



Report to Legislature on the Progress of the CalSTRS Funding Plan

June 2019

EXECUTIVE SUMMARY

In June 2014, Assembly Bill 1469 (Bonta) created a specific plan to fully fund the California State Teachers' Retirement System's Defined Benefit Program by 2046. The CalSTRS Funding Plan reflects a shared commitment by members, employers and the state to incrementally increase contributions to CalSTRS in a predictable manner to fully fund the Defined Benefit Program and ensure the long-term sustainability of CalSTRS.

The funding plan was enacted by the California State Legislature and Governor in 2014 and requires CalSTRS to provide a report to the Legislature every five years on the progress of the plan. The first report to the Legislature is due July 1, 2019. Existing statute requires that the first report compare the funding levels and projected contribution rates at the time the funding plan was enacted to those based on the June 30, 2018, actuarial valuation. The report must also indicate whether additional contributions are needed to reach full funding by 2046.

The purpose of this report is to fulfill this legislative requirement and assist stakeholders, policymakers and the public in assessing the soundness and sustainability of the Defined Benefit Program. This report is also intended to promote a better understanding of how the funding plan operates and how it is expected to achieve its goal of full funding over the next few decades.

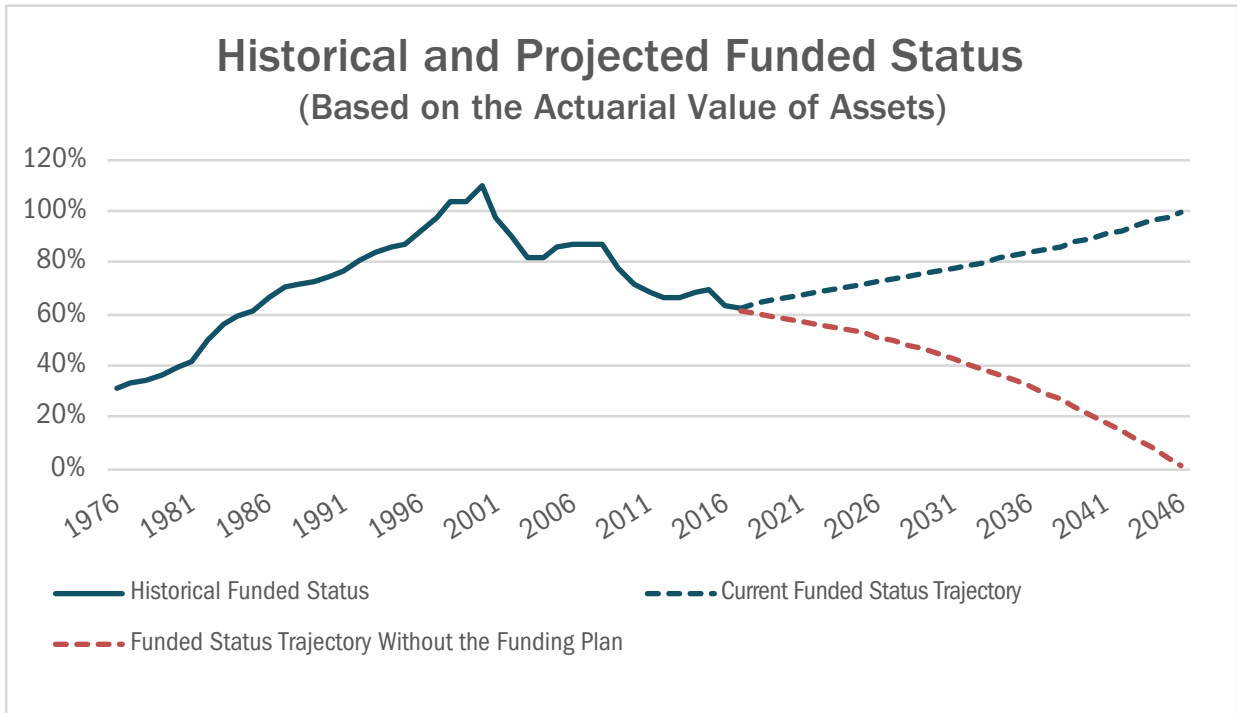
It is important to note that full funding is the most financially prudent way to provide benefits to past, present and future California educators. While proposals with a target of less than full funding may result in lower employer and state contribution rates in the near term, such proposals would increase total costs and decrease benefit security for CalSTRS members. For examples of the risks involved in such an approach, national news is often filled with stories of other states where low funding levels for retirement systems were the result of inadequate contributions.

As adopted, the funding plan lays out a measured schedule of contribution increases for both the state and employers, which balances the need for greater contributions with the need to adjust and prepare employer and state budgets for the financial impact of increased contributions. The funding plan also provides the Teachers' Retirement Board with limited authority to further increase or decrease both the state and employer contribution rates to ensure the plan remains on track and is able to respond, as necessary, to unexpected changes in CalSTRS' economic and demographic situation. These are important design features that have helped put CalSTRS in a much stronger position. Prior to the funding plan, the board had only a very limited ability to change the state contribution rate and no ability to adjust the employer contribution rate.

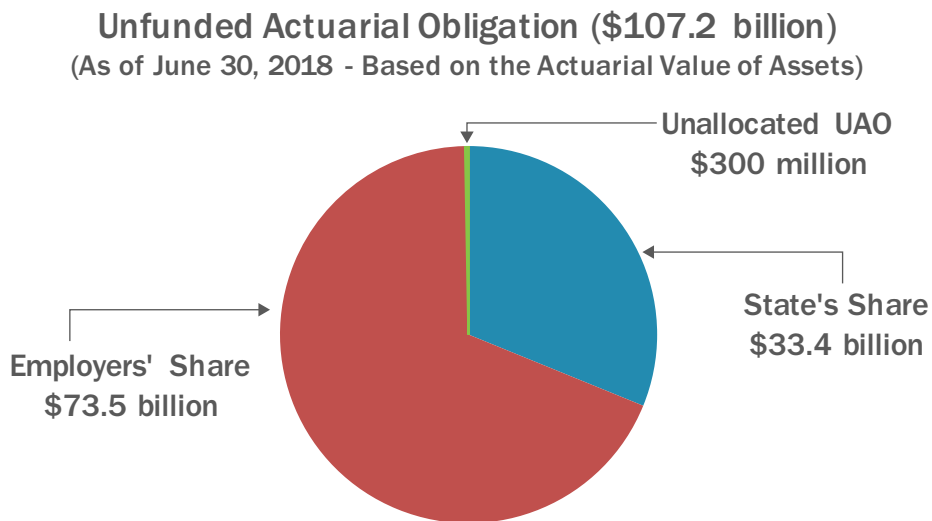
As shown throughout this report, the funding plan is working. Prior to the adoption of the funding plan, the Defined Benefit Program was expected to run out of assets by 2046. Today, it is expected to reach 99.9 percent funded by 2046.

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As explained in more detail in this report, reaching exactly 100 percent funded may not be possible since the funding plan does not address the entire unfunded actuarial obligation (UAO) in existence today. As anticipated by the funding plan, improvements in funding levels have been minimal since its inception and will continue to be minimal over the next few years while contribution rates for both employers and the state continue to be phased in over future fiscal years. Below is a chart showing projected funding levels with and without the funding plan.



As of June 30, 2018, the Defined Benefit Program was 64 percent funded, and the UAO was \$107.2 billion. As shown in the following chart, employers are currently responsible for about two-thirds of the entire UAO, while the state is responsible for about one-third.



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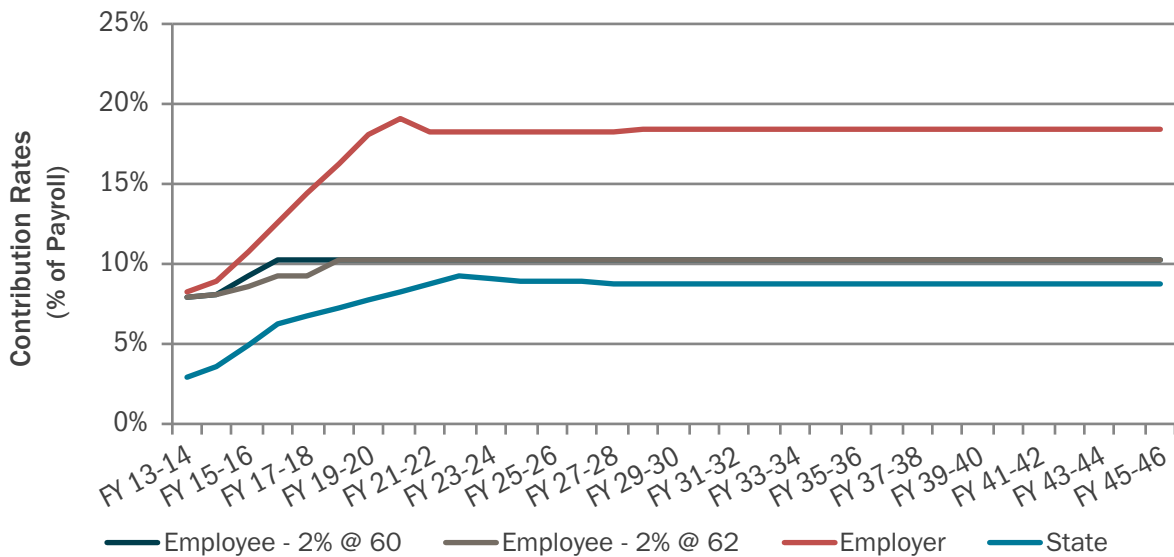
One of the key components of the funding plan is the flexibility it provides the board to adjust contribution rates for the state and employers, if necessary, to keep the funding plan on track and allow the Defined Benefit Program to reach full funding by 2046.

In May 2019, the board exercised its authority for the third year in a row to increase the state's contribution rate by the maximum 0.5 percent of payroll. It is currently expected that the board will need to increase the state contribution rate in each of the three fiscal years following 2019–20 to ensure the state's share of the UAO is eliminated by June 30, 2046. It is anticipated that the state will need to contribute around 9 percent of payroll over the long term to eliminate its share of the UAO by 2046. Note that the state also contributes an additional 2.5 percent of payroll to CalSTRS' Supplemental Benefit Maintenance Account, which provides inflation protection to retired members and beneficiaries and is separate from the Defined Benefit Program.

The employer contribution rate will continue to increase based on the schedule prescribed in law by the funding plan. Effective for fiscal year 2021–22, the board will be able to exercise its authority to adjust, if necessary, the employer contribution rate to ensure the employer share of the UAO is eliminated by 2046. At this time, it is projected that the board will reduce the employer rate in 2021–22. This will be addressed later in the report.

The following chart shows historical and projected contribution rates necessary for the state, employers and members to achieve full funding. These projected rates are estimates that could be impacted by actual investment performance, demographic changes and actuarial assumption changes.

Historical and Projected Contribution Rates



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Note that this report does not reflect the impact of the supplemental payments to CalSTRS included in the 2019–20 state budget to reduce the UAO of the system and reduce the contribution rates for employers and the state.

Key highlights of the funding plan explained in more detail in this report include:

- The funding plan is working. The Defined Benefit Program is expected to reach near full funding by 2046. The risk of a low-funded status or even running out of money has been considerably reduced with the adoption of the funding plan.
- The state bears most of the risk and financial responsibility for changes in the UAO caused by investment performance, demographic changes and actuarial assumption changes.
- The employer contribution rate is minimally impacted by investment performance, and when impacted, it generally moves in the opposite direction of the state contribution rate.
- The funding plan does not address the entire UAO in existence today. As explained in this report, a small portion of the existing UAO is currently unallocated.
- A recession resulting in both a decline in active

membership and a period of lower investment returns would put significant strain on the state and employers and would challenge CalSTRS' ability to achieve full funding.

The next formal report on the progress of the funding plan will be provided to the Legislature in 2024, based on the June 30, 2023, actuarial valuation. Until then, CalSTRS will continue to monitor the funding plan and its progress every year through CalSTRS' annual actuarial valuation process in the spring and again in the fall through the board's annual *Review of CalSTRS Funding Levels and Risks* report.

Continuous monitoring of the funding plan is important to identify and address trends that could impact the long-term funding of the system in a timely manner. If a situation were to develop under which the funding plan was no longer expected to allow the Defined Benefit Program to achieve full funding, it would be extremely important to act quickly to minimize long-term costs to members, employers and the state.

INTRODUCTION

This is the first statutorily-required report by CalSTRS to the Legislature on the progress of the funding plan, and going forward, a report is due to the Legislature every five years. This report is intended to assist the Legislature, stakeholders and the public in assessing the soundness and sustainability of the Defined Benefit Program, to promote a better understanding of how the funding plan operates, and to outline how the funding plan is expected to achieve its goal of full funding over the next few decades.

This report is based on the June 30, 2018, annual actuarial valuation and does not reflect year-to-date investment experience for fiscal year 2018–19. At the time of the writing of this report, the year-to-date return for fiscal year 2019–20 was below 7 percent, which is CalSTRS' assumed rate of return on trust assets. A return below 7 percent would likely result in a reduction in funding levels in the short term and require higher state contribution rates over the long term to achieve full funding by 2046. This report also does not reflect the impact of the 2019–20 state budget, which includes supplemental payments to CalSTRS to reduce the UAO of the system and contribution rates for employers and the state.

This report will focus on the following:

- Background on the Defined Benefit Program and the history of its funding.
- Details on how the funding plan operates.
- Changes in contribution rates and funding levels since 2014.
- Current projections of funding levels and contribution rates.
- Risks that could prevent CalSTRS from reaching full funding.
- Information on the importance of acting quickly if it is determined that another solution is needed to reach full funding.

HISTORY OF THE DEFINED BENEFIT PROGRAM AND ITS FUNDING STRUCTURE

The membership and the funding of the Defined Benefit Program has changed substantially in the more than 100 years since CalSTRS was established by law in 1913. When CalSTRS was founded, it had 120 retired members and 15,000 active members. Over time, the total membership has grown to about 950,000 members and their beneficiaries.

Today, CalSTRS is the largest educator-only pension fund in the world and the second largest pension fund in the United States. CalSTRS provides retirement, disability and survivor benefits for full-time and part-time California public school educators through a hybrid retirement system consisting of the Defined Benefit, Defined Benefit Supplement, and Cash Balance Benefit programs, as well as a voluntary defined contribution plan called CalSTRS Pension2®.

In 1913, what is now the Defined Benefit Program had only two sources of contributions: a \$12 annual contribution from each active member and a state contribution equal to 5 percent of the revenue generated by the state's inheritance tax. Employers did not make contributions to CalSTRS until 1935 when they began to make a \$12 annual contribution per active member. The members' contribution increased to \$24 per year at the same time.

The next significant change in the funding structure occurred nine years later, in 1944, when the member contribution amount changed from a flat dollar amount to a percentage of compensation, which also varied depending on the age and gender of the member. The member contribution rate ranged between 2.53 and 4.85 percent of compensation. At the same time, the state's contribution changed from a percentage of inheritance tax revenue to a pay-as-you-go payment, with the state paying the difference between the resources available and the cost of benefits in a given year. The member's contribution rate continued to be based on the member's age and gender and was adjusted several times between 1944 and 1972.

In 1956, the employer contribution of \$12 per member per year was augmented by a 3 percent of salary contribution, with a limitation that contributions could not exceed specified percentages of the assessed value of properties within the school district. In 1971, the employer contribution rate averaged about 2 percent of salary.

Until 1972, the funding structure did not allow CalSTRS to prefund the retirement benefits promised to California educators and was instead funded using a pay-as-you-go approach, with the state responsible for bridging any shortfalls.

The funding structure changed to a prefunding basis in 1972 with the adoption of the E. Richard Barnes Act. The member contribution rate, which averaged 7.4 percent, was changed to a fixed 8 percent of salary. The member contribution rate stayed at this level until the adoption of the funding plan in 2014. The employer contribution rate was also increased in 1972. Increases were phased in over time. The rate was initially set to a flat 3.2 percent of earnings effective with fiscal year 1972–73 and was increased gradually over the balance of the decade until it reached 8 percent in 1978–79, matching the contribution rate paid by members.

The payment made by the state also changed in 1972. Instead of being responsible for bridging the funding gap on a pay-as-you-go basis, the state started contributing a flat dollar amount of \$135 million per year, which was intended to bridge the funding shortfall in place at the time over a 30-year period. This flat dollar amount was modified a few times throughout the 1970s as CalSTRS' funding situation also changed. By 1990, the state's annual contribution had increased to about \$400 million. Additional state contributions, based on a percentage of pay, were also enacted in the 1980s to fund specific benefit enhancements.

In 1986, the financial responsibility of funding the crediting of unused sick leave service credit was transferred from the state to employers, resulting in an increase of 0.25 percent of salary in the employer contribution rate. This increase brought the total employer contribution rate to 8.25 percent of salary. This rate remained unchanged for employers until the passage of the funding plan in 2014.

The next significant change in program funding occurred in 1990 with the passage of Senate Bill 1370 (Green), the Elder State Teachers' Retirement Full Funding Act. The flat dollar contribution paid by the state was replaced with a contribution rate equal to 4.3 percent of a member's compensation to eliminate the funding shortfall in place at the time over the next 40 years.

HISTORY OF THE DEFINED BENEFIT PROGRAM AND ITS FUNDING STRUCTURE

As CalSTRS' funding situation improved in the late 1990s and early 2000s, the state's contribution rate was modified several times to adjust for the improved funding levels. By 2003, the state's base contribution rate was 2.017 percent of creditable compensation of the fiscal year ending in the prior calendar year. The board was also given the ability to set a supplemental contribution rate for the state above the base contribution rate to eliminate any unfunded liability associated with the 1990 benefit structure. State law limited the annual increase for the supplemental state contribution rate to 0.25 percent with a maximum supplemental rate of 1.505 percent.

Following the financial crisis and market downturn of 2008, the funding situation of the Defined Benefit Program deteriorated to the point that contributions were not enough to prevent it from running out of assets in about 30 years. A different funding structure was needed to address the situation.

Guided by its board, CalSTRS committed to promote the development of a comprehensive strategy to address the long-term funding needs of the system. After years of focused discussions, stakeholder outreach, legislative visits and hearings, the Legislature adopted AB 1469 in June 2014, creating the CalSTRS Funding Plan.

CALSTRS FUNDING PLAN

The funding plan, enacted by AB 1469 in 2014, put the Defined Benefit Program on the path to full funding by 2046 through incremental contribution increases shared among the program's three contributors: CalSTRS members, employers and the state.

Member Contribution Increases

AB 1469 increased member contributions on compensation that is creditable to the Defined Benefit Program. The member contribution rate had not increased beyond 8 percent since 1972. Below is a table showing the increases in the member contribution rate from 2014 through 2018.

Effective Date	Pre-CalSTRS Funding Plan Member Contribution Rate		Post-CalSTRS Funding Plan Member Contribution Rate	
	2% at 60 Members ¹	2% at 62 Members	2% at 60 Members ¹	2% at 62 Members ¹
July 1, 2014	8%	8%	8.15%	8.15%
July 1, 2015	8%	8%	9.20%	8.56%
July 1, 2016	8%	8%	10.25%	9.205%
July 1, 2017	8%	8%	10.25%	9.205%
July 1, 2018 & thereafter	8%	9%	10.25%	10.205%

¹ The contribution rate for CalSTRS 2% at 62 members is based, in part, on the normal cost of benefits and may increase or decrease in future years. The contribution rate for 2% at 60 members is set in statute.

In exchange for increased contributions to the Defined Benefit Program as part of the funding plan, CalSTRS members who performed creditable service on or after January 1, 2014, are now guaranteed a 2 percent annual benefit adjustment, also referred to as the improvement factor. The 2 percent improvement factor is provided to members once they have been retired for at least one year and is a component of the purchasing power protections within the plan. Prior to the funding plan, the improvement factor was not guaranteed for any member. For members who retired prior to January 1, 2014, the improvement factor is not guaranteed since the Legislature reserved the right to adjust the improvement factor as economic conditions dictate, as it had with regards to all members prior to the enactment of the funding plan.

In 2012, the Legislature enacted Assembly Bill 340 (Furutani), the Public Employees' Pension Reform Act (PEPRA), which was effective on January 1, 2013. PEPRA requires that members subject to the 2% at 62 benefit formula must pay at least one-half of the normal cost of their benefit and that their contribution rate be adjusted if the plan's normal cost changes by more than 1 percent of salary. Effective July 1, 2018, CalSTRS 2% at 62 members were required to contribute an additional 1 percent of creditable compensation to CalSTRS as a result of an increase in the plan's normal cost. This increase was driven by a change in actuarial assumptions adopted by the board to reflect longer life expectancies for CalSTRS members and lower investment return expectations in the future.

CALSTRS FUNDING PLAN

Employer Contribution Increases

The funding plan provided for increases in the employer contribution rate, which are being phased in over seven years. These supplemental contributions were intended to eliminate the employers' share of the UAO by 2046. Prior to the funding plan, the employer contribution rate had not increased since 1986. Below is a table showing the increases in the employer contribution rate from 2014 through 2020.

Effective Date	Base Employer Contribution Rate	Post-CalSTRS Funding Plan Contributions	
		Employer Supplemental Contribution Rate ¹	Total Employer Rate ²
July 1, 2014	8.25%	0.63%	8.88%
July 1, 2015	8.25%	2.48%	10.73%
July 1, 2016	8.25%	4.33%	12.58%
July 1, 2017	8.25%	6.18%	14.43%
July 1, 2018	8.25%	8.03%	16.28%
July 1, 2019	8.25%	9.88%	18.13%
July 1, 2020	8.25%	10.85%	19.10%

¹ The funding plan included a set schedule of employer supplemental rate increases through fiscal year 2020–21.

² The total employer rate does not reflect the supplemental pension payments in the 2019–20 state budget.

Starting in 2021–22, the funding plan provides the board limited authority to adjust the employer supplemental contribution rate, if necessary, to fully fund the employers' share of the UAO by 2046. Those adjustments are limited to 1 percent annually. Also, the total employer contribution rate cannot exceed 20.25 percent of creditable compensation.

State Contribution Increases

As described earlier in this report, prior to the adoption of the funding plan, the board had the ability to set a supplemental contribution rate for the state, in addition to the base rate of 2.017 percent, to eliminate any UAO associated with the 1990 benefit structure. State law limited the annual increase for the supplemental state contribution rate to 0.25 percent with a maximum supplemental rate of 1.505 percent.

The funding plan maintained the state's base contribution rate of 2.017 percent to the Defined Benefit Program. The funding plan increased the supplemental rate dedicated to paying for the 1990 benefit structure. The increases in the

state supplemental rate were phased in over three years, reaching 4.311 percent of payroll effective July 1, 2016, for a total contribution rate of 6.328 percent to the Defined Benefit Program. This contribution rate was anticipated to eliminate the state's share of the unfunded liability by 2046.

The funding plan also provided the board limited authority to adjust the state's contribution rate to eliminate the state's share of the unfunded liability by 2046, with increases limited to 0.5 percent each year. In May 2019, the board exercised its authority to increase the state supplemental contribution rate by 0.5 percent of payroll for the third time since the adoption of the funding plan.

CALSTRS FUNDING PLAN

Below is a table showing the state contribution rate to the Defined Benefit Program from 2014 through 2019.

Effective Date	Base State Contribution Rate	Pre-CalSTRS Funding Plan State Supplemental Contribution Rate	Post-CalSTRS Funding Plan Contributions	
			State Supplemental Contribution Rate	Total State Rate
July 1, 2014	2.017%	1.024%	1.437% ¹	3.454%
July 1, 2015	2.017%	1.274%	2.874% ¹	4.891%
July 1, 2016	2.017%	1.505%	4.311% ¹	6.328%
July 1, 2017	2.017%	1.505%	4.811% ²	6.828%
July 1, 2018	2.017%	1.505%	5.311% ³	7.328%
July 1, 2019	2.017%	1.505%	5.811% ⁴	7.828%

¹ The funding plan included a set schedule of state supplemental rate increases through fiscal year 2016–17.

² Adopted by the board in April 2017.

³ Adopted by the board in May 2018.

⁴ Adopted by the board in May 2019.

To eliminate the state's share of the UAO by 2046, additional increases in the state supplemental contribution rate of 0.5 percent of payroll, beyond those shown in the above table, are currently expected for three additional fiscal years. Note that future investment and demographic experience could impact this estimate.

In addition to the contribution rate to the Defined Benefit Program, the state also contributes 2.5 percent of payroll toward the Supplemental Benefit Maintenance Account, CalSTRS' inflation protection program.

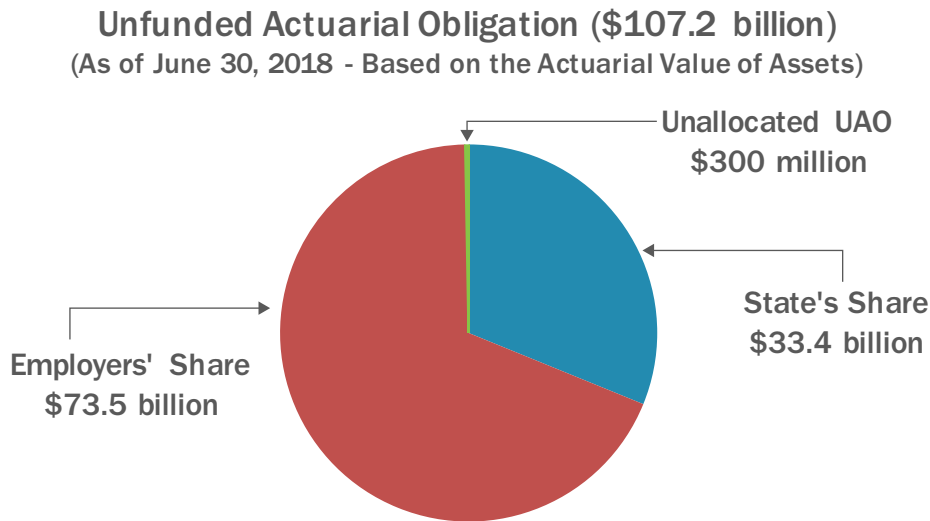
UNDERSTANDING HOW THE CALSTRS FUNDING PLAN OPERATES

Although the funding plan is working as designed and the Defined Benefit Program is projected to reach full funding, the funding plan is a complex funding structure with many intricacies that often lead to counterintuitive results. Understanding these intricacies is important to be able to recognize the types of events and factors that could impact contribution rates and potential situations that could impact CalSTRS' ability to reach full funding.

A key element of this complexity is the structure established to pay down the UAO. Specifically, the funding plan contains rules that are used to determine how much of the UAO is allocated to the state and employers. The UAO is not allocated to members. The state is responsible for any

UAO related to CalSTRS benefits that were in effect on July 1, 1990, which for this report, is referred to as the 1990 benefit structure. This responsibility applies to all service performed by CalSTRS members. The employers are responsible for any UAO that can be attributed to benefit changes that occurred on or after July 1, 1990, which for this report, is referred to as the post-1990 benefit structure. The employers' responsibility is limited to service accrued by members before July 1, 2014.

As of June 30, 2018, the rules of the funding plan have resulted in the following allocation of the UAO for the Defined Benefit Program.

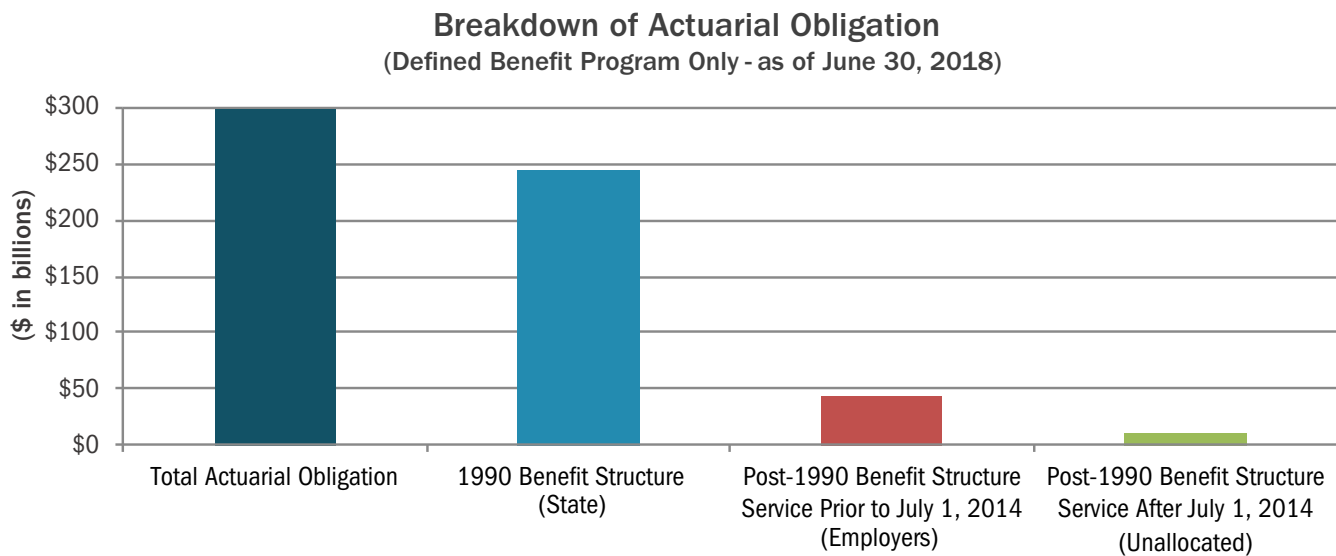


As illustrated above, employers are currently responsible for about two-thirds of the entire UAO for the Defined Benefit Program. This is the main reason why the employer contribution rate is projected to be the highest among the three contributors. The state is responsible for about one-third of the existing UAO. Finally, the funding plan does not address the entire UAO in existence today. The remaining portion of the UAO that is not allocated between the employers or the state is referred as the unallocated UAO.

UNDERSTANDING HOW THE CALSTRS FUNDING PLAN OPERATES

Even though employers are responsible for the greatest share of the existing UAO, the state's share of the UAO is most likely to materially increase or decrease as a result of economic and demographic experience. To understand why the state's share is more sensitive, it is helpful to further look into the UAO. The UAO for a pension plan is the difference between the actuarial obligation for the plan and the actuarial value of assets. Understanding the relative sizes of the actuarial obligation and the actuarial value of assets for the 1990 benefit structure, the post-1990 benefit structure and the unallocated will help illustrate the expected sensitivity.

Below is a chart showing the breakdown of the actuarial obligation as of June 30, 2018.



The state is responsible for funding the UAO for the 1990 benefit structure. Since the UAO is the difference between the actuarial obligation for the plan and the actuarial value of assets, changes in the actuarial obligation caused by demographic experience or changes in actuarial assumptions will result in changes in the UAO.

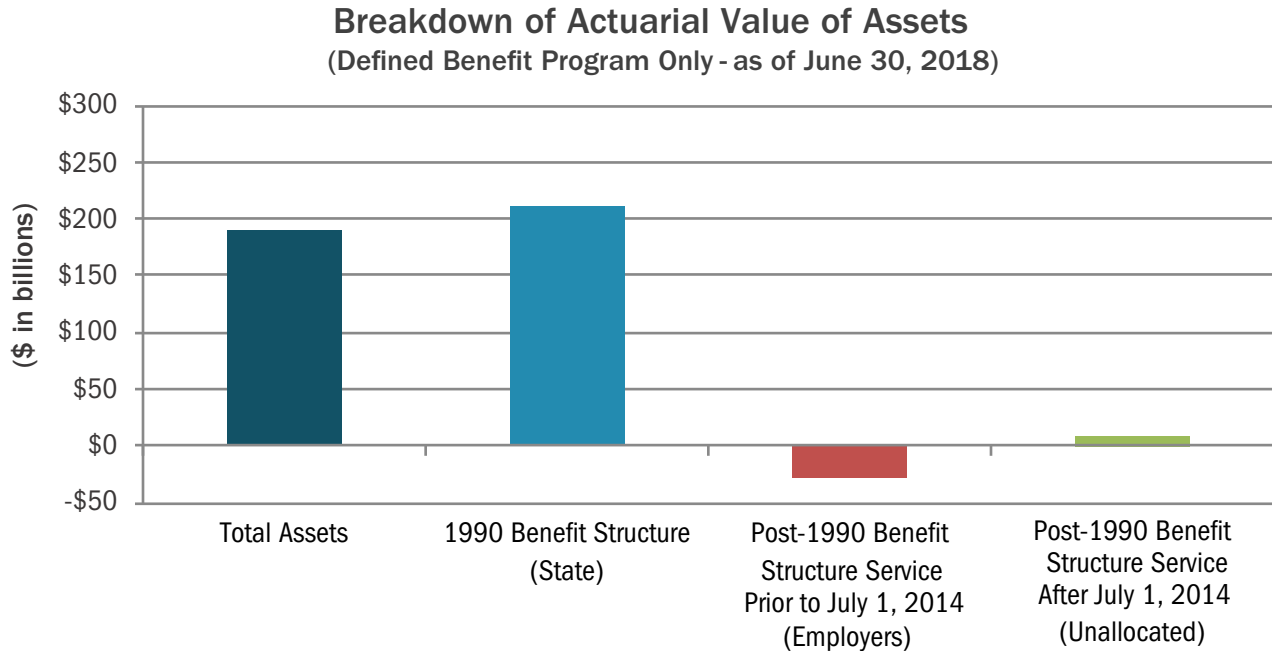
As shown above, the actuarial obligation for the 1990 benefit structure represents more than 80 percent of the total actuarial obligation for the Defined Benefit Program. This means that, even though employers are responsible for the largest share of the existing UAO, the state's share

of the UAO and the state contribution rate will be most impacted by future changes in actuarial assumptions or demographic experience.

Based on the current breakdown of the actuarial obligation, the state contribution rate would be expected to be about five times more sensitive to changes in actuarial assumptions and demographic experience than the employer contribution rate. This explains why the state's share of the UAO and the state contribution rate were the most impacted by the change in actuarial assumptions adopted by the board in February 2017.

UNDERSTANDING HOW THE CALSTRS FUNDING PLAN OPERATES

Next is a chart showing the breakdown of the assets for the Defined Benefit Program. The breakdown of the assets involves the calculation of a hypothetical asset value of the 1990 benefit structure as per rules set in the funding plan.



As can be seen in the above chart, the assets dedicated to the state to fund the 1990 benefit structure represent the largest share of the total assets needed to fund the Defined Benefit Program. In fact, the rules set in the funding plan result in the state having a share of the total assets that exceeds the actual assets on hand today. This is caused in part by the fact that the hypothetical asset value for the 1990 benefit structure is calculated based on the expectation that past benefit payments would have been lower under the 1990 benefit structure. The hypothetical asset value also ignores the member contribution of 2 percent of salary that was diverted from the Defined Benefit Program into the Defined Benefit Supplement Program for a period of 10 years.

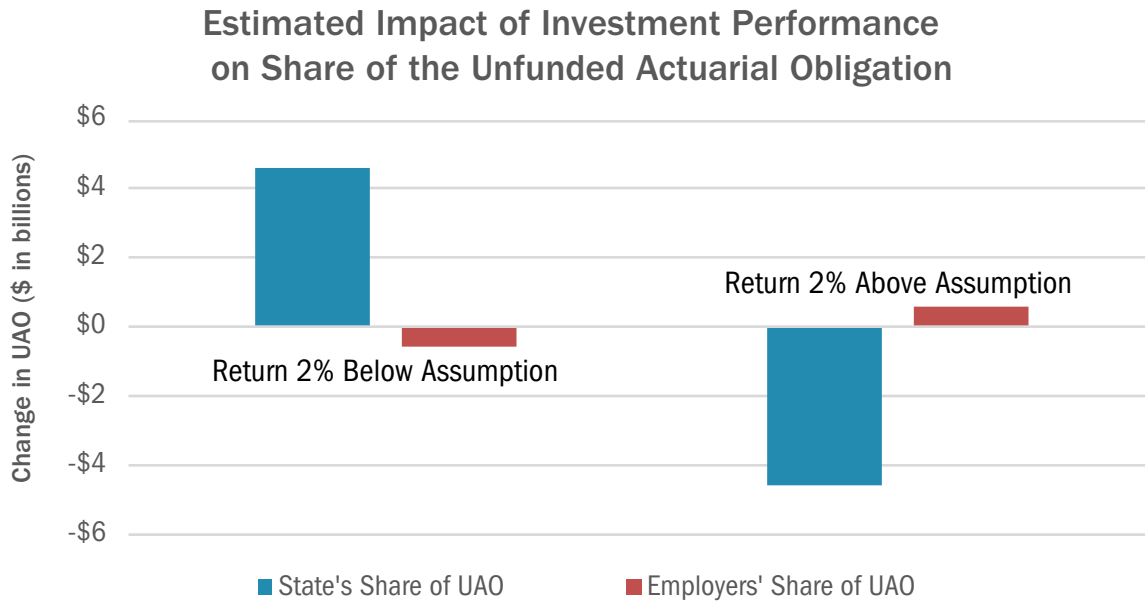
Since the hypothetical asset value for the 1990 benefit structure is greater than the current Defined Benefit Program asset, when returns are greater or lower than the assumed 7 percent, the actuarial gains or losses are greater on the

hypothetical asset value than on the actual assets of the Defined Benefit Program. As a result, the state's share of the UAO and the state's contribution rate are both extremely sensitive to investment volatility.

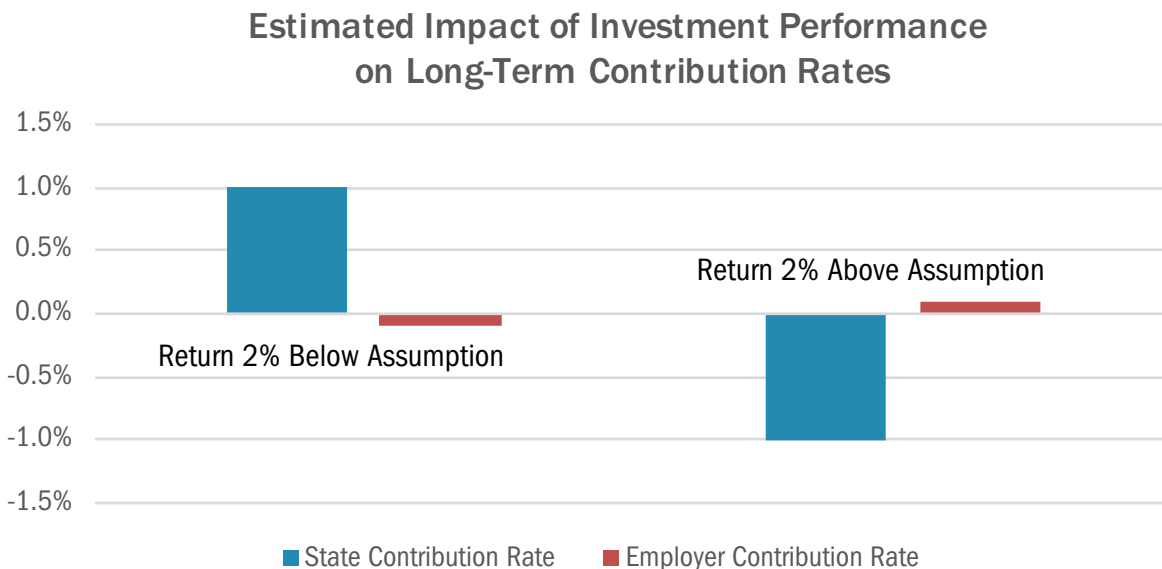
Since the state's share of the assets is greater than the actual total Defined Benefit Program assets, the employer's share is effectively a negative number. It is also much smaller relative to the state's share of the assets. As a result, the employer contribution rate is minimally impacted by investment volatility, and when it does change, it generally reacts in the opposite direction from that of the state. The employer contribution rate is expected to increase when the plan experiences investment returns greater than assumed and to decrease when the returns are less than assumed. This is a counterintuitive outcome resulting from the complex allocation structure of the funding plan.

UNDERSTANDING HOW THE CALSTRS FUNDING PLAN OPERATES

To help illustrate this counterintuitive interaction and the greater volatility expected for the state contribution rate, the following two charts show the impact on the share of the UAO and long-term contribution rates for both the state and the employers, assuming the investment return for the Defined Benefit Program was 2 percent above or below the current 7 percent investment return assumption.



As displayed above, an investment return of 5 percent in a fiscal year, 2 percent below the 7 percent return assumption, would result in an increase in the state's share of the UAO, while the employers' share would decrease. The increase in the state's share of the UAO would also be much larger than the decrease in the employers' share, leading to more contribution volatility in the state contribution rate as shown in the following chart.



UNDERSTANDING HOW THE CALSTRS FUNDING PLAN OPERATES

Consistent with the change in the share of the UAO, an investment return of 5 percent in a fiscal year, 2 percent below the 7 percent return assumption, would result in the need to increase the state contribution rate by about 1 percent of payroll long term, while the same investment return would result in the need to reduce the employer contribution rate by about 0.1 percent of payroll long term. An investment return of 9 percent would have the opposite effect for both the state and employer contribution rates.

As stated above, a portion of the UAO is not allocated to either employers or the state. It is referred to as the unallocated UAO. The funding plan assigned the responsibility to fund any shortfalls related to the post-1990 benefit structure to employers but limited that responsibility to service earned prior to July 1, 2014. No one group was assigned the responsibility for funding shortfall related to service earned after July 1, 2014, for the post-1990 benefit structure. The unallocated UAO increases or decreases depending on investment experience, and there is no mechanism within the funding plan to systematically eliminate this portion of the UAO.

When the funding plan was adopted, there was no unallocated UAO. However, the unallocated UAO is currently estimated to be about \$300 million as of June 30, 2018, based on the actuarial value of assets. Without a mechanism for funding the unallocated UAO, it is expected to grow to about \$500 million by 2046. The unallocated UAO could increase significantly if investment returns fall well below the assumed 7 percent. Similarly, it could be eliminated if investment returns exceed 7 percent over the long term. If the unallocated UAO were to be funded on an actuarial basis with a funding target of June 30, 2046, additional contributions of 0.04 percent of payroll would be required effective July 1, 2019.

CHANGES SINCE THE PASSAGE OF THE CALSTRS FUNDING PLAN

When the funding plan was adopted by the Legislature in 2014, it was based on CalSTRS annual actuarial valuation as of June 30, 2013, which was the most recent actuarial valuation available at the time. It is important to remember that 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 percent.

Since the passage of the funding plan, the board has taken steps to further 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 lower future investment earnings and longer life expectancies. The long-term investment return assumption was lowered from 7.5 percent to 7.0 percent 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.

As of June 30, 2018, financial markets have provided better than assumed returns, improving projected funding levels and future projected contribution rates, while putting the system in a stronger long-term financial position. The strong economy since the adoption of the funding plan has also contributed to faster growth in CalSTRS' membership and payroll, partially contributing to the projection of lower-than-anticipated employer rates.

These changes and events have had a mixed impact on funding levels and contribution rates. As shown in the table below, the funded status is slightly lower today than initially anticipated when the funding plan was adopted, while the UAO is slightly greater than anticipated.

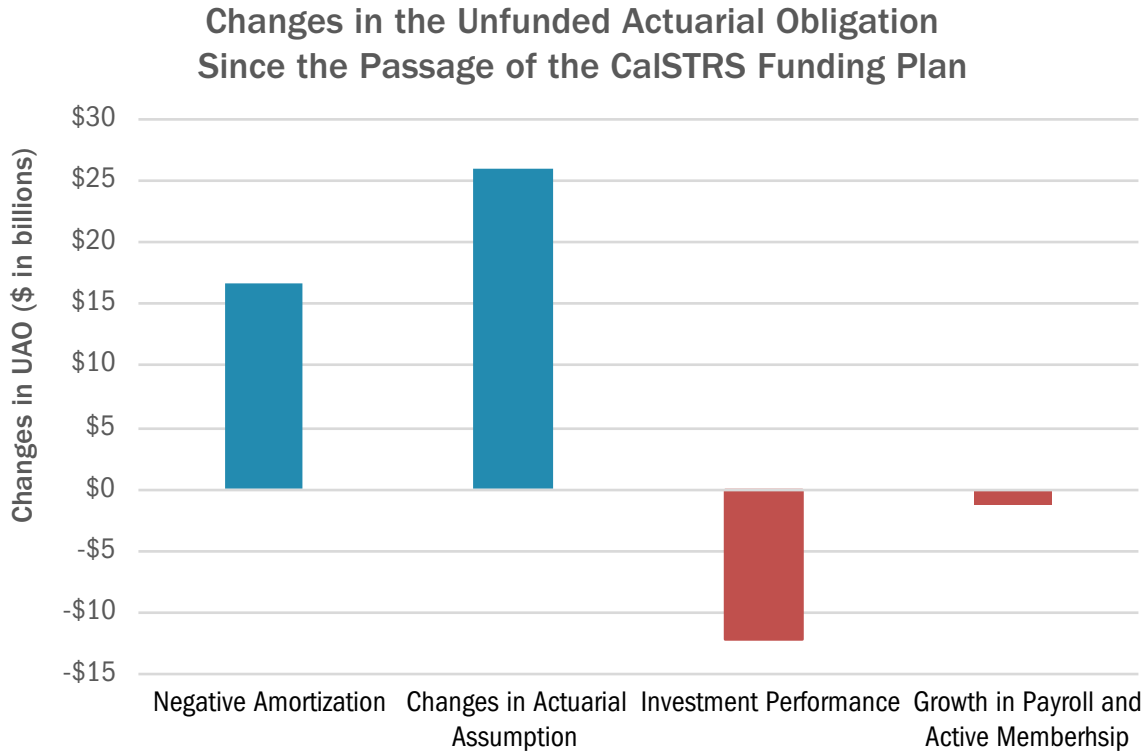
	Actual – Without Funding Plan (as of June 30, 2013)	Projected – With Funding Plan (as of June 30, 2018)	Actual – With Funding Plan (as of June 30, 2018)
Funded Status	66.5%	64.6%	64.0%
UAO	\$73.7 billion	\$98.5 billion	\$107.2 billion

While the Defined Benefit Program is currently on a path to full funding, the UAO is currently in a period of growth, which is expected to end around 2027. The growth in the UAO was fully anticipated when the funding plan was adopted. When a pension plan is less than 100 percent funded, contributions must exceed the normal cost to pay down the UAO and to make progress toward full funding. To ensure the UAO does not increase on a year-to-year basis, the payments toward the UAO must be greater than the interest that will be accrued on the UAO over the same time period. Failing to contribute an amount in excess of the interest will result in an increase of the UAO from year to year. This is referred to as negative amortization. For CalSTRS to avoid negative amortization, payments toward the UAO must be more than 7 percent of the UAO.

With the phased-in rate increases established through the funding plan, it was anticipated that the contributions would not be sufficient to prevent the UAO from increasing over the first few years. Additionally, funding levels were expected to decrease slightly, as compared to the levels in place at the time the funding plan was adopted. The UAO was expected to increase from \$73.7 billion on June 30, 2013, to \$98.5 billion on June 30, 2018. Accordingly, the plan's funded status was expected to decrease slightly from 66.5 percent to 64.6 percent. Due to the board's adoption of new demographic and investment return assumptions since the passage of the funding plan, the UAO increased slightly faster than anticipated. The UAO was \$107.2 billion as of June 30, 2018.

CHANGES SINCE THE PASSAGE OF THE CALSTRS FUNDING PLAN

Below is a chart illustrating the major factors that have led to the changes in the UAO, and their magnitude, between 2013 and 2018.



Contribution rates have also been affected by the same changes and events that took place in the last few years. Today, the state contribution rate is higher than projected when the funding plan was adopted. The employer rate, however, is now projected to be lower over the long term than initially anticipated in the funding plan.

As discussed earlier, the state's share of the UAO is most impacted by any changes in actuarial assumptions, demographic experience and, most importantly, investment experience. The new actuarial assumptions adopted by the board in 2017 combined with the impact of negative amortization have caused the state's share of the UAO to increase from about \$20 billion in 2013 to about \$33 billion as of June 30, 2018. This has resulted in the need for a higher long-term state contribution rate than originally anticipated in the funding plan.

The employers' share of the UAO has also increased since the passage of the funding plan from \$54 billion to \$73.5 billion, with most of the increase anticipated when the funding plan was adopted. However, the contribution rate necessary to eliminate it by 2046 is now expected to be lower than originally anticipated by the funding plan. The expected decrease in contribution rates for the employers can be attributed to the strong economy, which resulted in a faster-than-anticipated growth in CalSTRS' active membership and total payroll in the last few years. Having a larger payroll base is expected to allow the board to be able to lower the employer contribution rate and still collect the amount of money needed to eliminate the employers' share of the UAO by 2046.

The next section provides more details on projected funding levels and the contribution rates needed to eliminate both the state's share and the employers' share of the UAO.

CURRENT PROJECTED FUNDING LEVELS AND CONTRIBUTION RATES

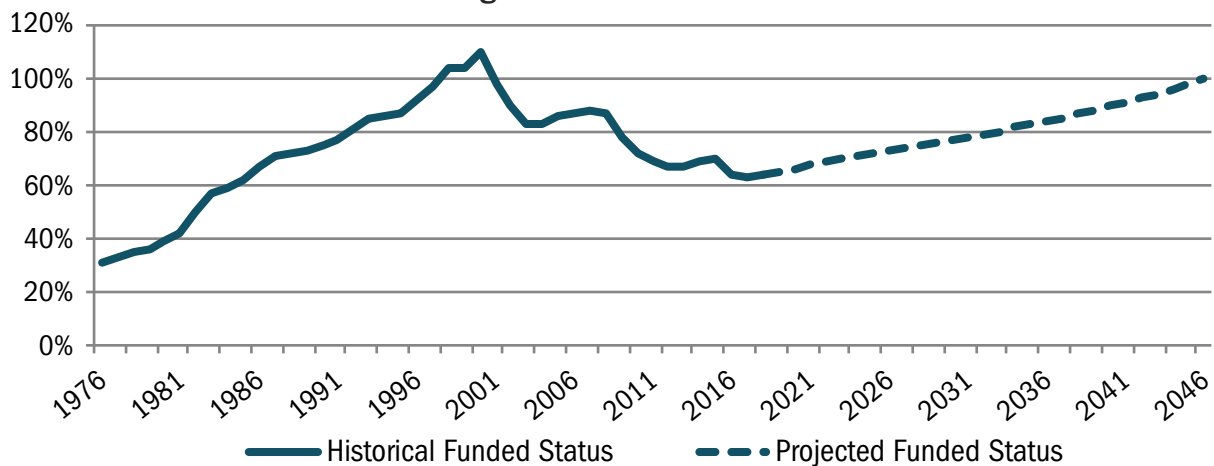
A key component of CalSTRS' mission is to ensure a financially sound retirement system for California's educators. Progress toward this goal was made possible in 2014 with the passage of the funding plan, which provided limited authority to the board to adjust the employer and state rates to ensure funding of the plan remains on schedule.

Even if the current UAO is slightly greater than originally anticipated when the funding plan was adopted, the limited rate-setting authority currently allows both the state's share and the employers' share of the UAO to be eliminated by 2046. However, as discussed earlier in this report, the unallocated UAO is expected to remain in 2046. By 2046, the Defined Benefit Program is expected to be 99.9 percent funded with a remaining unallocated UAO of about \$500 million. If the unallocated UAO were to be funded on an actuarial basis with a funding target of June 30, 2046, additional contributions of 0.04 percent of payroll would be required effective July 1, 2019.

Below is a chart showing both the historical and projected funded status through 2046 for the Defined Benefit Program. The funded status reported is based on the actuarial value of assets.

Historical and Projected Funded Status

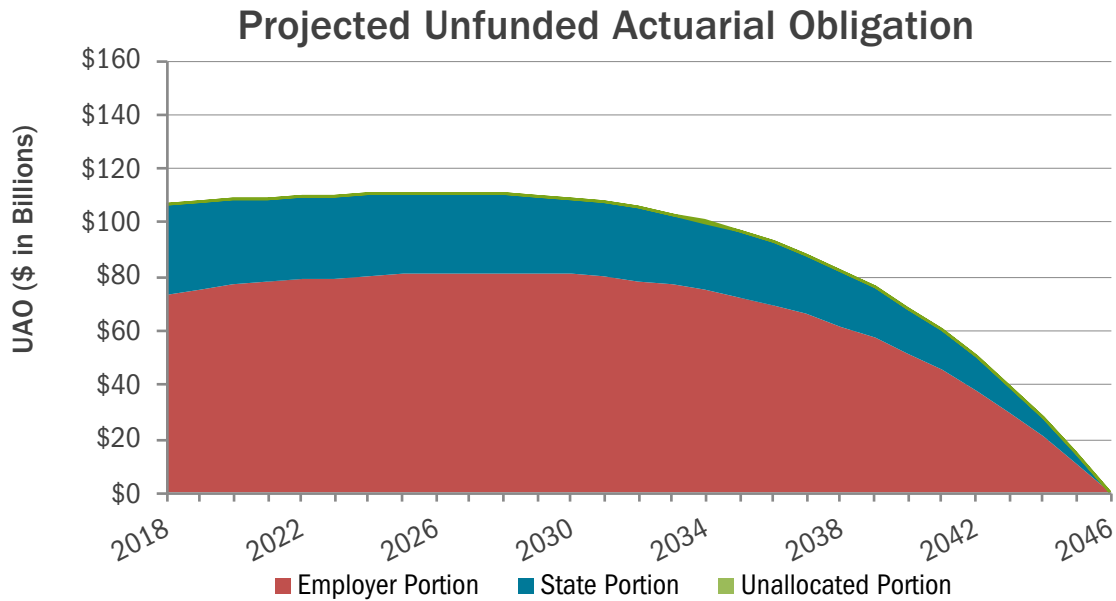
CalSTRS DB Program - Actuarial Value of Assets Basis



The chart on the next page shows how the UAO is expected to be reduced through 2046. As noted earlier in this report, contributions are not expected to be enough to prevent the UAO from increasing further until fiscal year 2026–27. Based on current projections, the UAO is expected to increase annually until reaching approximately \$111 billion in 2027, at which point it will stabilize and slowly decrease to approximately \$500 million by 2046.

Funding progress may appear to be slow, but it is important to remember that the existing UAO was built over decades of insufficient contributions into the system. Therefore, it will take many years to see substantial progress in the overall funding level of the system. For example, the current UAO is not expected to drop below the amount of the UAO when the funding plan was adopted until 2040, when it is expected to be just below \$70 billion. However, in 2040, the funded status is expected to be close to 90 percent, which is a much stronger funding situation than when the funding plan was adopted. It is also important to remember that the funding level trajectory is a much more important signal of overall plan sustainability than the raw funding level percentage.

CURRENT PROJECTED FUNDING LEVELS AND CONTRIBUTION RATES



To achieve the reduction in the UAO illustrated above, the board will need to exercise its authority to adjust contribution rates in the future.

Since the enactment of the funding plan, the authority to increase the state’s contribution rate has been exercised by the board. In May 2019, the board increased the state’s supplemental contribution rate by the maximum allowed, 0.5 percent of payroll, for the third year in a row. It is currently expected that the board will need to increase the state contribution rate for three more years to ensure the state’s share of the UAO is eliminated by 2046. It is anticipated that the state will need to contribute around 9 percent of payroll over the long term to the Defined Benefit Program to eliminate its share of the UAO by 2046. This is in addition to the 2.5 percent of payroll paid by the state toward the Supplemental Benefit Maintenance Account, the account that provides inflation protection for retired members and their beneficiaries.

The employer contribution rate will continue to increase based on the schedule laid out in the funding plan. Starting in fiscal year 2021–22, the board may adjust, if necessary,

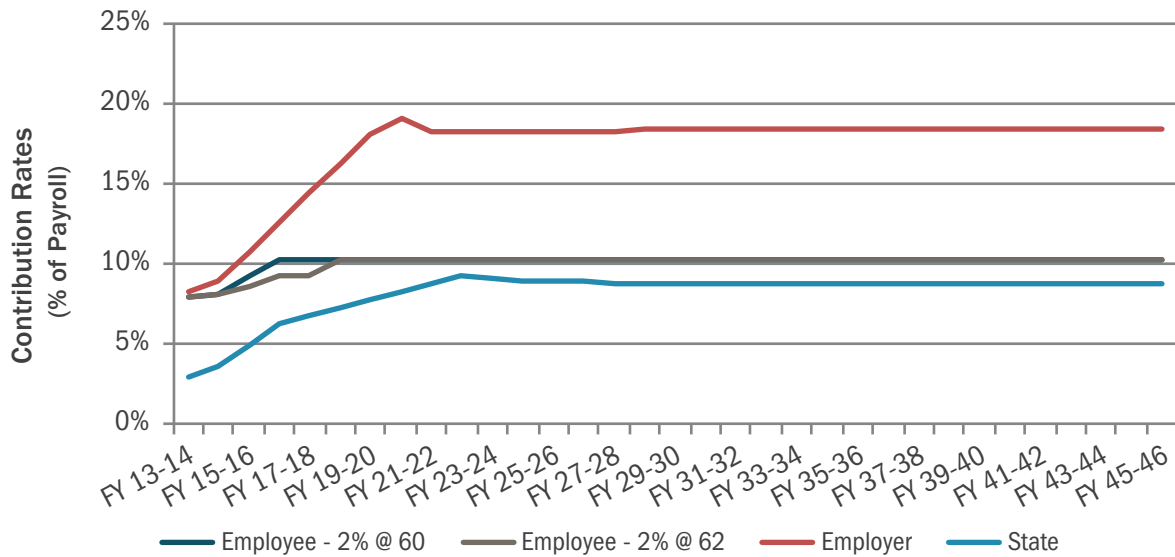
the employer contribution rate to ensure that employers eliminate their share of the UAO by 2046. Current estimates indicate that the board would reduce the employer contribution rate to approximately 18.3 percent of payroll effective July 1, 2021.

The contribution rate for CalSTRS 2% at 60 members is set in statute at 10.25 percent of salary. The contribution rate for CalSTRS 2% at 62 members is tied to the normal cost of benefits as required by PEPPRA. Effective July 1, 2018, CalSTRS 2% at 62 members were required to contribute an additional 1 percent of creditable compensation to CalSTRS as a result of an increase in the plan’s normal cost, which was driven by the changes in actuarial assumptions adopted by the board in 2017. The contribution rate for CalSTRS 2% at 62 members is currently set at 10.205 percent of salary. While the contribution rate for CalSTRS 2% at 62 members is based, in part, on the normal cost of benefits and may be subject to change based on new assumptions, CalSTRS does not anticipate this rate changing dramatically in the future. As mentioned earlier in this report, the contribution rate for CalSTRS 2% at 62 members will be impacted only if the plan’s normal cost changes by more than 1 percent.

CURRENT PROJECTED FUNDING LEVELS AND CONTRIBUTION RATES

Below is a chart showing historical and projected contribution rates for the state, employers and members necessary for CalSTRS to achieve full funding. The projected rates are estimates that could be impacted by actual investment performance, demographic changes and actuarial assumption changes.

Historical and Projected Contribution Rates



Note that these projected rates do not reflect the impact the 2019–20 state budget, which includes supplemental payments to CalSTRS to reduce the UAO of the system and reduce contribution rates for employers and the state.

RISKS FACING THE CALSTRS FUNDING PLAN

Defined benefit plans are a very efficient way to provide retirement security for educators. This efficiency is achieved by pooling investment, inflation and longevity risks, which has the effect of spreading the cost of adverse experience associated with these risks over a large group of people and longer periods of time than for defined contribution plans. While these risks are minimized under a defined benefit plan, they cannot be fully eliminated.

To address these risks, it is important for a retirement system to have a funding structure that targets full funding and provides enough flexibility to respond to fluctuations caused by demographic and economic experience.

With the adoption of the funding plan, CalSTRS has a funding structure in place that targets full funding and provides flexibility to respond to year-over-year changes in funding levels. As implemented, the funding plan is working and is expected to eliminate all but a small portion of the UAO by 2046. The rate-setting authority granted to the board has considerably reduced the risk of a low funded status or even running out of money.

However, risks remain that could impact CalSTRS' ability to achieve full funding by 2046. As illustrated later in this section, there is a possibility that the funding plan may not provide the board sufficient ability to adjust contribution rates in response to demographic and economic experience. If such a situation was to develop, additional funding would need to be provided to CalSTRS or another funding solution would need to be implemented.

The three main risks facing the Defined Benefit Program are longevity risk, risk of declines in membership and investment risk.

Longevity risk is the risk that CalSTRS members will live longer than currently assumed. Compared to investment risk, in which a shock in a single year can have a significant and lasting impact, longevity risk is a slowly developing demographic phenomenon that could potentially take decades before it is recognized. Longevity improvements have historically occurred with incremental improvements in public health and advancements in medical technologies, and these changes take time to impact whole populations.

Despite the slow nature of longevity risk, it is important that it is not ignored. In February 2017, the board took

an important step by adopting actuarial assumptions that recognize that educators' life expectancies have been increasing over time and will most likely continue to do so. CalSTRS implemented an approach to set actuarial assumptions for mortality called "generational mortality," which anticipates future improvements in life expectancy. The board adopted the use of a mortality improvement factor of 1.1 percent in each year for most ages. With generational mortality, CalSTRS is more accurately anticipating future improvements in life expectancy in the funding of the system. This assumption has strengthened the ability of CalSTRS to reach full funding by 2046 by recognizing potential improvements in life expectancy before they materialize.

The size of CalSTRS' active membership and overall payroll is directly related to contribution levels. When the overall payroll for CalSTRS' active members declines, an increase in contribution rates is necessary to ensure full funding even if the UAO has remained the same. The overall amount of contributions required to eliminate the UAO is still the same in dollar terms. However, since contributions are collected as a percentage of payroll, the contribution rates must increase to collect the same dollar amount. There is a risk that a decline in active membership and payroll, combined with limited rate adjustments, could prevent contribution rates from being set at the levels necessary to ensure full funding.

A decline in CalSTRS' active membership could occur for a number of reasons. Historically, recessions have often resulted in a reduction in the number of teachers in California as employers have been forced to make difficult decisions and, in many cases, reduce the number of teaching positions and increase class sizes. This risk could be exacerbated further if it was combined with a period of lower investment returns. A recession resulting in both a decline in active membership and a period of lower investment returns would put significant strain on the state, employers and CalSTRS' ability to achieve full funding.

Alternatively, the state might experience a decline in the student population, reducing the necessity for as many teachers. Based on the most recent student projection prepared by the California Department of Finance, the overall student population of California is expected to slowly

RISKS FACING THE CALSTRS FUNDING PLAN

decline by a minimal amount for the next 10 years. At this time, this projected decline is not expected to have a material impact on long-term payroll projections.

In addition, a continued growth in the number of charter schools in California could also impact future membership levels since charter schools can choose whether or not they will participate in the Defined Benefit Program at the time of their creation. Although charter schools still represent a small portion of all schools in California, the recent trend of charter schools not electing to participate in CalSTRS could exacerbate this risk if it begins to materially impact the overall number of active members who participate in CalSTRS.

The most significant risk for the funding plan is investment risk—specifically, not meeting the assumed investment return. While the employer contribution rate is minimally impacted by investment returns, not meeting the assumed investment return is the biggest risk to the state contribution rate, followed by the risk of a decline in membership. Since the state contribution rate is most impacted by investment performance, returns significantly below the assumed 7 percent could result in the need for the board to increase the state’s contribution rate by the maximum 0.5 percent of payroll every year through 2046 and still not achieve full funding.

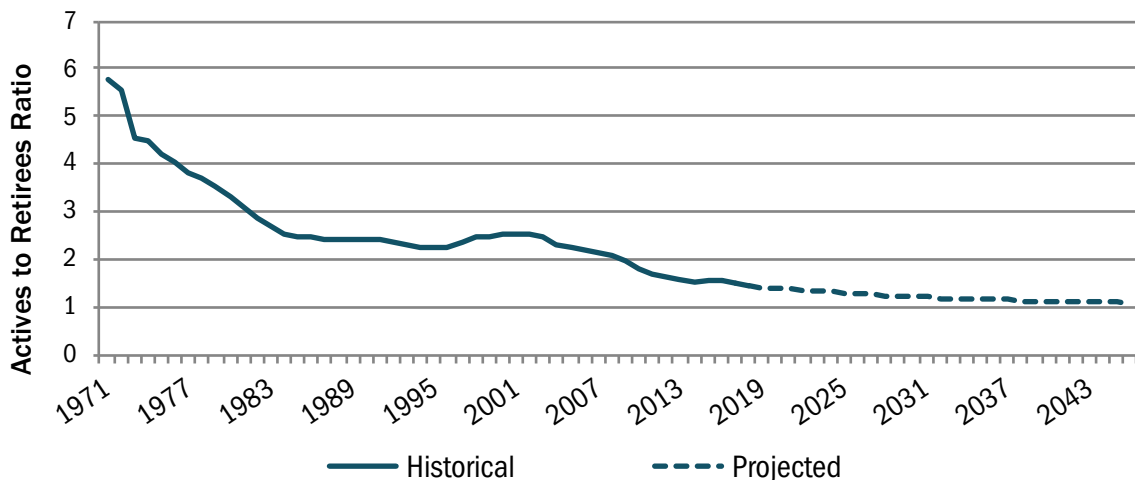
Such a situation could develop in various ways. CalSTRS could experience a sustained period of low returns or

CalSTRS could also experience another investment return “shock” like the one experienced during the 2007–2009 financial market crash. As a reminder, in 2007–08 and 2008–09, the CalSTRS investment portfolio sustained back-to-back years of negative returns of negative 4 percent and negative 25 percent. Recognizing the importance of mitigating against these types of equity market downturns, the board created and invested in a Risk Mitigating Strategies asset class starting in 2015.

Since the implementation of the funding plan, CalSTRS has regularly monitored the funding plan and these risks by providing annual updates to the board through the annual [Review of Funding Levels and Risks](#) report. The most recent report was presented in November 2018.

In addition to the risks highlighted above, another factor that could impact CalSTRS’ ability to reach full funding by 2046 is the maturity level of CalSTRS as a system, which can be measured by the ratio of active members to retirees. In general, as retirement systems become more mature, they are subject to increased volatility in the contributions needed to fully fund the benefits. The retirement of baby boomers has caused the active-to-retiree ratio to decrease over the last decade, which has increased the contribution volatility risk for CalSTRS. The volatility risk will continue to increase as the ratio continues to drop. The following chart shows the historical and projected active members-to-retirees ratio for CalSTRS.

CalSTRS Active Members-to-Retirees Ratio

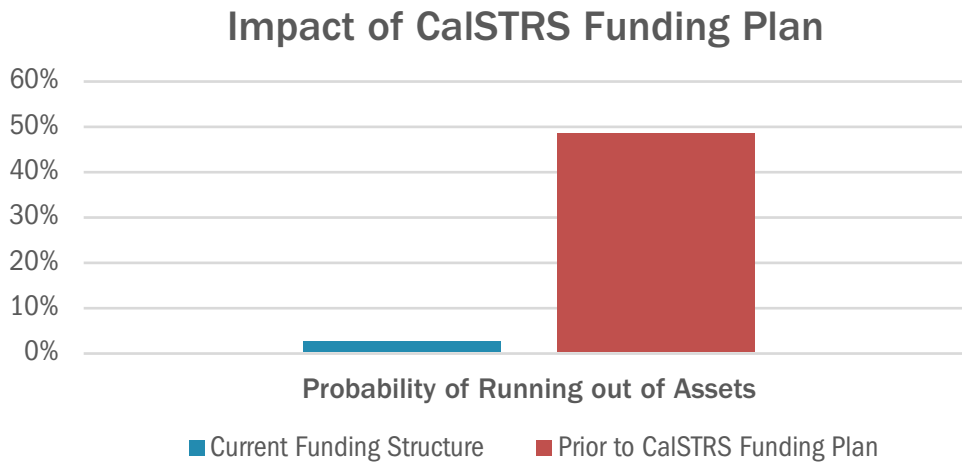


RISKS FACING THE CALSTRS FUNDING PLAN

As CalSTRS continues to mature as a retirement system, investment declines will be harder to absorb the later they occur, especially near the end of the funding plan in 2046, as there could be a very short amount of time between an investment loss and 2046.

One of the tools used to monitor these risks is CalSTRS' asset liability management framework, which involves the use of a stochastic model to assess the impact of long-term investment performance on funding and contribution levels. Five thousand sets of Monte Carlo simulations are

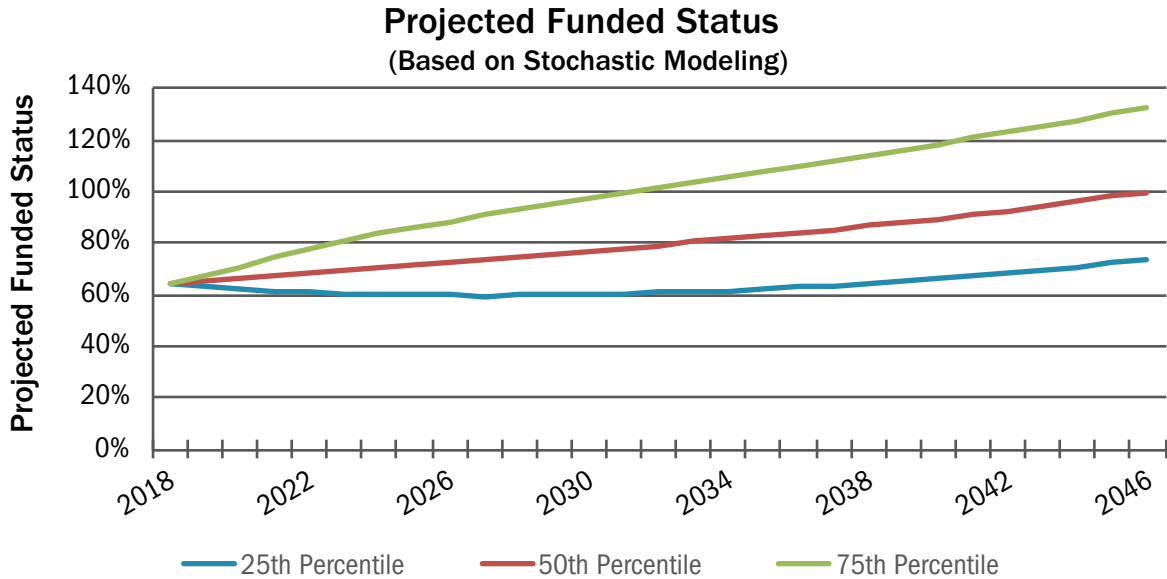
performed annually based on the asset allocation and actuarial assumptions adopted by the board. For each simulation, the contribution rates, assets and liabilities for the Defined Benefit Program are projected for the next 50 years. This analysis has shown the funding plan has increased the likelihood full funding will be achieved and greatly reduced the probability of reaching low funding levels or even running out of money. The following chart shows the probability of CalSTRS running out of assets over the next 30 years.



As can be seen above, the funding plan has greatly strengthened the financial soundness of the Defined Benefit Program. Prior to the adoption of the funding plan, running out of money was a very real possibility. Today, that probability is very low. Of the 5,000 simulations that were performed, the system ran out of assets in only 2 percent of these simulations. Prior to the funding plan, the probability of running out of assets was about 50 percent. It is important to realize that the risk of running out of money may never be fully eliminated because of the maturity levels of the system, investment volatility and the board's limited rate-setting authority. Similarly, achieving full funding by 2046 cannot be guaranteed. To illustrate this, a general idea of the range of possible future outcomes can be obtained by looking at percentiles of projected funding levels.

The chart on the next page shows the 25th, 50th and 75th percentile of the projected funded status. As can be seen, the 50th percentile for the funded status in 2046 is about 100 percent. Looking at it another way, it means the probability of reaching full funding in 2046 is about 50 percent. This has a lot to do with investment volatility. Even if the Defined Benefit Program were to be 100 percent funded in 2045, an investment return below the current assumed 7 percent in the last year before the end of the funding plan would likely prevent the Defined Benefit Program from reaching exactly full funding by 2046.

RISKS FACING THE CALSTRS FUNDING PLAN



Looking at the 25th percentile, one can see how the investment volatility inherent in the asset allocation of the Defined Benefit Program could significantly impact funding levels. There is a 25 percent chance that funding levels will remain near current levels for most of the life of the funding plan and end up close to 70 percent by 2046. Similarly, looking at the 75th percentile, one can see there is also a 25 percent chance that full funding will be achieved in about 10 to 15 years with funding levels improving every year thereafter. Note that the compounded investment return over the 30-year period was about 5.5 percent for the 25th percentile and about 8.5 percent for the 75th percentile.

Once again, the three main risks facing the funding plan are longevity risk, risk of declines in membership and investment risk. It is important for a retirement system to acknowledge and understand that while the impact of these risks can be mitigated, these risks cannot be fully eliminated. As a result, it is important to have a funding structure in place that targets full funding while providing enough flexibility to respond to fluctuations caused by demographic and economic experience. While at this time, the funding plan provides such structure, if a situation were to develop that would prevent the Defined Benefit Program from reaching full funding, another funding solution may be necessary. Acting quickly will be key to minimizing potential costs long term and strengthening funding levels earlier.

IMPORTANCE OF ACTING QUICKLY IF ANOTHER SOLUTION IS NEEDED

The funding plan was designed with the understanding that funding a pension plan involves risks. The funding plan provided the board with limited rate-setting authority as a mechanism to respond to unexpected demographic and economic events and to achieve full funding, while also providing rate stability for both employers and the state.

Although the funding plan is currently expected to provide enough rate-setting authority to achieve near-full funding by 2046, it is conceivable the system might reach a point where it is not sufficient. If such a situation develops, another solution may be necessary. Acting quickly will be key since providing additional contributions soon after a period of negative investment returns would improve the likelihood that CalSTRS is able to buy in at the bottom of the market and enjoy appreciation in asset values sooner. Acting quickly would then minimize long-term costs and strengthen funding levels sooner.

To demonstrate the importance of acting quickly, CalSTRS performed an analysis to determine where funding levels of the Defined Benefit Program would be today if contribution rates had been raised immediately following the 2008–09 financial crisis.

The analysis assumed that the employer contribution rate would have increased by 1 percent of payroll each year starting in 2009–10, and that the state contribution rate would have also increased by 0.5 percent of payroll each year starting in 2009–10. This is consistent with the existing rate-setting authority granted to the board. Member

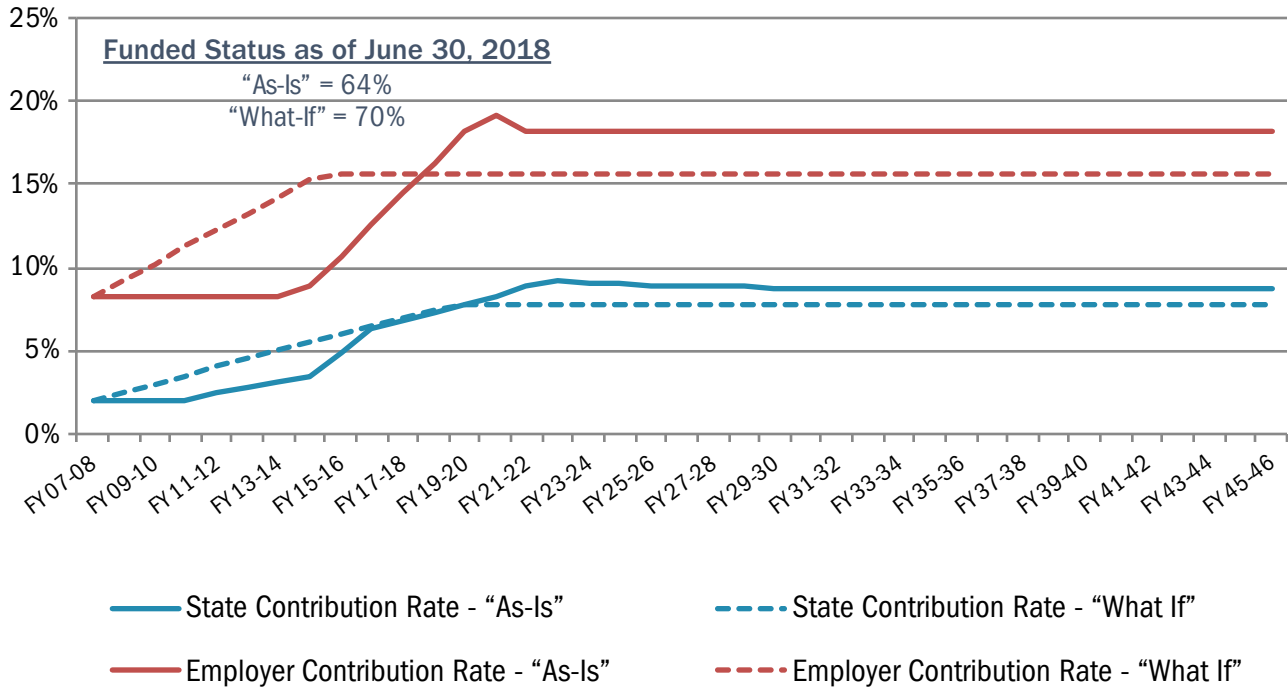
contribution rates were kept the same and increased solely in accordance with the funding plan.

The starting point for this analysis was the June 30, 2007, annual actuarial valuation. In that valuation, on a market value of assets basis, the Defined Benefit Program was almost fully funded with a funded status of 97.1 percent. Beginning with fiscal year 2007–08, the Defined Benefit Program had two consecutive years of negative investment returns. The return in 2007–08 was negative 4 percent, while in 2008–09, the heart of the financial crisis, the investment return was negative 25 percent. As a result, funding levels dropped by almost 40 percent over two years, and the fund was projected to run out of assets within 30 years. If contribution rates had been adjusted by 1 percent per year for employers and 0.5 percent per year for the state immediately following these investment market downturns, the analysis shows that the system would be in a stronger financial position today, funded at about 70 percent instead of 64 percent.

Contribution rates for both the state and employers would also be at a level below those in place this fiscal year and would not be expected to increase any further. Today, both the state and employer contribution rates are expected to increase by at least another 2 percent of payroll over the rates in place this fiscal year. The chart on the next page compares current contribution rate projections to where they would be today had the contribution rates been adjusted immediately following the financial crisis.

IMPORTANCE OF ACTING QUICKLY IF ANOTHER SOLUTION IS NEEDED

Comparison of Projected Contribution Rates What If Rates Had Been Increased Starting in 2008–09



The chart above clearly illustrates the power of compound interest and the importance of prefunding retirement benefits. By increasing contributions immediately following a decrease in funding levels, funding levels recover more quickly, and although contribution levels are higher in the short term, long-term contribution levels are lower, generating savings over time.

It also illustrates why, if a situation were to develop, acting quickly would be key to minimizing long-term costs and strengthening funding levels sooner.

CONCLUSION

CalSTRS was founded in 1913 with 120 retired members and 15,000 active members. More than 100 years later, it is with steadfast focus and a sense of purpose that CalSTRS remains committed to its mission to secure the financial future of California's educators and providing retirement, disability and survivor benefits to them and their families. These educators are found in every community throughout the state, preparing the next generation to contribute and make a difference in our society.

To ensure CalSTRS can fulfill its mission, it is important to focus on long-term sustainability. CalSTRS demonstrates its commitment to securing its members' retirement futures and organizational sustainability in various ways. First and foremost, CalSTRS is committed to ensuring that member benefits are secure with an adequate funding structure in place.

To that end, CalSTRS has come a long way. Just five years ago, the fund was projected to run out of assets in about 30 years. Today, CalSTRS is financially stronger and better positioned to achieve full funding thanks to the adoption of the funding plan through AB 1469 in 2014.

As discussed in this report, the funding plan is working as intended. CalSTRS has a funding structure in place that is focused on full funding and provides enough flexibility to respond to fluctuations caused by demographic and economic experience. The funding plan is expected to eliminate all but a small portion of the UAO by 2046.

However, risks remain that could prevent the system from reaching full funding by 2046. While the risks related to longevity and decline in membership are real and important, the fact remains that the largest risk facing CalSTRS is the risk from investment volatility. This risk will continue to increase over time simply due to the natural maturing of the system. CalSTRS is committed to managing and monitoring these risks.

As trusted fiduciaries, CalSTRS continually monitors the financial health of the fund by assessing funding levels and

risks twice a year: once in the spring through the annual actuarial valuation process and again in the fall through the annual [Review of Funding Levels and Risks](#) report. Continuous monitoring of funding plan risks is key to being able to timely identify trends that could impact the long-term funding of the system.

Achieving long-term sustainability encompasses more than having an appropriate funding structure in place. It also means taking deliberate actions and making informed, accountable decisions that will ensure a fully sustainable organization.

Examples include implementing the CalSTRS Collaborative Model to bring more investments in-house to reduce associated fees and to model best practices in corporate governance, applying risk-mitigation policies, developing workforce succession plans, and deploying member education on retirement security. Across the spectrum of its activities, CalSTRS consistently advocates for the importance of long-term value creation. For more information on CalSTRS sustainability efforts, please refer to the [CalSTRS website](#).

In 2019, the board will take on the very important task of reviewing the fund's asset allocation to evaluate the most appropriate way to invest the system's assets to best fulfill its mission. Also in 2019, CalSTRS will begin working on an experience study to review the appropriateness of the actuarial assumptions used in the funding of the system. Board decisions related to the asset allocation and actuarial assumptions are expected to occur in the fall of 2019 and winter of 2020.

This is the first report on the progress of the funding plan. As required by statute, CalSTRS will provide the next report to the Legislature no later than July 1, 2024. Until then, CalSTRS will continue to regularly educate and update stakeholders and the Legislature on the progress of the funding plan.



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