Long-Term Care Actuarial Valuation

As of June 30, 2020

CalPERS

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Actuarial Certification

August 2021

To the best of our knowledge, this report is complete and accurate and contains sufficient information to fully and fairly disclose the funded condition of the CalPERS Long-Term Care Program. This valuation is based on the participant and financial data as of June 30, 2020. It is our opinion that the valuation has been performed in accordance with generally accepted actuarial principles and the standards of practice prescribed by the Actuarial Standards Board and that the assumptions and methods are internally consistent and reasonable for the Program related to actual and anticipated future experience.

The undersigned, with actuarial credentials, meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein.

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Highlights and Executive Summary

Highlights and Executive Summary

Introduction

This is the actuarial valuation report as of June 30, 2020 for the CalPERS Long-Term Care Program (the Program). The financial projections used in this valuation analysis were produced under the First Principles Model by using the June 30, 2020 in-force data and updated assumptions. UHAS as consulting actuary for CalPERS completed a parallel valuation, and UHAS' valuation results are consistent with CalPERS' valuation results.

This actuarial valuation uses best estimate assumptions that are appropriate as of the date of valuation and these assumptions do not include any margin for adverse deviation. Assumptions could change as more information becomes known, which would impact the funded status reported in this valuation. The model, scenarios, and all assumptions were reviewed and updated this year. This report summarizes the approach, assumptions, and results of the actuarial valuation of the CalPERS Long-Term Care (LTC) Program as of June 30, 2020. For information on the sensitivity of the valuation results to changes in the actuarial assumptions, please refer to the "Risk Analysis" section and Appendices A and B.

Purpose of the Report

The purpose of the June 30, 2020 actuarial valuation report of the CalPERS Long-Term Care Program is to:

- Determine whether assets as of June 30, 2020, expected future premium levels, and future investment returns are sufficient to support future benefits.
- Provide actuarial information as of June 30, 2020 to the CalPERS Board of Administration and other interested parties.
- Provide information as of June 30, 2020 to be used in CalPERS financial statements.

Use of this report for other purposes may be inappropriate. More detailed information can be provided upon request.

Funded Status and Margin for the Program

As of June 30, 2020, the Program's funded status is 101%, increased from 69% last year, and the margin is positive 1.34%, increased from the negative 85.46% last year. Due to the underfunded status determined in the 2019 valuation, stabilization efforts were approved subsequently by the CalPERS Board to bring the program back to fully funded status. The approved stabilization efforts consist of asset allocation changes resulting in an increased discount rate, and a premium increase plan with 52% rate increase to be implemented in 2021 and up to 25% to be implemented in 2022. These discount rate and premium rate changes are reflected in this valuation. This valuation also incorporates additional morbidity assumption updates based on the analysis results from the 2020 experience study. For more details on the program and assumption changes, please see the "Key Assumption Changes and Findings" section. The table below provides the funded status and margin as of June 30, 2020.

Component	($ in Millions)
1)Present Value of Future Benefits	$8,348
2)Present Value of Future Expenses	389
3)Present Value of Future Premiums (PVFP)	3,919
4)Valuation Liabilities [(1+2) - (3)]	**$4,818**
5)Valuation Assets	$4,871
6)Valuation Margin [(5) – (4)]	**$53**
7)Margin as a % of PVFP [(6) / (3)]	**1.34%**
8)Funded Status [(5)/(4)]	**101%**

Highlights and Executive Summary

The table below shows the funded status and the margin/(deficit) for the LTC Program for the last five years. The low-interest-rate environment and the corresponding investment return expectation have had a large negative impact on the margin. In addition, higher future morbidity projection and lower future lapse projection also contributed to the large decrease in the 2019 valuation margin. The stabilization plan to change the asset allocation and increase premium rates brings the margin back to positive in the 2020 valuation.

5-Year History of Funded Status and Margin

Valuation Date	Funded Status	Margin / (Deficit)
June 30, 2016	106%	9.59%
June 30, 2017	99%	**(1.45%)**
June 30, 2018	101%	1.20%
June 30, 2019	69%	**(85.46%)**
June 30, 2020	101%	1.34%

Key Assumption Changes and Findings

The key program and assumption changes reflected in this actuarial valuation are as follows:

- As part of the stabilization efforts, the board approved the new discount rate target to be 4.75% in November 2020 and the associated asset allocation changes in March 2021. Increasing the discount rate assumption from 4% to 4.75% improved the margin by 29%.
- Also, as part of the stabilization efforts, the board approved a two-phase premium increase plan. The first phase, scheduled to be implemented in 2021, consists of a 52% premium increase along with options to convert to less expensive policies. The second phase is scheduled to be implemented in 2022 and consists of an additional premium increase up to 25%, for a total increase up to 90%. The increased future premiums helped to improve the margin by 61%.
- Experience analysis for the 2020 valuation indicated a gradual increasing trend in the claim utilization rate over the years. The structure of the claim utilization assumption in this valuation was improved to capture this gradual increasing trend in the assumption. The updated assumption also reflected the cumulative increase trend from historical years. This change has a negative impact to the margin by 7%.
- Morbidity improvement is an assumption that projects claim incidence level to gradually decrease in future years due to advancement in healthcare technology and other factors. However, in recent years there has not been consistent industry evidence or direct data support suggesting this trend would continue. As a result, this assumption is reduced in this valuation to reflect a lower outlook. This update has a negative impact to the margin by 1%.

Below are findings from comparing projected vs actual cashflows in fiscal year 2019-20:

- The Program's actual claim payment in fiscal year 2019-20 was $337.3 million, which was 3%, or $9.7 million, higher than projected.
- The Program's actual premium collected in fiscal year 2019-20 was $278.5 million, which was 1.9%, or $5 million, higher than projected.
- The Program experienced an investment return of 4.7% during the 2019-20 fiscal year, which exceeded the previous discount rate assumption of 4.0%. The investment return was $34.6 million higher than expected.
- This valuation reflected the impacts from COVID-19 captured in the data as of June 30, 2020. As majority of the COVID-19 impacts were concentrated after June 2020, the impacts prior to June 30, 2020 were minimal.

A complete reconciliation of the Program's margin/(deficit) is provided on page 9.

Highlights and Executive Summary

Changes Since the Prior Valuation

Actuarial Model

CalPERS uses a First Principles Model for the Program's valuation projection since 2017. Improvements to the First Principles Model are made subsequently each year when necessary. The modeling improvements and revisions made for the 2020 valuation include:

- Modified the model to accommodate the new claim utilization assumption structure

More information about the First Principles Based Model can be found in Appendix C.

Actuarial Assumptions

The First Principles Model requires development of granular assumptions. It requires multiple morbidity assumption components including claim incidence rates, claim termination rates, and claim utilization rates. The claim termination rates for the First Principles Model are also further refined into assumptions for claims recovery and on-claim death. Similarly, mortality for the First Principles Model is separated into active life and disabled life components. First Principles Model lapse rates are only applied to active policies.

Each year, actual experience is measured against the assumptions made, which are then updated to reflect the actual experience. For the 2020 valuation, all assumptions were updated to include one more year of recent data. Please refer to the "Summary of Key Assumptions" Section on page 11 for more information on the changes that were made. Assumptions are documented in more detail in Appendix C.

Premiums and Policies

As of June 30, 2020, there are 116,832 in-force policies with an annualized premium amount of $307,798,671. CalPERS historically implemented corrective actions, including premium increases, in 2003, 2007, 2010, and 2015/2016 to stabilize the LTC Fund. All historical premium increases were already fully implemented and reflected in the data of this valuation.

In June 30, 2019 valuation, the program had an underfunded status due to decreased future investment return projection and increased future claim liability projection. To address this funding risk, the board subsequently approved stabilization efforts to improve the financial position of the program. The stabilization efforts included a 52% premium increase in 2021 for all policies and up to 25% premium increase additionally in 2022 for a cumulative increase up to 90%. At the time this valuation is completed, the first phase of premium increase is planned to be implemented at November 2021, and the second phase of premium increase is planned to be implemented at November 2022. This valuation reflects 52% premium increase in 2021 and 25% premium increase in 2022.

To reduce the impact of higher premium to policyholders, options to convert to less expensive policies will be offered to policy holders. At the time this valuation is completed, conversion options were only finalized for the 52% rate increase. The percentage of the population that would select the conversion option is difficult to estimate. This valuation does not assume any conversion in the projection.

Highlights and Executive Summary

Subsequent Events

Due to COVID-19, the program experienced higher mortality and lower claim incidence, most noticeably during July 2020 to March 2021. These effects currently are expected to be short-term, pending confirmation based on subsequent data and how long COVID-19 persists in the population. These impacts were not reflected in this valuation but are expected to improve the margin for the 2021 valuation. The improvement on the margin is expected to be relatively small as these effects are assumed to be one-time and temporary only. Other subsequent short-term or long-term impact from COVID is unclear at this moment and is not included in this valuation.

This actuarial valuation report is based on financial information as of June 30, 2020. Investment return of the fund during fiscal year 2020-21 was 13%. The higher-than-expected investment return will have a positive impact on the margin and be reflected in the 2021 valuation.

A lawsuit was filed in 2013 contesting the increase in premiums from the 2012 stabilization plan. The impact of this lawsuit is uncertain and has not been reflected in this valuation.

Valuation Results

Valuation Results

Comparison of Current and Prior Year

The results summarized throughout this report refer to deficits/margins and to funded status. A deficit is an estimate of the level of a one-time rate increase in premiums needed to bring the Program back to a zero margin. If the current fund balance and present value of earnings are adequate, a positive number or a margin would result. A second method of expressing the current financial status of the Program is the funded status. In general, the funded status is calculated by dividing the Program's assets by the accrued liability, or reserves. For the LTC Program, the accrued liability is equal to the present value of future benefits and expenses less the present value of participant premiums. This definition is consistent with a statutory gross premium valuation reserve for LTC insurance. In this context, a breakeven position is a funded ratio of 100%.

These two methods of expressing the financial status of the LTC Program are consistent in that both will always produce a margin when the funded ratio is greater than 100% and both will always produce a deficit when the funded ratio is lower than 100%. They are not consistent, however, in that a 10% margin does not produce a 110% funded ratio.

The table below summarizes and compares the CalPERS Long-Term Care Program's June 30, 2020 actuarial valuation results to its June 30, 2019 results, including the present values of future cash flows for the current in-force participants. These present values are based on 60 years of projected cash flow.

Component	6/30/2019 ($ in Millions)	6/30/2020 ($ in Millions)
1) Present Value of Future Benefits	$8,952	$8,348
2) Present Value of Future Expenses	$396	$389
3) Present Value of Future Premiums (PVFP)	$2,488	$3,919
4) Valuation Liabilities [(1+2) - (3)]	**$6,860**	**$4,818**
5) Valuation Assets	$4,734	$4,871
6) Valuation Margin [(5) – (4)]	**($2,126)**	**$53**
7) Margin as a % of PVFP [(6) / (3)]	**(85.46%)**	**1.34%**
8) Funded Status [(5) / (4)]	**69%**	**101%**

This result shows that, with the discount rate change and the planned rate increases reflected in this valuation, the assets and expected future premiums are sufficient to support the program if the future experience conforms to our current actuarial assumptions.

Liability cashflows were calculated through the application of a projection of expected future cash flows based on the in-force policies as of June 30, 2020. This projection uses a set of underlying assumptions derived from the CalPERS Long-Term Care Program's assumed experience. Policies were projected on a seriatim basis using specific characteristics including issue age, issue date, policy form, benefit period, elimination period, underwriting status, and benefit options. We have not generated liabilities and reserves consistent with statutory reporting requirements as this self-funded plan is not subject to such requirements.

Detailed yearly cashflows and projected cash balances are provided in Appendix A.

Valuation Results

Reconciliation to Prior Valuation Results

With the discount rate change and planned premium increase, the Program's margin increased from negative 85.46% to positive 1.34% between the June 30, 2019 and June 30, 2020 reports. Factors that impacted the margin either negatively or positively during the fiscal year are the following:

The discount rate assumption update, premium increase, morbidity assumption updates, demographics and higher-than-expected investment return had positive impacts on the margin:

- Due to the low interest rate environment, in the 2019 valuation, the expected return of the program's previous target asset allocation was reduced to 4%. In March 2021, the board approved a new strategic asset allocation for the program, which increased the portfolio's expected return. The new target asset allocation supports the discount rate change from 4% to 4.75%.
- The board approved the stabilization efforts which included a 52% premium increase in 2021 for all policies, along with the options to convert to less expensive policies, and up to 25% additional premium increase in 2022 for a cumulative increase up to 90%. This valuation reflects the approved premium increase plan. No conversion is assumed in the projection.
- A few other morbidity assumption updates had positive impacts to the margin. First, an adjustment factor was added to claim incidence assumption structure to distinguish claim incidence between partnership and non-partnership policies. Second, the data extract used for the experience study was improved to better reflect the reimbursement level of the claims through site of care categories. Last, the estimated Incurred-But-Not-Reported (IBNR) claim amount decreased at June 30, 2020 compared to the estimated amount at the previous valuation date.
- Updating the projection using the June 30, 2020 demographic data had a positive impact on the margin. This impact is partially due to the actual open claim count at the valuation date being less than projected.
- The Program experienced an investment return of 4.7% during the 2019-20 fiscal year, which was higher than the previous discount rate assumption 4.0%. The investment return was $35 million higher than expected, which had a small positive impact to the margin.

Claim utilization assumption update, morbidity improvement assumption update, refreshing mortality and lapse assumptions, expense assumption update, and higher-than-expected claim cashflow had negative impacts on the margin:

- Experience analysis for 2020 valuation indicates a gradual increasing trend in the claim utilization rate over the years. The structure of the claim utilization assumption in this valuation was improved to capture this calendar-year increase trend in the assumption. The updated assumption also reflected the cumulative increase trend from historical years.
- Morbidity improvement is an assumption that projects claim incidence level to gradually decrease in future years due to improvement in healthcare technology and standard of living. This assumption historically has been common in the industry. In recent years, there has not been consistent industry-wide evidence suggesting the assumed morbidity improvement trend would continue in future years. Analysis on CalPERS data did not show a clear morbidity improvement trend. As a result, the morbidity improvement factors were reduced to reflect a lower outlook in this assumption.
- The mortality and lapse assumptions were refreshed using one more year of data. The updated values in these assumptions had small negative impact to the margin.
- The expense assumption was updated to not decrease based on the projected lives until 2028. This update had a small negative impact to the margin.
- The Program's actual claim payment in fiscal year 2019-20 was $337.3 million. That is 3%, or $9.7 million, higher than projected. The higher-than-projected claim had a small negative impact to the margin.

Valuation Results

This table below provides a detailed reconciliation of the factors that contributed to the change of margin.

	Change in Margin	Resulting Margin	Funded Status
Margin as of 6/30/19 valuation		**(85.46%)**	69%
Discount Rate Change	29.07%	**(56.39%)**	78%
Rate Increase	61.18%	4.79%	104%
Update to 2020 Demographics	2.07%	6.86%	106%
FY 2019-20 Non-Investment Gain/Loss	**(0.14%)**	6.72%	106%
FY 2019-20 Investment Gain/Loss	0.91%	7.63%	107%
Expense Assumption Update	**(0.46%)**	7.17%	106%
Mortality and Lapse Assumption Update	**(0.91%)**	6.26%	105%
Claim Utilization Assumption Update	**(7.17%)**	**(0.91%)**	99%
Morbidity Improvement Assumption Update	**(1.05%)**	**(1.96%)**	98%
Other Morbidity Assumption Update	3.30%	1.34%	101%
Margin as of 6/30/20 valuation		1.34%	101%

Valuation Results

Summary of Key Assumptions

To calculate the future claim payments, premiums, and investment income, assumptions are made about future events that affect the amount and timing of benefits to be paid and assets to be accumulated. Actual experience is measured against the assumptions, and the assumptions are then updated to reflect actual experience. This section provides general information on key assumptions used in the 2020 valuation.

Discount Rate

The discount rate assumption is a major assumption of the valuation, as it is used to project asset growth and to determine the present values of future premiums, expenses, and benefits. The previous discount rate assumption used in 2019 valuation reflected the investment mix initially approved in April 2012 by the Investment Committee with a minor change adopted by the Investment Committee in June 2018. The discount rate assumption used in 2019 valuation was 4%, which reflected the expected return of the previous asset allocation under the recent low interest rate environment. The CalPERS Long-Term Care Program experienced an investment gain due to a 4.7% rate of return during the 2019-20 fiscal year.

This June 30, 2020 valuation uses a discount rate assumption of 4.75% which was adopted by the board in November 2020. It reflects the future return assumptions as of September 30, 2020 and the target asset allocation approved by the board in the March 2021 Investment Committee.

Morbidity

Morbidity represents a substantial financial risk for Long-Term Care insurance products. The morbidity assumption reflects the expected claim payments for participants. The key components driving claim payments are:

- Claim incidence, which is the probability of going on claim
- Claim termination, which is the probability that an existing claim will close in a given month
- Claim utilization, which is the amount of claim payment reimbursed relative to the maximum daily benefit.

Assumptions were developed for claim incidence and termination based on data as of June 30, 2020, with a study cutoff date of December 31, 2018, whereas the utilization study had a cutoff date of June 30, 2020. Expected claim incidence rates and claim termination rates were credibility weighted using CalPERS actual claim experience and the industry data. The industry data uses the Society of Actuaries' Long Term Care Intercompany Experience Study - Aggregated Database 2000-2011 Report. Additional credibility is assigned to the Program's experience as the experience continues to emerge. Actual claim experience is summarized in the table "Comparison of Actual to Expected Cash Flows for 2019-20" in the "Assets" section on page 17.

Morbidity improvement assumption reflects the expectation for claim incidence to gradually improve in the population over time due to health care technology and other factors. Since such factors tend to impact morbidity and mortality at the same time, it is a common method in the industry to apply the morbidity improvement assumption in conjunction with mortality improvement assumption. In this valuation, the morbidity improvement assumption uses the mortality improvement assumption as a base but the annual improvement amount is capped at 0.75%.

Lapse

The lapse assumption reflects the expected portion of participants who terminate their policies each year by not paying the renewal premiums. Lapse assumptions can differ based on a variety of factors, including the participant's age at enrollment and the number of years they have had their policy. In general, it is assumed that the longer a participant keeps their policy, the less likely they are to lapse. Lapse rate assumptions greatly affect long-term care insurance premiums because when individuals lapse, future liabilities are immediately reduced while current assets are not affected. The First Principles Model uses an active life lapse assumption that only applies to active policyholders. See the "Rate Increase and Policy Conversion" section below for information regarding shock lapses associated with the rate increase.

Summary of Key Assumptions (continued)

Mortality

The mortality assumption summarizes the expected death rate of the population. Like the lapse assumption, mortality reduces future liabilities without affecting assets.

The First Principles Model tracks policyholder status and uses separate mortality assumptions for active policies and disabled policies. This method more accurately models the plan's overall mortality, particularly the extent to which the mix of active and disabled individuals may be different for a given attained age.

Active life and disabled life mortality assumptions are developed independently.

The 2012 Individual Annuity Mortality (IAM) table is used as the assumed general population mortality, and selection factors are developed based on CalPERS' actual experience. Projected mortality based on the 2012 IAM and CalPERS selection factors is then compared to the actual CalPERS mortality experience to determine more refined experience-based adjustment factors that vary by attained age for both active and on-claim participants. The combination of these adjustment factors with the 2012 IAM table and CalPERS selection factors produces the CalPERS experienced-based mortality assumption.

Mortality rates are broken down by the following categories: age, gender, and marital status at issue.

Mortality improvement assumption reflects the expectation for mortality to gradually improve in the population due to health care technology and other factors. The development of this assumption can be very challenging and often relies on a very large population base to complete a credible study. Therefore, it is common in the LTC industry to rely on industry mortality improvement scales rather than independently calculate this assumption. Since many CalPERS LTC Program members are also in the CalPERS Pension Program, we have chosen the same mortality improvement used by CalPERS Pension Valuation, which is a 15-year mortality improvement projection using 90 percent of the Society of Actuaries' Scale MP-2016.

Expense

Expenses for the Program include fees charged by the third-party administrator (TPA) and CalPERS expenses related to internal staff working on the LTC Program and the investments. Expense assumptions were updated based on last year's actual expenses and the five-year TPA contract which has been in effect since January 2018. The administrative expenses are expressed either as per participant per month or flat expenses per month. Credit card premium payment expenses are reflected as a percent of premium paid.

Rate Increase and Policy Conversion

This valuation projection includes the planned premium increases. 52% premium increase is assumed to become effective November 1, 2021, and an additional 25% premium increase is assumed to become effective November 1, 2022 for a total of 90% premium increase. Shock lapse and morbidity anti-selection assumptions due to the premium increases are applied in the projection.

Options to convert to less expensive polices to offset the 52% premium increase will be offered to policyholders. Conversion option acceptance rate and the potentially associated anti-selection rate are difficult to estimate. The projection in this valuation does not reflect any conversions.

Risk Analysis

Risk Analysis

The actuarial calculations supplied in this report are based on a number of assumptions about very long-term demographic and economic behavior. Unless these assumptions (claim incidence, claim termination, lapses, deaths, expenses, and investment return) are exactly realized each year, there will be differences on a year-to-year basis. The year-to-year differences between the assumptions and actual experience are called actuarial gains and losses which could either increase or decrease the funded status and margin of the LTC Program. If the actual experience differs from the assumptions over a prolonged period, it may result in a need for premium changes to ensure the financial integrity of the LTC Program. The next section displays the results of sensitivity testing performed around key actuarial assumptions.

Sensitivity Testing of Key Assumptions

Several scenarios were run to test the sensitivity of future cash flows to changes in assumptions with respect to claim incidence, claim termination, claim utilization, lapses, mortality, and investment earnings. The tables below illustrate the impact of changes to the base assumptions on asset adequacy levels.

Results are highly sensitive to the assumptions underlying the calculations. While these tests show the outcomes of each of these scenarios, they do not indicate the likelihood of each scenario; as such, this testing does not include the probability that the projected values will be realized.

Detailed yearly cash flows and projected fund balances for the base case and each of the scenarios tested as part of the sensitivity testing are provided in Appendix A. The base case scenario is based on our current actuarial assumptions used for this valuation.

Discount Rate

The discount rate assumption used in this valuation is 4.75%. In the sensitivity analysis, we test the impact of future investment returns on the margin and funded ratio of the LTC Program by increasing and decreasing the discount rate by 0.5%. The table below shows the impact on the margin and funded status. As expected, a higher discount rate increases both margin and funded status while a lower discount rate decreases both measures.

Impact of Discount Rate on Margin and Funded Ratio

Scenario Description	Margin	Funded Ratio
Base Case	1.34%	101%
Discount Rate Increased by 0.5% to 5.25%	11.90%	110%
Discount Rate Decreased by 0.5% to 4.25%	(9.80%)	92%

Claim Incidence

Claim incidence is the probability of an active policyholder going on claim. This is a key morbidity assumption for long-term care modeling and is calculated using new claim counts and active exposure life years. The sensitivity analysis tests the impact of claim incidence on the margin and funded ratio of the LTC Program by increasing and decreasing future expected claim incidence by 10%. As shown in the table below, lower-than-expected incidence increases both the margin and funded status while higher-than-expected claim incidence decreases both measures.

Impact of Claim Incidence on Margin and Funded Ratio

Scenario Description	Margin	Funded Ratio
Base Case	1.34%	101%
Lower Claim Incidence (Future Claims Incidence Reduced by 10%)	13.02%	112%
Higher Claim Incidence (Future Claims Incidence Increased by 10%)	(9.91%)	93%

Risk Analysis

Sensitivity Testing of Key Assumptions (continued)

Morbidity Improvement

Morbidity improvement is the assumption that projects claim incidence rate to decrease overtime due to healthcare technology advancement and other factors. It is possible that the assumed future decreases in claim incidence does not fully materialize. The sensitivity analysis tests the impact on the margin and funded ratio of the LTC Program if the morbidity improvement assumption does not materialize at all.

Impact of Morbidity Improvement Assumption on Margin and Funded Ratio

Scenario Description	Margin	Funded Ratio
Base Case	1.34%	101%
Remove Morbidity Improvement Assumption	(7.12%)	95%

Claim Termination

Claim termination is the probability that an existing claim will cease in a given month. Claim termination occurs due to recovery or death of a member while on claim. For the sensitivity analysis, we test the impact that claim terminations have on the margin and funded ratio of the LTC Program by increasing and decreasing future expected claim terminations by 10%. As shown in the table below, higher-than-expected claim terminations increase both the margin and funded status, while lower-than-expected claim terminations decrease both measures.

Impact of Claim Termination on Margin and Funded Ratio

Scenario Description	Margin	Funded Ratio
Base Case	1.34%	101%
Higher Claim Termination (Future Claim Termination Increased by 10%)	12.58%	111%
Lower Claim Termination (Future Claim Termination Decreased by 10%)	(13.04%)	91%

Claim Utilization

Claim utilization assumption projects the average percentage of maximum benefit allowance being used each month while on-claim. This assumption incorporates a trend projecting the utilization rate to increase each calendar year. For the sensitivity analysis, we test the impact of the yearly increase trend being 0.5 times higher or lower compared to the baseline assumption. As shown in the table below, higher-than-expected claim utilization decreases both the margin and funded status, while lower-than-expected claim utilization increases both measures.

Impact of Claim Utilization on Margin and Funded Ratio

Scenario Description	Margin	Funded Ratio
Base Case	1.34%	101%
Lower Claim Utilization (Yearly Increase Trend Being 0.5 times Lower)	3.85%	103%
Higher Claim Utilization (Yearly Increase Trend Being 0.5 times Higher)	(7.55%)	94%

Lapses

The lapse assumption reflects the expected portion of active participants who terminate their policies each year by not paying the renewal premiums. For the sensitivity analysis, we test the impact lapses have on the margin and funded ratio of the LTC Program by increasing and decreasing the assumed lapse rates by a flat 0.25%. As shown in the table below, higher-than-expected lapse assumptions increase both the margin and funded status, while lower-than-expected lapses decrease both measures.

Impact of Lapses on Margin and Funded Ratio

Scenario Description	Margin	Funded Ratio
Base Case	1.34%	101%
Lapse Rates Increased by 0.25%	5.25%	104%
Lapse Rates Decreased by 0.25%	(2.66%)	98%

Risk Analysis

Sensitivity Testing of Key Assumptions (continued)

Mortality

The mortality assumption reflects the expected death rate of the participants in the LTC Program. Like the lapse assumption, mortality reduces future liabilities without affecting the assets on hand. Because of this, higher-than-expected active mortality will generally result in an increase in the margin and funded status. For the sensitivity analysis, we test the impact mortality rates have on the margin and funded ratio of the LTC Program by increasing and decreasing the mortality rates by 10%. As shown in the table below, mortality deterioration (i.e., higher rates) increases both the margin and funded status, while mortality improvement (i.e., lower rates) decreases both measures.

Impact of Active Mortality on Margin and Funded Ratio

Scenario Description	Margin	Funded Ratio
Base Case	1.34%	101%
Mortality Rates Increased by 10%	8.52%	107%
Mortality Rates Decreased by 10%	(8.22%)	94%

Best and Worst Case

To test the potential "best case" and "worst case" scenarios, the sensitivity of the six key assumptions was tested simultaneously. The five key assumptions include discount rate, claim incidence, claim termination, claim utilization, lapses, and mortality. The table below shows the combined impact on the margin and the funded status when the experience is better for all six key assumptions, and when the experience is worse for all six key assumptions.

Combined Impact of Key Assumptions on Margin and Funded Ratio

Scenario Description	Margin	Funded Ratio
Base Case	1.34%	101%
Discount Rate Increases by 0.5% to 5.25% Lower Claim Incidence (Future Claim Incidence Reduced by 10%) Higher Claim Termination (Future Claim Termination Increased by 10%) Lower Claim Utilization (Yearly Increase Trend Being 0.5 times Lower) Lapses Increased by 0.25% Mortality Rates Increased by 10%	46.22%	155%
Discount Rate Decreases by 0.5% to 4.25% Higher Claim Incidence (Future Claim Incidence Increased by 10%) Lower Claim Termination (Future Claim Termination Decreased by 10%) Higher Claim Utilization (Yearly Increase Trend Being 0.5 times Higher) Lapses Decreased by 0.25% Mortality Rates Decreased by 10%	(62.84%)	65%

Policy Conversion

The base result of this valuation does not assume any conversions related to the rate increase offers. Generally, conversions to less expensive policies help the financial position of the LTC Program. Below we test the impact on the margin and funded ratio if the conversion acceptance rate related to the first 52% rate increase turns out to be 15% or 30%. Anti-selection related to conversion is hard to estimate and is not included in the testing below. As shown in the table below, conversion may have a positive impact on the margin without considering anti-selection.

Impact of Policy Conversion on Margin and Funded Ratio

Scenario Description	Margin	Funded Ratio
Base Case	1.34%	101%
15% Conversion Rate	3.76%	103%
30% Conversion Rate	6.59%	105%

Risk Analysis

Additional Sensitivity Testing

In addition to the sensitivity testing summarized above, we used the New York 7 interest rate scenarios to test different investment scenarios on the base case scenario. In the private industry, most LTC insurance companies use the seven interest rate scenarios defined in New York Regulation 126 to test asset adequacy and form an opinion with respect to asset adequacy analysis. Those scenarios prescribe the use of specific discount rate assumptions as described in the table below:

New York Regulation 126 Discount Rate Sensitivity

	Projection Years										
Scenarios	1	2	3	4	5	6	7	8	9	10	11+
Scenario #1	4.75%	4.75%	4.75%	4.75%	4.75%	4.75%	4.75%	4.75%	4.75%	4.75%	4.75%
Scenario #2	4.75%	5.25%	5.75%	6.25%	6.75%	7.25%	7.75%	8.25%	8.75%	9.25%	9.75%
Scenario #3	4.75%	5.75%	6.75%	7.75%	8.75%	9.75%	8.75%	7.75%	6.75%	5.75%	4.75%
Scenario #4	7.75%	7.75%	7.75%	7.75%	7.75%	7.75%	7.75%	7.75%	7.75%	7.75%	7.75%
Scenario #5	4.75%	4.25%	3.75%	3.25%	2.75%	2.25%	1.75%	1.25%	0.75%	0.25%	0.00%
Scenario #6	4.75%	3.75%	2.75%	1.75%	0.75%	0.00%	0.75%	1.75%	2.75%	3.75%	4.75%
Scenario #7	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%

The following table shows how varying the discount rate assumptions as described in the table above impacts the margin and funded status as of the valuation date.

Impact of Additional Discount Rate Sensitivity on Margin and Funded Ratio

Scenarios	Margin	Funded Ratio
Scenario #1	1.34%	101%
Scenario #2	60.62%	172%
Scenario #3	28.33%	125%
Scenario #4	59.14%	163%
Scenario #5	(105.41%)	49%
Scenario #6	(25.76%)	81%
Scenario #7	(74.90%)	57%

Detailed yearly cash flows and projected fund balances for these additional discount rate sensitivity scenarios are provided in Appendix B.

Assets

Assets

Reconciliation of the Market Value of Assets Over Prior Fiscal Year

	Market Value
Restated Market Value of Assets as of June 30, 2019	$4,733,744,813
Premiums Received During Fiscal Year 2019-20	$278,534,915
Benefit Payments in 2019-20	($337,297,912)
Expense Payments in 2019-20	($26,962,656)
Investment Returns in 2019-20	$222,493,030
Market Value of Assets as of June 30, 2020 [(1) + (2) + (3) + (4) + (5)]	**$4,870,512,188**

Comparison of Actual to Expected Cash Flows

Below is a table comparing the actual cash flows in 2019-20 to the cash flows that were projected as part of the June 30, 2019 valuation. As shown in the table, the investment experience had the biggest impact on the assets.

Comparison of Actual to Expected Cash Flows for 2019-2020

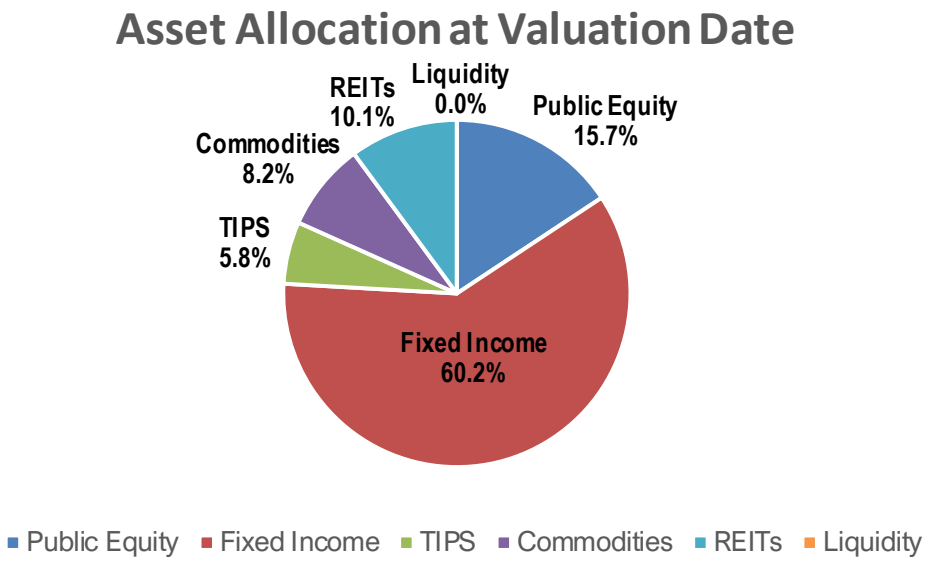
	Projected Results in the June 30, 2019 Valuation	Actual Results in the June 30, 2020 Valuation	Difference
Fund Balance as of June 30, 2019	$4,733,744,813	$4,733,744,813	$0
Cash Flows for 2019-20			
Premiums	$273,464,106	$278,534,915	$5,070,809
Investment Income	$187,884,277	$222,493,030	$34,608,752
Paid Claims	($327,580,679	($337,297,912)	($9,717,234)
Expenses	($26,546,988)	($26,962,656)	($415,668)
Balance as of June 30, 2020	**$4,840,965,529**	**$4,870,512,188**	**$ 29,546,659**

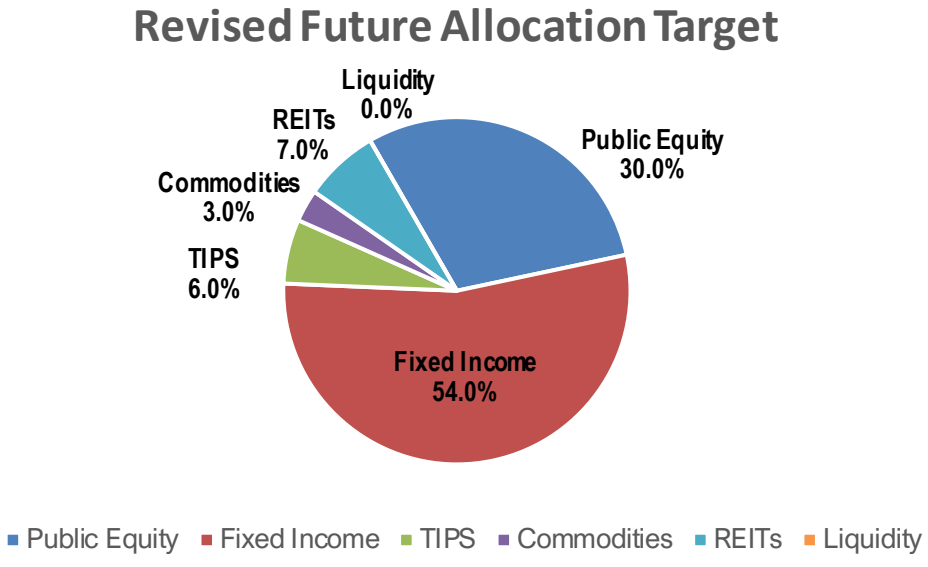
Assets

Asset Allocation

CalPERS follows a strategic allocation policy that identifies the percentage of funds to be invested in each asset class. A new strategic asset allocation target was adopted by the board in March 2021. The asset allocation and market value of assets as of June 30, 2020, as well as the revised future asset allocation target, are shown below.

Asset Class	Allocation at Valuation Date	Market Value at Valuation Date ($ in Millions)	Revised Future Allocation Target
Public Equity	15.7%	$769.1	30.0%
Fixed Income	60.2%	$2,954.9	54.0%
Treasury-Inflation Protected Securities (TIPS)	5.8%	$284.1	6.0%
Commodities	8.2%	$402.7	3.0%
Real Estate Investment Trusts (REITs)	10.1%	$499.4	7.0%
Liquidity	0.0%	$0.2	0.0%
Total Net Assets at Market:	**100.0%**	**$4,910.3**	**100.0%**

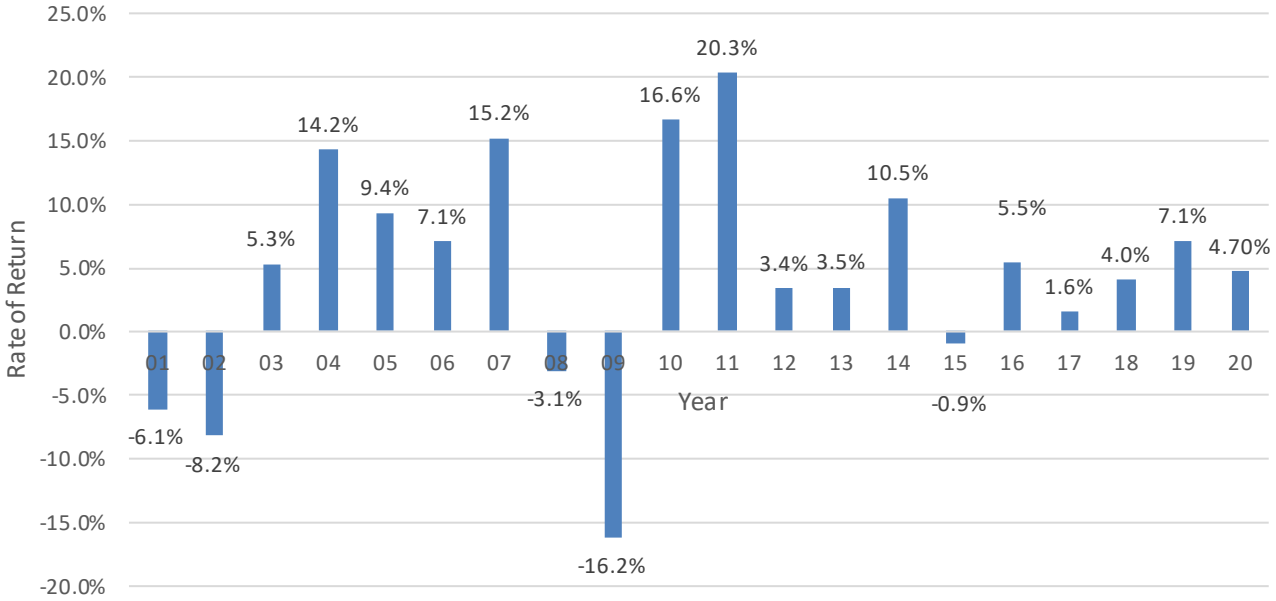




Assets

Historical Investment Return

The following table provides 20 years of historical investment returns for each fiscal year ending June 30. Prior to 2012, the program's portfolio allocated about 44% in equity. From 2012 to 2020, the targeted asset allocation switched to a more conservative mix with 15% in equity and 66% in fixed income.



Appendices

Appendix A – 60 Year Projection of Fund Balance for Scenarios Used in Sensitivity Testing of Key Assumptions

Appendix A

Base Case Scenario

The tables below contain information about the margin, funded status, and expected cash flows for the next 60 years based on the actuarial assumptions used in this valuation.

Main Results

Margin as Percentage of the Present Value of Premiums	Margin ($ in Millions)	Funded Status
1.3%	$53	101%

Projected Cash Flows and Fund Balance Over the Next 60 Years ($ in Thousands)

Calendar Year[1]	Lives	Expected Premiums	Expected Claims	Expenses	Investment Earnings	Fund Balance[2]
						$4,870,512
2020	114,824	$140,977	$174,382	$13,250	$113,796	$4,937,653
2021	107,924	$288,386	$361,165	$26,063	$231,858	$5,070,669
2022	103,446	$389,657	$383,576	$25,242	$240,182	$5,291,690
2023	99,170	$442,245	$404,631	$25,582	$251,726	$5,555,448
2024	94,787	$416,410	$425,812	$25,817	$263,143	$5,783,372
2025	90,322	$390,697	$445,721	$26,171	$272,885	$5,975,062
2026	85,822	$365,313	$463,675	$26,470	$280,956	$6,131,186
2027	81,293	$340,437	$479,902	$26,715	$287,394	$6,252,400
2028	76,774	$316,096	$495,181	$26,903	$292,216	$6,338,627
2029	72,291	$292,367	$510,669	$26,644	$295,393	$6,389,076
2030	67,857	$269,404	$524,934	$26,311	$296,916	$6,404,150
2040	29,489	$94,257	$559,897	$19,292	$233,773	$4,911,429
2050	8,400	$21,288	$343,105	$9,497	$116,256	$2,398,795
2060	1,644	$3,360	$133,967	$3,354	$46,778	$965,354
2070	241	$400	$33,936	$1,086	$27,162	$582,004
2080	36	$22	$3,046	$358	$16,125	$701,357

(1) Cash flows for 2020 and 2080 are for six months only.
(2) Fund balances are as of the end of the calendar year, except for the opening balance (as of June 30, 2020) and the last projected fund balance (as of June 30, 2080).

Total Sum of All Cash Flows and Present Values ($ in Thousands)

	Expected Premiums	Expected Claims	Expenses	Investment Earnings
Total Sum of Cash Flows	$5,872,611	$17,875,746	$726,352	$8,560,332
Present Value as of June 30, 2020	$3,919,742	$8,348,252	$389,348	$4,295,445

Appendix A

Discount Rate Increased by 0.50% to 5.25%

The tables below contain information about the margin, funded status, and expected cash flows for the next 60 years if the assumed discount rate and expected return were 5.25%, i.e. 0.50% higher.

Main Results

Margin as Percentage of the Present Value of Premiums	Margin ($ in Millions)	Funded Status
11.9%	$450	110%

Projected Cash Flows and Fund Balance Over the Next 60 Years ($ in Thousands)

Calendar Year[1]	Lives	Expected Premiums	Expected Claims	Expenses	Investment Earnings	Fund Balance[2]
						$4,870,512
2020	114,824	$140,977	$174,382	$13,250	$125,623	$4,949,480
2021	107,924	$288,386	$361,165	$26,066	$256,887	$5,107,523
2022	103,446	$389,657	$383,576	$25,249	$267,400	$5,355,755
2023	99,170	$442,245	$404,631	$25,595	$281,586	$5,649,360
2024	94,787	$416,410	$425,812	$25,837	$295,773	$5,909,894
2025	90,322	$390,697	$445,721	$26,198	$308,253	$6,136,926
2026	85,822	$365,313	$463,675	$26,505	$319,030	$6,331,088
2027	81,293	$340,437	$479,902	$26,760	$328,143	$6,493,007
2028	76,774	$316,096	$495,181	$26,958	$335,610	$6,622,573
2029	72,291	$292,367	$510,669	$26,710	$341,398	$6,718,960
2030	67,857	$269,404	$524,934	$26,390	$345,493	$6,782,532
2040	29,489	$94,257	$559,897	$19,576	$306,963	$5,909,651
2050	8,400	$21,288	$343,105	$10,199	$222,190	$4,288,917
2060	1,644	$3,360	$133,967	$4,901	$213,140	$4,205,881
2070	241	$400	$33,936	$4,403	$300,328	$6,002,156
2080	36	$22	$3,046	$3,757	$239,804	$9,490,183

(1) Cash flows for 2020 and 2080 are for six months only.
(2) Fund balances are as of the end of the calendar year, except for the opening balance (as of June 30, 2020) and the last projected fund balance (as of June 30, 2080).

Total Sum of All Cash Flows and Present Values ($ in Thousands)

	Expected Premiums	Expected Claims	Expenses	Investment Earnings
Total Sum of Cash Flows	$5,872,611	$17,875,746	$816,499	$17,439,305
Present Value as of June 30, 2020	$3,780,251	$7,822,262	$378,553	$5,490,216

Appendix A

Discount Rate Decreased by 0.50% to 4.25%

The tables below contain information about the margin, funded status, and expected cash flows for the next 60 years if the assumed discount rate and expected return were 4.25%, i.e. 0.50% lower.

Main Results

Margin as Percentage of the Present Value of Premiums	Margin ($ in Millions)	Funded Status
(9.8%)	($399)	92%

Projected Cash Flows and Fund Balance Over the Next 60 Years ($ in Thousands)

Calendar Year[1]	Lives	Expected Premiums	Expected Claims	Expenses	Investment Earnings	Fund Balance[2]
						$4,870,512
2020	114,824	$140,977	$174,382	$13,250	$101,940	$4,925,797
2021	107,924	$288,386	$361,165	$26,061	$206,946	$5,033,904
2022	103,446	$389,657	$383,576	$25,235	$213,337	$5,228,088
2023	99,170	$442,245	$404,631	$25,569	$222,526	$5,462,658
2024	94,787	$416,410	$425,812	$25,798	$231,500	$5,658,958
2025	90,322	$390,697	$445,721	$26,144	$238,872	$5,816,662
2026	85,822	$365,313	$463,675	$26,436	$244,649	$5,936,512
2027	81,293	$340,437	$479,902	$26,672	$248,866	$6,019,242
2028	76,774	$316,096	$495,181	$26,850	$251,545	$6,064,851
2029	72,291	$292,367	$510,669	$26,579	$252,661	$6,072,632
2030	67,857	$269,404	$524,934	$26,235	$252,210	$6,043,076
2040	29,489	$94,257	$559,897	$19,035	$173,577	$4,014,192
2050	8,400	$21,288	$343,105	$8,908	$40,303	$824,077
2060	1,644	$3,360	$133,967	$2,824	($58,889)	($1,510,416)
2070	241	$400	$33,936	$707	($130,157)	($3,209,468)
2080	36	$22	$3,046	$83	($102,081)	($4,957,955)

(1) Cash flows for 2020 and 2080 are for six months only.
(2) Fund balances are as of the end of the calendar year, except for the opening balance (as of June 30, 2020) and the last projected fund balance (as of June 30, 2080).

Total Sum of All Cash Flows and Present Values ($ in Thousands)

	Expected Premiums	Expected Claims	Expenses	Investment Earnings
Total Sum of Cash Flows	$5,872,611	$17,875,746	$705,073	$2,879,741
Present Value as of June 30, 2020	$4,068,612	$8,931,936	$406,108	$3,169,214

Appendix A

Claim Incidence Rates Increased by 10%

The tables below contain information about the margin, funded status, and expected cash flows for the next 60 years if the future claim incidence were to be 10% higher than expected.

Main Results

Margin as Percentage of the Present Value of Premiums	Margin ($ in Millions)	Funded Status
(9.9%)	($380)	93%

Projected Cash Flows and Fund Balance Over the Next 60 Years ($ in Thousands)

Calendar Year[1]	Lives	Expected Premiums	Expected Claims	Expenses	Investment Earnings	Fund Balance[2]
						$4,870,512
2020	114,819	$140,888	$175,573	$13,251	$113,787	$4,936,363
2021	107,886	$287,562	$370,658	$26,064	$231,592	$5,058,795
2022	103,381	$387,629	$400,904	$25,248	$239,192	$5,259,463
2023	99,014	$438,715	$427,705	$25,566	$249,590	$5,494,497
2024	94,526	$411,913	$452,976	$25,778	$259,519	$5,687,175
2025	89,951	$385,391	$475,783	$26,102	$267,495	$5,838,175
2026	85,339	$359,353	$495,483	$26,367	$273,573	$5,949,252
2027	80,702	$333,970	$512,551	$26,573	$277,836	$6,021,935
2028	76,085	$309,243	$528,127	$26,720	$280,336	$6,056,667
2029	71,515	$285,233	$543,587	$26,405	$281,062	$6,052,970
2030	67,006	$262,091	$557,525	$26,017	$280,016	$6,011,536
2040	28,537	$88,959	$578,411	$18,499	$187,017	$3,868,938
2050	7,966	$19,538	$345,472	$8,423	$34,434	$592,962
2060	1,532	$3,012	$132,089	$2,646	($83,153)	($1,898,838)
2070	222	$352	$32,687	$654	($178,248)	($3,947,024)
2080	33	$20	$2,887	$77	($144,987)	($6,322,813)

(1) Cash flows for 2020 and 2080 are for six months only.
(2) Fund balances are as of the end of the calendar year, except for the opening balance (as of June 30, 2020) and the last projected fund balance (as of June 30, 2080).

Total Sum of All Cash Flows and Present Values ($ in Thousands)

	Expected Premiums	Expected Claims	Expenses	Investment Earnings
Total Sum of Cash Flows	$5,714,300	$18,463,978	$690,522	$2,246,875
Present Value as of June 30, 2019	$3,837,663	$8,708,528	$380,018	$3,295,406

Appendix A

Claim Incidence Rates Reduced by 10%

The tables below contain information about the margin, funded status, and expected cash flows for the next 60 years if the future claim incidence were to be 10% lower than expected.

Main Results

Margin as Percentage of the Present Value of Premiums	Margin ($ in Millions)	Funded Status
13.0%	$522	112%

Projected Cash Flows and Fund Balance Over the Next 60 Years ($ in Thousands)

Calendar Year[1]	Lives	Expected Premiums	Expected Claims	Expenses	Investment Earnings	Fund Balance[2]
						$4,870,512
2020	114,830	$141,066	$173,191	$13,250	$113,805	$4,938,942
2021	107,963	$289,215	$351,624	$26,063	$232,125	$5,082,596
2022	103,597	$392,051	$366,041	$25,262	$241,184	$5,324,528
2023	99,412	$446,250	$381,002	$25,613	$253,908	$5,618,071
2024	95,134	$421,412	$397,574	$25,872	$266,880	$5,882,916
2025	90,781	$396,545	$414,356	$26,257	$278,473	$6,117,322
2026	86,395	$371,855	$430,329	$26,593	$288,640	$6,320,896
2027	81,975	$347,527	$445,482	$26,878	$297,373	$6,493,436
2028	77,558	$323,609	$460,242	$27,110	$304,656	$6,634,349
2029	73,165	$300,195	$475,548	$26,908	$310,443	$6,742,531
2030	68,808	$277,439	$489,952	$26,635	$314,710	$6,818,092
2040	30,549	$100,257	$538,140	$20,159	$284,120	$6,035,077
2050	8,896	$23,345	$339,089	$10,685	$205,590	$4,371,181
2060	1,776	$3,781	$135,460	$5,068	$189,109	$4,102,704
2070	264	$460	$35,197	$4,190	$251,392	$5,524,676
2080	40	$26	$3,220	$3,328	$190,928	$8,321,106

(1) Cash flows for 2020 and 2080 are for six months only.
(2) Fund balances are as of the end of the calendar year, except for the opening balance (as of June 30, 2020) and the last projected fund balance (as of June 30, 2080).

Total Sum of All Cash Flows and Present Values ($ in Thousands)

	Expected Premiums	Expected Claims	Expenses	Investment Earnings
Total Sum of Cash Flows	$6,050,491	$17,209,908	$825,466	$15,435,478
Present Value as of June 30, 2020	$4,011,289	$7,954,121	$405,284	$5,380,248

Appendix A

Morbidity Improvement Assumption Removed

The tables below contain information about the margin, funded status, and expected cash flows for the next 60 years if there is no morbidity improvement in the future.

Main Results

Margin as Percentage of the Present Value of Premiums	Margin ($ in Millions)	Funded Status
(7.1%)	($275)	95%

Projected Cash Flows and Fund Balance Over the Next 60 Years ($ in Thousands)

Calendar Year[1]	Lives	Expected Premiums	Expected Claims	Expenses	Investment Earnings	Fund Balance[2]
						$4,870,512
2020	114,824	$140,971	$174,470	$13,250	$113,795	$4,937,558
2021	107,920	$288,293	$362,243	$26,064	$231,832	$5,069,376
2022	103,430	$389,320	$386,349	$25,241	$240,056	$5,287,162
2023	99,135	$441,516	$409,498	$25,579	$251,389	$5,544,990
2024	94,724	$415,284	$433,107	$25,809	$262,460	$5,763,818
2025	90,223	$389,124	$455,685	$26,156	$271,698	$5,942,798
2026	85,677	$363,256	$476,460	$26,444	$279,088	$6,082,238
2027	81,094	$337,878	$495,582	$26,674	$284,654	$6,182,514
2028	76,515	$313,022	$513,841	$26,844	$288,399	$6,243,249
2029	71,966	$288,775	$532,369	$26,556	$290,283	$6,263,383
2030	67,461	$265,308	$549,633	$26,189	$290,284	$6,243,152
2040	28,591	$88,847	$587,878	$18,623	$201,178	$4,176,384
2050	7,920	$19,367	$346,277	$8,537	$53,899	$1,021,702
2060	1,518	$2,978	$131,427	$2,621	($52,151)	($1,214,826)
2070	220	$349	$32,350	$647	($128,620)	($2,852,413)
2080	33	$19	$2,853	$76	($105,921)	($4,619,552)

(3) Cash flows for 2020 and 2080 are for six months only.
(4) Fund balances are as of the end of the calendar year, except for the opening balance (as of June 30, 2020) and the last projected fund balance (as of June 30, 2080).

Total Sum of All Cash Flows and Present Values ($ in Thousands)

	Expected Premiums	Expected Claims	Expenses	Investment Earnings
Total Sum of Cash Flows	$5,752,464	$18,407,371	$694,109	$3,858,952
Present Value as of June 30, 2020	$3,865,847	$8,629,975	$381,752	$3,588,012

Appendix A

Claim Termination Rates Increased by 10%

The tables below contain information about the margin, funded status, and expected cash flows for the next 60 years if the future claim terminations were to be 10%t higher than expected.

Main Results

Margin as Percentage of the Present Value of Premiums	Margin ($ in Millions)	Funded Status
12.6%	$500	111%

Projected Cash Flows and Fund Balance Over the Next 60 Years ($ in Thousands)

Calendar Year[1]	Lives	Expected Premiums	Expected Claims	Expenses	Investment Earnings	Fund Balance[2]
						$4,870,512
2020	114,794	$141,037	$173,323	$13,248	$113,804	$4,938,782
2021	107,861	$288,915	$352,704	$26,051	$232,092	$5,081,033
2022	103,424	$391,185	$368,741	$25,239	$241,034	$5,319,272
2023	99,167	$444,672	$385,083	$25,576	$253,533	$5,606,818
2024	94,815	$419,319	$402,716	$25,819	$266,181	$5,863,783
2025	90,394	$394,010	$420,104	$26,185	$277,374	$6,088,879
2026	85,942	$368,967	$436,241	$26,501	$287,085	$6,282,190
2027	81,465	$344,371	$451,152	$26,766	$295,328	$6,443,972
2028	76,998	$320,253	$465,551	$26,977	$302,104	$6,573,801
2029	72,563	$296,696	$480,386	$26,747	$307,373	$6,670,736
2030	68,173	$273,862	$494,186	$26,447	$311,118	$6,735,083
2040	29,963	$97,899	$533,633	$19,798	$276,449	$5,867,264
2050	8,623	$22,555	$329,951	$10,356	$197,118	$4,188,733
2060	1,699	$3,614	$129,243	$4,846	$180,352	$3,912,709
2070	250	$435	$32,836	$3,994	$240,074	$5,276,330
2080	37	$24	$2,945	$3,179	$182,487	$7,953,308

(1) Cash flows for 2020 and 2080 are for six months only.
(2) Fund balances are as of the end of the calendar year, except for the opening balance (as of June 30, 2020) and the last projected fund balance (as of June 30, 2080).

Total Sum of All Cash Flows and Present Values ($ in Thousands)

	Expected Premiums	Expected Claims	Expenses	Investment Earnings
Total Sum of Cash Flows	$5,976,868	$17,041,620	$811,064	$14,958,613
Present Value as of June 30, 2020	$3,972,880	$7,942,513	$401,158	$5,276,377

Appendix A

Claim Termination Rates Reduced by 10%

The tables below contain information about the margin, funded status, and expected cash flows for the next 60 years if the future claim terminations were to be 10% lower than expected.

Main Results

Margin as Percentage of the Present Value of Premiums	Margin ($ in Millions)	Funded Status
(13.0%)	($506)	91%

Projected Cash Flows and Fund Balance Over the Next 60 Years ($ in Thousands)

Calendar Year[1]	Lives	Expected Premiums	Expected Claims	Expenses	Investment Earnings	Fund Balance[2]
						$4,870,512
2020	114,862	$140,923	$175,454	$13,253	$113,788	$4,936,516
2021	108,013	$287,899	$369,928	$26,079	$231,620	$5,060,028
2022	103,598	$388,562	$399,339	$25,278	$239,305	$5,263,278
2023	99,325	$440,380	$425,750	$25,614	$249,852	$5,502,146
2024	94,937	$414,119	$451,026	$25,847	$259,977	$5,699,369
2025	90,459	$388,096	$474,322	$26,196	$268,171	$5,855,117
2026	85,938	$362,469	$494,944	$26,487	$274,464	$5,970,619
2027	81,379	$337,392	$513,296	$26,720	$278,915	$6,046,910
2028	76,829	$312,890	$530,191	$26,892	$281,560	$6,084,276
2029	72,316	$289,046	$547,015	$26,613	$282,382	$6,082,077
2030	67,851	$266,001	$562,390	$26,258	$281,376	$6,040,806
2040	29,332	$91,550	$597,139	$18,919	$184,231	$3,799,043
2050	8,314	$20,328	$364,878	$8,635	$18,614	$234,640
2060	1,625	$3,168	$142,737	$2,805	($117,376)	($2,658,832)
2070	239	$374	$36,243	$703	($236,836)	($5,240,807)
2080	36	$21	$3,259	$83	($191,613)	($8,355,885)

(1) Cash flows for 2020 and 2080 are for six months only.
(2) Fund balances are as of the end of the calendar year, except for the opening balance (as of June 30, 2020) and the last projected fund balance (as of June 30, 2080).

Total Sum of All Cash Flows and Present Values ($ in Thousands)

	Expected Premiums	Expected Claims	Expenses	Investment Earnings
Total Sum of Cash Flows	$5,793,666	$19,029,472	$701,914	$711,323
Present Value as of June 30, 2020	$3,879,301	$8,871,311	$384,207	$3,114,090

Appendix A

Claim Utilization Rate with Higher Yearly Increases

The tables below contain information about the margin, funded status, and expected cash flows for the next 60 years if the future yearly increase trend of claim utilization rate being 0.5 times higher than projected.

Main Results

Margin as Percentage of the Present Value of Premiums	Margin ($ in Millions)	Funded Status
(7.6%)	($296)	94%

Projected Cash Flows and Fund Balance Over the Next 60 Years ($ in Thousands)

Calendar Year[1]	Lives	Expected Premiums	Expected Claims	Expenses	Investment Earnings	Fund Balance[2]
						$4,870,512
2020	114,824	$140,977	$175,019	$13,251	$113,789	$4,937,009
2021	107,924	$288,386	$363,374	$26,064	$231,780	$5,067,737
2022	103,444	$389,657	$387,173	$25,243	$239,964	$5,284,941
2023	99,166	$442,244	$409,762	$25,583	$251,291	$5,543,131
2024	94,782	$416,408	$432,603	$25,818	$262,405	$5,763,523
2025	90,312	$390,694	$454,269	$26,171	$271,748	$5,945,525
2026	85,809	$365,309	$473,961	$26,468	$279,318	$6,089,722
2027	81,276	$340,432	$492,001	$26,711	$285,146	$6,196,589
2028	76,754	$316,089	$509,141	$26,896	$289,243	$6,265,884
2029	72,268	$292,359	$526,577	$26,632	$291,571	$6,296,604
2030	67,830	$269,393	$542,770	$26,295	$292,111	$6,289,042
2040	29,447	$94,229	$590,789	$19,157	$211,274	$4,399,715
2050	8,378	$21,273	$371,969	$9,070	$62,268	$1,193,956
2060	1,637	$3,356	$150,101	$2,837	($52,578)	($1,233,475)
2070	240	$399	$39,204	$712	($136,867)	($3,037,679)
2080	36	$22	$3,601	$83	($113,519)	($4,951,167)

(3) Cash flows for 2020 and 2080 are for six months only.
(4) Fund balances are as of the end of the calendar year, except for the opening balance (as of June 30, 2020) and the last projected fund balance (as of June 30, 2080).

Total Sum of All Cash Flows and Present Values ($ in Thousands)

	Expected Premiums	Expected Claims	Expenses	Investment Earnings
Total Sum of Cash Flows	$5,872,026	$18,888,482	$708,681	$3,903,458
Present Value as of June 30, 2020	$3,919,521	$8,699,613	$386,231	$3,645,744

Appendix A

Claim Utilization Rate with Lower Yearly Increases

The tables below contain information about the margin, funded status, and expected cash flows for the next 60 years if the future yearly increase trend of claim utilization rate being 0.5 times lower than projected.

Main Results

Margin as Percentage of the Present Value of Premiums	Margin ($ in Millions)	Funded Status
3.8%	$151	103%

Projected Cash Flows and Fund Balance Over the Next 60 Years ($ in Thousands)

Calendar Year[1]	Lives	Expected Premiums	Expected Claims	Expenses	Investment Earnings	Fund Balance[2]
						$4,870,512
2020	114,825	$140,977	$174,062	$13,250	$113,799	$4,937,977
2021	107,924	$288,386	$360,020	$26,063	$231,898	$5,072,179
2022	103,447	$389,657	$381,683	$25,241	$240,296	$5,295,207
2023	99,172	$442,245	$401,901	$25,581	$251,954	$5,561,925
2024	94,790	$416,410	$422,287	$25,817	$263,531	$5,793,762
2025	90,328	$390,698	$441,386	$26,171	$273,478	$5,990,381
2026	85,829	$365,315	$458,575	$26,472	$281,801	$6,152,450
2027	81,304	$340,441	$474,083	$26,718	$288,539	$6,280,628
2028	76,788	$316,101	$488,685	$26,908	$293,707	$6,374,843
2029	72,306	$292,374	$503,517	$26,651	$297,280	$6,434,329
2030	67,874	$269,412	$517,181	$26,321	$299,246	$6,459,484
2040	29,517	$94,272	$550,967	$19,356	$242,814	$5,115,248
2050	8,415	$21,296	$340,063	$9,657	$134,326	$2,798,680
2060	1,647	$3,361	$133,485	$3,670	$76,282	$1,616,060
2070	242	$400	$33,881	$1,722	$73,954	$1,613,597
2080	36	$22	$3,043	$977	$52,657	$2,293,844

(5) Cash flows for 2020 and 2080 are for six months only.
(6) Fund balances are as of the end of the calendar year, except for the opening balance (as of June 30, 2020) and the last projected fund balance (as of June 30, 2080).

Total Sum of All Cash Flows and Present Values ($ in Thousands)

	Expected Premiums	Expected Claims	Expenses	Investment Earnings
Total Sum of Cash Flows	$5,872,920	$17,664,951	$743,851	$9,959,215
Present Value as of June 30, 2020	$3,919,866	$8,248,003	$391,547	$4,505,411

Appendix A

Lapses Increased by 0.25%

The tables below contain information about the margin, funded status, and expected cash flows for the next 60 years if the lapse rates were to be 0.25% higher than expected for each of the next 60 years.

Main Results

Margin as Percentage of the Present Value of Premiums	Margin ($ in Millions)	Funded Status
5.2%	$202	104%

Projected Cash Flows and Fund Balance Over the Next 60 Years ($ in Thousands)

Calendar Year[1]	Lives	Expected Premiums	Expected Claims	Expenses	Investment Earnings	Fund Balance[2]
						$4,870,512
2020	114,687	$140,857	$174,375	$13,244	$113,795	$4,937,546
2021	107,538	$287,587	$361,016	$26,016	$231,842	$5,069,942
2022	102,830	$387,618	$383,262	$25,154	$240,114	$5,289,258
2023	98,343	$438,853	$404,099	$25,450	$251,549	$5,550,111
2024	93,770	$412,188	$424,641	$25,641	$262,822	$5,774,841
2025	89,138	$385,775	$443,594	$25,949	$272,419	$5,963,492
2026	84,492	$359,814	$460,458	$26,202	$280,358	$6,117,003
2027	79,838	$334,479	$475,489	$26,402	$286,689	$6,236,281
2028	75,217	$309,791	$489,471	$26,546	$291,442	$6,321,497
2029	70,653	$285,823	$503,560	$26,228	$294,599	$6,372,132
2030	66,157	$262,718	$516,354	$25,840	$296,163	$6,388,819
2040	28,062	$89,659	$537,228	$18,555	$238,498	$5,025,180
2050	7,804	$19,755	$321,291	$9,095	$136,356	$2,852,402
2060	1,491	$3,042	$122,459	$3,540	$88,504	$1,890,981
2070	214	$353	$30,296	$1,961	$97,539	$2,135,318
2080	31	$19	$2,656	$1,288	$71,641	$3,121,545

(1) Cash flows for 2020 and 2080 are for six months only.
(2) Fund balances are as of the end of the calendar year, except for the opening balance (as of June 30, 2020) and the last projected fund balance (as of June 30, 2080).

Total Sum of All Cash Flows and Present Values ($ in Thousands)

	Expected Premiums	Expected Claims	Expenses	Investment Earnings
Total Sum of Cash Flows	$5,730,288	$17,190,916	$728,950	$10,440,611
Present Value as of June 30, 2020	$3,845,281	$8,130,092	$383,848	$4,527,716

Appendix A

Lapses Decreased by 0.25%

The tables below contain information about the margin, funded status, and expected cash flows for the next 60 years if the lapse rates were to be 0.25% lower than expected for each of the next 60 years.

Main Results

Margin as Percentage of the Present Value of Premiums	Margin ($ in Millions)	Funded Status
(2.7%)	($106)	98%

Projected Cash Flows and Fund Balance Over the Next 60 Years ($ in Thousands)

Calendar Year[1]	Lives	Expected Premiums	Expected Claims	Expenses	Investment Earnings	Fund Balance[2]
						$4,870,512
2020	114,962	$141,097	$174,389	$13,257	$113,797	$4,937,760
2021	108,311	$289,186	$361,313	$26,111	$231,874	$5,071,396
2022	104,064	$391,703	$383,890	$25,330	$240,251	$5,294,129
2023	100,001	$445,655	$405,161	$25,715	$251,904	$5,560,812
2024	95,811	$420,663	$426,987	$25,995	$263,466	$5,791,959
2025	91,519	$395,668	$447,860	$26,395	$273,355	$5,986,727
2026	87,170	$370,880	$466,920	$26,742	$281,560	$6,145,506
2027	82,770	$346,485	$484,364	$27,033	$288,106	$6,268,701
2028	78,360	$322,511	$500,969	$27,267	$292,999	$6,355,975
2029	73,964	$299,043	$517,890	$27,067	$296,198	$6,406,260
2030	69,595	$276,241	$533,670	$26,792	$297,680	$6,419,719
2040	30,985	$99,079	$583,520	$20,063	$228,892	$4,793,847
2050	9,041	$22,937	$366,381	$9,932	$95,244	$1,924,364
2060	1,813	$3,711	$146,540	$3,168	$2,842	($9,520)
2070	273	$453	$38,007	$795	($47,312)	($1,062,171)
2080	42	$26	$3,492	$96	($42,945)	($1,874,156)

(1) Cash flows for 2020 and 2080 are for six months only.
(2) Fund balances are as of the end of the calendar year, except for the opening balance (as of June 30, 2020) and the last projected fund balance (which is as of June 30, 2080).

Total Sum of All Cash Flows and Present Values ($ in Thousands)

	Expected Premiums	Expected Claims	Expenses	Investment Earnings
Total Sum of Cash Flows	$6,020,219	$18,601,899	$736,725	$6,573,736
Present Value as of June 30, 2020	$3,996,380	$8,576,861	$396,151	$4,050,716

Appendix A

Mortality Rates Increased by 10%

The tables below contain information about the margin, funded status, and expected cash flows for the next 60 years if the mortality rates were to be 10% higher than expected.

Main Results

Margin as Percentage of the Present Value of Premiums	Margin ($ in Millions)	Funded Status
8.5%	$326	107%

Projected Cash Flows and Fund Balance Over the Next 60 Years ($ in Thousands)

Calendar Year[1]	Lives	Expected Premiums	Expected Claims	Expenses	Investment Earnings	Fund Balance[2]
						$4,870,512
2020	114,689	$140,885	$174,601	$13,244	$113,793	$4,937,345
2021	107,531	$287,483	$361,249	$26,016	$231,824	$5,069,386
2022	102,801	$387,210	$382,679	$25,150	$240,089	$5,288,856
2023	98,289	$438,089	$402,324	$25,440	$251,550	$5,550,731
2024	93,695	$411,216	$421,774	$25,626	$262,894	$5,777,441
2025	89,042	$384,661	$439,748	$25,929	$272,604	$5,969,029
2026	84,374	$358,588	$455,646	$26,177	$280,703	$6,126,497
2027	79,700	$333,157	$469,745	$26,371	$287,242	$6,250,780
2028	75,059	$308,388	$482,850	$26,509	$292,251	$6,342,059
2029	70,475	$284,358	$496,129	$26,183	$295,715	$6,399,821
2030	65,961	$261,202	$508,185	$25,786	$297,634	$6,424,686
2040	27,735	$88,126	$524,115	$18,417	$246,271	$5,202,532
2050	7,617	$19,142	$309,688	$9,067	$155,975	$3,290,545
2060	1,444	$2,924	$117,244	$3,837	$124,466	$2,686,415
2070	207	$339	$28,656	$2,738	$156,377	$3,433,248
2080	31	$19	$2,497	$2,069	$117,827	$5,134,938

(1) Cash flows for 2020 and 2080 are for six months only.
(2) Fund balances are as of the end of the calendar year, except for the opening balance (as of June 30, 2020) and the last projected fund balance (as of June 30, 2080).

Total Sum of All Cash Flows and Present Values ($ in Thousands)

	Expected Premiums	Expected Claims	Expenses	Investment Earnings
Total Sum of Cash Flows	$5,690,055	$16,789,329	$744,622	$12,108,321
Present Value as of June 30, 2020	$3,825,835	$7,985,785	$384,587	$4,758,462

Appendix A

Mortality Rates Decreased by 10%

The tables below contain information about the margin, funded status, and expected cash flows for the next 60 years if the mortality were to be 10% lower than expected.

Main Results

Margin as Percentage of the Present Value of Premiums	Margin ($ in Millions)	Funded Status
(8.2%)	($332)	94%

Projected Cash Flows and Fund Balance Over the Next 60 Years ($ in Thousands)

Calendar Year[1]	Lives	Expected Premiums	Expected Claims	Expenses	Investment Earnings	Fund Balance[2]
						$4,870,512
2020	114,968	$141,077	$174,164	$13,257	$113,799	$4,937,967
2021	108,344	$289,360	$361,108	$26,114	$231,894	$5,071,999
2022	104,142	$392,318	$384,585	$25,341	$240,280	$5,294,671
2023	100,134	$446,822	$407,206	$25,736	$251,912	$5,560,463
2024	96,005	$422,235	$430,368	$26,029	$263,410	$5,789,711
2025	91,781	$397,627	$452,583	$26,445	$273,186	$5,981,496
2026	87,502	$373,200	$473,099	$26,808	$281,224	$6,136,012
2027	83,171	$349,129	$492,067	$27,118	$287,539	$6,253,495
2028	78,825	$325,441	$510,214	$27,372	$292,130	$6,333,482
2029	74,493	$302,222	$528,659	$27,200	$294,952	$6,374,797
2030	70,185	$279,638	$545,928	$26,954	$295,978	$6,377,531
2040	31,880	$102,801	$609,135	$20,488	$217,269	$4,526,201
2050	9,531	$24,446	$391,445	$10,142	$62,031	$1,180,041
2060	1,947	$4,028	$159,020	$3,327	($60,866)	($1,420,589)
2070	294	$496	$42,094	$860	($153,435)	($3,404,485)
2080	44	$28	$3,910	$101	($127,015)	($5,539,763)

(1) Cash flows for 2020 and 2080 are for six months only.
(2) Fund balances are as of the end of the calendar year ear, except for the opening balance (as of June 30, 2020) and the last projected fund balance (as of June 30, 2080).

Total Sum of All Cash Flows and Present Values ($ in Thousands)

	Expected Premiums	Expected Claims	Expenses	Investment Earnings
Total Sum of Cash Flows	$6,113,104	$19,403,118	$746,252	$3,625,991
Present Value as of June 30, 2020	$4,039,609	$8,842,649	$399,569	$3,656,418

Appendix A

"Best Case" Scenario

The tables below contain information about the margin, funded status, and expected cash flows for the next 60 years if the experience were to be better than expected for the key assumptions. Specifically, if the discount rate and expected return were to be 0.50% higher (5.25%), if lapse rates were to be 0.25% higher, if mortality rates were to be 10% higher, if the yearly increase trend of claim utilization rate being 0.5 times lower, and if other morbidity rates were to be 10% lower.

Main Results

Margin as Percentage of the Present Value of Premiums	Margin ($ in Millions)	Funded Status
46.2%	$1,727	155%

Projected Cash Flows and Fund Balance Over the Next 60 Years ($ in Thousands)

Calendar Year[1]	Lives	Expected Premiums	Expected Claims	Expenses	Investment Earnings	Fund Balance[2]
						$4,870,512
2020	114,520	$140,906	$172,041	$13,234	$125,641	$4,951,784
2021	107,104	$287,969	$342,260	$25,956	$257,419	$5,128,956
2022	102,203	$388,549	$348,914	$25,056	$269,348	$5,412,883
2023	97,579	$440,344	$357,414	$25,325	$285,726	$5,756,214
2024	92,914	$413,972	$368,145	$25,501	$302,791	$6,079,331
2025	88,225	$387,780	$379,236	$25,803	$318,782	$6,380,854
2026	83,550	$361,980	$389,891	$26,060	$333,656	$6,660,539
2027	78,890	$336,757	$399,992	$26,272	$347,415	$6,918,447
2028	74,277	$312,153	$409,944	$26,436	$360,056	$7,154,276
2029	69,728	$288,250	$420,513	$26,140	$371,548	$7,367,421
2030	65,255	$265,183	$430,298	$25,781	$381,891	$7,558,416
2040	27,491	$91,316	$447,076	$19,194	$437,048	$8,573,047
2050	7,563	$20,197	$267,432	$11,455	$503,813	$9,971,341
2060	1,428	$3,115	$101,431	$9,345	$717,304	$14,326,868
2070	203	$362	$24,839	$14,710	$1,150,118	$23,037,580
2080	30	$20	$2,150	$14,406	$936,274	$37,057,719

(1) Cash flows for 2020 and 2080 are for six months only.
(2) Fund balances are as of the end of the calendar year, except for the opening balance (as of June 30, 2020) and the last projected fund balance (as of June 30, 2080).

Total Sum of All Cash Flows and Present Values ($ in Thousands)

	Expected Premiums	Expected Claims	Expenses	Investment Earnings
Total Sum of Cash Flows	$5,781,661	$14,454,815	$1,062,359	$41,922,720
Present Value as of June 30, 2020	$3,736,396	$6,486,113	$393,983	$8,416,988

Appendix A

"Worst Case" Scenario

The tables below contain information about the margin, funded status, and expected cash flows for the next 60 years if the experience were to be worse than expected for the key assumptions. Specifically, if the discount rate and expected return were to be 0.50% lower (4.25%), if lapse rates were to be 0.25% lower, if mortality rates were to be 10% lower, if the yearly increase trend of claim utilization rate being 0.5 times higher, and if other morbidity rates were to be 10% higher.

Main Results

Margin as Percentage of the Present Value of Premiums	Margin ($ in Millions)	Funded Status
(62.84%)	($2,589)	65%

Projected Cash Flows and Fund Balance Over the Next 60 Years ($ in Thousands)

Calendar Year[1]	Lives	Expected Premiums	Expected Claims	Expenses	Investment Earnings	Fund Balance[2]
						$4,870,512
2020	115,130	$141,046	$177,094	$13,267	$101,923	$4,923,119
2021	108,760	$288,768	$382,095	$26,173	$206,463	$5,010,082
2022	104,728	$390,676	$422,590	$25,435	$211,573	$5,164,306
2023	100,829	$444,010	$458,958	$25,852	$218,748	$5,342,254
2024	96,760	$418,701	$493,700	$26,153	$225,034	$5,466,136
2025	92,547	$393,476	$525,669	$26,565	$229,076	$5,536,454
2026	88,251	$368,529	$554,065	$26,913	$230,922	$5,554,927
2027	83,875	$344,033	$579,561	$27,197	$230,639	$5,522,840
2028	79,472	$319,990	$603,257	$27,415	$228,263	$5,440,421
2029	75,074	$296,472	$626,812	$27,198	$223,771	$5,306,654
2030	70,693	$273,646	$648,664	$26,897	$217,144	$5,121,882
2040	31,758	$97,388	$725,760	$19,440	$45,197	$782,962
2050	9,395	$22,491	$473,151	$9,508	($233,236)	($5,950,358)
2060	1,911	$3,636	$198,419	$3,325	($524,869)	($12,972,703)
2070	290	$444	$54,014	$870	($858,026)	($21,073,608)
2080	44	$25	$5,166	$105	($650,915)	($31,606,885)

(1) Cash flows for 2020 and 2080 are for six months only.
(2) Fund balances are as of the end of the calendar year, except for the opening balance (as of June 30, 2020) and the last projected fund balance (as of June 30, 2080).

Total Sum of All Cash Flows and Present Values ($ in Thousands)

	Expected Premiums	Expected Claims	Expenses	Investment Earnings
Total Sum of Cash Flows	$5,966,560	$23,124,539	$729,795	($18,589,624)
Present Value as of June 30, 2020	$4,119,028	$11,161,972	$416,074	($647,573)

Appendix B – 60 Year Projection of Fund Balance for Additional Discount Rate Sensitivity Testing from New York Regulation 126

Appendix B

Scenario 1 – Base Case

The tables below contain information about the margin, funded status, and expected cash flows for the next 60 years based on the actuarial assumptions used in this valuation. This is the base scenario including a discount rate and expected return assumption of 4.75%.

Main Results

Margin as Percentage of the Present Value of Premiums	Margin ($ in Millions)	Funded Status
1.3%	$53	101%

Projected Cash Flows and Fund Balance Over the Next 60 Years ($ in Thousands)

Calendar Year[1]	Lives	Expected Premiums	Expected Claims	Expenses	Investment Earnings	Fund Balance[2]
						$4,870,512
2020	114,824	$140,977	$174,382	$13,250	$113,796	$4,937,653
2021	107,924	$288,386	$361,165	$26,063	$231,858	$5,070,669
2022	103,446	$389,657	$383,576	$25,242	$240,182	$5,291,690
2023	99,170	$442,245	$404,631	$25,582	$251,726	$5,555,448
2024	94,787	$416,410	$425,812	$25,817	$263,143	$5,783,372
2025	90,322	$390,697	$445,721	$26,171	$272,885	$5,975,062
2026	85,822	$365,313	$463,675	$26,470	$280,956	$6,131,186
2027	81,293	$340,437	$479,902	$26,715	$287,394	$6,252,400
2028	76,774	$316,096	$495,181	$26,903	$292,216	$6,338,627
2029	72,291	$292,367	$510,669	$26,644	$295,393	$6,389,076
2030	67,857	$269,404	$524,934	$26,311	$296,916	$6,404,150
2040	29,489	$94,257	$559,897	$19,292	$233,773	$4,911,429
2050	8,400	$21,288	$343,105	$9,497	$116,256	$2,398,795
2060	1,644	$3,360	$133,967	$3,354	$46,778	$965,354
2070	241	$400	$33,936	$1,086	$27,162	$582,004
2080	36	$22	$3,046	$358	$16,125	$701,357

(1) Cash flows for 2020 and 2080 are for six months only.
(2) Fund balances are as of the end of the calendar year, except for the opening balance (as of June 30, 2020) and the last projected fund balance (as of June 30, 2080).

Total Sum of All Cash Flows and Present Values ($ in Thousands)

	Expected Premiums	Expected Claims	Expenses	Investment Earnings
Total Sum of Cash Flows	$5,872,611	$17,875,746	$726,352	$8,560,332
Present Value as of June 30, 2020	$3,919,742	$8,348,252	$389,348	$4,295,445

Appendix B

Scenario 2 - Discount Rate Increasing by 0.50% for 10 Years

The tables below contain information about the margin, funded status, and expected cash flows for the next 60 years under scenario 2 of the NY 7 interest rates scenarios.

Main Results

Margin as Percentage of the Present Value of Premiums	Margin ($ in Millions)	Funded Status
60.6%	$2,043	172%

Projected Cash Flows and Fund Balance Over the Next 60 Years ($ in Thousands)

Calendar Year[1]	Lives	Expected Premiums	Expected Claims	Expenses	Investment Earnings	Fund Balance[2]
						$4,870,512
2020	114,824	$140,977	$174,382	$13,250	$113,796	$4,937,653
2021	107,924	$288,386	$361,165	$26,063	$243,979	$5,082,790
2022	103,446	$389,657	$383,576	$25,245	$278,741	$5,342,367
2023	99,170	$442,245	$404,631	$25,592	$321,001	$5,675,390
2024	94,787	$416,410	$425,812	$25,842	$367,852	$6,007,996
2025	90,322	$390,697	$445,721	$26,219	$417,813	$6,344,566
2026	85,822	$365,313	$463,675	$26,551	$471,252	$6,690,905
2027	81,293	$340,437	$479,902	$26,840	$528,719	$7,053,319
2028	76,774	$316,096	$495,181	$27,087	$590,891	$7,438,037
2029	72,291	$292,367	$510,669	$26,902	$658,534	$7,851,368
2030	67,857	$269,404	$524,934	$26,663	$732,643	$8,301,817
2040	29,489	$94,257	$559,897	$21,857	$1,293,398	$14,311,927
2050	8,400	$21,288	$343,105	$19,020	$2,598,155	$29,074,673
2060	1,644	$3,360	$133,967	$34,842	$6,190,720	$69,602,086
2070	241	$400	$33,936	$103,124	$15,483,021	$174,212,805
2080	36	$22	$3,046	$155,371	$19,028,025	$418,559,491

(1) Cash flows for 2020 and 2080 are for six months only.
(2) Fund balances are as of the end of the calendar year, except for the opening balance (as of June 30, 2020) and the last projected fund balance (as of June 30, 2080).

Total Sum of All Cash Flows and Present Values ($ in Thousands)

	Expected Premiums	Expected Claims	Expenses	Investment Earnings
Total Sum of Cash Flows	$5,872,611	$17,875,746	$3,511,944	$429,204,057
Present Value as of June 30, 2020	$3,370,504	$5,854,515	$343,391	$14,244,682

Appendix B

Scenario 3 - Discount Rate Increasing 1% for Five Years then Decreasing 1% for Five Years

The tables below contain information about the margin, funded status, and expected cash flows for the next 60 years under scenario 3 of the NY 7 interest rates scenarios.

Main Results

Margin as Percentage of the Present Value of Premiums	Margin ($ in Millions)	Funded Status
28.3%	$978	125%

Projected Cash Flows and Fund Balance Over the Next 60 Years ($ in Thousands)

Calendar Year[1]	Lives	Expected Premiums	Expected Claims	Expenses	Investment Earnings	Fund Balance[2]
						$4,870,512
2020	114,824	$140,977	$174,382	$13,250	$113,796	$4,937,653
2021	107,924	$288,386	$361,165	$26,063	$256,072	$5,094,883
2022	103,446	$389,657	$383,576	$25,247	$317,449	$5,393,166
2023	99,170	$442,245	$404,631	$25,603	$391,520	$5,796,697
2024	94,787	$416,410	$425,812	$25,868	$476,839	$6,238,265
2025	90,322	$390,697	$445,721	$26,268	$573,340	$6,730,313
2026	85,822	$365,313	$463,675	$26,636	$617,092	$7,222,407
2027	81,293	$340,437	$479,902	$26,959	$589,328	$7,645,311
2028	76,774	$316,096	$495,181	$27,222	$547,178	$7,986,181
2029	72,291	$292,367	$510,669	$27,030	$491,858	$8,232,708
2030	67,857	$269,404	$524,934	$26,754	$425,202	$8,375,627
2040	29,489	$94,257	$559,897	$20,209	$375,603	$8,038,685
2050	8,400	$21,288	$343,105	$11,358	$341,074	$7,355,670
2060	1,644	$3,360	$133,967	$7,125	$402,803	$8,814,700
2070	241	$400	$33,936	$8,723	$590,280	$12,996,311
2080	36	$22	$3,046	$7,807	$455,697	$19,862,737

(1) Cash flows for 2020 and 2080 are for six months only.
(2) Fund balances are as of the end of the calendar year, except for the opening balance (as of June 30, 2020) and the last projected fund balance (as of June 30, 2080).

Total Sum of All Cash Flows and Present Values ($ in Thousands)

	Expected Premiums	Expected Claims	Expenses	Investment Earnings
Total Sum of Cash Flows	$5,872,611	$17,875,746	$940,275	$27,935,634
Present Value as of June 30, 2020	$3,452,541	$6,989,104	$355,713	$7,118,909

Appendix B

Scenario 4 – Discount Rate Increased 3%

The tables below contain information about the margin, funded status, and expected cash flows for the next 60 years under scenario 4 of the NY 7 interest rates scenarios.

Main Results

Margin as Percentage of the Present Value of Premiums	Margin ($ in Millions)	Funded Status
59.1%	$1,892	163%

Projected Cash Flows and Fund Balance Over the Next 60 Years ($ in Thousands)

Calendar Year[1]	Lives	Expected Premiums	Expected Claims	Expenses	Investment Earnings	Fund Balance[2]
						$4,870,512
2020	114,824	$140,977	$174,382	$13,250	$184,343	$5,008,200
2021	107,924	$288,386	$361,165	$26,077	$383,782	$5,293,126
2022	103,446	$389,657	$383,576	$25,286	$409,121	$5,683,041
2023	99,170	$442,245	$404,631	$25,662	$441,035	$6,136,029
2024	94,787	$416,410	$425,812	$25,938	$474,336	$6,575,025
2025	90,322	$390,697	$445,721	$26,340	$506,596	$7,000,257
2026	85,822	$365,313	$463,675	$26,694	$537,870	$7,413,070
2027	81,293	$340,437	$479,902	$27,001	$568,271	$7,814,876
2028	76,774	$316,096	$495,181	$27,261	$597,889	$8,206,418
2029	72,291	$292,367	$510,669	$27,082	$626,740	$8,587,775
2030	67,857	$269,404	$524,934	$26,840	$654,873	$8,960,278
2040	29,489	$94,257	$559,897	$21,497	$937,641	$12,790,076
2050	8,400	$21,288	$343,105	$16,094	$1,489,523	$20,540,014
2060	1,644	$3,360	$133,967	$21,474	$2,865,529	$39,764,167
2070	241	$400	$33,936	$49,963	$5,921,056	$82,279,355
2080	36	$22	$3,046	$62,759	$6,077,017	$165,852,023

(1) Cash flows for 2020 and 2080 are for six months only.
(2) Fund balances are as of the end of the calendar year, except for the opening balance (as of June 30, 2020) and the last projected fund balance (as of June 30, 2080).

Total Sum of All Cash Flows and Present Values ($ in Thousands)

	Expected Premiums	Expected Claims	Expenses	Investment Earnings
Total Sum of Cash Flows	$5,872,611	$17,875,746	$2,037,717	$175,022,362
Present Value as of June 30, 2020	$3,198,396	$5,842,953	$334,382	$12,118,217

Appendix B

Scenario 5 – Discount Rate Decreasing 0.50% for 10 Years

The tables below contain information about the margin, funded status, and expected cash flows for the next 60 years under scenario 5 of the NY 7 interest rates scenarios. Interest rates in future years are floored at 0%.

Main Results

Margin as Percentage of the Present Value of Premiums	Margin ($ in Millions)	Funded Status
(105.41%)	($5,098)	49%

Projected Cash Flows and Fund Balance Over the Next 60 Years ($ in Thousands)

Calendar Year[1]	Lives	Expected Premiums	Expected Claims	Expenses	Investment Earnings	Fund Balance[2]
						$4,870,512
2020	114,824	$140,977	$174,382	$13,250	$113,796	$4,937,653
2021	107,924	$288,386	$361,165	$26,063	$219,708	$5,058,519
2022	103,446	$389,657	$383,576	$25,240	$201,775	$5,241,135
2023	99,170	$442,245	$404,631	$25,572	$183,690	$5,436,868
2024	94,787	$416,410	$425,812	$25,792	$162,642	$5,564,315
2025	90,322	$390,697	$445,721	$26,124	$138,177	$5,621,344
2026	85,822	$365,313	$463,675	$26,393	$111,278	$5,607,867
2027	81,293	$340,437	$479,902	$26,598	$82,986	$5,524,790
2028	76,774	$316,096	$495,181	$26,737	$54,348	$5,373,316
2029	72,291	$292,367	$510,669	$26,417	$26,400	$5,154,997
2030	67,857	$269,404	$524,934	$26,015	$6,354	$4,879,806
2040	29,489	$94,257	$559,897	$18,062	$0	$668,573
2050	8,400	$21,288	$343,105	$8,470	$0	($3,506,336)
2060	1,644	$3,360	$133,967	$2,824	$0	($5,663,319)
2070	241	$400	$33,936	$707	$0	($6,371,915)
2080	36	$22	$3,046	$83	$0	($6,520,526)

(1) Cash flows for 2020 and 2080 are for six months only.
(2) Fund balances are as of the end of the calendar year, except for the opening balance (as of June 30, 2020) and the last projected fund balance (as of June 30, 2080).

Total Sum of All Cash Flows and Present Values ($ in Thousands)

	Expected Premiums	Expected Claims	Expenses	Investment Earnings
Total Sum of Cash Flows	$5,872,611	$17,875,746	$689,058	$1,301,154
Present Value as of June 30, 2020	$4,836,339	$14,248,337	$556,673	$1,148,283

Appendix B

Scenario 6 – Discount Rate Decreasing 1% for Five Years then Increasing 1% for Five Years

The tables below contain information about the margin, funded status, and expected cash flows for the next 60 years under scenario 6 of the NY 7 interest rates scenarios. Interest rates in future years are floored at 0%.

Main Results

Margin as Percentage of the Present Value of Premiums	Margin ($ in Millions)	Funded Status
(25.76%)	($1,160)	81%

Projected Cash Flows and Fund Balance Over the Next 60 Years ($ in Thousands)

Calendar Year[1]	Lives	Expected Premiums	Expected Claims	Expenses	Investment Earnings	Fund Balance[2]
						$4,870,512
2020	114,824	$140,977	$174,382	$13,250	$113,796	$4,937,653
2021	107,924	$288,386	$361,165	$26,063	$207,529	$5,046,340
2022	103,446	$389,657	$383,576	$25,237	$163,519	$5,190,702
2023	99,170	$442,245	$404,631	$25,561	$116,888	$5,319,643
2024	94,787	$416,410	$425,812	$25,768	$66,278	$5,350,750
2025	90,322	$390,697	$445,721	$26,079	$19,959	$5,289,606
2026	85,822	$365,313	$463,675	$26,321	$19,456	$5,184,379
2027	81,293	$340,437	$479,902	$26,504	$63,522	$5,081,932
2028	76,774	$316,096	$495,181	$26,636	$111,761	$4,987,973
2029	72,291	$292,367	$510,669	$26,327	$157,851	$4,901,195
2030	67,857	$269,404	$524,934	$25,954	$202,028	$4,821,739
2040	29,489	$94,257	$559,897	$18,556	$119,933	$2,401,328
2050	8,400	$21,288	$343,105	$8,470	($64,228)	($1,580,857)
2060	1,644	$3,360	$133,967	$2,824	($239,830)	($5,354,851)
2070	241	$400	$33,936	$707	($428,442)	($9,465,066)
2080	36	$22	$3,046	$83	($341,871)	($14,906,932)

(1) Cash flows for 2020 and 2080 are for six months only.
(2) Fund balances are as of the end of the calendar year, except for the opening balance (as of June 30, 2020) and the last projected fund balance (as of June 30, 2080).

Total Sum of All Cash Flows and Present Values ($ in Thousands)

	Expected Premiums	Expected Claims	Expenses	Investment Earnings
Total Sum of Cash Flows	$5,872,611	$17,875,746	$693,537	($7,080,773)
Present Value as of June 30, 2020	$4,503,483	$10,084,399	$449,506	$939,328

Scenario 7 – Discount Rate Decreasing 3%

The tables below contain information about the margin, funded status, and expected cash flows for the next 60 years under scenario 7 of the NY 7 interest rates scenarios.

Main Results

Margin as Percentage of the Present Value of Premiums	Margin ($ in Millions)	Funded Status
(74.9%)	($3,736)	57%

Projected Cash Flows and Fund Balance Over the Next 60 Years ($ in Thousands)

Calendar Year[1]	Lives	Expected Premiums	Expected Claims	Expenses	Investment Earnings	Fund Balance[2]
						$4,870,512
2020	114,824	$140,977	$174,382	$13,250	$42,232	$4,866,089
2021	107,924	$288,386	$361,165	$26,049	$84,165	$4,851,426
2022	103,446	$389,657	$383,576	$25,199	$84,651	$4,916,959
2023	99,170	$442,245	$404,631	$25,506	$86,184	$5,015,251
2024	94,787	$416,410	$425,812	$25,705	$87,494	$5,067,637
2025	90,322	$390,697	$445,721	$26,019	$88,009	$5,074,604
2026	85,822	$365,313	$463,675	$26,274	$87,749	$5,037,716
2027	81,293	$340,437	$479,902	$26,471	$86,741	$4,958,521
2028	76,774	$316,096	$495,181	$26,608	$85,009	$4,837,838
2029	72,291	$292,367	$510,669	$26,292	$82,558	$4,675,802
2030	67,857	$269,404	$524,934	$25,900	$79,400	$4,473,771
2040	29,489	$94,257	$559,897	$18,082	$17,115	$753,021
2050	8,400	$21,288	$343,105	$8,470	($60,658)	($3,690,495)
2060	1,644	$3,360	$133,967	$2,824	($115,407)	($6,775,758)
2070	241	$400	$33,936	$707	($151,889)	($8,848,006)
2080	36	$22	$3,046	$83	($91,523)	($10,598,431)

(1) Cash flows for 2020 and 2080 are for six months only.
(2) Fund balances are as of the end of the calendar year, except for the opening balance (as of June 30, 2020) and the last projected fund balance (as of June 30, 2080).

Total Sum of All Cash Flows and Present Values ($ in Thousands)

	Expected Premiums	Expected Claims	Expenses	Investment Earnings
Total Sum of Cash Flows	$5,872,611	$17,875,746	$687,851	($2,777,958)
Present Value as of June 30, 2020	$4,988,778	$13,059,000	$536,691	($693,816)

Appendix C – Long-Term Care Model and Assumptions

Model

Projection results are based on the 116,832 in-force participants as of June 30, 2020. CalPERS LTC business consists of facility-only and comprehensive coverage options and includes a variety of elimination periods, benefit periods, and inflation coverage combinations. New optional benefits available to LTC4 policies, which include 3% simple or compound automatic inflation protection, 5% simple automatic inflation protection, restoration of benefits, and survivorship benefit, are projected in the model. A summary of the model cells we used for projection purposes has been included as Appendix D; the projection results for each cell reflect output from the First Principles Model.

The first principles modeling approach is becoming the industry standard for modeling long-term care insurance. This approach includes more detailed modeling on claim incidence, claim termination, and utilization. The First Principles Model automatically tracks policyholder status: policyholders are classified as "active", "disabled" (including site of care), or "inactive" (due to lapsation, death, or benefit expiration). In addition to tracking policyholder status, the First Principles Model follows lives as they progress through claims or as they recover back into the healthy population, tracking their used and remaining benefits. This detailed tracking of lives allows first principles models to more accurately project when benefits will be exhausted and to more accurately reflect the claim payment patterns as claimants move along their respective continuance curves.

Benefit exhaustion and the runout of incurred claims into paid claims are calculated inside the model. For the runout of incurred claims into paid claims, the First Principles Model pays claims exactly as the continuance curve and utilization assumptions suggest, allowing for detailed patterns of all segments of the population.

Important statistics such as the number of new and open claims, the rate at which claims are terminating (often distinguished between death, recovery, and exhaustion), and the split of the population between disabled and healthy lives can be easily tracked using the information available in the First Principles Model. These statistics offer increased transparency on what is driving deviations in experience, e.g., higher/lower-than-assumed claim incidence or longer/shorter-than-expected claim persistence. The ability to directly compare these figures against emerging experience is a useful tool which is not readily available from the Claim Cost Model. Used together with sensitivity testing, the additional information accessible in the First Principles Model allows for better insight into the CalPERS Program and the impacts of different assumption changes on its projected development.

The first principles modeling gives more credibility to CalPERS experience and provides more detailed actual-to-expected observations including the number of new claimants, the number of claim terminations, and the utilization of benefits.

Appendix C

Assumptions

Morbidity

There are three separate morbidity assumptions. The first assumption is the incidence rate, which determines the probability that an individual will go on claim at a given time. The second assumption is the continuance rate, or claim termination rate, which is the probability that an individual will continue with their claim from one month to the next. The third assumption is the claim utilization rate, which determines how much of the available benefit a policyholder will use while on claim as a percentage of the maximum benefit available.

Claim Incidence Rates

The incidence rate is developed using CalPERS claim data. When there is insufficient claim data available for full credibility, CalPERS experience rates are credibility weighted with the industry data using the 2000-2011 Long-Term Care Intercompany Experience Study Aggregated Databases from the Society of Actuaries (SOA). Before credibility weighting, adjustment factors are applied to incidence rates from industry data to bring the incidence distribution by site of care more in line with CalPERS experience.

A link to the SOA study and associated databases can be found at https://www.soa.org/experience-studies/2015/research-ltc-study-2000-11-aggregrated/. Please note that this is a website outside of CalPERS and the web address may be subject to change or removal. Unless noted otherwise, all references to SOA material in this section refer to this report and its associated databases.

Separate incidence rates were developed for the following categories:

- Gender: Male or Female
- Attained Age Bands: 0-49, 50-54, 55-59, 60-64, 65-69, 70-74, 75-79, 80-84, 85-89, or 90+
- Initial Site of Care: Home Health Care, Assisted Living Facility, or Nursing Home
- Policy Type: Comprehensive or Non-Comprehensive
- Duration of Claim: Long Duration or Short Duration claims. The initial diagnosis of a claim is used to identify potential Long Duration claims. Claims with initial diagnosis in the following diagnosis categories are identified as Long Duration claims: Alzheimer's, Mental, and Nervous System and Sense Organs.

The incidence study for the June 30, 2020 valuation uses all claim and exposure information as of June 30, 2020, with an experience study cutoff date at December 31, 2018. The experience study uses the following steps to calculate the incidence rates:

- Step 1: Aggregate the active life exposure.
    - The active life exposure is found by adding up all exposures while an individual is not on claim. In years when an individual does go on claim, a full year of exposure is credited to the individual for that year.
- Step 2: Aggregate claim counts.
    - The claim counts are grouped based on the different categories mentioned previously.
- Step 3: Calculate the incidence rates based on CalPERS experience.
    - The incidence rates are the total number of claims divided by the exposure.
- Step 4: Obtain incidence rates based on industry experience.
    - Base industry incidence rates are obtained from the SOA 2000-2011 Claim Incidence Rates Database. The base rates are then split between Long Duration and Short Duration claims. The split ratio is determined by the ratio between Long and Short Duration exposure amounts from the SOA 2000-2011 Claim Termination Rates Database.

Appendix C

Assumptions (continued)

- Step 5: Develop adjustment factors for industry incidence rates.
    - It was observed that compared to CalPERS data, SOA pre-2011 data had higher distribution in claims with Nursing Home as initial site of care. CalPERS data overall has higher distribution in Assisted Living Facility and Home Health Care claims. As a result, adjustment factors are developed to bring site of care distribution of the industry incidence rates more in line with CalPERS experience.
- Step 6: Calculate the credibility-weighted incidence rates.
    - Final incidence rates are credibility-weighted averages between the rates from CalPERS experience and the rates from SOA industry data.
    - CalPERS experience receives full credibility in areas with 271 or more claims. Otherwise, CalPERS experience receives partial or zero credibility.
- Step 7: Develop adjustment factors for underwriting groups, benefit period, marital status, and partnership policies.
    - Underwriting group factors are developed to reflect the variation in claim incidence rates between different underwriting methods. This set of factors is developed by underwriting group and by policy duration. Underwriting groups include Short Form (SF), Modified Guarantee Issue (MGI) with issue dates in 1995, MGI with issue dates after 1996, Long Form (LF) with issue dates from 1995 to 1998, and LF with issue dates after 1999. The underwriting group factors also include an adjustment component to adjust the actual-to-expected ratio of historical claim counts to 100%.
    - Benefit period factors are developed to reflect the variation in claim incidence rates between lifetime-benefit policies and non-lifetime-benefit policies.
    - Marital status factors are developed to reflect the variation in claim incidence rates between married and single policyholders.
    - Partnership policy adjustment factor is developed using actual-to-expected method to distinguish incidence rate between partnership and non-partnership comprehensive polices.
- Step 8: Apply morbidity improvement factors.
    - 90% of the SOA Mortality Improvement Scale MP-2016 is used for morbidity improvement factors, with annual improvement amount capped at 0.75%. Fifteen years of morbidity improvement projection are included in the assumption from year 2020. A link to SOA's table and report can be found at: https://www.soa.org/experience-studies/2016/mortality-improvement-scale-mp-2016/.

Claim Termination Rates

The claim termination rates are developed using CalPERS claim data. When there is insufficient claim data available for full credibility, the termination rates are credibility weighted with industry data using the 2000-2011 Long Term Care Intercompany Experience Study Aggregated Databases from the SOA. Adjustment factors are then applied to make the actual-to-expected ratio 100% based on historical data.

A link to the study and the databases can be found at https://www.soa.org/experience-studies/2015/research-ltc-study-2000-11-aggregrated/. Please note that this is a website outside of CalPERS and the web address may be subject to change or removal. Unless noted otherwise, all references to SOA material in this section refer to this report and its associated databases.

Appendix C

Assumptions (continued)

Separate claim termination rates were developed for the following categories:

- Gender: Male or Female
- Incurred Age Bands: 0-64, 65-74, 75-84, 85-89, or 90+
- Initial Site of Care: Home Health Care, Assisted Living Facility, or Nursing Home
    - Due to low data volume, ages 0-64 does not have separate claim termination rates for each site of care.
- Days on Claim: rates were developed for each 30-day interval starting from the incurred date of a claim.
- Duration of Claim: Claims with initial diagnosis in the following diagnosis categories are identified as Long Duration claims: Alzheimer's, Mental, and Nervous System and Sense Organs.

The claim termination study for the June 30, 2020 valuation uses all claim and exposure information as of June 30, 2020 and an experience study cutoff date at December 31, 2018. The claim termination study uses the following steps to calculate the claim termination rates:

- Step 1: Calculate exposure.
    - Exposure is the calculated open claim counts during each 30-day on-claim interval and is aggregated based on claim characteristics.
- Step 2: Obtain claim termination counts.
    - Terminations are non-benefit-exhaustion claim counts that closed during each 30-day on-claim interval and are aggregated based on claim characteristics.
- Step 3: Calculate the CalPERS-experience-based claim termination rate.
    - Claim termination rates are calculated as the claim termination counts in a given period divided by the exposure in that period.
- Step 4: Calculate industry claim termination rates.
    - The SOA Claim Termination Rates Database 2000-2011 was used to develop the industry rates. For areas without sufficient industry data, CalPERS' disabled mortality values were used.
- Step 5: Calculate the credibility-weighted claim termination rates.
    - Final claim termination rates are credibility-weighted averages between rates based on CalPERS experience and industry data.
    - CalPERS experience receives full credibility in areas with 271 or more exposure. Otherwise, CalPERS experience receives partial or zero credibility.
- Step 6: Apply A/E adjustment factors.
    - After Step 5, adjustment factors are applied to rates in each claim groups so that the actual-to-expected ratios of termination counts is 100% compared to historical data.
- Step 7: Develop marital status factors.
    - Marital status factors are applied in projection to reflect claim termination rate variations between the married and not-married populations. They are calculated for each age band and based on marital status at issue.

Claim Utilization Rate

The claim utilization assumption is developed using CalPERS' total claim data as of June 30, 2020. The assumption structure captures utilization rate variations by claims' initial site of care, MDB range, product series, benefit period, and yearly increase trend.

The claim utilization assumption is developed by following the steps below:

- Step 1: summarize the total benefit paid for each claim category

Appendix C

Assumptions (continued)

- Step 2: summarize total historical benefit allowance for each claim category
- Step 3: Derive utilization rate by site of care and MDB range for LTC1 using historical data
- Step 4: Calculate product series adjustment factors for LTC2 to LTC4 based on LTC1 result using actual-to-expected method
- Step 5: Calculate benefit period adjustment factors using actual-to-expected method
- Step 6: Calculate yearly increase adjustment factors using actual-to-expected method
- Step 7: Derive cumulative yearly increase cap based on historical data
- Step 8: Utilization rates in the initial projection year for existing open claims are based on the recent year data of each individual claim if there is 180 days or greater exposure.

Mortality

Since CalPERS does not have a sufficiently large enough population to develop its own mortality rates, the SOA 2012 Individual Annuitant Mortality (IAM) table was used as a baseline. Adjustment factors are then applied based on CalPERS plan experience. The First Principles Model uses two separate sets of adjustments to the IAM table, one for active mortality and one for disabled mortality.

The mortality study for the June 30, 2020 valuation uses the program's mortality and exposure data as of June 30, 2020, with an experience study cutoff date at December 31, 2018. The following steps are used to develop the mortality assumption:

- Step 1: Obtain death counts and develop active and disabled life exposures.
    - Death and exposure data are divided into several categories: active or disabled, age, gender, policy duration, and marital status. If there is a death, a full year of exposure is credited to the individual at the age of death.
- Step 2: Develop duration selection factors.
    - Duration selection factors are developed by comparing actual mortality and expected mortality (based on the IAM table) at each policy duration.
- Step 3: Develop marriage factors.
    - Marriage factors for active mortality vary by gender and attained age. They are derived by taking the ratio of A/E mortality for single and married active policies (split by attained age and gender) and calculating factors that will get those ratios close to 100 percent.
- Step 4: Develop attained age factors.
    - Attained age factors are developed by comparing actual mortality and expected mortality (based on the IAM table) at each attained age grouping. Age grouping intervals are determined so that each group has sufficient data credibility. The attained age factors are developed separately by gender and by active or disabled status. Attained age factors for disabled status are smoothed over the age group intervals.
- Step 5: Apply mortality improvement factors.
    - 90% of the SOA Mortality improvement Scale MP-2016 is used for mortality improvement factors, with a 15-year mortality improvement projection period. A link to SOA's table and report can be found at https://www.soa.org/experience-studies/2016/mortality-improvement-scale-mp-2016/.

Appendix C

Assumptions (continued)

Lapse

The lapse study for the June 30, 2020 valuation uses the program's lapse and exposure data as of June 30, 2020, with an experience study cutoff date at December 31, 2018. Lapse rates are calculated as the number of voluntary lapses divided by the total active life exposures. Shock lapses, which are determined as the lapses during rate increase years, are excluded from lapse counts. Policy terminations due to death or expiration of benefit are not included in this study. When a policy lapses, it receives a full year exposure at the duration of lapse. Due to the relatively low level of lapse experience in the recent two years, adjustment factors are applied to the final lapse rates to bring the assumption in line with recent experience.

Lapse rates are broken down by the following categories: issue age group and policy duration.

The following assumed voluntary lapse rates were used for all projection cells:

Policy Year	Issue Age Group					
	< 40	40 – 49	50 – 59	60 – 69	70 – 79	80+
1	4.51%	3.25%	2.66%	2.39%	2.46%	3.47%
2	3.23%	2.09%	1.59%	1.14%	1.25%	2.10%
3	2.28%	1.38%	0.97%	0.76%	0.73%	1.39%
4	2.21%	1.13%	0.76%	0.47%	0.57%	0.82%
5	1.45%	0.83%	0.51%	0.39%	0.47%	0.86%
6	1.34%	0.77%	0.43%	0.31%	0.46%	1.15%
7	1.39%	0.71%	0.41%	0.25%	0.34%	0.74%
8	1.09%	0.57%	0.35%	0.26%	0.39%	0.48%
9	1.10%	0.58%	0.37%	0.21%	0.42%	0.50%
10	1.11%	0.68%	0.41%	0.32%	0.36%	0.98%
11+	0.59%	0.35%	0.26%	0.46%	0.85%	1.16%

Expenses

We used the following expense assumptions:

- The third-party administrator (TPA) cost assumptions reflect the five-year contract with Long Term Care Group (LTCG), which became effective in 2018. Expenses after the five-year contract are assumed to increase at an annual inflation rate of 2.50%.
- CalPERS non-TPA expenses are assumed to be $475,119 per month through December of 2020 and assumed to increase by 2.50% for inflation each January thereafter.
- Projected inflated fixed-dollar fees are assumed to decrease in January 2028 by the ratio of the current in-force count to the prior year's in-force count. This is intended to reflect the fact that eventually when the Program's volume decline, expenses would decline as well.
- An option for participants to pay premiums with credit card has been available since 2014. It is assumed that 1.93% of premiums will be paid with credit card each year. The credit card fee is 1.70% of transaction amount, resulting in the credit card expense fee to be 0.033% of total premium.

Discount Rate

The 4.75% discount rate used in this valuation is based on the target asset allocation adopted by the Investment Committee of the board in March 2021. It is based on a blend of 10-year and 30-year capital market assumptions as of September 30, 2020. The blending method calculates the present value of expected cashflows using the short-term and long-term expected returns derived from the capital market assumptions, then find a level discount rate that would result in the same present value of expected cashflows. The final discount rate assumption is rounded down to the nearest quarter.

Appendix C

Assumptions (continued)

Rate Increase Related Assumptions

2012 Rate Increase Anti-Selection Factors

During the 85% rate increase implementation starting in 2012, plan conversion options were given to policyholders to either avoid the rate increase or minimize its financial impact. The model assumptions include anti-selection factors related to this increase.

A rate increase may prompt healthier participants to lapse or reduce benefits to lower the impact of a rate increase. Therefore, the total risk pool will be less healthy after a rate increase. A higher risk will be assumed for policyholders that did not convert to benefit plans with lower benefit allowance.

Anti-selection is difficult to measure, and we have not attempted to determine the actual anti-selection experienced by CalPERS. As a result, the suggested anti-selection factor is an estimate. The anti-selection factors are twice the shock lapse rate and grade down to 0% over 10 years.

Anti-selection factors vary by benefit plan and are applied to the 2013, 2014, 2015, and 2016 conversions. Please see the table below for the groups that received or will receive the anti-selection factors.

For those policies that accepted the rate increase, the following anti-selection factors are applied to increase the future morbidity risk.

LTC1 & LTC 2, Lifetime, Inflation Receiving the 85% Premium Rate Increase Anti-Selection Factors Related to Shock Lapse and Conversion		
Calendar Year	LTC1	LTC2
2020	1.1000	1.0936
2021	1.0731	1.0722
2022	1.0464	1.0510
2023	1.0199	1.0298
2024	1.0083	1.0109
2025	1.0016	1.0014
2026+	1.0000	1.0000

All Other Plans Receiving the 85% Premium Rate Increase Anti-Selection Factors Related to Shock Lapse	
Calendar Year	LTC1 & LTC2
2020	1.014
2021	1.010
2022	1.006
2023	1.002
2024+	1.000

Appendix C

Assumptions (continued)

For those policies that converted to a 10-year Benefit Increase Option, the following anti-selection factors are applied to decrease the future morbidity risk because it is assumed that healthier participants are more likely to lower their benefits to pay lower premiums when there is a rate increase.

LTC1 & LTC 2, 10-Year Benefit Increase Option Selection Factors		
Calendar Year	LTC1	LTC2
2020	0.9239	0.9071
2021	0.9439	0.9271
2022	0.9639	0.9471
2023	0.9839	0.9671
2024	0.9925	0.9871
2025	0.9986	0.9983
2026+	1.0000	1.0000

2021 Rate Increase Assumptions

The projection in this valuation assumes that shock lapses caused by the 2021 rate increase would be 3% of the population. This accounts for the total shock lapses associated with both phases of the rate increase.

Anti-selection due to the shock lapses is accounted for in the projections. It is assumed that the claim incidence rate in the population after the shock lapses would be 2.47% higher. This factor is derived by assuming the claim incidence risk of the shock lapse population being 20% of the plan average. This effect is set to grade down over 10 years as shown below. No conversion is assumed in the base result of this valuation.

Anti-Selection Factors Related to 2021 Shock Lapse	
Calendar Year	Anti-Selection Factor
2022	1.0247
2023	1.0223
2024	1.0198
2025	1.0173
2026	1.0148
2027	1.0124
2028	1.0099
2029	1.0074
2030	1.0049
2031+	1.0025

Appendix D – Summary of Model Cells

Summary of Model Cells Included in 6/30/2020 Projection[1]

Product Series	Plan Type	HHC	ALF	Benefit Period	Elimination Period	Inflation	Underwriting Type	Policy Count	Annualized Premium
LTC1	Comprehensive	50% HHC	50% ALF	3 Year	90	Inflation	LF	1,380	4,312,331
LTC1	Comprehensive	50% HHC	50% ALF	3 Year	90	Inflation	MGI	645	1,564,323
LTC1	Comprehensive	50% HHC	50% ALF	3 Year	90	Inflation	SF	542	1,396,508
LTC1	Comprehensive	50% HHC	50% ALF	3 Year	90	No Inflation	LF	6,867	12,470,470
LTC1	Comprehensive	50% HHC	50% ALF	3 Year	90	No Inflation	MGI	2,356	3,369,693
LTC1	Comprehensive	50% HHC	50% ALF	3 Year	90	No Inflation	SF	2,114	3,057,131
LTC1	Comprehensive	50% HHC	50% ALF	6 Year	90	Inflation	LF	875	3,175,227
LTC1	Comprehensive	50% HHC	50% ALF	6 Year	90	Inflation	MGI	574	1,586,378
LTC1	Comprehensive	50% HHC	50% ALF	6 Year	90	Inflation	SF	487	1,529,026
LTC1	Comprehensive	50% HHC	50% ALF	6 Year	90	No Inflation	LF	8,211	15,447,715
LTC1	Comprehensive	50% HHC	50% ALF	6 Year	90	No Inflation	MGI	4,394	6,952,913
LTC1	Comprehensive	50% HHC	50% ALF	6 Year	90	No Inflation	SF	3,870	6,036,780
LTC1	Comprehensive	50% HHC	50% ALF	10 Year	90	No Inflation	LF	9,284	26,917,935
LTC1	Comprehensive	50% HHC	50% ALF	10 Year	90	No Inflation	MGI	4,439	11,858,985
LTC1	Comprehensive	50% HHC	50% ALF	10 Year	90	No Inflation	SF	3,851	10,035,745
LTC1	Comprehensive	50% HHC	50% ALF	Lifetime	90	Inflation	LF	6,990	38,422,028
LTC1	Comprehensive	50% HHC	50% ALF	Lifetime	90	Inflation	MGI	6,333	27,086,193
LTC1	Comprehensive	50% HHC	50% ALF	Lifetime	90	Inflation	SF	4,222	19,240,123
LTC1	Comprehensive	50% HHC	50% ALF	Lifetime	90	No Inflation	LF	1,856	7,111,571
LTC1	Comprehensive	50% HHC	50% ALF	Lifetime	90	No Inflation	MGI	1,756	5,161,874
LTC1	Comprehensive	50% HHC	50% ALF	Lifetime	90	No Inflation	SF	1,188	3,470,400
LTC1	Comprehensive	50% HHC	50% ALF	In-Nonforfeiture	90	NA	LF	10	0
LTC1	Comprehensive	50% HHC	50% ALF	In-Nonforfeiture	90	NA	MGI	2	0
LTC1	Comprehensive	50% HHC	50% ALF	In-Nonforfeiture	90	NA	SF	1	0
LTC1	Facilities Only		50% ALF	3 Year	90	Inflation	LF	469	1,212,585
LTC1	Facilities Only		50% ALF	3 Year	90	Inflation	MGI	213	417,757
LTC1	Facilities Only		50% ALF	3 Year	90	Inflation	SF	196	411,455
LTC1	Facilities Only		50% ALF	3 Year	90	No Inflation	LF	3,283	4,793,849
LTC1	Facilities Only		50% ALF	3 Year	90	No Inflation	MGI	746	819,498
LTC1	Facilities Only		50% ALF	3 Year	90	No Inflation	SF	755	849,420
LTC1	Facilities Only		50% ALF	6 Year	90	Inflation	LF	129	421,204
LTC1	Facilities Only		50% ALF	6 Year	90	Inflation	MGI	57	145,336
LTC1	Facilities Only		50% ALF	6 Year	90	Inflation	SF	106	289,341
LTC1	Facilities Only		50% ALF	6 Year	90	No Inflation	LF	2,695	4,526,960
LTC1	Facilities Only		50% ALF	6 Year	90	No Inflation	MGI	662	874,233
LTC1	Facilities Only		50% ALF	6 Year	90	No Inflation	SF	762	948,317
LTC1	Facilities Only		50% ALF	10 Year	90	No Inflation	LF	2,413	6,101,475
LTC1	Facilities Only		50% ALF	10 Year	90	No Inflation	MGI	676	1,417,281
LTC1	Facilities Only		50% ALF	10 Year	90	No Inflation	SF	800	1,600,922
LTC1	Facilities Only		50% ALF	Lifetime	90	Inflation	LF	1,163	5,541,851
LTC1	Facilities Only		50% ALF	Lifetime	90	Inflation	MGI	551	1,982,350
LTC1	Facilities Only		50% ALF	Lifetime	90	Inflation	SF	573	2,064,701
LTC1	Facilities Only		50% ALF	Lifetime	90	No Inflation	LF	560	1,862,444
LTC1	Facilities Only		50% ALF	Lifetime	90	No Inflation	MGI	192	432,941
LTC1	Facilities Only		50% ALF	Lifetime	90	No Inflation	SF	162	377,432
LTC1	Facilities Only		50% ALF	In-Nonforfeiture	90	NA	LF	2	0

1) Model cells include all in-force data as of June 30, 2020. All benefits, including selected optional benefits, are valued in the projection except Benefit Increase Options.

Abbreviation	Description
ALF	Assisted Living Facility
HHC	Home Health Care
LF U/W	Long Form Underwriting
MGI U/W	Modified Guaranteed Issue Underwriting
SF U/W	Short Form Underwriting

Appendix D

Summary of Model Cells Included in 6/30/2020 Projection[1]

(LTC1 Continued)

LTC1	Partnership	50% HHC	50% ALF	6 Mo	30	Inflation	LF	56	47,111
LTC1	Partnership	50% HHC	50% ALF	6 Mo	30	Inflation	MGI	14	6,959
LTC1	Partnership	50% HHC	50% ALF	6 Mo	30	Inflation	SF	8	4,395
LTC1	Partnership	50% HHC	50% ALF	1 Year	30	Inflation	LF	701	760,433
LTC1	Partnership	50% HHC	50% ALF	1 Year	30	Inflation	MGI	232	169,654
LTC1	Partnership	50% HHC	50% ALF	1 Year	30	Inflation	SF	224	154,763
LTC1	Partnership	50% HHC	50% ALF	2 Year	30	Inflation	LF	1,306	2,108,710
LTC1	Partnership	50% HHC	50% ALF	2 Year	30	Inflation	MGI	453	518,763
LTC1	Partnership	50% HHC	50% ALF	2 Year	30	Inflation	SF	511	544,965
LTC1	Partnership	50% HHC	50% ALF	In-Nonforfeiture	30	NA	LF	66	0
LTC1	Partnership	50% HHC	50% ALF	In-Nonforfeiture	30	NA	MGI	40	0
LTC1	Partnership	50% HHC	50% ALF	In-Nonforfeiture	30	NA	SF	12	0
LTC1 Subtotal								**93,035**	**251,610,456**

Product Series	Plan Type	HHC	ALF	Benefit Period	Elimination Period	Inflation	Underwriting Type	Policy Count	Annualized Premium
LTC2	Comprehensive	50% HHC	70% ALF	3 Year	90	Inflation	LF	214	787,123
LTC2	Comprehensive	50% HHC	70% ALF	3 Year	90	Inflation	MGI	3	11,767
LTC2	Comprehensive	50% HHC	70% ALF	3 Year	90	Inflation	SF	3	15,850
LTC2	Comprehensive	50% HHC	70% ALF	3 Year	90	No Inflation	LF	1,345	2,310,807
LTC2	Comprehensive	50% HHC	70% ALF	3 Year	90	No Inflation	MGI	9	18,628
LTC2	Comprehensive	50% HHC	70% ALF	3 Year	90	No Inflation	SF	8	11,307
LTC2	Comprehensive	50% HHC	70% ALF	6 Year	90	Inflation	LF	17	84,514
LTC2	Comprehensive	50% HHC	70% ALF	6 Year	90	Inflation	SF	1	5,680
LTC2	Comprehensive	50% HHC	70% ALF	6 Year	90	No Inflation	LF	1,408	2,631,007
LTC2	Comprehensive	50% HHC	70% ALF	6 Year	90	No Inflation	MGI	22	46,486
LTC2	Comprehensive	50% HHC	70% ALF	6 Year	90	No Inflation	SF	18	42,459
LTC2	Comprehensive	50% HHC	70% ALF	10 Year	90	No Inflation	LF	1,586	4,156,086
LTC2	Comprehensive	50% HHC	70% ALF	10 Year	90	No Inflation	MGI	10	26,022
LTC2	Comprehensive	50% HHC	70% ALF	10 Year	90	No Inflation	SF	10	31,321
LTC2	Comprehensive	50% HHC	70% ALF	Lifetime	90	Inflation	LF	1,019	5,701,606
LTC2	Comprehensive	50% HHC	70% ALF	Lifetime	90	Inflation	MGI	10	73,457
LTC2	Comprehensive	50% HHC	70% ALF	Lifetime	90	Inflation	SF	9	51,713
LTC2	Comprehensive	50% HHC	70% ALF	Lifetime	90	No Inflation	LF	587	1,962,147
LTC2	Comprehensive	50% HHC	70% ALF	Lifetime	90	No Inflation	MGI	5	14,875
LTC2	Comprehensive	50% HHC	70% ALF	Lifetime	90	No Inflation	SF	3	8,980
LTC2	Facilities Only		70% ALF	3 Year	90	Inflation	LF	32	97,647
LTC2	Facilities Only		70% ALF	3 Year	90	No Inflation	LF	283	360,637
LTC2	Facilities Only		70% ALF	6 Year	90	Inflation	LF	9	29,942
LTC2	Facilities Only		70% ALF	6 Year	90	No Inflation	LF	237	348,746
LTC2	Facilities Only		70% ALF	10 Year	90	No Inflation	LF	245	461,426
LTC2	Facilities Only		70% ALF	10 Year	90	No Inflation	MGI	1	3,277
LTC2	Facilities Only		70% ALF	10 Year	90	No Inflation	SF	1	1,542
LTC2	Facilities Only		70% ALF	Lifetime	90	Inflation	LF	114	434,049
LTC2	Facilities Only		70% ALF	Lifetime	90	Inflation	MGI	1	8,989
LTC2	Facilities Only		70% ALF	Lifetime	90	No Inflation	LF	50	148,652
LTC2	Partnership	50% HHC	70% ALF	6 Mo	30	Inflation	LF	7	5,753
LTC2	Partnership	50% HHC	70% ALF	1 Year	30	Inflation	LF	72	82,150
LTC2	Partnership	50% HHC	70% ALF	2 Year	30	Inflation	LF	142	270,944
LTC2 Subtotal								**7,481**	**20,245,590**

1) Model cells include all in-force data as of June 30, 2020. All Benefits, including selected optional benefits, are valued in the projection except Benefit Increase Options.

Abbreviation	Description
ALF	Assisted Living Facility
HHC	Home Health Care
LF U/W	Long Form Underwriting
MGI U/W	Modified Guaranteed Issue Underwriting
SF U/W	Short Form Underwriting

Appendix D

Summary of Model Cells Included in 6/30/2020 Projection[1]

Product Series	Plan Type	HHC	ALF	Benefit Period	Elimination Period	Inflation	Underwriting Type	Policy Count	Annualized Premium
LTC3	Comprehensive	70% HHC	70% ALF	3 Year	90	Inflation	LF	1,935	3,795,608
LTC3	Comprehensive	70% HHC	70% ALF	3 Year	90	Inflation	MGI	310	412,348
LTC3	Comprehensive	70% HHC	70% ALF	3 Year	90	Inflation	SF	341	492,130
LTC3	Comprehensive	70% HHC	70% ALF	3 Year	90	No Inflation	LF	717	1,145,400
LTC3	Comprehensive	70% HHC	70% ALF	3 Year	90	No Inflation	MGI	57	68,640
LTC3	Comprehensive	70% HHC	70% ALF	3 Year	90	No Inflation	SF	41	31,381
LTC3	Comprehensive	70% HHC	70% ALF	6 Year	90	Inflation	LF	2,209	5,735,133
LTC3	Comprehensive	70% HHC	70% ALF	6 Year	90	Inflation	MGI	412	798,795
LTC3	Comprehensive	70% HHC	70% ALF	6 Year	90	Inflation	SF	385	807,902
LTC3	Comprehensive	70% HHC	70% ALF	6 Year	90	No Inflation	LF	2,143	3,879,777
LTC3	Comprehensive	70% HHC	70% ALF	6 Year	90	No Inflation	MGI	531	676,365
LTC3	Comprehensive	70% HHC	70% ALF	6 Year	90	No Inflation	SF	413	546,660
LTC3	Comprehensive	70% HHC	70% ALF	10 Year	90	No Inflation	LF	6	16,201
LTC3	Comprehensive	70% HHC	70% ALF	Lifetime	90	Inflation	LF	1,065	3,858,461
LTC3	Comprehensive	70% HHC	70% ALF	Lifetime	90	Inflation	MGI	10	51,777
LTC3	Comprehensive	70% HHC	70% ALF	Lifetime	90	Inflation	SF	6	21,633
LTC3	Comprehensive	70% HHC	70% ALF	Lifetime	90	No Inflation	LF	981	2,327,972
LTC3	Comprehensive	70% HHC	70% ALF	Lifetime	90	No Inflation	MGI	19	53,133
LTC3	Comprehensive	70% HHC	70% ALF	Lifetime	90	No Inflation	SF	15	35,238
LTC3	Facilities Only		70% ALF	3 Year	90	Inflation	LF	415	705,263
LTC3	Facilities Only		70% ALF	3 Year	90	Inflation	MGI	57	67,281
LTC3	Facilities Only		70% ALF	3 Year	90	Inflation	SF	107	139,242
LTC3	Facilities Only		70% ALF	3 Year	90	No Inflation	LF	185	235,501
LTC3	Facilities Only		70% ALF	3 Year	90	No Inflation	MGI	14	10,825
LTC3	Facilities Only		70% ALF	3 Year	90	No Inflation	SF	14	7,830
LTC3	Facilities Only		70% ALF	6 Year	90	Inflation	LF	156	355,455
LTC3	Facilities Only		70% ALF	6 Year	90	Inflation	MGI	14	27,266
LTC3	Facilities Only		70% ALF	6 Year	90	Inflation	SF	21	38,902
LTC3	Facilities Only		70% ALF	6 Year	90	No Inflation	LF	507	769,105
LTC3	Facilities Only		70% ALF	6 Year	90	No Inflation	MGI	55	57,981
LTC3	Facilities Only		70% ALF	6 Year	90	No Inflation	SF	77	80,481
LTC3	Facilities Only		70% ALF	Lifetime	90	Inflation	LF	168	423,911
LTC3	Facilities Only		70% ALF	Lifetime	90	Inflation	MGI	1	1,521
LTC3	Facilities Only		70% ALF	Lifetime	90	No Inflation	LF	137	273,027
LTC3	Facilities Only		70% ALF	Lifetime	90	No Inflation	MGI	1	4,259
LTC3	Partnership	70% HHC	70% ALF	6 Mo	30	Inflation	LF	1	2,065
LTC3	Partnership	70% HHC	70% ALF	1 Year	30	Inflation	LF	33	48,663
LTC3	Partnership	70% HHC	70% ALF	2 Year	30	Inflation	LF	61	136,019
LTC 3 Subtotal								**13,620**	**28,139,148**
LTC4	Comprehensive	100% HHC	100% ALF	3 Year	90	Inflation	LF	1,159	2,878,012
LTC4	Comprehensive	100% HHC	100% ALF	3 Year	90	No Inflation	LF	117	245,732
LTC4	Comprehensive	100% HHC	100% ALF	6 Year	90	Inflation	LF	807	2,564,747
LTC4	Comprehensive	100% HHC	100% ALF	6 Year	90	No Inflation	LF	67	210,401
LTC4	Comprehensive	100% HHC	100% ALF	10 Year	90	Inflation	LF	437	1,522,861
LTC4	Comprehensive	100% HHC	100% ALF	10 Year	90	No Inflation	LF	69	228,731
LTC4	Partnership	100% HHC	100% ALF	1 Year	30	Inflation	LF	9	23,078
LTC4	Partnership	100% HHC	100% ALF	2 Year	30	Inflation	LF	31	129,916
LTC4 Subtotal								**2,696**	**7,803,478**
Grand Total								**116,832**	**307,798,671**

1) Model cells include all in-force data as of June 30, 2020. All Benefits, including selected optional benefits, are valued in the projection except Benefit Increase Options.

Abbreviation	Description
ALF	Assisted Living Facility
HHC	Home Health Care
LF U/W	Long Form Underwriting
MGI U/W	Modified Guaranteed Issue Underwriting
SF U/W	Short Form Underwriting

Appendix E – Demographic Information

Data

We relied on the in-force data and claim information supplied by the third-party administrator LTCG and have evaluated that data for reasonableness and consistency. The principal materials we used were provided by LTCG and internal financial reports and included:

1. Data extracts from LTCG's administrative system
2. Financial statements
3. Plan descriptions

The Actuarial Valuation considers the quantitative and demographic characteristics of covered participants, including active participants and on-claim participants. This section presents a summary of significant statistical data on these participant groups. Future plan costs are affected by attained age, years in plan, and benefits chosen. In this year's valuation, there were 116,832 in-force participants averaging an attained age of 75.2 years and a policy duration of 21 years.

In-force Participants as of 6/30/2020 - Demographics and Selected Benefit Options

The following distributions of all in-force participants as of June 30, 2020 are included in Appendix E:

- By benefit period and elimination period
- By issue-age and attained-age
- By coverage
- By inflation option
- By gender
- By premium mode
- By underwriting type
- By product series

Appendix E

Distributions of Business In-force as of 6/30/2020

By Benefit Period and Elimination Period

Benefit Period	Elimination Period	Policy Count	Percent	Annualized Premium	Percent
6 Month	30 Day	95	0%	72,058	0%
1 Year	30 Day	1,410	1%	1,356,323	0%
2 Year	30 Day	2,687	2%	3,932,653	1%
In-Nonforfeiture	30 Day	118	0%	0	0%
3 Year	90 Day	27,969	23%	48,336,543	16%
6 Year	90 Day	33,153	27%	59,267,794	19%
10 Year	90 Day	24,441	20%	61,122,189	20%
Lifetime	90 Day	30,877	26%	132,455,549	43%
In-Nonforfeiture	90 Day	15	0%	0	0%
Total		**116,832**	**100%**	**307,798,671**	**100%**

By Issue-Age Band and Gender

Issue-Age Band	Policy Count				Annualized Premium			
	Females	Males	Total	Percent	Females	Males	Total	Percent
< 30	420	237	657	1%	493,785	292,558	786,343	0%
30-39	3,969	2,373	6,342	5%	6,012,972	3,582,665	9,595,637	3%
40-44	5,513	2,967	8,480	7%	10,148,268	5,460,582	15,608,850	5%
45-49	10,426	5,630	16,056	14%	22,417,192	12,090,837	34,508,029	11%
50-54	15,601	9,047	24,648	21%	37,735,019	21,996,517	59,731,535	19%
55-59	16,521	10,476	26,997	23%	45,417,944	29,430,886	74,848,830	24%
60-64	11,848	8,442	20,290	17%	36,628,153	26,499,622	63,127,775	21%
65-69	5,903	3,931	9,834	8%	20,751,721	13,990,580	34,742,301	11%
70-74	1,978	958	2,936	3%	7,864,382	3,984,680	11,849,062	4%
75-79	426	116	542	0%	2,022,246	642,003	2,664,248	1%
80-84	40	9	49	0%	263,963	65,910	329,873	0%
85-89	1	0	1	0%	6,188	0	6,188	0%
90-94	0	0	0	0%	0	0	0	0%
95+	0	0	0	0%	0	0	0	0%
Total	**72,646**	**44,186**	**116,832**	**100%**	**189,761,831**	**118,036,840**	**307,798,671**	**100%**

By Attained Age and Gender

Attained-Age Band	Policy Count				Annualized Premium			
	Females	Males	Total	Percent	Females	Males	Total	Percent
< 30	16	15	31	0%	11,173	10,754	21,927	0%
30-39	72	47	119	0%	81,228	57,442	138,670	0%
40-44	178	92	270	0%	237,484	115,098	352,582	0%
45-49	451	249	700	1%	620,293	355,824	976,117	0%
50-54	1,132	732	1,864	2%	1,707,104	1,102,027	2,809,131	1%
55-59	2,700	1,603	4,303	4%	4,528,809	2,686,927	7,215,736	2%
60-64	5,112	2,869	7,981	7%	9,308,666	5,239,286	14,547,952	5%
65-69	9,349	5,072	14,421	12%	19,578,201	10,854,846	30,433,047	10%
70-74	14,797	8,829	23,626	20%	35,570,329	21,263,530	56,833,860	18%
75-79	14,968	9,455	24,423	21%	40,633,300	26,400,654	67,033,954	22%
80-84	11,544	7,677	19,221	16%	34,513,305	23,673,712	58,187,017	19%
85-89	7,477	5,042	12,519	11%	24,604,434	16,753,264	41,357,698	13%
90-94	3,749	2,097	5,846	5%	13,864,533	7,750,756	21,615,289	7%
95+	1,101	407	1,508	1%	4,502,973	1,772,721	6,275,693	2%
Total	**72,646**	**44,186**	**116,832**	**100%**	**189,761,831**	**118,036,840**	**307,798,671**	**100%**

Appendix E

Distributions of Business In-force as of 6/30/2020 (continued)

By Plan Type

Plan Type	Policy Count	Percent	Annualized Premium	Percent
Partnership (Comprehensive)	3,979	3%	5,014,341	2%
Comprehensive	92,786	79%	260,600,221	85%
Facilities Only	20,067	17%	42,184,109	14%
Total	**116,832**	**100%**	**307,798,671**	**100%**

By Inflation

Inflation	Policy Count	Percent	Annualized Premium	Percent
No Inflation	75,890	65%	159,985,025	52%
Inflation	40,942	35%	147,813,646	48%
Total	**116,832**	**100%**	**307,798,671**	**100%**

By Marriage Status at Time of Issue

Marital Status	Gender	Policy Count	Percent	Annualized Premium	Percent
Married	F	49,360	42%	125,868,346	41%
Married	M	36,917	32%	97,986,129	32%
Single	F	23,286	20%	63,893,485	21%
Single	M	7,269	6%	20,050,710	7%
Total		**116,832**	**100%**	**307,798,671**	**100%**

By Premium Mode

Premium Mode	Policy Count	Percent	Annualized Premium	Percent
Monthly	88,342	76%	238,998,045	78%
Quarterly	21,973	19%	51,422,254	17%
Semi-Annually	3,760	3%	9,930,563	3%
Annually	2,757	2%	7,447,810	2%
Total	**116,832**	**100%**	**307,798,671**	**100%**

By Underwriting Type

Underwriting Type	Policy Count	Percent	Annualized Premium	Percent
LF	69,097	59%	186,617,063	61%
MGI	25,878	22%	66,799,934	22%
SF	21,857	19%	54,381,674	18%
Total	**116,832**	**100%**	**307,798,671**	**100%**

By Product Series

Product Series	Policy Count	Percent	Annualized Premium	Percent
LTC 1	93,035	80%	251,610,456	82%
LTC 2	7,481	6%	20,245,590	7%
LTC 3	13,620	12%	28,139,148	9%
LTC 4	2,696	2%	7,803,478	3%
Total	**116,832**	**100%**	**307,798,671**	**100%**

Appendix F – Glossary of Actuarial Terms

Glossary of Actuarial Terms

Anti-Selection - Individuals who let their policies lapse because of special events (see "Shock Lapses") are usually in better health. A participant does not normally drop their coverage if they anticipate that they will soon have a claim. As a result of this participant decision process, individuals who retain their policies are often, on average, in worse health than those who lapse them. This phenomenon is called anti-selection.

Base Case - The results of a projection using the "best estimate" assumptions in the LTC valuation. All sensitivity projections are done relative to this base case.

Benefit Period - This is the period of time that an insured would receive benefits if the full maximum daily benefit amount was paid each day an insured is on claim. If less than the maximum daily benefit amount was paid, the length of time that a claimant would receive benefits would be greater than this time period.

Claim Incidence - The probability of a policyholder incurring a claim is referred to as claim incidence.

Claim Termination - The probability that an existing claim will cease is referred to as claim termination.

Comprehensive Plan - A plan that covers home health care in addition to care in a nursing home and/or an assisted living facility.

Claim Continuance - The period of time that a participant continues to be on claim after a claim has begun.

Conversion - The voluntary decision to switch or reduce coverage, sometimes as the result of a specific event such as a premium rate increase.

Credible - A statistical measure of the degree to which data is considered reliable for predictive purposes. Credibility increases as a block of business grows and as more data accumulates over time.

Deficit - A calculation that determines the degree to which the current fund value is insufficient to pay future benefits, expressed as a percentage of the present value of future premiums. This number is an estimate of what one-time rate increase would be needed to bring the Program back to the target margin level. If the current fund value is more than enough to pay future benefits, the surplus is represented by a positive number. In formula terms:

{Current Fund Balance + Present Value of Premiums - Present Value of Benefits and Expenses} / Present Value of Premiums

Disabled Life Reserve - The value of future claim payments for those participants currently on claim.

Discount Rate - An interest rate used to determine present values. For CalPERS, the discount rate is set equal to the expected investment earnings rate.

Duration - The amount of time, typically measured in years since the issue date of the policy. Duration is sometimes referred to as policy year.

Appendix F

Glossary of Actuarial Terms (continued)

Elimination Period - The period of time in which the participant pays for care before benefits are paid from insurance proceeds.

First Principles Model - A model that uses fundamental concepts and assumptions to project cash flows. First principles model calculations tend to use more granular assumptions and track policyholder status and transitions more closely than a comparable claim cost model does.

Facility-Only Plan - A type of plan that pays for care in a nursing home or assisted living facility, but not for care at home or in the community.

Funded Ratio - Method of expressing the current financial status of the Program, which is consistent with the CalPERS pension and health plan financial status measurements. In general, the funded ratio is the assets divided by the accrued liability, or reserves. For long-term care insurance, the accrued liability is equal to the present value of future benefits and expenses less the present value of participant premiums. This definition is consistent with a statutory gross premium valuation reserve for LTC insurance. In this context, a breakeven position is a ratio of 100%. In formula terms:

Fund Balance / {Present Value of Benefits and Expenses - Present Value of Premiums}

Incidence - The number of participants that start a claim as a percentage of the participants that could start a claim over a specified time period (i.e., frequency of claim).

Incurred Claims - Incurred claims are made up of reported paid claims plus a reserve representing the assumed runout of existing open claims, as well as an estimate of claims that have incurred but have not yet been reported. The value of the latter unpaid claims is referred to as the IBNR (Incurred But Not Reported) Reserve.

Incurred Loss Ratio - The incurred loss ratio is the ratio of total losses incurred (paid and reserved) in claims divided by the total premiums earned.

Inflation Coverage - An optional feature that increases the amount of available benefits over time to protect a participant against rising health care costs. The CalPERS inflation coverage offers four different levels of automatic inflation protection: 3 or 5 percent simple, and 3 or 5 percent compound.

LTC1, LTC2, LTC3, LTC4 - Four different long-term care insurance plans sold to CalPERS participants. The main differences between the plans are the percentages of daily benefit for Home Health Care (HHC) and Assisted Living Facility (ALF) care available at the time of claim in comparison to the Nursing Home (NH) coverage for comprehensive policies. A summary of those benefits and the initial issue year is shown below.

LTC1 (1995) - NH (100%) / ALF (50%) / HHC (50%)
LTC2 (2003) - NH (100%) / ALF (70%) / HHC (50%)
LTC3 (2005) - NH (100%) / ALF (70%) / HHC (70%)
LTC4 (2014) - NH (100%) / ALF (100%) / HHC (100%)

Model - An actuarial tool used to project future cash flows including premiums, claims, investment returns, and expenses.

Appendix F

Glossary of Actuarial Terms (continued)

Morbidity - The generic term for the various assumptions underlying the expected/projected claims of a block of business.

Mortality - The rate of death.

Partnership Plan - A collaboration or "partnership" between the state government, insurance companies, and state residents who buy long-term care Partnership policies. The purpose of the Partnership Program is to encourage individuals to purchase LTC coverage and save the state money by increasing the private funding of LTC services, thereby reducing Medicaid payments for LTC. The advantage of the partnership plan for a participant is that once their insurance coverage is exhausted, their assets in an amount equal to the amount of insurance coverage used are protected when qualifying for Medicaid payments for LTC.

Persistency - The number of participants that remain active relative to the total number that started from one time period to another. Historically, LTC persistency has been higher than what was originally expected for CalPERS and the LTC industry as a whole. Because of the stronger-than-expected persistency, more participants are ultimately expected to submit claims than were originally expected, which puts additional financial strain on a LTC Program.

Present Value - A calculation that expresses future cash flows in a current cash equivalent amount based on assumed future interest rates (the discount rate).

Restoration of Benefits (ROB) - Benefit period will be restored if the participant recovers and is not eligible for benefits for at least 180 consecutive days. The maximum amount that can be restored over the life of the coverage is equal to the original total benefit amount purchased. This optional benefit rider is only available to LTC4 policies with a benefit period of three years or six years.

Return of Premium (ROP) - Returns some or all of a participant's premiums less any benefits paid to the spouse or estate if the participant dies before age 75. This is a built-in option for some of CalPERS's plans.

Selection Factors - Factors used to adjust attained age or ultimate morbidity to levels reflecting recent underwriting/issue, generally reducing the projected claims associated with those policies. Different selection factors are also used for the mortality assumption.

Shock Lapses - An insurance phenomenon where individuals allow their policies to lapse/terminate at a higher rate than usual due to a specific event such as a premium rate increase.

Survivorship Benefit - If both spouses or partners have this optional benefit, long-term care coverage for the surviving spouse or partner will be paid up if one spouse or partner dies after both have had coverage for a period of 10 years or more. This optional benefit rider is only available to LTC4 policies. Spouses or domestic partners must choose identical coverage to sign up for this optional benefit.

Terminations - The policies that are no longer active due to death, voluntary lapse, or any other reason.

Appendix F

Glossary of Actuarial Terms (continued)

Underwriting Type - Underwriting is the process of evaluating and selecting risks to be insured. Three types of underwriting were utilized at various times by CalPERS:

- Modified Guaranteed Issue (MGI) - limited underwriting for younger applicants active in the workforce
- Short Form (SF) - simplified application process with limited medical evaluation for younger applicants.
- Long Form (LF) - considered "full underwriting" due to the comprehensive nature of the medical questions asked and the associated underwriting process.

CalPERS only uses the long form of application for underwriting since 2002.

Voluntary Lapsation - Occurs when a participant chooses to voluntarily terminate their policy rather than terminate due to death or limitations on renewing contained within the policy itself.

Waiver of Premium or WOP - A benefit provision in a policy that allows the participant to stop making premium payments during the period of time in which they meet specific disabling conditions such as being eligible to be on LTC claim.

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