Alameda County Employees' Retirement Association
BOARD OF RETIREMENT

ACTUARIAL COMMITTEE/BOARD MEETING NOTICE and AGENDA

ACERA MISSION:

To provide ACERA members and employers with flexible, cost-effective, participant-oriented benefits through prudent investment management and superior member services.

Thursday, May 16, 2019
11:00 am

LOCATION	COMMITTEE MEMBERS	
ACERA C.G. "BUD" QUIST BOARD ROOM 475 14TH STREET, 10TH FLOOR OAKLAND, CALIFORNIA 94612-1900 MAIN LINE: 510.628.3000 FAX: 510.268.9574	DALE AMARAL, CHAIR	ELECTED SAFETY
	ELIZABETH ROGERS, VICE CHAIR	ELECTED GENERAL
	OPHELIA BASGAL	APPOINTED
	HENRY LEVY	EX-OFFICIO
	LIZ KOPPENHAVER	ELECTED RETIRED

Should a quorum of the Board attend this meeting, this meeting shall be deemed a joint meeting of the Board and Committee.

The order of agenda items is subject to change without notice. Board and Committee agendas and minutes are available online at www.acera.org.

Note regarding public comments: Public comments are limited to four (4) minutes per person in total.

Note regarding accommodations: The Board of Retirement will provide reasonable accommodations for persons with special needs of accessibility who plan to attend Board meetings. Please contact ACERA at (510) 628-3000 to arrange for accommodation.

Any materials required by law to be made available to the public prior to a meeting of the Board of Retirement can be inspected at 475-14th Street, Suite 1000 during normal business hours.

ACTUARIAL COMMITTEE/BOARD MEETING

Call to Order: 11:00 am

Public Input

Action Items: Matters for Discussion and Possible Motion by the Committee

1. **Actuarial Valuation and Review as of December 31, 2018**
   Discussion and possible motion to adopt the Actuarial Valuation and Review as of December 31, 2018.

   Recommendation
   Staff recommends that the Actuarial Committee recommend to the Board of Retirement that the Board adopt the Actuarial Valuation and Review as of December 31, 2018, including the employer and employee contribution rates.

   - Margo Allen
   - Andy Yeung, Segal Consulting

Information Items: These items are not presented for Committee action but consist of status updates and cyclical reports

2. Presentation and discussion of the results of the Actuarial Standard of Practice No 51, Assessment and Disclosure of Risk Associated with Measuring Pension Obligations and Determining Pension Plan Contributions (ASOP No. 51)

   - Margo Allen
   - Andy Yeung, Segal Consulting

Trustee Input

Future Discussion Items

None

Establishment of Next Meeting Date

TBD

Adjournment

MEMORANDUM TO THE ACTUARIAL COMMITTEE

DATE: May 16, 2019

TO: Members of the Actuarial Committee

FROM: Margo Allen, Fiscal Services Officer

SUBJECT: Actuarial Funding Valuation and Review as of December 31, 2018

Executive Summary

Staff and Segal Consulting (Segal) presented the Actuarial Valuation and Review as of December 31, 2018, at the April 18, 2019, Actuarial Committee meeting. Subsequent to the committee meeting, staff conducted a participating employers meeting on April 24, 2019, to present and discuss the following highlights of the referenced valuation:

The UAAL decreased from $2,156.7 million in 2017 to $2,137.1 million in 2018. This decrease in the UAAL was primarily due to the following factors:

a) higher than expected return on investments (after smoothing), and
b) other actuarial gains and the expected decrease due to contributions made to pay down the UAAL; **offset somewhat by**,
c) loss due to actual contributions lower than expected[1], and
d) higher than expected salary increases for active members.

The aggregate employer contribution rate[2] increased by 0.14% of payroll, that is, from 27.82% of payroll in 2017 to 27.96% for 2018. This change was primarily due to the following factors:

a) actual contributions lower than expected[1];
b) higher than expected salary increases for active members: and,
c) net effect of amortizing the prior year's UAAL over a different than expected projected total payroll[3]; **offset somewhat by**,
d) higher than expected return on investments (after smoothing); and,
e) Other actuarial gains.[4]

The aggregate employee contribution rate remained at 9.34% of payroll for 2018.

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[1] Including scheduled delay in implementing contribution rates after date of valuation.
[2] For employers with active member payroll.
[3] The prior year's UAAL is amortized over a smaller than expected projected total payroll for Safety members and a slightly larger than expected projected total payroll for General members.
[4] Including changes in membership demographics.

Recommendation

Staff recommends that the Actuarial Committee recommend to the Board of Retirement that the Board adopt the Actuarial Valuation and Review as of December 31, 2018, including the new employer and employee contribution rates.

MEMORANDUM TO THE ACTUARIAL COMMITTEE

DATE: May 16, 2019

TO: Members of the Actuarial Committee

FROM: Margo Allen, Fiscal Services Officer

SUBJECT: Results of the Actuarial Standard of Practice No 51, Assessment and Disclosure of Risk Associated with Measuring Pension Obligations and Determining Pension Plan Contributions (ASOP No. 51)

Executive Summary

Staff and Segal Consulting (Segal) are prepared to discuss the results of ACERA's risk assessment and review of the funded status as of December 31, 2018. In February 2019, the board adopted staff's recommendation to have Segal conduct a deterministic scenario test on ACERA's Actuarial Valuation and Review as of December 31, 2018.

As previously presented in February 2019, assessing and disclosing risk associated with measuring pension obligations and determining pension plan contributions is a new actuarial standard to satisfy disclosure requirements for ASOP No. 51, effective for a measurement date on or after November 1, 2018 and for ACERA's December 31, 2018, valuation.

Using ACERA's 10-year investment experience, Segal has conducted an analysis of the impact a hypothetical favorable and unfavorable future market experience (i.e., 14.50% and 0.00%, as compared to the expected investment return of 7.25%) would have on ACERA's funded status and employer contribution rates. Using these deterministic projections, Segal has measured and reported ACERA's funded ratios on both an actuarial value of assets basis and on a market value of asset basis to provide a backdrop for better defining and evaluating possible future funded statuses and employer contribution rates.

Attachment:
ACERA-Risk Assessment Including Review of Funded Status of the Pension Plan as of December 31, 2018, Segal Consulting

Alameda County Employees' Retirement Association

Risk Assessment Including Review of Funded Status of the Pension Plan as of December 31, 2018

Prepared by

Andy Yeung, ASA, MAAA, FCA, EA
Eva Yum, FSA, MAAA, EA

May 6, 2019

Table of Contents

Section 1: Introduction and Executive Summary

Introduction

The results included in our December 31, 2018 funding valuation report for the Pension Plan were prepared based on a single set of economic and non-economic actuarial assumptions under the premise that future experience of the Alameda County Employees' Retirement Association (ACERA) would match those assumptions. While those assumptions are reviewed every three years (with the assumptions from the last triennial experience study adopted by the Board of Retirement for use starting with the December 31, 2017 valuation), there is a risk that emerging results may differ significantly as actual experience proves to be different from the current assumptions.

The purpose of this report is to assist the Board of Retirement, participating employers and members and other stakeholders to better understand and assess the risks inherent in using a single set of actuarial assumptions in preparing the results in our December 31, 2018 funding valuation for ACERA.

New Actuarial Standard of Practice on Risk Assessment

The Actuarial Standards Board approved a new Actuarial Standard of Practice No. 51 (ASOP 51) regarding risk assessment when performing a funding valuation and it is effective with ACERA's December 31, 2018 actuarial valuation for benefits provided by the Pension Plan. ASOP 51 requires actuaries to identify risks that "may reasonably be anticipated to significantly affect the plan's future financial condition." Investment risk, asset/liability mismatch risk, interest rate risk, longevity and other demographic risks and contribution risk are cited as examples in ASOP 51. The Standard does not require the actuary to evaluate the likelihood of contributing entities to make contributions when due, nor does it require the actuary to assess the likelihood or consequences of future changes in applicable law.

The actuary's assessment can be qualitative or quantitative (e.g., based on numerical demonstrations). The actuary may use non-numerical methods for assessing risks that might take the form of commentary about potential adverse experience and the likely effect on future results. While the Standard does not require that every valuation include a

quantitative risk assessment, the actuary may recommend that a more detailed risk assessment be performed. When making that decision, the actuary will take into account such factors as the plan's design, maturity, size, funded status, asset allocation, cash flow, possible insolvency and current market conditions.

The Standard also requires disclosure of plan maturity measures and other historical information that are significant to understanding the risks associated with the Pension Plan and this information is included in this report. Besides information for the Pension Plan, we have included as part of the Plan design under Article 5.5 of the Statute the amount of "excess earnings" allocated from the Association's total investment portfolio to the Supplemental Retiree Benefit Reserve (SRBR) and the change in the sufficiency periods for benefits paid out of the SRBR. Based on our understanding of the statute which authorizes the SRBR, the investment return assumption used in the funding valuation has been developed without considering the impact of any future excess earnings allocation to the SRBR. However, for informational purposes, we have included in this report the same disclosure of such allocation that we have previously included in our funding valuation report.

In Section 2, we discuss some of the historical factors that have caused changes in ACERA's funded status and employer contribution rates.

In Section 3, we provide commentary on some risk factors that may result in future adverse experience and the likely effect they may have on future results. Even though we have not included a numerical analysis of all the risk factors, we have been directed by ACERA to illustrate the impact on the funded status and employer contribution rates using "Scenario Tests". These tests illustrate the effect of future investment returns on the portfolio coming in different from the current 7.25% annual investment return assumption used in the December 31, 2018 valuation.

Executive Summary

Historical Funded Status and Employer Contribution Rates

During the past 10 valuations from December 31, 2009 to 2018, the Association's funded ratios measured on an actuarial value of assets basis have decreased from about 81% to about 77% while the funded ratios measured on a market value of

assets basis have increased from about 70% to about 72%. From 2009 to 2018, the unfunded actuarial accrued liability (UAAL) measured on an actuarial value of asset basis has increased from about $1,110 million to about $2,137 million (and on a market value basis has increased from about $1,793 million to about $2,642 million) primarily as a result of strengthening the actuarial assumptions[1] used in preparing the valuations and unfavorable investment experience that were offset by some degree due to favorable non-investment experience. The total aggregate employer contribution rates have increased from about 19% to about 28% of payroll from 2009 to 2018 for the same reasons.[2]

During the past 10 valuations, the Association has become more mature as evidenced by an increase in the ratio of members in pay status (retirees and beneficiaries) to active members and by an increase in the ratios of plan assets and liabilities to active member payroll. This is significant for understanding the volatility of the historical (and future) employer contribution rates because any increase in UAAL due to unfavorable investment and non-investment experience for a relatively larger group of non-active and active members would have to be amortized and funded using the payroll of a relatively smaller group of active members.

In the 10 valuations from December 31, 2008 to 2017,[3] the assets available in the SRBR has increased from about $684 million to about $896 million. During this 10-year period, about $252 million in excess earnings were allocated to the SRBR and it was estimated that the assets in the SRBR would be sufficient to pay SRBR benefits for about 20 years (around 2028) in the December 31, 2008 valuation and for about 22 years (around 2038 to 2039) in the December 31, 2017 valuation.[4]

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1 For instance, the UAAL increased by $460 million and $396 million in the December 31, 2014 and December 31, 2017 valuations, respectively, as a result of the last two experience studies.

2 For instance, the increase in the employer's total rate (normal cost plus UAAL) was 3.44% in the December 31, 2014 valuation and 3.49% in the December 31, 2017 valuation, as a result of the last two experience studies.

3 We have not included the results from the December 31, 2018 SRBR valuation as the results from that valuation will not be available until later in 2019.

4 During the past 10 years, the Board took several actions to preserve the sufficiency period to pay benefits from the SRBR. For instance, the Board eliminated the Active Death Equity Benefit and froze the maximum Monthly Medical Allowance for several years.

Future Funded Status and Employer Contribution Rates

In this report, we have outlined some factors that may be studied in future risk reports. As investment experience in the past 10 years has a significant impact on the funded status and employer contribution rates, we have provided illustrative results under hypothetical favorable and unfavorable future market experience so that the impact of market performance can be better understood.

The funded ratio is about 77% on an actuarial value of asset basis in the December 31, 2018 valuation. Using a "deterministic" projection and assuming that ACERA were to earn a single year of favorable market return of 14.50% or an unfavorable market return of 0.00% in 2019 (compared to an expected investment return of 7.25%), the Association would still be expected to reach full funding at the end of 20 years.

The total employer contribution rate is about 28% of payroll in the December 31, 2018 valuation. Using a "deterministic" projection and assuming that ACERA were to earn a favorable market return of 14.50% in 2019, there would be an increase in the total employer contribution rate of about 0.7% of payroll in the December 31, 2019 valuation and a decrease of about 0.1% of payroll in the December 31, 2024[5] valuation when all the investment gains are fully recognized at the end of the 5-year asset smoothing period. Alternatively, an unfavorable market return of 0% in 2019 would bring an increase in the total employer contribution rate by 1.7% in the 2019 valuation and 6.3% in the 2024 valuation.

Furthermore, under either favorable or unfavorable hypothetical market return scenarios for 2019, the total employer contribution rate would be expected to approach about 10% of payroll at the end of 20 years. That 10% of payroll is the employer normal cost rate after ACERA's UAAL layers as of December 31, 2018 are paid off over periods ranging from 14 to 20 years and any new UAALs resulting from the hypothetical market experience in 2019 are paid off over 20 years pursuant to the Board's actuarial funding policy. This means that the Board's funding policy is very effective in achieving the general policy goal of achieving the long-term full funding of the costs of the benefits paid by ACERA.

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[5] Since the investment gains are recognized over ten six-month periods, the 2019 investment gains/losses will be completely recognized by June 30, 2024.

Section 2: Factors That Have Historically Impacted Funded Status and Employer Contribution Rates

Funded Status and Change in Unfunded Actuarial Accrued Liabilities

One common measure of ACERA's financial status is the funded ratio. This ratio compares the actuarial[6] and market value of assets to the actuarial accrued liabilities[7] of ACERA. The overall level of funding of ACERA has declined as a result of strengthening of the economic and non-economic assumptions especially in the last two triennial experience studies. Those new actuarial assumptions were used starting in the December 31, 2014 and 2017 valuations. The unfavorable investment experience also has an impact. The funding ratios for the past 10 valuations from December 31, 2009 to 2018 measured using both actuarial and market value of assets bases and the unfunded actuarial accrued liabilities[8] (UAAL) measured using both the actuarial value of assets and market value of assets bases are provided in Chart 1.

The factors that caused the changes in the UAAL for the past 10 valuations from December 31, 2009 to 2018 are identified in Chart 2. The results in Chart 2 show that the changes in the investment return assumption from 7.80% to 7.60% in the December 31, 2014 valuation and from 7.60% to 7.25% in the December 31, 2017 valuation. These reductions together with the changes in the mortality tables and other assumptions from the two last triennial

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6 The actuarial value of assets is equal to the market value of assets excluding unrecognized returns from the last few years. Unrecognized returns are based on the difference between actual and expected returns on a market value basis and are recognized over a five-year period.

7 For the actives, the actuarial accrued liability is the value of the accumulated normal costs allocated to the years before the valuation date. For the pensionsers, beneficiaries and deferred vested members, the actuarial accrued liability is the single sum present value of the lifetime benefit expected to be paid to those members.

8 The amount by which the actuarial accrued liability of the plan exceeds (or is exceeded by) the assets of the plan.

experience studies have by far the most impact on the UAAL for ACERA,[9] followed by the unfavorable investment experience during 2009 to 2018.

Chart 2 also shows that the unfavorable investment experience was offset to some extent by favorable non-investment experience. The non-investment experience included smaller salary increases received by active members and smaller cost-of-living-adjustment (COLA) increases received by retirees and beneficiaries than expected under the actuarial assumptions. The non-investment experience also included the scheduled delay in implementing the contribution rates determined in the annual valuation.

Finally, prior to 2014, Chart 2 shows some "negative amortization" under the longer amortization periods used in these years. Current amortization policy generally will not entail negative amortization in the future.

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[9] For instance, the UAAL increased by $460 million and $396 million in the December 31, 2014 and December 31, 2017 valuations, respectively, as a result of the last two experience studies.

Chart 1

Funded Ratio (Percentages) and Dollar UAAL ($ Millions)
In December 31, 2009 to 2018 Valuations

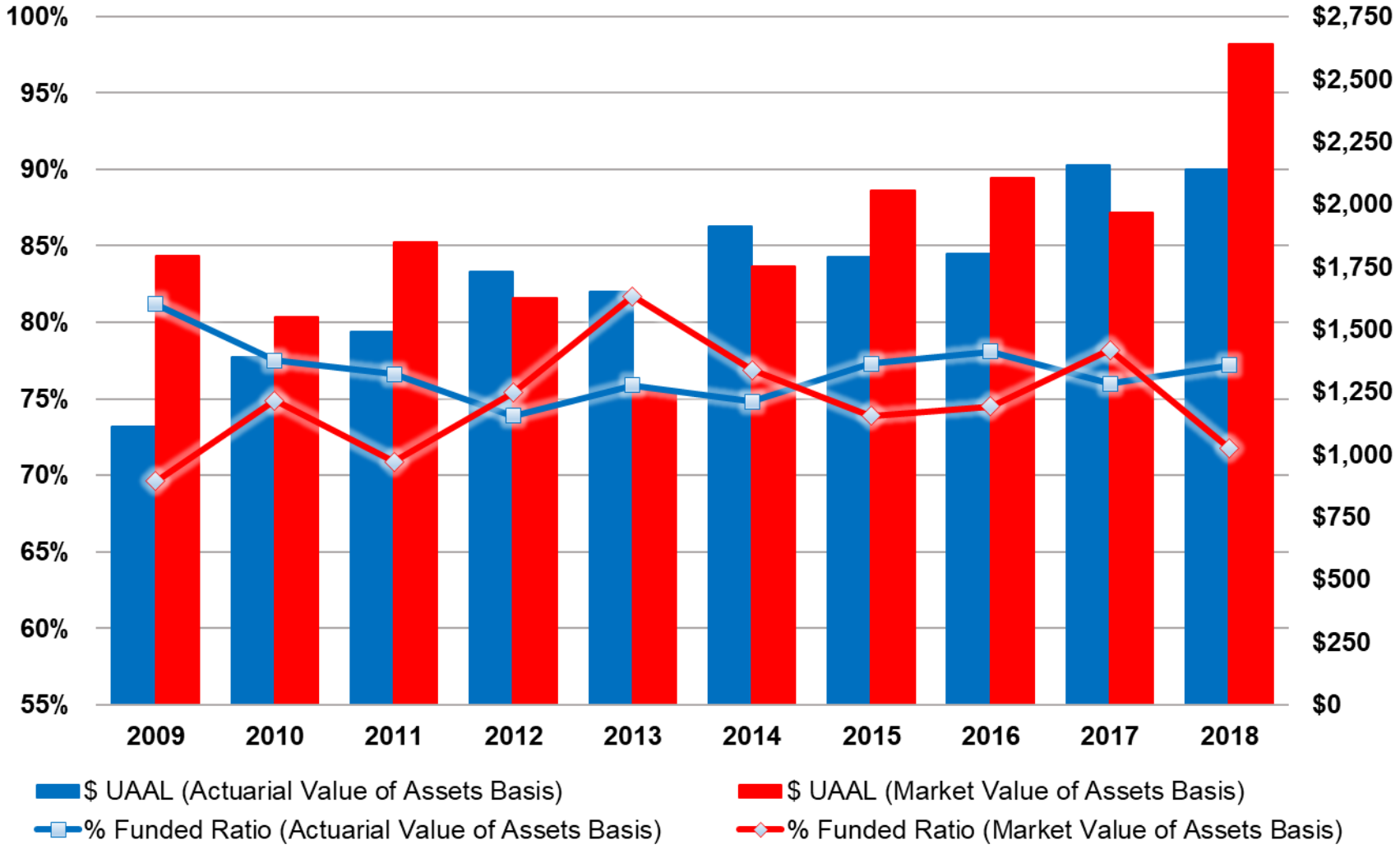
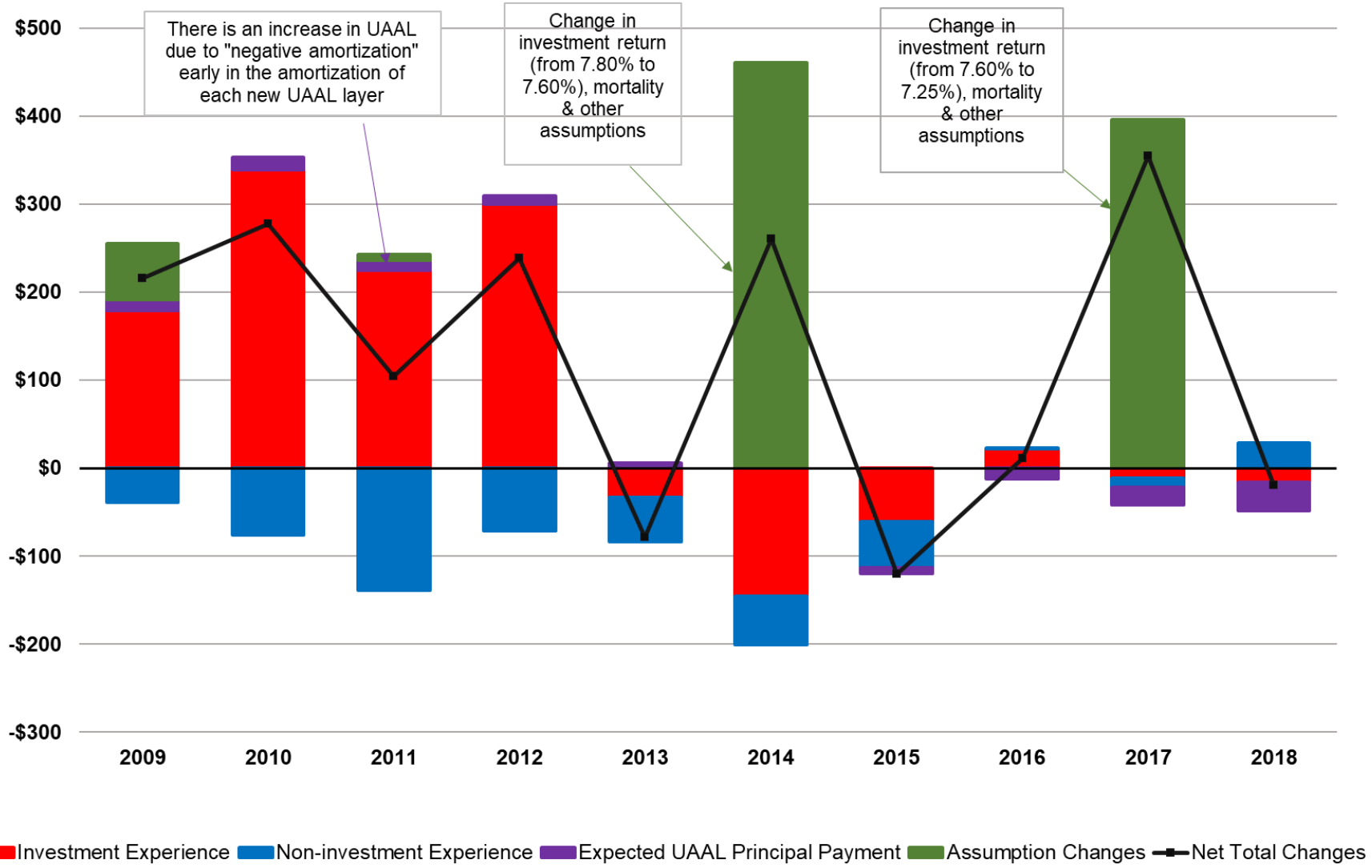


Chart 2

Factors that Changed UAAL in December 31, 2009 to 2018 Valuations ($ Millions)



Change in Employer Contribution Rates

The total (normal cost[10] plus UAAL) employer contribution rates determined in the December 31, 2009 to 2018 valuations are provided in Chart 3 and the factors that caused the changes in the total employer aggregate rates[11] are provided in Chart 4.

The employer's aggregate normal cost rates in Chart 3 has stayed relatively flat during the last 10 years. There had been increases in the employer's normal cost rates due to the changes in the actuarial assumptions. However, those increases were offset to some degree by the plan changes under the Public Employees' Pension Reform Act of 2013 (PEPRA) as new members have been enrolled in the lower cost PEPRA benefit tiers starting on January 1, 2013. Chart 4 shows that the changes in the investment return (from 7.80% to 7.60% in the December 31, 2014 valuation, from 7.60% to 7.25% in the December 31, 2017 valuation), mortality tables and other assumptions from the last two triennial experience studies have by far the most impact on increasing the UAAL contribution rates[12] for the employers followed by the unfavorable investment experience during 2009 to 2018.

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[10] The normal cost is the amount of contributions required to fund the level cost of the member's projected retirement benefit allocated to the current year of service.

[11] There are separate contribution rates determined in the valuation for the General and Safety membership groups and for the different benefit tiers. The aggregate rates have been calculated based on an average of those rates weighted by the payrolls of the active members reported in those valuations.

[12] For instance, the increase in the employer's total rate (normal cost plus UAAL) was 3.44% in the December 31, 2014 valuation and 3.49% in the December 31, 2017 valuation, as a result of the last two experience studies.

Chart 3

Employer Contribution Rates in December 31, 2009 to 2018 Valuations (% of Payroll)

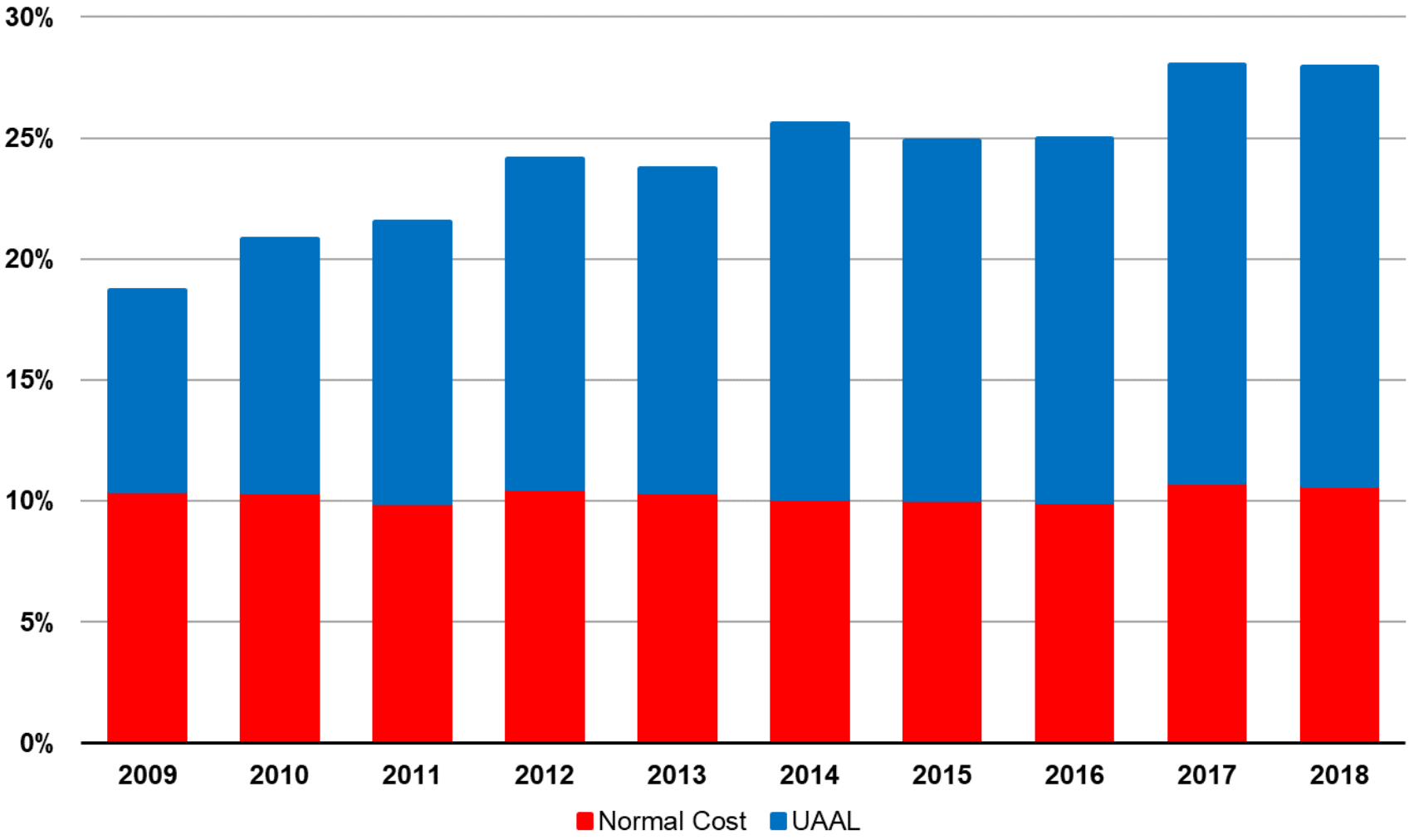
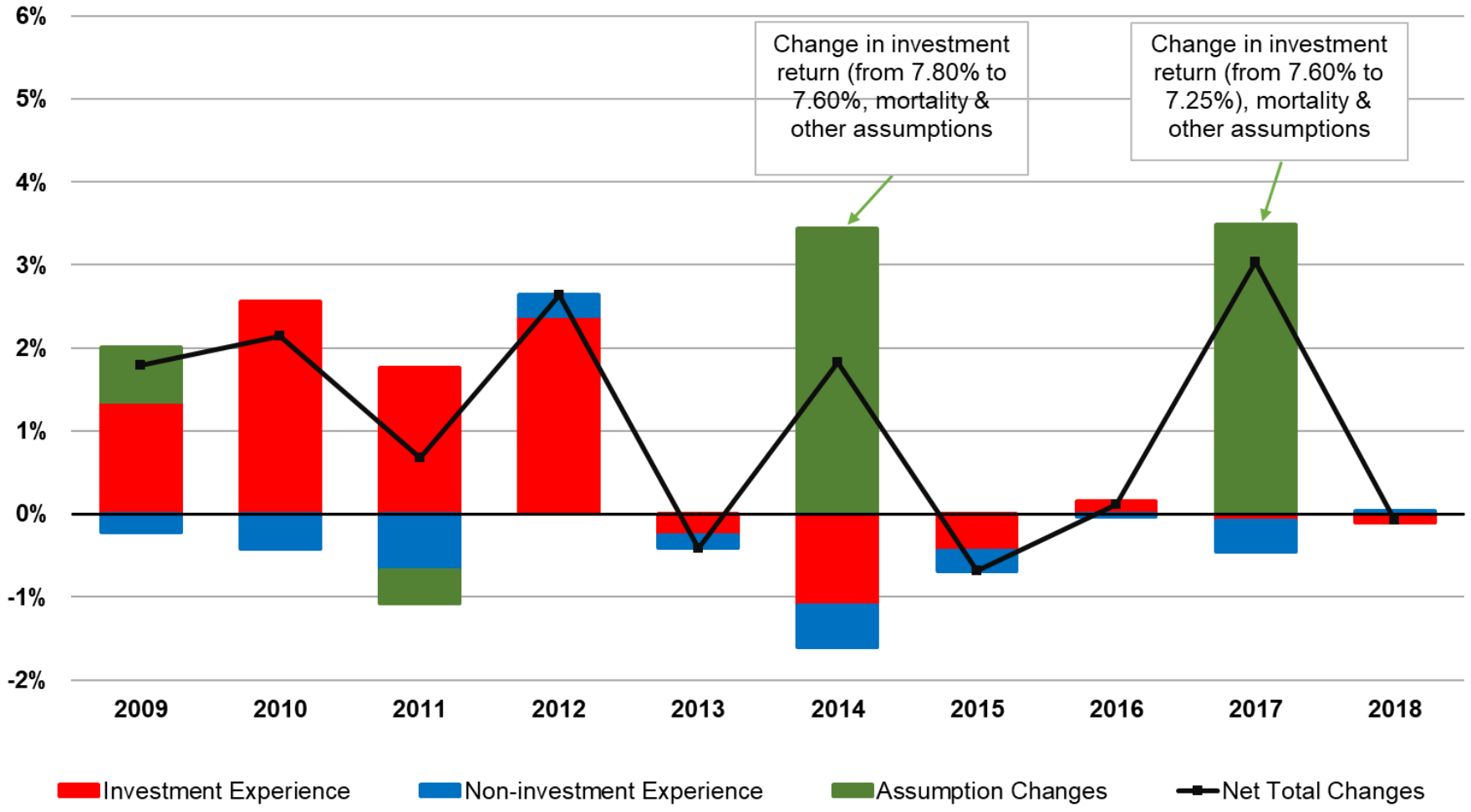


Chart 4

Change in Employer Contribution Rates in December 31, 2009 to 2018 Valuations
(% of Payroll)



Plan Maturity Factors That Contribute to Fluctuation in Employer Contribution Rates

The annual actuarial valuation considers the number and demographic characteristics of covered members, including active members and non-active members (vested terminated members, retired members and beneficiaries). In the past 10 valuations from December 31, 2009 to 2018, ACERA has become more mature, indicated by the continued increase in the ratio of non-active to active members covered by the Association as shown in Chart 5. The Chart also shows the ratio of members in pay status (retirees and beneficiaries) to active members. This ratio excludes the vested terminated members who have relatively smaller liabilities. The increase in the ratios is significant because any increase in UAAL due to unfavorable future investment and non-investment experience for a relatively larger group of non-active (and active) members would have to be amortized and funded using the payroll of a relatively smaller group of active members.

Besides the ratio of non-active to active members, another indicator of a more mature retirement plan is relatively larger amounts of assets and/or liabilities compared to active member payroll and increasing volatility in the level of required contributions. The Asset Volatility Ratio (AVR), which is equal to the market value of assets divided by total payroll, provides an indication of the potential contribution volatility for any given level of investment volatility. The Liability Volatility Ratio (LVR), which is equal to the actuarial accrued liability divided by payroll, provides an indication of the longer-term potential for contribution volatility for any given level of liability volatility.

In particular, ACERA's AVR was 6.2 as of December 31, 2018. This means that a 1% asset gain or loss in 2019 (relative to the assumed investment return) would amount to 6.2% of one-year's payroll. Similarly, ACERA's LVR was 8.6 as of December 31, 2018, so a 1% liability decrease or increase in 2019 would amount to 8.6% of one year's payroll. (The 6.2 and 8.6 are the AVR and LVR, respectively, for the entire Association. There are considerable differences in those ratios for the General (non-LARPD), General (LARPD) and Safety membership groups.)

Based on ACERA's policy to amortize actuarial experience over a period of 20 years, there would be a 0.4% of payroll decrease or increase in the required contribution rate for each 1% asset gain or loss and a 0.6% of payroll decrease or increase in the required contribution rate for each 1% liability gain or loss.

Chart 5

Ratios of Non-Active Members (Vested Terminated, Retirees and Beneficiaries) to Active Members & Members in Pay-Status (Retirees and Beneficiaries) to Active Members Ratio In December 31, 2009 to 2018 Valuations

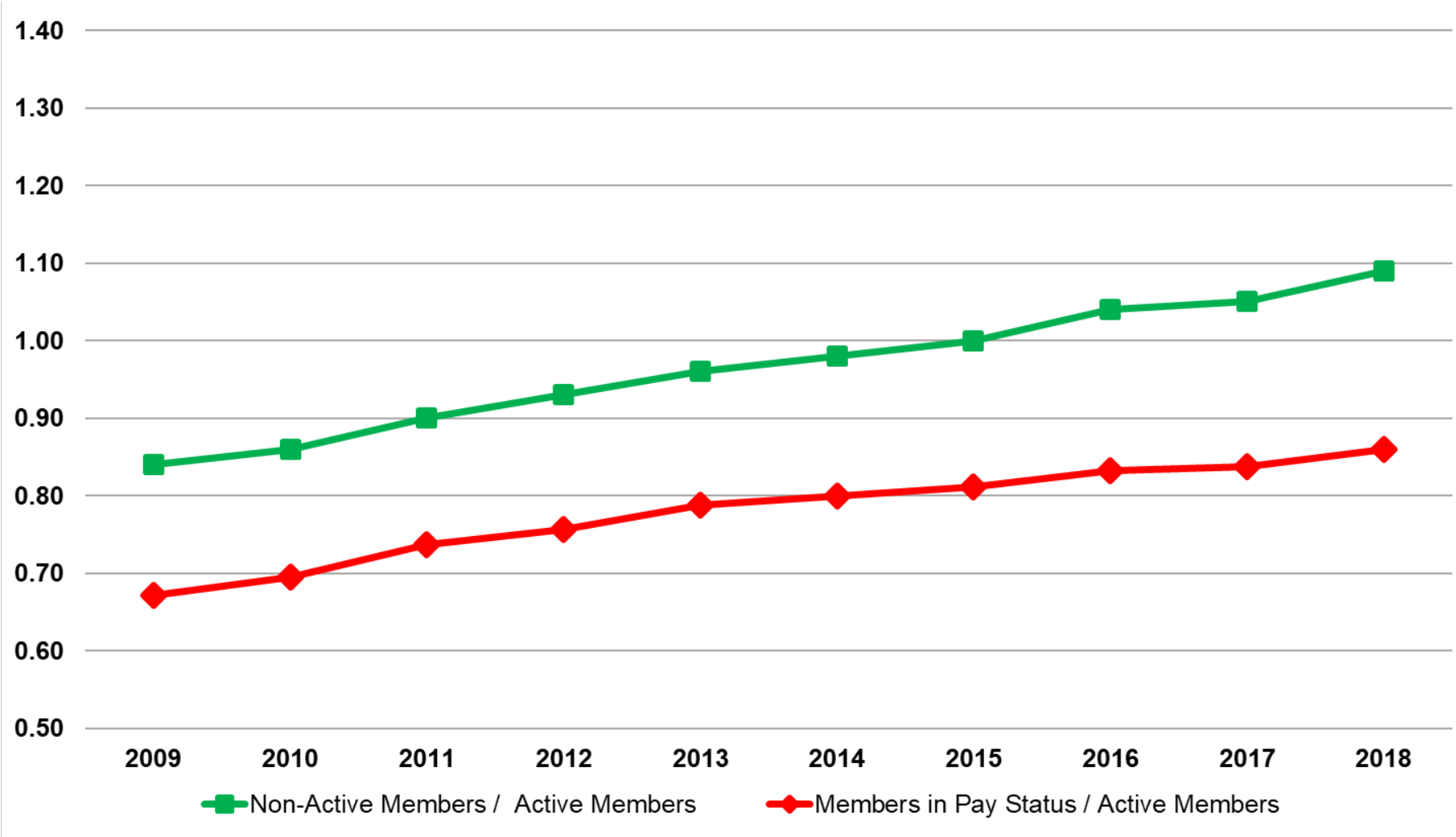
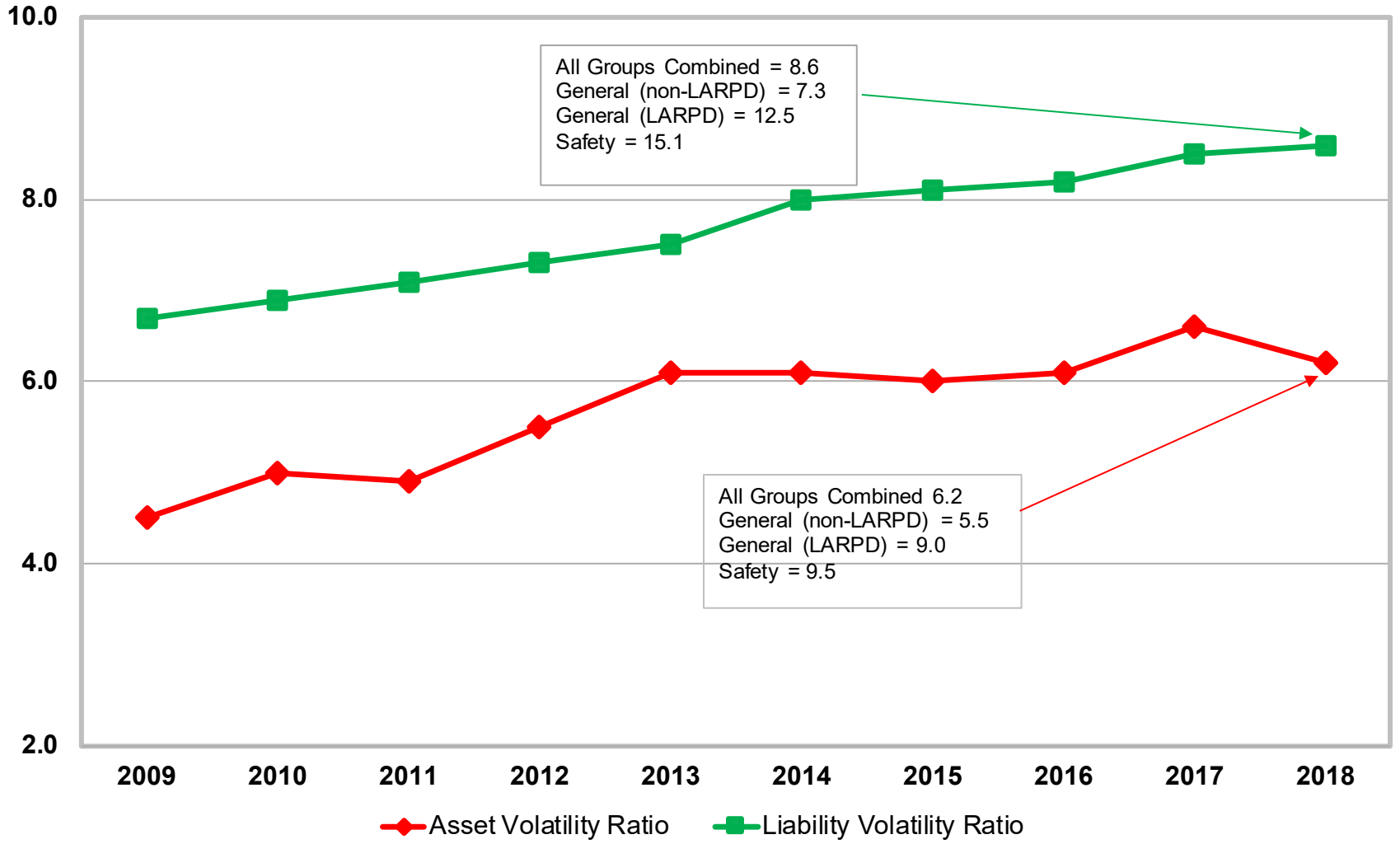


Chart 6

Asset Volatility Ratio and Liability Volatility Ratio in December 31, 2009 to 2018 Valuations



Supplemental Retiree Benefit Reserve

As part of the Plan design, under Article 5.5 of the Statute, excess earnings[13] are allocated from the Association's total investment portfolio to the SRBR. As a result, besides paying benefits from the Pension Plan, ACERA also provides benefits using assets available in the SRBR. In most recent actuarial study for the SRBR as of December 31, 2017, [14] there was about $896 million in assets available at the Board's discretion to provide non-vested retiree health subsidies[15] (other postemployment benefits or OPEB) and pension benefits[16] (non-OPEB).

In the 10 valuations from December 31, 2008 to 2017, the assets available in the SRBR has increased from about $684 million to about $896 million. During this 10-year period, about $252 million in excess earnings had been added to the SRBR. It was estimated that the assets in the SRBR would be sufficient to pay SRBR benefits for about 20 years (around 2028) in the December 31, 2008 valuation and for about 22 years (around 2038 to 2039) in the December 31, 2017 valuation. [17]

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[13] In general under the Board's interest crediting policy, earnings at one-half of the assumed annual valuation rate is credited every 6 months to reserves for the Pension Plan and the SRBR. Any remaining earnings (excess earnings) is allocated on a 50/50 basis between the Pension Plan and the SRBR.

[14] We have not included the results from the December 31, 2018 SRBR valuation as the results from that valuation will not be available until later in 2019.

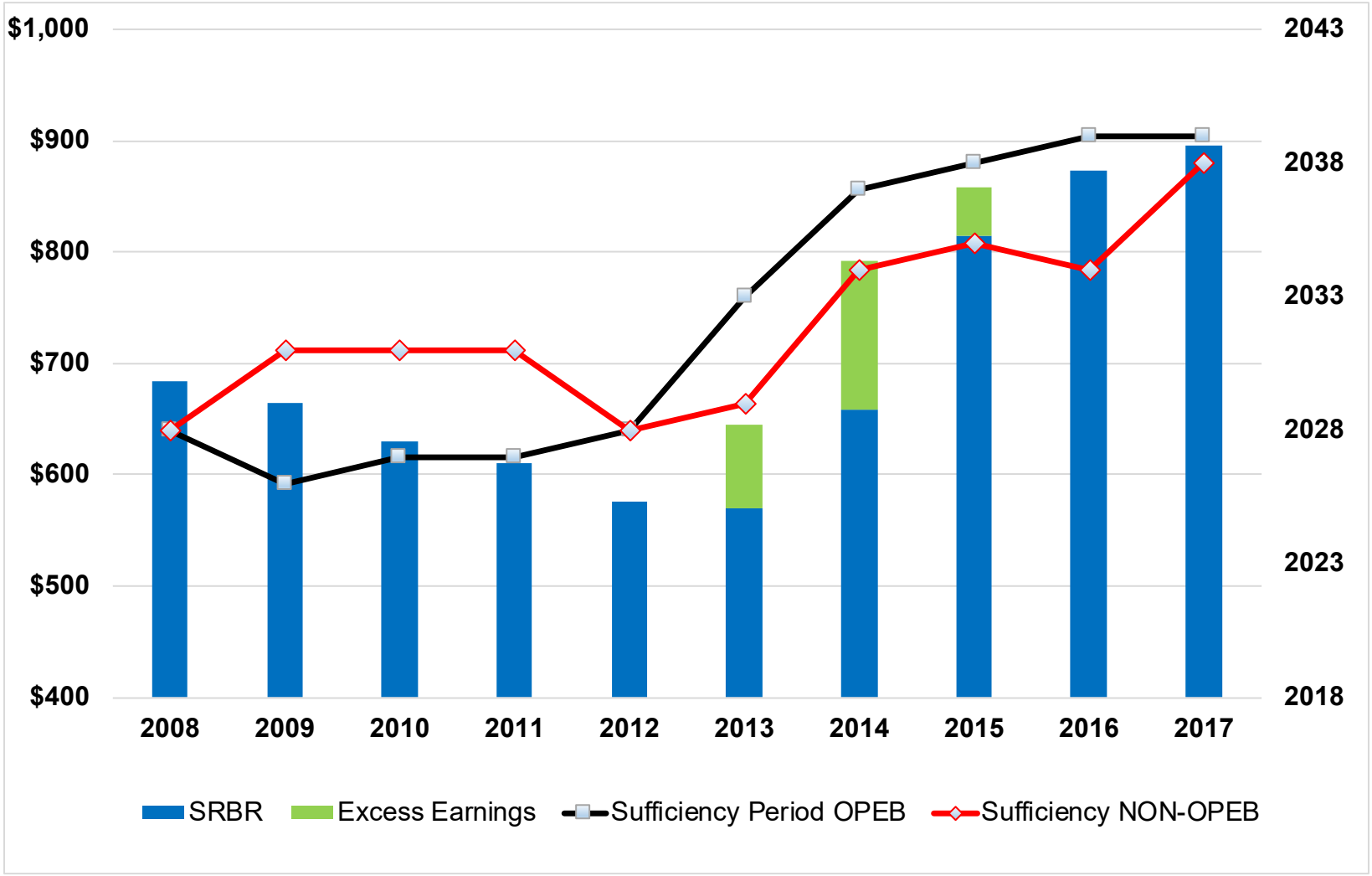
[15] The non-vested OPEB benefits include the Monthly Medical Allowance, reimbursement for premiums required for dental, vision and enrollment in Medicare Part B program.

[16] The non-vested pension benefits include supplemental COLAs and $1,000 lump sum retiree death benefits.

[17] Again, during the past 10 years the Board took several actions to preserve the sufficiency period to pay benefits from the SRBR. For instance the Board eliminated the Active Death Equity Benefit and froze the maximum monthly Monthly Medical Allowance for several years.

Chart 7

SRBR Assets ($ million) and Periods Benefits Can be Paid
In December 31, 2008 to 2017 Valuations



Section 3: Factors that May Impact Future Funded Status and Employer Contribution Rates

Future Risk Factors

As we discussed in Section 2, in the 2009 to 2018 valuations the funded ratios and the employer contribution rates have changed mainly as a result of changes in actuarial assumptions and investment experience.

In general, we would anticipate the following risk factors to have an influence on those two metrics in our future valuations:

- Investment risk – the potential that future market returns will be different from expected by the current 7.25% annual return assumption.

  We have included results from the "Scenario Tests" (see discussion later in this Section) so that ACERA can better understand the risk associated with earnings either more or less than the assumed rate. Also, we have included the amount of excess earnings that may be allocated and estimated the sufficiency of the SRBR under those scenarios.

- Asset/liability mismatch risk – the potential that changes in asset values are not matched by changes in the value of liabilities.

  Since the majority of the liabilities of ACERA are valued in a manner independent of the actual performance of the investment portfolio, ACERA's asset/liability mismatch risk[18] is the investment risk just discussed.

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[18] During 2018, ACERA paid benefits of about $471 million from the Pension Plan. Out of that total amount, only about $9 million was made in refund of employee contributions where the liabilities associated with the growth in the members' employee contribution account bear some relationship to the rate of return on ACERA's investment portfolio.

The Association might want to also use the AVR and LVR and associated contribution rate impacts provided in Section 2 when discussing with the employers the effect of unfavorable or favorable actuarial experience on the assets and the liabilities of ACERA.

- Interest rate risk – the potential that changes in interest rate will affect assets and/or liabilities.

  As just discussed above, changes in interest rates do not immediately affect the valuation of ACERA's liabilities. However, changes in the investment return assumption can affect both liabilities and contribution rates. During the last triennial experience study in 2017, we estimated that the total (employer and employee) contribution rate would increase by about 2.7% of payroll for a 0.25% reduction in the investment return assumption only.

  Since the Board has a policy of reviewing the investment return and the other actuarial assumptions every three years, we intend to include a "Sensitivity Test" showing the impact of changes in economic assumptions when we prepare next year's risk report in early 2020 (based on the December 31, 2019 actuarial valuation). Then, if the Board were to consider a change in ACERA's investment return assumption, the impact on employer and employee contribution rates would be available before we complete the next triennial experience study (recommending assumptions for the December 31, 2020 actuarial valuation).

- Plan design considerations – the potential SRBR excess earnings allocations and the impact to the investment return for the Pension Plan.

  As we have previously disclosed in the funding valuation report, the 7.25% investment return assumption used in the valuation for the Pension Plan has been developed without considering the impact of any future 50/50 excess earnings allocation to the SRBR. This is based on our understanding that Article 5.5 of the Statute, which authorizes the allocation of 50% of excess earnings to the SRBR, does not allow for the use of a different investment return for funding than is used for interest credit. This would appear in effect to

preclude the prefunding of the SRBR through the use of an assumption lower than the market earnings assumption of 7.25%.

Using a "stochastic" projection approach, we estimated that the 50/50 allocation of future excess earnings would have about the same impact as an "outflow" (i.e., assets not available to fund the benefits in the Pension Plan) that would average approximately 0.6% of assets over time. For informational purposes only, when we applied the results of our stochastic model to the December 31, 2018 valuation, we have estimated such an annual outflow would increase the Actuarial Accrued Liability in that valuation using a 7.25% investment return assumption by $0.69 billion) and would increase the employer's UAAL contribution rate by about 4%-5% of payroll.

- Longevity and other demographic risks – the potential that mortality or other demographic experience will be different than expected.

Aside from updates to the mortality tables to anticipate continued improvement in life expectancy for the Association's members, there were no major changes in the other non-economic assumptions in the last experience study. As can be observed from Charts 2 and 4, there had been relatively small impact on the UAAL and employer contribution rates due to unfavorable non-investment related experience relative to the assumptions used in the last 10 valuations. However, in the last triennial experience study in 2017, we alerted the Board that it should consider a new benefit weighted mortality basis when choosing the next mortality table, pending the availability of mortality experience from the Society of Actuaries (SOA) that included data from public sector retirement plans.

In January 2019, the SOA published the public sector mortality tables. While it is premature to estimate the impact of applying those new mortality tables on employer and employee contribution rates until we perform the next triennial experience study recommending assumptions for the December 31, 2020 valuation, the Board should still be aware that there will likely be an increase in liabilities and contribution rates.

- Contribution risk – ASOP 51 does not require the actuary to evaluate the ability or willingness of the plan sponsor or other contributing entity to make contributions to the plan when due. However, the ACERA employers have a well established practice of making the Actuarially Determined Contributions (ADC) determined in the annual actuarial valuation using the Board of Retirement's Actuarial Funding Policy.

  Furthermore, when ADCs determined in accordance with the ACERA Actuarial Funding Policy are made in the future by the employers (and contributions required by the statute are made by the employees), it is anticipated that the Association would have enough assets to provide all future benefits promised to the current members enrolled in the Association, if all of the actuarial assumptions used in the valuation are met.

Scenario Tests

Since the funded ratio, UAAL and the employer contribution rates have fluctuated as a result of deviation in investment experience in the last 10 valuations, we have examined the risk for ACERA associated with earnings either higher or lower than the assumed rate of 7.25% in future valuations using projections under a deterministic approach.

Deterministic Projection

To measure such risk, we have included a "Scenario Test" to study the change in liabilities and contribution rates if ACERA were to earn market return higher or lower than 7.25% in the next year following the December 31, 2018 valuation. In Charts 8, 9 and 10, we show the results assuming alternatively that the portfolio's market return in 2019 will be as follows: Scenario 1: 14.50%, Scenario 2: 7.25% (baseline) or Scenario 3: 0%. Chart 8 provides the funded ratios, Chart 9 provides the UAAL and Chart 10 provides the aggregate employer contribution rates projected under the three hypothetical market return scenarios.

Relative to the total employer contribution rate of about 28% of payroll in the December 31, 2018 valuation, if ACERA were to earn a market return of 14.50% in 2019 (which is 7.25% higher than the current investment return assumption of 7.25%), it would cause an increase in the employer contribution rates of about 0.7% of payroll in the December 31, 2019 valuation and a decrease of about 0.1% of payroll in the December 31, 2024[19] valuation when all of the investment gains or losses are fully recognized in the (smoothed) actuarial value of assets. Alternatively, if ACERA were to earn a market return of 0% in 2019 (which is 7.25% lower than the current investment return assumption of 7.25%), it would cause an increase in the employer contribution rate of about 1.7% in the 2019 valuation and 6.3% in the 2024 valuation.

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[19] Since the investment gains are recognized over ten six-month period, the 2019 investment gains/losses will be completely recognized by June 30, 2024.

Furthermore, under either favorable or unfavorable hypothetical market return scenarios for 2019, the total employer contribution rate would be expected to approach about 10% of payroll at the end of 20 years. That 10% of payroll is the employer normal cost rate after ACERA's UAAL layers as of December 31, 2018 are paid off over periods ranging from 14 to 20 years and any new UAALs resulting from the hypothetical market experience in 2019 are paid off over 20 years pursuant to the Board's actuarial funding policy. This means that the Board's funding policy is very effective in achieving the general policy goal of achieving the long-term full funding of the costs of the benefits paid by ACERA.

While we have not assigned a probability on the 2019 market return coming in at these rates, the Board and other stakeholders monitoring ACERA should still be able to prorate and estimate the funded status and employer contribution rates for the December 31, 2019 and next several valuations as the actual investment experience for 2019 year becomes available throughout the year.

SRBR Sufficiency Projection

We also provided in Charts 11, 12 and 13 the projection of the SRBR assets as well as the sufficiency period under each of the hypothetical market return Scenarios 1, 2 and 3, respectively. Of note is that it is only under Scenario 1 (assuming 14.50% market return in 2019) where substantial excess earnings in the amounts of $7 million in 2021 and $8 million in 2024 would be added to the SRBR.

As there would be no or relatively small excess earnings projected under the market return scenarios studied, absence any action that might be taken by the Board to change benefits, benefits would only be paid until around 2035 to 2038.

Chart 8

Projected Funded Ratios (on Actuarial Value of Assets Basis) under Three Hypothetical Market Return Scenarios for 2019

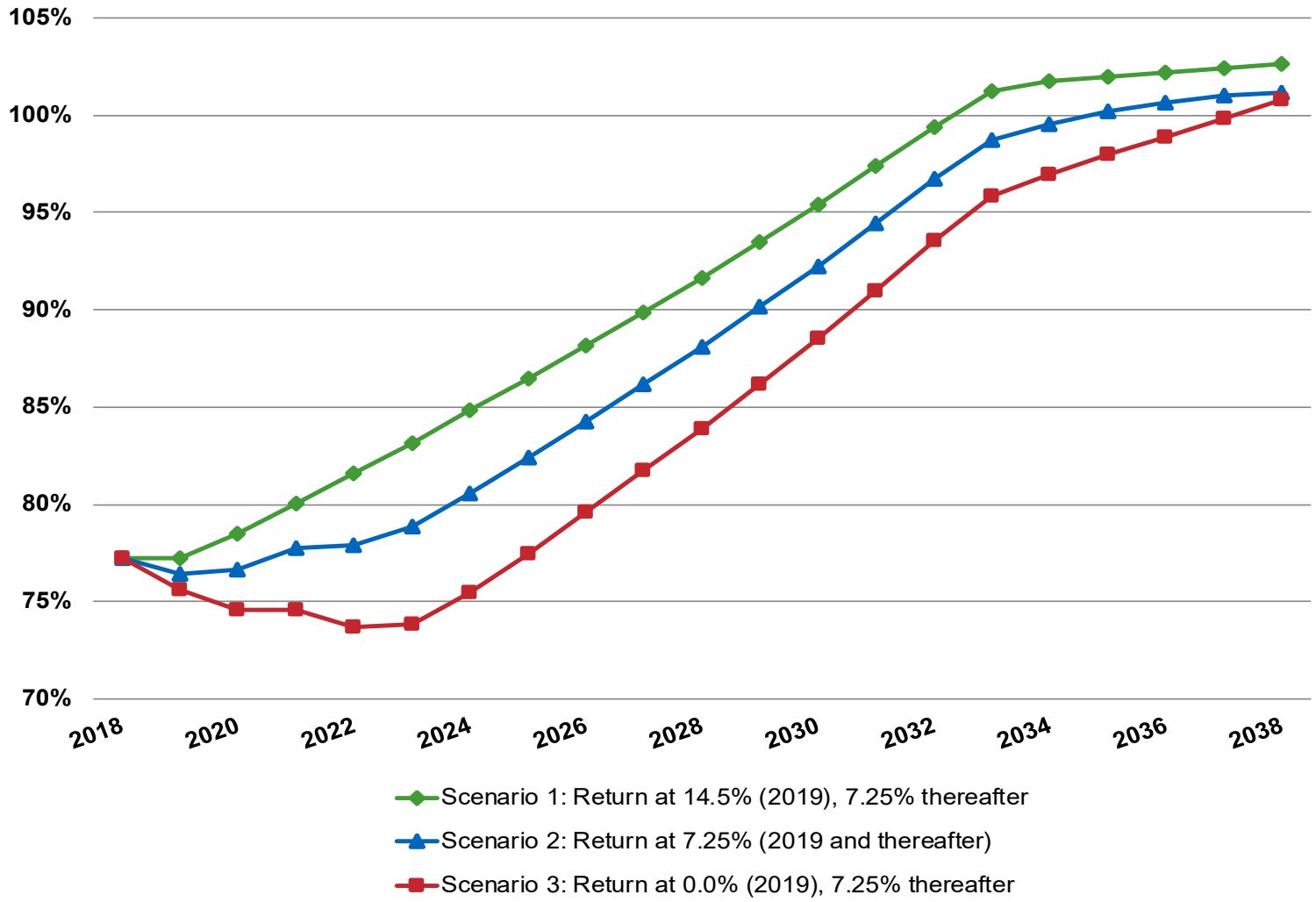


Chart 9

Projected UAAL (on Actuarial Value of Assets Basis) Under Three Hypothetical Market Return Scenarios for 2019 ($ Millions)

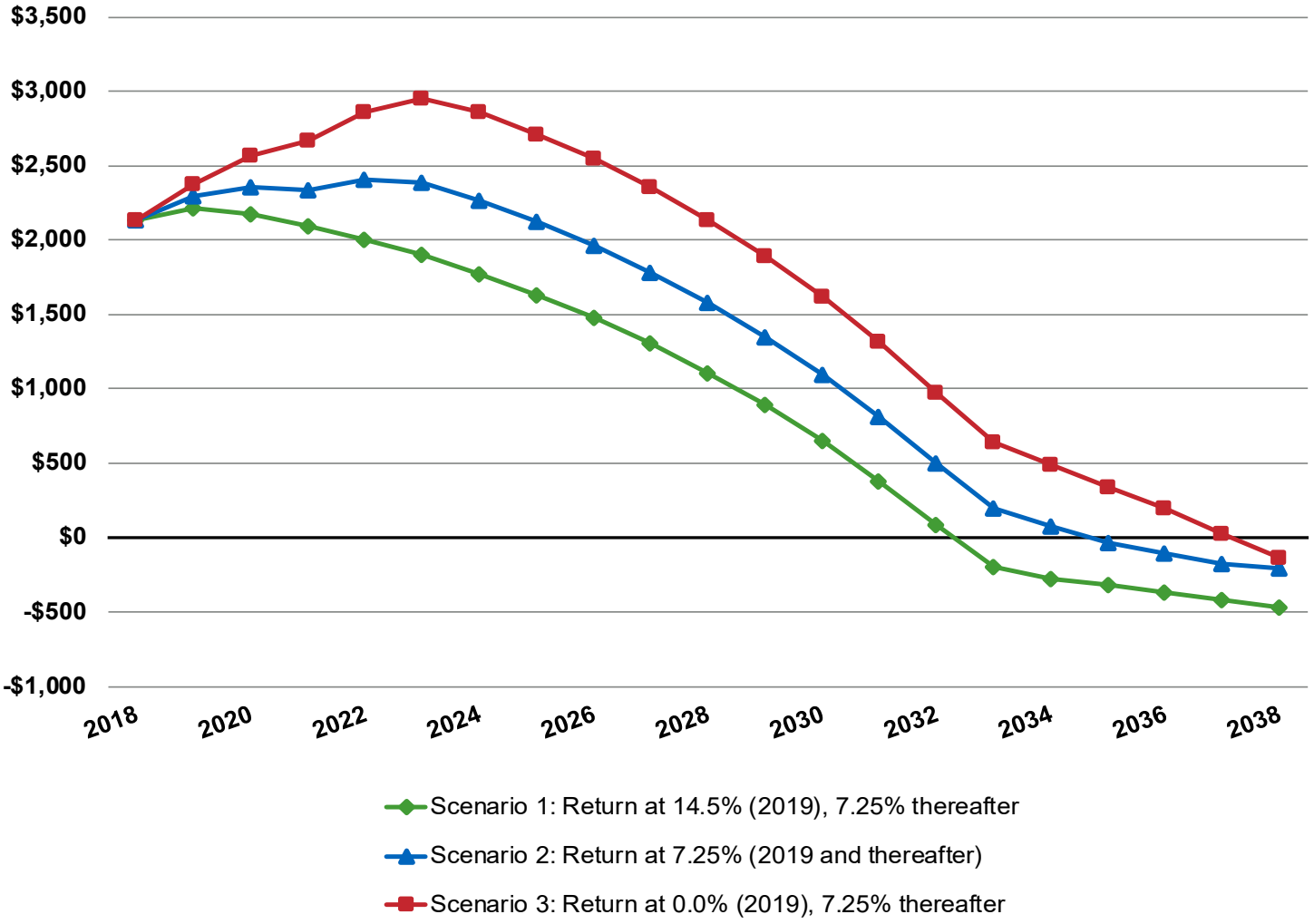


Chart 10

Projected Employer Contribution Rates Under
Three Hypothetical Market Return Scenarios for 2019 (% of Payroll)

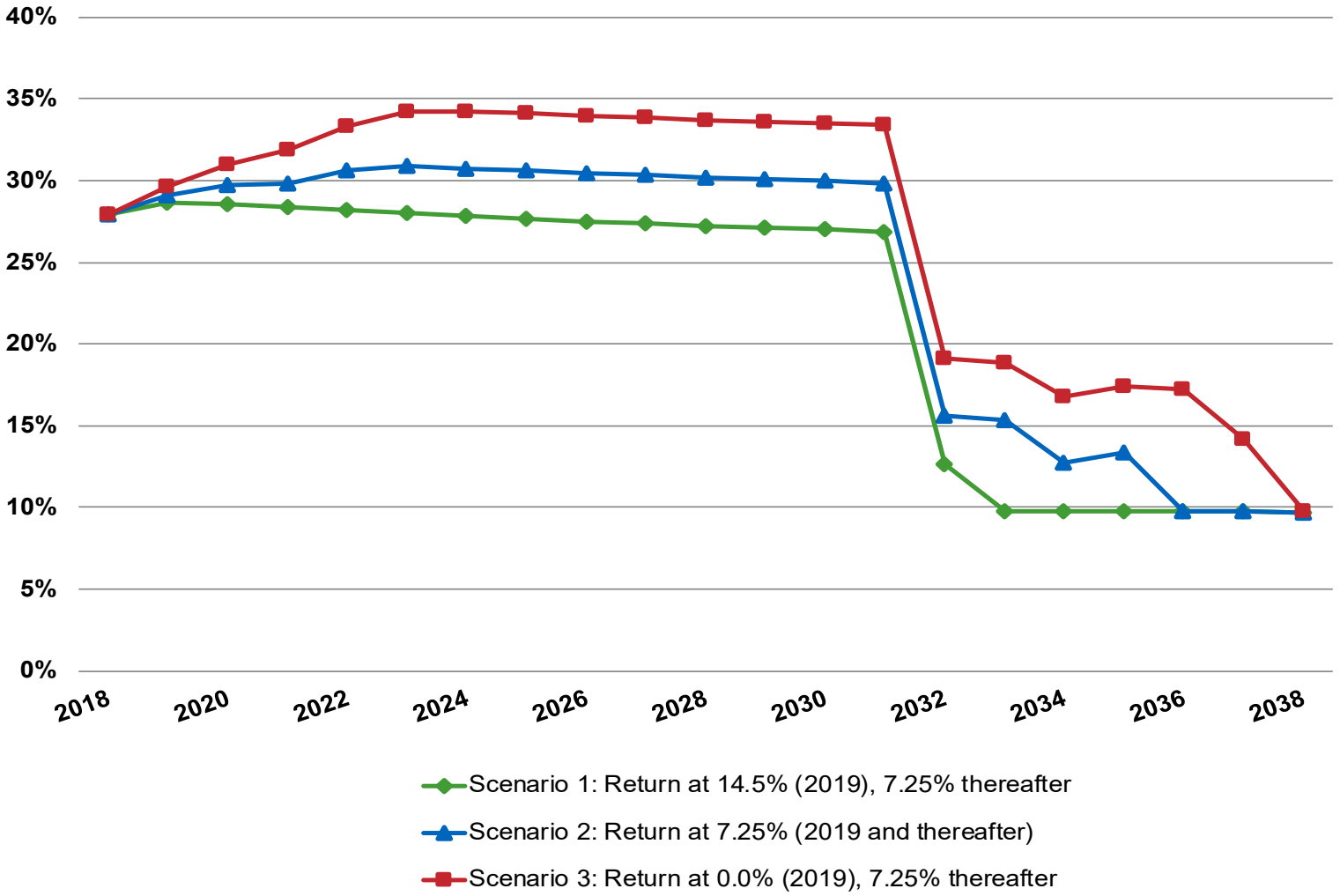


Chart 11

Projected SRBR Assets ($ Millions) and Periods Benefits Can be Paid Under Hypothetical Market Return Scenario 1 (Return at 14.5% for 2019)

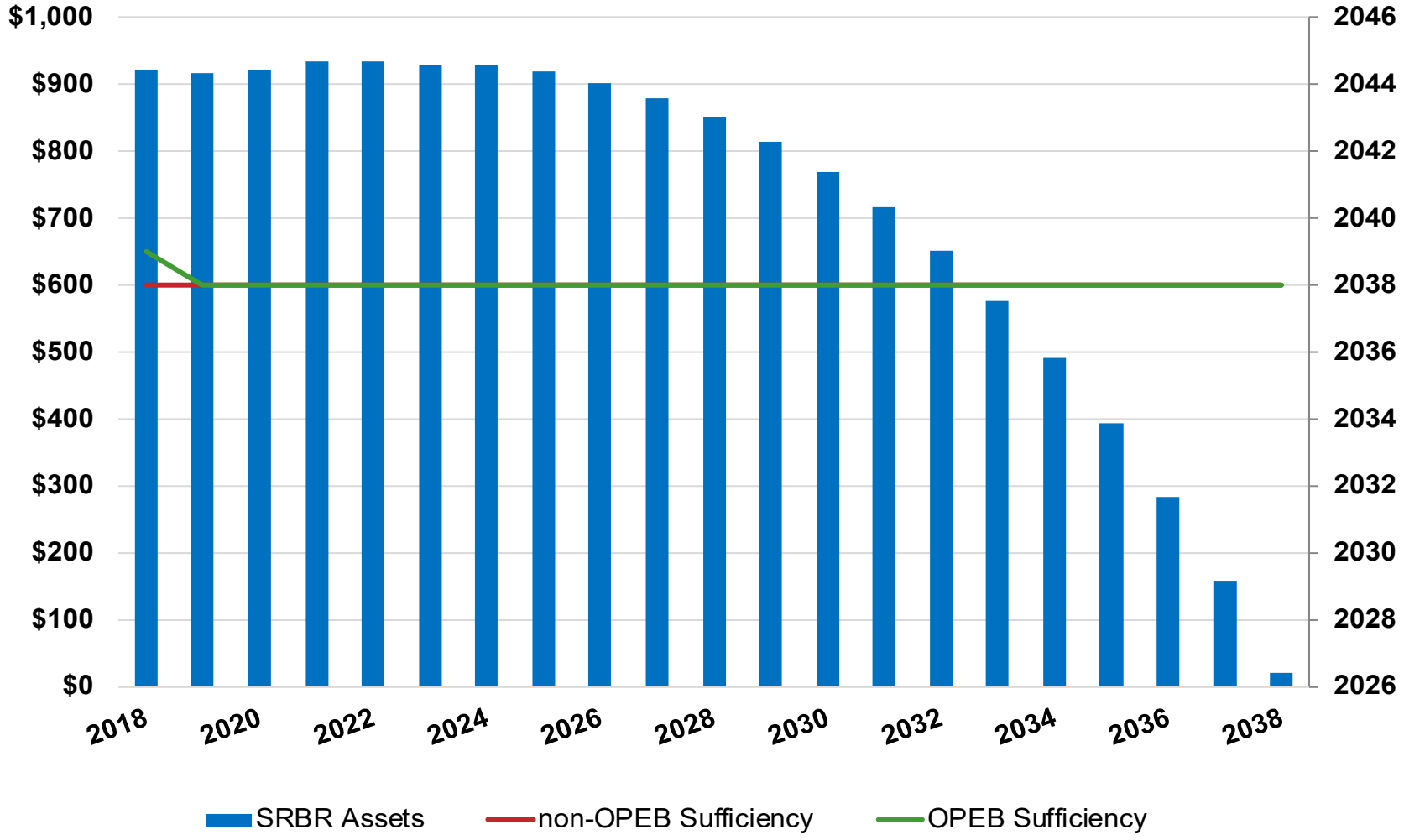


Chart 12

Projected SRBR Assets ($ Millions) and Periods Benefits Can be Paid Under Hypothetical Market Return Scenario 2 (Return at 7.25% for 2019)

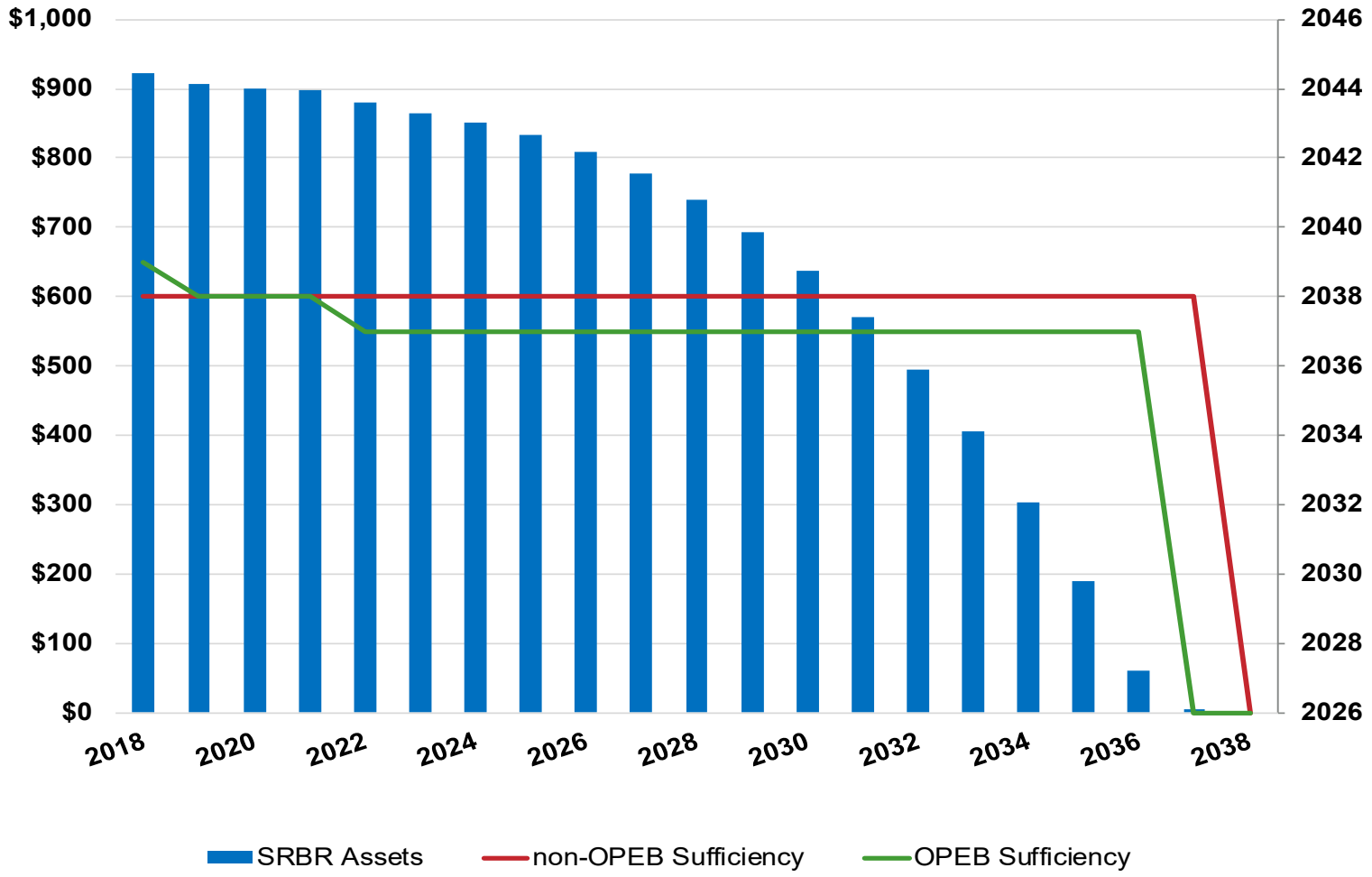
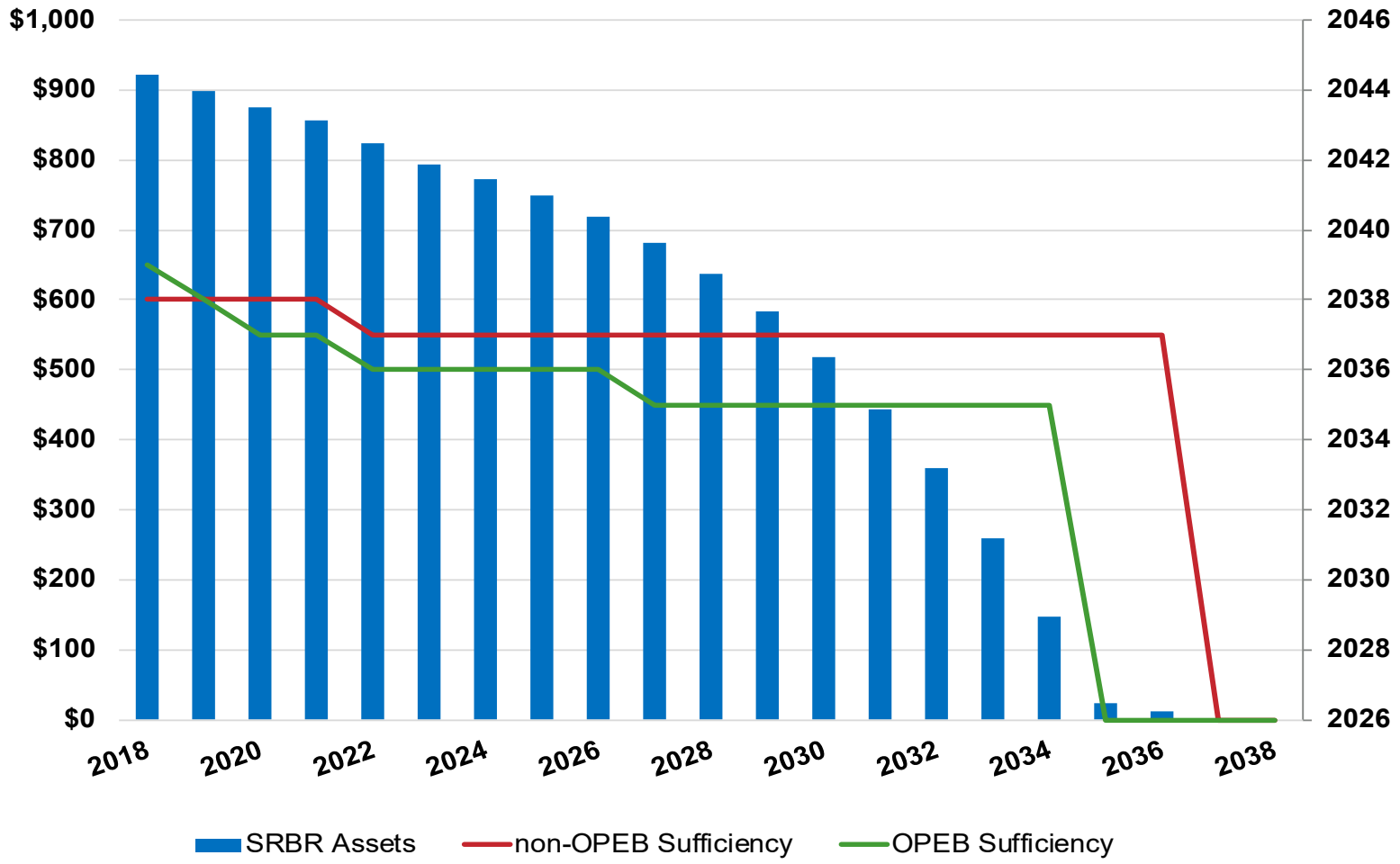


Chart 13

Projected SRBR Assets ($ Millions) and Periods Benefits Can be Paid Under Hypothetical Market Return Scenario 3 (Return at 0.0% for 2019)



Appendix: Actuarial Assumptions, Methods and Actuarial Certification

Actuarial Assumptions and Methods

Unless otherwise noted, the results included in this report have been prepared based on the assumptions and methods used in preparing the December 31, 2018 valuation.

Deterministic Projection

In addition, we have prepared the deterministic projection using the following assumptions and methods applied in the December 31, 2018 actuarial valuation:

- Non-economic assumptions will remain unchanged.
- Retirement benefit formulas will remain unchanged.
- 1937 Act and PEPRA statutes will remain unchanged.
- UAAL amortization method will remain unchanged (i.e., 20-year layers and level percent of pay).
- Economic assumptions will remain unchanged, including the annual 7.25% investment earnings and 3.50% active payroll growth assumptions.
- Deferred investment gains and losses will be recognized over a 5-year period.
- All other actuarial assumptions used in the December 31, 2018 actuarial valuation will be realized.

Other Considerations

We emphasize that both deterministic and stochastic projections, by their nature, are not a guarantee of future results. The modeling projections are intended to serve as illustrations of future financial outcomes that are based

on the information available to us at the time the modeling is undertaken and completed, and the agreed-upon assumptions and methodologies described herein. Emerging results may differ significantly if the actual experience proves to be different from these assumptions or if alternative methodologies are used. Actual experience may differ due to such variables as demographic experience, the economy, stock market performance and the regulatory environment.

Actuarial Certification

The actuarial calculations in this report were completed under the supervision of Eva Yum, FSA, MAAA, Enrolled Actuary.

The actuarial opinions expressed in this report were prepared by Andy Yeung, ASA, MAAA, FCA, Enrolled Actuary and Eva Yum, FSA, MAAA, Enrolled Actuary. They are members of the American Academy of Actuaries and they meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion herein.

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