

AWAKENING THE SLEEPING GIANT: CALIFORNIA'S PUBLIC PENSION SYSTEM
AND THE EFFECTS OF UNFUNDED LIABILITIES

Scott Dominic Seekatz
B.A., University of California, Irvine, 2007

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AWAKENING THE SLEEPING GIANT: CALIFORNIA'S PUBLIC PENSION
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A Thesis

by

Scott Dominic Seekatz

Approved by:

_____, Committee Chair
Robert Wassmer, Ph.D.

_____, Second Reader
Mary Kirlin, D.P.A.

Date

Student: Scott Dominic Seekatz

I certify that this student has met the requirements for format contained in the University format manual, and that this thesis is suitable for shelving in the Library and credit is to be awarded for the thesis.

_____, Department Chair
Robert Wassmer, Ph.D.

Date

Department of Public Policy and Administration

Abstract
of
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Statement of Problem

California's usage of a defined benefit program goes back to its creation in the 1930s. Over the years, the defined benefit system struck a natural balance between retirement liabilities and the assets available to cover these liabilities. Unfortunately, that balance was disrupted in the early 2000's. This imbalance occurred through increased pension benefits resulting in more liabilities, reductions of current assets through losses in the stock market, and ever presents budget deficits at the state and local levels. All of these events played together into the creation of new unfunded liabilities, which the state and taxpayers must fulfill. As of 2010, the cost of California's unfunded liabilities range between \$39 billion to \$239 billion over 20 years. In light of the rising cost of unfunded liabilities, constant budget deficits, and the lack of citizens' support for California's current public pension systems; is it within California's best interest to reform the current pension system, abolish the current pension system and implement a new system, or to maintain the status quo?

Conclusions Reached

A Criteria Alternative Matrix helped to analyze the positive and negative aspects of each alternative in order to find the optimum policy alternative. Through this analysis, a recommendation was made that California abandon the status quo and implement a hybrid cash balance retirement plan to mitigate current liabilities, and halt the creation of new liabilities.

_____, Committee Chair
Robert Wassmer, Ph.D.

Date

DEDICATION

To my bride to be, Sarah:

Gates is glad that he got the girl!

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Chapter 1

INTRODUCTION

The issue of retirement, and being able to afford to retire comfortably, has become important for almost every worker over the past century. Having mechanisms in place to ensure that older workers are able to retire and continue to live a life of normal subsistence has been the driving force behind the enactment of numerous public policies such as Social Security, Medicare, pensions, and 401K's. Of the systems set up for funding an individual's retirement; defined benefit programs (pensions) or defined contributions (401K's) are the two most popular mechanisms that employers utilize to fund employee retirements. These two options make up a large majority of retiree's income.

With a major recession of the world economy in late 2008, the financial stability of pension systems around the world became a major concern. States and local governments have watched the value of their pension assets decline, and in some states that loss has cut the value of their assets by up to one-third (Pew Center on the States, 2010). In 2008 alone, the value of the California Public Employees Retirement System (CalPERS) fund lost \$70 billion, decreasing from \$253 billion on January 1, 2008 to slightly under \$183 billion on December 31, 2008, a decrease of over 23% (CalPERS, 2009, Pew Center on the States, 2010). This decrease also came at a time when California's budget saw a deficit of over \$60 billion, resulting from the meltdown of the state and national economy (Halper & Goldmacher, 2010).

Since 2008, there has been renewed interest in California's pension system and the future benefits that the system will provide. It is important to note, ultimate fiduciary responsibility of fully funding pension liabilities fall to the taxpayer in the event that the pension system assets cannot cover the liabilities, which creates a unfunded liability. Unfunded liabilities play a large role in the costs that the pension systems, and possibly the taxpayers, will have to pay in the future. According to a report from Stanford University, the CalPERS system alone has almost \$240 billion in unfunded liabilities over the next 20 years (Bornstein et al., 2010).

The declining stock market in the late 2000's, the rising cost of unfunded liabilities, and the public's temperament on the issue have raised questions about the future of public pension systems for public employees. These questions mainly focus around how pension systems will be able to finance the guaranteed pension benefits promised to hundreds of thousands of public employees and their dependents in the upcoming years. This is even more of a concern if a majority of public employees are within 10 years of retirement, and the difficulties of operating in an environment of constant budget deficits may continue for years to come. In light of the rising cost of unfunded liabilities, constant budget deficits, and the lack of citizens' support for California's current public pension systems; is it within California's best interest to reform the current pension system, abolish the current pension system and implement a new system, or to maintain the status quo?

The remainder of this chapter contains sections that explain the difference between a defined benefit and defined contribution plans, their usage, and the history of

retirement funding in California. The last section of this chapter will outline the remaining layout of this thesis.

Defined Benefit and Defined Contribution Plans: What are They?

Historically, there have been two systems of retirement funding which include defined benefit (DB) and defined contributions (DC) retirement plans. Defined benefit (DB) plans, traditionally known as pension systems, consist of a predefined formula set at the time of hire, providing a lifetime annuity upon retirement. The amount of this lifetime annuity is broken down into monthly pension payments, calculated by a retirement formula that takes into account the number of years of employment, highest salary for a certain amount of time (1 year, 3 years, etc). Lastly, there is a retirement multiplying amount set at the time of hire by their employer, which can be any number such as (1%, 2%, 3%, etc). The employee pays a certain percentage of their income into a pension fund (employee contribution), combined with employer contributions, along with any returns on investments that the pension fund realizes. It is from this pension fund that future pension annuities are withdrawn. The theory is that over time the employee and employer contributions, compounded with future returns on investment to the fund, will provide sufficient resources to pay the future pension liabilities.

The other type of a retirement system is a defined contribution (DC) plan, known as 401K retirement plans. Employee contributions traditionally fund a DC plan, and depending on their employer, may consist of some type of an employer contribution, or a matching deposited into the fund. DC plans do not require an

employer contribution, and in some cases may not have one. The employee independently invests the contributions, and any returns on investment in a variety of securities (stocks, mutual funds, bonds, etc). The employee has total control as to the mix of those investments, allowing for different risk preferences. During retirement, the retiree withdraws money from the assets in the fund, or can roll the assets in the fund into a more secure Individual Retirement Account (IRA).

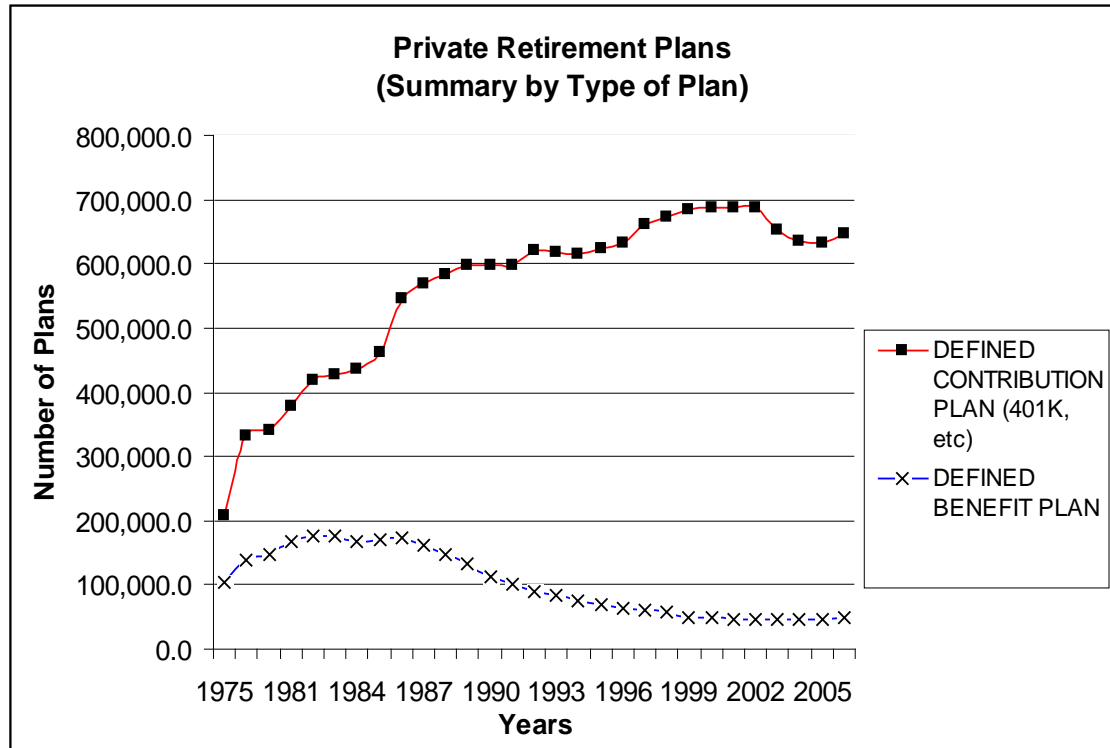
There are major differences in funding between the DB and DC systems, and the type of financing available to retirees. In a DB plan, the employer holds the ultimate fiduciary and legal responsibility to ensure that the liabilities are available when the individual retires. This means that regardless of any declines or losses that the plan encounters, the employer is required to provide the contracted pension obligation at the time of retirement. If a loss does exist, it is the employer's responsibility to find the necessary resources to fulfill any unfunded liabilities. In a DC plan, the employee is solely responsible for the funding and performance of their retirement plan. This sole responsibility to fund the plan is with the employee since there is no requirement that the employers provide a contribution or a match, instead some employers elect to make these contributions but there is no obligation to make these contributions. With the employee being responsible for their retirement account, they personally shoulder any risks that occur in the account.

The Usage of the Plans: Private Versus Public

Prior to the 1980's, DB plans were the primary tool of retirement funding for employees, if the employer provided one at all (US Bureau of Labor Statistics, 2005). It

is important to note that while DC plans were not largely used until the 1980's, most employers did not provide any source of retirement funding, and retirees would instead rely on their Social Security benefits or any savings they accumulated to fund their retirement, if they ever retired. Most of the employers that offered DB plans were usually large companies, traditionally manufacturing companies, highly unionized, and relatively low skill and low wage employees. In the 1970's, employers began to set up DC retirement systems, which allowed their employees to elect to set aside money for retirement, but it would be taxed, along with any returns that the investments made, essentially reducing any real prospects of funding a retirement (Employee Benefit Research Institute, 2005). In 1978, Congress amended section 401K of the Internal Revenue Code to defining this this benefit as taxable income, as long as the retiree elects to receive it as an annuity in retirement, rather than a direct cash payment before retirement (Employee Benefit Research Institute, 2005). This 1978 change to the code essentially allowed for employers to provide a source of retirement funding for their employees, while not increasing any liability on themselves, as they would have had under a DB plan. As can be seen by Figure 1.1 on the next page, after the passage of the 1978 change to the code, 401K plans became a staple benefit of private employers, while at the same time large majorities of DB plans were either closed to new employees, frozen, or eliminated altogether. Unfortunately, there is no data on the number of DC and DB plans prior to 1975, since the Bureau of Labor Statistics did not collect this data before 1975.

Figure 1.1 Distribution of Retirement Plans by Private Employers



Source: (US Bureau of Labor Statistics, 2005)

While Figure 1.1 above shows that private employers had made the shift from DB plans to DC plans, public employee employers (government) continued to maintain their use of DB plans. Today government employers make up a clear majority of all DB plans still in existence. Overall, when looking at both public and private employees, nearly 82% of public employees in the United States are in a DB system, while only 21% of private employees are in a DB system (US Bureau of Labor Statistics, 2009). Furthermore, in California alone one in ten adult California's are members of CalPERS, CalSTRS, or the University of California Retirement System (Kogan et al., 2010). In 2009, CalPERS contracted with 57 county offices of education,

four school districts, 449 cities and towns, and 1,022 special districts to maintain some type of a DB plan for retirees (CalPERS, 2009).

History of California's Pension System

The evolution of the DB system in California has a rich history, from its creation during the depression to the multiple changes along the way that have changed how it is funded. Prior to 1919, California did not have a retirement system of any kind. This was also at a time when there was no Social Security, which came about in 1935. The Legislature passed AB 609 in 1919, which allowed counties and cities to create and maintain their own retirement systems for city and county employees (Chapter 373, California Secretary of State, 1919). It was not until 1929 that the Legislature passed Assembly Constitutional Amendment 37, which upon voter approval, would allow the state to create a retirement system for state employees, state college teachers, and Governor's appointees (Chapter 87, California Secretary of State, 1929). ACA 37 became Proposition 5 on the 1930 general election ballot and passed with a slim majority of Californians, 51.6% of the vote ("California Ballot Measure Database," n.d.). By passing Proposition 5, Californians provided the Legislature with the power to create a DB pension system, and in 1931, the Legislature approved SB 683, creating the State Employee Retirement System (SERS), tasked with setting up and managing California's pension system (Chapter 700, California Secretary of State, 1931). Initially, SERS was only to provide retirees with pension benefits, but had no authority to provide employees with health benefits. In 1961, the Legislature passed AB 541, which authorized SERS to provide health and life insurance benefits to employees and

eligible vested retirees, which continues today (Chapter 1236, California Secretary of State, 1961). SERS would later change their name to the California Public Employees Retirement System (CalPERS) in 1967, which is the current name of the agency (CalPERS, 2007).

Up until 1939, the newly created SERS system only catered to state employees, since state law already allowed local cities and counties to create and maintain their own DB systems, as enacted by AB 609 in 1919. Smaller cities and counties, along with smaller special districts, did not have the number of employees to mitigate the cost necessary to set-up or maintain a DB pension system, so in many cases they did not provide one to their employees. Seeing this, the Legislature approved AB 1057 in 1939, which allowed cities and counties to contract with SERS to provide pension benefits to their municipal employees (Chapter 927, California Secretary of State, 1939). Under this agreement, cities would establish their own retirement vesting requirements (age of retirement, years of service, etc) and SERS would then bill the local government for the cost to maintain this level of benefits (CalPERS, 2007). This law is still in effect today, and at the end of fiscal year 2009 CalPERS had contracted with 36 counties, 449 cities/municipalities, and 1,022 special districts to provide the pension and healthcare benefits for their retired employees (CalPERS, 2009).

Beyond just the structural creation of a DB system in California, the Legislature and voters have approved two constitutional amendments that fundamentally altered the funds that CalPERS and other pension funds could invest in, and the total percent of fund assets invested in various equities. Initially in the 1931 language that created the

SERS system, there was a provision that stated that bonds were the only securities the system could invest their assets in. Since bonds are predictable and provide a stable rate of return, which is important for a DB system, they became the main investment vehicle. The first leap that SERS made into the stock market was with the legislature's passage of ACA 57 in 1965 (Chapter 160, California Secretary of State, 1965). ACA 57 allowed SERS to invest up to 25% of their assets in common or preferred stocks, essentially allowing SERS to diversify their assets out of bonds and into the stock market, which can provide higher rates of return, but also comes with more investment risk (Chapter 160, California Secretary of State, 1965). The voters in Proposition 1 on the general election of 1966 approved ACA 57 by a vote of 59.6% to 40.4% ("California Ballot Measure Database," n.d.). For 18 years, the 25% cap of assets in the stock market remained in place until the passage of ACA 16 in 1983, which completely eliminated the cap and allowed CalPERS to decide on their own appropriate mix of investments for their assets (Chapter 105, California Secretary of State, 1983). Voters in the form of Proposition 21 on the 1984 primary election ballot approved ACA 16 by a vote of 53.2% to 46.8% ("California Ballot Measure Database," n.d.). The approval of proposition 21 opened up the CalPERS fund to the opportunity to achieve large returns on investment. Just like the approval of Proposition 1 in 1966, this opened the CalPERS fund to more risk, which could result in massive losses to the fund in the wake of a collapse of the stock market, or large changes in the performance of equities.

Based upon the information provided, it became apparent that there is a need to highlight the difference in asset accumulation that occurs when DB plans invest in

government bonds or the stock market. In order to show the difference in assets accumulation between government bonds and the stock market, an analysis can show the difference between a yearly 5% rate of return (government bond) and the usage of CalPERS yearly rate of return from the beginning of 1991 through the end of 2010. For this hypothetical situation, an assumption will be that an employee began working for the State of California in the beginning of 1991 at a salary of \$45,000, and received yearly raises of 3%. This employee retired at the end of 2010 after 20 years of employment at 55 years old with a high one-year salary of \$78,908. Based on this information, the employee is entitled to 40% of their pay yearly, 20 years at 2% at 55 formula, which is \$31,563. Another assumption is that this person will live to the median age, which is 76 (CalPERS, 2009). With this information, it is possible to calculate the liability to California for this one employee of \$631,262, found by multiplying the yearly pension of \$31,563 by 20 years.

Utilizing employee and employer, historic contribution rates between 1991 and 2010, it was possible to calculate the asset accumulation over the 20 years of employment under a 5% constant rate of return and using CalPERS historic rate of returns from 1991-2010. Over this period, the employee contributed \$36,164 in employee contributions with the employer contributing \$156,270. With a yearly rate of return along with employee and employer contributions over the years, the total assets after 20 years with a 5% rate of return equaled \$202,056. With a yearly rate of return equal to CalPERS returns from 1991-2010, along with the historic employee and employer contributions total assets would equal \$125,752. From this hypothetical

situation the 5% rate of return assets are roughly \$76,000 higher. It is important to note that both plans were relatively close until 2008 when CalPERS lost over 23% of its value (CalPERS, 2009). With this information, it is possible to see the risk that can occur when investing assets in the stock market compared to the risk free nature of bond investments.

Retirement Formulas

One of the largest issues when looking at pensions is the benefit factor and the minimum retirement age for retirees. State employees have been broken down into three broad classifications of employees, which are miscellaneous (clerical, administrative, industrial, etc), state safety (milk inspectors, fish and game wardens, public safety dispatchers, etc), and peace officers/firefighters (highway patrol, firefighters, prison guards, etc.) (CalPERS, 2007). Prior to 1999, the three classifications had the following retirement benefit formula; miscellaneous/industrial 2% at 60, state safety 2% at 55, and peace officer/firefighter 2% at 50 (Chapter 555, California Secretary of State, 1999). Retirement was calculated by the number of years worked multiplied by the retirement factor (i.e. 25 years multiplied by 2% =50%) which was then multiplied by the highest one year salary that the retiree worked. This formula would provide the yearly annuity pay out to an employee upon their retirement.

The “final compensation” calculation was not always the highest one year of salary, prior to 1990 a three-year average was used to calculate what the employees compensation was (Summers, 2010; Hill & Korber, 2004). In 1990, as part of a budget compromise with various labor unions, the legislature approved SB 2465 by then

Senator Cecil, which changed the final compensation calculation from an average three-year period to the highest one-year salary (Chapter 1251, California Secretary of State, 1990). As the unofficial procedure of any budget deal, SB 2465 in its final form was never heard before any Legislative committee, and passed out of the Legislature at 2:45AM with only one legislator casting a “no” vote (Sacramento Bee Editorial, 2004). At the time of passage, the Department of Finance estimated that this change would only cost the state \$69 million a year, and by 2004, it had already ballooned to \$100 million a year. In 2010, the Legislature approved Senate Bill 22 in the sixth extraordinary session (SB 22 6X). In addition to rolling back the provisions of a 1999 pension increase, SB 22 6X also increased the final compensation time frame from the highest one year to the average of three years, but this only applied to new state employees (Chapter 3 of the 6th Extraordinary session 2009-2010, California Secretary of State, 2010).

In the late 1990's the stock market was providing returns on investment in the 10%-20% range and the CalPERS system was anticipating enormous surpluses in their assets for the next decade and beyond (CalPERS, 1999). While the system had surpluses, CalPERS was not able to provide any more money to retirees without a change to the retirement formulas established in California statute. In 1999, the CalPERS board suggested enhancements to the retirement formulas provided to retirees who according to a report by CalPERS, were barely living above the poverty line (CalPERS, 1999). The proposal included reducing the minimum retirement age for miscellaneous and industrial employees from 60 to 55, increasing the benefit factor for

state safety employees from two percent to two and a half percent, and increasing the benefit factor for peace officers and firefighters from two percent to three percent (CalPERS, 1999). The report, released from CalPERS, stated that these benefit increases would be paid for by future investment returns, and would not cost the state or taxpayers anything since it would be paid for with ever increasing stock market returns and appreciation of assets (CalPERS, 1999). SB 400 enacted the recommendations of the CalPERS board and unanimously passed out of the California State Senate (39-0), on a (70-7) vote out of the California State Assembly, and signed into law by then Governor Gray Davis (Chapter 555, California Secretary of State, 1999).

After the Dotcom Bubble bust and the recession of the early 2000's, individuals and politicians began taking a deeper look at the public employee pension system and the benefits provided¹. Over the years, legislators introduced multiple pieces of legislation to move public employees from a DB to a DC plan, or reduce the benefits provided in SB 400, but all of them failed to gain any traction in the Legislature (Chapter 3 of the 6th Extraordinary session 2009-2010, California Secretary of State, 2010). Governor Arnold Schwarzenegger even threatened in 2005 to fund a proposition to force a change from DB to DC plans, but pulled back that idea before signatures were even gathered (CalPERS, 2007). Five years later, Governor Schwarzenegger began to hone in on pensions again, specifically the unaffordable nature of the SB 400 pension

¹ CalPERS maintained over 100% funding levels in fiscal years 1997-1998, 1998-1999, 1999-2000, and 2000-2001. With the system funded over 100%, there were no actuarial unfunded liabilities in those years, including 1999 when SB 400 became law.

enhancements enacted 11 years earlier². The Governor stated publicly that he would not sign the 2010-2011 state budget if it did not include “pension reform,” essentially a repeal of SB 400 for new hires. The Governor received his pension reform in the form of SB 22 in the sixth extraordinary session on October 8, 2010. SB 22 6X reinstated pension guarantees for new employees hired on or after January 15, 2011 to pre SB 400 levels, which satisfied the goals of the Governor (Chapter 3 of the 6th Extraordinary session 2009-2010, California Secretary of State, 2010).

Table 1.1 Pension Formulas

Retirement Category	Formula prior to SB 400 (1999)	SB 400 Formulas in effect 1999-2010	Pension Reform in October 2010 Budget (SB 22 X6)
Miscellaneous Industrial	2% at 60	2% at age 55	2% at 60
State Safety	2% at 55	2.5% at age 55	2% at 55
Peace Officer/ Firefighter/ CHP	2% at 50	3% at Age 50	2.5% at 55

Source: (CalPERS, 2007), (Chapter 555, California Secretary of State, 1999), & (Chapter 3 of the 6th Extraordinary session 2009-2010, California Secretary of State, 2010)

Organization of Thesis

The remaining portions of this thesis are broken up into five separate chapters. Chapter Two will focus on the unfunded liabilities in the pension system, how large they are, and what that means for future Californians. Chapter Three will present a

² It is impossible to assume what the unfunded liabilities would look like had California not enacted SB 400 (1999) since it effectively altered the employer contribution rates to backfull for the new liabilities created by the retroactivity of the proposal and the new liabilities it created. In addition, this may have also enticed people to work for the state, resulting in higher liabilities. It would be appropriate to state that California would still have unfunded liabilities had the state not seen SB 400, but not be as large as they currently are.

review of the literature surrounding the issues of reducing benefits and increasing employee contributions, the institution of DC plans, and hybrid plans, with research depicting the various effects these policy options have on reducing unfunded liabilities. Chapter Four will explain the methodology utilized for the remaining portions of the thesis, including an overview of the alternatives, along with the criteria and weights used in the criteria alternative matrix (CAM) analysis. Chapter Five will present the results of both a qualitative and quantitative CAM analysis, combined with the results reached based upon the application of the criteria and weights, in addition to a sensitivity analysis on each of the alternatives. Lastly, Chapter Six will pull together the results of the CAM analysis, comfort tradeoffs, and propose recommendations for how California should move forward in reducing unfunded liabilities in the pension system.

Chapter 2

HOW LARGE IS THE PROBLEM OF PENSIONS AND UNFUNDED LIABILITIES

The previous chapter focused on what is the difference between DB and DC plans, along with the long and rich history of DB plans in California. This chapter will examine pensions and the liabilities that they create for communities both at the local and state level. In order to understand the magnitude of problems created by unfunded liabilities, this section will examine the issues of unfunded liabilities, the cost to government to maintain pensions, what other states have done in the arena of pensions, and lastly the opinions Californian's when it comes to public pensions.

Unfunded Liabilities

Under both the United States and California Constitutions, the contract clause protects DB pension guarantees under the determination that they are classified as deferred compensation from the years of employment, that employees is entitled to (Article I Section 10 of the United States Constitution, & Article I Section 9 of the Constitution of the State of California). It is because of this determination of deferred compensation that it is nearly impossible for an employer to change the benefits for current employees from one retirement system to another, or to reduce their benefits. Over the years, there has been extensive litigation over this issue at the state and federal level. From this litigation and determination of deferred compensation, the remainder of this thesis will operate on the understanding that current employees cannot have their

retirement benefits reduced or eliminated (Betts v. Board of Administration, 1978). The court summed up their opinion best in the case of Betts v. Board of Administration (1978) by stating:

A public employee's pension constitutes an element of compensation, and a vested contractual right to pension benefits accrues upon acceptance of employment. Such a pension right may not be destroyed, once vested without impairing a contractual obligation of the employing public entities.

Since retirement benefits cannot be reduced or eliminated, liabilities to provide the agreed upon benefits are created by DB plan employers. Liabilities exist in DB pension plans since by definition it is the responsibility of the plan to provide a specific annuity to a person upon retirement, and to maintain that annuity for the remainder of the retiree's life. Since DB plans are essentially deferred compensation, paid in retirement, the employer, in this case the State of California or local governments, hold a fiduciary responsibility to fulfill any cost that the plans assets are not able to provide for. Any excess cost not covered by the assets in CalPERS pension plan would be the responsibility of taxpayers to provide.

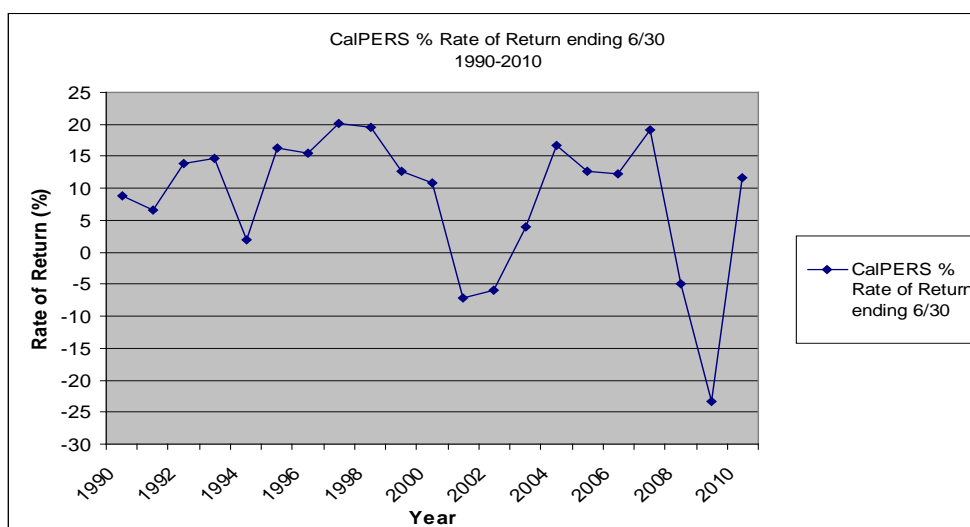
An actuary, estimates DB pension liabilities by calculating how much it would cost to provide the promised benefit to retired employees as they retire. Actuaries use various tools to estimate this cost such as average salaries and estimated salaries in the future, current and future demand for employees, and the average retirement age and lifespan of retirees. Once there is an understanding of what the cost will be in the future, the actuary needs to decide what the current assets are in the DB plan, and then discount the future rate of returns for investments over time to find the future worth of

those assets. If the predicted cost of the liability exceeds the future assets in the DB fund an unfunded liability exist, since the future costs of a DB plan exceeds the future assets in the DB plan. If an unfunded liability is present, it is the responsibility of the employer, in this case, the taxpayers to provide additional funding to eliminate the unfunded liability.

While some people believe that they are able to predict the market, economists rely on a tool called the discount rate to predict the value of an asset in the future. By calculating the present value of an asset, it is possible to factor in a certain discount rate over a specific number of years, which arrives at the discount rate. The discount rate assumes the future asset balance necessary to cover the liabilities, and allows for the compounding of any rate of returns back into the investment to show the economist what the present value of the fund should be right now to cover future liabilities. This technique is used with DB plans to find out if current investments will be able to cover future liabilities, given a specific discount rate. The simplest way to calculate the future value using the discount rate is to take the future amount needed to cover liabilities, divide it by the discount rate, and then raise that discount rate to the power equal to the number of years you want to discount in the future. For example, if you needed \$1 million in 30 years and wanted to know how much money to invest today assuming a rate of return of eight percent compounded yearly, it would be safe to assume that you would need to invest \$99,377 today, and hope for an eight percent return on investment over the next 30 years ($\$1,000,000 \div 1.08^{30}$).

There is a large difference between a discount rate and a return on investments. A return on investments is the actual amount of money or the value of the assets through increased valuation of the asset with interest, dividends, or appreciation of assets in the plan. The return on investments can fluctuate from year to year based on market and economic conditions, and the rate can be either positive or negative. Since it is nearly unfeasible to guess the rate of return just from year to year, it is impossible to calculate the rate of return for multiple years in the future. Figure 2.1 below shows the CalPERS rate of return from 1990-2010 which shows how erratic and unpredictable it can be, ranging from a high of 21% to a low of -23%.

Figure 2.1 CalPERS Rate of Return From 1990-2010



Source: CalPERS annual statements (1990-2010)

The question then arises of what rate a plan should use for their discount rate, given the volatile nature of rate of returns. When looking at this issue from an economic issue, the amount of risk should have a bearing on the discount rate adopted.

The discount rate should directly connect to the amount of risk assumed, given that the employer has a contractual obligation to provide this benefit in the future. Since DB pension benefits are deferred compensation for retirees, and that the ultimate fiduciary responsibility to fulfill their payment lies with the State of California, it is safe to assume that the employer will always be able to pay for future pension liabilities. With such little risk associated with the CalPERS fund, financial economics dictates that the risk of providing the benefit should correlate to the risk in investment. Since the risks carried by the state are essentially risk free in that their fulfillment will occur, the investment should also carry a risk free approach. When looking at investments that carry no investment risk, one would usually look toward a 30 year US treasury bonds, which currently carries an investment yield of 4.48% on April 1, 2011 (US Department of the Treasury, 2011).

A discount rate of 4.48% would highlight the no risk nature of DB pension benefits in California, and one would assume utilized by pension funds. Under current law, CalPERS has the ability to adopt their own discount rate based upon actuarial calculations. For the past few years CalPERS has adopted a discount rate of 7.75% (CalPERS, 2009). CalPERS, and other public DB plans, continue to utilize their rate of returns in place of risk-free discount rates, based upon the determination of the Government Accounting Standards Board (GASB), which does not require that government DB plans utilize a risk free rate (The Economist, 2010). This is in stark contradiction to the regulations on private employer DB plans, managed by the Financial Accounting Standards Board, which must always utilize a risk-free discount

rate (The Economist, 2010). California is not alone in using a discount rate that reflects their anticipated rate of return. According to a study by the Pew Center (2010), nine states use a discount rate equal to or lower than California's 7.75%, while 34 other states use a discount rate higher than California's.

Table 2.1 Discount Rates Used Throughout U.S.

Rate	Number of States at that rate	
7.25%	2	NC, SC
7.50%	7	GA, IN, IA, KY, TN, VA, WV
7.75%	7	CA, FL, ID, ME, MD, SD, UT
7.80%	1	WI
8.00%	22	AL, AZ, AR, DE, HI, MI, MS, MO, MT, NE, NV, NM, NY, ND, OH, OK, OR, PA, TX, WA, WY
8.25%	6	AK, LA, MA, NJ, RI, VT
8.50%	5	CO, CT, IL, MN, NH

Source: Pew Center of the States, 2010

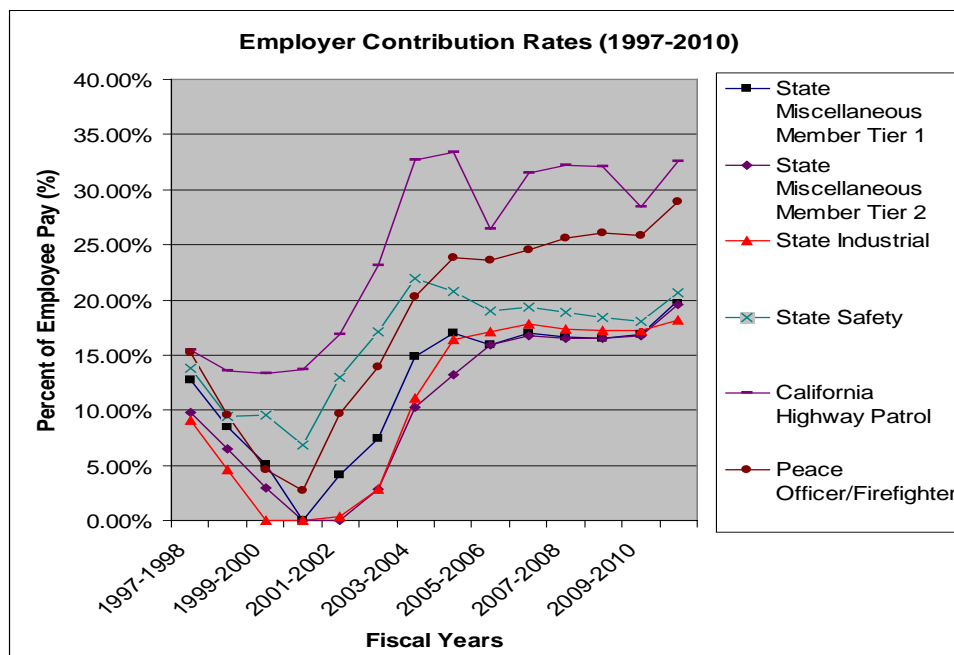
While CalPERS continues to utilize their rate of return, it is important to understand the effects on the stated unfunded liability caused by using a higher discount rate. In 2010, a group of economics students at Stanford calculated CalPERS unfunded liability using a risk-free discount rate of 4.14% (Bornstein et al., 2010). Their results forecasted a CalPERS unfunded liability of \$239 billion, compared to CalPERS stated unfunded liability of \$39 billion when utilizing a discount rate of 7.75% (Bornstein et al., 2010). Using a higher discount rate reduces unfunded liabilities, which result in lower employee and employer contributions, which results in the creation of unfunded liabilities later if the fund is not able to maintain these rates of returns. By overstating our investments, California is simply praying for excellent investment returns, which

only opens the state and taxpayers to a lot of risk in the stock market. If there comes a time in the future, where the assets do not reflect the high discount rate, taxpayers will be on the hook to provide more funding to CalPERS. This funding increase can come at the expense of other general fund programs such as education, public safety, and health services just to name a few or through higher taxes to cover the liabilities.

Contribution Rates

There is always a question in government for how something is it going to be funded. Monthly contributions from the employee and employer are deposited into the DB fund, where invested into new assets. In a DB plan, the fiduciary responsibility is on the employer to ensure that the plan is able to cover its assets; the employer contribution rate can fluctuate from year to year based upon the demands of the fund, performance of the stock market, and the actuarial cost in the future to cover the liabilities. Figure 2.2 below highlights how erratic and unpredictable the employer contribution rate can be from year to year. This stands in stark contrast to the amount of money that the employee has to contribute, dictated by a combination of statute, collective bargaining memorandum of understanding (MOU), or through a contract with an employee.

Figure 2.2: Employer Contribution Rates 1997-2010



Source: CalPERS annual memorandum of employer contribution rate (1997-2010)

While the employee contribution rate is constant, it is possible for the rate to change, but it requires a change to the law or the MOU under which the employee works (LAO, 2010). When looking at state employees, their required contribution rates are set through statute and break down such as the following. From 1999 to 2010, miscellaneous and industrial employees contribute five percent of their final pay to CalPERS, while state safety, CHP, and peace officers contribute six percent of their pay. With the passage of AB 1625 in 2010, the contribution rates increased from five percent to seven percent for miscellaneous and industrial employees, and from six percent to nine percent for safety, CHP, and peace officers (Chapter 728, Secretary of State, 2010). Increasing employee contribution rates result in more assets in the pension system, and can result in some stability for the employer contribution rate.

Municipal Pensions

When people usually think about DB plans in California, the attention usually turns straight to the state government since they employ the largest number of public employees. While the state employs the largest total number of employees, one should not discount the thousands of cities, counties, and special districts who also employ and provide pension benefits for thousands of employees. These local governments decide on what retirement funding mechanism to use in their benefits package (DC, DB, and hybrid); a large majority continue to use a DB system. As described earlier, local governments can create their own retirement system, or contract with CalPERS to provide their retirement benefits.

While the state may have their own issues to deal with in regards to pension liabilities, local governments also have liabilities that they have an obligation to fund. These liabilities can come at the expense of other vital city and county services, ever competing for the same slice of local revenue. It is with this tragedy of the commons approach to local government financing that numerous local cities and their pension funds have run into trouble, or have had to declare bankruptcy just to mitigate the liability. The examples below provide insight into these pension problems, occurring in the past 10 years within local governments in California.

In the early part of the 2000's a \$1.7 billion hole in San Diego's pension system was discovered, based upon the past decisions of the city's pension board and the city council (San Diego Union Tribute, n.d.). This hole was created in the late 1980's, and continued through the 1990's when the city of San Diego was trying to find ways to

reduce their obligation to pay into the fund, while also appeasing public employee groups (police, fire, etc.) by increasing the retirement benefits (Erie et al., 2010). Over time, the city began to reduce their short-term employer contribution payments in order to dedicate those resources instead to other parts of the city's budget, in the hopes that either investment returns would help cover the lost revenue, or that future taxpayers would pay for this long-term liability. With the burst of the dot com bubble, and the recession of the early 2000's, the unfunded liability of San Diego's pension finally became apparent and valued at \$1.7 billion (San Diego Union Tribune, n.d.). This unfunded liability has resulted in the city council having to freeze benefits for employees, redirection of scarce funding from other public functions such as police and fire, and the possibility of tax increases to close the hole. This is in addition to the regularly increasing current employer contributions that the city has to make to the plan just to stay current with employee benefits.

The City of Vallejo is a quiet town on the northeastern shore of San Francisco bay, which created a ruckus in 2008 when it became the largest city in California to file for Chapter 9 bankruptcy protections (Greenhut, 2010). This bankruptcy came about as a perfect storm, starting with the foreclosure crisis, which swept a large amount of tax windfall from the city coffers because of fewer taxes collected in the form of property taxes, sales taxes, and other fees for services. This was along with recently enacted public employee contracts, which had very favorable benefits increases, especially for the city's police and fire officers. It was unveiled that the city was spending nearly 74% of their budget on police and fire salaries and overtime, in addition to their pension

obligations, which cost a normal city about 60% of their budget (Greenhut, 2010). With an increase in retirement benefit cost, reductions in tax revenue, and bond indebtedness issues, the city of Vallejo entered chapter 9 bankruptcy protections that enable them to reorganize debt, void union contracts, and renegotiate new contracts (Greenhut, 2010).

In October of 2010, the city of Los Angeles reported that within five years, over one third of their operating budget would go to pension related costs, unsustainable for any city, even one the size of LA. In order to mitigate this unprecedented cost, Los Angeles Mayor Antonio Villaraigosa proposed a change to the current pension system for new employees, estimated to save the city \$173 million for every 1,000 new police and firefighters hired (McDonnell, 2010). The major savings under this plan would materialize by reducing the retirement factor from three percent at age 50 to two percent at age 50 (Villaraigosa, 2010). The other savings come from increasing the employee contribution, requiring employees to contribute toward their retiree healthcare (two percent of pay) and computing final salary based upon the highest 24 months of pay instead of the current 12 months. On March 8, 2011, the voters went to the polls and the voters of Los Angeles approved measure G with 75% of the vote (Reston et al., 2011).

Public Opinion of Pensions

The previous few sections have focused exclusively on the policy and economic problems of unfunded liabilities, but there has been little mention of the public's perception of DB pension plans and the retirement benefits provided to public employees. One main way to gauge public perception of DB plans is to look at public

opinion polling results that have asked Californians their thoughts about DB plans, and the retirement benefits provided to public employees. Luckily, the Public Policy Institute of California (PPIC) has reported on the public's thoughts about pensions three times over the past eight years (2003, 2005, and 2010). As can be seen in Table 2.2 on the next page, when asked if public employees should be moved to a 401K system over 60% of the respondents favored that change, compared to around 20% of respondents who opposed (PPIC, 2005 & 2010). The largest increase came when asking how big of a problem employee benefits are on the budget; in 2005, 31% said that it was a big problem with 41% saying that it is somewhat of a problem (PPIC, 2005). PPIC asked this same question five years later in 2010; this time 41% said that these benefits are a big problem on budgets and 35% saying it is somewhat of a problem (PPIC, 2010).

Table 2.2 Public Opinion Polls 2003-2010

Date Range	Question	Results	Survey Source
01/12/2010 - 01/19/2010	Would you favor or oppose changing the pension systems for new public employees from defined benefits to a defined contribution system similar to a 401(k) plan?	Favor (67%), Oppose (21%), Don't know (12%)	PPIC: Californians and Their Government, January 2010
01/12/2010 - 01/19/2010	At this time, how much of a problem for state and local government budgets is the amount of money that is being spent on their public employee pension or retirement systems?	Big problem (41%), Somewhat of a problem (35%), Not a problem (14%), Don't know (10%)	PPIC Statewide Survey: Californians and Their Government, January 2010
1/11/2005 - 01/18/2005	Would you favor or oppose changing the pension systems for new public employees from defined benefits to a defined contribution system similar to a 401(k) plan?	Favor (61%), Oppose (25%), Don't know (14%)	PPIC: Special Survey on the California State Budget, January 2005
1/11/2005 - 01/18/2005	At this time, how much of a problem for state and local government budgets is the amount of money that is being spent on their public employee pension or retirement systems?	Big problem (31%), Somewhat of a problem (41%), Not a problem (17%), Don't know (11%)	PPIC: Special Survey on the California State Budget, January 2005
5/22/2003 - 06/01/2003	Do you or anyone in your immediate family work as a public employee or receive a pension as a former public employee—that is for federal, state, or local government, a state college or university, or a public school?	Yes (27%), No (73%)	PPIC: Special Survey on the California State Budget, June 2003
02/6/2003 - 02/17/2003	Do you or anyone in your immediate family work as a public employee or receive a pension as a former public employee—that is for federal, state, or local government, a state college or university, or a public school?	Yes (28%), No (72%)	PPIC: Californians and Their Government, February 2003

Source: Public Policy Institute of California (PPIC, 2003, 2005, & 2010)

The public opinion polls highlight the trends that has occurred over the years, where more people in the public question, or even begin to oppose the benefits provided to public employees. 2010 especially became a time in which citizens began to understand DB pension plans for public employees from the press, which focused almost exclusively on the potential unfunded liabilities in the system. This attention prompted many local governments to look long and hard at the future cost of public employee benefits because of the public sentiment that had become visible. In reaction to the public's perception of these problems associated with DB plans, the loss of pension assets invested in the stock market, and pressure from private employees who face massive losses in their DC retirement account, numerous cities put pieces of pension reform onto the ballot. These local pension reform measures on the November 2010 gubernatorial ballot either provided cities with a mechanisms to reduce retirement benefits, or prevent local governments altogether from unilaterally increasing pension benefits without a vote of the people. All together, there were 10 measures from nine cities and counties on the ballot, in which nine measures passed with one failing. The election results are available in Table 2.3 on the next page.

Table 2.3 Local Government Election Results. November 2010

City	Measure	Vote Yes To No	What it does
Bakersfield	D	54.99% to 45.01%	Effective for new sworn peace officers hired after January 1, 2011 <ul style="list-style-type: none"> • Pay 100% of retirement (no employer contribution) • Retirement formula of 2% at 50 instead of 3% at 50 • Salary calculated by 36 months of highest pay
Carlsbad	G	64.28% to 35.72%	Requires a public vote of the people for any increase of pension benefits
Redding	A	64.36% to 35.64%	Would require the city to enter collective bargaining asking for employees to pay more into their retirement
Redding	B	69.56% to 30.44%	Requires 5 years of employment before vested healthcare benefits are provided
Menlo Park	L	72.19% to 27.81%	Effective only for new non peace officers <ul style="list-style-type: none"> • Set retirement age at 60 instead of 55 • Set retirement 2% at 60 instead of 2.7% at 55 • Requires a public vote of the people for any future increase of pension benefits
Pacific Grove	R	74.27% to 25.73%	Caps employer contribution at 10% of employee pay
Riverside	L	52.33% to 47.67%	Requires voter approve to increase or decrease public safety retirement benefits
Riverside	M	61.11% to 38.89%	Requires voter approve to increase public safety benefits, but County Supervisors can decrease benefits without vote
San Francisco	B	42.54% to 57.46%	<ul style="list-style-type: none"> • Increase employee contributions 7% to 9% • Increases the amount that employees pay for health care from 25% to 50% of the total cost
San Jose	W	73.35% to 27.65%	Allows the city to change their retirement system in the future for new employees, which would effectively allow for a DC plan to be implemented

Source: (City and County of San Francisco Department of Elections, 2010; Kern County Registrar of Voters, 2010; Monterey County Registrar of Voters, 2010; Riverside County Registrar of Voters, 2010; San Diego County Registrar of Voters, 2010; San Mateo County Registrar of Voters, 2010; Santa Clara County Registrar of Voters, 2010; Shasta County Registrar of Voters, 2010;)

All of these local pension reform measures are treading on new ground, and the future of them is currently unknown. Public employee unions have already stated publicly that they will fight many of these measures through the judicial system, under the assessment that they attempt to abrogate the cities from fulfilling their contractual obligations under the contract clause in the California Constitution (Wenner, 2010). Only time will tell exactly how far local governments can go in regards to curtailing promised pension benefits.

What Other States Have Done to Address Pensions

With the near melt down of the financial markets in 2008, a large majority of states began to look at their DB pension systems. In 2001, only two states made changes to their DB pension systems, through either reducing benefits or increasing employee contributions (Munnell et al., 2008). This is contrasted to nine years later, in the year 2010 alone, 19 states acted on efforts to either reduce benefits, increase employee contributions, or some combination of the two (Pew Center on the States, 2010). Overall, between 2001 and 2010, all but 12 states in the union enacted some form of pension reform which either reduced benefits, increased employee contributions, or some combination of these two (Pew Center on the States, 2010). Over the years, some states have enacted reforms that either reduce the retirement benefits for employees, or require employees to contribute more to their retirement

through employee contributions. Both of these approaches help to stabilize unfunded liabilities, but most states continued to utilize the same traditional DB plans. Table 2.4 below highlights some of the pension reform areas undertaken in various states and the implementation years.

Table 2.4 Significant Selected Pension Changes. By Year

State	Year	Description of change
Michigan	1997	DC plan for all new employees
Florida	2000	Optional DC plan for employees which allowed current and new employees to switch to a 401(a) plan which is 100% funded by employers
Nebraska	2003	Cash balance account, employees and employers contribute and state invest the money, state guarantees a 5% rate of return
Ohio	2003	Choice for a DC, DB, or hybrid plan
Oregon	2003	Hybrid plan with DB funded by the employer and DC plan funded by the employee
Alaska	2005	Require new employees to enter a DC plan
Hawaii	2007	Restrict benefit enhancement or lower retirement age if unfunded liabilities exist in the DB system between 2008 and 2011
Georgia	2008	Instituted a new hybrid plan for new hires which provides 1/2 of the current DB plan with a mandatory DC plan with 1% employee contribution
Kentucky	2008	New tiers which lower retirement benefits, increased employer healthcare contributions
New York	2009	Increased retirement age from 55 to 62 for new employees, increase the years of service to best from 5 years to 10 years
Colorado	2010	Increased employee contributions, increased retirement age from 55 to 60, capped cost of living adjustment increases at 2% instead of 3.5%
Illinois	2010	Increased retirement age from 60 to 67, cap maximum salary on which pensions could be calculated
Missouri	2010	Increased retirement age to 67, longer vesting time
Utah	2010	Hybrid plan; employee contribution fluctuates year to year to meet the demands of the pension fund, employer contribution capped at 10%

Source: Pew Center on the States (2010).

Chapter 3

LITERATURE REVIEW

In the midst of the Great Recession of the late 2000's, many people have begun to focus on government spending and the amount of debt created by government. This was present in the 2010 midterm elections, with voters worrying about the amount of debt at the federal level (Sidoti and Agiesta, 2010). There is general concern about the amount of debt that is being obligated onto future generations and how to correct this imbalance. This concern arises from the notion that politicians are not taking the hard steps necessary to ensure that the government does not continue to spend more money in expenditures than it receives in revenue.

While the national debt is not the focus of this paper, it does set the stage for California's issues with unfunded pension liabilities, along with what those obligations present for future Californians. The previous chapter focused exclusively on how large the problems of unfunded liabilities are for the State of California, and local governments. The values of unfunded liabilities in the CalPERS system alone fluctuate in estimation, from a low of \$35 billion, as officially reported by CalPERS, to a high of \$240 billion as observed in a Stanford University report (CalPERS, 2009; Bornstein et al., 2010). It is easy to see that there is no one agreed upon way to measure and calculate unfunded liabilities. This is evident with the earlier discussions on discount rates and if they should reflect the rate of return or follow a more "risk free" approach, along with fundamental questions regarding the contribution rates that employers and

employees must pay. While unfunded liabilities are currently present in the system, it is important for the government to take the steps necessary to reduce and eliminate these future liabilities.

This chapter will focus on a review of the literature surrounding the issue of unfunded liabilities, and specifically examine three broad approaches that have the possibility to either reduce or eliminate future unfunded liabilities within the pension system. The three broad approaches are change contribution rates and retirement ages, switch to a defined contribution (DC) plan, and implement a hybrid cash balance plan. A portion of each section will focus on understanding the effects that each of the alternatives have on reducing, or even eliminating short and long-term liabilities.

Change Contribution Rates and Increase Retirement Age

When looking at unfunded liabilities, it is important to understand who contributes to the pension system and the way in which those contributions arrive. As described in the previous chapter, both employees and employers contribute a portion of their wages towards retirement, which in 2009-2010 was a combined \$10.4 billion (CalPERS, 2009). In the 2009-2010 budget year, state and local governments paid CalPERS nearly \$7 billion in employer contributions (CalPERS, 2009). This was in addition to the \$3.3 billion that employees paid to the CalPERS system (CalPERS, 2009). Withdrawn monthly from their paychecks, the employee's contribution is a fixed amount dictated by California statute. This is in contrast to the employer contribution rate, adjusted yearly to meet the funding demands of the pension system. When thinking of this employer contribution, it is important to remember that the

employer contribution is essentially, what government and taxpayer's must contribute to CalPERS.

Figure 2.2 provided in the previous chapter, highlights the employer contribution rate over the years and the fluctuations that have occurred. This fluctuation is extremely hard to predict, and usually not known until two to three months before the beginning of the new fiscal year. This unpredictability can cause problems for local and state government since they are required to produce and enact a balanced budget every year. With this unpredictability in the employer contribution, it can hard for government, especially local government, to plan for long term strategic budgeting. This also becomes a problem when recessions wreak havoc on city and state's tax coffers. Buck (2010) highlights in his article about the upcoming pension crisis, that it would take 30 years for California to fully fund the pensions system. After considering the massive losses in 2009, with no changes to the current system investment returns would have to exceed 20 % per year (Buck, 2010). This is almost two and a half times the assumed yearly investment returns currently published by CalPERS (Buck, 2010).

When it comes to reducing unfunded liabilities, an increase of contribution rates has the greatest short-term effect on reducing unfunded liabilities, with more money deposited into the pension fund. This is possible since, of the other two alternatives provided, changing of contribution rates is the only alternative that can affect both new and current employees, which allows for more contributions from employees. Judicial precedent notes that DB retirement plans constitute deferred compensation, making it virtually impossible in the current legal environment to reduce or eliminate this

obligation (*Betts v. Board of Administration, 1978*). While the court has upheld this guarantee, legal precedent has also held that contribution rates for employees can increase or decrease through state statute, or memorandums of understanding (MOU) (*Betts v. Board of Administration, 1978*).

By being able to manipulate the employee contribution rates, government in theory should be able to maintain DB pensions and come closer to full funding. Local governments and the state can already increase employee contribution rates, the problem comes with upsetting employees since you are taking a larger portion from their paycheck, especially in a recession, or from their union that negotiates their MOU. Politically, it is from this reluctance to upset employees or their union that employee contribution rates have remained low throughout the years, or in the case of many local governments where no employee contribution exist (Rauh & Novy-Marx, 2010). Reluctance to increase contribution rates allows local governments and the state to create future liabilities without having to address them in the present. Some local governments have even increased pension benefits while not increase their employer contribution, but instead allowed the cost of these increase in benefits to become an unfunded liabilities (San Diego Union Tribune, n.d.).

The California Legislative Analyst Office (2010) estimates that by increasing the employee contribution rate by three percentage points for roughly 95,000 state employees, results in general fund savings of \$100 million a year. While \$100 million may not seem like a lot of money when compared to the 2010-2011 fiscal year general fund budget of \$86 billion, this is still the same amount of money the general fund

spends on State Parks every year (Department of Finance, 2010). Beyond a savings to California's general fund, an increase in the employee contribution rate can also help to reduce future unfunded liabilities. This is possible with a larger percentage of employees pay withheld and deposited into the pension fund. When compounded with future investment returns (conservative return of five percent a year) over the long term, this \$100 million for one fiscal year will become nearly \$430 million in savings over 30 years.

When it comes to the issue of reducing actual future liabilities, increasing employee contributions does not reduce actual liabilities (Rauh & Novy-Marx, 2010). As has been stated throughout this thesis, liabilities are created when promises are provided to employees through deferred compensation, which is what DB plans are. Adding one dollar into the pension system in the form of an employee contribution does not reduce the liability incurred by the state by a dollar. Instead, increased employee contributions help to bolster the assets in the pension fund. It is through this bolstering of pension assets through more employee contributions, reduction of future unfunded liabilities can occur. These additional assets in the pension system can help to reduce the amount of unfunded liabilities in the future (Rauh & Novy-Marx, 2010).

Increasing the retirement age is also an area that can reduce the creation of unfunded liabilities in the future. While case law does not allow increased retirement age for current employees, it is possible to increase the retirement age for new employees (*Betts v. Board of Administration*, 1978). By keeping employees on the job longer, it is possible to reduce unfunded liabilities in two ways. First, the employee is

required to work longer on the job, and in that capacity contribute more to the pension system in the form of employee contributions (Rauh & Novy-Marx, 2010). The second relates to life expectancy and the reduced number of years that the retiree will be able to draw from the pension system after they retire. With the retiree able to draw on less years of retirement, the amount of each employee's liability declines.

Rauh & Novy-Marx (2010) studied the effects on liabilities by increasing the retirement age. In their study, they were able to quantify that a one-year increase in the retirement age resulted in a two to four percent reduction in liabilities (Rauh & Novy-Marx, 2010). The main reason that increasing the retirement age does not have a larger impact on liabilities is since it can only apply to new hires, who will retire at least 20 years in the future. Increasing the retirement age on new employees does nothing to address short term unfunded liability.

Switch to a Defined Contribution Plan

Defined benefit (DB) public pension plans continue to be the main retirement vehicle for most public employees (Snell, 2010). As was discussed in the previous chapter, most private businesses may have never had a DB plan option for their employees or may have already made the switch from a DB plan to a DC plan. There are numerous reasons why private employers utilize DC plans. One of the largest reasons is that DC plans are not considered deferred compensation plans, and therefore the employer does not hold any obligations to fund any liabilities in the future (Munnell et al., 2008). Employers have no additional future cost for their employee's retirement, which is contrary to a DB plan. DC plans also allow for stability in government

spending on retirement programs. Unlike a DB program, which requires the employer contribution to fluctuate from year to year, based upon funding levels and market conditions, DC plans either do not have an employer contribution, or one that is fixed and does not fluctuate (Summers, 2010). By having a fixed cost, government can project the cost of DC contributions for years to come, allowing for long term budget projections.

The literature has pointed out unintended consequences that occur when switching new employees to a DC plan. Olleman (2009) points out that by removing future employees from the DB program you also need to take into account the loss of future assets to the pension system not realized in the future. In DB plans, current employees subsidize past employees who are now retired, and in the future when the current employees retire, future employees will subsidize their retirement (Olleman, 2009). With no future employee contributing into the DB fund, future unfunded liabilities rise even higher with the need to offset future retirement liabilities for current DB employees (Olleman, 2009). Olleman (2009) observes three specific consequences overlooked when moving from a DB to DC plan. The first is that new members enter a DB system without unfunded obligations since they are so far away from vesting requirements and minimum retirement age (Olleman, 2009). The second issue observed by Olleman (2009), is that contributions for new members are worth more than the projected DB cost for those members, essentially the one dollar invested in the plan by the employee is not worth as much as one dollar invested by a person about to retire. The last observation and most important one to notice, is that unfunded liabilities are

not reduced for existing members when new members are enrolled into a DC plan (Olleman, 2009). With retirees forced to rely on investment returns solely to finance their retirements, they and their investments are at the whim of the stock market. It is from this direct action in the stock market that individuals reaching retirement age may delay retiring (Munnell et al, 2008). This delay may occur because of losses that occur in the market. Employees in 401K plans are also at a disadvantage when it comes to return on investments to their accounts. Between 1988 and 2004, 401K plans averaged a 9.7% rate of return, while DB plans averaged a 10.7% rate of return (Munnell et al., 2006). From their sheer size, DB plans require professional management, which allows them to acquire large quantities of equities in the market. This is the opposite of DC plans, where the employee/retiree manages their individual account. By having an individual account, it is impossible to obtain the sheer diversity of investments that a DB plan can acquire (Munnell et al., 2008). Administrative costs also come into question with this transition. DC plans generally have a higher cost in operation than DB plans, generally due to the smaller investment assets and the individual nature of the account. Administrative costs of DB plans are typically around 0.3% of assets, while DC plans usually run an administrative cost of 1.1% (Munnell et al., 2008).

Attempts to Implement a DC Plan in California and Other States

This section will focus on how switching from a DB to DC plan was done in other states, and the savings or costs that were achieved with doing so. Over the past 20 years, numerous states examined the potential benefits and tradeoffs of switching from a DB plan to a DC plan. Snell (2010) states that as of June 2010, three states (Alaska,

Michigan, and Nebraska) implemented mandatory DC retirement plans. This is in addition to six other states (Colorado, Florida, Georgia, Montana, North Dakota, and Ohio) that currently have optional DC plans (Snell, 2010; Munnell et al., 2008).

Michigan switched to a pure DC plan in 1996, for all new employees hired after March 31, 1997 (Snell, 2010; Summers, 2010). Current employees have the option to switch from the DB to DC program. Under this DC plan, the state contributes four percent of every paycheck to the employee's 401K account, along with matching employee's contributions up to three percent (Archie et al., 2006; Summers, 2010). According to the Michigan Department of Management and Budget, the state saved \$100 million in the first year of implementation (Ferrara, 2002).

Alaska was able to realize similar results as observed in Michigan. Under Alaska's plan, new employees hired after July 1, 2006 were required to enroll in the DC program, with current employees having the option to switch from the DB plan to the DC plan (Snell, 2010; Summers, 2010). Employees contribute eight percent of their salary towards their 401K account with no employer contribution, except for public safety officers and teachers (Archie et al., 2006; Summers, 2010). With the containment of employer contributions for only certain employees, and the reduction of future liabilities, the new DC program reduced cost by 38% for public employees and by just over 42% for teachers (Archie et al., 2006).

While other states have seen savings and a reduction of liabilities from transferring from a DB to DC plan, there are questions on how this would affect California. In 2005, Assemblyman Keith Richman introduced Assembly Constitutional

Amendment (ACA) 1, which would require that all new state workers hired after July 1, 2007 enroll in a DC program (ACA 1, 2005; Summers, 2010). Under this plan, the employer would contribute three percent of the employees pay into their 401K account, with the employee also contributing three percent of their pay into their 401K (Archie et al., 2006). There would also be an opportunity for the employer to match any additional contribution the employee made up to an additional three percent. The Legislative Analyst Office (2005) estimated that by shifting from a DB to DC plan, California would save between a few million dollars to over one billion dollars annually (p.138). CalPERS stated that the cost to implement a DC program would be \$820 million in the first year, mostly associated with setting up the numerous 401K accounts (Archie et al., 2006). Over the next 20 years, the state would save about \$16 billion, which increases to \$36 billion in savings over 30 years (Archie et al., 2006). The main driver of this savings are from lower contributions by employers and the reduction of future liabilities on the system, had these employees been enrolled in a DB program.

Tradeoffs of a DC Retirement Plan

While some states have seen savings by switching from a DB plan to a DC plan, there have been some situations when the switch has had a negative effect. In 1991, the West Virginia DB teacher's retirement plan closed to new members, who were then required to have DC plans. Over next 12 years, West Virginia found it difficult to finance the unfunded liabilities of current employees in the DB retirement plan, because of the loss of new members, who historically financed the pensions of retirees (Olleman, 2009). In 2003, the state analyzed the possibility of returning teachers back

to the DB plan. This inquiry was timely since the state saw the cost of unfunded liabilities rising in the DB program, and individuals in the DC plan were expressing their concerns on retiring in the wake of stock market losses (Olleman, 2009). In 2005, the Legislature opened the DB plan to new employees when they realized that having employees on a DB plan was less expensive than having some employees on a DC plan and others on a DB plan. In 2008, teachers in the DC plan had the option of either staying in the DC plan or changing to the DB plan. Seventy-eight percent of teachers took the opportunity and switched their accounts from the DC plan to the DB plan (Olleman, 2009). West Virginia projects a savings of \$1.2 billion over 30 years, due mainly to moving employees back to a DB plan (Olleman, 2009). While striking in the information presented, there has been no similar analysis conducted on the possible negative effects of switching new employees away from a DB plan for California.

Switching from a DB to DC system does have some positive and negative effects on reducing future unfunded liabilities. Eliminating the creation of liabilities from new employees does help reduce future unfunded liabilities. On the other hand, in removing new employees who would contribute to the fund, a large stream of revenue is foregone, which would subsidize retirees. This ultimately increases unfunded liabilities for current employees and retirees. When undertaking such a discussion on switching employees from a DB to DC system, it must be understood if this is a long term or short-term decision, and to devote the resources necessary to achieve the goal.

Implement a Hybrid Retirement Plan

The previous two alternatives presented are solid in their foundation since they have a long history of implementation. Simply altering the benefits and contributions provided to employees, or moving from a DB plan to a DC plan are old ideas, implemented in other states and their results are noticeable. Unfortunately, the alternative in this section is not as refined, and has more shades of grey in details. Furthermore, the application and enactment of hybrid plans across the United States are different in structure, which changes the effect that they have on unfunded liabilities.

As described in the previous chapter, hybrid pension plans incorporate components found within both DB and DC plans. While hybrid retirement plans contains elements of both DB and DC plans, federal pension law recognizes them as a DB plan since the plans create liabilities on the employer (Turner, 2003). This classification is applicable since hybrid plans were not in existence before the passage of the 1974 Employee Retirement Income Security Act, which classified plans as either DB or DC plans (Turner, 2003 & Clark et al., 2001). By creating a retirement plan that contains both DC and DB components, it is possible for the system to provide a reduced and predictable annuity payment similar to a DB plan, while the employee gains the portability and equal distribution of funding found only in a DC plan.

Hybrid plans are similar to DB and DC plans. Turner (2003) states that hybrid plans in the eyes of the employee seem to act more like a DC retirement plan, while to the employer the hybrid plan acts like a DB plan. The employee and employer contributions follow that of a DB plan, where the employer deposits a portion of the

employees pay into an account, which can also incorporate an employee contribution (United States Department of Labor, 2010). This differs from a DC plan where the employee is responsible for funding the account, while there may be some type of an employer match or not (Turner, 2003 & Clark et al., 2001). Unlike DC plans that allow the employee to manage their portfolio and make specific investments, hybrid pension plans are professional managed by the plan provider, just as DB plans (United States Department of Labor, 2010). The way of paying out the benefits to retirees also follows a DB plan, in the sense that the plan provides an annuity to a retiree (Turner, 2003). This is different from a DC plan where usually a lump sum is the only form of payment afforded. Just like DB plans, hybrid plans have liabilities that the employers must fulfill. This guarantee protects employees and retirees from the closing or liquidation of the plan, and mandates that payments to vested employees and retirees materialize (Turner, 2003). In the case where the employer is unable or unwilling to fulfill their obligation, the federal government can assume the pension plan and make necessary arrangements to manage the plan (United States Department of Labor, 2010).

While there are many similarities between hybrid plans and DB plans, there are various areas where it follows that of a DC plan. The manner in which an employee has an account that has a hypothetical balance is unlike that of a DB plan, where there is no yearly account balance. Every employee has a hypothetical account, and yearly the employer contributes a certain percentage of pay (five or six percent for example) along with a guaranteed interest credit based on government bond's interest rates (usually four to five percent). By providing this interest credit, the retirement plan can guarantee

retirees a stable and predictable source of account appreciation in the future. Every year the plan calculates the balance of this account, with all of the contributions made and every interest credit provided, which allows the employee to know how much their account is worth. Hybrid retirement plans do not provide certain formulas such as those found in DB. Instead, hybrid plans function like a DC plan by contributing a certain percentage of an employees pay to their retirement account every year and provide them with interest credits. The theory is that when a person's salary increases they will receive more contributions into their account from their employer. Employer contributions are set at a certain percentage of the employees pay, instead of the alternative provided under a DB system where the employer contribution is erratic and unpredictable from year to year. Beyond the funding of the account, hybrid plans act like DC plans since they provide employees with the portability to take a job in a different job sector and not lose the employer contributions and returns on investments. Since hybrid plans provide employees with their hypothetical account balance, an employee is able to know how much money they have before separation and roll their money into a new employer's retirement plan. This portability is not available in traditional DB plans, and instead under current law if an employee moves to a new employer outside of their current pension plan the employee has two options. They can either keep the money in the current plan and collect a pension during retirement, or take with them only the amount of money that the employee has contributed to the plan over the years, and lose all rights to the employer contributions and investment returns (Clark et al., 2003).

Implementation of Hybrid Accounts in Other States

Hybrid retirement plans implementation has occurred on a limited basis in various states around the United States (Clark et al., 2001). As of the end of 2010, eight states implemented hybrid pension plans, with six of them already in operation, and two (Utah and Michigan) to begin enrolling new state employees hired in 2011 (Snell, 2010 & Neumann, 2010). While public plans proceed with caution towards hybrid plans, the private sector has been embracing their usage for over 10 years. According to the Government Accountability Office (2000), in 2000 19% of fortune 1,000 companies had some form of a hybrid retirement plan for their employees (Clark et al., 2001).

Every plan is unique to the state, and tailored specifically to what the Legislature or government officials were trying to accomplish when implementing the plan. For example, if a state became concerned about unfunded liabilities they could require that new employees have a 401K account in addition to their DB account. In this scenario, the employer provides a contribution to both the 401K and the DB account but is able to reduce the retirement benefit from maybe two percent to one percent, or some other type of arrangement (Turner, 2003). By reducing a benefit in one area, or transferring liability from the employer to the employee, states are able to reduce their share of future liabilities in addition to unfunded liabilities (Clark et al., 2001 and Turner, 2003).

The most recent state to switch to a hybrid retirement plan was Utah, which approved legislation in March of 2010 to change their retirement system from a DB pension to a hybrid retirement plan (Roche, 2010). Legislation became necessary once the Utah Retirement System announced that they were expecting an unfunded liability

of \$6.5 billion, which to put into perspective is roughly 58% of Utah's 2010 budget of \$11.2 billion (Roche, 2010 & Utah Department of Finance, 2010). This unfunded liability did not exist prior to 2008, but with the near meltdown of the global economy in September of 2008, Utah's retirement system lost nearly 23% of its value (Roche, 2010). Lawmakers reacted to this enormous unfunded liability by holding legislative hearings, and eventually passing legislation to create a hybrid retirement plan.

Utah's hybrid plan will move future liabilities away from the state, and transfer those liabilities to the employees who will be retiring under the system. The legislation caps the total employer contribution at ten percent of total wages (Chapter 266, Utah Secretary of State, 2010). The employee contribution rate will fluctuate from year to year, based upon the needs of the fund in order to maintain full funding. This change will put the employees into the driver's seat to ensure full funding of the retirement fund, instead of requiring the employer to be fiduciary responsible for any shortcomings in the fund. Prior to the enactment of this legislation Utah employees did not contribute anything to the retirement fund (Roche, 2010). The Legislation allows employees to create and contribute to 401K accounts, in addition to their contributions to URS (Chapter 266, Utah Secretary of State, 2010). In years where the ten percent employer contribution overfunds the retirement system (over 100% of its liabilities), the excess money is equally distributed to employees 401K accounts (Chapter 266, Utah Secretary of State, 2010). This change essentially removes the state from having to provide any additional money beyond the employer contribution each year to the fund, and leaves the employees with the responsibilities of ensuring full funding of the retirement fund.

Conclusion

The first three chapters have focused on how California arrived at where we are today, along with what the literature and application in other states tell us about ways to mitigate unfunded liabilities. The questions presented in Chapter One was, In light of the rising cost of unfunded liabilities, constant budget deficits, and the lack of citizens' support for California's current public pension systems; is it within California's best interest to reform the current pension system, abolish the current pension system and implement a new system, or to maintain the status quo? The first two chapters focused on how we got to where we are today and how large unfunded liabilities are.

This chapter set out to examine the issue of unfunded liabilities and the options available to policy makers to either reduce or eliminate these unfunded liabilities. Three policy options identified in the literature include changing contribution rates and retirement ages, switching to a defined contribution (DC) plan, and implementing a hybrid cash balance plan. The literature provided in-depth information on each policy option, and the effectiveness they have had in California and other states in reducing or eliminating unfunded liabilities.

The next chapter will introduce the methodology for further analysis as well as the policy alternatives. This methodology will then be put into practice in Chapter Five, where it will help identify the optimal policy alternative. Chapter Six will conclude with a discussion of the policy alternatives and their ability to solve the research problem of reducing liabilities. This thesis will conclude with formal recommendations

to policy makers and Californian's on the best way to go about reducing or eliminating future unfunded liabilities.

Chapter 4

METHODOLOGY

Throughout the previous three chapters, there has been a discussion of the history and background of the public pension system in California. This chapter will focus on the reasons for intervention, as well as to frame an approach for California in reducing unfunded liabilities in the pension system. In order to analyze what is the ideal approach to deal with this issue, Bardach's (2009) Eightfold Path and Munger's (2000) criteria-alternative matrix (CAM), provide a template for proper policy analysis. Specifically, Bardach (2009) provides a methodology that focuses on the analysis of policy alternatives and possible criteria, which will help later on to evaluate the possible outcomes of the implementation of these alternatives. This chapter will conclude with a discussion of Criteria-Alternative Matrix (CAM) analysis, as described by Munger (2000), which can help to organize the alternative and weights, and allow for deeper analysis of this issue.

Overview of Methodology

Any public policy discussion that embarks into areas of research requires a model for how the analysis will be undertaken. These models are essentially methods, or steps, that researchers use to collect data and dive into further analysis. This paper will utilize the methodology laid out by Bardach (2009) entitled the Eightfold Path. This methodology employs an eight-part approach to ensure proper analysis and reporting of the data, and to help ensure that the researcher has not overlooked

important issues in the process. The eight steps utilized by Bardach (2009) include 1. Defining the problem, 2. Assemble some evidence, 3. Construct the alternatives, 4. Select the criteria, 5. Project the outcomes, 6. Confront the trade-offs, 7. Decide, and 8. Tell your story (p. xvi). Isaacs (2009) utilized this methodology in a similar thesis, which helped the author to construct a model and organize the data for further analysis.

Step 1: Define the Problem

Bardach (2009) states the importance of this step since “it gives you both a reason for doing all the work necessary to complete the project and a sense of direction for your evidence-gathering activity” (p.1). Without a defined problem in place, there would be no further work since the problem drives the momentum and reasoning for the analysis. When defining the problem, it is important to state explicitly what the problem is and why it is a problem. Bardach (2009) reminds authors in constructing the problem statement that the author should be mindful not to taint the problem statement with potential bias, which is possible by not including causes or solutions in the definition (p.7). The problem statement should also make it clear to the reader why the public should care about this issue, and frame the reasons that change is necessary. While not everyone may agree that that the problem exists as presented in the statement of the problem, it does provide the author with the opportunity to frame the situation and the environment the problem is operating within (Bardach, 2009). This step also comes back into play with the last step of telling your story, since the problem statement helps to structure the presentation of the story (Bardach, 2009). The introduction of this thesis provides a statement of the problem that is facing the state: California currently

holds too much in unfunded liabilities within the current public pension system. This is because California has not created a system to generate the assets necessary to cover the liabilities created in the public pension system. Unfunded liabilities become a problem since the employer (taxpayers) must address unfunded liabilities, and they hold a fiduciary responsible to pay the liabilities in the future. Since the current system cannot guarantee enough assets to cover liabilities in the current defined benefit system, unfunded liabilities begin to accumulate for future benefits. If not addressed, government will be responsible for paying these extra cost which will come at the expense of other government programs such as education, public safety, and health and human services having their resources diverted.

Step 2: Collect the Evidence

Once a problem statement is developed, it is time to go out and collect the evidence to show that a problem exists. Bardach suggests that there are three reasons that evidence is necessary for a successful policy analysis. This includes assessing the nature and extent of the problem, assessing the particular features of the policy, and assesses the things that work effectively in similar situations (Bardach, 2009, p. 11). Data, such as raw numbers, statistics, and facts, combine to make the evidence, which the researcher uses to support that a problem exist (Bardach, 2009). Bardach (2009) states it is important to “collect only those data that can be turned into information that, in turn, can be converted into evidence that has some bearing on your problem” (p.10). A large majority of the evidence was presented in chapter two of this thesis, which focused on how large is the problem of unfunded liabilities. Chapter Two laid out the

raw data and statistics of California's unfunded liabilities, such as why do they exist, how large are they, comparing our liabilities to other states, and how the public perceives unfunded liabilities. Chapter Three presented a breadth of the academic literature surrounding different retirement systems and their affects on unfunded liabilities. The literature review provides a comparison to California, since it focuses on what other states have done to address their issues with unfunded liabilities.

Step 3: Construct the Alternatives

With a clear definition of the problem and evidence to support the claims, it is time to focus on the construction of policy alternatives. These policy alternatives represent possible options for policy makers to keep in mind when addressing this problem. To begin this process, Bardach (2009) recommends making a list of all possible alternatives presented through either practical application or the literature (p.16). This list should be comprehensive in nature, with the eventual goal of reducing the alternatives to a managed number, somewhere around two or three (Bardach, 2009). Bardach (2009) suggest that the author work to shorten the comprehensive list through merging alternatives, eliminating impractical one, and reorganizing basic ones into more advanced alternatives (p.16). In addition to the finalized two or three alternatives chosen from the lists, another alternative of letting the current conditions continue will be analyzed. Bardach (2009) says that this is required since "the world is full of naturally occurring, ongoing changes, some of which may mitigate the problem on which you are working" (p.17). A finalized list of alternatives, along with a further discussion of why these alternatives selected will follow in this chapter.

Step 4: Select the Criteria

While step three focused on constructing alternatives, step four will focus on selecting the criteria that will be critical in the policy analysis. Selecting criteria is important since it allows the author to bring their values to the forefront and apply those values to each alternative (Bardach, 2009). It is through this application that the policy analyst can consider the impacts of each policy on these values. While the most important criteria to focus on is whether or not the alternative will solve the problem described in step 1, it is also important to focus on the other values that are inherent to policy analysis and implementation (Bardach, 2009, p.26). Some common criteria that Bardach identifies include efficiency, equity, legality, political acceptability, and administration (Bardach 2009). In addition to simply selecting the criteria important to the analysis, the author must focus on the weights of each criterion. Bardach (2009) states that weights can either be assigned by the government, or that the researcher can assign weights based upon the notion that the researcher either wants to focus on a certain criterion, or that the current government standard does not focus enough on a certain criterion (Bardach, 2009, p.32). The criterion selected for this analysis, along with the corresponding weights will be addressed in further detail later in this chapter.

Step 5: Project the Outcomes

The fifth steps ask the author to project the outcomes. This simply asks that the author project all outcomes or impacts to society caused by the alternatives (Bardach, 2009, p.38). Bardach (2009) is quick to let the author know that this is the toughest step of them all since it requires the analyst to confront both the positive and negative

aspects of each alternative. In order to overcome the uneasiness of this step, Bardach (2009) proposes three steps to use. The first is to understand that policy focuses on the future and not the past or present, and that we do not know what will happen in the future (Bardach, 2009, p.38). The second step is to be realistic and understand that public policy imposes a moral burden heavier than many people realize, since public policy affects everyone and can cause both positive and negative externalities (Bardach, 2009, p.38-9). The last step is to be wary of the “51-49” principle, which is where researchers feel that a simple majority (51%) of confidence should be treated as if it was 100% confidence, so it is important to note tradeoffs, and know that no policy is 100% perfect (Bardach, 2009, p.39). In order to help organize all of these projections, this thesis will utilize an outcome matrix that will help to analyze the complexities and uncertainties present in each alternative. The organizations of alternatives will follow later with a thorough discussion of outcome matrixes, along with the projection of outcomes presented in the next chapter.

Step 6: Confront the Tradeoffs

Step six asks the analyst to confront the tradeoffs of different policies. These occur when one policy may seem to dominate in one area while falling short in on others. Bardach (2009) proposes some common tradeoffs associated with policy analysis including money and a good or service, or private borne cost versus the social benefits (p.53). Criteria and weights will help confront tradeoffs with the goal of analyzing the effects of each criterion on the alternatives. The next chapter will confront the tradeoffs with an analysis of each alternative against the criteria selected.

Step 7: Decide

The second to last step asks the analyst to pretend that they are a policy maker and make the best decision to solve the problem. After analyzing all of the alternatives and outcomes projected, the analyst makes their recommendation. When a final decision has been identified it is important to conduct the “\$20 dollar bill test” which Bardach (2009) described as asking the question of why this alternative has not been implemented before (p.57)? Once the analyst has this information, they should pick the best alternative given the analysis and explain why chosen. The last chapter of this thesis will focus on the conclusion and provide a write-up on the best alternative given the criterion used and weights applied.

Step 8: Tell the Story

This step asks the author to ensure that they have defined who the audience of the story is, and provide the details necessary for the audience to understand what is being provided. Bardach (2009) refers to this as the “Grandma Bessie test” which is to try and succinctly explain what your research is about and why you concluded what you did (p.58). If the author has a hard time explaining their analysis then it is possible that the audience of the paper will have an even harder time understanding it. It is through a clear understanding of the audience, along with providing a logical flow of the narrative that a story be told. The concluding chapter of this thesis is where the story will unfold.

Alternatives

Before alternatives are proposed, one must know exactly what the root problem is and why analysis is warranted. The research question is simply, in light of the rising

cost of unfunded liabilities, constant budget deficits, and the lack of citizens' support for California's current public pension systems; is it within California's best interest to reform the current pension system, abolish the current pension system and implement a new system, or to maintain the status quo? In order to analyze how to solve the problem of unfunded liabilities, alternative approaches to the status quo require analysis and results compared against what is happening under the current system. Bardach (2009), states that alternatives are "alternative strategies of intervention to solve or mitigate the problem" (p. 15). In order to help mitigate the effects of unfunded liabilities, California has four possible alternatives. First, it can continue to operate the DB plan in place and not make any changes. This option allows the status quo to continue, and provides a baseline for comparison amongst the other proposed alternatives. Second, the state can reduce benefits and increase employee contribution. This option would follow that of many other states that have reduced benefits and increased contributions in order to reduce unfunded liabilities. Third, it can close the DB plan to new employees and require them to enroll in a DC plan. Lastly, the state can implement a hybrid cash-balance retirement plan. This is a relatively new type of retirement plan, which incorporates parts of DB and DC plans in one. Table 4.1, on the next page, provides a brief description of the four alternatives, further detail of each alternative will follow the table.

Table 4.1 Alternatives

Alternative	Description
I. Maintain Status Quo	Do not do anything, and continue the current DB system with current retirement benefits.
II. Increase Contributions and Retirement Age	Increase employee contributions on all employees, and increase the minimum retirement age for only new employees in DB plan.
III. Increase contributions and open DC	Increase employee contributions to DB plan for current employees, and require new employees to be in a DC plan.
IV. Hybrid System	Implement a Hybrid plan for all new employees

Alternative 1: Maintain the Status Quo

Under this alternative, no changes would occur to the current pension system. California would continue to offer a DB pension system, which will offer retirement benefits to both new and future employees. The current benefit formula would remain in effect along with the current contribution levels for both employees and employers. With the current system continuing along with the retirement benefits in place, the mitigation of unfunded liabilities could occur through natural changes in the market, higher employer contributions, and from new resources diverted from other general fund priorities or increased taxes.

Alternative 2: Increase Employee Contributions and Increase Retirement Age in DB System

This alternative would result in all employees contributing a larger portion of their paycheck to CalPERS. Employee contributions would double from their current level of five percent of income over \$513 for miscellaneous employees, to ten percent of income over \$513 (CalPERS, 2009). This would also apply to public safety

employees who currently contribute six to eight percent of income over \$513, which would increase to 13% of income over \$513 (CalPERS, 2009).

Alternative 3: Require New Employees to be in a DC Plan and Increase Employee Contribution for Current Employees

This option would require all new employees to enroll in a DC retirement plan, as well as increasing employee employees for current employees in the DB pension plan. Under the DC retirement plan, employers would contribute five percent of an employee's earning to a 401K account with the employee required to contribute three percent of their pay to the account. An additional five percent employer match is available if the employee elects to contribute more to their 401K beyond the initial three percent. As for increasing employee contributions, the same conditions applied in the previous alternative would apply to this alternative for current employees in the DB system.

Alternative 4: Implement a Hybrid Cash Plan for New Employees

Under this alternative, new employees would enroll in a hybrid cash balance plan, while current employees would remain in their DB plan. The hybrid plan would require employees to contribute five percent of their paycheck into the hybrid account with employers contributing another five percent. The government, who manages the plan, invests the employee's contribution. The employer guarantees an annual interest payment to each employee, which would be equal to the 30-year Treasury bond for that year. This interest payment is essentially the rate of return from the government's investment in risk free investments.

Criteria

Bardach (2009) states, “identifying criteria is one of the most important steps since it sets the values and philosophy, which will ultimately shape the overall policy analysis” (p.26). It is important to note that criteria should not singlehandedly judge the alternatives for the analysis. Instead, Bardach (2009) argues that the criteria should apply to the projected outcomes in a way to allow comparison of each criterion amongst the entire alternative (p.27). There are two types of criteria used in policy analysis; evaluative and analytical (Bardach, 2009). An evaluative criterion requires a value judgment by the analyst in order to draw a useful conclusion. This type of criteria applies more to qualitative issues where it is difficult to quantify this result. Analytical criteria rely on direct knowledge, such as factual knowledge to assess the proposed alternatives. This criterion applies to information that is quantitative in nature and is comparable to one another. For this analysis, the only evaluative criterion used is equity. Analytical criteria selected are reducing unfunded liabilities, political feasibility, and administrative feasibility. Table 4.2 below lists the criterion selected. Following Table 4.2 will be a more detailed discussion of each criterion.

Table 4.2 Criteria and Type

	Criterion	Type of Criterion
I.	Reduce Unfunded Liabilities	Analytical
II.	Equity	Evaluative
III.	Political Feasibility	Analytical
IV.	Administrative Feasibility	Analytical

Criteria 1: Reducing Unfunded Liabilities

Does the alternative reduce unfunded liabilities from their current levels? The focus of this paper is on reducing unfunded liabilities so it is important to use this as a criterion for policy analysis. This criterion will evaluate how effective each alternative is in reducing the unfunded liabilities from the current pension system to the proposed alternative. Measuring variation in unfunded liabilities from current levels will show how well the alternative works in reducing liabilities. If there is a reduction in unfunded liabilities, it is important to consider if this is a temporary or a long-term reduction in future liabilities. If the results of the reduction are only temporary then there must be further consideration if this is a viable alternative to reduce unfunded liabilities. An alternative that reduces unfunded liabilities in the long term will do better than an alternative that does not reduce liabilities or only has a temporary effect.

Criteria 2: Equity

Does the alternative create any inequalities; does the distribution occur equally amongst all stakeholders? Equity is an important virtue of government, since it serves everyone and should have no prejudice. Government policies must ensure that inequalities do not occur, or that any negative externalities do not hurt a certain population at the expense of another. Equity should also focus on ensuring that resources and their impacts from a change in policy do not negatively influence other government functions, or divert scarce resources.

Specifically, this criterion will focus on the economic cost to both new and future employees, how the alternatives affect current and future members along with

retirees, if liabilities are shifted from employer to employees is this a fair trade, and how risk is managed amongst all of the stakeholders. The fairness to transfer the cost or liabilities, from employer to employee will receive special consideration in the analysis. In addition, will decreasing retirement benefits result in other components of employee compensation increasing to attract quality employees? This can lead to increased cost to California in order to recruit and hire competent individuals. What does this do to current employees who may see new employees hired at a higher salary? There may be a time during employment that the benefits outweigh the amount of the salary, unfortunately the literature does not point to when this change occurs. When looking at equity between both current and new employees, one must be cognizant of any disparities in pay caused solely by having to enhance pay to attract quality employees.

Equity will also measure the balance between the benefit to the employee and the cost to the taxpayer through unfunded liabilities. Lastly, the impact of the alternative on other resources that have been obligated to other government services. A higher sense of shared impacts amongst all stakeholders will indicate a high degree of equity. A lower degree of equity will be indicated by unfair distributions of inequalities amongst stakeholders, or an unfair benefit between groups.

Criteria 3: Political Feasibility

Do political leaders and members support the alternatives? Changing pension systems will require the cooperation of legislative leaders and their members, along with members of the executive branch, including the Governor. A proper analysis of an alternative should take into account the possibility that the political stakeholders can

agree upon and ultimately enact the alternative. Feasibility must also factor in agreements with other stakeholders, such as labor unions and taxpayer advocate groups. In order to gauge political feasibility, an analysis of legislation is helpful. This analysis will consist of examining past and current pieces of public policy, as well as the political environment that existed at that time. Correlations between past proposals and the current environment will help measure political feasibility for each alternative. If an issue is unlikely to have high chances of acceptance by the political establishment it will be assigned a lower degree of political feasibility. If an alternative is likely to have a high probability of acceptance, it will have a higher degree of political feasibility.

Criteria 4: Administrative Feasibility

Does the implementation of the alternative occur in an efficient way? This measure will focus on the amount of ease or difficulty in implementing the alternative. In order to gauge efficiency of implantation, regulations at the federal and state level will need examination, along with a look at the way in which government organizations roles would change. An alternative that is complex and not efficient in design will indicate a lower level of administrative feasibility. Alternatives that are simpler in design and efficient will draw a higher level of administrative feasibility.

Applying Weights to Criteria

With each criterion presented in the previous section, it is important to consider if all of the criteria should evaluate the alternatives equally. While every criterion is important to the complete policy analysis, the impact of one criterion might be more influential than the impact of another criterion on the alternative (Bardach, 2009). In

order to address this issue, each criterion will have a weight assigned, which will highlight the individual value of that criterion on the overall analysis of each alternative (Munger, 2000).

In order to decide what weight to assign to each criterion, there needs to be some metric used to find the ideal weight. Isaacs (2009) was able to use public opinion polling data as her metric, and use that information to extrapolate appropriate weights for each criterion. Following on this approach, statewide public opinion polling data was found for the years of 2003, 2005, 2010, where the Public Policy Institute of California (PPIC) asked certain questions about pensions to a sample of Californian's. In addition to using the polling data to find the appropriate weights, other observed factors will also help to find the weight values. Table 4.4 on the next page highlights the questions asked and the answers provided to the PPIC surveys.

Table 4.3 Public Opinion Polls 2003-2010

Date Range	Question	Results	Survey Source
01/12/2010 - 01/19/2010	Would you favor or oppose changing the pension systems for new public employees from defined benefits to a defined contribution system similar to a 401(k) plan?	Favor (67%), Oppose (21%), Don't know (12%)	PPIC: Californians and Their Government, January 2010
01/12/2010 - 01/19/2010	At this time, how much of a problem for state and local government budgets is the amount of money that is being spent on their public employee pension or retirement systems?	Big problem (41%), Somewhat of a problem (35%), Not a problem (14%), Don't know (10%)	PPIC Statewide Survey: Californians and Their Government, January 2010
1/11/2005 - 01/18/2005	Would you favor or oppose changing the pension systems for new public employees from defined benefits to a defined contribution system similar to a 401(k) plan?	Favor (61%), Oppose (25%), Don't know (14%)	PPIC: Special Survey on the California State Budget, January 2005
1/11/2005 - 01/18/2005	At this time, how much of a problem for state and local government budgets is the amount of money that is being spent on their public employee pension or retirement systems?	Big problem (31%), Somewhat of a problem (41%), Not a problem (17%), Don't know (11%)	PPIC: Special Survey on the California State Budget, January 2005
5/22/2003 - 06/01/2003	Do you or anyone in your immediate family work as a public employee or receive a pension as a former public employee—that is for federal, state, or local government, a state college or university, or a public school?	Yes (27%), No (73%)	PPIC: Special Survey on the California State Budget, June 2003
02/6/2003 - 02/17/2003	Do you or anyone in your immediate family work as a public employee or receive a pension as a former public employee—that is for federal, state, or local government, a state college or university, or a public school?	Yes (28%), No (72%)	PPIC: Californians and Their Government, February 2003

Source: Public Policy Institute of California (PPIC, 2003, 2005, & 2010)

The first criterion is reducing unfunded liabilities. This criterion directly correlates back to the research question to find the best alternative to reduce unfunded liabilities in the long term. While there was no specific question addressing the issue of unfunded liabilities in the survey, there was a question regarding the cost of public pension plans on government and if they were viewed as a problem or not. In both 2005 and 2010, over 70% of those surveyed said that pension costs represented a problem for state and local budgets (PPIC, 2005 & 2010). From understanding the importance of this criterion through both the research question for this paper and the fact that over 70% of Californian's surveyed stated that public pension costs were a problem for state and local governments, it only made sense that this criterion would have the highest weight of .45.

The second criterion for weighting is equity. As explained earlier, it is important for any government decision to have a sense of equity since the government should not be in a position to have one group receive something at the expense of another. In this case, the two groups to weigh equity between are the public employees who are receiving their retirement, and the taxpayers who are financing their retirement and any unfunded liabilities created. When it comes to taxpayer equity, the retirement system should provide a cost effective way to provide a reasonable retirement option to retirees. Currently over 70% of individuals polled by PPIC stated that the cost of pensions was a big deal, which leads to the conclusion that taxpayer feels that there is currently uneven equity between employees and taxpayers. When looking at the public opinion polls from the perspective of the employee, it was interesting to find that in

2003 around 23% of respondents stated that either themselves or a family member either work as a public employee or receive a pension (PPIC 2003). While 23% does not make up a majority, that is almost one quarter of California's who are either receiving a pension or in a position one day to receive one. With the information in the public poll, and the notion that government should ensure equity between all stakeholders, a weight of .25 was assigned to this criterion.

Political feasibility is the third criterion for consideration. Over the years, numerous pieces of legislation have tried to abolish our current DB pension system or to tinker with the benefits provided to public employees. In almost every case, the bill was either not approved by the first legislative committee, or not even brought up for a vote because of a lack of support from a majority of legislators. While the will may not be evident in the legislature, the PPIC poll results ran contradictory to that of legislators. In 2005 and 2010, over 60% of survey respondents favored switching public employees from a DC pension plan to a DC retirement plan (PPIC, 2005 & 2010). Since pension changes would require changes to either California statute by legislators or a constitutional amendment, and the potential influence of the public's attitude on this issue, a weight of .20 is appropriate.

Administrative feasibility is the last criterion to weight. Ensuring the implementation of the alternative is an important issue to focus on during any analysis. In the case of pension alternatives, there enactment comes through state statute, and needs to be upheld by the public agency (CalPERS) tasked with implementation. The environment in which administrative implementation is under can also change based

upon other alternatives, such as the cost of unfunded liabilities and the legislatures response to unfunded liabilities. With these factors in mind, the lowest ratings of all of the criteria is applied which is .10. Table 4.4 below provides a quick summary of the criteria, along with each of the weights assigned.

Table 4.4 Criteria and Weight

	Criterion	Weight
I.	Reducing Unfunded Liabilities (UL)	45%
II.	Equity (EQ)	25%
III.	Political Feasibility (PF)	20%
IV.	Administrative Feasibility (AF)	10%
Total		100%

While each criterion had weights assigned, they are not set in stone and a review will occur later on with a sensitivity analysis. Munger (2002) states that sensitivity analyses are necessary since they “tests to see whether the results are sensitive to or dependent on specific values or assumptions” (p.373). Essentially, a sensitivity analysis requires the researcher to re-run their analysis with a slight variation in the weights and measure any variance against the results of the original analysis. If this variation is enough to alter the choice alternative, then a discussion must ensue about the best alternative given the assumptions made. Chapter Five will contain a sensitivity analysis of each alternative.

Criteria-Alternative Matrix

Once a decision on the alternatives is complete, and the criteria and weights distributed, it becomes time to start the discussion of how to confront tradeoffs. There will come a time in policy analysis where one alternative may do well in one area and

poorly in another (Bardach, 2009). The researcher needs to be able to visually see that tradeoff, and note that issue for further discussion. One method mentioned by Munger (2000) is to use a criteria-alternative matrix (CAM). A CAM provides a matrix for the analyst to use in order to organize and process the analysis (Munger, 2000). CAM's have proven their effectiveness in both a report on scrap tire usage to the California Integrated Waste Management Board by Dr. Rob Wassmer (2002) and for a thesis on the future of California's pension system by Emily Isaacs (2009).

A CAM is simply set-up as a grid design with the criteria listed in the rows and the alternatives listed in the columns (Munger, 2000 & Bardach, 2009). Each cell represents how that particular alternative fared against that specific criterion (Munger, 2000). A CAM analysis can be either qualitative or quantitative in nature, which is at the discretion of the researcher (Bardach, 2009). A qualitative CAM would use words to describe how a particular alternative fared against a specific criterion, and state if there was a high or low degree of strength between the two. A quantitative CAM analysis utilizes numbers to represent a value describing the relationship between that specific alternative and the particular criterion (Munger, 2009). In a quantitative CAM, a ranking for each alternative is set for how it correlates with a particular criterion. This value will either be a higher number if there is a strong relationship between the alternative and the criterion, or a lower number if there is a weak relationship between the two (Munger, 2002). Weights are assigned to each criterion, which provides the researcher the ability to state how important each criterion is.

Each value is multiplied by the weight assigned, and the sum of each column is added up to provide a total score for that alternative. All of the total scores for each alternative are then ranked from highest to lowest, which provides the researcher with the preferred alternative given this set of criteria and weights assigned (Munger, 2002). Once a preferred alternative is found, it is important for the researcher to look for any crucial tradeoffs that may occur if the alternative was implemented. This can be found by looking down the column of each alternative and see the variation in the relationship to each criterion. Munger (2002) points out that while an alternative may receive a high total score, it may have scored lower in categories that had lower weights and higher in categories with higher weights. If this is the case, the analyst has a responsibility to see if this alternative makes sense given the projected tradeoffs that will occur if implemented.

Bardach (2009) points out that a CAM is simply a mechanism that allows researchers to organize their data and confront tradeoffs. While it does help to identify potential alternative, researchers must still ask themselves from time to time, does this make sense? If the alternative and the tradeoffs associated do not make sense then the researcher should reexamine the criteria and the weights assigned. Table 4.5, on the next page, highlights each criterion and the standard used to rate each criterion.

Table 4.5 Criteria and Rating

	Criterion	Lower Weighting	Higher Weighting
I.	Reducing Unfunded Liabilities (UL)	Does not lower the unfunded liabilities from current levels. Temporary solution.	Lowers unfunded liabilities from current levels. A permanent solution
II.	Equity (EQ)	Unequal distribution of cost and benefits between workers and taxpayers.	Equal distribution of cost and benefits between workers and taxpayers.
III.	Political Feasibility (PF)	Little to no support by key government officials and/or citizens	Supported by key government officials and/or citizens
IV.	Administrative Feasibility (AF)	No clear direction to implementation. Lack of support by government agency	Clear direction to implementation. Supported by government agency.

The next chapter will include a qualitative and a quantitative CAM analysis.

First, a qualitative analysis will be utilized to help lay out exactly what assumptions are being made in regards to each alternative, and how it does against each criterion. The results of the qualitative analysis will be helpful to the researcher when applying weights and rankings each criterion, and provide a justification why that ranking was appropriate. By providing the rationale behind the decision, the researcher makes their thought process known and provides the opportunity for readers to disagree and apply their own rankings.

Conclusion

This chapter has laid out in detail how the analysis presented in the next chapter will be undertaken and the methods employed. From this methodology, the next chapter will contain both a qualitative and quantitative CAM analysis. This CAM will

contain the alternatives and criteria laid out in this chapter, as well as the corresponding weights for each criterion. The product of the analysis in the next chapter will lay the foundation for assessing each alternative, and ultimately lead to the selection of a policy recommendation for potential implementation.

Chapter 5

ANALYSIS OF ALTERNATIVES AND RESULTS

This thesis offers a roadmap that explains the problem of unfunded pension liabilities, how we got into this problem, and the methodological framework for identifying and analyzing an optimal policy option to solve. The previous chapter outlined policy alternatives along with corresponding criterion and weights. This chapter will take those alternatives and apply each criterion and weight to the alternatives to analyze the projected outcomes. A criteria alternative matrix (CAM) organizes this analysis and provides the tools for determining the optimum public policy alternative for California.

This chapter starts with a description of the best outcome expected from any policy option. The next section of the chapter revisits each of the alternatives and criterion introduced in the previous chapter. Applied to each alternative will be a criterion, which will lead to a qualitative CAM analysis for each alternative. The last section of this chapter will focus on the quantitative CAM analysis, which will incorporate each criterion's weight as well as the corresponding rankings assigned. The final chapter will take the results of the quantitative CAM analysis and recommend the policy alternative that had the highest score given each criterion and corresponding weight.

The Hypothesized Best Outcome

The best outcome for each of the alternatives selected would be to obtain very high ratings amongst all of the weighted criterion. Criteria selected in the previous chapter include reducing unfunded liabilities, equity, political feasibility, and administrative feasibility. The hypothesized alternative would satisfy each criterion and provide a large benefit with little to no negative impacts on other stakeholders. Unfunded liabilities would be lower or eliminated under the alternative, and these results would not be short term in nature. The alternative would promote equity by distributing costs or benefits equally across all of those affected, while not affecting other government programs, or relying on increased taxpayer support. Political feasibility is possible through legislative approval and consensus between key stakeholder such as labor unions and taxpayer advocates, as well as buy-in from the public at large. The alternative is clear in what the goals are and is easy to implement at the administrative level. While it would be nearly impossible for any alternative to satisfy every one of these area, it is important to see how well each policy option satisfies each of these criteria.

Policy Alternatives by Criteria

This section will focus on each of the policy alternatives and judge them against the criterion outlined in Chapter Four. These criterions include reducing unfunded liabilities, equity, political feasibility, and administrative feasibility. The outcomes of the qualitative CAM analysis of each alternative with criteria will be available in Table 5.1, following the narrative of each alternative below.

Alternative 0: Maintain the Status Quo

The current system has led California to the situation where the state has a 30 year unfunded liability of at least \$39 to \$239 billion in the CalPERS system (Bornstein et al., 2010 & CalPERS, 2009). Structurally, the status quo lacks the mechanisms necessary to address unfunded liabilities internally because of the inability to change benefits for all employees, unable to increase employee contribution rates, and the clear fact that DB pension plans represent deferred compensation with the employer holding a fiduciary responsibility to provide the benefit. Externally, the status quo has the ability to reduce unfunded liabilities by increasing the employer contribution rate, which is the rate that CalPERS charges to each employer as a percentage of employee pay. In addition to the employer contribution rate, mitigation of unfunded liabilities can occur through more resources diverted from California's general fund or directly from taxpayers through higher taxes. It is from this lack of internal ability to control unfunded liabilities that there is a very weak relationship between this alternative and the criterion of reducing unfunded liabilities.

Within the status quo, there is a fair sense of equity between employees. All employees are equal in the sense that there is a common benefit formula used by all, and that one group of employees does not receive a different benefit than others. Equity is not as apparent when looking at the employer's relation with the status quo. The employer is constantly seeing their contribution rate change from year to year, and over the past 10 years alone, it has gone from a low of zero percent to a high of 30% (CalPERS, 2009). This volatility occurs while the employee contribution rate has

remained stable for the past 10 years. In addition to the employer contribution rate, the government and ultimately taxpayers hold 100% of the liability to make good on the benefits, regardless of CalPERS ability to provide the benefits through the DB pension assets. From this equal distribution amongst employees, highly volatile employer contribution rate, and the public holding all of the fiduciary responsibility to provide the benefit, there is a moderate relationship between the alternative and the criterion of equity.

When it comes to the status quo there is a relatively strong feeling of political feasibility. Legislators and other government leaders have already agreed to this current system. In addition, the legislature has an increasingly high track record of killing any legislative proposal that comes along to alter the status quo. While this has been true in the past, there is current a high degree of anxiety in the public about the cost of DB pension systems. In a PPIC (2010) survey, 76% of Californian has said that the money spent on the current DB pension system is a problem, and 67% of those surveyed said that they would support shifting new employees to a non-DB pension system. While the status quo may have a high degree of support from the current legislators, there is a growing concern with the public, which can quickly change the political feasibility of the status quo. With this in mind, there is a moderate relationship between the alternative and the criterion of political feasibility.

The last criterion for this alternative is regarding administrative feasibility. The current DB system has been in existence since 1932 and without modification will continue to provide DB benefits in the future. The CalPERS fund is the largest public

pension fund in the nation and requires a large operation to manage the over \$230 billion in assets that it controls (CalPERS, 2009). The current system is already in place and requires no modifications to the current operations of CalPERS. From the long history of DB pensions in California, along with the sheer size of the CalPERS pension assets, there is a very strong relationship between this alternative and administrative feasibility.

Alternative 1: Increase Employee Contribution and Increase Retirement Age

This alternative attempts to reduce unfunded liabilities by increasing employee contributions into CalPERS in an attempt to bolster the assets in the retirement fund, and to increase retirement ages for new employees to ensure longer years of contributions and shorter years of delivered benefits. Increasing employee contributions for all employees will result in more assets available in the retirement fund to cover the liabilities created. With more assets available to cover liabilities, it becomes possible to erase some of the unfunded liabilities created in the past, before this new stream of increased contributions. Increased retirement ages also reduce unfunded liabilities since it forces employees to work longer before they can retire. This alternative proposes increasing the retirement age for new employees by five years. While five years might not sound like a long time when looking at the normal length of service in many companies being in the 20-30 years area, five years can mean a lot when it comes to additional contributions and fewer liabilities created for retirement. This alternative would result in five more years of employee and employer contributions compounded with annual investment rate of returns, which will only result

in more assets in the fund to cover liabilities. In addition to working five more years, this reduces by five years the amount of time that the retiree could have possibly been retired and collecting their DB benefits because of natural life causes. While this alternative does help to mitigate some of the unfunded liabilities in the system, it is important to note that this alternative continues the existence of a DB system, which has the potential to continue creating unfunded liabilities in the future. One negative aspect of the additional five years is that employees may receive additional pay increases during this time, which would only increase future liabilities. With this in mind, there is a moderate relationship between the alternative and the criterion of reducing unfunded liabilities.

When looking at the equity created with this alternative, there is an unequal division in benefits provided between new employees and current employees. While every employee would end up paying higher employee contributions today, new employees will be paying these contributions for many more years, essentially subsidizing the unfunded liabilities created by current employees. Also, additional years of employment create an inequality since one group of employees would be able to retire five years earlier than the newly hired group of employees. This burden distribution is not equitable between both groups since it places a majority of the increased contributions and higher retirement ages on new employees, who will have to bear this cost for their entire career, compared to current employees. When it comes to the equity between taxpayers this alternative is not equitable since it will still mandate erratic employer contributions, and 100% of the liabilities still reside with the

government to provide this benefit. When it comes to the issues of equity, there is a weak relationship between this alternative and the criterion of equity.

Politically, this alternative has some hurdles to overcome. Politicians in the legislature have been hesitant to transfer costs on to public employees. Reluctantly, after 10 years, the legislature finally rolled back pension increases passed in 1999, only after then Governor Arnold Schwarzenegger threatened not to sign the 2010-2011 budget without this accompanying legislation. This just shows the reluctance of the legislative majority to alter any of the DB pension benefits provided to employees. In addition to the legislators disproving of changing benefits, labor unions would also oppose any changes that may occur. Some of this dissatisfaction by the legislative majority and labor unions may be lower than anticipated because this alternative continues a DB pension system. The public would welcome any change to the current benefits since they already believe that pension costs are a problem (PPIC, 2010). This alternative has a weak relationship with the criterion of political feasibility because of the lack of legislative support, offset by the broad support of the public.

Lastly, is the consideration of this alternative against the criterion of administrative feasibility. This system does not alter the overall structure for the DB pension plan already in place. The only changes that would occur under this alternative are to change retirement formulas, which will require a little work up front but nothing more once the system is in place. Since this alternative mostly is a continuation of a current structure, there is a very strong relationship between this alternative and the criterion of administrative feasibility.

Alternative 2: Require New Employees to be in a DC Plan and Increase Employee Contributions for Current Employees.

This alternative attempts to reduce unfunded liabilities by creating a retirement system that does not create liabilities. In a DC plan, employers hold no liabilities for providing retirement benefits in the future. Employees hold all of the liability in a DC plan and are responsible for funding their own retirement from the assets and investments in their DC account. While this alternative eliminates liabilities from new employees, the unfunded liabilities for current employees who stay in the DB system will continue. Currently, DB systems work with younger employees subsidizing older workers and retirees by providing assets to the retirement system in the form of employee and employer contributions. The new employee receives very little benefit from the DB system during the early years of employment, but older employees or retirees receive a large benefit from the new employees, since the younger employees are essentially subsidizing the soon to be retirement for current employees or current retirement. This subsidization occurs since the new employees are essentially earning their years in the system and they are putting more money into the system than the benefits that they are receiving from the system. This is the complete opposite for older employees and retirees since they are putting less into the system than what they are currently taking out, or will soon be taking out. Since this alternative would remove new employees from the DB system, unfunded liabilities will increase, but not as fast since this alternative also calls for higher employee contributions. Like the previous proposal, increasing employee contributions help to mitigate unfunded liabilities since

the contributions provide more assets to the pension system. This alternative produces a strong correlations with the criterion of reducing unfunded liabilities since liabilities would be non-existent for new employees, while unfunded liabilities for current and retirees would increase since there would be less net contributions coming into the system, but would be mitigated slightly by higher employee contributions.

This alternative has some issues with equity that need addressing. Two separate retirement systems would exist and would have to operate side by side. Both of the retirement systems have positive and negative benefits that they provide. The inequality occurs when one set of employees is able to receive a retirement benefit that another group may see as superior to the retirement benefits that they may receive in the future. This superiority in retirement benefits points to the fact that retirees in a DB plan receive their retirement benefits guaranteed no matter what, and in a DC plan retirees are responsible for their plan and only receive the assets in their DC plan at retirement. The equity between employees and taxpayers is a bit stronger than what it is under current law since liabilities never materialize for new employees, and current employees will have increased employee contributions to help offset unfunded liabilities. While higher contributions may help lower the unfunded liabilities, a DB plan is still in use, which places 100% of the liability with the government and essentially taxpayers to finance any shortfalls that occurs. This alternative has a weak relationship with the criterion of equity since it does remove future liabilities, but fails to eliminate current liabilities and creates inequalities between various groups of employees.

The legislature has not embraced this idea of transitioning employees from DB to DC plans in the past, and there is very little chance of seeing this change in the near future. Numerous proposals have come forward in the legislature with the intention of creating a DC system for new employees, and each one of these bills never made it out of their first committee (Isaacs, 2009). Labor unions and taxpayer stakeholders are continually at odds with this proposal. The labor unions see any transition to a DC system as a loss for their members, and taxpayer advocates see this transition as a necessity to stem the coming tide of unfunded liabilities. Publically, there is large support to switch public employees to a DC plan. PPIC (2010) polled Californians and asked if they would support switching public employees from a DB to a DC plan, and 67% of those polled support such a change. There is a moderate correlation between this alternative and the criterion of political feasibility. While there has been a lack of support inside the legislative process, a majority of Californians do support the move, which is why there is a moderate correlation.

This alternative would require either CalPERS, or some other entity, to set up and manage the DC program. CalPERS would be the first choice to implement this alternative since they are already set up to run the DB retirement plan. CalPERS may lack the staff or equipment necessary to run both a DB and DC system. Implementation would require CalPERS to change their public interface to allow employees in the DC plan to log in and specify how they would like to invest their assets. This alternative also keeps the current DB system in place for current employees, which would not result in any changes to CalPERS for this program. This alternative requires structural

changes to CalPERS in order to implement a DC systems, or would require contracting out with a third party to run the system if CalPERS is unwilling or unable to implement the program. With these apparent issues, there seems to be a very weak correlation between this alternative and the criterion of administrative feasibility.

Alternative 3: Implement a Hybrid Cash Balance Plan for New Employees

A hybrid plan provides an opportunity to reduce the amount of unfunded liabilities, while continuing the safe retirement investment system. Hybrid plans incorporates components of both a DB and DC plan into one plan. The DC component of the hybrid plan is that each employee has their own individual account, and if they separate from the state, they could take their account with them, which is not available to employees under a DB plan. The hybrid plan acts like a DB plan since employee and employer contributions are invested in one large investment vehicle by investors. Similar to a DB plan, a hybrid plan has a liability associated which is to provide a yearly annual interest payment to each employee. This interest payment is the only liability that the employer holds but, should not become an unfunded liability if the investments are made correctly in safe US treasury bonds, as would be required. Hybrid plans provide retirees with investment security and a safe annual interest return, which would be guaranteed by law. Current employees will continue to be in a DB plan, which will continue with unfunded liabilities. Similar to the previous alternative, there are concerns that unfunded liabilities in the DB program would increase since there would be no new employees to subsidize employees that are closer to retirement or already retired. This alternative has a strong correlation with the criterion of

reducing unfunded liabilities since liabilities in the hybrid plan are essentially non-existent if assets are in safe investments. The only problem with this alternative is that the DB plan continues with current employees, and new unfunded liabilities can come about if assets are not able to cover liabilities.

While equity was a larger issue in the previous alternative with switching new employees to a DC plan, this alternative does not create as much inequality between both current and new employees. Employees in both of the retirement system have secure retirement benefits and do not have to worry about investment losses, like in a DC plan. The hybrid plan also provides employees with a steady annual interest return, which is compounded and increases the value of their retirement accounts. Taxpayers also benefit under a hybrid plan since employees would have a retirement system that ensures a safe investment for retirement, while not increasing any liabilities on the government or taxpayers. Since this alternative provides a sense of cost sharing between employee and employers combined with a moderate difference in retirement options between new and current employees there is a strong correlation between this alternative and the criterion of equity.

It is a little tricky to understand exactly what the political feasibility of this alternative is since hybrid plans are relatively new. The California State Legislature has never seen a legislative proposal for a hybrid retirement plan. Even though this plan is relatively new, legislators and both labor unions and taxpayer advocates have been asking for a retirement plan that protects employee assets for the future, and reduces liabilities to the state. A hybrid plan accomplishes the goals of all political

stakeholders. The public should also support this alternative since it helps to reduce the cost of retirement plans and unfunded liabilities, which is a large concern to Californians (PPIC, 2010). With this information in mind, there should be a strong correlation between this alternative and the criterion of political feasibility since hybrid plans provide a safe investment vehicle that creates no liabilities to the state.

Implementation of this alternative should not have any large issues associated with it. CalPERS would administer this program and create a separate investment account for the hybrid plan. CalPERS is the logical agency to administer this alternative since they already have the system and staff necessary to undertake implementing the hybrid system. This alternative would not fundamentally alter the way that CalPERS works, and would easily be incorporated into the agency. With this in mind, there is a very strong correlation between this alternative and the criterion of administrative feasibility.

Table 5.1 Qualitative CAM Analysis

Criterion	Alternative 0: Maintain Status Quo	Alternative 1: Increase Contribution and Increase Retirement Age	Alternative 2: Implement DC Plan and Increase Contribution	Alternative 3: Implement Hybrid Plan
Criterion 1: Reduce Unfunded Liabilities	Very Weak; Continues to create future unfunded liabilities; no long-term solution to reduce current liabilities	Moderate; Continues to create unfunded liabilities through DB plan, reduces current unfunded liabilities through higher employee contributions	Strong; No unfunded liabilities created for new employees, current employees continue to create unfunded liabilities since no more new employee contributions to subsidize liabilities, long term solution for new employees since no unfunded liabilities created	Strong; Very small and manageable liability created for new employees, current employees continue to create unfunded liabilities since no more new employee contributions to subsidize liabilities, long term solution for new employees since no unfunded liabilities created
Criterion 2: Equity	Moderate; No difference in benefits between current and future employees; No cost sharing between employees and employer, 100% of risk on taxpayers	Weak; Different benefits for groups of employees, more cost sharing between employees and employers through higher contributions, 100% of risk held by taxpayers.	Weak; Different benefits between employees, retirement inequality between employees since DC plans not guaranteed, cost sharing between employees and employers.	Strong; Different benefits between groups of employees, lower retirement inequality since hybrid plan assets are safe, cost sharing between employees and employers.
Criterion 3: Political Feasibility	Moderate; Past efforts to modify plan failed, democratic controlled legislature and allies support current plan, majority of Californians do not support status quo	Moderate; Continues the DB pension plan, similar to legislation already passed, local government ballot measures lowering benefits and increasing contributions have passed in numerous cities across the state	Very Weak; Past efforts to transition to a DC plan have failed in the past, democratic controlled legislature and allies strongly opposed to DC plan, strong majority of Californians support a move to DC plan.	Strong; Has not been tried before in the California legislature, secure retirement plan, reduces costs on employers and taxpayers.
Criterion 4: Administrative Feasibility	Very Strong; No structural changes to the current operation of CalPERS	Very Strong; No structural changes to the current operation of CalPERS	Very Weak; Major structural changes to CalPERS for DC system or contract out to third party.	Strong; Some minor changes to CalPERS to implement.

Quantitative CAM Analysis Results

Table 5.1 on the previous page outlines each of the alternatives against specified criteria and the ranking assigned between the two. This ranking can be either; very weak, weak, moderate, strong, or very strong. This ranking describes the relationship that exists between the alternative and the specific criterion. In the qualitative CAM analysis in Table 5.1, a ranking was assigned between the alternatives and criterion. These assigned rankings transfer over to the quantitative CAM analysis in table 5.2, which will follow this section. This quantitative analysis applied the rankings assigned in Table 5.1 with the criteria weights identified in the previous chapter. The assigned weights were; 0.45 for reducing unfunded liabilities, 0.25 for equity, 0.20 for political feasibility, and 0.10 for administrative feasibility. These weights, discussed in great length in the previous chapter, provide the basis for the analysis and how much of an impact their score will have on the total score.

By multiplying the weight by the ranking assigned, a total score for the criterion by alternative is available. By adding up all of the scores by criterion for each alternative, the total score becomes apparent. This total score provides the researcher with information on which alternative satisfied the assigned criteria, identified by the highest total score. The alternative with the highest total score was the option to implement a hybrid pension system in the form of a cash balance plan. The overall score for this alternative as identified on table 5.2 was 4.00. This alternative ranked strong in every criterion assigned throughout the analysis.

Second highest total score for an alternative went to alternative one, which would increase employee contributions for all employees and increase the retirement age for new employees. The overall score for this alternative was 2.95. The policy option ranked very strong in administrative feasibility, and moderate in both reducing unfunded liabilities and political feasibility. Unfortunately, this alternative received a weak ranking for the criterion of equity due to the unequal benefits between new and current employees.

The third highest alternative was alternative two, which would to implement a DC retirement system for new employees and require higher employee contributions for current employees. This alternative achieved a total score of 2.60. A strong ranking for this alternative arose out of the ability for the alternative to reduce unfunded liabilities, but lower rankings were assigned to the other three criterion. Equity, political feasibility, and administrative feasibility were not satisfied since the alternative created inequalities between employees, an unlikely chance of being agreed upon by the legislature, and not easy to implement.

Lastly, alternative zero of maintaining the status quo received the lowest total score of 2.30. While this option received a very strong ranking for administrative feasibility and moderate rankings in both political feasibility and equity, it failed to obtain anything but a very weak ranking for the criterion of reducing unfunded liabilities. This low ranking is appropriate since the status quo is the main reason that California has a problem, and the status quo lacks the structural mechanisms necessary

to reduce or eliminate these unfunded liabilities without fundamental reform from the Legislature.

Table 5.2 Quantitative CAM Analysis

Criterion	Alternatives			
	Alternative 0: Maintain Status Quo	Alternative 1: Increase Contribution and Increase Retirement Age	Alternative 2: Implement DC Plan and Increase Contribution	Alternative 3: Implement Hybrid Plan
	Ratings: (1- Very Weak), (2 – Weak), (3 – Moderate), (4 – Strong), (5 – Very Strong)			
	R X W = Total	R X W = Total	R X W = Total	R X W = Total
Criterion 1: Reduce Unfunded Liabilities	1 X .45 = .45	3 X .45 = 1.35	4 X .45 = 1.80	4 X .45 = 1.80
Criterion 2: Equity	3 X .25 = .75	2 X .25 = .50	2 X .25 = .50	4 X .25 = 1.00
Criterion 3: Political Feasibility	3 X .20 = .60	3 X .20 = .60	1 X .20 = .20	4 X .20 = .80
Criterion 4: Administrative Feasibility	5 X .10 = .50	5 X .10 = .50	1 X .10 = .10	4 X .10 = .40
Total Score	2.30	2.95	2.60	4.00

Sensitivity Analysis

This section will focus on running additional analysis on the results presented in Table 5.2 above. Sensitivity analysis provides an opportunity for the researcher to display how sensitive the results are with additional changes in either the weights or the rankings assigned. It is important to understand how sensitive the results are since any of the rankings or weight can change because of different environmental conditions or changes of public opinion. With such natural or environmental changes, it is important to understand how the results would differ with such changes and the variation from the baseline with these changes.

Three sensitivity analyses follow, which includes an analysis of a slight variation in the weights (Tables 5.3, 5.4, 5.5, and 5.6), large variation in the weights (Tables 5.7, 5.8, 5.9, and 5.10), and concluding with analysis focusing on changes to the rankings assigned (Tables 5.11, 5.12, 5.13, 5.14, and 5.15). Below is the first table to set up the sensitivity analysis while examining a small weight change. The weights used in the original CAM analysis are in the first column. The second two columns contain weights that are altered five percent in different directions from the original weights. Table 5.3 below contains the altered weights.

Table 5.3 Sensitivity Analysis Criteria. Slight Weight Changes

Criteria	Original Weight	First Altered Weight	Second Altered Weight
Reduce Unfunded Liabilities	.45	.40	.50
Equity	.25	.20	.30
Political Feasibility	.20	.25	.15
Administrative Feasibility	.10	.15	.05

Table 5.4 First Altered CAM Matrix. Slight Weight Changes

Criterion	Alternatives			
	Alternative 0: Maintain Status Quo	Alternative 1: Increase Contribution and Increase Retirement Age	Alternative 2: Implement DC Plan and Increase Contribution	Alternative 3: Implement Hybrid Plan
	Ratings: (1- Very Weak), (2 – Weak), (3 – Moderate), (4 – Strong), (5 – Very Strong)			
	R X W = Total	R X W = Total	R X W = Total	R X W = Total
Criterion 1: Reduce Unfunded Liabilities	1 X .40 = .40	3 X .40 = 1.20	4 X .40 = 1.60	4 X .40 = 1.60
Criterion 2: Equity	3 X .20 = .60	2 X .20 = .40	2 X .20 = .40	4 X .20 = .80
Criterion 3: Political Feasibility	3 X .25 = .75	3 X .25 = .75	1 X .25 = .25	4 X .25 = 1.00
Criterion 4: Administrative Feasibility	5 X .15 = .75	5 X .15 = .75	1 X .15 = .15	4 X .15 = .60
Total Score	2.50	3.10	2.40	4.00

Table 5.5 Second Altered CAM Matrix. Slight Weight Changes

Criterion	Alternatives			
	Alternative 0: Maintain Status Quo	Alternative 1: Increase Contribution and Increase Retirement Age	Alternative 2: Implement DC Plan and Increase Contribution	Alternative 3: Implement Hybrid Plan
	Ratings: (1- Very Weak), (2 – Weak), (3 – Moderate), (4 – Strong), (5 – Very Strong)			
	R X W = Total	R X W = Total	R X W = Total	R X W = Total
Criterion 1: Reduce Unfunded Liabilities	1 X .50 = .50	3 X .50 = 1.50	4 X .50 = 2.0	4 X .50 = 2.00
Criterion 2: Equity	3 X .30 = .90	2 X .30 = .60	2 X .30 = .60	4 X .30 = 1.20
Criterion 3: Political Feasibility	3 X .15 = .45	3 X .15 = .45	1 X .15 = .15	4 X .15 = .60
Criterion 4: Administrative Feasibility	5 X .05 = .25	5 X .05 = .25	1 X .05 = .05	4 X .05 = .20
Total Score	2.10	2.80	2.80	4.00

Table 5.6 Sensitivity Analysis Outcome. Slight Weight Changes

Alternative	Original Score	First Altered Outcome Score	Second Altered Outcome Score
0. Maintain Status Quo	2.30 (4)	2.50 (3)	2.10 (4)
1. Increase Employee Contribution for All Employees and Increase Retirement Age for New Employees	2.95 (2)	3.10 (2)	2.80 (2)
2. Implement DC for New Employees and Increase Employee Contribution for Existing Employees	2.60 (3)	2.40 (4)	2.80 (2)
3. Implement Hybrid Cash Balance Plan for New Employees	4.00 (1)	4.00 (1)	4.00 (1)

The results of Table 5.6 highlight the variation of the total scores for each alternative that occur with a slight five percent change in the weights of each criterion. While the weights changed for all of the criteria, alternative three continued to stay the top rated alternative amongst all of the weight changes with no variation in the score amongst all of the different weight changes. Alternative one continued to be the second highest weighted alternative with the changes in weights. While the first alternative retained the second highest score, the variation between the highest (3.10) and lowest score (2.80) was .30. Alternative two had a different ranking for each of the outcomes. The variation for alternative two ranged from a high of 2.80 to a low of 2.40, resulting in a total variation of .40. The last alternative, alternative one continued to fair poorly in the analysis with staying either at a ranking of three or four. The variation of alternative zero ranged from a high total score of 2.50 to a low score of 2.10, with a total variation of .40. This first sensitivity analysis has shown that with a small five

percent change in the weights assigned, the top rated alternative three continues to be the top alternative, while the other alternatives have somewhat different variances based on the weights assigned.

While the previous sensitivity analysis measured the variance of a small change of the weights assigned, the next analysis will focus on the sensitivity of each alternative with large variation in the weights. The first altered weight column decreases the weights of highly weighted criterion (reduce unfunded liabilities and equity) in the original analysis and increase the weights of lower weighted criterion (political feasibility and administrative feasibility). The second altered weight increases the weights of the higher criteria and decreases the weights of the lower criteria. Table 5.7 below highlights the different weights applied to the sensitivity analysis provided in Tables 5.8 and 5.9, which are to follow this page.

Table 5.7 Sensitivity Analysis Criteria. Large Weight Changes

Criteria	Original Weight	First Altered Weight	Second Altered Weight
Reduce Unfunded Liabilities	.45	.20	.50
Equity	.25	.15	.35
Political Feasibility	.20	.30	.10
Administrative Feasibility	.10	.35	.05

Table 5.8 First Altered CAM Matrix. Large Weight Changes

Criterion	Alternatives			
	Alternative 0: Maintain Status Quo	Alternative 1: Increase Contribution and Increase Retirement Age	Alternative 2: Implement DC Plan and Increase Contribution	Alternative 3: Implement Hybrid Plan
	Ratings: (1- Very Weak), (2 – Weak), (3 – Moderate), (4 – Strong), (5 – Very Strong)			
	R X W = Total	R X W = Total	R X W = Total	R X W = Total
Criterion 1: Reduce Unfunded Liabilities	1 X .20 = .20	3 X .20 = .60	4 X .20 = .80	4 X .20 = .80
Criterion 2: Equity	3 X .15 = .45	2 X .15 = .30	2 X .15 = .30	4 X .15 = .60
Criterion 3: Political Feasibility	3 X .30 = .90	3 X .30 = .90	1 X .30 = .30	4 X .30 = 1.20
Criterion 4: Administrative Feasibility	5 X .35 = 1.75	5 X .35 = 1.75	1 X .35 = .35	4 X .35 = 1.40
Total Score	3.30	3.55	1.75	4.00

Table 5.9 Second Altered CAM Matrix. Large Weight Changes

Criterion	Alternatives			
	Alternative 0: Maintain Status Quo	Alternative 1: Increase Contribution and Increase Retirement Age	Alternative 2: Implement DC Plan and Increase Contribution	Alternative 3: Implement Hybrid Plan
	Ratings: (1- Very Weak), (2 – Weak), (3 – Moderate), (4 – Strong), (5 – Very Strong)			
	R X W = Total	R X W = Total	R X W = Total	R X W = Total
Criterion 1: Reduce Unfunded Liabilities	1 X .50 = .50	3 X .50 = 1.50	4 X .50 = 2.0	4 X .50 = 2.00
Criterion 2: Equity	3 X .35 = 1.05	2 X .35 = .70	2 X .35 = .70	4 X .35 = 1.40
Criterion 3: Political Feasibility	3 X .10 = .30	3 X .10 = .30	1 X .10 = .10	4 X .10 = .40
Criterion 4: Administrative Feasibility	5 X .05 = .25	5 X .05 = .25	1 X .05 = .05	4 X .05 = .20
Total Score	2.10	2.75	2.85	4.00

Table 5.10 Sensitivity Analysis Outcome and Score. Large Weight Changes

Alternative	Original Score	First Altered Outcome Score	Second Altered Outcome Score
0. Maintain Status Quo	2.30 (4)	3.30 (3)	2.10 (4)
1. Increase Employee Contribution for All Employees and Increase Retirement Age for New Employees	2.95 (2)	3.55 (2)	2.75 (3)
2. Implement DC for New Employees and Increase Employee Contribution for Existing Employees	2.60 (3)	1.75 (4)	2.85 (2)
3. Implement Hybrid Cash Balance Plan for New Employees	4.00 (1)	4.00 (1)	4.00 (1)

The results of table 5.10 highlight the variation of the total scores with large variations in the weights assigned to each criterion. The first altered score column was where the weights of high weight criterion were lowered and the weights of low weighted criterion were increased. The second altered score column was where the weights of the high weighted criterion were increased further and the weights of lower weighted criterion were decreased. As present in the first sensitivity analysis, alternative three continues to be the top alternative with a consistent score of four across all of the analysis. There was no variation in the total score for alternative three. Alternative one continued being the second highest alternative with the first alteration of weights, but went to third highest with the second alternation. The variation of alternative one went from a high of 3.55 to a low of 2.75, allowing for a total variation of .80. Alternative two continued to be erratic in the total ratings going from fourth in the first analysis and then jumping up to second in the second analysis. The variation of

this alternative went from a high of 2.85 to a low of 1.75, leaving a total variance of 1.10. Alternative zero continues to score amongst the lowest, either third or fourth with a total variance of 1.20.

This analysis has shown that alternative three continues to receive the highest total score with large changes in the weights assigned to the criteria. Alternative one continues to be the second rated when the weights are reversed and third when the rankings are increased, but with a variance of .80 it continues to show that it does have some sensitivity between changing weights. The second alternative continues to be erratic with its total score and in this analysis, it ranked either as fourth or second. The big concern with this alternative continues to be its sensitivity, which points to a large amount of variance caused by changes in the weights assigned. Alternative zero has the largest variation of sensitivity with the largest variance of 1.20 between the two analyses.

While the two-sensitivity analysis focused on variance of the total score caused by different assigned weights, the rankings assigned to each criterion remained stable. It is important to look at the sensitivity of each alternative with different rankings, and to see how that difference can affect the total scores of each alternative. Variation in the ranking between the alternative and the criterion can occur because of the difference between how researchers look at the problem and how individuals may overstate or understate the correlation between the alternative and the criterion. In order to compensate for this variation in the ranking of the criterion to the alternative, a sensitivity analysis follows below, which will result in four changes to the alternatives.

Table 5.11 through Table 5.14 below highlights the original ranking and the change in ranking.

Table 5.11 Sensitivity Analysis. Ranking Change Alternative 0

Criterion	Alternatives			
	Alternative 0: Maintain Status Quo	Alternative 1: Increase Contribution and Increase Retirement Age	Alternative 2: Implement DC Plan and Increase Contribution	Alternative 3: Implement Hybrid Plan
	Ratings: (1- Very Weak), (2 – Weak), (3 – Moderate), (4 – Strong), (5 – Very Strong)			
	R X W = Total	R X W = Total	R X W = Total	R X W = Total
Criterion 1: Reduce Unfunded Liabilities	1 X .45 = .45	3 X .45 = 1.35	4 X .45 = 1.80	4 X .45 = 1.80
Criterion 2: Equity	4 X .25 = 1.00 Originally was 3	2 X .25 = .50	2 X .25 = .50	4 X .25 = 1.00
Criterion 3: Political Feasibility	3 X .20 = .60	3 X .20 = .60	1 X .20 = .20	4 X .20 = .80
Criterion 4: Administrative Feasibility	5 X .10 = .50	5 X .10 = .50	1 X .10 = .10	3 X .10 = .40
Total Score	2.55	2.95	2.60	4.00

Table 5.12 Sensitivity Analysis. Ranking Change Alternative 1

Criterion	Alternatives			
	Alternative 0: Maintain Status Quo	Alternative 1: Increase Contribution and Increase Retirement Age	Alternative 2: Implement DC Plan and Increase Contribution	Alternative 3: Implement Hybrid Plan
	Ratings: (1- Very Weak), (2 – Weak), (3 – Moderate), (4 – Strong), (5 – Very Strong)			
	R X W = Total	R X W = Total	R X W = Total	R X W = Total
Criterion 1: Reduce Unfunded Liabilities	1 X .45 = .45	3 X .45 = 1.35	4 X .45 = 1.80	4 X .45 = 1.80
Criterion 2: Equity	3 X .25 = .75	3 X .25 = .75 Originally was 2	2 X .25 = .50	4 X .25 = 1.00
Criterion 3: Political Feasibility	3 X .20 = .60	3 X .20 = .60	1 X .20 = .20	4 X .20 = .80
Criterion 4: Administrative Feasibility	5 X .10 = .50	5 X .10 = .50	1 X .10 = .10	3 X .10 = .40
Total Score	2.30	3.20	2.60	4.00

Table 5.13 Sensitivity Analysis. Ranking Change Alternative 2

Criterion	Alternatives			
	Alternative 0: Maintain Status Quo	Alternative 1: Increase Contribution and Increase Retirement Age	Alternative 2: Implement DC Plan and Increase Contribution	Alternative 3: Implement Hybrid Plan
	Ratings: (1- Very Weak), (2 – Weak), (3 – Moderate), (4 – Strong), (5 – Very Strong)			
	R X W = Total	R X W = Total	R X W = Total	R X W = Total
Criterion 1: Reduce Unfunded Liabilities	1 X .45 = .45	3 X .45 = 1.35	3 X .45 = 1.45 Originally was 4	4 X .45 = 1.80
Criterion 2: Equity	3 X .25 = .75	2 X .25 = .50	2 X .25 = .50	4 X .25 = 1.00
Criterion 3: Political Feasibility	3 X .20 = .60	3 X .20 = .60	1 X .20 = .20	4 X .20 = .80
Criterion 4: Administrative Feasibility	5 X .10 = .50	5 X .10 = .50	1 X .10 = .10	3 X .10 = .40
Total Score	2.30	2.95	2.25	4.00

Table 5.14 Sensitivity Analysis. Ranking Change Alternative 3

Criterion	Alternatives			
	Alternative 0: Maintain Status Quo	Alternative 1: Increase Contribution and Increase Retirement Age	Alternative 2: Implement DC Plan and Increase Contribution	Alternative 3: Implement Hybrid Plan
	Ratings: (1- Very Weak), (2 – Weak), (3 – Moderate), (4 – Strong), (5 – Very Strong)			
	R X W = Total	R X W = Total	R X W = Total	R X W = Total
Criterion 1: Reduce Unfunded Liabilities	1 X .45 = .45	3 X .45 = 1.35	4 X .45 = 1.80	4 X .45 = 1.80
Criterion 2: Equity	3 X .25 = .75	2 X .25 = .50	2 X .25 = .50	4 X .25 = 1.00
Criterion 3: Political Feasibility	3 X .20 = .60	3 X .20 = .60	1 X .20 = .20	3 X .20 = .60 Originally was 4
Criterion 4: Administrative Feasibility	5 X .10 = .50	5 X .10 = .50	1 X .10 = .10	3 X .10 = .40
Total Score	2.30	2.95	2.60	3.80

Table 5.15 Sensitivity Analysis Outcome. Ranking Changes

Alternative	Original Total Score Table 5.2	Alternative 0 Altered on Equity: 3 to 4. Table 5.11 Total Score	Alternative 1 Altered on Equity: 2 to 3. Table 5.12 Total Score	Alternative 2 Altered on Reduce Unfunded Liabilities: 4 to 3. Table 5.13 Total Score	Alternative 3 Altered on Political Feasibility: 4 to 3. Table 5.14 Total Score
1. Maintain Status Quo	2.30 (4)	<u>2.55 (4)</u>	2.30 (4)	2.30 (3)	2.30 (4)
2. Increase Employee Contribution for All Employees and Increase Retirement Age for New Employees	2.95 (2)	2.95 (2)	<u>3.20 (2)</u>	2.95 (2)	2.95 (2)
3. Implement DC for New Employees and Increase Employee Contribution for Existing Employees	2.60 (3)	2.60 (3)	2.60 (3)	<u>2.25 (4)</u>	2.60 (3)
4. Implement Hybrid Cash Balance Plan for New Employees	4.00 (1)	4.00 (1)	4.00 (1)	4.00 (1)	<u>3.80 (1)</u>

Table 5.15 above displays the result of the sensitivity analysis of changing ranks for each of the four alternatives. Alternative zero's ranking increased from three to four, resulting in a score change from 2.30 to 2.55. The decision to increase equity's ranking came about since some people might see that keeping the status quo in effect

may be more equitable than stated in the original analysis, resulting in the higher total score. While the total score for this alternative did increase from the original total score, the overall score amongst the other alternatives did not change and this alternative continues to have the lowest score amongst alternatives. For alternative one, the ranking for equity increased from two to three resulting in a total score increase from 2.95 to 3.20. A decision was made to increase the ranking for equity for this alternative since there may be some moderate equity under this alternative since employees continue to be on a DB plan and taxpayers will hold less unfunded liabilities through higher employee contributions for all employees and higher retirement ages for new employees. This alternative continues to have the second highest total score amongst all of the alternatives. Alternative two had the ranking for reducing unfunded liabilities reduced from four to three, resulting in a total score reduction from 2.6 to 2.25. This reduction is possible since some people may see that this alternative does nothing to reduce unfunded liabilities since the DB plan will continue to be in place. This reduction in ranking resulted in the total score for alternative two going from third highest to the lowest of the four alternatives. For alternative three, the ranking for political feasibility decreased from four to three resulting in a total score reduction from 4.00 to 3.80. This ranking decrease could result from individuals believing that the alternative may not be acceptable by key political stakeholders such as legislators, unions, taxpayer advocates, or Californian's themselves. This reduction did not reduce the alternatives ranking as compared to the total scores of other alternatives.

While the ranking for each of the alternatives was altered while holding the other alternatives constant, there was little change in the total overall scores when compared to other alternatives. There was one time when a total score ranking for an alternative reduced from third highest to the lowest, which was when alternative two had a reduction in the criterion of unfunded liabilities. With relatively no change in the overall total scores of the alternatives caused by this change in ranking, it would be safe to assume that there is little sensitivity amongst the alternatives with slight changes in the rankings.

Conclusion

This chapter presents the results of the CAM analysis. The alternatives and weights came from Chapter Four and the rankings came about in this chapter, with the rankings from this chapter highlighted in Table 5.1. Based on the results of the qualitative CAM analysis, the four proposed alternatives total scores were calculated for the quantitative analysis, presented in Table 5.2. The initial CAM analysis identified alternative three; implement a hybrid plan for new employees, as the optimal public policy options holding the criterion, weights, and rankings constant.

While alternative three was the optimal policy option while holding all areas constant, it became apparent that environmental conditions can change and individuals could potentially rank alternatives or weight criterion differently. It is extremely possible that Democrat and Republican legislators would change the weights for the criterion or rank the alternatives differently. In order to identify the optimal policy alternative in the face of this uncertainty, sensitivity analyses were conducted. These

analyses showed that when the criterion weights or alternative ranks differed, alternative three continued to have the highest total rank, making it the optimal policy alternative.

Chapter 6

RECOMMENDATIONS AND CONCLUSIONS

Over the past century, planning for retirement and having stable income for retirement has become an important area for all workers and their families. This has been evident through government programs such as Social Security, and the addition of individual employer sanctioned and supported retirement programs such as defined benefit (DB) pension plans and defined contribution (DC) 401K plans. The stock market losses of 2008, associated with the recession, brought about large reductions in the assets of DB pension plans across the world, including California's CalPERS pension system. In addition to a loss of assets in the CalPERS fund because of the recession, California experienced reductions in tax revenue bringing about problems with the state's budget and increases in the need for public services. With a reduction in pension assets compounded with large budget deficits and higher utilization of social services, individuals began to focus on the ability of CalPERS to fulfill their liabilities in the future, and possible unfunded liabilities that may arise because of a lack of assets to cover these promised liabilities.

The purpose of this thesis was to examine the issue of unfunded liabilities in DB pension systems, and to find the best path to mitigate or even eliminate these liabilities. Before it was possible to examine the issue of unfunded liabilities, it was important to understand how large the problem of unfunded liabilities is, and to examine the policy choices of other states in addressing unfunded liabilities. Understanding the size of

unfunded liabilities and the policy options from other states made it possible to apply that knowledge to California, and mitigate the negative effects of unfunded liabilities.

In addition to applying policy options from other states, this thesis takes into account the different environmental factors unique to California such as our politics, economics, and culture in order to help evaluate the alternative policy choices to mitigate unfunded liabilities. While taxpayers hold the greatest risk with unfunded liabilities because of the fiduciary responsibility to fulfill that liability, it was important to balance all benefits and risks between public employees, legislators, and taxpayers. Therefore, the analysis judged policy options on shared risks and benefits amongst the stakeholders.

Organization of Thesis

This thesis consisted of six chapters, including this chapter. The first chapter set up the problem statement and the reason that a thesis was necessary to study the issue of unfunded pension liabilities. This chapter defined important terms, described the fundamental retirement funding structures of a defined benefit (DB), and defined contribution (DC) system. The remaining sections of the first chapter went over the history of pension systems in California and the key decisions that were made in the past that have contributed to where we are today with unfunded liabilities.

While chapter one ended with a discussion of how California got to where it is today, Chapter Two focused on the problem of unfunded liabilities and how large they are currently, and their potential for growth in the future. Some areas examined include the breadth of unfunded liabilities, contribution rates for both employees and

employers, and the health of municipal pension programs. A section in the chapter focused on public opinion polling data so that the reader understood the issue of unfunded liabilities, while also focusing on what the public thinks about the current DB system and the unfunded liabilities created.

Chapter Three focused on the literature surrounding different techniques utilized by California and other states to mitigate unfunded liabilities. This literature review focused on three alternatives and the academic literature surrounding them. The literature provided background information on the application of these ideas and their impacts on unfunded liabilities. In addition to providing theoretical information on the alternatives, information on cost savings and their effects on unfunded liabilities were also included.

The first three chapters focused on the issues of how we got to where we are today, how large the problem is, and what can the literature tell us about ways to reduce unfunded liabilities. Chapter Four introduces Bardach's (2009) eight steps to policy analysis, which set the foundation for analysis of alternatives, criterion, and weights. The chapter continued with a description of the four alternatives, four criteria, the weights assigned to each criterion, and what would constitute a high or weak relationship between the criterion and the alternative. The chapter concluded with a discussion of Munger's (2000) criteria alternative matrix (CAM) and its application in the analysis.

Chapter Five applied Munger's (2000) CAM analysis to find the optimal policy alternatives given the criterion and assigned weights. This chapter focused on what the

best policy alternative would look like in a perfect world, along with a deeper explanation of each alternative. The section concluded with a qualitative analysis of each alternative given the assigned criterion. This qualitative analysis provided the correlation of strength between the criterion and the alternative. This information was then inputted into a quantitative CAM analysis, where the rankings and weights were put together to come up with the alternative scores. A sensitivity analysis followed this discussion, which ensures that the preferred alternative does not vary with a small or large variation in the weights or different rankings assigned.

This final chapter begins with a summary of the results obtained in chapter five. There will then be a discussion of each alternative and the tradeoffs associated with their implementation. The last section of the chapter will take the information from the policy analysis, CAM results, sensitivity analysis, and the problem statement, to make formal recommendation to citizens, elected officials, and employees on what the State of California should do to address unfunded liabilities.

Overview of Alternatives and Tradeoffs

The previous two chapters focused on setting up the methodology to analyze the four alternatives along with the corresponding weights with a criteria-alternative matrix (CAM), and implementing the CAM to find the optimum public policy alternative. This optimum alternative came about by examining the total scores calculated by ranking each alternative against the criterion, and applying the weights identified in Chapter Four. Based upon the results of the CAM analysis performed in Chapter Five, Alternative Three (Implement a Hybrid Plan), received the highest total score making it

the preferred policy alternative. While Alternative Three received the highest total score on the CAM analysis, when accounting for tradeoffs it is possible that the alternative may not be the best choice. Unanticipated consequences could occur from implementation; this could ultimately lead to either a new or a different set of policy problems, which would need addressing. This section will discuss each alternative in relation to the potential tradeoffs and consequences that could occur if adopted.

Implement a Hybrid Cash Balance Plan for New Employees

A hybrid cash balance plan ultimately provides the best of both retirement systems provided to employees, DB and DC plans. The hybrid plan provides the employee the safe and predictable annuity of a DB plan, while reducing the liabilities that taxpayers hold, just like in a DC plan. Amongst all of the criteria, this alternative ranked relatively high in all criterion areas.

One possible tradeoff in adopting a hybrid plan is that this alternative has the potential to increase unfunded liabilities since the taxpayers will continue to hold a fiduciary responsibility to fulfill these liabilities. While the alternative has the potential to mitigate unfunded liabilities for new employees, there is a possibility that this alternative could result in more unfunded liabilities. This liability is the annual interest payment, which the employer must provide to the employee yearly. While the alternative calls for the state to invest in safe investment vehicles such as US Treasury bonds, there is still a slight possibility that the state would not have the investment assets to cover the liability that could result in the creation of an unfunded liability. This alternative does reduce the risk of future unfunded liabilities created under the

status quo, and further reduces this liability without shifting all of the risk to the employee. The main consideration for stakeholders to make is if this alternative reduces the risk of unfunded liabilities, or if the slight possibility that this alternative could result in additional unfunded liabilities, if the investment in safe investment vehicles does not materialize, is enough to cancel out the net benefits of this alternative.

Increase Employee Contribution for All Employees and Increase Minimum Retirement Age for New Employees

By altering the current DB system through higher employee contribution and higher retirement ages for new employees, unfunded liabilities decrease. This reduction occurs since there are more assets in the DB system through more contributions from current and new employees, compounded with more years of contributions from new employees because of higher retirement age minimums. While this option has the potential to decrease unfunded liabilities by adding more assets from employee to the system, taxpayers would continue to hold a fiduciary responsibility to realize any unfunded liabilities created.

The main tradeoff to confront with this alternative is that it creates unequal benefits between current and future employees. With new employees having to work more years and pay more into the pension system in the form of higher contributions, some employees may decide to pass on a job with the state. In addition to new employees deciding not to work for the state, current employees may decide to leave state service because of the higher employee contributions, which ultimately reduce their net earnings. The possible reduction of current employees and future employees

not applying for jobs at the state could possibly result in higher costs for recruiting qualified individuals, which may require the state to hire individuals at a higher salary step, further exacerbates the problem of unfunded liabilities in the future. The main consideration here is to see if the net benefits of reducing future unfunded liabilities outweigh the possible risk of lower employee retention and higher cost for recruiting and retaining qualified individuals.

Implement a DC Plan for New Employees Increase Employee Contributions for Current Employees

This alternative attempts to reduce unfunded liabilities by requiring all new employees to enroll in a DC plan and have current employees in the DB plan pay more into the system in the form of higher employee contributions. With new employees required to enroll in a DC plan where the employee holds all of the risk, the employer holds no fiduciary responsibility in the future since there are no liabilities created. Current employees will continue to be in the DB system but will have to pay more into the system in the form of higher employee contributions, which will help bolster the assets in the plan to mitigate the creation of future unfunded liabilities. As shown in the analysis, this alternative may alleviate future unfunded liabilities, but lacks any source of equity between employees and fails to obtain any support with majorities in the legislature, and lacks administrative feasibility.

There are multiple tradeoffs associated with this alternative including a lack of equity between employees, and the possibility that the policy may result in the creation of more unfunded liabilities. New and current employees would essentially have

different retirement benefits and new employees may feel that they are not as valuable as current employees are, since they are in the DC plan and hold all of the risks for their future retirement. This inequity can lead to individuals either deciding not to work for the state or more turnovers occurring with future employees deciding not to stay with the state for their entire careers. This can lead to higher recruitment and training cost, along with a loss of overall efficiency in state programs because of higher turnover. In addition to higher cost to recruit and retain employees, this alternative may result in higher unfunded liabilities with a reduction in the number of people in the DB system. With the DB system closed to new employees, there is only a stagnant and ever eroding base of individuals paying more into the system than benefits received. Under this alternative, there will come a time when more individuals are withdrawing more benefits out of the current systems assets than paying into the system, which will lead to the creation of unfunded liabilities. The worst situation occurs in the future when there are no employees paying into the system and all of the members in the system are retirees drawing down their pensions, which will require contributions from the general fund or taxpayers in order to fulfill the liabilities, if there are not enough assets in the plan. While this alternative eradicates the creation of unfunded liabilities by new employees, it is important to weigh that benefit against the potential for higher unfunded liabilities in the current DB system and the higher cost for recruitment and retention of employees.

Maintain the Status Quo

This alternative presents a very strong option when it comes to ensuring equity between employees and having both political and administrative feasibility, since it is already in place. Since this option is already in place, there would be no changes to the current system and benefits would remain in place. With the status quo remaining in place unchanged, the risk of fulfilling any unfunded liabilities remain with the taxpayer, which can result in redirection of general fund resources for education, public safety, and health and human services programs, or can result in increased taxes to cover the liabilities.

While this alternative satisfied all of the other criteria for the analysis presented in the previous chapter, its main tradeoff became its demise, which is that it does not reduce unfunded liabilities. It is because of the current DB system that unfunded liabilities exist and that the employer has the ultimate fiduciary responsibility to fulfill that liability. The status quo lacks any structural ability to change in order to mitigate unfunded liabilities. It is from the fact that because of the status quo unfunded liabilities came about in the first case, combined with a lack of a structural ability for the current system to mitigate new liabilities, that this alternative received the lowest score amongst the alternatives.

Recommendations

All of the previous chapters of this thesis help to provide a background for analyzing the four proposed alternatives and helped to identify the optimum policy alternative given the conditions unique to California. It was only through a deeper

understanding of the background of unfunded liabilities in California combined with a review of relevant academic literature on the subject, and utilizing a CAM analysis to test proposed alternatives against selected criteria, that it became possible to obtain quantitative results on the effectiveness of each alternative. Each alternative underwent a sensitivity analysis to find any variability caused by small and large changes in the weighting for each criterion, and the variability caused by changing the rankings assigned to each alternative. The results from the previous chapter, augmented by the research of academic articles, and the facts of unfunded liabilities in California, led to the realization that there are two possible avenues for California in reducing unfunded liabilities. Below are the recommendations that California should consider, which are to implement the optimum policy alternative of implementing a hybrid plan, followed by the alternative of increasing employee contributions for all employees and increasing the retirement age for new employees, if the previous alternative is not implemented.

Recommendation 1

The status quo continually received some of the lowest scores from the CAM analysis, directly pointing to the inability of this alternative to reduce unfunded liabilities. Practical and academic knowledge support this assertion since the status quo is the reason that California has to confront the issue of unfunded liabilities in the future. The future risks and costs to the state and taxpayers of California simply outweigh any benefits provided by this alternative. The recommendation is that California citizens and legislators move forward, support implementing recommendation number four, and disband the status quo.

Recommendation 2

While the alternative of implementing a DC plan for new employees along with increasing employee contributions for current employees has a proven track record in other states such as Michigan and Alaska, given the criterion and the unique environment in California, this alternative did not fare well and received either the lowest or second lowest total score. One of the main reasons that this alternative received low scores came with the lack of equity between employees for risk shouldered, no political feasibility in the legislature, and virtually no administrative infrastructure in California to implement this alternative. It is because of the assessment that a recommendation not to pursue this option is possible.

Recommendation 3

Increasing the employee contribution for all employees and increasing the retirement age for new employees is the policy alternative that continually received the second highest total score, in all but one of the analyses performed. This main reason, which assisted in the higher ranking for this alternative, came from the fact that this alternative did not abolish the DB pension plan and the benefits available to retirees. It is from this augmentation of the current program that political and administrative feasibility will help to benefit this alternative. One of the few negative aspects of this alternative is that a fiduciary responsibility to fulfill any unfunded liabilities will remain with the taxpayers, and the state of California. Overall, the net benefits of mitigating future unfunded liabilities through higher employee contributions and increased retirement ages outweighs the costs of maintaining the fiduciary responsibility to fulfill

liabilities, which is already present under current law. Therefore, a formal recommendation that California only pursue this alternative as a backup proposal, only if the preferred alternative in recommendation four does not move forward.

Recommendation 4

It is the formal recommendation from this analysis, backed up by the academic research, that the citizens and elected officials of California support a Constitutional Amendment to implement a hybrid cash balance plan for all new employees. Continually, during the analysis, this option received the highest total score, and when examining the potential tradeoffs associated with this alternative, the benefits realized simply overshadow any costs and risks. While this alternative does not shift all of the risks away from the state and taxpayers, through the incorporation of both DB and DC components significant risks are lower, and the result is the mitigation of future unfunded liabilities. In order for implementation of this recommendation to occur, there must be political support from taxpayers and legislators, as well as support from unions and taxpayer advocates. It is only with the support from these groups that this recommendation can move forward.

Conclusion

Throughout this thesis, there has been a focus on the issue of unfunded liabilities in the DB pension system and the effect they can have on California. Early on in the first three chapters, there was an attempt to understand the history of pension systems in California, how large the problem of unfunded liabilities are, and what the academic literature says about unfunded liabilities, along with ways to remedy them. With a

deeper understanding of what unfunded liabilities are and what the literature says about how to mitigate them, Chapter Four and Five set out to analyze potential alternatives utilizing a CAM analysis to find the optimum policy alternative. It was from this analysis of alternatives that the formal recommendation that California citizens and elected officials amend the constitution of California to implement a hybrid cash balance came forward as the preferred recommendation. It is possible that different people would have arrived at different recommendations based upon the alternatives proposed, the criterion used, or the way that they view the environment of California. While this analysis did not occur in a vacuum, the alternatives and criterion used may not be the best indicators of the problem in the future, and further analysis should focus on the relevant variables at the time of a new analysis.

Future research on this topic should focus on mitigating unfunded liabilities by examining the recommendations recently released in a pension study by California's Little Hoover Commission (2011). The main recommendation in this study departed from this analysis, with the assumption that future liabilities do not reflect deferred compensation and case law does not preclude California from altering un-accrued pension benefits through a clarification in state statute or an amendment to California's Constitution. This thesis early on adopted the understanding that case law, the Constitution of California and the United States, precluded the state from altering un-accrued future benefits, which all future pension benefits were set on the first day of employment, and any alteration is unconstitutional. Future researchers may wish to reexamine the methodology and alternatives proposed in this thesis under the

assumption that future un-accrued benefits may be altered. Had this thesis adopted this assumption earlier on, the results of the CAM analysis and recommendations made would be different than they are in this thesis.

The goal of this thesis was to answer the research question, in light of the rising cost of unfunded liabilities, constant budget deficits, and the lack of citizens' support for California's current public pension systems; is it within California's best interest to reform the current pension system, abolish the current pension system and implement a new system, or to maintain the status quo? From the analysis performed and the top recommendation identified, it is within California's best interest to abolish the current pension system for new employees and implement a new system. Specifically, California should implement a hybrid plan for new employees in an attempt to reduce future unfunded liabilities. There is no easy solution to solving the growing issue of unfunded liabilities, it will require key stakeholders to come together and understand that unfunded liabilities are not a viable option for citizens, elected officials, or employees, and they need to be addressed relatively soon before the creation of more liabilities, which will only exacerbate the problem.

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