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Does the California Public Employees' Retirement System have the Framework for a Sustainable Future?

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by
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Table of Contents

List of Figures

List of Tables

INTRODUCTION

According to the Milliman 2015 Public Pension Study, the Unfunded Accrued Liability for the 100 largest U.S. public pension plans was $1.20 trillion and the median funded ratio of the market assets was 71.7% (Sielman, 2015). The ten largest retirement systems made up nearly 40% of the total Accrued Liability (Sielman, 2015). The California Public Employees' Retirement System (CalPERS), the nation's largest public retirement system, was included in this study and had a market value of $301.1 billion in 2015 (CalPERS, 2015a). California State Teachers' Retirement System (CalSTRS), the second largest public retirement system listed in the study, had a market value of $191.4 billion (CalSTRS, 2015). According to the Public Policy Institute of California, the two plans cover 65% of the four million State, county and local employees who are members in California's public retirement systems (Cook, 2015a). Both of these plans have significant Unfunded Liabilities that contributed to the funding gap described in the Milliman report. CalPERS reported $93.5 billion of Unfunded Liabilities based on the June 30, 2014 valuation and CalSTRS reported $73.7 billion of Unfunded Liabilities for that same year (Cook, 2015a).

Local governments provide nearly 60% of the employer's contribution in the public pensions (Cook, 2015b) and as the contribution rates continue to rise, the local governments will be faced with costly bills that will be difficult to afford. Even as the economy improves, California local governments' revenues are expected to grow slowly. The Legislative Analyst's Office showed a 6.4% growth in 2015-2016 from the prior year for the big three General Fund revenues (Personal Income Tax, Sales and Use Tax, and Corporation Tax) and then with projected growth rates of 3.0%, 4.5%, 1.7%, and 2.2% in subsequent years (Legislative Analyst's Office, 2015). Increasing taxes and fees, reducing services, and /or borrowing money are some

of the tools the governments has to pay for the higher pension costs. The State and local governments in California will be challenged to fund essential services such as public safety and public schools and still make the required employer contributions for the public pensions as required by law. A high Net Pension Liability will result in lower credit ratings, and thus it will be costlier for the governments to borrow money for capital programs and other purposes.

This research will examine from a financial standpoint the financial status of CalPERS' defined benefit plan only, not the plan's other post-retirement employee benefits. This report contains an overview of CalPERS, along with information about Defined Pension Plans and key legislation and accounting guidelines influencing the public retirement systems. This research project benchmarked CalPERS against the Teacher Retirement System of Texas, Florida Retirement System, and the New York State and Local Retirement System, which all have a Funded Status of over 80%. Significant observations were made about the framework of the four public retirement systems that can help the CalPERS and the other public retirement systems achieve a sustainable future. This research will examine how CalPERS can achieve the sufficient investment returns necessary to ensure the payout of future benefits to its members at the appropriate cost to employers and employees.

BACKGROUND

Overview of CalPERS

CalPERS had a total of 1.8 million members, with 48% active members (869,000), 34% retirees and beneficiaries (611,000), and 18% inactive members (336,000) as of June 30, 2015. CalPERS' membership is comprised of three large categories of employees. The classified (non-

teaching) school employees make up the "School" membership (38%); State employees, including ones from the California State University, make up the "State" membership (31%); and employees of local governments make up the "Public Agency" membership (31%). Certified teachers and administrators in K-12 and instructors in community colleges are typically in CalSTRS. CalPERS is a cost-sharing, multi-employer pension plan and is comprised of the State of California, along with close to 3,007 employers in California who contract with CalPERS for their pension and health benefits (CalPERS, 2016a). Examples of employers in this area that participate in CalPERS are Santa Clara County and almost all cities in Santa Clara and San Mateo counties, with the exception of San Jose that has its own separate pension system (CalPERS, 2015a).

The average monthly pension payment for all service retirees in 2014-2015 was $2,627 and these retirees had an average of just over 20 years of service (CalPERS, 2016b). The monthly payments may be the only source of income for the retirees, as not all public employees in California are covered by Social Security. The following group of employees do not pay into Social Security and therefore have no Social Security coverage: California Highway Patrol (CHP), teachers, state firefighters, correctional officers, and judges, as well as the employees of more than 450 cities, counties and special districts (Mendel, 2009). The Windfall Elimination Provision of the Social Security Act states that for the rest of the employees who are covered by Social Security, the calculation of Social Security benefits may be reduced to avoid "double-dipping". This would apply if an employee paid into Social Security in a previous employment and then started a career in the public sector and did not continue to pay into Social Security while employed in the public sector (CalSTRS, n.d.).

The assets and liabilities of CalPERS are combined across numerous employers and multiple generations of employees, and the risks and gains are shared by this pool of long-term investors. CalPERS is by far the largest public retirement system in California with 38% of the total assets, followed by CalSTRS with 26%, and University of California's Defined Benefit Plan with 7%. The top ten largest public retirement systems make up 88.5% of all systems in this category. The asset distribution was State, 74.1%; counties, 15.9%; cities, 9.3%; special districts, 0.6%; and other, 0.1%. Of the 131 public retirement systems that filed their reports with the State Controller's Office for 2010-2011, 86 systems were Defined Benefit Plans and 45 were Defined Contribution Plans. There are six statewide pension plans in California, comprised of CalPERS, CalSTRS, the University of California Retirement System, and the remaining three plans are small and include judges and legislators. Fiscal year 2010-2011 was the latest Public Retirement Systems Annual Report available from the State Controller's Office. (California State Controller's Office, 2011).

CalPERS is also the largest public retirement system nation-wide, with $301.1 billion in assets. CalSTRS had $191.4 billion of assets and New York State and Local Employees Retirement System ($184.5 billion) followed closely behind. The Florida Retirement System ($148.0 billion) was the fourth largest and the Teachers Retirement System of Texas ($127.9 billion) rounded out the top five largest public retirement systems.

Defined Benefits Plans

Retirement benefits are promised for a lifetime in a Defined Benefits (DB) plan. The monthly DB allowance is calculated by multiplying the employee's years of service, a benefit factor and final average salary (highest average in a 12 or 36 months period). The DB formula is set by

contract negotiations with the unions and through legislation. The most common formula for the monthly DB allowance in CalPERS for non-safety members is 2% of the final average salary at 55 years old and for safety members, 3% of the final year salary at 50 years old (CalPERS, 2014a).

In contrast, in a Defined Contribution plan, the only thing promised to the employee is that the employer will contribute a defined amount each year during employment. This money, along with the employee's contribution, is invested in a fund similar to a 401(k) that the employee controls. The amount the employee receives upon retirement depends on the total amount contributed and the earnings on the investments. The employee bears the entire risk of the investments and the responsibility for their management (CalPERS, 2014a).

In a DB plan, the retiree receives a monthly allowance which is guaranteed by the government and ultimately by the taxpayers. This future cost or Projected Benefit Obligations (PBO) should be set aside or accrued today so that the monthly allowances can be paid to the employee when he retires. The liability or PBO is calculated by actuaries based on the demographics of the employee group (e.g., average retirement age, life expectancies, turnover rates, morbidity) and other economic assumptions such as rate of return, projected rate of inflation, wage increases and promotions (Kilgour, 2013). The contributions towards the PBO made by the employer and employees, plus investment income,

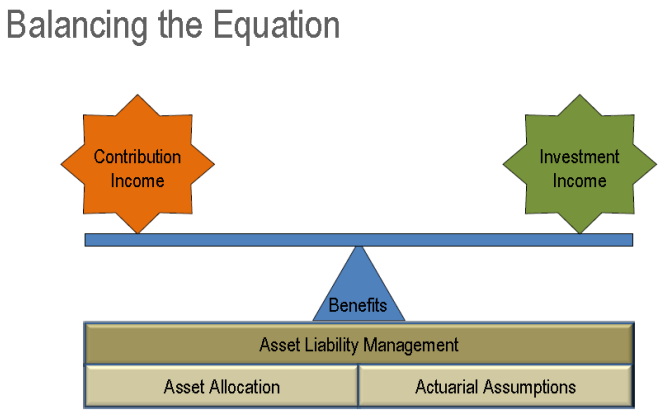

Figure 1 Contribution and investment incomes pay for the pension benefits
Source: CalPERS. (2013). ALM Workshop – Attachment 1 – CalPERS.

are used to pay for the monthly allowances. Figure 1 shows how this equation is delicately balanced. Asset Allocation and Actuarial Assumptions are the two components of the Asset Liability Management that form the base of the equation. The asset allocation of the investments and the assumptions used to fund the DB plan are critical to ensuring there will be enough funds available to pay for future benefits. Over the last 20 years, the majority of every dollar spent on CalPERS pensions came from investments (65 cents), followed by employer contributions (22 cents) and then employee contributions (13 cents) (CalPERS, 2016a).

The employee contributes a fixed percentage of his earnings towards the PBO as does his employer, who is responsible for paying the Actuarially Determined Employer Contribution (Employer Contribution) which is a fixed percentage of the covered payroll (Kilgour, 2013). CalPERS has the authority to adjust the Employer Contribution as needed and to require employers to pay the full amount of the PBO (Kilgour, 2013). The Employer Contribution is derived by first calculating the Present Value (PV) of the benefits accrued in a given year and the administrative costs (also known as the Normal Costs) (Kilgour, 2013). The PV is the current worth of benefits payable in the future after applying a discount rate for the assumed interest rate and adjusting for the probability of its payment. Combine the PV with the amortized payments to make up any Unfunded Liabilities. The amortization is usually between 20 to 30 years (Munnel & Aubry, 2015). The Employer Contribution continually changes based on the funded status of the PBO. The Funded Status identifies the value of the assets that are available today to pay for the future benefits.

One of the biggest challenges for the State, schools, and public agencies in CalPERS is to set aside enough money for the employer contribution for the pensions. There will be a strain on local governments' budgets and their ability to provide essential services. According to John

Shirley, City Manager of Sacramento, "Our greatest challenge over the next 10 years is dealing with the $450 million unfunded liability for retired employee health care benefits while at the same time paying for ever-increasing pension costs imposed by CalPERS" (Spiegel and Hudson, 2015, 3). Four public agencies that contract with CalPERS (cities of Stockton, San Bernardino, and Vallejo, and town of Mammoth) have declared bankruptcy (CalPERS, 2015b). Other local governments may be forced to cut services and lay off employees and/or collect higher taxes and fees to meet the pension obligations or to declare bankruptcy.

Legislature Background

CalPERS, established in 1932, initially had an investment policy that restricted investments to safe and stable bonds, but this changed in 1966 with the passage of Proposition 1. Proposition 1 gave approval for CalPERS and other California public pension systems to invest 25% of their assets in blue chip equities. Proposition 84, enacted in 1984, gave approval for CalPERS to invest in anything prudent. Proposition 162, also known as the California Pension Protection Act, made three changes to how the public retirement plans were managed, was enacted in 1992. This Proposition gave the retirement boards exclusive authority over the administration and investments of the public retirement systems; it specified that the highest priority of the board was providing benefits to members and their beneficiaries; and stated that the Legislature could not change the composition and terms of board membership unless approved by a majority popular vote. The Proposition effectively shifted the power over the public retirement plans from elected officials and taxpayers to members of the boards. Prior to Proposition 162, elected officials could redirect funds out of a public pension because there were no State or federal laws preventing this action, but Proposition 162 put an end to this. SB 400, a major retroactive state pension increase enacted in 1999, gave enhanced benefits to all State and School employees.

These legislative changes have created long lasting impacts on the financial health of the pension plan and are discussed further in the Literature Review section. (Kilgour, 2014)

California Rule

The California Rule came about as the result of several judiciary decisions regarding public pensions. This rule states that the pension benefits given to an employee on the date of hire are protected and public employers cannot change future pension benefits unless the disadvantage to the participant is offset with something else that is at least comparable as long as the employee is employed (Kilgour, 2014). This rule makes it very difficult for the employer to implement cost savings measures such as changing the benefit formula or increasing the Employee Contributions.

The 2013 Public Employee Pension Reform Act (AB 340) did reduce pension costs; however, most of the provisions of the Act applied only to employees hired after January 1, 2013 due to the California Rule. The benefit formula for non-safety employees was changed from 2.5% at 55 years old to 2% at 62 years old, with a maximum of 2.5% at 65 years. Three new DB formulas were created for new safety employees that either reduced the benefit factor and/or increased the age when the safety employees could retire. In addition to other reforms, the final compensation is based on a three years average rather than the highest year average and new employees were required to pay half of the pension's Normal Costs. The 50-50 split of the Normal Cost is required for new employees hired by public agencies, California State University, and schools, as well as judicial and legislative employees. The reform did not require a Normal Cost split for most State workers, but did encourage this practice going forward. (CalPERS, 2012)

GASB 67/68

The Government Accounting Standards Board (GASB) 67/68 statements significantly changed the financial reporting and accounting requirements for public pension plans and the plan sponsors beginning with the June 2014 reports. Among other things, it required the use of the Individual Entry Age Normal Cost Method as the basis for financial reporting, the Net Pension Liability (NPL) replaced the Net Pension Obligation which is the Actuarial Accrued Liability (AAL) less Market Value of Assets (MVA, previously it was Actuarial Value of Assets (AVA)). The smoothing techniques that were used for calculating the AVA cannot be applied to calculate the MVA (Kilgour, 2013)

The new guidelines also changed how the discount rate is used to convert the PBO to the Present Value. Public pension plans can continue to use the assumed Rate of Return on Investments (ROR) as the discount rate for the portion of the liability that is expected to be covered by the plan assets. The stricter reporting requirements of GASB 67/68 applies to the retirement systems that project their plan to be insufficient to cover the benefit payments. A much lower discount rate is used to calculate the present value of the liability that is unfunded. Using this blended rate increased the unfunded liability and presented a more realistic value of the funded status of the public pension in comparison to pre-GASB 67/68. The lower discount rate would be equivalent to the riskless rate of borrowing high-quality municipal bonds to cover the Unfunded Liability. GASB 67/68 also reduced the amortization periods from up to 30 years to a period based on the remaining service years of the participants, which is typically 10 to 12 years (Kilgour, 2013).

The combination of using the MVA for the NPL, using a blended rate, and shorter amortization periods will make the public pension plans appear in worse financial conditions

compared to pre-GASB 67/68. In addition, for cost-sharing plans such as CalPERS, each participating employer must now report in their financial statements its proportionate share of the Unfunded Liability. The financial picture will now be more accurate and it will be clear to the elected officials, trustees, plan administrators, stakeholders, and the public how much debt is owed and how it will influence the credit rating of these entities (Kilgour, 2013).

METHODOLOGY

The research determined how CalPERS' investment strategy benchmarked against three large public retirement systems in the United States that have a high funded ratio of assets to unfunded liabilities: New York State and Local Employees Retirement System (NYSLRS), Teacher Retirement System of Texas (TRS), and Florida Retirement System (FRS). The purpose of examining the data is to provide objective information to managers and other stakeholders that will improve the decision-making and performance, in addition to increasing the level of accountability (Wholey, Hatry, Newcomer, 2004). Table 1 contains data for each of the public retirement systems based on the following questions:

1. How many members and employers are in this public pension plan? What is the ratio of actives to retirees/survivors/ beneficiaries?
2. What is the governance structure of the board of trustees?
3. What is the market value of the investments and is there an investment policy? What are the laws and regulations governing the investments?
4. What is the asset allocation, assumed Rate of Return on Investments, and the actual Rate of Return on Investments for a 1-year, 5-year, 10-year, 20-year, and 25-year?
5. What is the Actuarial Value of the Assets, Actuarial Accrued Liability and the Unfunded Actuarial Accrued Liability? What is the Funded Status?

By comparing the four systems, significant observations were made so that CalPERS can be in a better position to achieve the sufficient investment returns necessary to ensure the payout of future benefits to its members at the appropriate cost to employers and employees.

As described in Theodore H. Poister (2008), *Measuring performance in public and nonprofit organizations,* the research included the following steps:

1. Identify measures to be used
2. Develop precise definitions of the measures
3. Collect the data from the public pension plans
4. Use the data to assess the various public pension plans

LITERATIVE REVIEW

Milliman 2015 Public Pension Funding Study

The Milliman 2015 Public Pension Funding Study reviewed the funded status of the 100 largest U.S. public pension plans. The various plan sponsors' assessments of the funded status were included in the report along with Milliman's own evaluation of the assumed ROR. The assumed ROR was recalibrated and this resulted in a higher Accrued Liability and the Funded Status for the aggregate plans. The median assumed ROR decreased from 8.00% in the 2012 study to 7.75% in the 2013 and 2014 studies and then decreased slightly to 7.65% in the 2015 study. The 7.65% was 40 basis points higher than Milliman's independently evaluated assumed ROR of 7.25%. Using the 7.25% assumed ROR rather than the median 7.65% caused the Accrued Liabilities to increase by $0.18 trillion, from the report of $4.08 trillion to $4.26 trillion. The aggregate Accrued Liability reported of $4.08 trillion consisted of $1.67 trillion Accrued Liability from the 12.5 million active plan members and $2.41 trillion Accrued Liability from the 12.6 million members that had not started to collect their pension. (Sielman, 2015)

The plan sponsors reported the Market Value of the Assets at $3.06 trillion; therefore, the Unfunded Accrued Liability was $1.20 trillion, compared to the sponsors' reported $1.02 trillion. The Funded Ratio of the Market Value of Assets, after using the recalibrated assumed ROR, decreased the 75.0% reported by the plan sponsors to 71.7%. A comparison of the 2014 recalibrated figure to the 2015 recalibrated figure for this valuation showed an overall increase from 68.2% to 71.7%. The Funded Ratio based on the Actuarial Value of the Assets and the recalibrated assumed ROR decreased from the plan sponsors' reported 72% to 68.9%. Furthermore, there was also a decrease from 69.4% to 68.9% based on the recalibrated figure

from last year. For the first time, the number of retired and inactive members was larger than the number of active members for the 100 public pension plans. A reduction on the assumed ROR of 100 basis points causes a 12% to 13% increase in the Accrued Liability, which causes a decrease in the funded status of the public pension plan. In addition, the asset allocations were 70% in non-fixed income and 30% in fixed income. (Sielman, 2015)

Increased Pension Costs

The current state of CalPERS's Unfunded Liability can be attributed to increased pension costs from: 1) employers not paying the full amount of the Actuarially Required Contribution; 2) aggressive investment strategies; 3) enhanced benefits and higher compensation; and 4) divestment activities.

Funding Holidays

In the 1990s, when more investments were shifted from bonds to equities, the rate of returns were double-digits and resulted in more than doubling the assets per worker (Pew Charitable Trusts & Laura and John Arnold Foundation, 2014). This was during the dot-com boom and it seemed as though the high returns would continue indefinitely. Half of the states had reached 100% funding of their public pension plans by 2000 (Pew Center on the States, 2010). CalPERS's investments performed very well during this period; the plan was 101% funded in 1995 and rose to a high of 137.9%. A "funding holiday" was enjoyed by some employers, which translated into little or no payments made for the employer contributions. For example, the employer contributions for CalPERS's State plans was $1.2 billion in 1997-1998 (Funded Ratio 133.9%) and decreased to a low of $156.7 million made by employer contributions in 2000-2001 (Funded Ratio 104.6%). The employer contribution rate increased to $677 million in 2001-2002

(Funded Ratio 86.9%) and then climbed to $1.2 billion in 2002-2003 (Funded Ratio 79.8%). By 2006-2007, the Funded Ratio was 101.2% and would rise and fall between then and today. The employer contributions for CalPERS's State plans has pretty much increased every year beginning in 2000-2001 until today. (M. Ramirez, personal communication, December 4, 2015). Not paying the full amount of the Actuarially Determined Contribution had unwanted consequences for the financial health of the pension system. Michael Travaglini, executive director of the Massachusetts Pension Reserves Investment Management Board, stated "you need to make contributions in all market environments" (Pew Center on States, 2010, 24). Policymakers must be disciplined and continue making the employer contribution even during periods of strong returns because the stock market is volatile and unpredictable, and eventually the day will come when there is another significant market loss.

Enhanced Benefits and Salaries Raises

SB 400, a major retroactive state pension increase enacted in 1999, gave enhanced benefits to all State and School employees in CalPERS. CalPERS' pension costs increased when the DB formula for CHP changed from 2% at 50 years old to 3% at 50 at years old and retirees received pension increases of 1% to 6% depending on when the person retired (Mendell, 2015c). In addition, local police were also authorized 3% at 50 years old as part of this bill (Mendell, 2015c). SB 400 was "an opportunity to restore equity among CalPERS members without costing a dime of additional taxpayer money" said William Crist, the CalPERS board president at the time. SB 400 increased the base of the pension obligation without much consideration of the long-term impacts of the change (Mendell, 2015d).

Generous increases in the payroll also resulted in higher pension obligations. Between 1999 and 2009, the number of state employees increased by 39% and the average pay for state

workers increased by 50%; local government workers increased by 60%, and local safety workers increased by 69% (Little Hoover Commission, 2011). Benefit enhancements can affect the pension obligation in the long term and should be carefully considered before the changes are made.

A Shift to Aggressive Investment Strategies

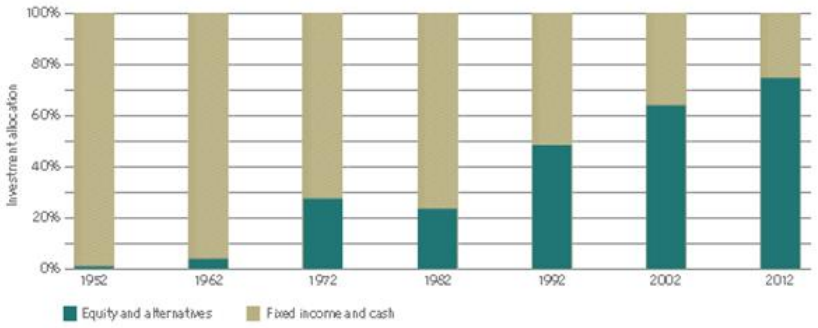

Figure 2 State public pension investment shift over 30 years.
The Pew Charitable Trusts and Laura and John Arnold Foundation. (2014). State public pension investment shift over 30 years.

Although public pension plans are funded by employers' and employees' contributions, investment earnings are supposed to pay 60% of the benefits (Pew Charitable Trusts & Laura and John Arnold Foundation, 2014). As shown in Figure 2, over the past 30 years, public pension plans shifted their investments from fixed income investments - such as government and corporate bonds - to riskier investments (Pew Charitable Trusts & Laura and John Arnold Foundation, 2014). Beginning in the 1980s, investments shifted to equities and in the last decade alternative investments, such as private equities, hedge funds, real estate and commodities, became a large percentage of the portfolio for the public pension plans (Pew Charitable Trusts & Laura and John Arnold Foundation, 2014). There is a high level of risk with the equities and alternative investments because there is small probability of earning extremely high RORs; however, there is a very high probability of relatively low or even negative returns since investments are volatile and the investment loss can be significant. In addition, pension funds

are exposed to market risks and there is only a 5% chance that the pension will have enough investment income to meet the needs of the retirees 15 years later (Novy-Marx, R., & Rauh, J. D., 2009).

The stock market has fluctuated over the last ten years as evidenced by the wide range of the ROR. The low end of the range was a 23.6% loss in 2009 and the high end was a 20.7% gain in 2011 followed by a 1% gain in 2012. Even with six out of the last ten years being double-digit gains, the ROR for CalPERS over a 10-year period was only 6.2%. The 23.6% loss in 2009 had a significant impact on CalPERS' investments and the assets dropped from $251.2 billion in 2007 to $178.9 billion. Put differently, the Funded Status dropped from 101.2% as of June 30, 2007 to 60.8% in 2009, and the impact could have been much worse had CalPERS not been nearly fully funded (Mendell, 2014) (M. Ramirez, personal communication, December 4, 2015). By 2014, the MVA had almost doubled since 2009, yet CalPERS's investments had only increased by 68% and had not fully recovered from the Great Recession despite a major bull market (Mendell, 2015a). There are investment losses to the pension as the gap between the actual ROR and the assumed ROR widens. This funding gap is reduced by collecting more revenue through contribution increases unless the investments outperform the assumed ROR in the ensuing years.

Divestment Activities

Through the years, CalPERS divested its investments based on political motivations, moral benefits, health, and social goals. Wilshire estimated that the present value of historical exclusions to-date due to CalPERS's divestment activities ranged from a loss of $3.79 billion to $8.32 billion. A 1987 law during the Apartheid era required divestment of South African investments, which cost CalPERS an estimated $590 million in 1989. If CalPERS had held onto

that investment, it would have grown to be somewhere between $1.1 billion to $4.27 billion in 2014. Divestments of tobacco-related securities, certain Emerging Markets (permissible countries and principles), companies on the Iran and Sudan lists, and certain firearm-related companies also caused CalPERS to lose billions of dollars. (Wilshire, 2015)

In October 2015, Governor Brown signed into law Senate Bill 185 the Public Divestiture of Thermal Coal Companies Act. Though the California Pension Protection Act gave CalPERS's Board of Administration exclusive authority over the investments of the public retirement systems, the Legislature can prohibit certain investments by retirement boards for the social good. The bill states that CalPERS and CalSTRS are required to constructively engage with the publicly traded coal companies in its portfolio to establish whether the coal companies are transitioning their business models to produce clean energy. CalPERS and CalSTRS boards would then determine if they would divest its investments. The retirement boards could choose not to divest its investments if doing otherwise is not consistent with the retirement board's fiduciary responsibilities (Calpers, 2015c). According to the California Watchdog.org, "… the industry [coal] is going through its worst slump in decades and coal companies' market values have dropped nearly 90% since 2011" (Nikolewski, 2015). Though CalPERS has a mere 0.03% or $83 million of its portfolio in coal companies, divesting its investment would mean a financial loss (Nikolewski, 2015). Wilshire stated that the generally accepted academic argument regarding limiting investments had a "deleterious impact on performance over long periods of time" (Wilshire, 2015).

Unfunded Status of the Plan

Since governments are not required to fully fund public pension plans, there is the danger that the government has taken on more risk than prudent and this could lead to insolvency or

bankruptcy. In the private sector, all current and future liabilities must be funded (1974 Employee Retirement Income Security Act). As of the June 30, 2001 valuation date, the Funded Status of CalPERS was 104.6%. Since then, it has been slowly decreasing and reached a low of 60.8% in 2009 and then climbed to an estimated 73.3% as of June 30, 2015 valuation (M. Ramirez, personal communication, December 4, 2015). The average Funded Rate over this 13-year period was 82.2%.

The Funded Status of CalPERS was estimated to be 73.3% which is a 3% decrease from the previous year's 76.3% due to the actual ROR of 2.4% in 2015. The actual ROR was 5% lower than the assumed ROR of 7.5% (Borenstein, 2015). Since investment earnings are not performing at the projected level, this gap must be made up by collecting more revenue through the increase of the employer contributions and the employee contributions, albeit the latter is from a limited pool of new employees. Chief Investment Officer Ted Eliopoulos warns that if the funded status falls below 50%, this would be "a difficult place to climb out if we get there." (Borenstein, 2015). CalPERS staff projects that there is a 28% to 35% chance of falling below the 50% funded status level within the next 30 years (CalPERS, 2015b).

Underfunding affects the financial outlook for an agency and more scrutiny is now given by the bond rating agencies. Bond rating agencies look at the Unfunded Liabilities associated with the retirement benefits to determine creditworthiness and financial stability for an agency. The higher the credit rating, the less an agency pays to borrow money. In 2011, rating agency Moody's Investor Service added pension underfunding to an entity's general indebtedness and applied a 5.5% discount rate rather than the typical 8% (Kilgour, 2013). Prior to this, Moody's used the discount rate reported in the pension plans. Moody's also changed its methodology and now uses the MVA and amortizations over 17 years. Previously Moody's used the AVA and

amortizations over 30 years to calculate the pension's Funded Status (Kilgour, 2013). Moody's new methodology increased the total pension underfunding from $766 billion to $2.2 trillion and thus with the revised Unfunded Liability, the employer contributions increased from 2.6% of revenue to 9.1% (Kilgour, 2013).

The Stability of the Public Pension Plans Continue to be Threatened

A negative cash flow occurs when the payout for the monthly DB allowance is more than the contributions from employees and employers, and the investments are liquidated to bridge the gap. In 2013-2014, a total of $17.8 billion was paid from CalPERS to retirees. A negative cash flow of $5.2 billion resulted when only $12.6 billion was collected from employees ($3.8 billion) and employers ($8.8 billion) (Petersen, 2015a). Clearly the revenue coming into the fund is not enough to pay for all the expenses, and the cash flow will only get worse when and if the following occurs: the next wave of baby boomers retire, the retirees are projected to live longer or the number of retirees become larger than the active members that are making contributions into the plan. CalPERS is expected to have negative cash flows over the next fifteen years unless there are significant increases in the contributions or the ROR is higher than projected (Lamont, 2015).

In 2013 there were 28,588 retirees compared to 13,780 retirees in 1999 (CalPERS, 2014a). The ratio of active employees to retirees has been steadily declining and a

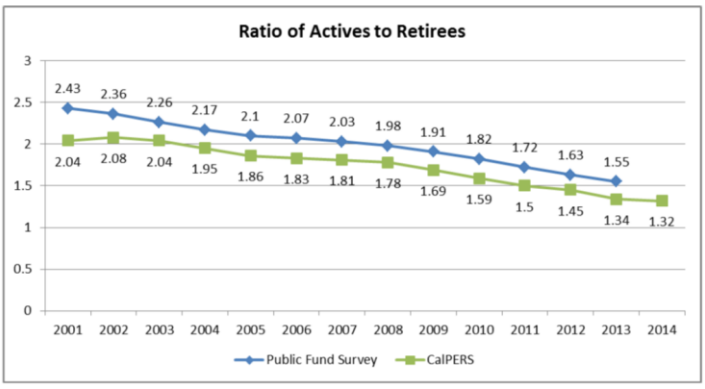

Figure 3 Ratio of Actives to Retirees
Source: CalPERS. (2014b). State actuarial valuation as of June 30, 2014.

significant number of baby boomers is expected to retire in the near term. The ratio of workers to retirees was 2.04 in 2001, and now the ratio was 1.3 of workers to retirees in 2014 (Figure 3).

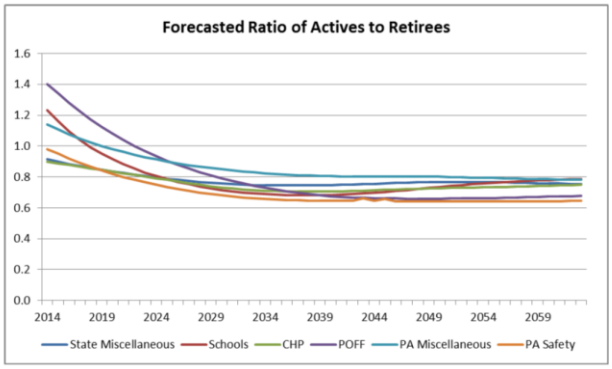

Figure 4 Forecasted Ratio of Actives to Retirees
Source: CalPERS. (2014b). State actuarial valuation as of June 30, 2014.

This ratio is forecasted to be less than 1 by 2025 and continue to be in the range of 0.6 and 0.8 past 2059 (Figure 4). For a mature plan, if the assumed ROR is not achieved, this will likely cause large swings in the contribution rate since there are not enough active members contributing in the plan to stabilize the rates and this could lead to insolvency or bankruptcy. Normally a retirement plan with a mature plan would "derisk" (move risky investments into safer ones to reduce risk) (Borenstein, 2015). However, CalPERS still has the majority of its assets allocated to Equity which leaves the employers and its members vulnerable to another financial collapse. (CalPERS, 2015b)

Ideally, CalPERS should escalate the employer contributions which would increase the funded status and reduce the risk of the plan. However, employer contribution levels now are at the highest point and are expected to climb higher still and remain at that level until 2026-2027 and then gradually fall back to the 2014-2015 level almost 20 years later (Mendell, 2014). According to CalPERS' State Actuarial Valuation (CalPERS, 2014b), the Employer Contributions is expected to increase by $487.2 million, from $4.3 billion to $4.8 billion, between 2014-2015 and 2015-2016. This difference was largely due to new demographic actuarial assumptions approved in 2014, increases in payroll (salary increases and new employees), and changes to the amortization and smoothing policy. The projected employer

Figure 5 Projected Future Contribution Rates
Source: CalPERS. (2014b). State actuarial valuation as of June 30, 2014.

Plan	New Rate	Projected Future Employer Contribution Rates				
	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
State Miscellaneous Tier 1	25.068%	27.3%	28.1%	28.9%	29.8%	30.1%
State Miscellaneous Tier 2	24.389%	26.8%	27.8%	28.8%	29.8%	30.2%
State Industrial	17.775%	19.0%	19.5%	19.9%	20.4%	20.5%
State Safety	18.082%	18.8%	18.8%	18.8%	18.8%	18.7%
POFF	37.338%	40.4%	41.2%	42.1%	43.0%	43.3%
CHP	45.406%	49.6%	50.7%	51.9%	53.0%	53.5%

contribution rate over the next five years will continue to climb as shown in Figure 5, assuming a 7.5% rate of return, all actuarial assumptions are realized, and there are no further changes to the assumptions, contributions, and benefits of the plan. There are 62 safety plans and eight miscellaneous plans that have rates above 50% of payroll (Mendell, 2014).

FINDINGS

Membership

CalPERS had a total of 1.8 million members, comprised of the non-teaching school employees, State employees, and employees of local governments. There were 3,007 employers participating in the plan as of June 30, 2015. There were 1.3 workers to every retirees, with 868,713 active members compared to 611,078 retirees, survivors, and beneficiaries. All current employees contributing a portion of their paycheck towards the pension are considered active employees. Inactive members that are vested but not currently receiving benefits or non-vested members not considered "active" and were excluded from the ratio. (CalPERS, 2016a).

The Teacher Retirement System of Texas (TRS) had a total of 1.5 million members. The membership includes employees and retirees of state-supported educational institutions in Texas, with 1,347 employers participating in the plan. The ratio of actives to retirees was 2.2 with close to 828,851 active members compared to 377,738 retirees, survivors, and beneficiaries 2. (TRS, 2015)

The Florida State Retirement System (FRS) had 1.0 million members. There were 1,016 employers in the retirement system which included all state, county, district school board, state college, and state university employers with optional participation of cities, charter schools, metropolitan planning districts, and special districts in Florida. The ratio of workers to retiree, survivors, and beneficiaries was 1.5 (626,578 active members compared to 428,685 retirees, survivors, and beneficiaries). (FRS, 2015a)

The New York State and Local Retirement Systems (NYSLRS) is comprised of two different systems administered by the same staff. They are the Employees' Retirement System (ERS) and Police and Fire Retirement System (PFRS). The members of ERS work for public employers in non-teaching positions and include uniformed services personnel, such as correction officers and sheriffs. Police officers and firefighters make up the membership of PFRS. Both the ERS and the PFRS do not include any public employers in New York City as New York City has its own retirement system. There were 1.1 million members in NYSLRS, of which approximately 1.0 million were in ERS and 68,000 were in PFRS. The number of employers in NYSLRS was 3,032 and the ratio of active members to retirees was 1.2 with 522,927 active members and 430,308 retirees, survivors, and beneficiaries. (NYSLRS, 2015a)

The Governance Structure of the Boards of Trustees of the Public Pension Systems

The trustees of CalPERS, Teacher Retirement System of Texas, Florida State Retirement System and New York State and Local Retirement System have similar responsibilities for the respective pension system such as setting employer contribution rates, authority and responsibility for the investment of assets, and completing actuarial valuations. The Board of Administration for CalPERS consists of 13 members who are elected, appointed, or hold office ex officio. Each board member is elected for a four-year term. Two board members were Governor Appointees, four members were ex officio (State Treasurer, State Controller, Director of the California Department of Human Resources, and a designee of the State Personnel Board Representative), one member was appointed jointly by the Senate Rules Committee and the Speaker of the Assembly, and the remaining six members were elected by active and retired state and local

government workers. The Chief Executive Officer is in charge of administering the directions set by the board and the day-to-day operations. (CalPERS, 2015a)

The Teacher Retirement System of Texas has a nine-member board of trustees with three trustees directly appointed by the Governor and the remaining trustees are appointed by the Governor from lists generated by specific groups. They serve six-year terms. The administration of the plan is led by the Executive Director. (TRS, 2015)

The number of trustees is much smaller for the Florida State Retirement System and the New York State and Local Retirement Systems. The members of these boards are all elected officials and serving as trustees is part of their job responsibilties. The trustees of the Florida State Board of Administration consist of the Governor as Chairman, the Chief Financial Officer, and the Attorney General. The Governor appoints the Secretary of the Department of Management Services who appoints the State Retirement Director who manages FRS (FRS, 2015a). The New York State Comptroller is the sole trustee of the New York State and Local Retirement Systems. He is responsible for the investment of the assets and leads the administration of the system (NYSLRS, 2015a).

Investment Guidelines

The CalPERS Public Employees' Retirement Fund has a market value of $301.1 billion as of June 30, 2015. CalPERS Total Fund Investment Policy sets forth the investment beliefs and objectives for its investment program. CalPERS Investment Policy identifies the objectives and policies of the investment program. The overall objective of the investment program is to generate returns at the appropriate risk levels to provide benefits to members and their

beneficiaries over a long-term and according to the law. Specifically, the performance objectives are 1) achieve a long-term rate of return that meets or exceeds the actuarial rate of return; 2) maximize the returns for the level of risk taken; 3) achieve a return that exceeds the Policy index; and 4) invest assets efficiently and effectively. The California Constitution, Article XVI, section 17 gives the CalPERS Board the sole fiduciary responsibility over the assets and the administration of the retirement system. The strategic objectives, specific investment policies, performance goals and benchmarks, restrictions and responsibilities outlined in the policy are intended to provide the framework for the management of the assets and enable transparency and compliance. The Asset Class Allocation section sets the targets and ranges for specific types of investments. Benchmarks are specified for the various asset classes to see if the investment strategy is meeting or exceeding the goal. The Investment Risk Management section strives to find the balance between risk and return, with a large, diversified pool of asset classes (CalPERS, 2016c).

The Teacher Retirement System of Texas's Pension Trust Fund had a market value of $127.93 billion as of August 31, 2015. The Investment Policy Statement was similar to CalPERS. The statement defines the roles and responsibilities of the Board, Investment Division, consultants and advisors. The investment program is structured and managed to achieve the following objectives 1) control risk through diversification of asset classes and establishing long-term return expectations and risk; and 2) achieve a long-term rate of return that exceeds the a) assumed actuarial rate of return adopted by the Board; b) long-term rate of inflation by an annualized 5%; and c) return of a composite benchmark of the respective long-term normal asset mix. The retirement plan operates under the provisions of the Texas

Constitution, Article XVI, Section 67 and Texas Government Code, Title 8, Subtitle C. (TRS, 2014)

The Florida State Retirement System Pension Plan Trust Fund had a market value of $147.97 billion as of June 30, 2015. The Defined Benefit Plan Investment Policy Statement's investment objectives are to provide investment returns sufficient for the plan that ensures timely payment of benefits to current and future participants and keeps the plan at a reasonable cost. The long-term investment objective is to earn a compounded return of 5% plus the rate of inflation per annum over the long run, This was achieved over 20-, 25- and 30-year periods but not over a 10- or 15-year period. The plan adheres to statutory guidelines mandated by the Florida Constitution and Florida Statutes Section 215.47. (FRS, 2014).

The New York State Common Retirement Fund in the New York State and Local Retirement Systems had a market value of $184.50 billion as of March 31, 2015. The General Investment Policies provides the framework for a well diversified investment program. The investment income, along with employer and employee contributions, should be sufficient to fund the current and future benefits of the retirement plan's participants as they become due. The Comptroller is bound by provisions set out in the Retirement and Social Security Law (RSSL), Regulations of the New York State Department of Financial Services, and State Banking Law. The "legal list", found in the RSSL and Banking Law, sets limitations on the quantity and quality of investments that may be held in certain asset classes and the "basket clause" of the RSSL allows up to 25% of the assets to be invested in areas specifically not authorized by other statues. (NYSLRS, 2015b)

Asset Allocations and the Return on Investments

According to CalPERS, the market value of the assets in the Public Employees' Retirement Fund (PERF) as of June 30, 2015 was $301.1 billion, with 53.8% of the current allocation in Global Equity ($162.0 billion), 9.6% in Private Equity ($28.9 billion), 17.6% in Global Fixed Income ($53.0 billion), 10.5% in Real Assets ($31.6 billion), 2.5% in Liquidity ($7.5 billion), 5.2% in Inflation Sensitive Assets ($15.7 billion), and 0.4% in Absolute Return Strategy ($1.2 billion), and 0.4% in Total Plan Level (Figure 6). In 2015, the 1-year ROR was 2.4%, for the 5-year period it was 10.7%, and for the 10-year period, which included the Great Recession, it was 6.2%. The ROR for the 20-year period was 7.76%. The long-term assumed ROR for CalPERS's was 7.5%. (CalPERS, 2015a).

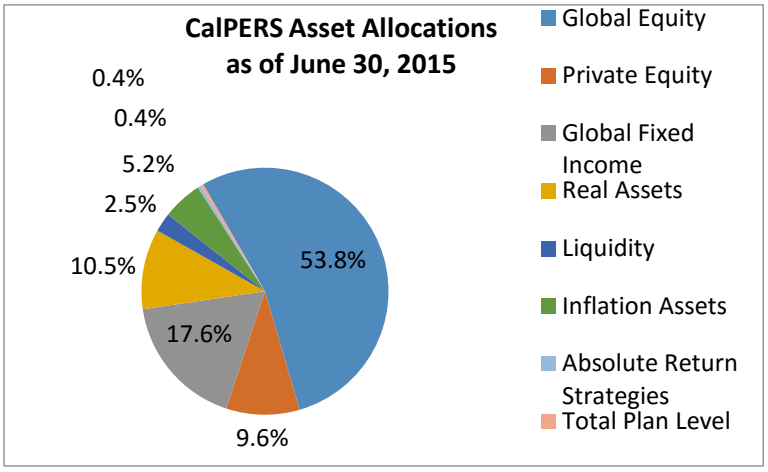

Figure 6 CalPERS Asset Allocations

Source: CalPERS. (2015a). 2014-15 comprehensive annual report.

According to the Teacher Retirement System of Texas 2015 Comprehensive Annual Financial Report (2015), the market value of the assets in the Pension Trust Fund as of August 31, 2015 was $127.9 billion, with 62.7% of the current allocation in

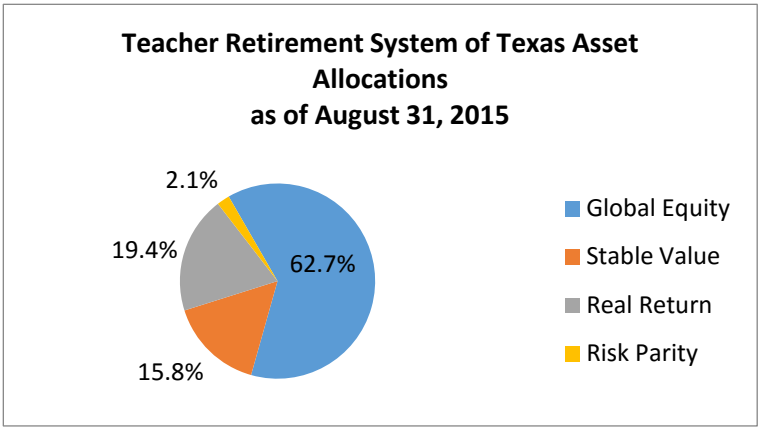

Figure 7 Teacher Retirement System of Texas Asset Allocations

Source: Teacher Retirement System of Texas. (2015). 2015 comprehensive annual financial report.

Global Equity ($80.2 billion), 15.8% in Stable Value ($20.2 billion), 19.4% in Real Return ($24.8 billion), and 2.1% in Risk Parity ($2.7 billion) (Figure 7). In 2015, the 1-year was -0.3%, the 5-year period it was 9.6%, and the 10-year period was 6.2%. The long-term assumed ROR for the fund was 8% (TRS, 2015).

The Florida Retirement System Pension Plan had a market value of $147.97 billion as of June 30, 2015. Approximately 58.1% of the asset allocation was in Global Equity ($86.00 billion), 6% was in Private Equity ($8.9 billion), 19.8% in Global Fixed Income ($29.3 billion), 8.3% in Real Estate ($12.3 billion), 6.9% in Strategic Investments ($10.2 billion), and 0.8% in Cash and Short Term Securities ($1.2 billion)(Figure 8).

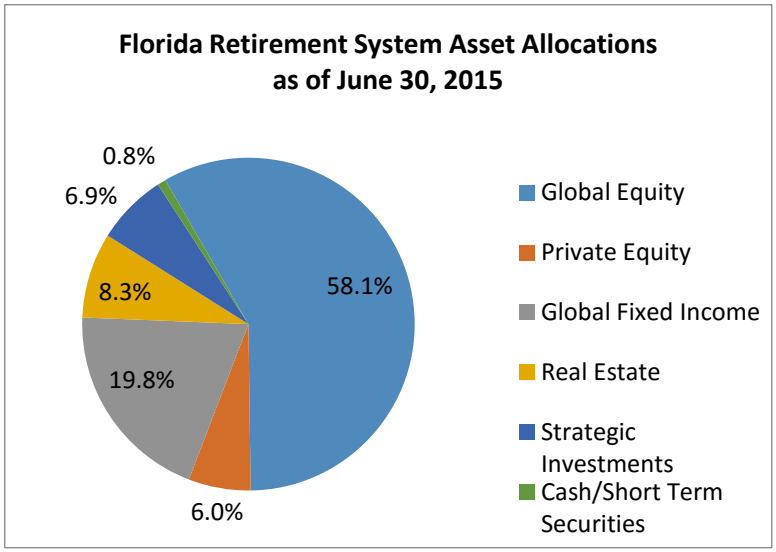

Figure 8 Florida Retirement System Asset Allocations

Source: Florida Retirement System. (2015a). Florida retirement system pension plan and other state administered systems comprehensive annual financial report fiscal year ended june 30, 2015.

The 1-year ROR was 3.7%, for the 5-year period it was 11.0%, for the 10-year period was 6.6%, and for the 20-year period it was 8.1%. The long-term assumed ROR for the fund was 7.65% (FRS, 2015b).

The New York State and Local Retirement System had a market value of $184.5 billion as of March 31, 2015. Approximately 39.5% of the asset allocation was in Domestic Equity ($72.9 billion), 13.7% was in International Equity ($25.3 billion), 7.5% in Private Equity ($13.8 billion), 21.4% in Global Fixed Income ($39.5 billion), 6.4% in Real Estate ($11.9 billion), 3.5%

in Absolute Return Strategy ($6.5 billion), 0.7% in Opportunistic Funds ($1.3 billion), 1.9% in Cash ($3.5 billion), 0.2% in Real Assets ($369,000), and 5.2% in Inflation Indexed Bonds ($9.6 billion) (Figure 9). The 1-year ROR was 7.16%, for the 5-year period it was 10.2%, for the 10-year period it was 7.1%, for the 20-year period it was 8.7%, and for the 25-year period it was 9.0%. The long-term assumed ROR for the fund was 7.0% (NYSLRS, 2015a).

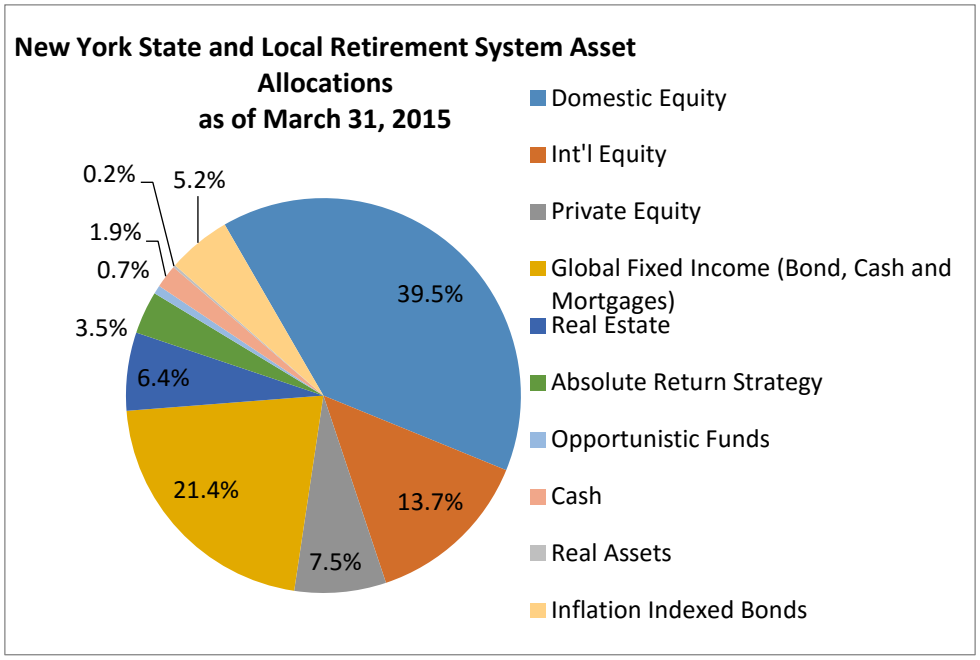

Figure 9 New York State and Local Retirement System Asset Allocations

Source: New York State and Local Retirement System. (2015a). 2015 comprehensive annual financial report.

Actuarial Information

The MVA is based on the stock market price on a given day if the investments were sold. When an Actuary uses the MVA to determine the amount Plan Administrators need to set aside to pay future retirees, the amount may vary greatly from year to year as the stock market fluctuates from year to year and this cost would be difficult to budget. Therefore, the actuary uses the AVA, which is an average value of the assets over a period. The AVA is important in determining whether the plan will meet its future Net Pension Liability. Actuarial valuation methods and assumptions, chosen by the Trustees, are used to smooth out the effects of the short-term volatility in the market value of assets. The AVA tends to lag behind the markets and can

be different from the MVA when there are large market movements. The ratio of AVA to MVA measures the extent to which the public pension plans have experienced overall market gains or losses over time. If the ratio is over 100%, the market has experienced more losses than gains; whereas if the ratio is under 100%, it means there have been more gains than losses. (Sielman, 2015)

The Actuarial Accrued Liability (AAL) represents the portion of the present value of fully projected benefits of service credits earned as of the valuation date. The Unfunded Actuarial Accrued Liability (UAAL) is the excess, if any, of the Actuarial Accrued Liability less the Actuarial Value of Assets. The UAAL represents the PV of the benefits earned that are not covered by the current plan assets. The Funded Ratio refers to the percentage of the current plan assets that would cover the future pension benefits. The ratio is calculated by diving the AVA by the AAL (Sielman, 2015).

The CalPERS' AVA was $301.3 billion and the AAL was $394.7 billion as of June 30, 2014 valuation. During that same period, the UAAL was $93.5 billion and the Funded Ratio for the plan was 76.3% (CalPERS, 2015a).

The AVA for the Teacher Retirement System of Texas was $133.5 billion and the AAL was $166.5 billion. The UAAL was $33.0 billion and the Funded Ratio for the plan was 80.2%. The actuarial funding method is the Individual Entry Age Normal Cost Method. (Gabriel Roeder Smith & Company, 2015)

The AVA for the Florida Retirement System was $143.2 billion and the AAL was $165.5 billion. The UAAL was $22.3 billion and the Funded Ratio for the plan was 86.5%. If the

pension plan had adhered to the financial reporting requirements established by GASB and used the MVA and the Individual Entry Age Normal for its calculations, the Unfunded Liability would have been much lower ($12.9 billion compared to $22.3 billion). The actuarial funding method used for the calculation was the Ultimate Entry Age Normal Cost Method. (FRS, 2015a)

The AVA for the New York State and Local Employees' Retirement System was $184.2 billion and the AAL was $196.5 billion. The UAAL was $12.4 billion and the Funded Ratio for the plan was 93.7% (Dutcher, 2015).

ANALYSIS

Membership – Three of the Four Pension Plans are Nearing Maturity Levels

All four public pension plans had over one million members and were multi-employer pension plans. CalPERS by far had the most members and employers with 1.8 million members and 3,007 employers followed closely by TRS (1.5 million members, 1,347 employers), NYSLRS (1.07 million, 3,032 employers), and then FRS (1.03 million, 1,016 employers). The ratio of the total number of active employees to the total number of retirees, survivors, and beneficiaries showed that NYSLR has the lowest ratio of 1.2 followed closely by the 1.3 ratio for CalPERS and 1.5 ratio for FRS. A ratio at or below ones indicates a more mature plan. Not only is the public pension plan responsible for paying benefits to a higher number of retirees, the *number* of active members making contributions is smaller. The monthly allowances to the retirees are funded by employer and employee contributions and earnings from investments. If the actual ROR is lower than the assumed ROR, this gap must be made up by higher contributions from employers and employees. Higher employer contribution rates could lead to service level cuts for the public agency or even bankruptcy. The negative impact increases further if the financial market collapses and the investments were not diversified. It is expected that with the pending retirement of the baby boomers, this ratio will only get smaller unless there are significant increases in the number of new members entering the pension plan. However, due to retirement reforms such as the 2013 Public Employee Pension Reform Act, new members will most likely be hired in at a lower benefit level. This lower benefit tier will have little to no Unfunded Liabilities so the contribution rates will be low or the new member may be enrolled in a Defined Contribution Plan. The savings realized by the employer due to the lower contribution rates is

required to be to be allocated to the Unfunded Liability, subject to the appropriation in the annual budget (CalPERS, 2016d). TRS had more than double the number of active members compared to retirees, beneficiaries, and survivors which indicated the pension plan is not reaching a maturity level.

It is not surprising that three out of the four public pension plans are nearing maturity levels since their assets are by far much larger than the other 96 public pension plans included in the Milliman 2015 Annual Study on Public Pension Funding (Sielman, 2015). The MVA for each of the four public pension plans was over $100 million and the number of active members exceeded 400,000. There were no other public pension plans that met either of these two criteria with the exception of CalSTRS which met both criteria. However, CalSTRS Funded Status was below 70% in 2015 and therefore not benchmarked in this research (CalSTRS, 2015).

Governance Structure – Appointed Versus Elected and Term Limits

Both FRS and NYSLRS had only elected officials that served as trustees of their boards. This is different from CalPERS and TRS where the Governor appointed directly or indirectly the majority of the board members. The board members would be held accountable by its members if the position was elected rather than appointed. If the board member is not doing a good job, the person would not be re-elected. The process is more democratic if the membership decides who will represent them. The majority of the board members are stakeholders that currently receive or will receive a pension upon retirement. It would seem that the interest of the pension plan's membership is best served when the board members are elected by membership rather than appointed by the Governor. However, appointed board members may have some advantages too. Perhaps the appointed board member will be more concerned with long-term

sustainability of the public pension plan if this person does not have to be concerned with getting re-elected and doing what the people currently want. The hybrid governance structure that CalPERS has is more tipped to the politicians since only six out of the 13 board members are elected by the membership and the rest are appointed. Adding board members who have the financial expertise, are not stakeholders nor appointed is something that could be explored in future research.

The CalPERS' board members serve for a four-year term with no term limits. There are also no term limits for the President or committee chairs. The President and Vice President are elected annually for a one-year term and the current President, Rob Feckner, has been elected for 12 consecutive years as the President. In 2016, CalPERS' governance committee sought to change the term limits and it was Rob Feckner's vote that became the deciding vote when he voted against term limits (Mendell, 2016). Term limits is another area that should be explored in future research.

Guidelines for Investment Vary Significantly Among Pension Plans

CalPERS Investment Policy, which is 62 pages long, was comprehensive and clearly documented the objectives and policies for its investment program. CalPERS was the only pension plan that adopted ten Investment Beliefs which provides a framework for the strategic management of the investment portfolios and provides context of the organizational priorities. It was the only guideline that described in detail the frequency and types of report that the Investment Office staff, General Pension Consultants, and the Private Asset Class Board Investment Consultants must provide. For example, the Investment Office staff must report the asset class allocations relative to their target and ranges, as well as investment performance

returns and any deviations from the policy range at the next Committee meeting or sooner if deemed necessary. Therefore, on a monthly basis the Investment Committee receives a report from the Investment Office staff about asset allocation, risk, and investment performance. These updates are important and will help the trustees perform their fiduciary duties. CalPERS also listed in detail the investment responsibilities and expectations for the Investment Committee, Investment Office staff, Actuarial Office staff, External Manager and consultants.

TRS Policy Statement was contained in 46 pages and included information similar to CalPERS' with less details. NYSLRS and FRS had relatively short general guidelines, 16 pages and 9 pages respectively. NYSLRS guidelines were unique in that there was a "legal list" which set limitations on the quality and quantity of investments in certain asset classes (mainly Fixed Income and Equity). Additionally, a "basket clause" provides much flexibility for the investments since up to 25% of the assets could be invested in areas not specifically authorized by any other provision of law (e.g., alternative investments such as hedge funds, commodities, private equity and international bonds that are typically more risky than stocks and bonds and have higher fees). The State Comptroller of New York must follow the "prudent person" and "exclusive benefit" fiduciary standards and there are policies and practices in place to ensure that the fund is managed to ethical standards and the actions are transparent. Hence, NYSLRS guidelines included Ethical Standards whereas no other pension plans benchmarked did.

There was a bill to increase the basket clause percentage from 25% to 30% to mitigate market volatility while maintaining high returns. The N.Y. Legislature approved the bill in June 2014; however, the Governor vetoed it (Steyer, 2014). Increasing the percentage of investments allowed under the "basket clause" would have given the Comptroller too much flexibility and

further increased the risk for alternative investments that are typically more difficult to value and monitor.

CALPERS' Asset Allocations Today Are Similar to Its Asset Allocation Before the Stock Market Crash in 2008

CalPERS holds close to 63% in Equity as of June 30, 2015 which was very similar to the 66% of the Equity investments held as of June 30, 2007. In 2006-2007, the stock market had a strong performance and the ROR for Equity was 23.7% (2015 CAFR, 2015 and 2007 CAFR, 2007). Despite huge losses related to the subprime lending market in spring 2007, the stock market continued to climb and the Dow Jones Industrial Average reached a closing high in October 2007. Eventually the market began to plummet and by December 2007, the United States had fallen into a recession. The market continued to decline until it reached a low in October 2008 (Kosakowski, n.d.). The 2008 CAFR reported that 61.7% of the asset allocations were in Equity as of June 30, 2008 and since there were significant losses in Global Equity, the ROR was a loss of 9% for this asset class (CalPERS, 2008). The 2009 CAFR reflected the largest impact of the stock market crash of 2008 with a ROR in Equity of -28.6%, with 55.6% invested in this asset class (CalPERS, 2009). According to one financial strategist, Albert Edwards, recent events make him believe that the "world is headed for a disaster, and will take the prices of equities down with it." (Matthews, 2016) Edwards predicts the U.S. stock market will plunge as much as 75%. The stock market is cyclical and when the next stock market crash occurs, if CalPERS continues to have a majority of its investments in Equity, the MVA will decrease significantly during the next stock market crash and it will be very difficult for the public pension plan to rebound.

Categorizing the Risk of the Asset Allocations

CalPERS' Investment Committee attended the 2013 Asset Liabilities Management Workshop and reviewed the asset classes and risk factors framework (CalPERS, 2013). The risk factors (low, moderate, and high) associated with the asset classes were used to categorize the investments of the four pension plans, resulting in an analysis that showed the overall risk of the public pension plans. Over 93% of the asset classes owned by CalPERS, TRS, FRS and NYSLRS were categorized for the risk analysis. A few of the asset classes were not included in the analysis because the risk associated with the particular asset class could not be easily defined unless more research was performed on the particular holdings in the asset class. Total Plan Level, Risk Parity, Strategic Investments, and Opportunistic are examples of the asset classes excluded from the risk analysis as the investments could potentially be diversified among various asset classes. Investments in equities (e.g., Global Equity, Private Equity, Domestic Equity) were considered high risk; Real Assets, Inflation Assets, Real Return, and Real Estate were considered moderate risk; and Global Fixed Income, Inflation Indexed Funds, Liquidity, Absolute Return Strategies, Stable Value, Cash/Short Term Securities were considered low risk.

Majority of Asset Allocation in High/Moderate Risk Categories

	High	Moderate	Low	% of Total Allocation
CalPERS	63.40%	15.70%	20.5%	99.60%
TRS	62.70%	19.41%	15.8%	97.88%
FRS	64.16%	8.30%	20.6%	93.09%
NYSLRS	60.70%	6.60%	28.5%	95.80%

Table #1 Asset Allocations in Risk Categories and Percent of Total Allocation

Source: CalPERS. (2015a). 2014-15 comprehensive annual report.

Florida Retirement System. (2015a). Florida retirement system pension plan and other state administered systems

New York State and Local Retirement System. (2015a). 2015 comprehensive annual financial report

Teacher Retirement System of Texas. (2015). 2015 comprehensive annual financial report.

CalPERS had 79.1% of its assets allocation in high/moderate risk investments, with 63% invested in high risk (53.8% Global Equity and 9.6% Private Equity). Approximately 20.9% of CalPERS' assets were considered low risk. In 2015, CalPERS' assets had a very low ROR of 2.4%. TRS had a similar allocation with 82.1% of the assets considered high/moderate risk, with 62.7% invested in Global Equity (i.e., U.S., Non-U.S. Developed, Emerging Markets, Directional Hedge Funds, Public Equity, and Private Equity). At most 16.0% of TRS's assets were invested in what is considered low risk. This strategy brought a loss of 0.3% over the one-year period.

In contrast, although NYSLRS had approximately the same percentage of high risk assets, the percentage of low risk investments was at least 28.5% of the portfolio. With the exclusion of the Absolute Return Strategy, the 28.5% allocated in low risk was considerably higher than the other three public pension plans. This strategy also provided the highest one-year ROR of the group at 7.2%. Investing in Fixed Income, considered as low risk, is considered to be a sound investment strategy because it has historically been less volatile than equities, there is

income generation, and it diversifies the assets allocation. It was difficult to compare FRS to the other three public pension plans because of the inability to determine the risk level of the Strategic Investments. This asset class is approximately 7% of the asset allocation and if it were considered moderate/high risk, then the asset allocation would be very similar to CalPERS with a 79%/ 20% split. If Strategic Investments was considered low risk, the makeup would be similar to NYSLRS with a 72%/ 27% split.

Rate of Return on Investments are More Likely to Meet or Exceed the Assumed Rate in the Long Run

	Rate of Return on Investments					Long Term Assumed Rate of Return
	1 year	5-year	10-year	20-year	25-year	
CalPERS	2.4%	10.7%	6.2%	7.8%	N/A	7.5%
TRS	-0.3%	9.6%	6.2%	7.7%	8.7%	8.0%
FRS	3.7%	11.0%	6.9%	8.1%	8.7%	7.7%
NYSLRS	7.2%	10.2%	7.1%	8.7%	9.0%	7.5%

Table #2 Rate of Return on Investments

The box is shaded if the Rate of Return exceeded the Assumed Rate of Return over a 10-year period

Source: CalPERS. (2015a). 2014-15 comprehensive annual report.

Florida Retirement System. (2015a). Florida retirement system pension plan and other state administered systems

New York State and Local Retirement System. (2015a). 2015 comprehensive annual financial report

Teacher Retirement System of Texas. (2015). 2015 comprehensive annual financial report.

Looking at the RoRs from a long-term perspective (i.e., 10+ years) revealed that none of the four public pension plans exceeded the long-term assumed ROR for the 10-year period. The actual 10-year ROR for the four pension plans ranged from 6.2% to 7.1%. CalPERS and NYSLRS had the lowest assumed ROR among the group yet the assumed ROR was not low enough to be less

than or equal to the actual ROR over the 10-year period. CalPERS, FRS, and NYSLRS both fell short of the assumed ROR (130 basis points, 80 basis points 30 basis points, respectively). Over a 20 year period, CalPERS, FRS, and NYSLRS exceeded the assumed RoR over a 20-year period for and TRS, FRS and NYSLR exceeded the assumed ROR over a 25-year period. NYSLRS changed their long-term assumed ROR to 7.0% effective September 2015. NYSLRS had the highest ROR over the 10-year period and now has the lowest assumed ROR.

When the actual ROR varies from the assumed ROR, this causes more financial strain on the public pension plan. For example, the CalPERS investments in 2015 should have earned $22.6 billion based on the assumed 7.5% return and the $301.1 billion MVA. However, the actual return was 2.4%. The difference between the assumed and actual ROR was approximately $16 billion or 5.3% of the MVA. Therefore, if there were no smoothing efforts, in order to make up for the previous year's losses, the target for the following year would be increased from 7.5% to 12.8% (Ring, E 2016). This process of smoothing out market ups and downs, that is, using the investment gains/losses from a particular year to offset the investment gains/losses from a nearby year, ensure that the contribution rates don't vary greatly from year to year if the actual ROR is not equal to the assumed ROR. However, smoothing also makes it difficult to identify the financial position of the pension plan at a given point in time.

A sensitivity analysis of the assumed ROR was performed on the State Miscellaneous Tier 1 in CalPERS. The assumed ROR is currently at 7.5% and if this rate reduced by 1%, the Employer Contribution rate would increase from 25.1 % to 36.1% and the Funded Status would decrease from 72.0% to 64.5%. If the assumed ROR increased by 1.0%, the Employer Contribution would decrease from 25.1% to 15.2% and the Funded Status would increase from

72.0% to 80.6%. The 1.0% increase in the assumed ROR seems like a win-win for cash strapped agencies since the Funded Status increases and the contribution amount decreases. However, if the actual ROR is less than the assumed ROR, the funding gap gets larger and larger and this could eventually lead to bankruptcy (CalPERS, 2014b).

In 2015 CalPERS proposed to slowly shift risky investments into more conservative investments to increase the financial stability of the pension system (Mendell, 2015b). By decreasing the assumed ROR from 7.5% to 6.5% over 20 to 30 years, some of the investments could be shifted to less risky ones. This action would reduce the risk somewhat of another big loss when the next economic downturn occurs and reduce the risk of spikes in contribution rates. However, these lower assumed investment returns must be offset by an increase to the Employer Contribution over a period of time unless the market performs exceptionally better than projected (Mendell, 2015b). The rate increase for the employer contribution would be added to the 50% rate increase implemented earlier in 2015 (Petersen, 2015b). For example, the State's portion of the Employer Contribution is expected to increase above current levels by $200 million in 2016-2017 and more than $700 million by 2019-2020 (The Legislative Analyst's Office, 2015). Although Governor Brown has no authority over the CalPERS Board, the Governor advocated that CalPERS act more aggressively by lowering the assumed ROR over five years and amortizing it over 20 years (Mendell, 2015a). This five- year phased-in approach would have caused the State's contribution to increase by more than $1 billion by 2020s (The Legislative Analyst's Office, 2015). In November 2015, the Board approved the Risk Mitigation Policy, reducing the assumed ROR from 7.5% to 6.5% over 20 years, as well as adjusting the strategic asset allocation target *only* in years of good investment returns where actual investment returns outperformed the existing discount rate by at least four percentage points (Petersen, 2015b). The

policy is a step in the right direction; it will increase the financial sustainability of the pension system by gradually lowering the risks of the investments over several years.

The Funded Ratio of CalPERS is Much Lower than Benchmarks

CalPERS had an Unfunded Actuarial Accrued Liability of $93.5 billion and a Funded Ratio of 76.3% as of the June 30, 2014 valuation. The Funded Ratio was estimated to drop to 73.3% as of the June 30, 2015 valuation. By comparison, NYSLERS had a Funded Ratio of 93.7%, the highest of the benchmark group. NYSLERS' ROR was the highest compared to the three other public pension plans for all the periods except for the 10-year period which the actual ROR was over 10%. There were 21 years out of the 35 years (1981-2015) where the ROR for NYSLERS were double-digits and only three years had a negative return (2001, 2003, and 2009). Clearly NYSLERS investments had solid gains which boosted the funded ratio of the plan. NYSLERS was consistent about making contributions. Between 2005 and 2014, the contributions remained at similar levels or increased for all the years except for 2008. FRS followed next with an 86.5% funded ratio and then TRS which had an 80.2% funded ratio.

CONCLUSION

CalPERS ratio of active employees to retirees, beneficiaries and survivors is 1.3. More of its members will be beginning their retirement years in the near future and CalPERS must embrace its fiduciary duties and ensure that investments generate returns at the appropriate risk levels to provide benefits to members and their beneficiaries over a long-term. CalPERS should allocate a higher percentage of its asset allocation to Fixed Income. This investment strategy would be

similar to NYSLRS, which was demonstrated in this paper as a retirement system that was financially solid and well funded. The actuarial assumptions used for CalPERS, particularly the assumed ROR, cannot be overly optimistic and unattainable.

CalPERS must be more proactive in securing financial stability for its plan and its membership. The current funded status is at a tipping point and could drop even lower should there be another market downturn. The trustees, elected officials, plan administrators and union leaders must identify ways to increase the employer and employee contributions, reduce the assumed Rate of Return, and still provide essential services to the community while compensating the employees in a fair manner. Employees must understand how they share the risk of the unfunded status and what concessions they can make to contribute towards financial stability. All stakeholders must work together to ensure the best retirement package is available today and for future generations to come.

Table 3 Benchmark of CalPERS against the Teachers Retirement System of Texas, Florida State Retirement System, and New York State and Local Employees Retirement Systems.

Benchmark	CALPERS	Teacher Retirement System of Texas	Florida State Retirement System	New York State and Local Retirement Systems
Number of members	1.8 million	1.5 million	1.0 million	1.1 million Two different retirement systems: Employee Retirement System with approximately 1 million members and the Police and Fire Retirement System with just over 68,000 members
Number of employers participating in the plan	3,007	1,347	1,016	3,032
Ratio of actives to retirees/survivors/ beneficiaries	1.3	2.2	1.5	1.2
Governance Structure of the board	*13 members who are elected by membership, appointed by the Governor or Legislature, or hold office ex officio.*	9 trustees who are chosen directly or indirectly by the Governor	Governor as Chairman, Chief Financial Officer, and Attorney General	Comptroller
What is the Market Value of the Investments?	$301.1 billion	$128.0 billion	$147.97 billion	$184.5 billion
Is there an Investment Policy?	CalPERS Total Fund	Investment Policy	Defined Benefit	General Investment Policies

Benchmark	CALPERS	Teacher Retirement System of Texas	Florida State Retirement System	New York State and Local Retirement Systems
	Investment Policy (adopted March 16, 2016 and effective April 18, 2016)	Statement (effective October 2014)	Investment Policy Statement (effective March 2014).	November 2015
Laws and Regulations Governing the Investments	Ca Constitution, Article XVI, section 17	Texas Constitution, Article XVI, Section 67 (a)(3) and Section 825.301, Government Code, Title 8, Subtitle C	Florida Constitution and Florida Statutes Section 215.47	Retirement and Social Security Law, Regulations of the New York State Department of Financial Services, and State Banking Law
Asset Allocation	Refer to the Findings section of the paper			
Assumed Rate of Return on investments	7.5%	8%	7.65%	7.5% 7.0% as of 9/2015
Rate of Return on Investment				
1-Year Return	2.4%	-0.3%	3.7%	7.2%
5-Year Return	10.7%	9.6%	11.0%	10.2%
10-Year Return	6.2%	6.2%	6.9%	7.1%
20-Year Return	7.8%	7.7%	8.1%	8.7%
25-Year Return	N/A	8.7%	8.7%	7.5%

Benchmark	CALPERS	Teacher Retirement System of Texas	Florida State Retirement System	New York State and Local Retirement Systems
Actuarial Value of Assets	$301.3 billion[1]	$133.5 billion	$143.2 billion	$184.2 billion
Actuarial Accrued Liability	$394.7 billion[1]	$166.5 billion	$165.5 billion	$196.5 billion
Unfunded Actuarial Accrued Liability	$93.5 billion[1]	$33.0 billion	$22.3 billion	$12.4 billion
Funded Status based on Actuarial Value of the Assets	76.3% as of 6/30/2014 The ratio is estimated to drop to 73.3% as of 6/30/2015	80.2%	86.5%	93.7%

Source:

CalPERS. (2015a). 2014-15 comprehensive annual report.

Florida Retirement System. (2015a). Florida retirement system pension plan and other state administered systems comprehensive annual financial report fiscal year ended june 30, 2015.

New York State and Local Retirement System. (2015a). 2015 comprehensive annual financial report.

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[1] June 30, 2014 was the last actuarial valuation performed for CalPERS

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