

Long-Term Care Actuarial Valuation

As of June 30, 2017

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Actuarial Certification

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, 2017. It is our opinion that the valuation has been performed in accordance with generally accepted actuarial principles, in accordance with 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

- INTRODUCTION
- PURPOSE OF THE REPORT
- FUNDED STATUS AND MARGIN FOR THE PROGRAM
- KEY FINDINGS
- CHANGES SINCE THE PRIOR VALUATION
- SUBSEQUENT EVENTS

Introduction

This is the actuarial valuation report as of June 30, 2017 for the CalPERS Long-Term Care Program (the Program). The financial projections used in this valuation analysis were produced under a new model called the First Principles Model. United Health Actuarial Services, Inc. (UHAS) was contracted to develop the First Principles Model and they worked hand-in-hand with CalPERS to develop the assumptions for the new model. For comparison purposes, UHAS also completed a similar valuation using the previous model called the Claim Cost Model. This year's valuation report will present the valuation results under both the new model and the old model.

Please note that a first principles modeling approach has more detailed calculations and this approach is becoming the industry standard for modeling long-term care insurance. The more detailed modeling now includes claims incidence, continuance, and utilization whereas the previous claim cost model combined all of these assumptions into one bucket, i.e. "claim cost". The First Principles Model gives more credibility to CalPERS experience and allows for more detailed actual-to-expected observations including the number of new claimants, the number of claim terminations and the utilization of benefits.

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, 2017. 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, 2017 actuarial valuation report of the CalPERS Long-Term Care Program is to:

- Determine whether assets as of June 30, 2017 and expected future premium levels are sufficient to support the future benefits.
- Provide actuarial information as of June 30, 2017 to the CalPERS Board of Administration and other interested parties.
- Provide information as of June 30, 2017 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.

HIGHLIGHTS AND EXECUTIVE SUMMARY

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Funded Status and Margin for the Program

As of June 30, 2016, the funded status for the LTC Program was 106 percent and the margin was 9.59 percent. This year, CalPERS adopted a new valuation projection model called the First Principles Model. This model produces a more accurate projection of future cash flows and this new cash flow projection increased the margin. However, a lower discount rate and lower-than-expected investment returns decreased the margin significantly. The margin decreased to negative 1.45 percent and the funded status dropped to 99 percent as of June 30, 2017. The table below shows the funded status and margin as of June 30, 2017.

Funded Status and Margin as of June 30, 2017

Component	(\$ in Millions)
1. Present Value of Future Benefits	\$6,498
2. Present Value of Future Expenses	\$336
3. Present Value of Future Premiums (PVFP)	\$2,455
4. Valuation Liabilities (= 1 + 2 – 3)	\$4,378
5. Valuation Assets	\$4,343
6. Valuation Margin (= 5 – 4)	(\$35)
7. Margin as a % of PVFP (= 6 / 3)	(1.45%)
8. Funded Status (= 5 / 4)	99%

With the implementation of the Stabilization Plan, the Program's funded status was more than 100 percent funded and the margin was positive from 2013 until 2016. The 2017 results would have continued this trend; however, a change in the discount rate resulted in a decrease in the funded status and margin. The table below shows the funded status and the margin/(deficit) for the Long-Term Care Program for the last 5 years based on the best estimate assumptions (i.e., the "base case" scenario). There has been a steady decline in the funded status and the valuation margin of the Program over the past three years. The main drivers of these decreases are higher-than-expected claim experience, lower-than-expected investment returns and this year's adoption of a lower discount rate to reflect lower-than-expected future investment returns.

5-Year History of Funded Status and Margin

Valuation Date	Funded Status	Margin / (Deficit)
June 30, 2013	123%	19.66%
June 30, 2014	123%	23.49%
June 30, 2015	111%	14.44%
June 30, 2016	106%	9.59%
June 30, 2017	99%	(1.45%)

Key Findings

The following are the key findings from this actuarial valuation:

- The Program's funded status decreased from 106 percent on June 30, 2016 to 99 percent on June 30, 2017 and the margin decreased from 9.59 percent to a deficit of 1.45 percent. The factors listed below impacted the 2017 margin.
 - The adoption of the new First Principles Model led to improved paid claim and claim reserve estimates. The new model projects claim counts and individual policyholder status for all projected years. These estimate improvements and revised assumptions to reflect these modeling refinements had a positive impact on the margin.
 - The discount rate was lowered from 5.75 to 5.25 percent in February 2018 by the CalPERS Board. The new discount rate reflects the current investment mix as well as the current set of Capital Market Assumptions adopted in June 2017. The margin as of June 30, 2017 is a deficit 1.45 percent and the margin would have been 12.13 percent using the previous discount rate of 5.75 percent. The lower discount rate had a negative impact on the margin.
 - The Program experienced a large investment loss during the 2016-17 fiscal year due to an investment return of 1.56 percent, which was lower than the 5.75 percent assumed discount rate. The loss translated to \$177,293,913 less than expected investment income which negatively impacted the margin.
 - This year's expense assumptions are based on actual experience and a new third-party administrator (TPA) contract which became effective January 1, 2018. The administration expenses assumption after the five-year contract, was changed from using claim adjudication costs which vary by incurred claims, to using a per participant per month fee based on the new contract. The new expense assumptions are lower than the previous assumptions and made a positive impact on the margin.

A complete reconciliation of the Program's margin/(deficit) is provided on page 11.

Changes Since the Prior Valuation

Actuarial Model

Since 2004 CalPERS has used a Claim Cost Model for the LTC valuation projections. This year's LTC valuation uses a First Principles Model which has many advantages over the Claim Cost Model.

The previous Claim Cost Model used total life persistency assumptions, in which status (healthy versus disabled) was not tracked and the same mortality and lapse assumption applied to all lives, regardless of status. The Claim Cost Model used incurred claims that were based on healthy lives, which separated the population between healthy and disabled lives by applying a set of factors. This set of factors were expressed as a ratio of healthy lives to total lives, which were applied as an adjustment to the incurred claims.

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Many companies within the Long-Term Care industry have switched to a First Principles Model over the past five years. The First Principles Model has many advantages over the Claim Cost Model. The First Principles Model projects policyholder statuses such as healthy, disabled (including site of care), lapsed or deceased. It also projects policyholder transitions between these statuses such as claim incidence, deaths, lapses, benefit expirations and recoveries from on-claim back to healthy. These statistics increase model transparency and makes it easier to determine the main drivers of actual-to-expected deviations in projected policyholder experience. The First Principles Model also tracks of used and remaining benefits for each policyholder. This detailed tracking of lives allows for the First Principles Model to more accurately project when benefits will be exhausted and more accurately reflects claim payment patterns as claimants move along their respective continuance curves.

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

Actuarial Assumptions

The First Principles Model requires development of more granular assumptions than the Claim Cost Model. While the Claim Cost Model required one claim cost assumption, the First Principles Model requires separate 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.

Assumptions are updated based upon emerging experiences and future expectations. 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

In an effort to stabilize the LTC Fund, CalPERS implemented corrective actions including premium increases, in 2003, 2007 and 2010. In addition, starting in 2011, all LTC1 policies with lifetime coverage and inflation protection receive an on-going annual 5 percent premium increase. In October 2012, the CalPERS Board approved the Stabilization Plan to help improve the financial position of the Long-Term Care Program. The Stabilization Plan included premium increases for some participants, provided the ability for participants to convert to less expensive policies and stopped the ongoing 5 percent rate increase after 2014. LTC1 and LTC2 participants with the lifetime benefit period or inflation protection had their premiums increased by 36 percent in both 2016 and 2017 for a cumulative 85 percent increase. This valuation projection reflects all the actions planned and implemented by the Stabilization Plan.

Subsequent Events

There were no known events that would impact the results of this valuation as of the time of preparing this report. The actuarial valuation report as of June 30, 2017 is based on financial information as of that date. Changes in the value of assets subsequent to that date, to the extent that they may exist, are not reflected. Investment returns less than assumed will decrease the

HIGHLIGHTS AND EXECUTIVE SUMMARY

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funded status of the Program, while returns greater than assumed will increase the funded status of the Program.

VALUATION RESULTS

- COMPARISON OF CURRENT AND PRIOR YEAR
- RECONCILIATION TO PRIOR VALUATION RESULTS
- SUMMARY OF KEY ASSUMPTIONS

VALUATION RESULTS

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Comparison of Current and Prior Year

The Program results summarized throughout this report refer to funded status and also to deficits or margins. A deficit is an estimate of the level of a one-time rate increase in premiums that would be 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 the Program assets divided 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 percent.

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 percent and will always produce a deficit when the funded ratio is lower than 100 percent. They are not consistent in that a 10 percent margin does not produce a 110 percent funded ratio.

The table below summarizes the results of the actuarial valuation of the CalPERS Long-Term Care Program as of June 30, 2017 compared to June 30, 2016. Results presented include the present value of future cash flows for the current inforce participants. Present values are based on 60 years of projected cash flow.

Component	6/30/2016 (\$ in Millions)	6/30/2017 (\$ in Millions)
1. Present Value of Future Benefits	\$6,225	\$6,498
2. Present Value of Future Expenses	\$404	\$336
3. Present Value of Future Premiums (PVFP)	\$2,589	\$2,455
4. Valuation Liabilities (= 1 + 2 – 3)	\$4,040	\$4,378
5. Valuation Assets	\$4,288	\$4,343
6. Valuation Margin (= 5 – 4)	\$248	(\$35)
7. Margin as a % of PVFP (= 6 / 3)	9.59%	(1.45%)
8. Funded Status (= 5 / 4)	106%	99%

VALUATION RESULTS

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Our analysis indicates that if experience conforms to our best estimate assumptions, the current assets and rate structure are not 100 percent sufficient to fund future claims and expenses for the next 60 years.

Liability cash flows were derived through the application of a projection of expected future cash flows based on the inforce policies as of June 30, 2017 using a set of underlying assumptions based upon 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 cash flows and projected cash balances are provided in Appendix A.

Reconciliation to Prior Valuation Results

The June 30, 2016 valuation margin was 9.59 percent. Under the old Claim Cost Model, updating all assumptions reflecting actual experience and the new discount rate of 5.25 percent reduced the margin to a deficit of 9.86 percent as of June 30, 2017. Several factors impacted the margin either positively or negatively during the fiscal year. Changes to the morbidity assumption and the discount rate as well investment losses in the last fiscal year had the biggest negative impacts on the margin.

Morbidity experience is slow to develop due to the long claim process, which limits the development of the claim assumptions. Therefore, the morbidity assumption increase is based on the previous few years of higher actual-to-expected results. The claim costs also increased because more credibility was assigned to the Program's actual claim cost experience, which is slightly worse than the industry's experience.

The Program experienced a large investment loss during 2016-17 fiscal as a result of an investment return of 1.56 percent, which was lower than the assumed 5.75 percent discount rate assumption. The lower than expected return decreased the margin by 7.05 percent. Demographic experience gains slightly increased the margin. The updated termination assumption and the new expense assumption based on the new five-year TPA contract had a positive impact on the margin. The aggregate impact of these assumption changes was a decrease in margin.

Switching to the First Principles Model improved the underlying assumptions and accuracy to future claim projections. Using this more accurate model, the final margin was set at a deficit of 1.45 percent.

VALUATION RESULTS

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

	Results as a Present-Value of Premiums
Margin under Claim Cost Model as of 6/30/16:	9.59%
Projected One Year Forward (Passage of Time)	0.89%
Demographic Experience Gain	2.41%
Investment Loss for FY 2016-2017	(7.05%)
Morbidity Assumption Change	(7.06%)
Expenses Assumption Change	4.30%
Mortality/Lapse Change	1.17%
Discount Rate Change	(14.11%)
Margin under Claim Cost Model as of 6/30/17:	(9.86%)
Model Changed from Claim Cost to First Principles Based	8.41%
Margin under First Principle Based Model as of 6/30/17	(1.45%)

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. This year, new assumptions were developed for the new First Principles Model. Actual experience is measured against the assumptions and assumptions are updated to reflect actual experiences. This section provides general information on key assumptions used in the 2017 valuation.

Discount Rate

The discount rate used in this valuation was approved in February 2018 by the CalPERS Board, and reflects the current investment mix and the revised set of Capital Market Assumptions adopted in June 2017. For valuation purposes, the discount rate was revised from 5.75 percent to 5.25 percent net of investment expenses. The discount rate is a major component of the valuation process and is used to project asset growth and to determine present values of future premiums, expenses and benefits. CalPERS Long-Term Care Program experienced an investment loss during the fiscal year ending June 30, 2017, as the actual return for the year was only 1.56 percent, while the assumed investment return was 5.75 percent.

VALUATION RESULTS

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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
- Utilization, which is the level of amount of claim payment reimbursed relative to the maximum daily benefit.

Assumptions were developed for each of these three key claim components based on data as of March 31, 2017, with an experience study cutoff date of December 31, 2015. 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. Changes were also made that addressed the potential for anti-selection resulting from the less healthy participants not converting to less expensive policies which were offered as part of the Stabilization Plan. Actual claim experience is summarized in the table "Comparison of Actual to Expected Cash Flows for 2016-17" in the Assets Section on page 21.

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 vary based on a variety of factors, including the participants' age at enrollment and the number of years participants have their policies. In general, it is assumed that the longer that participants keep their policies, 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 although current assets are not affected.

The First Principles Model uses an active life lapse assumption that only applies to active policyholders.

Mortality

The mortality assumption summarizes the expected death rate of the population. Similar to 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

VALUATION RESULTS

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mortality, particularly to the extent that 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 IAM table is used as the assumed industry level mortality and selection factors are developed based on CalPERS actual experience.

Actual CalPERS mortality experience is then compared to the expected assumption based on the 2012 IAM and CalPERS selection factors to determine more refined experience-based adjustment factors that vary by attained-age for both active participants and participants on claim. These experience-based adjustment factors combined with the 2012 IAM mortality table and CalPERS selection factors result in the CalPERS experienced-based mortality assumption.

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

Mortality improvement assumption development 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 to independently calculate this assumption. For this valuation, we used SOA standard Scale BB table to project mortality improvement factors.

Expense

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

RISK ANALYSIS

- SENSITIVITY TESTING OF KEY ASSUMPTIONS
- ADDITIONAL SENSITIVITY TESTING

Risk Analysis

The actuarial calculations supplied in this report are based on assumptions about long-term demographic and economic behavior. Unless these assumptions (claim incidence, claim continuance, 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 actual experience and the assumptions are called actuarial gains and losses and either increase or decrease the funded status and margin of the LTC Program. If the actual experience differs from the assumption 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 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 continuance, voluntary 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 indicate outcomes under each of these scenarios, they do not indicate the likelihood of each scenario, and therefore, this testing does not indicate the probability that projected values will be realized.

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

Discount Rate

The discount rate assumption used in this valuation is 5.25 percent. For the sensitivity analysis, we are testing 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 percent. The table below shows the impact on the margin and funded status. As expected, a lower discount rate results in a lower margin and lower funded status while a higher discount rate results in an increase for both measures.

Impact of Discount Rate on Margin and Funded Ratio

Scenario Description	Margin	Funded Ratio
Base Case	(1.45%)	99%
Discount rate increased by 0.5% to 5.75%	12.13%	107%
Discount rate decreased by 0.5% to 4.75%	(15.68%)	92%

RISK ANALYSIS

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Claim Incidence

Claim incidence is the probability that an active policyholder goes 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. This sensitivity analysis tests the impact that claim incidence has on the margin and funded ratio of the LTC Program by increasing and decreasing future expected claim incidence by 10 percent. As shown in the table below, higher-than-expected incidence lowers both the margin and funded status, while lower-than-expected claim incidence increases both measures.

Impact of Claim Incidence on Margin and Funded Ratio

Scenario Description	Margin	Funded Ratio
Base Case	(1.45%)	99%
Lower Claim Incidence (Future claims incidence reduced by 10%)	13.73%	109%
Higher Claim Incidence (Future claims incidence increased by 10%)	(16.07%)	92%

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 policyholder while on claim. This sensitivity analysis tests 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 percent. 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	(1.45%)	99%
Higher Claim Termination (Future claim termination increased by 10%)	12.87%	108%
Lower Claim Termination (Future claim termination decreased by 10%)	(18.78%)	91%

RISK ANALYSIS

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Lapses

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

Impact of Lapses on Margin and Funded Ratio

Scenario Description	Margin	Funded Ratio
Base Case	(1.45%)	99%
Lapse Rates increased by 0.25%	3.97%	102%
Lapse Rates decreased by 0.25%	(6.96%)	96%

Mortality

The mortality assumption reflects the expected death rate of the participants in the LTC Program. Similar to the lapse assumption, mortality reduces future liabilities without affecting the assets on hand. For this reason, higher-than-expected active mortality will generally result in an increase in the margin and funded status. For the sensitivity analysis, we are testing the impact mortality rates have on the margin and funded ratio of the LTC Program by increasing and decreasing the mortality rates by 10 percent. As shown in the table below, if mortality rates improve, (i.e., rates are lower), both the margin and funded status will be lower, while if mortality rates deteriorate, (i.e., rates are higher), both measures would increase.

Impact of Active Mortality on Margin and Funded Ratio

Scenario Description	Margin	Funded Ratio
Base Case	(1.45%)	99%
Mortality rates increased by 10%	7.80%	105%
Mortality rates decreased by 10%	(12.60%)	93%

RISK ANALYSIS

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Best and Worst Case

In order to test for the potential “best case” and “worst case” scenarios, the sensitivity of five of the key assumptions were tested simultaneously. The table below shows the combined impact on the margin and the funded status if the experience were to be better and worse than expected for the discount rate, claim incidence, claim termination, lapses and mortality.

Combined Impact of key Assumptions on Margin and Funded Status

Scenario Description	Margin	Funded Ratio
Base Case	(1.45%)	99%
Discount rate increases by 0.5% to 5.75% Lower Claim Incidence (Future claim incidence reduced by 10%) Higher Claim Termination (Future claim termination increased by 10%) Lapses increased by 0.25% Mortality rates increased by 10%	53.25%	140%
Discount rate decreases by 0.5% to 4.75% Higher Claim Incidence (Future claim incidence increased by 10%) Lower Claim Termination (Future claim termination decreased by 10%) Lapses decreased by 0.25% Mortality rates decreased by 10%	(68.00%)	71%

RISK ANALYSIS

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Additional Sensitivity Testing

In addition to the sensitivity testing summarized above, we tested varying investment scenarios on the base case scenario using the New York 7 interest rate scenarios. 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	5.25%	5.25%	5.25%	5.25%	5.25%	5.25%	5.25%	5.25%	5.25%	5.25%	5.25%
Scenario #2	5.25%	5.75%	6.25%	6.75%	7.25%	7.75%	8.25%	8.75%	9.25%	9.75%	10.25%
Scenario #3	5.25%	6.25%	7.25%	8.25%	9.25%	10.25%	9.25%	8.25%	7.25%	6.25%	5.25%
Scenario #4	8.25%	8.25%	8.25%	8.25%	8.25%	8.25%	8.25%	8.25%	8.25%	8.25%	8.25%
Scenario #5	5.25%	4.75%	4.25%	3.75%	3.25%	2.75%	2.25%	1.75%	1.25%	0.75%	0.25%
Scenario #6	5.25%	4.25%	3.25%	2.25%	1.25%	0.25%	1.25%	2.25%	3.25%	4.25%	5.25%
Scenario #7	2.25%	2.25%	2.25%	2.25%	2.25%	2.25%	2.25%	2.25%	2.25%	2.25%	2.25%

The table below shows the impact on the margin and the funded status of varying the discount rate assumption as described in the above table.

Impact of Additional Discount Rate Sensitivity on Margin and Funded Ratio

Scenario	Margin	Funded Ratio
Scenario #1	(1.45%)	99%
Scenario #2	72.46%	156%
Scenario #3	34.68%	121%
Scenario #4	72.82%	152%
Scenario #5	(138.70%)	51%
Scenario #6	(38.47%)	80%
Scenario #7	(98.01%)	59%

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

ASSETS

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ASSETS

- RECONCILIATION OF THE MARKET VALUE OF ASSETS OVER THE PRIOR FISCAL YEAR
- COMPARISON OF ACTUAL TO EXPECTED CASH FLOWS
- ASSET ALLOCATION

Reconciliation of the Market Value of Assets Over Prior Fiscal Year

1. Market Value of Assets as of June 30, 2016	\$4,288,345,735
2. Premiums Received during fiscal year 2016 -17	\$306,302,533
3. Benefit Payments in 2016 -17	(\$293,582,641)
4. Expense Payments in 2016 -17	(\$27,007,266)
5. Investment Returns in 2016 -17	\$68,986,120
6. Market Value of Assets as of June 30, 2017	\$4,343,044,482

Comparison of Actual to Expected Cash Flows

Below is a table comparing the actual cash flows in 2016-17 to the cash flows that were projected as part of the June 30, 2016 valuation. As shown in the table, the investment experience and loss of premiums had the biggest impact on the assets.

Comparison of Actual to Expected Cash Flows for 2016-17

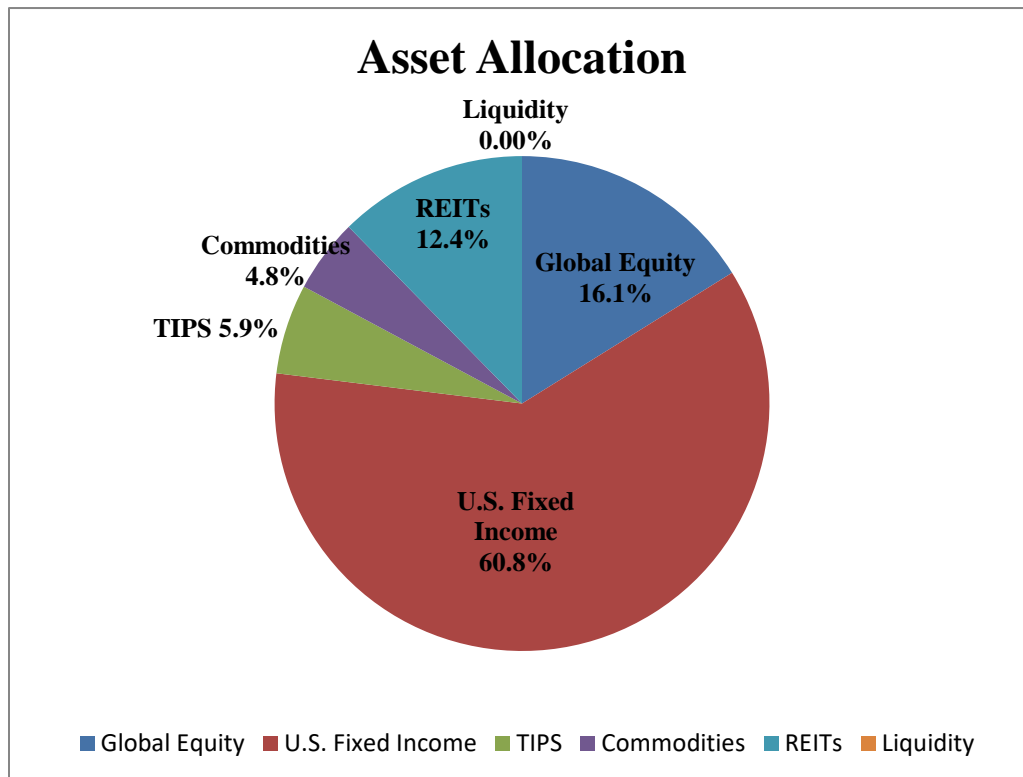
	Projected Results in the June 30, 2016 Valuation	Actual Results in June 30, 2017 Valuation	Difference
Balance as of June 30, 2016	\$4,288,345,735	\$4,288,345,735	\$-
Cash Flows for 2016-17			
• Premiums	\$313,687,051	\$306,302,533	(\$7,384,518)
• Investment Income	\$246,280,033	\$68,986,120	(\$177,293,913)
• Paid Claims	(\$308,523,533)	(\$293,582,641)	\$14,940,892
• Expenses	(\$26,095,886)	(\$27,007,266)	(\$911,380)
Balance as of June 30, 2017	\$4,513,693,400	\$4,343,044,482	(\$170,648,919)

Asset Allocation

CalPERS follows a strategic allocation policy that identifies the percentage of funds to be invested in each asset class. The target allocation was changed to a more conservative asset mix by the Board in April 2012.

The asset allocation and market value of assets are shown below as of June 30, 2017.

Asset Class	Target Allocation	Current Allocation	Current Market Value (Millions)
Global Equity	15.0%	16.1%	\$706
U.S. Fixed Income	61.0%	60.8%	\$2,661
Treasury-Inflation Protected Securities (TIPS)	6.0%	5.9%	\$257
Commodities	6.0%	4.8%	\$211
Real Estate Investment Trusts (REITs)	12.0%	12.4%	\$540
Liquidity	0.0%	0.0%	\$0
Total Net Assets At Market:	100.0	100.0%	\$4,375



APPENDIX A

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

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APPENDIX A

A-1

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
(1.45%)	(\$36)	99%

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
						\$4,342,602
2017	125,915	\$150,297	\$161,292	\$12,704	\$112,251	\$4,431,154
2018	121,110	\$285,163	\$330,336	\$26,392	\$230,828	\$4,590,418
2019	116,220	\$270,359	\$342,018	\$25,737	\$238,515	\$4,731,538
2020	111,253	\$255,641	\$350,720	\$25,067	\$245,329	\$4,856,722
2021	106,261	\$241,075	\$361,345	\$24,394	\$251,277	\$4,963,335
2022	101,264	\$226,743	\$373,783	\$23,727	\$256,195	\$5,048,763
2023	96,240	\$212,699	\$383,664	\$23,556	\$260,053	\$5,114,295
2024	91,237	\$198,950	\$393,908	\$23,331	\$262,881	\$5,158,887
2025	86,250	\$185,545	\$403,288	\$23,209	\$264,628	\$5,182,563
2026	81,328	\$172,525	\$412,177	\$23,030	\$265,305	\$5,185,185
2027	76,482	\$159,919	\$420,544	\$22,797	\$264,903	\$5,166,666
2037	34,552	\$60,798	\$455,187	\$17,398	\$201,220	\$3,826,532
2047	9,769	\$13,999	\$294,472	\$8,478	\$85,339	\$1,566,815
2057	1,646	\$1,919	\$105,579	\$2,437	\$9,714	\$142,312
2067	183	\$171	\$24,407	\$459	(\$24,515)	(\$503,594)
2077	19	\$6	\$2,394	\$37	(\$24,384)	(\$966,512)

Note:

- 1- Cash flows for 2017 and 2077 are for 6 months only.
- 2- Fund balances are as of the end of the Calendar Year, except for the opening balance which is as of June 30, 2017 and the last projected fund balance which is as of June 30, 2077.

Total Sum of all cash Flows and Present Values (\$ in thousands)

	Expected Premiums	Expected Claims	Expenses	Investment Earnings
Total Sum of Cash Flows	\$3,744,280	\$14,741,556	\$642,576	\$6,330,738
Present Value as of June 30, 2017	\$2,455,391	\$6,497,527	\$335,974	\$3,560,262

APPENDIX A

A-2

Discount Rate Increased by 0.50 Percent to 5.75 Percent

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 5.75 percent, i.e. 0.50 percent higher.

Main Results

Margin as Percentage of the Present Value of Premiums	Margin (\$ in millions)	Funded Status
12.13%	\$288	107%

Projected Cash Flows and Fund Balance Over Next 60 years (\$ in thousands)

Calendar Year ¹	Lives	Expected Premiums	Expected Claims	Expenses	Investment Earnings	Fund Balance ²
						\$4,342,602
2017	125,915	\$150,297	\$161,292	\$12,704	\$122,794	\$4,441,697
2018	121,110	\$285,163	\$330,336	\$26,393	\$253,420	\$4,623,552
2019	116,220	\$270,359	\$342,018	\$25,739	\$263,138	\$4,789,293
2020	111,253	\$255,641	\$350,720	\$25,071	\$272,017	\$4,941,160
2021	106,261	\$241,075	\$361,345	\$24,400	\$280,067	\$5,076,558
2022	101,264	\$226,743	\$373,783	\$23,735	\$287,109	\$5,192,891
2023	96,240	\$212,699	\$383,664	\$23,567	\$293,112	\$5,291,471
2024	91,237	\$198,950	\$393,908	\$23,344	\$298,109	\$5,371,277
2025	86,250	\$185,545	\$403,288	\$23,226	\$302,048	\$5,432,357
2026	81,328	\$172,525	\$412,177	\$23,050	\$304,940	\$5,474,594
2027	76,482	\$159,919	\$420,544	\$22,821	\$306,779	\$5,497,927
2037	34,552	\$60,798	\$455,187	\$17,485	\$267,109	\$4,704,834
2047	9,769	\$13,999	\$294,472	\$8,706	\$186,077	\$3,277,928
2057	1,646	\$1,919	\$105,579	\$2,971	\$175,940	\$3,183,028
2067	183	\$171	\$24,407	\$1,568	\$261,266	\$4,792,308
2077	19	\$6	\$2,394	\$1,225	\$219,974	\$7,977,892

Note:

- 1- Cash flows for 2017 and 2077 are for 6 months only.
- 2- Fund balances are as of the end of the Calendar Year, except for the opening balance which is as of June 30, 2017 and the last projected fund balance which is as of June 30, 2077.

Total Sum of all cash Flows and Present Values (\$ in thousands)

	Expected Premiums	Expected Claims	Expenses	Investment Earnings
Total Sum of Cash Flows	\$3,744,280	\$14,741,556	\$673,101	\$15,305,667
Present Value as of June 30, 2017	\$2,375,153	\$6,107,187	\$322,446	\$4,581,104

APPENDIX A

A-3

Discount Rate Decreased by 0.50 Percent to 4.75 Percent

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 4.75 percent, i.e. 0.50 percent lower.

Main Results

Margin as Percentage of the Present Value of Premiums	Margin (\$ in millions)	Funded Status
(15.68%)	(\$398)	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
						\$4,342,602
2017	125,915	\$150,297	\$161,292	\$12,704	\$101,683	\$4,420,586
2018	121,110	\$285,163	\$330,336	\$26,391	\$208,341	\$4,557,364
2019	116,220	\$270,359	\$342,018	\$25,734	\$214,228	\$4,674,199
2020	111,253	\$255,641	\$350,720	\$25,063	\$219,238	\$4,773,295
2021	106,261	\$241,075	\$361,345	\$24,388	\$223,381	\$4,852,018
2022	101,264	\$226,743	\$373,783	\$23,719	\$226,505	\$4,907,764
2023	96,240	\$212,699	\$383,664	\$23,546	\$228,586	\$4,941,839
2024	91,237	\$198,950	\$393,908	\$23,318	\$229,649	\$4,953,212
2025	86,250	\$185,545	\$403,288	\$23,193	\$229,652	\$4,941,927
2026	81,328	\$172,525	\$412,177	\$23,011	\$228,603	\$4,907,867
2027	76,482	\$159,919	\$420,544	\$22,774	\$226,497	\$4,850,965
2037	34,552	\$60,798	\$455,187	\$17,318	\$147,238	\$3,039,739
2047	9,769	\$13,999	\$294,472	\$8,287	\$13,293	\$149,318
2057	1,646	\$1,919	\$105,579	\$2,393	(\$95,579)	(\$2,160,138)
2067	183	\$171	\$24,407	\$459	(\$187,818)	(\$4,154,005)
2077	19	\$6	\$2,394	\$37	(\$151,324)	(\$6,598,837)

Note:

- 1- Cash flows for 2017 and 2077 are for 6 months only.
- 2- Fund balances are as of the end of the Calendar Year, except for the opening balance which is as of June 30, 2017 and the last projected fund balance which is as of June 30, 2077.

Total Sum of all cash Flows and Present Values (\$ in thousands)

	Expected Premiums	Expected Claims	Expenses	Investment Earnings
Total Sum of Cash Flows	\$3,744,280	\$14,741,556	\$639,287	\$695,124
Present Value as of June 30, 2017	\$2,540,949	\$6,929,461	\$352,497	\$2,595,116

APPENDIX A

A-4

Claim Incidence Rates Increased by 10 Percent

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

Main Results

Margin as Percentage of the Present Value of Premiums	Margin (\$ in millions)	Funded Status
(16.07%)	(\$388)	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
						\$4,342,602
2017	125,911	\$150,212	\$162,269	\$12,703	\$112,243	\$4,430,084
2018	121,070	\$284,471	\$338,422	\$26,388	\$230,578	\$4,580,324
2019	116,121	\$269,065	\$356,466	\$25,723	\$237,602	\$4,704,802
2020	111,078	\$253,829	\$369,996	\$25,041	\$243,397	\$4,806,991
2021	105,999	\$238,827	\$384,134	\$24,352	\$248,030	\$4,885,362
2022	100,909	\$224,137	\$398,889	\$23,668	\$251,392	\$4,938,334
2023	95,791	\$209,806	\$410,143	\$23,469	\$253,500	\$4,968,027
2024	90,699	\$195,829	\$421,190	\$23,214	\$254,417	\$4,973,869
2025	85,629	\$182,250	\$430,945	\$23,061	\$254,115	\$4,956,229
2026	80,633	\$169,105	\$439,894	\$22,849	\$252,617	\$4,915,208
2027	75,724	\$156,418	\$448,109	\$22,583	\$249,926	\$4,850,860
2037	33,673	\$58,043	\$475,356	\$16,901	\$157,441	\$2,937,679
2047	9,340	\$12,992	\$300,486	\$7,904	\$2,317	(\$100,746)
2057	1,546	\$1,737	\$105,600	\$2,251	(\$130,507)	(\$2,668,762)
2067	169	\$151	\$24,051	\$425	(\$258,197)	(\$5,188,190)
2077	17	\$5	\$2,350	\$35	(\$216,716)	(\$8,580,705)

Note:

- 1- Cash flows for 2017 and 2077 are for 6 months only.
- 2- Fund balances are as of the end of the Calendar Year, except for the opening balance which is as of June 30, 2017 and the last projected fund balance which is as of June 30, 2077.

Total Sum of all cash Flows and Present Values (\$ in thousands)

	Expected Premiums	Expected Claims	Expenses	Investment Earnings
Total Sum of Cash Flows	\$3,663,435	\$15,349,598	\$627,753	(\$609,390)
Present Value as of June 30, 2017	\$2,416,295	\$6,815,621	\$331,455	\$2,681,633

APPENDIX A

A-5

Claim Incidence Rates Reduced by 10 Percent

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

Main Results

Margin as Percentage of the Present Value of Premiums	Margin (\$ in millions)	Funded Status
13.73%	\$343	109%

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
						\$4,342,602
2017	125,920	\$150,381	\$160,326	\$12,704	\$112,259	\$4,432,212
2018	121,150	\$285,859	\$322,226	\$26,396	\$231,078	\$4,600,528
2019	116,320	\$271,669	\$327,418	\$25,750	\$239,433	\$4,758,462
2020	111,430	\$257,488	\$331,104	\$25,093	\$247,279	\$4,907,032
2021	106,528	\$243,381	\$337,996	\$24,436	\$254,570	\$5,042,550
2022	101,626	\$229,430	\$347,885	\$23,787	\$261,086	\$5,161,394
2023	96,701	\$215,699	\$356,164	\$23,645	\$266,751	\$5,264,035
2024	91,791	\$202,202	\$365,389	\$23,451	\$271,561	\$5,348,959
2025	86,892	\$188,994	\$374,195	\$23,362	\$275,447	\$5,415,843
2026	82,048	\$176,121	\$382,844	\$23,218	\$278,402	\$5,464,304
2027	77,270	\$163,615	\$391,202	\$23,019	\$280,411	\$5,494,109
2037	35,492	\$63,809	\$432,340	\$17,927	\$247,569	\$4,768,389
2047	10,243	\$15,144	\$286,650	\$9,103	\$174,393	\$3,356,215
2057	1,759	\$2,132	\$105,050	\$3,132	\$160,654	\$3,168,304
2067	198	\$194	\$24,693	\$1,551	\$226,727	\$4,532,520
2077	20	\$7	\$2,437	\$1,118	\$181,929	\$7,200,607

Note:

- 1- Cash flows for 2017 and 2077 are for 6 months only.
- 2- Fund balances are as of the end of the Calendar Year, except for the opening balance which is as of June 30, 2017 and the last projected fund balance which is as of June 30, 2077.

Total Sum of all cash Flows and Present Values (\$ in thousands)

	Expected Premiums	Expected Claims	Expenses	Investment Earnings
Total Sum of Cash Flows	\$3,831,404	\$14,064,597	\$684,014	\$13,775,213
Present Value as of June 30, 2017	\$2,496,964	\$6,154,005	\$342,787	\$4,498,137

APPENDIX A

A-6

Claim Termination Rates Increased by 10 Percent

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

Main Results

Margin as Percentage of the Present Value of Premiums	Margin (\$ in millions)	Funded Status
12.87%	\$320	108%

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
						\$4,342,602
2017	125,895	\$150,355	\$160,621	\$12,703	\$112,254	\$4,431,888
2018	121,074	\$285,635	\$322,864	\$26,387	\$231,041	\$4,599,313
2019	116,196	\$271,224	\$328,607	\$25,732	\$239,331	\$4,755,529
2020	111,261	\$256,836	\$333,255	\$25,068	\$247,058	\$4,901,099
2021	106,313	\$242,549	\$341,093	\$24,403	\$254,161	\$5,032,313
2022	101,365	\$228,453	\$351,421	\$23,745	\$260,434	\$5,146,033
2023	96,400	\$214,613	\$360,029	\$23,591	\$265,819	\$5,242,845
2024	91,456	\$201,038	\$369,362	\$23,383	\$270,317	\$5,321,454
2025	86,532	\$187,780	\$378,274	\$23,283	\$273,868	\$5,381,545
2026	81,668	\$174,880	\$386,959	\$23,127	\$276,465	\$5,422,803
2027	76,876	\$162,367	\$395,279	\$22,917	\$278,095	\$5,445,070
2037	35,119	\$62,953	\$432,361	\$17,744	\$241,267	\$4,641,768
2047	10,024	\$14,786	\$281,067	\$8,904	\$165,462	\$3,179,935
2057	1,694	\$2,054	\$100,080	\$3,001	\$149,611	\$2,949,439
2067	187	\$185	\$22,601	\$1,449	\$210,754	\$4,213,384
2077	18	\$7	\$2,075	\$1,039	\$169,248	\$6,698,780

Note:

- 3- Cash flows for 2017 and 2077 are for 6 months only.
- 4- Fund balances are as of the end of the Calendar Year, except for the opening balance which is as of June 30, 2017 and the last projected fund balance which is as of June 30, 2077.

Total Sum of all cash Flows and Present Values (\$ in thousands)

	Expected Premiums	Expected Claims	Expenses	Investment Earnings
Total Sum of Cash Flows	\$3,803,679	\$13,983,321	\$676,081	\$13,211,901
Present Value as of June 30, 2017	\$2,483,430	\$6,165,743	\$340,758	\$4,409,899

APPENDIX A

A-7

Claim Termination Rates Reduced by 10 Percent

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

Main Results

Margin as Percentage of the Present Value of Premiums	Margin (\$ in millions)	Funded Status
(18.78%)	(\$456)	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
						\$4,342,602
2017	125,942	\$150,242	\$161,939	\$12,705	\$112,247	\$4,430,448
2018	121,167	\$284,720	\$338,011	\$26,399	\$230,614	\$4,581,371
2019	116,282	\$269,537	\$356,197	\$25,746	\$237,676	\$4,706,641
2020	111,299	\$254,502	\$369,617	\$25,074	\$243,519	\$4,809,971
2021	106,279	\$239,666	\$383,686	\$24,395	\$248,219	\$4,889,775
2022	101,243	\$225,103	\$398,855	\$23,721	\$251,650	\$4,943,953
2023	96,172	\$210,862	\$410,516	\$23,537	\$253,812	\$4,974,574
2024	91,118	\$196,945	\$422,120	\$23,297	\$254,766	\$4,980,867
2025	86,074	\$183,398	\$432,315	\$23,157	\$254,475	\$4,963,268
2026	81,098	\$170,264	\$441,670	\$22,958	\$252,970	\$4,921,874
2027	76,202	\$157,571	\$450,289	\$22,702	\$250,249	\$4,856,702
2037	34,093	\$58,747	\$483,513	\$17,088	\$155,387	\$2,892,569
2047	9,574	\$13,265	\$312,529	\$8,075	(\$7,941)	(\$312,407)
2057	1,615	\$1,794	\$113,624	\$2,348	(\$154,720)	(\$3,158,210)
2067	182	\$158	\$27,249	\$456	(\$302,371)	(\$6,075,358)
2077	19	\$6	\$2,891	\$39	(\$253,749)	(\$10,047,063)

Note:

- 5- Cash flows for 2017 and 2077 are for 6 months only.
- 6- Fund balances are as of the end of the Calendar Year, except for the opening balance which is as of June 30, 2017 and the last projected fund balance which is as of June 30, 2077.

Total Sum of all cash Flows and Present Values (\$ in thousands)

	Expected Premiums	Expected Claims	Expenses	Investment Earnings
Total Sum of Cash Flows	\$3,687,760	\$15,687,797	\$633,975	(\$1,755,653)
Present Value as of June 30, 2017	\$2,428,630	\$6,893,887	\$333,443	\$2,571,789

APPENDIX A

A-8

Lapses Increased by 0.25 Percent

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 percent 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
3.97%	\$96	102%

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
						\$4,342,602
2017	125,761	\$150,168	\$161,305	\$12,696	\$112,249	\$4,431,018
2018	120,670	\$284,389	\$330,229	\$26,339	\$230,807	\$4,589,646
2019	115,517	\$268,948	\$341,576	\$25,638	\$238,453	\$4,729,833
2020	110,311	\$253,669	\$349,771	\$24,926	\$245,216	\$4,854,021
2021	105,104	\$238,616	\$359,744	\$24,215	\$251,117	\$4,959,796
2022	99,917	\$223,869	\$371,411	\$23,514	\$256,000	\$5,044,740
2023	94,728	\$209,478	\$380,420	\$23,288	\$259,848	\$5,110,359
2024	89,583	\$195,447	\$389,705	\$23,008	\$262,698	\$5,155,790
2025	84,478	\$181,821	\$398,053	\$22,832	\$264,511	\$5,181,238
2026	79,461	\$168,640	\$405,855	\$22,601	\$265,306	\$5,186,728
2027	74,542	\$155,927	\$413,092	\$22,317	\$265,083	\$5,172,329
2037	32,860	\$57,812	\$436,307	\$16,636	\$208,089	\$3,972,713
2047	9,067	\$12,981	\$275,508	\$7,973	\$109,500	\$2,060,428
2057	1,491	\$1,734	\$96,624	\$2,393	\$59,527	\$1,145,326
2067	162	\$150	\$22,005	\$698	\$62,112	\$1,234,108
2077	16	\$5	\$2,198	\$313	\$47,223	\$1,868,288

Note:

- 1- Cash flows for 2017 and 2077 are for 6 months only.
- 2- Fund balances are as of the end of the Calendar Year, except for the opening balance which is as of June 30, 2017 and the last projected fund balance which is as of June 30, 2077.

Total Sum of all cash Flows and Present Values (\$ in thousands)

	Expected Premiums	Expected Claims	Expenses	Investment Earnings
Total Sum of Cash Flows	\$3,655,684	\$14,171,238	\$629,223	\$8,670,463
Present Value as of June 30, 2017	\$2,412,071	\$6,329,685	\$329,194	\$3,802,287

APPENDIX A

A-9

Lapses Decreased by 0.25 Percent

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 percent 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
(6.96%)	(\$174)	96%

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
						\$4,342,602
2017	126,069	\$150,425	\$161,278	\$12,711	\$112,252	\$4,431,290
2018	121,551	\$285,938	\$330,442	\$26,444	\$230,850	\$4,591,192
2019	116,926	\$271,775	\$342,460	\$25,835	\$238,578	\$4,733,249
2020	112,201	\$257,624	\$351,672	\$25,209	\$245,442	\$4,859,434
2021	107,429	\$243,554	\$362,954	\$24,574	\$251,438	\$4,966,897
2022	102,626	\$229,647	\$376,172	\$23,942	\$256,392	\$5,052,822
2023	97,774	\$215,962	\$386,938	\$23,828	\$260,261	\$5,118,279
2024	92,919	\$202,508	\$398,158	\$23,658	\$263,066	\$5,162,037
2025	88,056	\$189,335	\$408,592	\$23,592	\$264,747	\$5,183,934
2026	83,235	\$176,490	\$418,597	\$23,468	\$265,305	\$5,183,664
2027	78,467	\$164,004	\$428,129	\$23,287	\$264,724	\$5,160,975
2037	36,326	\$63,930	\$474,863	\$18,195	\$194,158	\$3,676,132
2047	10,524	\$15,095	\$314,724	\$9,021	\$60,177	\$1,052,499
2057	1,817	\$2,122	\$115,381	\$2,635	(\$42,534)	(\$909,994)
2067	206	\$194	\$27,103	\$517	(\$115,735)	(\$2,333,680)
2077	21	\$7	\$2,619	\$43	(\$99,955)	(\$3,958,408)

Note:

- 1- Cash flows for 2017 and 2077 are for 6 months only.
- 2- Fund balances are as of the end of the Calendar Year, except for the opening balance which is as of June 30, 2017 and the last projected fund balance which is as of June 30, 2077.

Total Sum of all cash Flows and Present Values (\$ in thousands)

	Expected Premiums	Expected Claims	Expenses	Investment Earnings
Total Sum of Cash Flows	\$3,836,254	\$15,345,807	\$663,734	\$3,872,277
Present Value as of June 30, 2017	\$2,499,985	\$6,673,112	\$343,560	\$3,306,858

APPENDIX A

A-10

Mortality Rates Increased by 10 Percent

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 percent higher than expected.

Main Results

Margin as Percentage of the Present Value of Premiums	Margin (\$ in millions)	Funded Status
7.80%	\$187	105%

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
						\$4,342,602
2017	125,783	\$150,208	\$161,873	\$12,698	\$112,242	\$4,430,482
2018	120,717	\$284,388	\$331,078	\$26,346	\$230,755	\$4,588,202
2019	115,576	\$268,853	\$341,866	\$25,647	\$238,364	\$4,727,906
2020	110,368	\$253,482	\$349,280	\$24,936	\$245,119	\$4,852,292
2021	105,151	\$238,339	\$358,359	\$24,223	\$251,051	\$4,959,099
2022	99,943	\$223,502	\$369,060	\$23,519	\$256,011	\$5,046,034
2023	94,729	\$209,025	\$377,072	\$23,289	\$259,987	\$5,114,685
2024	89,556	\$194,915	\$385,397	\$23,004	\$263,020	\$5,164,219
2025	84,421	\$181,214	\$392,844	\$22,820	\$265,071	\$5,194,839
2026	79,373	\$167,965	\$399,832	\$22,580	\$266,157	\$5,206,549
2027	74,423	\$155,193	\$406,333	\$22,287	\$266,279	\$5,199,401
2037	32,495	\$56,840	\$425,947	\$16,481	\$215,435	\$4,124,820
2047	8,820	\$12,518	\$266,347	\$7,820	\$128,304	\$2,441,839
2057	1,433	\$1,649	\$92,994	\$2,435	\$95,168	\$1,861,575
2067	155	\$141	\$21,182	\$961	\$122,839	\$2,451,800
2077	16	\$5	\$2,142	\$608	\$97,226	\$3,847,698

Note:

- 1- Cash flows for 2017 and 2077 are for 6 months only.
- 2- Fund balances are as of the end of the Calendar Year, except for the opening balance which is as of June 30, 2017 and the last projected fund balance which is as of June 30, 2077.

Total Sum of all cash Flows and Present Values (\$ in thousands)

	Expected Premiums	Expected Claims	Expenses	Investment Earnings
Total Sum of Cash Flows	\$3,632,719	\$13,866,339	\$631,611	\$10,370,326
Present Value as of June 30, 2017	\$2,402,732	\$6,229,287	\$328,572	\$3,991,823

APPENDIX A

A-11

Mortality Rates Decreased by 10 Percent

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 percent lower than expected.

Main Results

Margin as Percentage of the Present Value of Premiums	Margin (\$ in millions)	Funded Status
(12.6%)	(\$317)	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
						\$4,342,602
2017	126,055	\$150,390	\$160,658	\$12,710	\$112,260	\$4,431,884
2018	121,525	\$285,990	\$329,525	\$26,441	\$230,908	\$4,592,816
2019	116,909	\$271,977	\$342,176	\$25,832	\$238,679	\$4,735,464
2020	112,209	\$257,986	\$352,293	\$25,208	\$245,555	\$4,861,504
2021	107,472	\$244,078	\$364,644	\$24,579	\$251,521	\$4,967,880
2022	102,716	\$230,332	\$379,052	\$23,954	\$256,391	\$5,051,596
2023	97,916	\$216,803	\$391,084	\$23,852	\$260,115	\$5,113,578
2024	93,117	\$203,499	\$403,573	\$23,696	\$262,708	\$5,152,516
2025	88,312	\$190,467	\$415,251	\$23,647	\$264,107	\$5,168,193
2026	83,549	\$177,752	\$426,439	\$23,540	\$264,310	\$5,160,276
2027	78,838	\$165,382	\$437,102	\$23,379	\$263,300	\$5,128,476
2037	37,063	\$65,693	\$491,461	\$18,513	\$184,126	\$3,467,340
2047	11,010	\$15,969	\$331,419	\$9,343	\$32,339	\$486,317
2057	1,941	\$2,299	\$123,028	\$2,812	(\$97,290)	(\$2,011,504)
2067	223	\$214	\$29,095	\$560	(\$210,171)	(\$4,227,888)
2077	23	\$8	\$2,779	\$46	(\$178,052)	(\$7,050,240)

Note:

- 1- Cash flows for 2017 and 2077 are for 6 months only.
- 2- Fund balances are as of the end of the Calendar Year, except for the opening balance which is as of June 30, 2017 and the last projected fund balance which is as of June 30, 2077.

Total Sum of all cash Flows and Present Values (\$ in thousands)

	Expected Premiums	Expected Claims	Expenses	Investment Earnings
Total Sum of Cash Flows	\$3,879,088	\$15,863,425	\$673,310	\$1,264,805
Present Value as of June 30, 2017	\$2,517,431	\$6,831,141	\$346,184	\$3,023,159

APPENDIX A

A-12

“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 percent higher or 5.75 percent, if lapse rates were to be 0.25 percent higher, if mortality rates were to be higher by 10 percent, and if morbidity rates were 10 percent lower.

Main Results

Margin as Percentage of the Present Value of Premiums	Margin (\$ in millions)	Funded Status
53.25%	\$1,248	140%

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
						\$4,342,602
2017	125,607	\$150,217	\$160,313	\$12,689	\$122,795	\$4,442,612
2018	120,266	\$284,726	\$315,667	\$26,291	\$253,811	\$4,639,190
2019	114,925	\$269,503	\$314,028	\$25,556	\$264,762	\$4,833,871
2020	109,579	\$254,376	\$312,272	\$24,821	\$275,604	\$5,026,759
2021	104,270	\$239,423	\$314,620	\$24,095	\$286,248	\$5,213,715
2022	99,009	\$224,733	\$320,314	\$23,385	\$296,444	\$5,391,193
2023	93,775	\$210,370	\$324,959	\$23,143	\$306,112	\$5,559,573
2024	88,601	\$196,353	\$330,745	\$22,852	\$315,246	\$5,717,574
2025	83,486	\$182,729	\$336,428	\$22,668	\$323,786	\$5,864,993
2026	78,467	\$169,541	\$342,155	\$22,431	\$331,731	\$6,001,679
2027	73,554	\$156,816	\$347,705	\$22,145	\$339,080	\$6,127,724
2037	32,136	\$58,405	\$365,852	\$16,602	\$383,985	\$6,898,666
2047	8,737	\$13,126	\$229,001	\$8,522	\$451,255	\$8,187,274
2057	1,409	\$1,747	\$78,974	\$4,242	\$674,151	\$12,358,225
2067	149	\$151	\$17,485	\$5,217	\$1,142,927	\$21,008,720
2077	15	\$5	\$1,692	\$5,318	\$979,597	\$35,531,996

Note:

- 1- Cash flows for 2017 and 2077 are for 6 months only.
- 2- Fund balances are as of the end of the Calendar Year, except for the opening balance which is as of June 30, 2017 and the last projected fund balance which is as of June 30, 2077.

Total Sum of all cash Flows and Present Values (\$ in thousands)

	Expected Premiums	Expected Claims	Expenses	Investment Earnings
Total Sum of Cash Flows	\$3,674,911	\$11,982,937	\$740,905	\$40,238,326
Present Value as of June 30, 2017	\$2,344,126	\$5,118,762	\$319,669	\$6,980,770

APPENDIX A

A-13

“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 percent lower or 4.75 percent, if lapse rates were to be 0.25 percent lower, if mortality rates were to be lower by 10 percent, and if morbidity rates were 10 percent higher.

Main Results

Margin as Percentage of the Present Value of Premiums	Margin (\$ in millions)	Funded Status
(68.00%)	(\$1,752)	71%

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
						\$4,342,602
2017	126,224	\$150,373	\$162,335	\$12,718	\$101,681	\$4,419,603
2018	121,967	\$285,568	\$345,682	\$26,494	\$208,002	\$4,540,996
2019	117,551	\$271,153	\$371,882	\$25,921	\$212,811	\$4,627,156
2020	112,990	\$256,825	\$392,479	\$25,321	\$216,082	\$4,682,263
2021	108,347	\$242,637	\$412,905	\$24,706	\$217,904	\$4,705,193
2022	103,643	\$228,664	\$433,584	\$24,087	\$218,186	\$4,694,372
2023	98,858	\$214,946	\$450,053	\$23,994	\$216,949	\$4,652,220
2024	94,053	\$201,479	\$466,043	\$23,841	\$214,259	\$4,578,073
2025	89,216	\$188,309	\$480,284	\$23,790	\$210,085	\$4,472,393
2026	84,412	\$175,477	\$493,387	\$23,676	\$204,455	\$4,335,262
2027	79,653	\$163,013	\$505,553	\$23,503	\$197,365	\$4,166,583
2037	37,292	\$63,307	\$564,213	\$18,329	\$43,729	\$702,872
2047	11,004	\$14,955	\$378,540	\$9,218	(\$211,192)	(\$4,843,158)
2057	1,945	\$2,114	\$141,840	\$2,814	(\$488,827)	(\$10,850,361)
2067	227	\$195	\$34,544	\$569	(\$826,471)	(\$18,243,014)
2077	24	\$7	\$3,492	\$49	(\$654,930)	(\$28,556,316)

Note:

- 1- Cash flows for 2017 and 2077 are for 6 months only.
- 2- Fund balances are as of the end of the Calendar Year, except for the opening balance which is as of June 30, 2017 and the last projected fund balance which is as of June 30, 2077.

Total Sum of all cash Flows and Present Values (\$ in thousands)

	Expected Premiums	Expected Claims	Expenses	Investment Earnings
Total Sum of Cash Flows	\$3,815,446	\$18,146,555	\$672,008	(\$17,895,801)
Present Value as of June 30, 2017	\$2,576,341	\$8,306,164	\$364,816	(\$108,364)

APPENDIX B

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

- SCENARIO 1 – BASE CASE..... B-1
.....
- SCENARIO 2 – DISCOUNT RATE INCREASING 0.50 PERCENT FOR 10 YEARS..... B-2
- SCENARIO 3 – DISCOUNT RATE INCREASING 1 PERCENT FOR 5 YEARS THEN
DECREASING 1 PERCENT FOR 5 YEARS B-3
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INCREASING 1 PERCENT FOR 5 YEARS..... B-6
- SCENARIO 7 – DISCOUNT RATE DECREASED 3 PERCENT B-7

APPENDIX B

B-1

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 same as the base scenario with a discount rate and expected return of 5.25 percent.

Main Results

Margin as Percentage of the Present Value of Premiums	Margin (\$ in millions)	Funded Status
(1.45%)	(\$36)	99%

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
						\$4,342,602
2017	125,915	\$150,297	\$161,292	\$12,704	\$112,251	\$4,431,154
2018	121,110	\$285,163	\$330,336	\$26,392	\$230,828	\$4,590,418
2019	116,220	\$270,359	\$342,018	\$25,737	\$238,515	\$4,731,538
2020	111,253	\$255,641	\$350,720	\$25,067	\$245,329	\$4,856,722
2021	106,261	\$241,075	\$361,345	\$24,394	\$251,277	\$4,963,335
2022	101,264	\$226,743	\$373,783	\$23,727	\$256,195	\$5,048,763
2023	96,240	\$212,699	\$383,664	\$23,556	\$260,053	\$5,114,295
2024	91,237	\$198,950	\$393,908	\$23,331	\$262,881	\$5,158,887
2025	86,250	\$185,545	\$403,288	\$23,209	\$264,628	\$5,182,563
2026	81,328	\$172,525	\$412,177	\$23,030	\$265,305	\$5,185,185
2027	76,482	\$159,919	\$420,544	\$22,797	\$264,903	\$5,166,666
2037	34,552	\$60,798	\$455,187	\$17,398	\$201,220	\$3,826,532
2047	9,769	\$13,999	\$294,472	\$8,478	\$85,339	\$1,566,815
2057	1,646	\$1,919	\$105,579	\$2,437	\$9,714	\$142,312
2067	183	\$171	\$24,407	\$459	(\$24,515)	(\$503,594)
2077	19	\$6	\$2,394	\$37	(\$24,384)	(\$966,512)

Note:

- 1- Cash flows for 2017 and 2077 are for 6 months only.
- 2- Fund balances are as of the end of the Calendar Year, except for the opening balance which is as of June 30, 2017 and the last projected fund balance which is as of June 30, 2077.

Total Sum of all cash Flows and Present Values (\$ in thousands)

	Expected Premiums	Expected Claims	Expenses	Investment Earnings
Total Sum of Cash Flows	\$3,744,280	\$14,741,556	\$642,576	\$6,330,738
Present Value as of June 30, 2017	\$2,455,391	\$6,497,527	\$335,974	\$3,560,262

APPENDIX B

B-2

Scenario 2 - Discount Rate Increasing 0.50 Percent 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
72.46%	\$1,552	156%

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
						\$4,342,602
2017	125,915	\$150,297	\$161,292	\$12,704	\$112,251	\$4,431,154
2018	121,110	\$285,163	\$330,336	\$26,392	\$241,765	\$4,601,355
2019	116,220	\$270,359	\$342,018	\$25,737	\$273,177	\$4,777,136
2020	111,253	\$255,641	\$350,720	\$25,070	\$306,626	\$4,963,613
2021	106,261	\$241,075	\$361,345	\$24,402	\$342,431	\$5,161,374
2022	101,264	\$226,743	\$373,783	\$23,741	\$380,751	\$5,371,343
2023	96,240	\$212,699	\$383,664	\$23,580	\$421,979	\$5,598,777
2024	91,237	\$198,950	\$393,908	\$23,368	\$466,696	\$5,847,147
2025	86,250	\$185,545	\$403,288	\$23,263	\$515,492	\$6,121,633
2026	81,328	\$172,525	\$412,177	\$23,106	\$569,191	\$6,428,066
2027	76,482	\$159,919	\$420,544	\$22,899	\$628,778	\$6,773,320
2037	34,552	\$60,798	\$455,187	\$18,163	\$1,119,180	\$11,828,581
2047	9,769	\$13,999	\$294,472	\$11,481	\$2,340,092	\$25,023,539
2057	1,646	\$1,919	\$105,579	\$13,025	\$5,860,057	\$62,972,972
2067	183	\$171	\$24,407	\$37,103	\$15,441,193	\$165,732,877
2077	19	\$6	\$2,394	\$59,647	\$19,884,189	\$417,536,733

Note:

- 1- Cash flows for 2017 and 2077 are for 6 months only.
- 2- Fund balances are as of the end of the Calendar Year, except for the opening balance which is as of June 30, 2017 and the last projected fund balance which is as of June 30, 2077.

Total Sum of all cash Flows and Present Values (\$ in thousands)

	Expected Premiums	Expected Claims	Expenses	Investment Earnings
Total Sum of Cash Flows	\$3,744,280	\$14,741,556	\$1,658,080	\$425,849,487
Present Value as of June 30, 2017	\$2,142,144	\$4,655,928	\$276,551	\$11,584,112

APPENDIX B

B-3

Scenario 3 - Discount Rate Increasing 1 Percent for 5 Years then Decreasing 1 Percent for 5 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
34.68%	\$760	121%

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
						\$4,342,602
2017	125,915	\$150,297	\$161,292	\$12,704	\$112,251	\$4,431,154
2018	121,110	\$285,163	\$330,336	\$26,392	\$252,676	\$4,612,266
2019	116,220	\$270,359	\$342,018	\$25,738	\$307,975	\$4,822,845
2020	111,253	\$255,641	\$350,720	\$25,073	\$369,048	\$5,071,741
2021	106,261	\$241,075	\$361,345	\$24,409	\$437,414	\$5,364,476
2022	101,264	\$226,743	\$373,783	\$23,756	\$514,696	\$5,708,375
2023	96,240	\$212,699	\$383,664	\$23,605	\$547,498	\$6,061,303
2024	91,237	\$198,950	\$393,908	\$23,403	\$521,237	\$6,364,180
2025	86,250	\$185,545	\$403,288	\$23,303	\$484,300	\$6,607,433
2026	81,328	\$172,525	\$412,177	\$23,145	\$437,542	\$6,782,178
2027	76,482	\$159,919	\$420,544	\$22,928	\$382,226	\$6,880,851
2037	34,552	\$60,798	\$455,187	\$17,690	\$343,726	\$6,683,291
2047	9,769	\$13,999	\$294,472	\$9,118	\$322,766	\$6,326,335
2057	1,646	\$1,919	\$105,579	\$3,835	\$405,138	\$8,068,914
2067	183	\$171	\$24,407	\$3,400	\$633,747	\$12,691,465
2077	19	\$6	\$2,394	\$3,094	\$516,243	\$20,434,746

Note:

- 1- Cash flows for 2017 and 2077 are for 6 months only.
- 2- Fund balances are as of the end of the Calendar Year, except for the opening balance which is as of June 30, 2017 and the last projected fund balance which is as of June 30, 2077.

Total Sum of all cash Flows and Present Values (\$ in thousands)

	Expected Premiums	Expected Claims	Expenses	Investment Earnings
Total Sum of Cash Flows	\$3,744,280	\$14,741,556	\$724,153	\$27,813,573
Present Value as of June 30, 2017	\$2,189,995	\$5,476,317	\$296,695	\$6,150,033

APPENDIX B

B-4

Scenario 4 – Discount Rate Increased 3 Percent

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
72.82%	\$1,485	152%

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
						\$4,342,602
2017	125,915	\$150,297	\$161,292	\$12,704	\$175,140	\$4,494,043
2018	121,110	\$285,163	\$330,336	\$26,396	\$367,932	\$4,790,407
2019	116,220	\$270,359	\$342,018	\$25,750	\$391,327	\$5,084,325
2020	111,253	\$255,641	\$350,720	\$25,091	\$414,644	\$5,378,799
2021	106,261	\$241,075	\$361,345	\$24,431	\$437,962	\$5,672,060
2022	101,264	\$226,743	\$373,783	\$23,778	\$461,093	\$5,962,335
2023	96,240	\$212,699	\$383,664	\$23,624	\$484,060	\$6,251,805
2024	91,237	\$198,950	\$393,908	\$23,417	\$506,981	\$6,540,411
2025	86,250	\$185,545	\$403,288	\$23,317	\$529,862	\$6,829,212
2026	81,328	\$172,525	\$412,177	\$23,162	\$552,801	\$7,119,199
2027	76,482	\$159,919	\$420,544	\$22,956	\$575,881	\$7,411,498
2037	34,552	\$60,798	\$455,187	\$18,083	\$840,112	\$10,814,533
2047	9,769	\$13,999	\$294,472	\$10,647	\$1,398,196	\$18,200,192
2057	1,646	\$1,919	\$105,579	\$8,794	\$2,839,506	\$37,201,789
2067	183	\$171	\$24,407	\$18,722	\$6,184,950	\$81,132,356
2077	19	\$6	\$2,394	\$24,999	\$6,671,930	\$171,671,781

Note:

- 1- Cash flows for 2017 and 2077 are for 6 months only.
- 2- Fund balances are as of the end of the Calendar Year, except for the opening balance which is as of June 30, 2017 and the last projected fund balance which is as of June 30, 2077.

Total Sum of all cash Flows and Present Values (\$ in thousands)

	Expected Premiums	Expected Claims	Expenses	Investment Earnings
Total Sum of Cash Flows	\$3,744,280	\$14,741,556	\$1,135,883	\$179,462,338
Present Value as of June 30, 2017	\$2,039,644	\$4,627,690	\$269,296	\$10,228,049

APPENDIX B

B-5

Scenario 5 – Discount Rate Decreasing 0.50 Percent 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.

Main Results

Margin as Percentage of the Present Value of Premiums	Margin (\$ in millions)	Funded Status
(138.70%)	(\$4,155)	51%

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
						\$4,342,602
2017	125,915	\$150,297	\$161,292	\$12,704	\$112,251	\$4,431,154
2018	121,110	\$285,163	\$330,336	\$26,392	\$219,865	\$4,579,455
2019	116,220	\$270,359	\$342,018	\$25,736	\$203,991	\$4,686,052
2020	111,253	\$255,641	\$350,720	\$25,064	\$185,152	\$4,751,061
2021	106,261	\$241,075	\$361,345	\$24,387	\$163,887	\$4,770,292
2022	101,264	\$226,743	\$373,783	\$23,713	\$140,687	\$4,740,226
2023	96,240	\$212,699	\$383,664	\$23,533	\$116,216	\$4,661,943
2024	91,237	\$198,950	\$393,908	\$23,296	\$91,207	\$4,534,896
2025	86,250	\$185,545	\$403,288	\$23,161	\$66,373	\$4,360,365
2026	81,328	\$172,525	\$412,177	\$22,965	\$42,453	\$4,140,201
2027	76,482	\$159,919	\$420,544	\$22,711	\$20,162	\$3,877,027
2037	34,552	\$60,798	\$455,187	\$17,029	\$1,038	\$210,616
2047	9,769	\$13,999	\$294,472	\$8,227	(\$8,272)	(\$3,459,987)
2057	1,646	\$1,919	\$105,579	\$2,393	(\$13,308)	(\$5,388,311)
2067	183	\$171	\$24,407	\$459	(\$15,102)	(\$6,067,937)
2077	19	\$6	\$2,394	\$37	(\$7,888)	(\$6,323,078)

Note:

- 1- Cash flows for 2017 and 2077 are for 6 months only.
- 2- Fund balances are as of the end of the Calendar Year, except for the opening balance which is as of June 30, 2017 and the last projected fund balance which is as of June 30, 2077.

Total Sum of all cash Flows and Present Values (\$ in thousands)

	Expected Premiums	Expected Claims	Expenses	Investment Earnings
Total Sum of Cash Flows	\$3,744,280	\$14,741,556	\$635,180	\$966,776
Present Value as of June 30, 2017	\$2,995,354	\$11,005,886	\$486,739	\$909,343

APPENDIX B

B-6

Scenario 6 - Discount Rate Decreasing 1 Percent for 5 Years then Increasing 1 Percent for 5 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.

Main Results

Margin as Percentage of the Present Value of Premiums	Margin (\$ in millions)	Funded Status
(38.47%)	(\$1,073)	80%

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
						\$4,342,602
2017	125,915	\$150,297	\$161,292	\$12,704	\$112,251	\$4,431,154
2018	121,110	\$285,163	\$330,336	\$26,392	\$208,876	\$4,568,466
2019	116,220	\$270,359	\$342,018	\$25,735	\$169,604	\$4,640,677
2020	111,253	\$255,641	\$350,720	\$25,061	\$126,091	\$4,646,628
2021	106,261	\$241,075	\$361,345	\$24,379	\$80,196	\$4,582,175
2022	101,264	\$226,743	\$373,783	\$23,699	\$33,891	\$4,445,327
2023	96,240	\$212,699	\$383,664	\$23,512	\$32,325	\$4,283,175
2024	91,237	\$198,950	\$393,908	\$23,268	\$72,752	\$4,137,701
2025	86,250	\$185,545	\$403,288	\$23,130	\$110,175	\$4,007,004
2026	81,328	\$172,525	\$412,177	\$22,936	\$145,042	\$3,889,458
2027	76,482	\$159,919	\$420,544	\$22,690	\$177,735	\$3,783,878
2037	34,552	\$60,798	\$455,187	\$17,161	\$86,264	\$1,522,059
2047	9,769	\$13,999	\$294,472	\$8,227	(\$106,221)	(\$2,273,390)
2057	1,646	\$1,919	\$105,579	\$2,393	(\$309,726)	(\$6,261,677)
2067	183	\$171	\$24,407	\$459	(\$557,366)	(\$11,186,000)
2077	19	\$6	\$2,394	\$37	(\$463,123)	(\$18,335,682)

Note:

- 1- Cash flows for 2017 and 2077 are for 6 months only.
- 2- Fund balances are as of the end of the Calendar Year, except for the opening balance which is as of June 30, 2017 and the last projected fund balance which is as of June 30, 2077.

Total Sum of all cash Flows and Present Values (\$ in thousands)

	Expected Premiums	Expected Claims	Expenses	Investment Earnings
Total Sum of Cash Flows	\$3,744,280	\$14,741,556	\$636,103	(\$11,044,906)
Present Value as of June 30, 2017	\$2,790,303	\$7,814,022	\$392,374	\$452,592

APPENDIX B

B-7

Scenario 7 - Discount Rate Decreasing 3 Percent

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
(98.01%)	(\$3,007)	59%

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
						\$4,342,602
2017	125,915	\$150,297	\$161,292	\$12,704	\$48,459	\$4,367,363
2018	121,110	\$285,163	\$330,336	\$26,388	\$97,487	\$4,393,290
2019	116,220	\$270,359	\$342,018	\$25,723	\$97,780	\$4,393,689
2020	111,253	\$255,641	\$350,720	\$25,044	\$97,533	\$4,371,099
2021	106,261	\$241,075	\$361,345	\$24,360	\$96,756	\$4,323,226
2022	101,264	\$226,743	\$373,783	\$23,681	\$95,387	\$4,247,892
2023	96,240	\$212,699	\$383,664	\$23,497	\$93,422	\$4,146,851
2024	91,237	\$198,950	\$393,908	\$23,257	\$90,885	\$4,019,521
2025	86,250	\$185,545	\$403,288	\$23,121	\$87,764	\$3,866,421
2026	81,328	\$172,525	\$412,177	\$22,925	\$84,076	\$3,687,920
2027	76,482	\$159,919	\$420,544	\$22,674	\$79,828	\$3,484,449
2037	34,552	\$60,798	\$455,187	\$17,028	\$9,199	\$211,768
2047	9,769	\$13,999	\$294,472	\$8,227	(\$81,050)	(\$3,826,515)
2057	1,646	\$1,919	\$105,579	\$2,393	(\$149,576)	(\$6,849,560)
2067	183	\$171	\$24,407	\$459	(\$201,552)	(\$9,171,500)
2077	19	\$6	\$2,394	\$37	(\$126,707)	(\$11,453,714)

Note:

- 1- Cash flows for 2017 and 2077 are for 6 months only.
- 2- Fund balances are as of the end of the Calendar Year, except for the opening balance which is as of June 30, 2017 and the last projected fund balance which is as of June 30, 2077.

Total Sum of all cash Flows and Present Values (\$ in thousands)

	Expected Premiums	Expected Claims	Expenses	Investment Earnings
Total Sum of Cash Flows	\$3,744,280	\$14,741,556	\$634,746	(\$4,164,294)
Present Value as of June 30, 2017	\$3,068,203	\$9,952,384	\$465,629	(\$854,050)

APPENDIX C

Long-Term Care Model and Assumptions

Model

Projection results are based on 128,299 inforce policies as of June 30, 2017. CalPERS LTC business consists of facility-only and comprehensive coverage and includes a variety of elimination periods, benefit periods, and inflation coverage combinations. New optional benefits available to LTC4 policies are projected in the model, which include 3 percent simple or compound automatic inflation protection, 5 percent simple automatic inflation protection, restoration of benefits and survivorship benefit. A summary of the model cells we used for projection purposes has been included as Appendix D. Projection results for each cell reflect output from the First Principles Model.

The previously used Claim Cost Model projects total exposures using total deaths and lapses as decrements. The total-lives claim cost approach calculates claim costs using incurred claims based on total exposures. These calculated claim costs are applied to the projected total exposures in the model. An adjustment factor (i.e., the “J-prime factor”) modifies the claim costs to take into account that only health lives can start a new claim. The J-prime factors are defined as healthy exposure over total exposure. Benefit exhaustion and runout of incurred claims into paid claims are calculated outside of the model, and then entered as additional inputs.

By contrast, the First Principles Model automatically tracks policyholder status. In the First Principles Model, policyholders are classified as either “healthy”, “disabled” (including site of care) or “inactive” (either due to lapsation, death, or benefit expiration). The First Principles Model has the ability to track active policyholder status, which avoids the need for time-consuming and lengthy efforts of estimating this outside of the model.

In addition to tracking the status of policyholders, 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 for First Principles Model to more accurately project when benefits will be exhausted, and also to more accurately reflect the claim payment patterns as claimants move along their respective continuance curves.

In the Claim Cost Model, benefit exhaustion and the runout of incurred claims into paid claims are calculated outside of the model and then entered as additional inputs. With the First Principles Model, this work can be done inside the model while also improving the accuracy of the calculations. Particularly, for the runout of incurred claims into paid claims, the Claim Cost Model uses aggregated runout patterns that do not fully reflect all the varied continuance curves and utilization assumptions for a covered population, and often does not account for the different claimant ages. The First Principles Model pays claims exactly as the continuance curve and utilization assumptions suggest, allowing for detailed patterns for all segments of the population.

The First Principles Model is also highly adaptive to assumption changes, automatically calculating the separation between healthy and disabled lives in response to adjustments to the underlying assumptions.

The improved modeling allows important statistics to be easily tracked using the information available in the First Principles Model—the number of new and open claims, the rate at which

claims are terminating (often with splits for death, recovery, and exhaustion) and the split of the population between disabled and healthy lives. These statistics offer increased transparency on what drives deviations in experience, for example, higher or lower than assumed claim incidence or claims persisting for longer or shorter than expected. The ability to directly compare these figures against emerging experience is a useful tool that is not readily available with 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.

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 salvage factors or the utilization rate. These factors determine how much of the available benefit a policyholder will use during claim as a percentage of the maximum benefit available.

Incidence Rates:

The incidence rate is developed using CalPERS claim data, and when there is insufficient claim data available for full credibility, the incidence rates are credibility weighted with industry data using the Society of Actuaries report [The Long Term Care Intercompany Experience Study - Aggregated Database 2000-2011 Report](#). Unless noted otherwise, all references to the SOA material in this section is in reference to this report and its associated databases.

Separate incidence rates were developed for the following categories:

- Gender: Male and Female
- Duration of claim: Long or Short Duration Claims, for a further explanation of this breakdown, please see the paragraph following this list
- Attained Age Bands: 0-49, 50-54, 55-59, 60-64, 65-69, 70-74, 75-79, 80-84, 85-89, and 90+
- Initial Site of Care: Home Health Care, Assisted Living Facility, and Nursing Home

The initial diagnosis is used to determine the duration of claim, and this is based on the following groupings from the SOA 2000-2011 Long-Term Care Aggregated Databases Long Duration claims: Alzheimer's, Mental, and Nervous System and Sense Organs. A listing of ICD9 codes can be found in the [1984-2007 Long-Term Care Intercompany Report & Tables](#), in Appendix

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G1. Please note that this is a website outside of CalPERS and the web address may be subject to change, or removal.

The experience study data for the June 30, 2017 valuation uses all claim and exposure information as of March 31, 2017, with an experience study cutoff date of December 31, 2015.

The experience study uses the following steps to calculate the incidence rates:

- Step 1: Determine 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 goes on claim, a full year of exposure is credited to the individual for that year.
- Step 2: Determine claims.
 - The claim count is grouped based on the different categories.
- Step 3: Determine the CalPERS experience based incidence rates.
 - The incidence rates are the total number of claims divided by the exposure.
- Step 4: Get the manual incidence rates.
 - The manual incidence rates are determined in two steps. All categories except duration come from the Claim Incidence Rates Database 2000-2011. The split between Long and Short Duration claims is determined by adding the total number of claims within each grouping from the SOA Claim Termination Rates Database 2000-2011. For example, the SOA rate from the Claim Incidence Rates Database 2000-2011 is 0.20, then within the Claim Termination Rates Database 2000-2011 there were five claims for short duration diagnosis categories, and 15 claims for long duration diagnosis categories. The manual rates for this example would be 0.05 for the Short Duration and 0.15 for the Long Duration.
- Step 5: Calculate the credibility weighted Incidence Rates.
 - The CalPERS standard for full credibility is 271 claims.
 - The credibility weighted incidence rates are calculated as the CalPERS credibility weight times the CalPERS experience based incidence rate plus one minus the CalPERS credibility weight multiplied by the SOA manual incidence rate.
- Step 6: Get factors for marital status at issue, and underwriting group, and duration.
 - Actual-to-Expected factors are created for each of these factors.
 - Marital status at issue is either single or married.
 - Underwriting groups are Short Form (SF), Modified Guarantee Issue (MGI) with issue dates in 1995, Modified Guarantee Issue (MGI) with issue dates after 1996, Long Form (LF) with issue dates from 1995 to 1998, and Long Form (LF) with issue dates after 1999.
 - Durational groupings were done by underwriting group and include different values for the first fourteen years, with an ultimate value after year fourteen.
- Step 7: Apply morbidity improvement factors.

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- Since morbidity and mortality improvements are related, morbidity improvement factors are the Scale BB mortality improvement factors, with a cap of 1.25%.

Claim Termination Rates

The claim termination rates are developed using CalPERS claim data and when there is insufficient claim data available for full credibility, the termination rates are credibility weighted with industry data using the Society of Actuaries [Long Term Care Intercompany Experience Study 2000-2011 Long-Term Care Aggregated Databases](#). 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 the SOA material in this section is in reference to this report and its associated databases.

Separate claim termination rates were developed for the following categories:

- Gender: Male and Female
- Duration of claim: Long or Short Duration Claims, for a further explanation of this breakdown, please see the paragraph following this list
- Incurred Age Bands: 0-64, 65-74, 75-84, 85-89, and 90+
- Initial Site of Care: Home Health care, Assisted Living Facility, and Nursing Home
 - Due to low amounts of data, ages 0-64 did not have separate continuance rates for the different sites of care.

The initial diagnosis is used to determine the duration of claim and is based on the following groupings from the SOA 2000-2011 Long-Term Care Aggregated Databases, including the following groupings for Long Duration claims: Alzheimer's, Mental, and Nervous System and Sense Organs. A listing of ICD9 codes can be found in the [1984-2007 Long-Term Care Intercompany Report & Tables](#), in Appendix G1. Please note that this is a website outside of CalPERS and the web address may be subject to change, or removal.

The experience study data for the June 30, 2017 valuation uses all claim and exposure information as of March 31, 2017, with an experience study cutoff date of December 31, 2015. The claim termination study uses the following steps to calculate the claim termination rates:

- Step 1: Gather all the exposures.
 - The exposure is the on-claim time for all claims that commenced on or before December 31, 2015. The claims are categorized as open, closed, or closed due to expiration of benefits as of December 31, 2015. These claims are then categorized based on their characteristics.
- Step 2: Gather all the claim terminations.
 - The terminations are claims that have closed on or before December 31, 2015. The closed claims also must not have closed due to expiration of benefits. The terminations are grouped based on their characteristics.

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- Step 3: Determine the CalPERS experience based claim termination rates.
 - The claim termination rates are determined from the date of incurral, including the elimination period. Claim termination rates are the number of claims that were closed in a given period divided by the exposure in that period. Claim terminations for days 31-60 are the claims closed with a thirty-day elimination period that closed between the first and thirtieth day after the elimination period. The exposure for days 31-60 includes all claims that were paid at least one day and had a thirty-day elimination period. Claim terminations for days 91-120, include claims with a ninety-day elimination period that terminated within the first thirty paid days and claims with a thirty day elimination period that terminated between the paid days of sixty-one and ninety. The following chart illustrates how these were done.

Days	31-60	61-90	91-120	121-150	151-180
Claim Terminations used (days after elimination period)					
30-day elimination period	1-30	31-60	61-90	91-120	121-150
90-day elimination period	N/A	N/A	1-30	31-60	61-90
Exposure Used (minimum number of paid days)					
30-day elimination period	1	31	61	91	121
90-day elimination period	N/A	N/A	1	31	61

- Step 4: Get the manual claim termination rates.
 - The manual rates come from the Claim Terminations Rates Database 2000-2011. The method for calculating the manual termination rate varies by elimination period. Since claim termination rates between days 1-30, cover only those who previously have had a claim, the manual claim terminations were based on the zero-day elimination period category only. For claim terminations between 31-90 days, the 30-day elimination period category was selected. For claims after 90 days, the combination of 30-day and 90/100-day elimination period categories were used.
- Step 5: Calculate the credibility weighted continuance rates.
 - The credibility for CalPERS continuance was given as the square root of the number of claims at each interval, divided by 271, with a maximum of 100% credibility. If credibility is less than 20%, 0% credibility was assigned. The credibility for the manual rates was 100% minus the credibility for CalPERS data.
- Step 6: Get marital status factors.

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- Marital status factors were calculated for each age band based on marital status at issue.

Salvage Factors

The salvage factors are developed using CalPERS claim data using all open claims as of March 31, 2017. If a grouping does not have any claims to develop salvage factors, the salvage factors from the prior series are used (i.e. if LTC2 in a specific grouping does not have data, the salvage factor for the same group from LTC1 is used).

The following groupings were used for the salvage factors:

- Product Series: LTC1, LTC2, LTC3, and LTC4
- Initial Site of Care: Home Health Care, Assisted Living Facility, or Nursing Home
- Inflation: Policies having inflation, or Policies not having inflation
- Policy Type: Comprehensive, Facilities Only, or Partnership

The following steps were done to get the salvage factors:

- Step 1: Gather all open claims.
 - This includes getting information about policy characteristics, total amount paid, and total amount allowed to be paid.
- Step 2: Group the data, and get the totals.
 - Add up the total amount paid and the total allowed amounts by their characteristics.
- Step 3: Calculate the salvage factors.
 - Divide the total amount paid by the total allowed amount for each group.

Mortality

Since CalPERS does not have enough experience to develop their own mortality tables, they use the industry 2012 Individual Annuitant Mortality (IAM) table. CalPERS then applies adjustment factors based on their plan's policyholder 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 following steps are used to calculate the mortality:

- Step 1: Develop total death exposures.
 - Exposure and deaths are divided into several categories: active and disabled mortality by age, by gender and by policy duration. If there is a death, the exposure for that individual at that age is rounded up to one.
- Step 2: Develop Selection factors.

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- Selection factors are developed using a comparison by duration of actual mortality and expected mortality. The results are displayed in the tables at the end of this section.
- Step 3: Develop attained age factors.
 - Attained age factors are developed using an actual to expected comparison at different groupings of attained ages. 271 is considered credible for this study. The attained age factors are developed separately for both genders and for active and disabled mortality.
- Step 4: Apply mortality improvement factors.
 - [Scale BB mortality improvement factors](#) were used for this purpose. Please note that this is a website outside of CalPERS and the web address may be subject to change or removal.

Lapse

Lapse rates are calculated as the number of lapses divided by the total active life exposures. Each active life at the start of the experience period contributes a full year to the exposure. Lapses contribute a full year to both the numerator and denominator of the lapse rate calculation.

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

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

Policy Year	Age Group					
	<40	40-49	50-59	60-69	70-79	80+
1	5.20%	3.77%	3.09%	2.70%	2.72%	3.70%
2	3.89%	2.53%	2.08%	1.31%	1.36%	2.41%
3	3.36%	2.01%	1.57%	1.04%	0.81%	1.60%
4	3.39%	1.91%	1.42%	0.90%	0.81%	1.13%
5	2.58%	1.59%	1.18%	0.71%	0.64%	0.96%
6	2.72%	1.68%	1.10%	0.69%	0.81%	1.44%
7	2.74%	1.55%	1.06%	0.66%	0.69%	1.60%
8	2.99%	1.75%	1.23%	0.73%	0.89%	1.12%
9	2.71%	1.65%	1.05%	0.60%	1.00%	1.48%
10	2.40%	1.56%	0.94%	0.70%	0.81%	1.35%
11+	2.53%	1.46%	0.92%	0.98%	1.27%	1.91%

Expenses

We used the following expense assumptions:

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- The third-party-administration (TPA) cost assumptions reflect the new five-year contract with Long Term Care Group (LTCG) which is effective in 2018. Expenses after the five-year contract are assumed to increase at an annual inflation rate of 2.75 percent.
- Projected inflated fixed dollar fees are assumed to decrease in January 2019 by the ratio of current premium to the prior year premium. The intent is to adjust for the fact that if the Program volume declines, expenses would decline as well.
- CalPERS non-TPA expenses are assumed to be \$431,229 per month through December of 2017 and assumed to increase by 2.75 percent for inflation each January thereafter.
- An option for participants allowing one-time premium payments using credit cards has been available since 2014. The credit card fee assumes that each year 1.267 percent of participants will use a credit card to pay their premiums at a cost of 3 percent of premium resulting in a total 0.038 percent of premium annual expense fee for credit cards.

Discount Rate

A 5.25 percent discount rate was approved in February 2018 by the Finance and Administration Committee. The new discount rate of 5.25 percent reflects the current investment mix as well as the current set of Capital market Assumptions adopted in June 2017.

The new discount rate calculation method considers both short-term and long-term expectations as well as the expected cash flows for the LTC fund. The short-term and long-term expected geometric returns were blended to create a level discount rate such that the present value of expected cash flows were close. Finally, the derived level discount rate was rounded down to the nearest quarter percent giving the final rate of 5.25 percent.

Rate Increase Related Assumptions:

During the 85 percent rate increase implementation starting in 2013, 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 less rich benefit plans.

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 two times the shock lapse rate and grade down to 0 percent over 10 years.

Anti-selection factors vary by benefit plan and are applied to the 2013, 2014, 2016, and 2017 conversions. See the table below for the groups that received or will receive the anti-selection factors.

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

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LTC1<C2, Lifetime, Inflation Receiving the 85% Premium Rate Increase Anti-Selection Factors Related to Shock Lapse and Conversions		
Selection Period	Calendar Year	Base Scenario
1	2017	1.1817
2	2018	1.1543
3	2019	1.1270
4	2020	1.1000
5	2021	1.0731
6	2022	1.0464
7	2023	1.0199
8	2024	1.0083
9	2025+	1.0016

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All Other Plans Receiving the 85% Premium Rate Increase Anti-Selection Factors Related to Shock Lapse		
Selection Period	Calendar Year	Base Scenario
1	2017	1.026
2	2018	1.022
3	2019	1.018
4	2020	1.014
5	2021	1.010
6	2022	1.006
7	2023	1.002
8	2024+	1.000

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

LTC1<C3, 10-year Benefit Increase Option Selection factors		
Selection Period	Calendar Year	Base Scenario
1	2017	0.8639
2	2018	0.8839
3	2019	0.9039
4	2020	0.9239
5	2021	0.9439
6	2022	0.9639
7	2023	0.9839
8	2024	0.9925
9	2025	0.9986
10	2026+	1.0000

APPENDIX D

Summary of Model Cells

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CalPERS LTC Program

Summary of Model Cells Included in 6/30/2017 Projection¹

Product Series	Plan Type	HHC	ALF	Benefit Period	Elimination Period	Inflation	Underwriting Type	Policy Count	Expected Annual Premium
LTC1	Comprehensive	50% HHC	50% ALF	3 Year	90	Inflation	LF	1,664	5,366,241
LTC1	Comprehensive	50% HHC	50% ALF	3 Year	90	Inflation	MGI	695	1,701,266
LTC1	Comprehensive	50% HHC	50% ALF	3 Year	90	Inflation	SF	580	1,512,974
LTC1	Comprehensive	50% HHC	50% ALF	3 Year	90	No Inflation	LF	8,167	14,631,643
LTC1	Comprehensive	50% HHC	50% ALF	3 Year	90	No Inflation	MGI	2,537	3,306,700
LTC1	Comprehensive	50% HHC	50% ALF	3 Year	90	No Inflation	SF	2,255	2,986,964
LTC1	Comprehensive	50% HHC	50% ALF	6 Year	90	Inflation	LF	957	3,585,739
LTC1	Comprehensive	50% HHC	50% ALF	6 Year	90	Inflation	MGI	593	1,664,047
LTC1	Comprehensive	50% HHC	50% ALF	6 Year	90	Inflation	SF	514	1,639,855
LTC1	Comprehensive	50% HHC	50% ALF	6 Year	90	No Inflation	LF	8,963	16,032,174
LTC1	Comprehensive	50% HHC	50% ALF	6 Year	90	No Inflation	MGI	4,632	6,475,624
LTC1	Comprehensive	50% HHC	50% ALF	6 Year	90	No Inflation	SF	4,041	5,633,725
LTC1	Comprehensive	50% HHC	50% ALF	10 Year	90	No Inflation	LF	10,051	27,934,581
LTC1	Comprehensive	50% HHC	50% ALF	10 Year	90	No Inflation	MGI	4,672	11,504,083
LTC1	Comprehensive	50% HHC	50% ALF	10 Year	90	No Inflation	SF	4,044	9,713,621
LTC1	Comprehensive	50% HHC	50% ALF	Lifetime	90	Inflation	LF	8,081	45,177,060
LTC1	Comprehensive	50% HHC	50% ALF	Lifetime	90	Inflation	MGI	6,834	29,424,182
LTC1	Comprehensive	50% HHC	50% ALF	Lifetime	90	Inflation	SF	4,506	20,661,177
LTC1	Comprehensive	50% HHC	50% ALF	Lifetime	90	No Inflation	LF	2,359	9,255,088
LTC1	Comprehensive	50% HHC	50% ALF	Lifetime	90	No Inflation	MGI	1,932	5,211,239
LTC1	Comprehensive	50% HHC	50% ALF	Lifetime	90	No Inflation	SF	1,294	3,541,943
LTC1	Facilities Only		50% ALF	3 Year	90	Inflation	LF	650	1,777,897
LTC1	Facilities Only		50% ALF	3 Year	90	Inflation	MGI	237	471,536
LTC1	Facilities Only		50% ALF	3 Year	90	Inflation	SF	210	451,684
LTC1	Facilities Only		50% ALF	3 Year	90	No Inflation	LF	4,148	5,959,092
LTC1	Facilities Only		50% ALF	3 Year	90	No Inflation	MGI	839	838,021
LTC1	Facilities Only		50% ALF	3 Year	90	No Inflation	SF	828	853,906
LTC1	Facilities Only		50% ALF	6 Year	90	Inflation	LF	177	626,096
LTC1	Facilities Only		50% ALF	6 Year	90	Inflation	MGI	65	167,853
LTC1	Facilities Only		50% ALF	6 Year	90	Inflation	SF	114	316,894
LTC1	Facilities Only		50% ALF	6 Year	90	No Inflation	LF	3,294	5,403,246
LTC1	Facilities Only		50% ALF	6 Year	90	No Inflation	MGI	719	856,621
LTC1	Facilities Only		50% ALF	6 Year	90	No Inflation	SF	833	979,891
LTC1	Facilities Only		50% ALF	10 Year	90	No Inflation	LF	2,828	6,972,007
LTC1	Facilities Only		50% ALF	10 Year	90	No Inflation	MGI	732	1,394,511
LTC1	Facilities Only		50% ALF	10 Year	90	No Inflation	SF	862	1,587,625
LTC1	Facilities Only		50% ALF	Lifetime	90	Inflation	LF	1,530	7,343,532
LTC1	Facilities Only		50% ALF	Lifetime	90	Inflation	MGI	619	2,257,231
LTC1	Facilities Only		50% ALF	Lifetime	90	Inflation	SF	625	2,279,565
LTC1	Facilities Only		50% ALF	Lifetime	90	No Inflation	LF	808	2,667,668
LTC1	Facilities Only		50% ALF	Lifetime	90	No Inflation	MGI	222	476,348
LTC1	Facilities Only		50% ALF	Lifetime	90	No Inflation	SF	188	417,921
LTC1	Partnership	50% HHC	50% ALF	6 Mo	30	Inflation	LF	166	75,025
LTC1	Partnership	50% HHC	50% ALF	6 Mo	30	Inflation	MGI	53	8,039
LTC1	Partnership	50% HHC	50% ALF	6 Mo	30	Inflation	SF	20	4,395
LTC1	Partnership	50% HHC	50% ALF	1 Year	30	Inflation	LF	928	1,089,419
LTC1	Partnership	50% HHC	50% ALF	1 Year	30	Inflation	MGI	267	201,725
LTC1	Partnership	50% HHC	50% ALF	1 Year	30	Inflation	SF	238	168,028
LTC1	Partnership	50% HHC	50% ALF	2 Year	30	Inflation	LF	1,583	2,733,674
LTC1	Partnership	50% HHC	50% ALF	2 Year	30	Inflation	MGI	498	579,823
LTC1	Partnership	50% HHC	50% ALF	2 Year	30	Inflation	SF	550	599,931
LTC1 Subtotal								104,202	276,519,131

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

Note:

1- Model cells include all inforce data as of June 30, 2017. All benefits including selected optional benefits are valued in the projection except Benefit Increase Options.

APPENDIX D

D-2

CalPERS LTC Program
Summary of Model Cells Included in 6/30/2017 Projection

Product Series	Plan Type	HHC	ALF	Benefit Period	Elimination Period	Inflation	Underwriting Type	Policy Count	Expected Annual Premium
LTC2	Comprehensive	50% HHC	70% ALF	3 Year	90	Inflation	LF	231	854,396
LTC2	Comprehensive	50% HHC	70% ALF	3 Year	90	Inflation	MGI	2	7,667
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	1,419	2,252,761
LTC2	Comprehensive	50% HHC	70% ALF	3 Year	90	No Inflation	MGI	9	17,528
LTC2	Comprehensive	50% HHC	70% ALF	3 Year	90	No Inflation	SF	9	13,746
LTC2	Comprehensive	50% HHC	70% ALF	6 Year	90	Inflation	LF	18	87,589
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	1,456	2,503,553
LTC2	Comprehensive	50% HHC	70% ALF	6 Year	90	No Inflation	MGI	20	39,996
LTC2	Comprehensive	50% HHC	70% ALF	6 Year	90	No Inflation	SF	18	36,708
LTC2	Comprehensive	50% HHC	70% ALF	10 Year	90	No Inflation	LF	1,637	3,932,432
LTC2	Comprehensive	50% HHC	70% ALF	10 Year	90	No Inflation	MGI	10	24,249
LTC2	Comprehensive	50% HHC	70% ALF	10 Year	90	No Inflation	SF	11	29,009
LTC2	Comprehensive	50% HHC	70% ALF	Lifetime	90	Inflation	LF	1,085	6,103,864
LTC2	Comprehensive	50% HHC	70% ALF	Lifetime	90	Inflation	MGI	9	67,856
LTC2	Comprehensive	50% HHC	70% ALF	Lifetime	90	Inflation	SF	9	51,713
LTC2	Comprehensive	50% HHC	70% ALF	Lifetime	90	No Inflation	LF	628	2,008,438
LTC2	Comprehensive	50% HHC	70% ALF	Lifetime	90	No Inflation	MGI	5	12,774
LTC2	Comprehensive	50% HHC	70% ALF	Lifetime	90	No Inflation	SF	3	8,980
LTC2	Facilities Only		70% ALF	3 Year	90	Inflation	LF	35	113,410
LTC2	Facilities Only		70% ALF	3 Year	90	No Inflation	LF	302	362,736
LTC2	Facilities Only		70% ALF	6 Year	90	Inflation	LF	9	29,942
LTC2	Facilities Only		70% ALF	6 Year	90	No Inflation	LF	258	348,462
LTC2	Facilities Only		70% ALF	10 Year	90	No Inflation	LF	256	450,875
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	121	474,421
LTC2	Facilities Only		70% ALF	Lifetime	90	Inflation	MGI	1	8,989
LTC2	Facilities Only		70% ALF	Lifetime	90	No Inflation	LF	54	164,105
LTC2	Partnership	50% HHC	70% ALF	6 Mo	30	Inflation	LF	9	8,189
LTC2	Partnership	50% HHC	70% ALF	1 Year	30	Inflation	LF	77	92,824
LTC2	Partnership	50% HHC	70% ALF	2 Year	30	Inflation	LF	151	292,774
LTC2 Subtotal								7,858	20,426,334

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

Note:

- 1- Model cells include all inforce data as of June 30, 2017. All benefits including selected optional benefits are valued in the projection except Benefit Increase Options.

APPENDIX D

D-3

CalPERS LTC Program
Summary of Model Cells Included in 6/30/2017 Projection

Product Series	Plan Type	HHC	ALF	Benefit Period	Elimination Period	Inflation	Underwriting Type	Policy Count	Expected Annual Premium
LTC3	Comprehensive	70% HHC	70% ALF	3 Year	90	Inflation	LF	2,055	4,114,882
LTC3	Comprehensive	70% HHC	70% ALF	3 Year	90	Inflation	MGI	325	440,770
LTC3	Comprehensive	70% HHC	70% ALF	3 Year	90	Inflation	SF	358	524,989
LTC3	Comprehensive	70% HHC	70% ALF	3 Year	90	No Inflation	LF	758	1,118,619
LTC3	Comprehensive	70% HHC	70% ALF	3 Year	90	No Inflation	MGI	61	66,982
LTC3	Comprehensive	70% HHC	70% ALF	3 Year	90	No Inflation	SF	45	34,834
LTC3	Comprehensive	70% HHC	70% ALF	6 Year	90	Inflation	LF	2,319	6,101,385
LTC3	Comprehensive	70% HHC	70% ALF	6 Year	90	Inflation	MGI	441	866,389
LTC3	Comprehensive	70% HHC	70% ALF	6 Year	90	Inflation	SF	401	850,076
LTC3	Comprehensive	70% HHC	70% ALF	6 Year	90	No Inflation	LF	2,371	4,117,556
LTC3	Comprehensive	70% HHC	70% ALF	6 Year	90	No Inflation	MGI	565	671,618
LTC3	Comprehensive	70% HHC	70% ALF	6 Year	90	No Inflation	SF	443	551,703
LTC3	Comprehensive	70% HHC	70% ALF	10 Year	90	No Inflation	LF	5	9,908
LTC3	Comprehensive	70% HHC	70% ALF	Lifetime	90	Inflation	LF	1,098	4,026,808
LTC3	Comprehensive	70% HHC	70% ALF	Lifetime	90	Inflation	MGI	8	45,812
LTC3	Comprehensive	70% HHC	70% ALF	Lifetime	90	Inflation	SF	6	21,633
LTC3	Comprehensive	70% HHC	70% ALF	Lifetime	90	No Inflation	LF	1,015	2,192,898
LTC3	Comprehensive	70% HHC	70% ALF	Lifetime	90	No Inflation	MGI	21	54,859
LTC3	Comprehensive	70% HHC	70% ALF	Lifetime	90	No Inflation	SF	15	30,454
LTC3	Facilities Only		70% ALF	3 Year	90	Inflation	LF	468	816,744
LTC3	Facilities Only		70% ALF	3 Year	90	Inflation	MGI	60	72,545
LTC3	Facilities Only		70% ALF	3 Year	90	Inflation	SF	113	150,171
LTC3	Facilities Only		70% ALF	3 Year	90	No Inflation	LF	234	303,654
LTC3	Facilities Only		70% ALF	3 Year	90	No Inflation	MGI	15	10,925
LTC3	Facilities Only		70% ALF	3 Year	90	No Inflation	SF	18	10,499
LTC3	Facilities Only		70% ALF	6 Year	90	Inflation	LF	172	401,478
LTC3	Facilities Only		70% ALF	6 Year	90	Inflation	MGI	15	30,440
LTC3	Facilities Only		70% ALF	6 Year	90	Inflation	SF	23	45,190
LTC3	Facilities Only		70% ALF	6 Year	90	No Inflation	LF	625	946,948
LTC3	Facilities Only		70% ALF	6 Year	90	No Inflation	MGI	63	59,341
LTC3	Facilities Only		70% ALF	6 Year	90	No Inflation	SF	86	83,117
LTC3	Facilities Only		70% ALF	Lifetime	90	Inflation	LF	172	432,726
LTC3	Facilities Only		70% ALF	Lifetime	90	Inflation	MGI	1	1,521
LTC3	Facilities Only		70% ALF	Lifetime	90	No Inflation	LF	143	251,440
LTC3	Facilities Only		70% ALF	Lifetime	90	No Inflation	MGI	1	4,259
LTC3	Partnership		70% ALF	6 Mo	30	Inflation	LF	1	2,065
LTC3	Partnership		70% ALF	1 Year	30	Inflation	LF	34	50,446
LTC3	Partnership		70% ALF	2 Year	30	Inflation	LF	64	146,622
LTC3 Subtotal								14,618	29,662,303
LTC4	Comprehensive	100% HHC	100% ALF	3 Year	90	Inflation	LF	663	1,652,068
LTC4	Comprehensive	100% HHC	100% ALF	3 Year	90	No Inflation	LF	83	168,885
LTC4	Comprehensive	100% HHC	100% ALF	6 Year	90	Inflation	LF	481	1,468,007
LTC4	Comprehensive	100% HHC	100% ALF	6 Year	90	No Inflation	LF	66	202,252
LTC4	Comprehensive	100% HHC	100% ALF	10 Year	90	Inflation	LF	240	862,914
LTC4	Comprehensive	100% HHC	100% ALF	10 Year	90	No Inflation	LF	59	190,789
LTC4	Partnership		70% ALF	1 Year	30	Inflation	LF	4	10,826
LTC4	Partnership		70% ALF	2 Year	30	Inflation	LF	25	97,594
LTC4 Subtotal								1,621	4,653,335
Grand Total								128,299	331,261,102

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

Note:

- 1- Model cells include all inforce data as of June 30, 2017. All benefits including selected optional benefits are valued in the projection except Benefit Increase Options.

APPENDIX E

Demographic Information

Data

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

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

The Actuarial Valuation considers the number 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 128,299 inforce participants with an average attained age of 72.4 and an average duration of 18.

Inforce Participants as of 6/30/2017 - Demographics and Selected Benefit Options

The following distributions for all inforce participants as of June 30, 2017 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

E-2

CalPERS LTC Program
Distributions of Business Inforce as of 6/30/2017
with Adjustments Reflecting Conversions as of 7/31/2017

By Benefit Period and Elimination Period

Benefit Period	Elimination Period	Policy Count	Percent	Expected Annual Premium	Percent
6 Month	30 Day	249	0%	97,713	0%
1 Year	30 Day	1,548	1%	1,613,268	0%
2 Year	30 Day	2,871	2%	4,450,418	1%
3 Year	90 Day	30,076	23%	52,982,583	16%
6 Year	90 Day	34,753	27%	62,829,195	19%
10 Year	90 Day	25,409	20%	64,611,422	20%
Lifetime	90 Day	33,393	26%	144,676,503	44%
Total		128,299	100%	331,261,102	100%

By Issue-Age Band and Gender

Issue-Age Band	Policy Count				Expected Annual Premium			
	Females	Males	Total	Percent	Females	Males	Total	Percent
< 30	419	232	651	1%	489,415	286,725	776,140	0%
30-39	4,030	2,410	6,440	5%	5,927,953	3,549,303	9,477,256	3%
40-44	5,594	3,032	8,626	7%	9,858,579	5,325,699	15,184,278	5%
45-49	10,642	5,761	16,403	13%	21,721,882	11,834,823	33,556,705	10%
50-54	16,046	9,427	25,473	20%	36,888,999	21,706,095	58,595,093	18%
55-59	17,372	11,222	28,594	22%	45,768,175	29,970,027	75,738,202	23%
60-64	13,280	9,835	23,115	18%	39,346,780	29,661,640	69,008,420	21%
65-69	7,506	5,324	12,830	10%	25,473,663	18,423,317	43,896,980	13%
70-74	3,187	1,678	4,865	4%	12,285,361	6,611,603	18,896,964	6%
75-79	855	315	1,170	1%	3,899,127	1,469,351	5,368,478	2%
80-84	105	23	128	0%	611,667	128,284	739,951	0%
85-89	4	0	4	0%	22,635	0	22,635	0%
90-94	0	0	0	0%	0	0	0	0%
95+	0	0	0	0%	0	0	0	0%
Total	79,040	49,259	128,299	100%	202,294,236	128,966,866	331,261,102	100%

APPENDIX E

E-3

By Attained Age and Gender

Attained Age	Policy Count				Expected Annual Premium			
	Females	Males	Total	Percent	Females	Males	Total	Percent
<30	15	11	26	0%	11,565	8,449	20,014	0%
30	3	1	4	0%	2,020	408	2,428	0%
31	1	2	3	0%	1,406	3,219	4,625	0%
32	4	1	5	0%	5,266	1,012	6,278	0%
33	8	4	12	0%	5,670	5,205	10,875	0%
34	9	4	13	0%	14,021	3,650	17,671	0%
35	5	3	8	0%	5,035	4,269	9,304	0%
36	7	7	14	0%	6,207	11,102	17,309	0%
37	19	9	28	0%	23,799	7,844	31,643	0%
38	16	6	22	0%	19,601	9,236	28,837	0%
39	27	12	39	0%	34,940	12,268	47,208	0%
40	37	17	54	0%	42,814	19,916	62,730	0%
41	37	26	63	0%	44,655	31,554	76,209	0%
42	44	21	65	0%	48,466	21,000	69,466	0%
43	64	28	92	0%	77,075	38,535	115,610	0%
44	78	46	124	0%	97,973	62,904	160,877	0%
45	90	59	149	0%	117,332	79,116	196,448	0%
46	126	63	189	0%	175,743	84,874	260,617	0%
47	169	98	267	0%	240,756	129,015	369,772	0%
48	191	118	309	0%	262,655	156,536	419,191	0%
49	160	137	297	0%	221,648	220,851	442,499	0%
50	267	153	420	0%	384,274	216,638	600,912	0%
51	289	190	479	0%	408,028	267,618	675,645	0%
52	362	209	571	0%	515,351	307,304	822,655	0%
53	446	266	712	1%	698,778	414,092	1,112,870	0%
54	522	357	879	1%	875,280	561,296	1,436,576	0%
55	584	357	941	1%	911,670	596,296	1,507,966	0%
56	695	368	1,063	1%	1,128,885	601,003	1,729,887	1%
57	730	440	1,170	1%	1,193,425	686,995	1,880,420	1%
58	879	483	1,362	1%	1,433,495	822,093	2,255,588	1%
59	983	567	1,550	1%	1,616,700	957,279	2,573,980	1%
60	1,185	671	1,856	1%	2,144,665	1,235,366	3,380,031	1%
61	1,279	691	1,970	2%	2,249,215	1,174,956	3,424,171	1%
62	1,462	812	2,274	2%	2,754,966	1,466,607	4,221,573	1%
63	1,722	885	2,607	2%	3,302,227	1,735,460	5,037,687	2%
64	1,919	1,019	2,938	2%	3,772,430	1,990,704	5,763,134	2%
65	2,087	1,066	3,153	2%	4,183,216	2,299,861	6,483,077	2%
66	2,271	1,332	3,603	3%	4,637,417	2,766,968	7,404,385	2%
67	2,521	1,477	3,998	3%	5,265,090	3,057,876	8,322,966	3%
68	2,804	1,653	4,457	3%	6,143,025	3,600,456	9,743,480	3%
69	3,097	1,901	4,998	4%	7,006,278	4,325,229	11,331,507	3%
70	3,804	2,248	6,052	5%	8,948,391	5,410,493	14,358,883	4%
71	2,971	1,860	4,831	4%	7,189,773	4,409,420	11,599,193	4%
72	3,204	1,907	5,111	4%	7,973,022	4,724,309	12,697,330	4%
73	3,123	2,036	5,159	4%	7,900,768	5,179,634	13,080,402	4%
74	3,456	2,261	5,717	4%	8,826,872	6,099,690	14,926,563	5%
75	3,114	2,018	5,132	4%	8,266,016	5,458,943	13,724,959	4%
76	2,813	1,868	4,681	4%	7,731,252	5,203,630	12,934,882	4%
77	2,735	1,844	4,579	4%	7,667,395	5,304,988	12,972,383	4%
78	2,786	1,831	4,617	4%	7,845,114	5,263,118	13,108,232	4%
79	2,545	1,810	4,355	3%	7,130,210	5,492,196	12,622,406	4%
80	2,395	1,581	3,976	3%	7,068,113	4,666,036	11,734,149	4%
81	2,222	1,642	3,864	3%	6,610,922	4,868,030	11,478,952	3%
82	2,102	1,446	3,548	3%	6,525,469	4,496,225	11,021,695	3%
83	1,891	1,374	3,265	3%	5,825,885	4,323,333	10,149,217	3%
84	1,801	1,273	3,074	2%	5,676,485	4,058,910	9,735,395	3%
85	1,655	1,255	2,910	2%	5,306,871	4,100,618	9,407,489	3%
86	1,572	1,083	2,655	2%	5,221,956	3,670,001	8,891,957	3%
87	1,322	976	2,298	2%	4,559,445	3,351,568	7,911,014	2%
88	1,235	815	2,050	2%	4,434,993	2,961,542	7,396,536	2%
89	1,081	609	1,690	1%	3,852,941	2,256,467	6,109,408	2%
90	940	499	1,439	1%	3,457,173	1,816,930	5,274,103	2%
91	753	432	1,185	1%	2,830,845	1,628,620	4,459,465	1%
92	647	309	956	1%	2,533,366	1,264,385	3,797,752	1%
93	521	245	766	1%	2,024,963	1,014,943	3,039,906	1%
94	388	169	557	0%	1,526,465	651,156	2,177,621	1%
95	249	126	375	0%	1,049,942	534,754	1,584,696	0%
96	203	76	279	0%	863,111	334,298	1,197,410	0%
97	126	42	168	0%	553,366	156,630	709,996	0%
98	75	26	101	0%	337,817	109,432	447,248	0%
99+	97	28	125	0%	472,236	161,505	633,741	0%
Total	79,040	49,259	128,299	100%	202,294,236	128,966,866	331,261,102	100%

APPENDIX E

E-4

By Plan Type

Plan Type	Policy Count	Percent	Expected Annual Premium	Percent
Partnership (Comprehensive)	4,668	4%	6,161,399	2%
Comprehensive	99,856	78%	275,421,803	83%
Facilities Only	23,775	19%	49,677,901	15%
Total	128,299	100%	331,261,102	100%

By Inflation

Inflation	Policy Count	Percent	Expected Annual Premium	Percent
No Inflation	84,018	65%	167,871,487	51%
Inflation	44,281	35%	163,389,615	49%
Total	128,299	100%	331,261,102	100%

By Marital Status at time of Issue

Marital Status	Gender	Policy Count	Percent	Expected Annual Premium	Percent
Married	F	49,138	38%	101,489,302	36%
Married	M	39,296	31%	119,911,891	31%
Divorced	F	10,691	8%	7,890,641	8%
Divorced	M	2,842	2%	27,311,642	2%
Single	F	9,469	7%	11,519,862	7%
Single	M	4,483	3%	24,162,782	3%
Widowed	F	9,202	7%	6,296,021	9%
Widowed	M	1,916	1%	29,546,886	2%
Unknown	F	534	0%	1,745,193	0%
Unknown	M	716	1%	1,368,414	1%
Separated	F	6	0%	8,748	0%
Separated	M	6	0%	9,720	0%
Total		128,299	100%	331,261,102	100%

By Marital Status

Marital Status	Policy Count	Percent	Expected Annual Premium	Percent
Married	88,434	69%	221,401,193	67%
Other	39,865	31%	109,859,910	33%
Total	128,299	100%	331,261,102	100%

APPENDIX E

E-5

By Premium Mode

Premium Mode	Policy Count	Percent	Expected Annual Premium	Percent
Monthly	97,415	76%	258,132,047	78%
Quarterly	23,852	19%	54,536,243	16%
Semi-Annually	4,084	3%	10,555,243	3%
Annually	2,948	2%	8,037,569	2%
Total	128,299	100%	331,261,102	100%

By Underwriting Type

Underwriting Type	Policy Count	Percent	Expected Annual Premium	Percent
LF	77,255	60%	206,398,463	62%
MGI	27,779	22%	69,046,647	21%
SF	23,265	18%	55,815,993	17%
Total	128,299	100%	331,261,102	100%

By Product Series

Product Series	Policy Count	Percent	Expected Annual Premium	Percent
LTC 1	104,225	81%	276,519,131	83%
LTC 2	7,858	6%	20,426,334	6%
LTC 3	14,618	11%	29,662,303	9%
LTC 4	1,598	1%	4,653,335	1%
Total	128,299	100%	331,261,102	100%

APPENDIX F

Glossary of Terms

Glossary of Terms

Anti-Selection - Individuals who let their policies lapse because of special events (see “Shock Lapses”) are usually in better health. Participants normally do not 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 is paid each day an insured is on claim. If less than the maximum daily benefit amount is 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 election to switch/reduce coverage, sometimes as a 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 over time as more data accumulates.

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, a positive number represents a surplus. 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.

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

First Principle 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.

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 percent. 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 participants that could start a claim over a specified time period (i.e., frequency of claim).

Incurred Claims - Incurred claims are made up of paid claims plus a reserve representing the assumed continuance of claims on known claimants which have yet to be paid as well as claims that have begun on unknown claimants but have not yet been reported. The amount of the latter unpaid claims is referred to as the IBNR (Incurred But Not Reported) Reserve.

Inflation Coverage - An optional feature that increases the amount of available benefits over time in order 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 the Home Health Care (HHC) and Assisted Living Facility (ALF) care that are 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%) / 50% HHC
LTC2 (2003) - NH (100%) / ALF (70%) / 50% HHC
LTC3 (2005) - NH (100%) / ALF (70%) / 70% HHC
LTC4 (2014) - NH (100%) / ALF (100%) / 100% HHC

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

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

Mortality - The rate of incidence of death.

Partnership Plan - A collaboration or “partnership” between 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 private funding of LTC services and thereby reducing Medicaid payments for LTC. The advantage of the partnership plan for a participant is that once his/her insurance coverage is exhausted, his/her 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. 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 or (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 3 years or 6 years.

Return of Premium or (ROP) - Returns some or all 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 plans LTC1, LTC2, and LTC3.

Selection Factors - Factors used to adjust attained age or ultimate claim costs to levels reflecting recent underwriting/issue, therefore reducing (in general) claim costs 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 a surviving spouse or partner will be paid up if one spouse or partner dies after each 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 sign up for this optional benefit.

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

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:

- MGI - Modified Guaranteed Issue; limited underwriting for younger applicants actively at work.
- SF - Short Form; simplified application process with limited medical evaluation for younger applicants.
- LF - Long Form; considered “full underwriting” due to the comprehensive nature of medical questions asked and the associated underwriting process.

Currently, CalPERS only uses the long form of application for underwriting and has done so since 2002.

Voluntary Lapsation - When a participant chooses to terminate his/her policy of his/her own volition - not due to death or other limitation on renewing contained within the policy.

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