

CALSTRS

2023 Review of Funding Levels and Risks

Presented November 2, 2023

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INTRODUCTION

This is the eighth annual edition of the *Review of Funding Levels and Risks* report. The *Review of Funding Levels and Risks* report provides information to the Teachers' Retirement Board, stakeholders, policymakers and the public to assess the soundness and sustainability of the CalSTRS Defined Benefit Program and to promote a better understanding of how well the CalSTRS Funding Plan is expected to accomplish its goal of achieving full funding by 2046.

To better understand the risks associated with funding the system, this report examines a range of potential negative outcomes, both economic and demographic, that could endanger the long-term funding of the system and prevent the system from reaching full funding.

This report is based on the June 30, 2022 annual valuation of the Defined Benefit Program and reflects all relevant changes that have occurred since the valuation, including the investment return reported for the 2022–23 fiscal year.

This report includes four main sections focusing on the following:

- **Path to full funding:** Discusses the significant changes in the past year and their impact on long-term funding and contribution rates.
- **The risk environment:** Discusses the risks to long-term funding, including longevity risk, risks related to membership decline, and future payroll growth and investment-related risk.
- **Measures of plan maturity and volatility:** Discusses how increasing maturity levels impact contribution rate volatility.
- **Ability to reach full funding under different actuarial assumptions:** Discusses how changes to some of the key economic assumptions would impact CalSTRS' ability to reach full funding.

EXECUTIVE SUMMARY

The California State Teachers' Retirement System was founded in 1913 with 120 retired members and 15,000 active members. More than 100 years later, CalSTRS serves more than one million members and beneficiaries and remains committed to its mission to secure the financial future and sustain the trust of California's public school educators and to provide retirement, disability and survivor benefits to them and their families.

To that end, CalSTRS has come a long way. Prior to the 2014 adoption of the funding plan, the Defined Benefit Program was expected to run out of assets in approximately 30 years. Thanks to the funding plan and the limited rate-setting authority it provides the board to adjust the state and employer contribution rates, CalSTRS is now financially stronger and better positioned to achieve full funding and react to demographic and economic changes.

CalSTRS continually monitors the funding plan and the financial health of the fund and provides formal assessments of funding levels and risks to the board twice a year. These formal assessments are presented in the spring through the annual actuarial valuation report and in the fall through this report. In addition to these two formal reports, CalSTRS provides updates on the status of various funding-related risks as part of the semiannual enterprise risk management report. These semiannual reports are generally presented to the board in March and September each year.

As shown in this year's *Review of Funding Levels and Risks* report, despite just falling short of meeting its 7% investment return assumption in 2022–23 with a time-weighted rate of return of 6.3%, CalSTRS continues to be slightly ahead of schedule in its goal of having the Defined Benefit Program reach full funding by 2046. For more detail, please refer to the "Path to full funding" section.

Key results and findings of this report include:

- Current contribution rates for the state and employers are still projected to be sufficient to allow both the state and the employers to eliminate their share of the CalSTRS unfunded actuarial obligation by 2046. Contribution rate increases are not expected to be needed for fiscal year 2024–25.
- The state remains well ahead of schedule to eliminate its share of the CalSTRS unfunded actuarial obligation. Its share is currently projected to be eliminated in 2028.
- The largest risk facing CalSTRS' ability to reach full funding remains investment-related risk, especially considering the Defined Benefit Program continues to mature, which will increase the system's sensitivity to investment experience. The state's share of the unfunded actuarial obligation could quickly increase if CalSTRS were to experience a year in which the investment return is significantly below the assumed rate of return.
- The Department of Finance is currently projecting decreases in enrollment in K–12 public schools which could lead to future declines in the size of the active membership, resulting in lower than anticipated payroll growth. This could negatively impact CalSTRS' ability to achieve full funding, requiring contribution rate increases, especially for employers. It could also impact the ongoing appropriateness of CalSTRS' 3.5% payroll growth assumption.
- A recession resulting in a period of low investment returns coupled with a decline in the size of the active membership could hurt CalSTRS' ability to reach full funding. However, by having a funding plan in place, CalSTRS remains in a favorable position to be able to react to a future recession and keep the funding plan on track.
- The ability of the funding plan to allow CalSTRS to reach full funding is dependent on CalSTRS meeting its current actuarial assumptions over the long term. Uncertain investment markets and payroll growth could put pressure on CalSTRS' ability to meet some of its long-term actuarial assumptions. Actuarial assumptions

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are currently being reviewed, and the result of the review will be presented to the board in January 2024.

CalSTRS is also required by statute to provide a report to the Legislature every five years on the progress of the funding plan. The first progress [report](#) was completed and provided to the Legislature in June 2019. The next progress report is due in June 2024.

For the next progress report, the board will have the opportunity in March 2024 to discuss and consider whether the report should include for consideration potential improvements to further strengthen the funding plan and CalSTRS' ability to reach full funding. Making minor modifications to the funding plan, by addressing certain features, would help mitigate the impact of some of the risks identified in this report. In March 2021, the California Legislative Analyst's Office published a [report](#) recommending such minor modification be made to strengthen the funding plan to address some of the features discussed in this report.

Path to full funding

Key findings:

- Despite falling short of meeting its 7% investment return assumption, CalSTRS remains ahead of schedule in its goal of having the Defined Benefit Program reach full funding by 2046.
- Contribution rates for the state and employers are expected to remain the same in fiscal year 2024-25 to eliminate their respective shares of the unfunded actuarial obligation by 2046.

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One of CalSTRS' main goals is to ensure a financially sound retirement system for California's educators. Progress toward this goal was made possible in 2014 with the passage of the CalSTRS Funding Plan.

The funding plan set out a measured schedule of contribution rate increases for members, employers and the state with the goal of achieving full funding by 2046. It also provided the board with limited authority to adjust rates to help keep the funding plan on schedule.

This section discusses how significant changes in the past year have impacted future funding levels and the contribution rates needed for the state and employers to continue the progress toward reaching full funding by 2046.

Significant changes in the past year

Over the last year, the board continued to exercise its rate-setting authority to keep the funding plan on track for the Defined Benefit Program to reach full funding by 2046. At the May 2023 meeting, the board voted to keep the state contribution rate to the Defined Benefit Program at 8.328%¹ of payroll and the employer contribution rate at 19.1% of payroll. Although both contribution rates could have been reduced and still allowed the Defined Benefit Program to reach full funding by 2046, the board took the prudent approach of keeping contribution rates at existing levels knowing CalSTRS would likely earn less than its assumed 7% investment return in fiscal year 2022–23. In July 2023, CalSTRS reported a time-weighted rate of return of 6.3% for fiscal year 2022–23.

Despite falling short of meeting its 7% investment return assumption, CalSTRS remains ahead of schedule in its goal of the Defined Benefit Program reaching full funding by 2046. This is due to the exceptional 27.2% investment return earned by CalSTRS in fiscal year 2020–21.

After a significant decline in the number of active members who participate in the Defined Benefit Program during the COVID years, the number of active teachers increased for the second year in a row. The number of active members increased by about 9,000 in 2022–23. The number of active members on June 30, 2023, was approximately 458,000—the highest since 2009. Combined with larger than anticipated salary increases for active members, the total payroll increased by about 6%, more than the assumed 3.5% annual growth.

¹ Throughout this report, only the state contribution rate to the Defined Benefit Program is being analyzed. The state also contributes 2.5% of payroll to fund the Supplemental Benefit Maintenance Account, CalSTRS' inflation protection program.

The impact of these events on projected funding levels and contribution rates is discussed in greater detail in the next few sections.

The board's decision in May 2023 to maintain contribution rates at existing levels could prove important in providing rate stability since actuarial assumptions are currently being reviewed. With the anticipated continued decreases in enrollment in K–12 public schools, discussed in more detail later in this report, the ongoing appropriateness of the 3.5% payroll growth assumption will be reviewed in the next experience study. The results of the experience study will be presented to the board in January 2024. A reduction in the payroll growth assumption would normally require an increase to contribution rates but since the board did not lower contribution rates in May 2023, existing state and employer contribution rates are expected to remain sufficient in fiscal year 2024–25 even if changes to actuarial assumptions are needed.

Changes since the passage of the CalSTRS Funding Plan

When the funding plan was adopted by the Governor and Legislature in 2014, it was based on the actuarial valuation as of June 30, 2013. The funding plan was developed based on the actuarial assumptions in place at that time, which included a long-term investment return assumption of 7.5%.

Since the passage of the funding plan, the board has taken several steps to strengthen the funding of the system. In 2015, the board recognized the importance of protecting against equity market downturns by creating and investing in a Risk Mitigating Strategies asset class. In 2017, the board adopted new actuarial assumptions, reflecting

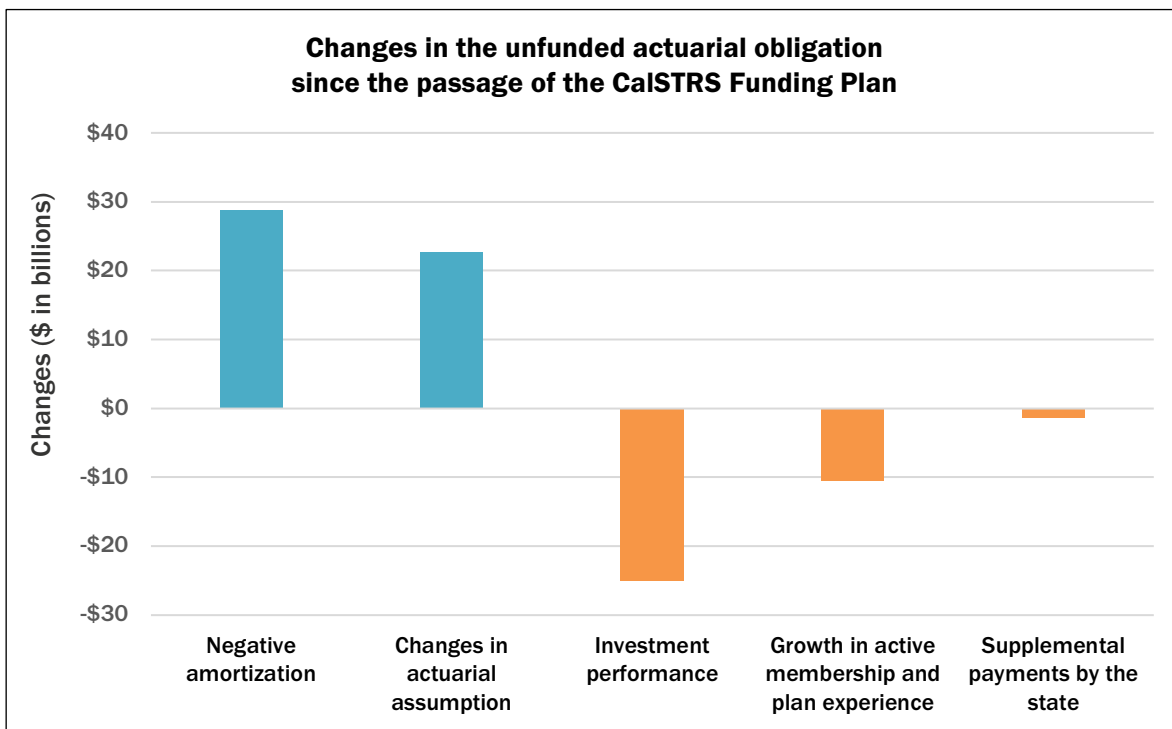
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lower future investment earnings and longer life expectancies. The long-term investment return assumption was lowered from 7.5% to 7.0% over a two-year period, while the assumed life expectancy of CalSTRS’ members was increased by two to three years through the adoption of updated mortality assumptions.

Since fiscal year 2017–18, the first year the board was given the authority to set the state contribution rate, the board increased the state contribution rate by 0.5% of payroll on four occasions to keep the funding plan on track. The board also voted to keep the employer rate at 19.1% for the last three years to keep the employers on track to eliminate their share of CalSTRS’ unfunded actuarial obligation by 2046.

Given all these actions, it is instructive to see how the total unfunded actuarial obligation has changed since the adoption of the funding plan. The unfunded actuarial obligation on June 30, 2013, was \$73.7 billion. In the June 30, 2022 actuarial valuation, the unfunded actuarial obligation was \$88.6 billion—approximately \$15 billion higher than in 2013.

The chart below illustrates the major factors that have led to both increases and decreases in the unfunded actuarial obligation since the passage of the funding plan.



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The unfunded actuarial obligation increased by approximately \$29 billion as a result of negative amortization. When a pension plan is less than 100% funded, contributions toward the unfunded actuarial obligation must exceed the interest on the unfunded actuarial obligation to prevent it from increasing over time. Failing to contribute an amount greater than the interest will result in an increase of the unfunded actuarial obligation from year to year. This is referred to as negative amortization. For CalSTRS to avoid negative amortization, payments toward the unfunded actuarial obligation must be more than 7% of the unfunded actuarial obligation. With the phased-in rate increases established through the funding plan, it was anticipated that contributions would not be sufficient to prevent the unfunded actuarial obligation from increasing during the first few years.

Another big contributor to the increase in the unfunded actuarial obligation since the passage of the funding plan is the board's adoption of new demographic and investment return assumptions. Changes in actuarial assumptions have resulted in an increase of about \$23 billion in the unfunded actuarial obligation. Note that the changes in actuarial assumptions have put CalSTRS in a stronger financial position long term even if they resulted in a one-time increase in the unfunded actuarial obligation.

Several factors helped mitigate the increases in the unfunded actuarial obligation. Positive plan experience, mainly investment performance and growth in the active membership, combined with the supplemental payments made by the state to reduce their share of CalSTRS' unfunded actuarial obligation, have resulted in a total decrease of approximately \$37 billion in the unfunded actuarial obligation.

The combined effect of the increases and decreases have resulted in a total increase of \$15 billion in the unfunded actuarial obligation since 2013.

Despite the increase in the unfunded actuarial obligation, funding levels have gradually improved since 2013. The funded status of the Defined Benefit Program was 66.9% on June 30, 2013. On June 30, 2022, the most recent actuarial valuation, the funded status was 74.4%. When the funding plan was adopted in 2014, it was projected that the funded status would be 67.5% on June 30, 2022.

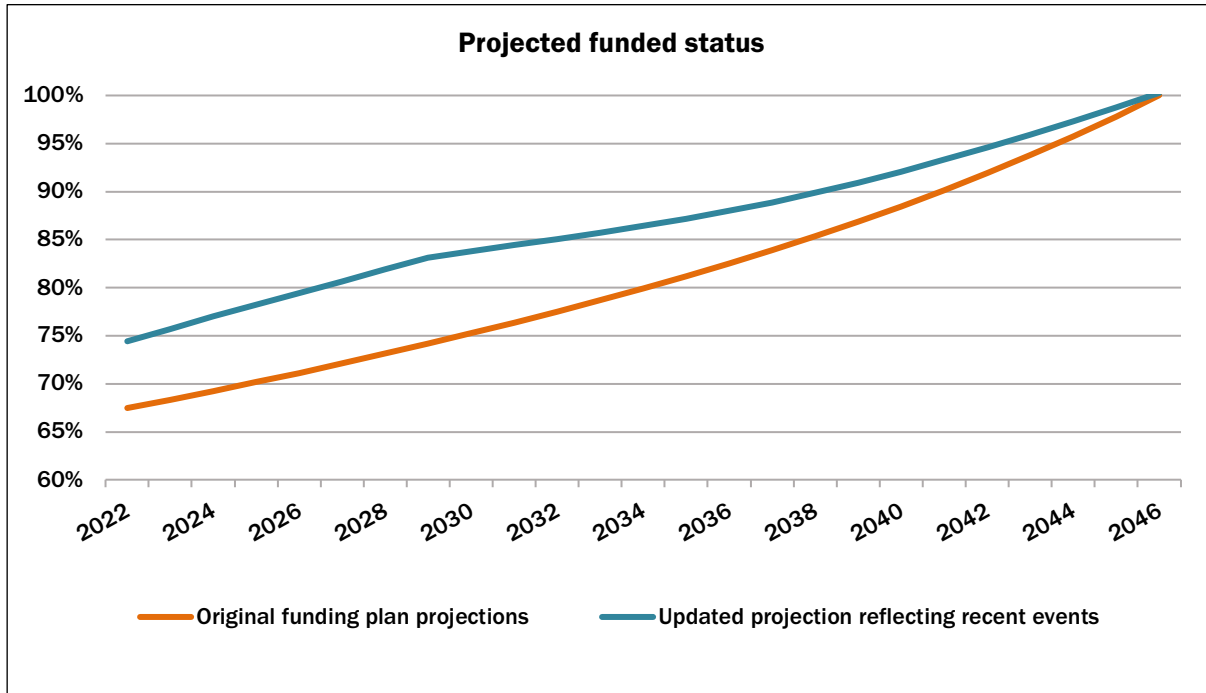
The next section provides additional detail on projected funding levels and the projected unfunded actuarial obligation.

Projected funding levels

When the June 30, 2022 actuarial valuation was presented to the board in May 2023, it showed the funded status for the Defined Benefit Program was 74.4%. The valuation also showed projected funding levels were ahead of the funding plan's schedule to reach full funding by 2046. These projections assumed CalSTRS would earn a 7% investment return in all future years, including for fiscal year 2022–23.

The following chart compares projected funding levels that were expected when the funding plan was adopted in 2014 to the current projected levels reflecting last year's investment return of 6.3%.

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As shown above, despite falling just short of meeting its 7% investment return assumption in 2022–23, CalSTRS remains ahead of the original schedule to reach full funding by 2046. This is due to the exceptional 27.2% investment return earned by CalSTRS in fiscal year 2020–21.

Note that for funding purposes, the funded ratio reported by CalSTRS is based on the actuarial value of assets calculated using the three-year asset smoothing policy adopted by the board. This value is a “smoothed” value that differs from the market value by reflecting only one-third of the net accumulated investment gains and losses. This approach is used to smooth out the impact of investment volatility on funding levels and contribution rates.

It is important to remember that these projections assume all actuarial assumptions will be met in the future. Specifically, it assumes the fund will earn 7% each year and that payroll will grow at 3.5% over the long term. A period of low investment returns could materially impact future funding levels.

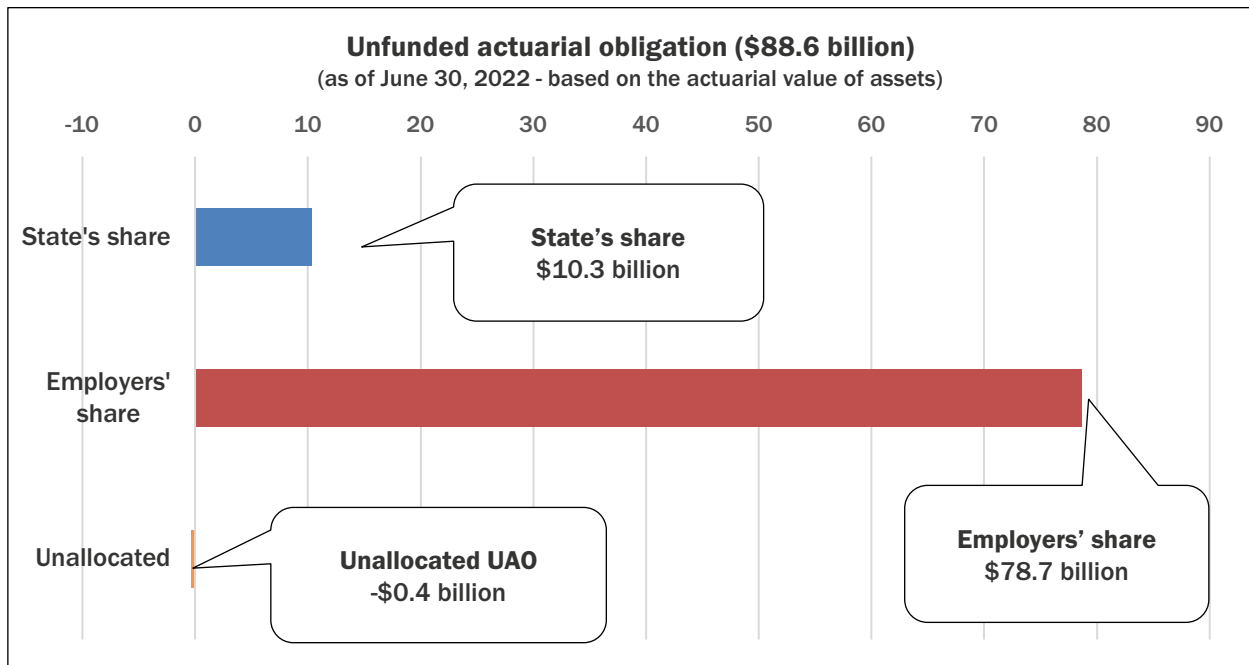
Projected unfunded actuarial obligation

Although the system is currently on a path to reach full funding, it is important to understand how the unfunded actuarial obligation and its various components are expected to evolve over time.

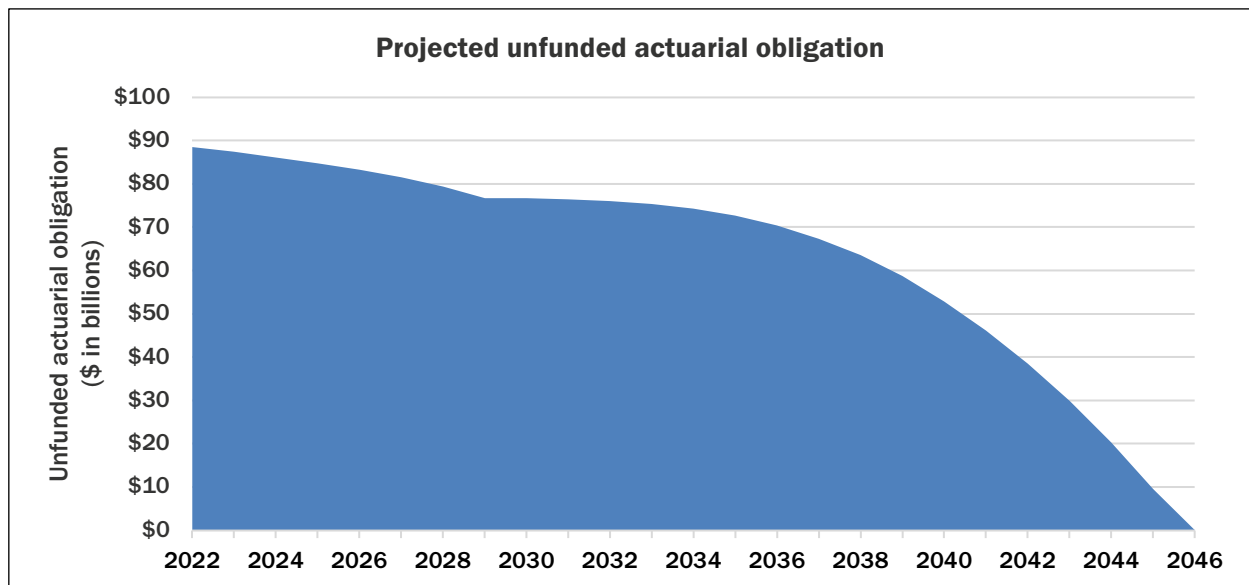
As per the rules of the funding plan, the unfunded actuarial obligation is divided between the state, the employers and the unallocated portion. The unallocated portion of the unfunded actuarial obligation is the portion for which the funding plan did not provide any authority to CalSTRS to adjust contribution rates to pay it down.

The following chart illustrates the breakdown of the unfunded actuarial obligation as of June 30, 2022. As can be seen, the unallocated portion was negative, meaning it was in a surplus position. Prior to 2021, the unallocated had always been positive.

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The following chart illustrates how the unfunded actuarial obligation is expected to change over time. As can be seen, the total unfunded actuarial obligation is projected to decline each year in the future and be eliminated by 2046.



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When looking at the separate components of the unfunded actuarial obligation, it is worth noting the employers' share of CalSTRS' unfunded actuarial obligation is expected to continue to slightly increase over the next few years, will start to significantly decrease in the last 10 years of the funding plan, and is expected to be eliminated in 2046. The state's share is expected to decrease quickly over the next few years and is expected to be eliminated by 2028. However, the state's share remains extremely sensitive to investment performance. If CalSTRS were to experience a year with an investment return well below its 7% assumed return, the state's share could be materially impacted. Since the unallocated portion is in a surplus position, this unallocated surplus is expected to grow over time and reach \$2.3 billion by 2046. The unallocated portion could also quickly become unfunded again if CalSTRS were to have a year in which the investment return is well below 7%.

Projected contribution rates

In May 2023, the board took the prudent approach of keeping contribution rates at existing levels knowing CalSTRS would likely earn less than its assumed 7% investment return in fiscal year 2022–23. The board kept the state contribution rate to the Defined Benefit Program at 8.328% of payroll and the employer contribution rate at 19.1% of payroll. Keeping contribution rates stable provides budget stability for the state and employers and strengthens the funding plan by reducing the risk the state and employers may not be able to eliminate their share of the unfunded actuarial obligation by 2046.

Assuming the board continues to keep contribution rates at existing levels, it is expected the state would be able to fully eliminate their share of the unfunded actuarial obligation by 2028. By keeping the employer rate at 19.1% of payroll, the employers' share is expected to be eliminated by 2045. These projections are based on the current actuarial assumptions. Actuarial assumptions are currently being reviewed. Changes in actuarial assumptions could impact the above projection.

Note that the board could also lower the state contribution rate by 0.5% each year going forward, and the state would eliminate their share of the unfunded actuarial obligation by 2031 instead of 2028. Doing so, however, could potentially increase the risk to the funding plan, especially if CalSTRS were to experience a year in which the investment return is well below 7%. Keeping the state contribution rate at existing levels not only helps improve funding levels faster but also provides CalSTRS greater flexibility if future circumstances require increases to the contribution rate.

It is important to highlight one of the features of the funding plan. As per the rules of the funding plan, once the state has eliminated its share of CalSTRS unfunded actuarial obligation, the state contribution rate will be immediately reduced to the base contribution rate of 2.017% of payroll. Based on current projections, the state contribution rate to the Defined Benefit Program would go from 8.328% of payroll in fiscal year 2028–29 to 2.017% of payroll in fiscal year 2029–30. This poses an additional risk to the funding plan if CalSTRS were to experience a year in which the investment return is well below 7% immediately after the state contribution rate drops to 2.017% of payroll. Once this occurs, the board would only be able to raise the state contribution rate by 0.5% each year. It would take 12 years to simply return to the state contribution rate in place in the prior fiscal year, potentially resulting in a situation where the state can no longer eliminate its share of the unfunded liability by 2046.

With the next progress report on the funding plan due to the Legislature by June 30, 2024, the board will have an opportunity in March 2024 to consider whether to highlight this and other features that increase the risk to the funding plan and whether potential improvements should be included for consideration to further strengthen the funding plan.

The risk environment

Key findings:

- Anticipated continued decreases in enrollment in K-12 public schools could negatively impact CalSTRS' ability to achieve full funding if it leads to future declines in the number of teachers in California.
- The largest risk facing CalSTRS' ability to reach full funding remains investment-related risk.
- CalSTRS remains in a favorable position to withstand a recession in the next few years while keeping the funding plan on track.

THE RISK ENVIRONMENT

The risk environment is dynamic. In fiscal year 2020–21, CalSTRS experienced one of the highest investment returns in its history. In 2021–22, CalSTRS had its first negative investment return in more than 10 years. Last fiscal year, CalSTRS earned just below its 7% assumed return with a 6.3% time-weighted investment return. After seeing Inflation levels at their highest in more than 40 years, inflation was 3.1% in fiscal year 2022–23, just above the assumed long-term inflation rate of 2.75%. More than three years since the COVID-19 pandemic, the lingering effect on people’s health has resulted in decreases in life expectancies and raised questions about what the long-term impact on mortality will be. Furthermore, CalSTRS has experienced significant swings in the number of active members over the last few years.

This section discusses the long-term funding impact of risks like these going forward. Specifically, this section will examine the risk associated with longevity, payroll growth and investments.

Longevity risk

Each year, this report updates and examines the impact of longevity on the funding of the system. Longevity risk refers to the potential that members live longer than anticipated, and thus, the lifetime benefit they receive lasts longer than expected. This section analyzes longevity from a historical perspective and how CalSTRS addresses the risk using generational mortality.

Before reviewing the historical and projected mortality data, it is worth taking a moment to address the COVID-19 pandemic. The previous two Funding Levels and Risks reports included specific data related to the COVID-19 pandemic and deaths among CalSTRS members. That data is no longer being collected at CalSTRS as the COVID-19 virus has transitioned to an endemic disease that will

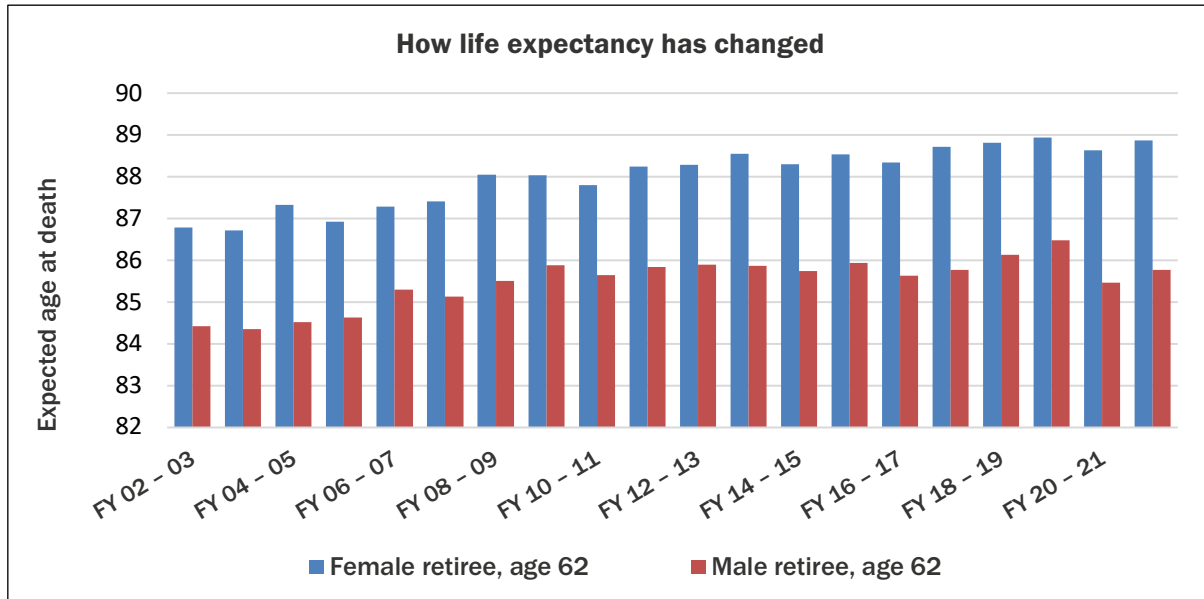
likely always be with us. What remains to be seen, however, is what the long-term impact to longevity will be. As the chart in the next section illustrates, after a dip in life expectancy during the pandemic, the most recent data suggests that life expectancy has increased in the past year.

It will take years before the full impact of the pandemic to longevity is fully understood. In the meantime, CalSTRS is likely to take a cautious approach in how it incorporates the impacts of the COVID-19 pandemic. As CalSTRS conducts the next experience study, which will be presented to the board in January 2024, it is unlikely the mortality rates recommended will reflect the full mortality experience from the COVID-19 pandemic as it is unclear if that experience is appropriate to reflect in long-term rates.

THE RISK ENVIRONMENT

Historical and projected life expectancy

CalSTRS has been tracking the period life expectancy of CalSTRS retired members since 1990. The following chart shows the historical trend over the last 20 years of life expectancy for a CalSTRS member retiring at age 62.

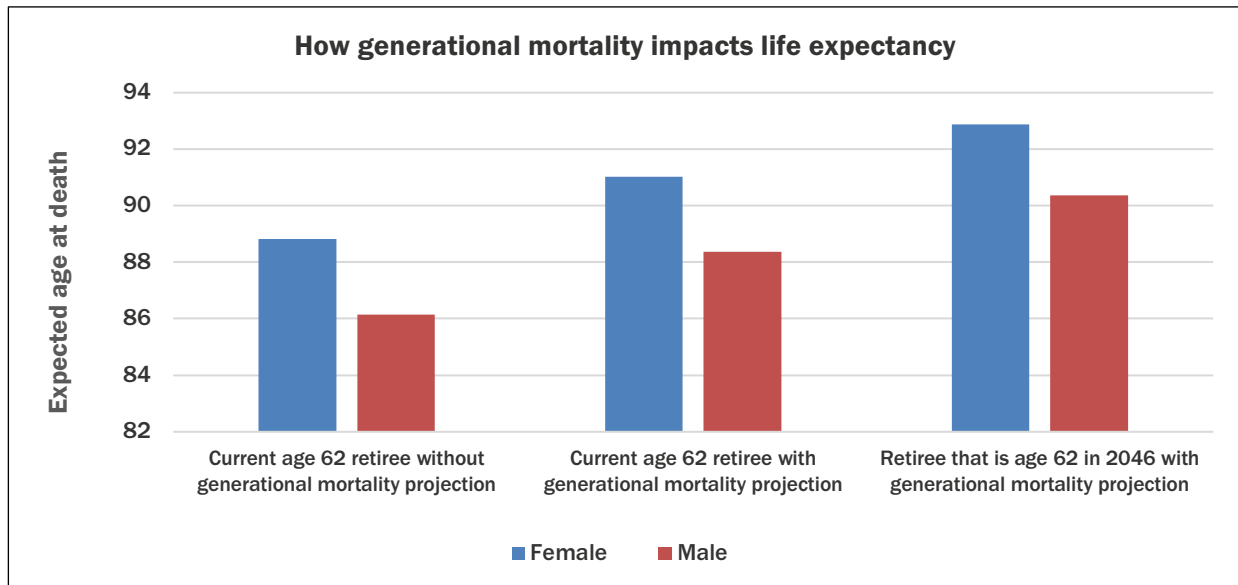


As illustrated, there are small variations from year to year. The overall trend shows an increasing life expectancy over the past 20 years. In fact, between 2002 and 2022, the period life expectancy for females increased by over two years and males increased almost one and a half years. There was a significant dip in life expectancies due to the COVID-19 pandemic; however, the past year saw a slight increase from the pandemic low.

In 2017, the board made an important decision for the long-term sustainability of CalSTRS when it adopted the use of a technique known as generational mortality. This technique anticipates future improvements in life expectancy in the funding of the system, recognizing potential improvements in mortality ahead of time. CalSTRS currently uses an annual mortality improvement factor of 1.1% for most ages.

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The following chart illustrates the impact of generational mortality on a typical member retiring at age 62. Without generational mortality, a member retiring today would be expected to live to the approximate age of 89 for a female and the approximate age of 86 for a male. By including generational mortality, the same member would be expected to live to age 91 for a female and to age 88 for a male. This effect compounds over time as the chart shows: By 2046, a member retiring at age 62 would be anticipated to live two additional years—to age 93 for a female and age 90 for a male.



To get an idea of the financial implications of the improvement in life expectancy, consider that for the 2022–23 fiscal year, CalSTRS paid about \$18 billion in benefits. If each member receiving a benefit today lives an additional two years, that would result in an additional \$36 billion in benefits over the life of the members as compared to what would have been paid if there were no improvements in mortality over time.

By adopting generational mortality, CalSTRS is accounting for these anticipated increases in life expectancy when determining the contribution rates needed to fund the system, putting CalSTRS in a stronger funding position as a result. CalSTRS reaffirmed its assumptions on both mortality rates and the 1.1% mortality improvement factor when it adopted the 2020 Actuarial Experience Analysis in January 2020. The next review will be presented to the board in January 2024 and, as discussed, will consider the impact of the COVID-19 pandemic.

THE RISK ENVIRONMENT

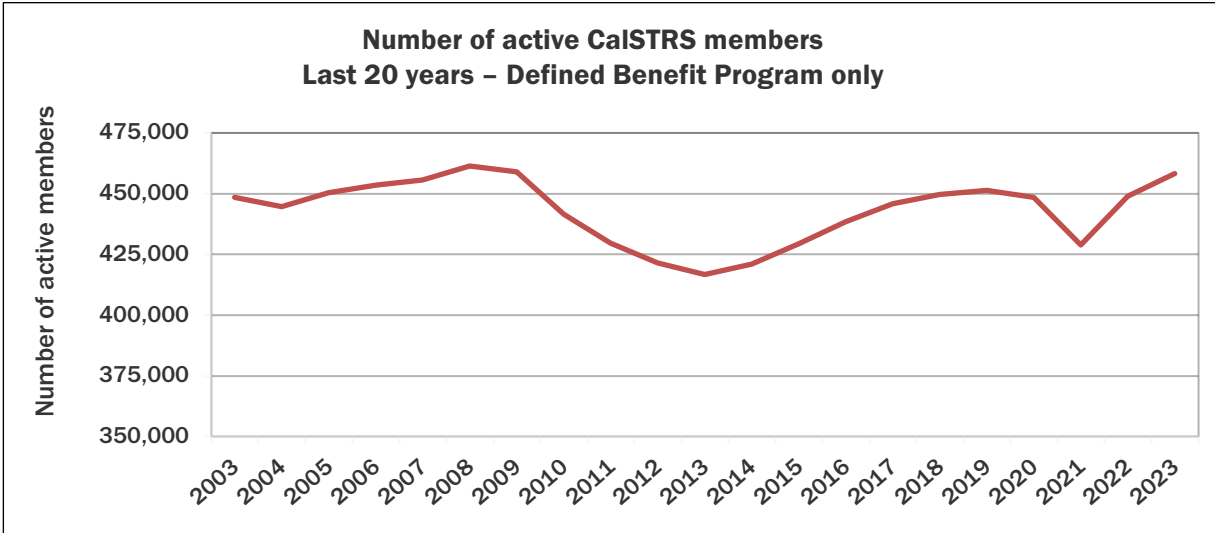
Membership and payroll growth risk

The risks associated with the number of active members and the growth of their overall payroll is another area that can have an impact on both funding levels and contribution rates. CalSTRS assumes the Defined Benefit Program payroll will grow by 3.5% annually over the long term. This assumption implies in part that the number of active members in the Defined Benefit Program will remain stable over time. This assumption is key in determining contribution rates and whether the funding plan will successfully eliminate the current unfunded actuarial obligation by 2046 since CalSTRS collects contributions as a percentage of payroll. If the payroll declines or fails to grow as assumed, CalSTRS’ ability to make progress toward full funding could be at risk.

It is important to realize that when payroll fails to increase as assumed, it does not increase the overall cost to fund retirement benefits, nor does it change the dollar amount required to eliminate the unfunded actuarial obligation. However, the contribution rates needed to collect these contributions must increase just to collect the same amounts. If the needed increases in the contribution rates exceed the limits imposed by the funding plan, CalSTRS may not be able to reach full funding by 2046. Later in this report, the impact of payroll growth on CalSTRS’ ability to reach full funding is measured in combination with the impact of lower-than-assumed investment performance.

Recent changes in active membership

The following chart shows the number of active members participating in the Defined Benefit Program for the last 20 years.



After the sharp decline in the number of active teachers during the COVID-19 pandemic, the total number of active members has increased for the last two years, returning to levels not seen since 2009. The total payroll increased by more than 6% over the last fiscal year, resulting in CalSTRS collecting approximately \$175 million more in contributions from employers than anticipated in 2022–23. The increase in active teachers in the last two years is good news and helps strengthen the funding plan.

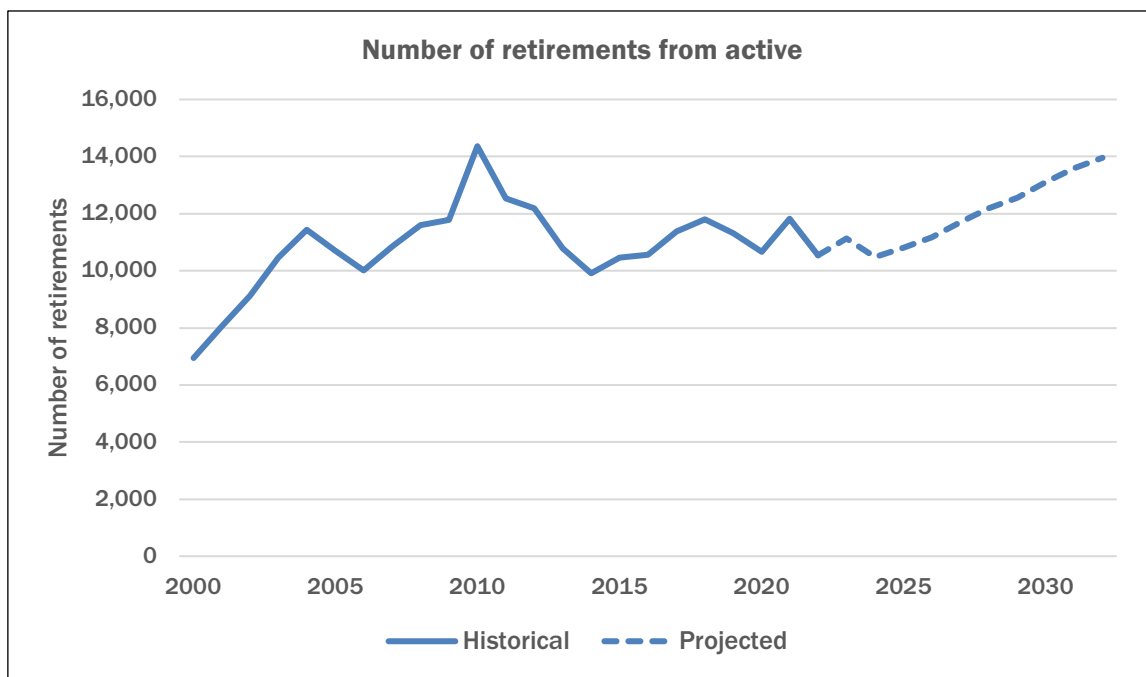
A likely contributor to the decline in active membership during the COVID-19 pandemic was the higher-than-expected retirements CalSTRS experienced in 2020–21 and the uncertainties related to the pandemic.

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Looking ahead, CalSTRS produced demographic projections to show potential trends in the expected number of retirements over the next decade. When looking at the potential number of teachers retiring in a particular year, one of the biggest drivers is the number of active teachers eligible to retire. Today, approximately 90,000 active teachers are over the age of 55. In 2009–10 when CalSTRS experienced its highest number of active teachers retiring in a single year, approximately 110,000 active teachers were over the age of 55.

Over the next decade, the number of teachers eligible to retire is expected to increase. By 2030, CalSTRS projects there will be 115,000 active teachers above the age of 55. This can be explained in part by the significant increase in the number of active teachers in California during the 1990s. Between the years 1990 and 2000, the number of active teachers who were members of the Defined Benefit Program increased from approximately 300,000 to 420,000. Most of those teachers hired in that decade are either currently eligible to retire or will become eligible to retire in the next few years. As a result, retirements from active teachers are expected to increase significantly over the next five to 10 years.

The chart below shows the historical number of retirements from active teachers since 2000 as well as the projected number of retirements for the next decade.



As can be seen above, the number of retirements is expected to increase over the next decade, approaching some of the levels seen in 2010 when CalSTRS experienced its highest ever number of retirements.

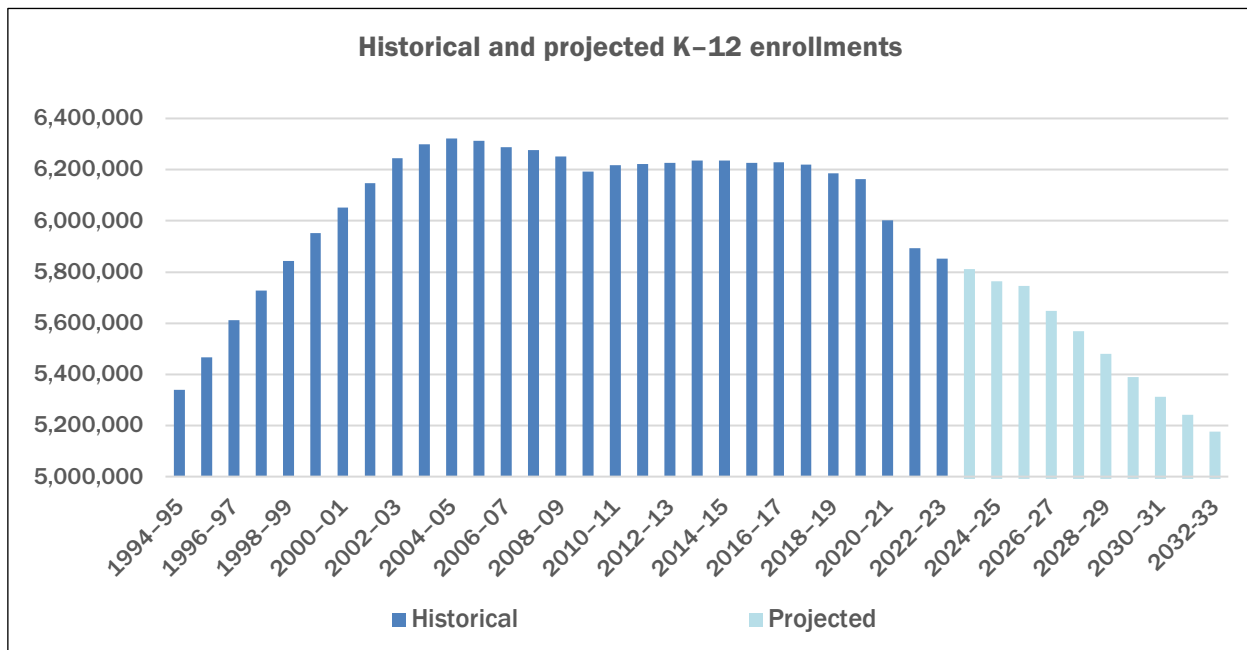
Although an increase in retirements does not necessarily impact long-term funding, if schools do not replace the teachers who retire in the future, that could result in a reduction in the overall number of teachers and impact CalSTRS' ability to reach full funding by 2046. With the anticipated decline in the number of children enrolled in K–12 public schools discussed in the next section, the risk that the number of teachers may go down in the future is real and will be considered when the ongoing appropriateness of the 3.5% payroll growth assumption is reviewed in the next experience study.

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Enrollment in K–12 public schools and community colleges

An area of particular concern related to payroll growth and the number of teachers in California is the decreasing population of students enrolled in K–12 public schools and those enrolled in community colleges in California. After being fairly steady between 2010 and 2020, California experienced a significant decline in enrollment in both K–12 public schools and community colleges starting in 2020–21. Total enrollment in K–12 public schools in California dropped by about 310,000, or a 5% reduction, between 2019–20 and 2022–23. At the same time, the number of students enrolled at community colleges dropped by 310,000, or 20%, between the fall of 2019 and the fall of 2021 before rebounding a little bit and increasing by approximately 30,000 in the fall of 2022. Still, enrollment in community colleges is down 18%, or about 280,000, since 2019.

Looking ahead further, in October 2023, the State of California updated its projection of K–12 enrollments for California. The updated projection assumes the number of children enrolled in K–12 public schools will continue to decline for the next 10 years. The most recent projection anticipates a decline of approximately 12% over the next 10 years. Compared to 2019–20, this would represent a 16% reduction in K–12 enrollment. As shown below, the number of children enrolled in K–12 public schools is now expected to drop below the levels last seen in California in the mid-1990s. Note that enrollment projections for community colleges are not available.

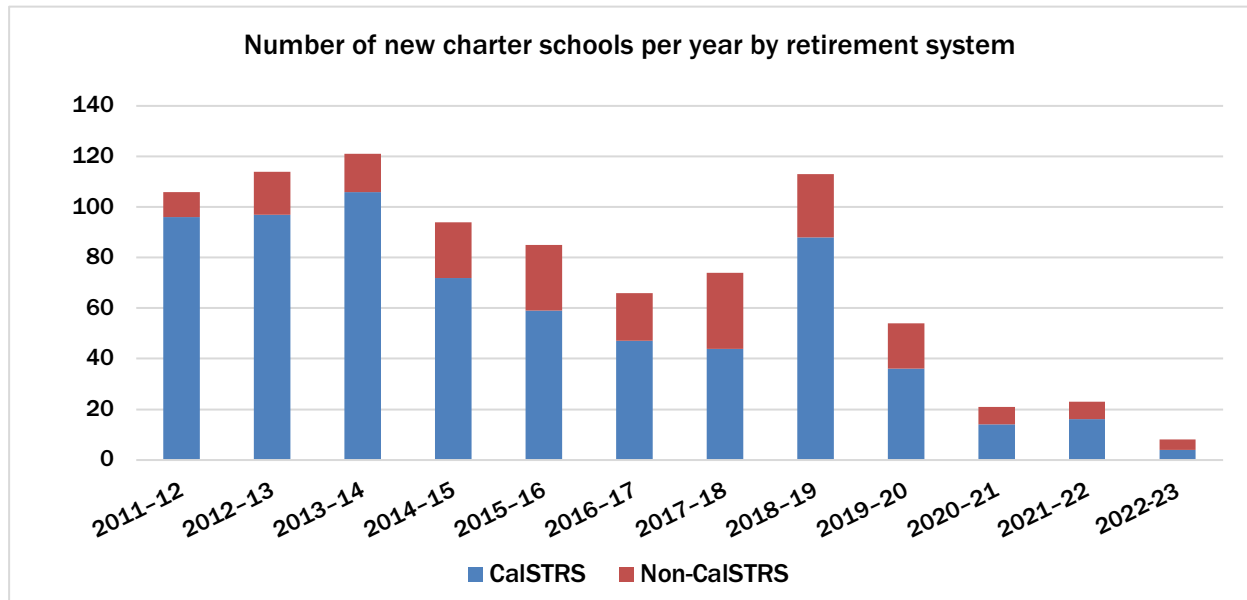


If the anticipated reduction in enrollment results in a need for fewer teachers in California, it would impact the number of active teachers who participate in the Defined Benefit Program and ultimately the growth in payroll. The situation could worsen if school districts were to face budget issues and rely either on layoffs or hiring freezes, leaving positions vacant as teachers leave or retire to reduce budget pressure. One countervailing force that could potentially offset some of the factors listed above would be reductions in class sizes. For example, last year, the Los Angeles Unified School District agreed, as part of their new labor contract, to reduce class sizes. CalSTRS will continue to monitor the situation. However, based on the revised projected decline in K–12 enrollment, it may be necessary to adjust the payroll growth assumption as part of the next experience study.

THE RISK ENVIRONMENT

Update on charter schools not electing CalSTRS

For the past several years, CalSTRS has observed a trend among newly created charter schools of selecting a retirement system other than CalSTRS. When initially created, a charter school has the option to join CalSTRS or provide an alternate retirement benefit. Before the adoption of the funding plan, it was typical to have more than 90% of newly created charter schools opting for CalSTRS benefits. However, as the following chart shows, since about 2014, between 20% and 40% of newly created charter schools have been selecting an alternate retirement system and have not elected to join CalSTRS. Note that since the COVID-19 pandemic, the growth in the number of charter schools in California has slowed significantly.



Despite this recent trend, most charter schools still provide a CalSTRS benefit to their teachers. In the 2022–23 fiscal year, about 88% of the 1,285 charter schools provided a CalSTRS benefit. In terms of number of teachers, based on the most recent data from the California Department of Education, there were approximately 37,000 full-time equivalent teachers working in charter schools. Of those, about 32,200, or 87%, are covered by CalSTRS, and 4,800 have a non-CalSTRS benefit. Note that 4,800 represents just over 1% of CalSTRS’ active member population. It is likely that if all these charter schools had instead elected to provide CalSTRS benefits, CalSTRS payroll would be approximately 1% higher today.

If the total payroll was 1% higher, the employer contribution rate could be reduced by about 0.15% of payroll and still allow the employers to eliminate their share of the unfunded actuarial obligation by 2046. A higher payroll would not result in a lower unfunded actuarial obligation and would not impact the overall dollar amount needed to pay it down. However, as a percentage of payroll, the contribution rates would be lower.

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Investment risk

Investment volatility and the risk that CalSTRS may not be able to meet its assumed investment return over the long-term remains the greatest risk facing CalSTRS today. The combination of a maturing system and the decreasing timeframe of the funding plan only serves to increase this risk.

The funding plan interacts with investment volatility risk in several ways. First, when investment returns are below expectations, the unfunded actuarial obligation increases, requiring additional contributions to bridge the gap. The funding plan provides the board limited authority to increase contribution rates for both the state and employers through 2046 for this purpose.

Second, although employers are currently responsible for the greatest share of the unfunded actuarial obligation, the state bears the greatest risk when it comes to investment volatility. This is due to rules set in the funding plan that allocate the largest share of the assets to the state. As a result, its share of the unfunded actuarial obligation is most sensitive to investment volatility. There is also the issue of the unallocated share of the unfunded actuarial obligation. As stated earlier in this report, the unallocated portion of the unfunded actuarial obligation is the portion for which the funding plan did not provide any authority to CalSTRS to adjust contribution rates to pay it down. Even though the unallocated portion is in a surplus position, it could quickly become unfunded again if CalSTRS were to have another year in which the investment return is well below 7%.

Third, the specific restrictions that the funding plan places on contribution rate increases for both the state and employers limit CalSTRS' ability to respond to investment volatility. The board has authority to increase the state's contribution rate by a maximum 0.5% of payroll each year with no limit on the maximum rate. The employer rate can be increased by 1.0% of payroll each year with a maximum rate of 20.25% for employers. Another risk related to the state contribution rate is that the state contribution rate will be reduced to 2.017% of payroll once the state has eliminated its share of the unfunded

liability. The risk associated with this aspect of the funding plan is particularly evident given the sensitivity of the state's share to investment volatility, which will be demonstrated in this report.

Finally, since the funding plan has an expiration date, the time period over which to fund any existing and new unfunded actuarial obligation is declining each year. The funding plan set the target of 2046 to fully fund the Defined Benefit Program, after which the board's authority to adjust contribution rates expires. As the 2046 deadline approaches, CalSTRS' capacity to withstand economic stresses will be limited and will make it harder for CalSTRS to reach full funding.

Risk of a large investment loss in a single year

The purpose of this section is to highlight an investment-related risk that is exacerbated by one of the limitations in the funding plan. Specifically, the funding plan has a provision that requires the state's supplemental contribution rate be reduced to 0% of payroll immediately once the state's share of the unfunded actuarial obligation has been eliminated, as it is currently projected to do by 2028. Once this occurs, the state's total contributions toward the Defined Benefit Program will drop from the current level of 8.328% of payroll to the base rate of 2.017% in fiscal year 2029–30. This provision essentially overrides any discretion the board has in setting the state supplemental rate.

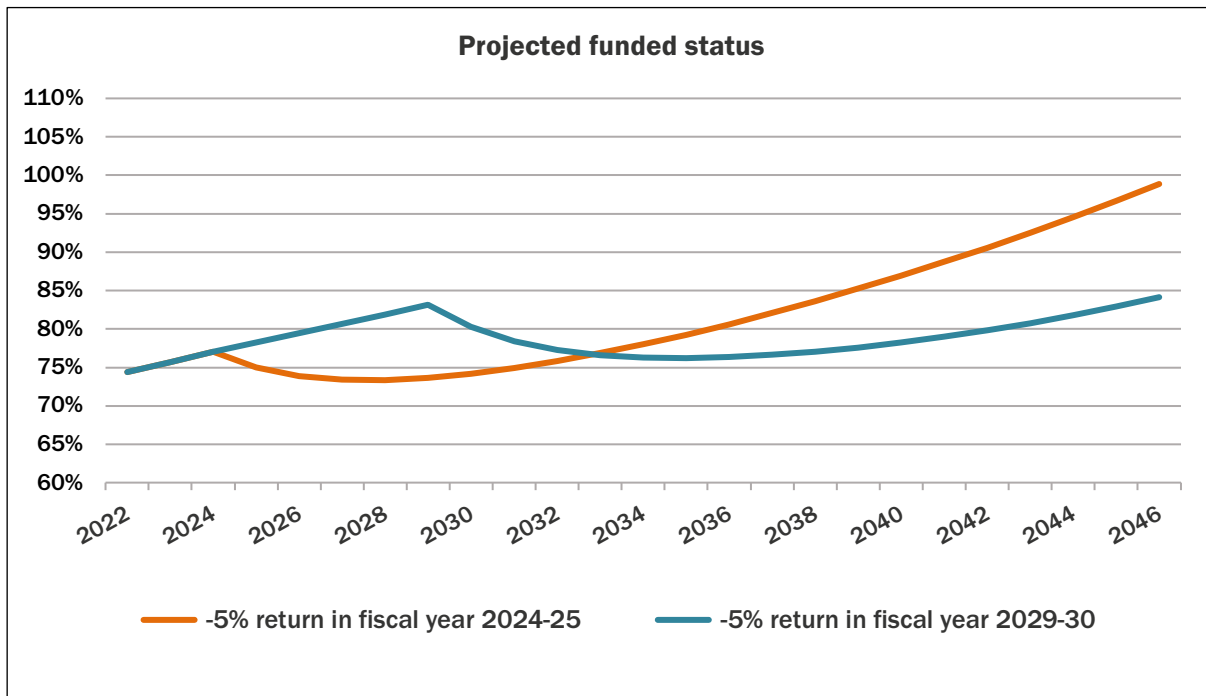
The challenge this introduces to funding the Defined Benefit Program is that once the state's supplemental rate has been reduced to zero, if it ever needed to be increased again, the board is limited to increases of only 0.5% of payroll each year as per the funding plan. Since at that point the state supplemental rate would be starting from 0% and increasing by only half a percent each year, it could take many years before the board is able to increase the rate to the levels necessary to reduce any newly realized unfunded actuarial obligation.

To illustrate this risk, consider two simple scenarios. In both scenarios, it is assumed that CalSTRS will earn its expected rate of investment return of 7% in most years; however, the first scenario considers

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the results from an investment loss in a single year if it occurs in fiscal year 2024–25, and the second scenario considers the results from a loss in fiscal year 2029–30. The scenarios consider a loss of the same magnitude but five years apart. The key point that will be important in the resulting impact on funding levels and contribution rates is that in the first scenario, the loss occurs before the state’s supplemental rate has been reduced and in the second scenario, the loss occurs after the reduction in the state rate.

The following chart highlights the results of this exercise. This analysis used a -5% return in the relevant fiscal years.



Although the loss is the same in both scenarios, the timing of the loss results in different outcomes. If the loss occurs in 2024–25, before the state supplemental contribution rate drops to 0%, the board would be able to increase the state supplemental contribution rate to the levels needed for the state to eliminate its share of the unfunded actuarial obligation by 2046.

If instead, the -5% investment loss occurs in 2029–30, after the state supplemental contribution rate drops to 0%, the board would not be able to bring the state contribution rate to the levels needed for the state to eliminate its share of the unfunded actuarial obligation by 2046. In this example, negative amortization would cause the state’s share of the unfunded actuarial obligation to increase every year until reaching approximately \$117 billion on June 30, 2046. In both examples, the unallocated portion of the unfunded actuarial obligation would no longer be in a surplus position, and since the board cannot adjust contribution rates to eliminate it, it would be expected to grow to approximately \$10 billion by June 30, 2046.

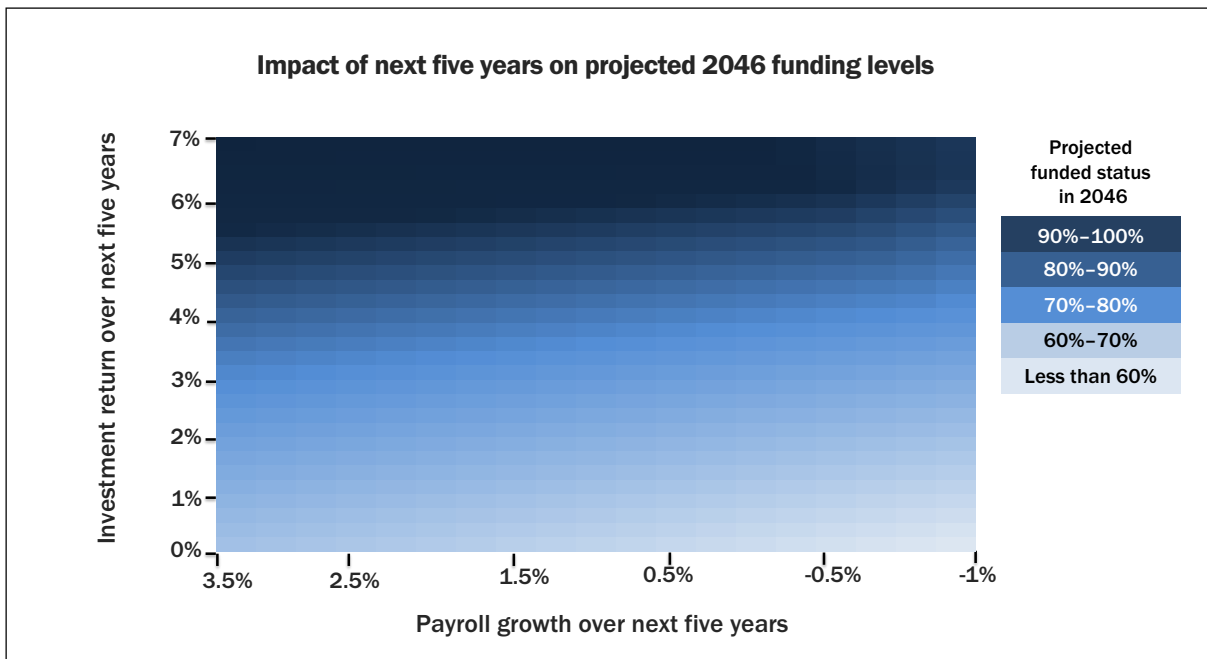
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Risk of sustained low returns and lower payroll growth

A useful way to analyze the ability of the funding plan to react to economic and demographic changes and reach full funding is to analyze both the impact of low investment returns with the impact of significant reductions in the number of active members and payroll generally seen with recessions. In past recessions, CalSTRS experienced both periods of low investment returns combined with significant reductions in the number of active members and payroll. These are the situations that would most stress the funding plan.

For this section, various combinations of investment returns and payroll growth over a five-year period were analyzed to see how the funding plan would react and whether CalSTRS would still be able to reach full funding by 2046.

The results of this analysis are presented in the form of the heat map, below. The darkest shade of blue indicates the projected funded status in 2046 is at or near 100%, while the lightest shade of blue indicates the funded status would be below 60% in 2046, which is below the level when the funding plan was adopted. Note that beyond the first five years, it is assumed that all actuarial assumptions, including the 7% investment return assumption, will be realized through 2046.



As shown above, CalSTRS is in a favorable position to react to a recession and stay on track toward reaching full funding by 2046. However, CalSTRS is still at risk of not being able to reach full funding if faced with a severe recession as illustrated in the bottom right corner of the chart. For example, the financial crisis in 2007 through 2009 triggered a severe recession that, if repeated, would fit in the bottom right corner in the above chart.

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In the scenarios where CalSTRS would not be able to reach full funding, additional funding would have to be provided to CalSTRS in the form of supplemental payments or changes would be needed to allow for higher contribution rates, to provide the board with authority to address the unallocated portion of the unfunded actuarial obligation, or to extend the funding plan.

It is worth noting that these scenarios do not assume that an economic recovery will occur. Past recessions were typically followed by some level of economic rebound with the number of teachers and corresponding payrolls recovering to pre-recession levels. A recovery would likely relieve some of the stress placed on the funding plan's capacity to recover funding levels.

A period of sustained low returns and lower payroll growth would also impact the state and employer contribution rates. Note that member contribution rates are not impacted by plan experience but could be impacted if actuarial assumptions were to change. This is discussed in more detail later in this report. A lower payroll growth would have the most impact on the employer rate. For example, if investment returns were 7% over the next five years, but payroll growth is flat, the employer rate would reach the maximum rate of 20.25% by 2025–26 and remain there through the end of the funding plan. However, if investment returns were 0% for the next five years while payroll grows at the assumed rate, the state contribution rate would need to increase to about 18% of payroll, while the employer rate would not have to increase for employers to eliminate their share of the unfunded liability by 2046.

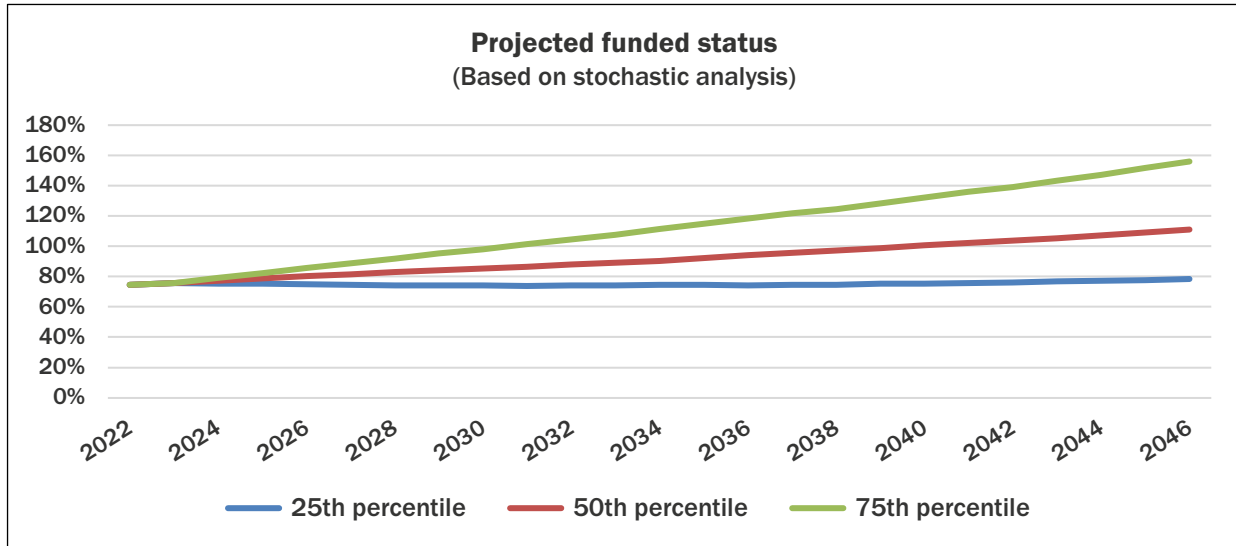
A combination of both lower returns and lower payroll growth would normally result in both the state and the employers having to contribute more. In the worst-case scenario in the above heat map, the employer rate would have to be set at the maximum rate of 20.25%, while the state rate would increase until reaching about 19% of payroll. These increases would not be enough to allow CalSTRS to reach full funding. In that scenario, the Defined Benefit Program would be expected to be approximately 57% funded in 2046.

Impact of long-term investment performance

Another useful way to analyze the ability of the funding plan to react to investment volatility and meet its full funding goal is to use a stochastic model. A stochastic model uses a technique known as Monte Carlo simulation in which a large number of random hypothetical scenarios are generated. These scenarios are calibrated to have the statistical characteristics of the CalSTRS Investment Portfolio, using both the capital market assumptions and asset allocation adopted by the board in 2023 as part of the most recent asset liability management study. For this analysis, 5,000 simulations of hypothetical future returns were generated. For each simulation, the assets and liabilities for the system were projected forward for more than 30 years. With this information, it is possible to assess the impact of long-term investment performance and volatility on the funding levels.

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The following chart shows the 25th, 50th and 75th percentiles of the projected funded status for the Defined Benefit Program. Note that the compounded investment return over the period was about 6.1% for the 25th percentile and just above 9.0% for the 75th percentile.



These simulations clearly illustrate how much volatility there is in the future funding of the system. In 2046, the 25th percentile funded status is 78%, and the 75th percentile is 156%. This means there is a one in two chance that the funded status in 2046 will fall in this wide range. The 50th percentile in 2046 is 111%.

Risk measures

This section updates the risk measures that were introduced in previous Review of Funding Levels and Risks reports. These measures were reassessed for this report using the 5,000 stochastic scenarios discussed earlier, which were calibrated to simulate possible future investment returns from the asset allocation and capital market assumptions that were adopted by the board in 2023. These measures are intended to assess three main risks:

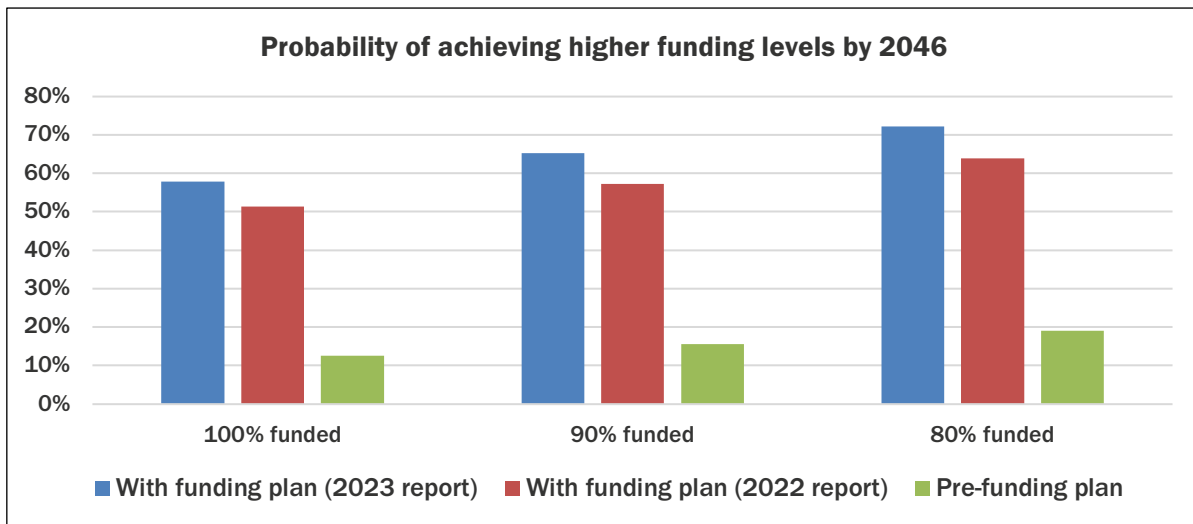
- Ability of achieving full funding.
- Risk of low funding levels.
- Risk of high state contribution rates.

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Probability of achieving full funding

The funding plan sets a target of achieving a 100% funded status by the target year of 2046. As discussed earlier, the Defined Benefit Program is currently slightly ahead of schedule in the goal of reaching full funding by 2046. There is a great deal of uncertainty in this projection. To better understand how likely the plan is to make progress toward its goal of reaching full funding by 2046, the first risk measure quantifies the probability that the funded status attains specific funding thresholds by the 2046 target date.

The following chart illustrates the probability that, by the 2046 target year, the fund will have attained a funded status of either 100%, 90% or 80%. For comparison, the chart also shows the risk measure’s levels from the previous year’s report.



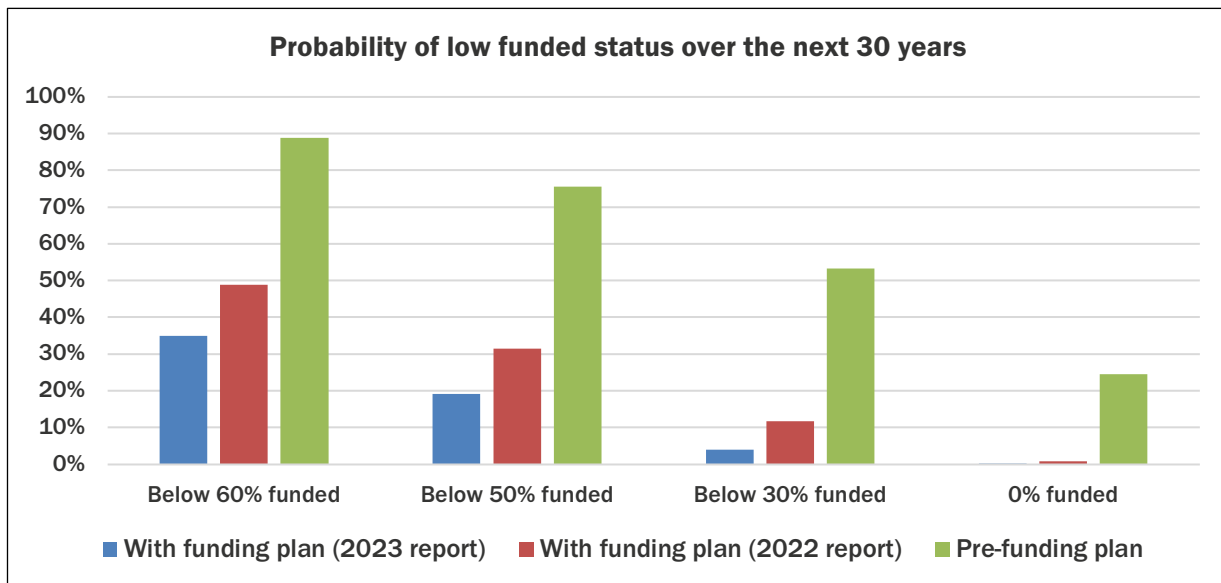
The improvements in probabilities were mostly the result of the new asset allocation and capital market assumptions adopted by the board in 2023. The new asset allocation has a similar expected investment return when compared to the previous asset allocation, but it has a lower implied volatility. The lower volatility has resulted in improvements in funding measures. The above chart also shows the probability of reaching the various funding levels had the funding plan not been implemented. As shown, the fund would have much lower probabilities of reaching full funding by 2046 had the funding plan not been adopted.

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Probability of low funding levels

Prior to the passage of the funding plan in 2014, the fund was projected to run out of assets by 2046. Although the funding plan has almost eliminated the risk of completely depleting the assets by 2046, there is still a risk that the funded status would decline and fall to uncomfortably low levels. This risk will never be fully eliminated due to the maturity level of the system, the investment volatility implied by the CalSTRS asset allocation and the rules of the funding plan.

The second risk measure quantifies the risk of funding levels declining by measuring the probability that the funded status will fall below certain thresholds at any point over the duration of the funding plan. The following chart shows the probability that the funded status will fall below 60%, 50%, 30% or down to 0% at some point over the duration of the funding plan. It compares how this risk measure has changed over the last year and compares to the probabilities had the funding plan not been adopted.



As illustrated above, the probability the fund will run out of assets by 2046 has been almost eliminated, falling to below 1%. Had the funding plan not been adopted, there would be about a 25% chance of running out of assets. The chart also shows the probability of falling to a low-funded status improved over the last year. The improvements in the probabilities are the result of the new asset allocation adopted by the board earlier this year. The new asset allocation has a similar expected investment return when compared to the previous asset allocation, but it has a lower implied volatility. The lower volatility has resulted in improvements in this funding measure.

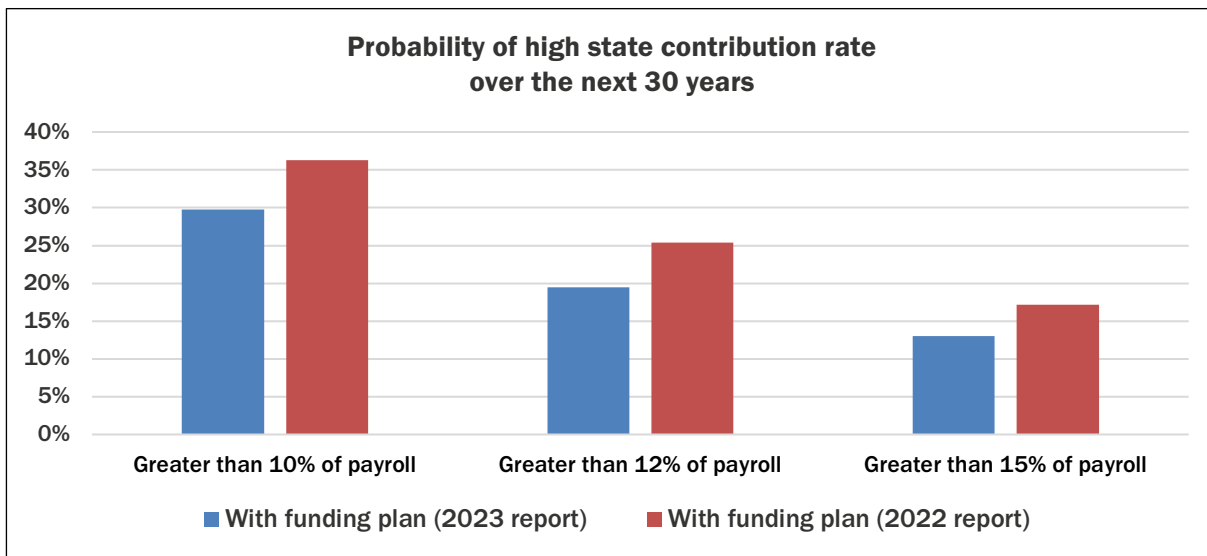
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Probability of high contribution rates

The final risk measure considers the likelihood that the state’s contribution rate increases to specified thresholds. This risk measure focuses specifically on the state because the employers have a cap of 20.25% on their contribution rate, and the employer rate is generally not significantly impacted by investment performance under the rules of the funding plan. Thus, the risk is essentially mitigated in statute for employers. Furthermore, the state’s share of the unfunded actuarial obligation has greater sensitivity to volatility in the investment returns, increasing the risk that the state rate will need to be increased in the future.

Under the rules set in the funding plan, the state contribution rate can increase each year by no more than 0.5% of payroll with no limit on the actual rate. Last May, the board kept the state supplemental rate at 6.311% for fiscal year 2023–24. This supplemental rate is in addition to the state base rate of 2.017%. In total, the state contributes 8.328% of payroll to fund its share of the unfunded actuarial obligation of the Defined Benefit Program for fiscal year 2023–24.

The following chart updates the probabilities that the state contribution rate exceeds specified thresholds over the duration of the funding plan. For comparison, the chart also shows the probabilities that were reported for this risk measure last year. For context, the state’s contribution rate is currently projected to go down to the base contribution rate of 2.017% by fiscal year 2029-30. The rates do not include the state’s 2.5% contribution rate for the Supplemental Benefit Maintenance Account.



The above chart shows that, at all levels, the probability the state experiences a high contribution rate has decreased since the previous year. The decreases in the probabilities are the results of the new asset allocation adopted by the board earlier this year. The new asset allocation has a similar expected investment return when compared to the previous asset allocation, but it has a lower implied volatility. The lower volatility has resulted in improvements in this funding measure.

Measures of plan maturity and volatility

Key findings:

- As the Defined Benefit Program continues to make progress toward full funding, it is also expected to continue to mature, which will increase its sensitivity to investment experience.
- Reacting to an investment loss will become much harder in 15 years compared to today because of the increased maturity levels and the decreasing funding period resulting from the 2046 end date for the funding plan.

MEASURES OF PLAN MATURITY AND VOLATILITY

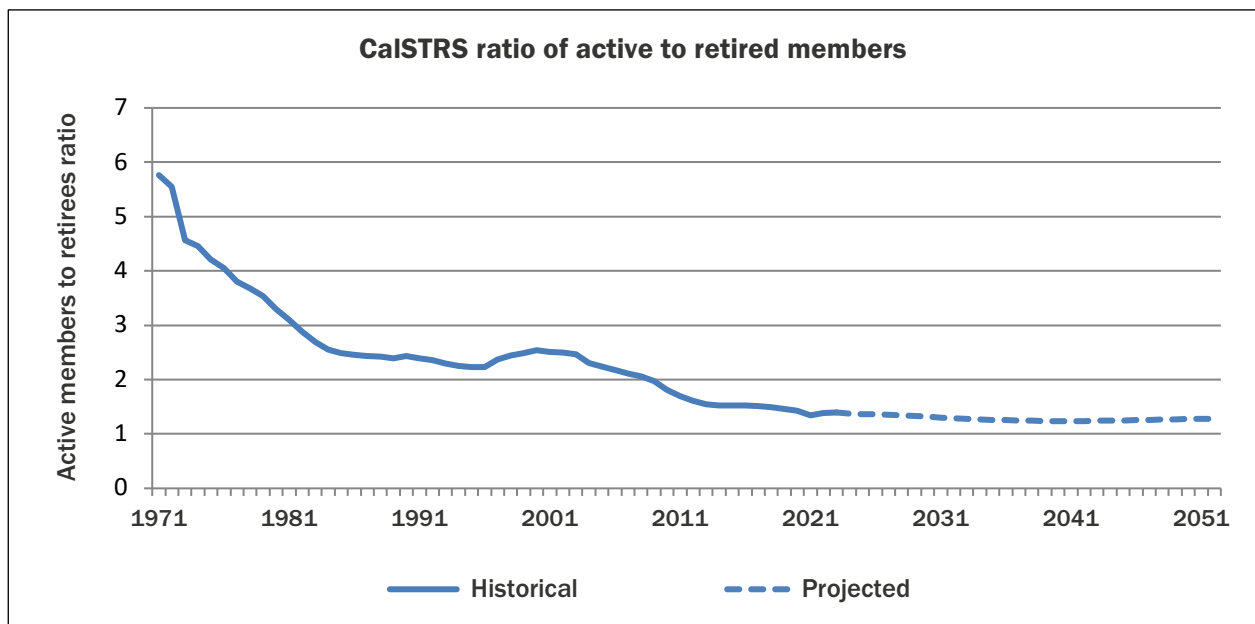
As expected, CalSTRS continues to mature as a pension plan. As pension plans mature, they become more sensitive to certain risks. Understanding plan maturity and how it affects the ability of CalSTRS to tolerate risk is essential when analyzing how investment return volatility, improvements in longevity or even growth in payroll and size of active membership could impact the ability of CalSTRS to reach full funding.

In this section, the maturity of the system is examined in the context of the number of active members to retirees, the projected cash flows and the volatility ratios, which measure the volatility in contribution rates in response to the volatility in investment returns.

Ratio of active to retired members

The aging of the population and the retirement of baby boomers has been felt by all retirement systems across the nation. This demographic shift has long been predicted by actuaries and reflected in the funding of the system. Even though it was anticipated, this demographic shift has increased the amount of risk faced by the system.

There are various ways to assess the maturity level of a retirement system. One is to look at the ratio of active to retired members. In the early years of a retirement system, the ratio of active to retired members will be very high as the system will be mostly composed of active members. As the system matures, the ratio starts declining. A mature system will often have a ratio near or below one. For CalSTRS and other retirement systems in the United States, these ratios have been declining steadily in recent years. The following chart illustrates CalSTRS' historical and projected ratio of active to retired members. Note that the count of retired members for this ratio also includes beneficiaries currently receiving a benefit.



As seen in the previous chart, the ratio of active to retired members for CalSTRS was about 6-to-1 in 1971. The ratio has decreased steadily over time. Today the ratio is about 1.4-to-1. The ratio is projected to approach 1-to-1 over the next 40 years. Assuming the number of active members in the system remains at today's level, this ratio is not expected to go below one over that time period.

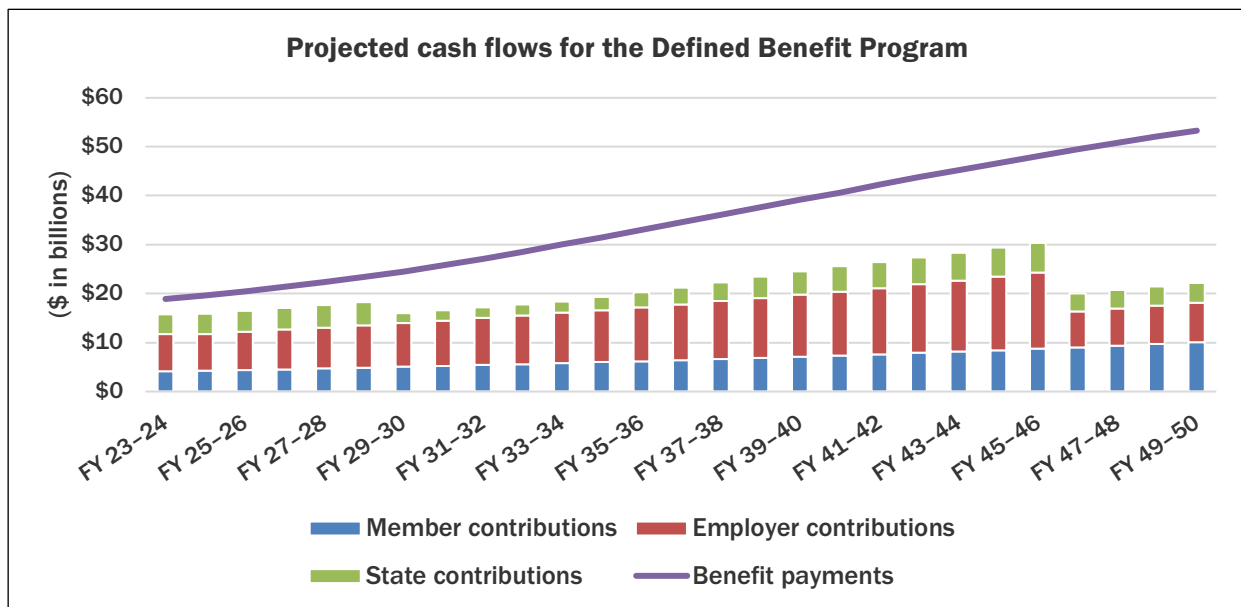
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A decline in the CalSTRS active member population could accelerate this trend and push the ratio below one. Similarly, if improvements in life expectancy end up being greater than the improvements currently built into the actuarial assumption, it would impact the ratio of active to retired members and potentially bring the ratio closer to one over a shorter period of time and even possibly below one.

Projected cash flows

The cash flows for a retirement system are another good indicator of the maturity level of the system. As a pension plan matures, it is normal for benefit payments to exceed contributions coming into the system. Having negative cash flows does not indicate the plan has been poorly managed. When prefunding a pension plan, it is important to remember that the objective is to accumulate assets to pay benefits. Put another way, the objective of prefunding is to ultimately create negative cash flows.

CalSTRS first experienced negative cash flows in 1999. The gap between contributions and benefits paid increased in the years leading up to the funding plan. With the passage of the funding plan and the increased contributions from members, employers and the state, the gap narrowed for a few years but started once again to increase. The following chart shows the projected cash flows for the Defined Benefit Program and Supplemental Benefit Maintenance Account combined.



As shown in the chart above, the gap between benefit payments and contributions will continue to increase year after year, especially after the state supplemental contribution rate is expected to be eliminated in fiscal year 2029–30. Beyond 2046, the gap is expected to sharply increase once the contribution rates return to their pre-funding plan level.

It is important not to view negative cash flows as an issue and to remember pension plans are designed to pay benefits. It is normal for mature pension plans to have benefit payments that exceed contributions coming into the system. Even if negative cash flows are a natural state for any mature pension fund and must be considered as part of the asset liability management process of a pension plan, negative cash flows do not necessarily imply the system will have to sell assets to make benefit payments. Cash generated from investments such as coupons on bonds, rent on real estate and dividends must be considered as well as the relative size of the cash flows compared to the total assets in the fund.

MEASURES OF PLAN MATURITY AND VOLATILITY

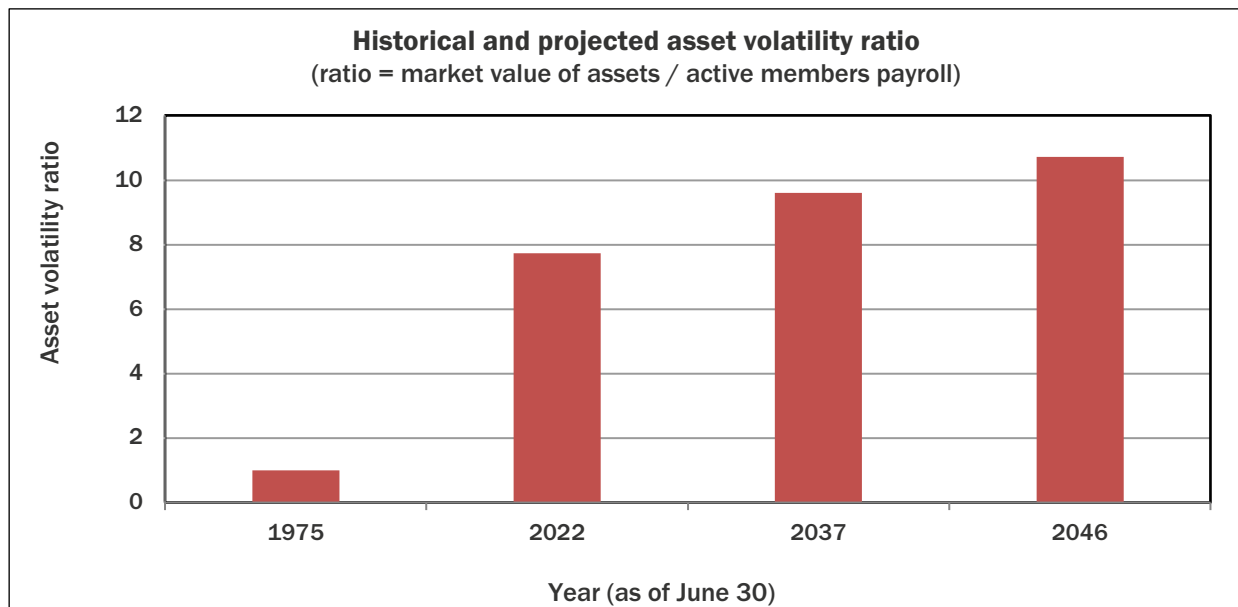
Today, enough cash is being generated from investment income to cover the gap. The gap between projected benefit payments and future contributions is expected to represent between 1% to 2.5% of the assets through the end of the funding plan. Cash generated by investments would have to be at least 2.5% of total assets to avoid having to sell assets to pay benefits. Over the last 30 years, cash generated by investments has averaged 2.7%.

Increasing volatility

As retirement systems become more mature, these systems are subject to increased volatility in the contribution rates needed to fully fund the benefits. The drop in the active-to-retiree ratio over the last decade has increased the contribution volatility risk for CalSTRS, and this volatility risk will continue to increase as the ratio continues to drop in the future.

One indicator of the contribution volatility is the asset volatility ratio. The asset volatility ratio is the ratio of the market value of assets over the total payroll for active members. Plans with a high ratio will be subject to higher contribution volatility.

The asset volatility ratio for CalSTRS has increased significantly over the last 40 years. Back in 1975, the asset volatility ratio was at about one, meaning the assets of the plan were about the same size as the payroll. The size of the assets, when compared to payroll, has increased steadily over time. As of the most recent actuarial valuation, the asset volatility ratio was about 7.5, which is typical for a mature system like CalSTRS. This means that the contribution volatility is currently about seven and a half times higher than it was in 1975. As shown on the following chart, the asset volatility ratio for CalSTRS is expected to continue to increase over time, reaching almost 10 in 15 years and about 11 by the end of the funding plan.



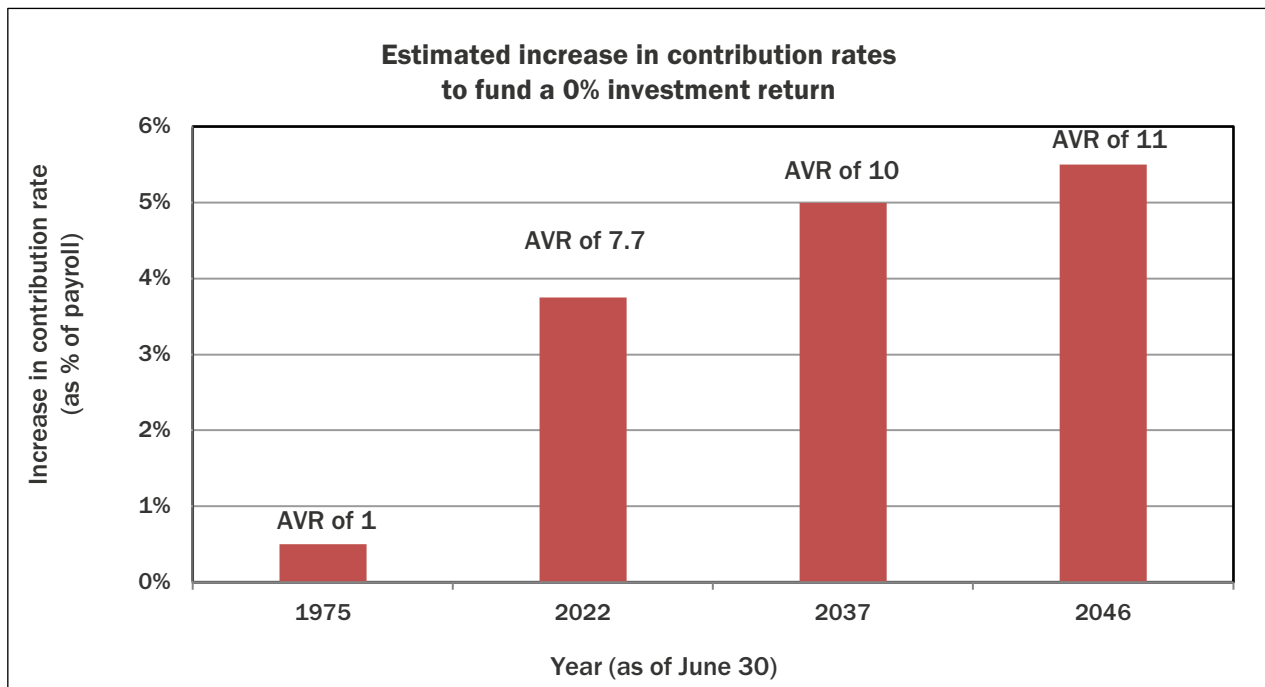
There are various reasons why the asset volatility ratio is projected to increase over time. One is expected improvements in funding levels. As of the June 30, 2022 actuarial valuation, the Defined Benefit Program was about 74.4% funded. If the system was 100% funded today, the asset volatility ratio would be 9.2. As additional contributions flow into the system pursuant to the funding plan, the funded ratio is projected to improve and move toward the target of being 100% funded. As a result, the asset volatility ratio will increase over time. In addition, the system has not yet reached its full maturity stage. As more members retire, the asset volatility ratio is also expected to continue to increase.

MEASURES OF PLAN MATURITY AND VOLATILITY

It is important to keep in mind that there is nothing to “fix” if the asset volatility ratio is high. A high asset volatility ratio simply indicates that there is more money invested for the plan—a good thing overall. It should, however, serve as a reminder that the more money invested, the more of an impact investment gains and losses will have on the contribution levels needed to fully fund the system.

With the expected increases in asset volatility ratio over time, the funding risk of the system will be greater in 20 years than it is today, resulting in greater volatility in the level of contributions that would be needed to ensure the plan remains 100% funded over the long term.

To help demonstrate this increased contribution volatility, the following chart displays the cost to eliminate, over a 20-year funding period, the unfunded actuarial obligation created from a 0% investment return. Note that a 0% investment return represents an investment loss from an actuarial perspective of about 7%, since a 0% is 7% less than the assumed 7% investment return. Since the year 2000, the system has experienced a negative return on five occasions.



Further compounding contribution rate volatility is an aspect of the funding plan that is often overlooked. The fixed time frame for paying down the unfunded actuarial obligation by 2046 will result in a declining amortization period, increasing contribution volatility going forward. Today, the existing shortfall is amortized through 2046, over a period of 23 years. In 10 years, any remaining shortfall will be amortized over 13 years. If markets were to fall short of expectations in 20 years, the shortfall would have to be paid over a three-year period, requiring higher contributions than would normally be needed if the funding period was 20 years. As a result, the limited rate-setting authority granted to the board is more likely to be insufficient in 20 years, following an economic downturn, due to the combined impact of the funding period shortening and maturity levels increasing.

Ability to reach full funding under different actuarial assumptions

Key findings:

- A formal review of the actuarial assumption is currently underway and will be presented to the board in January 2024. The payroll growth assumption will be examined closely as part of this study.
- CalSTRS would be expected to reach full funding should the board elect to adopt more conservative actuarial assumptions in the funding of the system.

ABILITY TO REACH FULL FUNDING UNDER DIFFERENT ACTUARIAL ASSUMPTIONS

So far, this report has included discussions and risk measures illustrating the funding plan’s capacity to react to short-term and long-term deviations from the current actuarial assumptions and to meet the goal of reaching full funding by 2046. For all scenarios analyzed in this report, it was assumed that actuarial assumptions would remain the same when calculating the liabilities.

In this section, the ability of the funding plan to reach full funding by 2046 is tested against different economic actuarial assumptions. For each scenario analyzed, both the liabilities and the assets were projected using the revised set of assumptions, assuming the change would be long term and permanent.

Including this information in this report is not an indication that actuarial assumptions must be changed. The information is provided for informational purposes only to help illustrate how the funding plan would absorb the impact of using more conservative actuarial assumptions in the funding of the system.

Various combinations of actuarial assumptions for the investment return and payroll growth were analyzed to see how the funding plan would react and whether CalSTRS would still be able to reach full funding by 2046.

Regarding the investment return assumption, in May 2023, the board adopted a new asset allocation. The new allocation, when combined with the capital market assumptions adopted earlier in the year, has an expected return that still supports an assumed investment return of 7.0%, and no change will be

recommended to the board as part of the experience study that will be presented to the board in January 2024. Despite this, it is a useful exercise to examine how the funding plan would react to lowering the investment return should the board decide to reduce investment risk at some point in the future.

As indicated earlier in the report, if the anticipated reduction in enrollment in K–12 public schools results in a need for fewer teachers in California, it could impact the number of active teachers who participate in the Defined Benefit Program and ultimately the growth in the payroll. This assumption will be examined closely as part of the experience study that will be presented in January 2024, and changes may be recommended if necessary.

In the following analysis, the ability of the funding plan to react to changes in actuarial assumptions was tested by lowering the investment return assumption from 7.0% to 6.75% and 6.5%. Similarly, the payroll growth assumption was lowered from 3.5% to 3.0% and 2.5%. For scenarios in which the payroll growth was lowered, the underlying real wage growth was also lowered by 0.25%.

The table below shows the projected funded status in 2046 for each set of actuarial assumptions.

Projected funded status on June 30, 2046

Future payroll growth	Investment return 7%	Investment return 6.75%	Investment return 6.5%
3.50%	100%	100%	100%
3.00%	100%	99%	100%
2.50%	100%	99%	100%

As can be seen in the above table, under all scenarios the funded status is expected to be at or just slightly below 100% by June 30, 2046. The slightly lower funded status under the 6.75% scenario is related to the requirement that the state contribution rate drop to 2.017% when the state’s share of the unfunded actuarial obligation is eliminated.

ABILITY TO REACH FULL FUNDING UNDER DIFFERENT ACTUARIAL ASSUMPTIONS

Adopting more conservative assumptions could also impact contribution rates for the state, employers and CalSTRS 2% at 62 members. Generally, the state contribution rate is most impacted by a change in the assumed investment return, while the employer rate is more sensitive to changes in the payroll growth assumption. The CalSTRS 2% at 62 members contribution rate is sensitive to increases in the normal cost which generally is most sensitive to change in the assumed investment return.

The table below shows the average state contribution rate to the Defined Benefit Program through 2046 under each assumption scenario. The board elected to keep the state contribution rate at 8.328% of payroll for the Defined Benefit Program for fiscal year 2023–24. Currently, the state contribution rate is expected to drop to 2.017% in fiscal year 2029–30. As a result, the state contribution rate is currently expected to average 5.1% of payroll through 2046.

Average state contribution rate through 2046

Future payroll growth	Investment return 7%	Investment return 6.75%	Investment return 6.5%
3.50%	5.1% of payroll	7.6% of payroll	10.8% of payroll
3.00%	4.3% of payroll	6.4% of payroll	10.1% of payroll
2.50%	4.3% of payroll	6.4% of payroll	10.3% of payroll

Adopting a more conservative investment return assumption would increase the average state contribution rate. However, as the table shows, lowering the payroll growth decreases the state contribution rate. This is because the underlying wage growth assumption was also lowered, which decreases the normal cost and actuarial obligation which impacts the state contribution rate. Also notice that the average rate is lower than the current state contribution rate when the investment return assumption is lowered to 6.75%, indicating the board could be in a position to lower the state contribution rate even under slightly more conservative assumptions. If the investment return assumption was lowered to 6.5%, increases in the state contribution rate would be required to allow the state to eliminate its share of the unfunded actuarial obligation by 2046.

The table below shows the average employer contribution rate to the Defined Benefit Program through 2046 under each assumption scenario. The board adopted an employer contribution rate of 19.1% of payroll for fiscal year 2023–24.

Average employer contribution rate through 2046

Future payroll growth	Investment return 7%	Investment return 6.75%	Investment return 6.5%
3.50%	18.2% of payroll	17.5% of payroll	17.1% of payroll
3.00%	18.4% of payroll	18.1% of payroll	17.7% of payroll
2.50%	19.0% of payroll	18.8% of payroll	18.4% of payroll

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Although counterintuitive, adopting a more conservative investment return assumption would decrease the average employer contribution rate through 2046. This is because the increase to the employers share of the unfunded actuarial obligation is small compared to the cumulative impact of a lower interest rate being charged to amortize their share of the unfunded actuarial obligation. When the investment return assumption is lowered, it also lowers the interest charges on the payments made by employers to eliminate their share of the unfunded actuarial obligation. In a sense, it is similar to the interest charged on a mortgage. In this situation, the lower interest charges on the existing unfunded actuarial obligation more than offset the initial increase in the unfunded actuarial obligation caused by the lowering of the investment return assumption. Note that lowering the payroll growth assumption results in an increase in the average employer contribution rate for similar reasons to those discussed in the membership and payroll growth risk section.

Adopting more conservative actuarial assumptions could also impact the CalSTRS 2% at 62 member contribution rate. Under the California Public Employees’ Pension Reform Act of 2013 (PEPRA), CalSTRS 2% at 62 members are required to pay at least one-half of the normal cost of their Defined Benefit Program benefit, rounded to the nearest quarter of 1%. The normal cost is the annual cost for each year of service that is necessary to adequately fund the benefits over time if all assumptions are met. Adopting a more conservative investment assumption will increase the normal cost. However, to impact CalSTRS 2% at 62 members, the normal cost would have to change by more than 1% since the last time the member contribution rate was set. The table shows the CalSTRS 2% at 62 member contribution rate and whether an increase would be required under each assumption scenario.

CalSTRS 2% at 62 member contribution rate

Future payroll growth	Investment return 7%	Investment return 6.75%	Investment return 6.5%
3.50%	10.205% No increase	10.955% 0.75% increase	11.705% 1.5% increase
3.00%	10.205% No increase	10.705% 0.5% increase	11.455% 1.25% increase
2.50%	10.205% No increase	10.705% 0.5% increase	11.455% 1.25% increase

The contribution rate for CalSTRS 2% at 62 members would have to increase if the investment return assumption was reduced. As indicated in the table above, the increase is slightly smaller when paired with a reduction to the underlying wage growth assumption, as in last two rows of the table.

This analysis shows that CalSTRS is still in a favorable position today and would be expected to reach full funding if the board elected to adopt more conservative actuarial assumptions in the funding of the system. However, there would be additional costs for the state, employers and some members under these assumptions.

CONCLUSION

This report discussed a variety of risks associated with the funding of CalSTRS. Even if baseline projections indicate CalSTRS expects to reach full funding by 2046, significant risks remain that could prevent the system from reaching full funding by 2046.

Although the risks related to longevity, active membership decline and future payroll growth are real and important, the fact remains that the largest risk facing CalSTRS is risk from investment returns falling short of the assumed return. This risk will continue to increase over time due to the natural maturing of the system and the scheduled end date of the funding plan, set at 2046.

As noted in this report, some of the features of the funding plan could limit CalSTRS' ability to react adequately to changes in economic and demographic conditions and reach full funding. These features include:

- The end date of 2046.
- The lack of authority to adjust contribution rates for the unallocated share of the unfunded actuarial obligation.
- The 0.5% limit on state contribution rate increases.
- The requirement that the state contribution rate immediately drop to 2.017% once the state has eliminated its share of CalSTRS unfunded actuarial obligation.

CalSTRS is required by statute to provide its next progress report on the funding plan to the Legislature by June 30, 2024. For the next progress report to the Legislature, the board will have the opportunity in March 2024 to discuss and consider whether the report should include for consideration potential improvements to further strengthen the funding plan and CalSTRS' ability to reach full funding. Making minor modifications to the funding plan, by addressing the above features, would help mitigate the impact of some of the risks identified in this report.

Finally, in January 2024, the board will be presented with the next experience study which will review and recommend updates to the economic and demographic actuarial assumptions. This review occurs every four years and helps ensure the actuarial assumptions remain reasonable and reflect the actual experience of the system. Regular reviews and adjustments to the assumptions are key to ensuring the plan stays on track to reach full funding.

In May 2023, as part of the Asset Liability Management study, the board adopted a new asset allocation that has an expected return consistent with the existing 7% investment return assumption. As a result, it is anticipated that no changes will be recommended to the assumed investment return. However, as mentioned in this report, the experience study will take a close look at and possibly recommend changes to the long-term payroll growth assumption.