standard Deviation of Investment Return/Total Payroll
   - Measures the risk associated with negative asset returns relative impact on the funded status of the plan. A decrease in this measure indicates a decrease in investment risk.

iii. Total UAL/Total Payroll
   - Measures the risk associated with contribution decreases relative impact on the ability to fund the UAAL. A decrease in this measure indicates a decrease in contribution risk.

iv. Total Assets/Total Payroll
   - Measures the risk associated with the ability to respond to asset experience through adjustments in contributions. A decrease in this measure indicates a decrease in asset risk.

v. Total AAL/Total Payroll
   - Measures the risk associated with the ability to respond to liability experience through adjustments in contributions. A decrease in this measure indicates a decrease in experience risk. This also provides a long-term measure of the asset risk in situations where the System has a funded ration below 100%.

**C. Elements (Concluded)**

**d. Peer Review (Actuarial Audit)**
Conduct a peer review of the Actuary's work every five years.

**e. Asset Liability Study**
Conduct an asset liability study at least once every five years or as needed due to economic/financial conditions.

## D. Glossary

1. **Actuarial Accrued Liability (AAL):** The difference between (i) the actual present value of future plan benefits, and (ii) the actuarial present value of future normal cost. Sometimes referred to as "accrued liability" or "past service liability".
2. **Actuarial Assumptions:** Estimates of future plan experience with respect to rates of mortality, disability, turnover, retirement, rate or rates of investment income and salary increases. Decrement assumptions (rates of mortality, disability, turnover and retirement) are generally based on past experience, often modified for projected changes in conditions. Economic assumptions (salary increases and investment income) consist of an underlying rate in an inflation-free environment plus a provision for a long-term average rate of inflation.
3. **Actuarial Cost Method:** A mathematical budgeting procedure for allocating the dollar amount of the "actuarial present value of future plan benefit" between the actuarial present value of future normal cost and the actuarial accrued liability. Sometimes referred to as the "actuarial funding method".
4. **Actuarial Gain (Loss):** A measure of the difference between actual experience and that expected based upon a set of actuarial assumptions during the period between two actuarial valuation dates, in accordance with the actuarial cost method being used. For example, if during a given year the assets earn more than the investment return assumption, the amount of earnings above the assumption will cause an unexpected reduction in UAAL, or "actuarial gain" as the next valuation. These include contribution gains and losses that result from actual contributions made being greater or less than the level determined under policy.
5. **Actuary:** A person who is trained in the applications of probability and compound interest to problems in business and finance that involve payment of money in the future, contingent upon the occurrence of future events. Most actuaries in the United States are Members of the American Academy of Actuaries (MAAA). The Society of Actuaries is an international research, education and membership organization for actuaries in the life and health insurance, employee benefits, and pension fields. It administers a series of examinations leading initially to Associateship and designation ASA and ultimately to Fellowship with the designation FSA.
6. **Amortization:** Paying off an interest-bearing liability by means of periodic payments of interest and principal, as opposed to paying it off with a lump sum payment.
7. **Asset Liability Study:** A comprehensive strategic asset allocation review designed to assess the continuing appropriateness of the Investment Objectives and Asset Allocation Policy. It includes a study of future benefit payments, liabilities, required funding, the appropriateness of the actuarial interest rate assumption and the prospective funded status of liabilities. It may also include a study of portfolio design for optimal diversification and comparisons with peer practices.
8. **Corridor:** A range described as a percentage beyond which the market value and actuarial value of assets should not exceed without significant changes to the employer contribution rate.

## D. Glossary (Concluded)

9. **Entry Age Normal Actuarial Cost Method:** A funding method that calculates the Normal Cost as a level percentage of pay over the working lifetime of the plan's members.
10. **Experience Study:** An actuarial investigation of demographic and economic experiences of the system during the period studied. The investigation was made for the purpose of updating the actuarial assumptions used in valuing the actuarial liabilities.
11. **Funding Value of Assets:** The value of current plan assets recognized for valuation purposes. Generally based on a phased-in recognition of all or a portion of market related investment return. Sometimes referred to as Actuarial Value of Assets.
12. **Market Value of Assets:** The fair value of plan assets as reported in the plan's audited financial statements.
13. **Normal Cost (NC):** The annual cost assigned, under the actuarial funding method, to current and subsequent plan years. Sometimes referred to as "current service cost". Any payment toward the unfunded actuarial liability is not part of the normal cost.
14. **Rolling Period:** An amortization method in which the amortization period is reset each following year for the same period of time.
15. **Unfunded Actuarial Accrued Liability (UAAL):** The positive difference, if any, between the actuarial accrued liability and valuation assets. Sometimes referred to as "unfunded accrued liability".

## E. Appendix

Attached are reference materials which shall be updated from time to time, but which are not part of this Policy. Changes/revisions to the reference materials need not be adopted by the Board of Trustees. Substantive changes to this Policy require Board of Trustee approval.

# Financing Unfunded Accrued Liabilities and Full Funding Credits December 31, 2019 Valuations

The following procedures were applied to financing liabilities in the valuation.

**Financing Periods if employer is less than 120% funded on a market basis.**

1. Instrumentalities: 10-year rolling period.

2. Early Retirement Incentive Plan liabilities: a period up to 10 years selected by the Employer upon adoption of ERI.

3. For taxing bodies (Regular, SLEP, and ECO rate Groups): 22-year closed period until remaining period reaches 15 years (then 15-year rolling period).

**Financing Period if employer is over 120% funded on a market basis.**

4. Irrespective of the size of the employer or the funding level, grant the employer an option to amortize overfunding over 120% over a 5-year period.

5. For employers with 50 or more employees, grant the employer an option to adopt a minimum contribution rate until the overfunding is reduced to 120%.

6. Irrespective of the size of the employer, surplus in a plan can be used to satisfy early retirement incentive costs so long as the reserve balance does not drop below 120%.

SLEP supplemental liabilities attributable to Public Act 94-712 were financed over 17 years for most employers (five employers were financed over 18 years; 1 employer was financed over 19 years; 2 employers were financed over 20 years; three employers were financed over 26 years; four employers were financed over 27 years and one employer was financed over 28 years).

The mass production valuation applies rules 1 through 3. For rules 4 through 6, the period provided on the IMRF rate tape is used for valuation purposes and IMRF staff reviews each case individually to see if changes are needed to comply with Board policy.

# Relationship Between the Board and the Actuary

The actuary should have the primary responsibility for choosing the ***demographic*** assumptions used in the actuarial valuation, making use of specialized training and experience.

The actuary and other professionals can provide guidance concerning the choice of suitable economic assumptions, but the basis of the economic assumptions is expected market returns for various asset classes and the assumed rate of inflation (a quantity which defies accurate prediction). Given an assumed rate of future inflation, it is very important that this rate be applied in a consistent manner in deriving the assumed rate of investment return, the economic portion of the assumption on pay increases to individual employees, and the assumed rate of growth of active member payroll. Consistent application of assumptions is an area in which the actuary has specialized training.

A sound procedure is that the actuary suggests reasonable alternatives for economic assumptions, followed by discussion involving the actuary, the Board of Trustees, and other professionals, and the Board then makes a final choice from the various reasonable alternatives.

# SECTION E

## FINANCIAL PRINCIPLES

# Financial Principles and Operational Techniques of IMRF

***Promises Made, and To Be Paid For:*** As each year is completed, IMRF in effect hands an "IOU" to each member then acquiring a year of service credit. The "IOU" says: "The Illinois Municipal Retirement Fund owes you one year's worth of retirement benefits, payments in cash commencing when you retire."

The related ***key financial questions*** are:

***Which generation of taxpayers contributes the money to cover the IOU?***

***The present taxpayers,*** who receive the benefit of the member's present year of service? ***Or the future taxpayers,*** who happen to be in Illinois at the time the IOU becomes a cash demand, years and often decades later?

***The law governing IMRF financing intends that this year's taxpayers contribute the money to cover the IOUs being handed out this year.*** With this financial objective, ***the employer contribution rate is expected to remain approximately level from generation to generation of taxpayers.***

There are systems which have a design for deferring contributions to future taxpayers. Lured by a lower contribution rate now, they put aside the consequence that the contribution rate must then relentlessly grow to a level much higher than would be required if a level contribution pattern were followed.

An inevitable by-product of the level-cost design is the accumulation of reserve assets, for decades, and the income produced when the assets are invested. ***Investment income*** ultimately becomes ***the 3rd and largest contributor*** for benefits to members, and is interlocked with the contribution amounts required from members and employers.

Translated to actuarial terminology, this level-cost objective means that the contribution rates must total at least the following:

Normal Cost (the cost of members' service being rendered this year)

... plus ...

Interest at the assumed real rate of return on Unfunded Actuarial Accrued Liabilities (unfunded actuarial accrued liabilities are the difference between: accrued liabilities for service already rendered; and the accrued assets of IMRF).

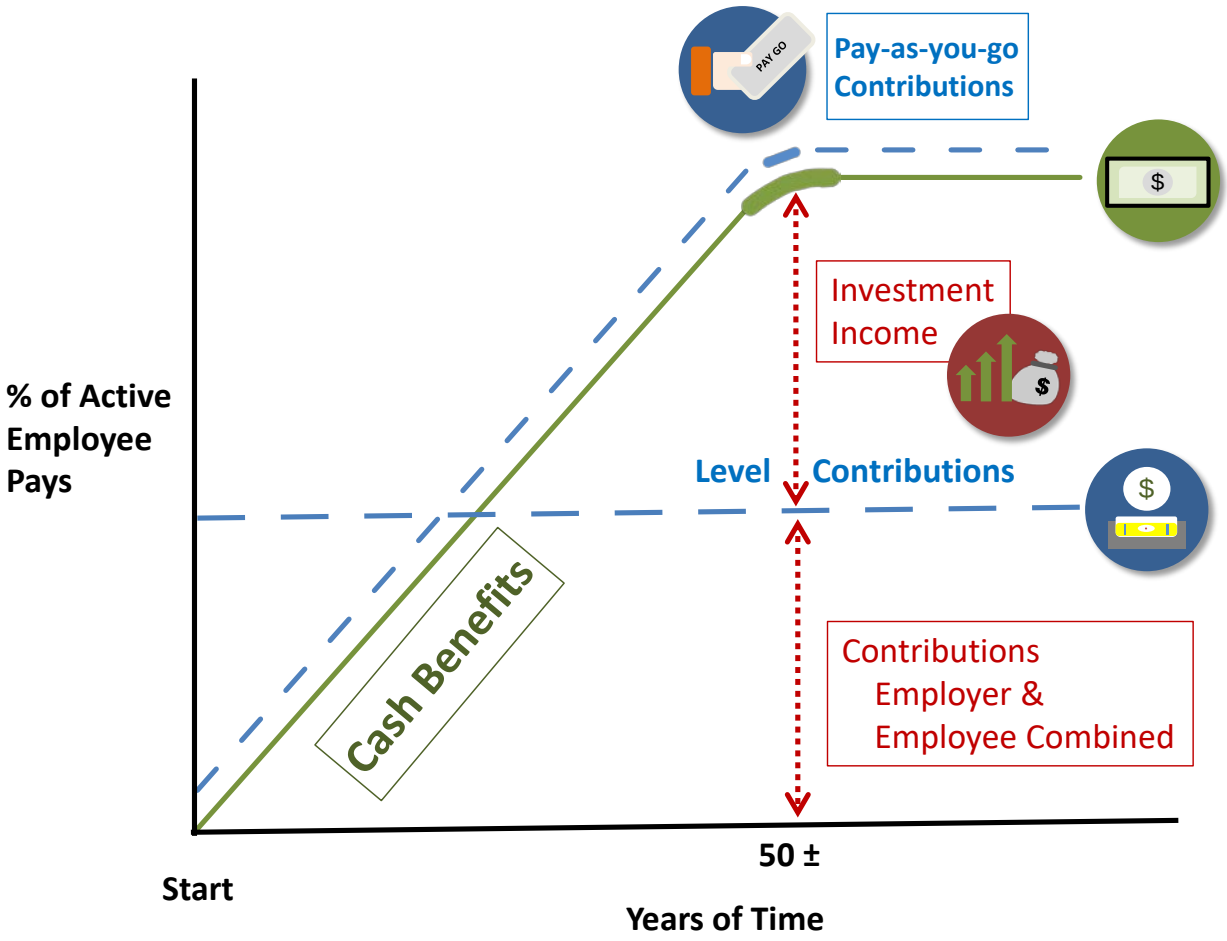
However, that statement is theoretical only. Contributions made at only that level would provide very little in the way of benefit security.

***Computing Contributions to Support Fund Benefits:*** From a given schedule of benefits and from member and asset data, the actuary calculates the contribution rates to support the benefits by means of ***an actuarial valuation and a funding method.***

An actuarial valuation has a number of ingredients such as: the rate of investment return which plan assets will earn; the rates of withdrawal of active members who leave covered employment; the rates of mortality; the rates of disability; the rates of pay increases; and the assumed age or ages at actual retirement. These rates cannot be known today. Consequently, in an actuarial valuation, assumptions must be made as to what the above rates will be for the next year and for decades in the future. The assumptions are established by the Board of Trustees after receiving the advice of the actuary.

***Reconciling Differences Between Assumed Experience and Actual Experience:*** Once actual experience has occurred and has been observed, it will not coincide exactly with assumed experience, regardless of the skill of the actuary and the many calculations made. The future cannot be predicted.

IMRF copes with these continually changing differences by having annual actuarial valuations. Each actuarial valuation is a complete recalculation of assumed future experience, taking into account all past differences between assumed and actual experience. The result is ***continuing adjustments in financial position.*** Once every three years, an Experience Study is conducted to fully review differences between actual and assumed experience and recommend changes to our assumed experience, where appropriate.




**CASH BENEFITS LINE.** This relentlessly increasing line is the fundamental reality of retirement plan financing. It happens each time a new benefit is added for future retirements (and happens regardless of the design for contributing for benefits).

**LEVEL CONTRIBUTION LINE.** Determining the level contribution line requires detailed assumptions concerning a variety of experiences in future decades, including:

- **Economic Risk Areas**
  - Rates of investment return
  - Rates of pay increase due to economic changes
  - Changes in active member group size
- **Non-Economic Risk Areas**
  - Ages at actual retirement
  - Rates of mortality before and after retirement
  - Rates of withdrawal of active members (turnover)
  - Rates of disability
  - Rates of pay increase due to merit & seniority

# The Actuarial Valuation Process

***The financing diagram*** on the previous page shows the relationship between ***the two fundamentally different philosophies of paying*** for retirement benefits: the method where contributions match cash benefit payments (or barely exceed cash benefit payments, as in the Federal Social Security program) which is thus an ***increasing contribution method;*** and, the ***level contribution method*** which attempts to equalize contributions between the generations.

***The actuarial valuation*** is the mathematical process by which the level contribution rate is determined. The activity constituting the valuation may be summarized as follows:

A. ***Census Data***, including:

Retired lives now receiving benefits
Former members with vested benefits not yet payable
Active members

B. + ***Asset data*** (cash & investments)

C. + ***Benefit provisions*** that establish eligibility and amounts of payments to members

D. + ***Assumptions concerning future experience*** in various risk areas

E. + ***The funding method*** for employer contributions (the long-term, planned pattern for employer contributions)

F. + ***Mathematically combining the assumptions, the funding method, and the data***

G. = Determination of:

Plan Financial position and/or
New Employer Contribution Rates

# Glossary

**Accrued Service -** The service credited under the plan which was rendered before the date of the actuarial valuation.

**Accumulated Benefit Obligation -** The actuarial present value of vested and non-vested benefits based on service to date and past and current salary levels.

**Actuarial Equivalent -** A single amount or series of amounts of equal value to another single amount or series of amounts, computed on the basis of the rate(s) of interest and mortality tables used by the plan.

**Actuarial Present Value -** The amount of funds presently required to provide a payment or series of payments in the future. It is determined by discounting the future payments at a predetermined rate of interest, taking into account the probability of payment.

**Actuarial Present Value of Credited Projected Benefits or Pension Benefit Obligation -** The present value of future benefits based on service to date and the effect of projected salary increases.

**ERI -** Early Retirement Incentive Plan.

**Funded Percent -** A measure of the ratio of the funding value of assets to the actuarial accrued liability.

**Plan Termination Liability -** The actuarial present value of future plan benefits based on the assumption that there will be no further accruals for future service and salary. The termination liability will generally be less than the liabilities computed on a "going concern" basis and is not normally determined in a routine actuarial valuation.

**Reserve Account -** An account used to indicate that funds have been set aside for a specific purpose and are not generally available for other uses.