Possible Solutions to the Rhode Island State Government's Unfunded Pension Liability

The Honors Program
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ABSTRACT

This paper examines the possible causes of the nationwide unfunded public pension liability problem in the U.S., and what solutions are being proposed to combat the issue. After examining the general problems associated with multiple states' pension systems, a specific analysis of the Rhode Island public pension system will be conducted. Through this investigation, the factors that led to the crisis in Rhode Island will be unveiled, and possible solutions to the state-specific problem will be developed. In order to arrive at a set of final recommendations for the government, a model will be used to evaluate the effects of different recommendations on their ability to decrease the unfunded liability's outstanding sum. This model will have both qualitative and quantitative factors included. The qualitative section will evaluate the possible positive and negative effects of the proposals, while the quantitative section will try to predict the possible monetary and fiscal effects the solutions will have on the outstanding liability. Finally I conclude with a set of solid analytical and statistical recommendations that can be taken to the government of Rhode Island in hopes of being considered for future implementation.

INTRODUCTION

Pension plans have long been used as a vehicle to support retirement savings for employees in both the public and private sectors. Public pensions, the main topic of this paper, first gained popularity in the United States as a method to attract, retain, and motivate military personnel in the days of the Revolutionary and Civil Wars (Craig). Throughout their development they have evolved into complex retirement funds that manage trillions of dollars nationwide, a huge responsibility for the governments that oversee them. What this paper is concerned with is how a mismanagement of those funds through irresponsible policy decisions and market fluctuations can lead to enormous unfunded liabilities.

Pensions Defined

To fully understand the situation, a brief overview of pensions must be given. A pension plan, as defined by the Rhode Island Public Expenditure Council (RIPEC), is a program designed to provide a benefit - a portion of salary post-employment - to employees who meet minimum requirements based on age and years of service (Rhode Island Public Expenditure Council). A pension fund holds assets and liabilities just like a normal business would. The pension represents a liability to pay employees covered under the fund a benefit that accrues over their service with the government. Pension funds amass assets through contributions by employees and employers, and by the returns gained or lost through investment exposure. One of two things can happen to a fund throughout its lifetime: (1) it can grow from higher than expected investment returns and/or decreases in benefits, or (2) an unfunded liability can develop when liabilities (benefits) exceed assets (contributions and returns). There are two basic types of pension funds, one being the defined benefit plan and the other being the defined contribution plan. These plans differ in terms of who bears the risk, how a benefit is calculated, how the funds are invested, and how they influence behavior (Rhode Island Public Expenditure Council).

Defined benefit plans are contractual agreements between an employer and an employee to pay retirement benefits based on such factors as age, years of service, and a specified salary rate. The plans are normally funded through employee and employer contributions which are then invested in vehicles such as government bonds, equity securities, etc, to achieve returns

suitable to fund a portion of the plan. Regardless of the performances of the investments, benefits must be paid to those employees eligible to retire and seeking to collect the compensation. Generally a defined benefit plan is thought to situate more risk with the employer than with the employee. As stated before, the benefits accumulated by the employees must contractually be paid regardless of whether or not the specific fund has the available resources to do so. Therefore, the employer bears the risk of contributions or investment returns not being high enough to support the bill. The employees' risks are normally just those of transferring to a new job which the fund does not cover or any increases in inflation above those expected and compensated for in any cost of living adjustments (COLA). A lack of funds in the plan can have serious implications for any government budget with this problem. The behavior influenced by defined benefit plans can most readily be exhibited by the lower worker turnover and higher employee salaries. For example, because defined benefit plans offer guaranteed lifetime income after retirement, most employees are incentivized to stay with that employer longer. As a result, typical payroll expenses are higher, which directly affects salary bases when determining the benefits payable to retirees. Also, defined benefit plans normally have higher benefits than those of defined contribution plans.

Defined contribution plans are very different from defined benefit plans. A defined contribution plan is a guarantee by an employer that contributions will be dispersed to a retirement account created for the employee. Generally, an employee contributes a certain percentage of his/her salary to the plan. That amount is normally matched by the employer up to a specific percentage. Under these plans, the risk falls upon the employee as the funds that are in the account at the time of retirement is the amount which the employee can retire on. Under no circumstances is the employer obligated to make extra contributions in order to raise the value of the plan to a certain level. The associated benefit of these types of funds is accrued through contributions by the employee and employer, and investment returns. Here however, the employee has control over what assets are included in his/her plan. Therefore the employee reaps the reward (or loss) of his/her investment decisions. A distinct advantage of this type of plan is that it is portable – meaning it can be transferred from one job to another. Though these types of plans are quite common in the private sector, where the

employer most normally does not have the available resources to cover losses or underfunding of a defined benefit plan, they have not penetrated the public sector to a great degree. According to RIPEC, those participating in defined contribution plans represent less than four percent of the state and local workforce and less than one percent of the total state and local pension assets (Rhode Island Public Expenditure Council).

Over the past two decades our nation's public system has begun to see marked deteriorations in defined benefit pension programs. The next section of this paper will review current literature to determine what causes led to the current crisis our state governments, specifically Rhode Island's, are experiencing concerning unfunded pension liabilities.

LITERATURE REVIEW

Problems with the Current Public Pension System

Public pension systems in the United States have long been effective vehicles for government employers looking to provide their employees with retirement plans. However, as of the past two decades or so, pension systems have seen noticeable deteriorations. Whether this is simply a result of debilitating market conditions or a result of a lack of responsible fiscal policy is debated quite thoroughly. However, most normally the conclusion is such that irresponsible fiscal policies are exacerbated by negative market fluctuations, and that the real, underlying problem lay with the decision-making of governments. Throughout this review four main problems suspected of leading to the current pension crisis will be examined. They are:

- Excessive benefits for government employees
- A lack of proper planning and decision-making by governmental bodies
- Changing demographics
- Failures to make annual required contributions to the funds

Each problem consists of many sub-issues that evidence how these four problems have led to the crisis.

First to be examined is how excessive benefits for government employees have led to a liability that requires an increased amount of assets be held in the funds. The argument has

often been made that pension benefits are a tool used to attract higher-talented workers. However, this argument has been unsubstantiated by evidence. As cited in a study by the Reason Foundation, the average raw wage for state and local government employees is $23.52 per hour, compared with $16.71 per hour for private sector employees. When benefits are included, the public sector employee's wage increases to $34.13, while the private sector employee's increases only to $23.41. This suggests that even when benefits are included, the private sector employee does not get paid as much as the raw wage of the public sector employee (Passantino and Summers). Union pressure to increase wages has grown substantially over the past decade. What most government employers are doing in response to the demands is increasing benefits. Increasing pension benefits has often been seen as a way to appease unions while not incurring any direct costs that may hurt the reputation, and therefore voter approval of, the officials in charge of the specific government employer. Basically, what has occurred is one big game of "pass the buck" to a future generation.

To delve a little more deeply into some particular practices that increase benefits, pension spiking and DROP programs will be examined. Pension spiking is the practice of "gaming" the system to improve one's final compensation, which in turn improves pension benefits, shortly before retirement. One example of pension spiking is utilizing unused vacation time to increase the amount of one's final compensation. Under this practice employees who have accumulated large amounts of vacation time can "cash-in" the time as a lump sum payment that is included as compensation. What is even more detrimental to the fund is that the vacation time is "sold back" at the employee's current salary, not at the level at which the vacation time was accrued. According to the Reason study, in New Jersey, sick time and vacation time sell-back benefits are expected to cost taxpayers nearly $1.5 billion in the coming years (as of 2005) (Passantino and Summers).

Another example of excessive benefits are the DROP programs currently instated in many government pension programs. A Deferred Retirement Option Program is a plan designed to retain senior employees who are close to or beyond the retirement age. The basic concept of this program is to incentivize senior employees to stay with the employer for typically three to five years during which the employer will deposit monthly "pension substitution" checks into

an individual account. These amounts are typically what the employee would have received had he/she retired, and the cash often earns generous amounts of interest as well – typically 8% or 8.5% (Passantino and Summers). At the time of entering into the DROP, the employees' benefits are frozen at their current level, and upon retirement are dispursed along with the DROP account values. The harm in this is that the government is giving away pension benefits at the same time they are paying for salaries, and often the benefits earn higher rates than they would have regularly, costing the government even more money.

The second major problem to be evaluated is the lack of proper planning and decision-making on the parts of the governmental bodies in control of the funds. Much of the current crisis pension funds are experiencing right now is a result of a lack of proper planning by both actuaries and policy makers. For example, "the median investment return assumption for fiscal year 2003 was 8%. The actual return on the aggregate funds has only been about 4.1% over the past five years (2000-2005) (Brainard)". The problem here is that every year returns are less than expected, contributions will fall short of the actual liability and the unfunded liability will increase as a result. To complicate this problem, many government employers do not use a smoothing process for evaluating returns (Passantino and Summers). What this would entail is essentially a process of averaging investment returns over a certain period, take 10 years for example, in order to arrive at a "smoother" contribution rate – one not determined on a year-by-year basis that would fluctuate wildly.

Runups of the market throughout the 1990s were ideal situations for pension funds. Assets were much higher than liabilities and many pension funds enjoyed surpluses from contribution rates. One would expect decision-making to be relatively easy; leave the surplus in the fund to provide a cushion for future years when the market might not be performing so well, which inevitably will happen. However, that is not what most pension fund officials do. Instead, most enjoy a "contribution holiday" where they do not make any contributions for that year and instead divert the funds to another cause such as shrinking the budget gap (Mendel). The question then becomes, "what happens when markets go awry?" Will the government pump more money into the fund's annual contribution? More often than not they won't says the Reason Foundation, because poor market situations are often correlated with

poor economic activity and strong budgetary pressures. The runups also lead to positive investment returns that are often not cashed out. While this does not occur on a wide-scale basis, some governments including Rhode Island in some cases, have a trend of "letting their gains ride," and not cashing out when the returns could be put into safer, lower-yielding bonds (Rhode Island Public Expenditure Council).

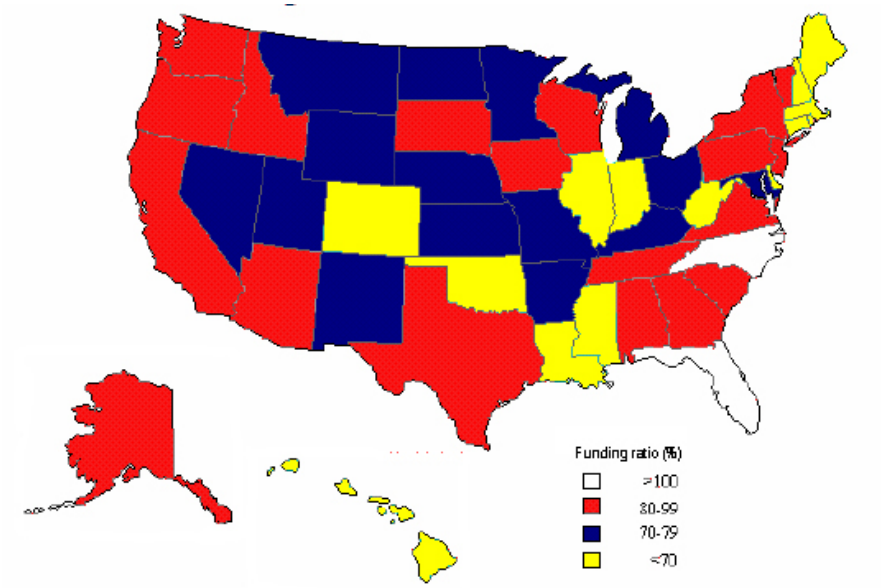
A last ill-fated policy decision in most cases – the problems in Pennsylvania's municipal system might have been solved using this method – is the use of pension-obligation bonds to secure funding to pay down the unfunded liability. POBs are the same as regular debt-obligation bonds except the proceeds go to fund a pension crisis. What occurs is that the government issues the bonds to the general public, uses the proceeds to pay down the debt, and then repays the bonds at a later, specified date (the maturity date of the bond). The problem with this approach is that the government is betting that the return on the bonds, normally around 6-7% will be less than the market returns on the investment of contributions (Hayllar). As we have seen, throughout 2000-2005 pension fund investments have aggregately grown only approximately 4.1%. Therefore, as mentioned above, it is hard to tell whether or not this approach, taken by the municipal governments in Philadelphia and Pittsburgh, will work, or if it will turn out to be a costly gamble.

The next problem to be evaluated is the changing demographic of pension fund participants. According to a study by the Urban Institute, "the typical time a man spends in retirement has nearly doubled since 1950 (Penner, Perun and Steuerle)." This is a result of an increasing life expectancy and decreasing trend of retirement age. Consequently, costs for retirement are going up, which in a defined-benefit program fall on the employer. It also does not help the situation that possibly the largest generation, the "Baby Boomers" will be retiring soon, some have already begun to retire. As cited in the Reason Foundation study, "At the federal level, more than half of all government employees will be eligible to retire in the next five years (Passantino and Summers)." This is a daunting figure staring pension fund managers in the face. The question is, how will a decreasing active worker base support an increasing retiree base? This specific situation will be discussed later concerning Rhode Island.

The current economy is changing demographics as well. Health care costs are soaring right now, and as health care makes up a significant amount of pension benefits, a solution must be devised to combat these rising expenses. The unemployment rate is also producing negative effects on pension plans. According to the U.S. Bureau of Labor Statistics, as of October 2009, the national unemployment rate is 9.5%. Large payroll losses are producing negative effects on contribution rates – as the number of employees contributing to the fund goes down unexpectedly, actuarial estimates become increasingly incorrect. Accordingly, the unfunded liability either does not get paid down or unfortunately increases. In Rhode Island, the rate of active employees participating in the fund is down 5% from June 2007 to June 2008 alone (Rhode Island Public Expenditure Council).

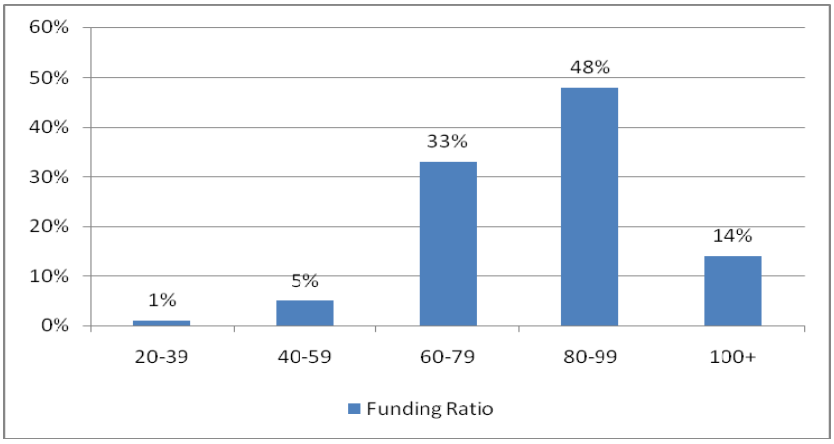
The last problem to be described is the failure of many government employers to make the annual required contribution. Though many reasons have previously been discussed as to why a pension fund might not be hitting contribution rates, there are several key factors that even more directly impact the ability to make a required contribution. Shown below are depictions of current funding ratios in the United States. It should be noted that 80% is considered to be well-funded.

Figure 1. State Funding Levels: Assets as a Percentage of Liabilities



Source: Julia K. Bonafede, Steven J. Foresti, and Benjamin J. Yang, *2004 Wilshire Report on State Retirement Systems: Funding Levels and Allocation*, Wilshire Associates, March 12, 2004, p. 8.

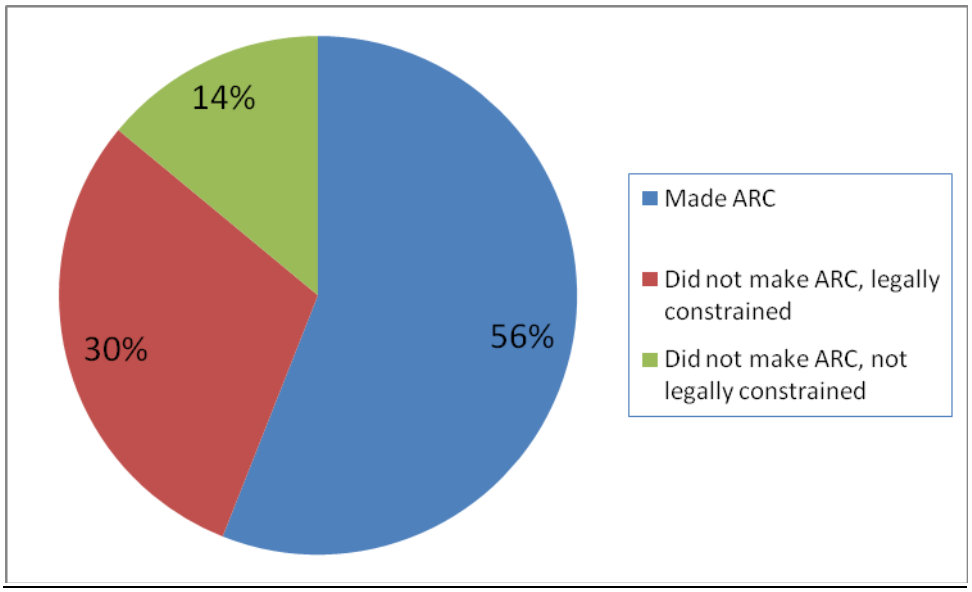
Figure 2. Distribution of State and Local Plans by Funding Ratio, 2006



Source: Re-creation from National Association of State Retirement Administrators and National Council on Teacher Retirement, *Public Fund Survey*, 2006

The first of these reasons is that the government may actually be legally constrained from increasing the contribution rate above a certain level. As noted in a study by the Center for Retirement Research at Boston College, "44% of sponsors that did not pay 100% of the annual required contribution were legally constrained." Take for example, the Kansas state employees' retirement system. They made only 63.4% of their ARC because a statute is in place that prohibits them from making a contribution equal to or above the certain level prescribed by actuaries in 2006 (Munnell, Haverstick and Aubry). Most states that have statutes limiting contribution rates have begun to take action to ease the constraints. Depicted below is a graph of those plans that made or did not make their contribution rates, and if they were legally constrained.

Figure 3. Distribution of Plans by ARC payment and Legal Constraint, 2006



Source: Re-creation from authors' calculations from 2006 PFS and various annual reports

Another reason contributing to why state and local governments might not make their required contribution rates is the accounting method used in arriving at the determined rate. Referring once more to the Boston College study, "the choice of actuarial cost method –

either Entry-Age or Projected Unit Credit – may also indicate the strength of a sponsor's funding commitment (Munnell, Haverstick and Aubry)." The Entry-Age method normally recognizes a larger benefit upon retirement than the PUC method and therefore generally requires a higher contribution rate. The significant minority using the PUC are determined to be taking the "cheap way out," showing their lack of commitment to the ARC (Munnell, Haverstick and Aubry). The last statistically significant factor for the study was the size of the plan. According to the study, larger size plans more typically failed to meet their ARC simply because of the strain put on the government budget.

Solutions Offered by State Governments and Finance Professionals

Pension fund officials and the general public have begun to recognize the severe effects a mismanaged pension fund can have on a state budget, the employees covered, and the taxpayers supporting the fund. To combat the ever-mounting problems discussed above several proposed solutions have been introduced by state governments and financial professionals. Five main proposals are listed below.

- Implement Defined Contribution Plans for all new employees
- Keep contribution levels steady, avoiding giving away pension surpluses
- Move a greater percentage of the fund's investments into hedge funds to earn higher returns
- Institute voter approval requirements for all increases in government benefits
- Have a one-time liquidation of underperforming assets, or the sale of pension-obligation bonds, as short term fixes to buy time for a long term solution to be developed

Some states and municipalities, such Illinois and San Diego have begun to implement a few of these solutions, and the results so far have been positive. However, what this paper is concerned with is how proposed solutions will benefit or detriment the specific case of the Rhode Island state government's pension program.

Rhode Island State Pension Program

The Rhode Island state pension program has been drug down over the past decade by a slew of ill-fated policy decisions and lackluster performance from investment returns. As a result, the state is facing one of its worst financial crises ever, with over $7 billion hanging above the

head of a budget that is already fiscally strained to the limit. Below are some key statistics concerning the current picture of the pension system (Rhode Island Public Expenditure Council):

- The estimated funding ratio for the Employee's Retirement System of Rhode Island (ERSRI) is 57.5% while the aggregate funding ratio nationwide is approximately 86%
- Combined, Rhode Island's state employee and teacher pensions have an unfunded liability of approximately $5 billion (does not include municipal, state, or judges pensions)
- The state's ARC for pensions for state employees and teachers increased from 4.6% of general revenue expenditures in 1997 to 5.9% in 2007
- Based on a recent comparison among other New England states, Rhode Island's benefit program seems to be the most generous

What has also not necessarily been put on the books yet is the enormous negative effect the national economic and financial crises have had on the budget and the pension system of Rhode Island.

Chronic underfunding, overly optimistic investment return assumptions in the past few years, and excessively generous benefits have been the downfalls of the Rhode Island pension system. Listed below is a table that shows how Rhode Island has underfunded its pension system for years. Note again that to be considered a well-funded plan, a funding ratio of at least 80% should be achieved.

Figure 4. Funded Ratio Trends for Rhode Island

Funded Ratio Trends Rhode Island Retirement Systems					
Year	State Employees	Teachers	State Police	Judges	Municipal Employees
1996	77.50%	74.00%	84.80%	97.10%	121.40%
1997	78.30%	73.40%	89.40%	74.30%	132.90%
1998	80.60%	76.20%	92.10%	81.60%	128.80%
1999	84.40%	82.10%	78.20%	74.50%	126.70%
2000	81.60%	80.60%	81.50%	75.90%	124.60%
2001	77.90%	77.40%	86.40%	76.40%	118.10%
2002	71.70%	73.20%	75.50%	68.50%	111.30%
2003	64.50%	64.20%	73.70%	72.00%	100.70%
2004	59.60%	59.30%	75.80%	73.30%	93.20%
2005	56.30%	55.40%	79.00%	87.00%	87.20%
2006	54.60%	52.70%	86.00%	86.80%	87.00%
2007	57.50%	55.40%	76.10%	83.80%	90.50%

Source: Re-creation from Rhode Island Public Expenditure Council, 2009

What makes matter worse is that the base of support for this funding ratio is eroding as the "Baby Boomer" generation retires. According to the RIPEC, the active to retiree ratio (state employees) is 1.24 and 1.55 (for teachers) in 2007. Though both of these are greater than one, they have been degrading for several years now.

As mentioned above, Rhode Island has also seen an average actuarial expected return higher that what their investments have actually produced in the past few years. After the smoothing effect is taken into consideration, investment returns over the past five years (2003-2008) have been 3.12% compared to the 8.25% actuarial assumed rate. The plan has also underperformed the S&P 500, the plan's benchmark, in 2007, while only slightly outperforming it in years past (Please refer to Appendix A – ERSRI Performance History Benchmarked against the S&P 500). The problem this creates is contribution shortfalls. In the case of a severe financial crisis like the one we are in today, the effects can be devastating – and they probably will be though they have yet to be reported for the most part. Listed below is the market performance of investments compared to actuarial assumptions. However

this chart tells only half the picture because the losses from the investments in 2008 are expected to eclipse 6.0%, and will be even higher in 2009 (Rhode Island Public Expenditure Council). More than likely, Rhode Island's unfunded liability will increase over the next two years before we start to see any positive changes.

Figure 5. Investment Rate Return History for Rhode Island's State Pension Plan

Investment Rate Return History		
Year Ending June 30,	Market	Actuarial
1995	17.00%	10.20%
1996	13.70%	13.70%
1997	19.10%	19.10%
1998	16.10%	16.50%
1999	10.10%	14.70%
2000	9.10%	8.80%
2001	-11.00%	4.90%
2002	-8.40%	0.90%
2003	2.60%	-0.80%
2004	18.70%	0.40%
2005	11.40%	1.80%
2006	11.60%	7.40%
2007	18.20%	13.00%

Source: Re-creation from Rhode Island Public Expenditure Council, 2009

Lastly, the generous benefits enjoyed by many employees of the Rhode Island government have come at a steep cost to taxpayers. In 1989 and 1990 alone, a $230 million charge was rung up by the state as increases in benefits were not met by any increases in the contribution rate. Consequently the health of the fund was severely affected. Compared to other states in New England, Rhode Island's benefits are extremely generous. Shown below is a chart of how Rhode Island's benefits compare against other New England states. The reason a person at age 55 was shown was to display the effects Rhode Island's no-penalty for early retirement policy has on the costs associated with the fund.

Figure 6. Ranking of Benefits for New England States

Member Retiring at age 55 with 30 Years of Service and $70,000 Final Average Salary						
State	Annual Benefit	Rank	Benefit % of RI	Actuarial PV	Rank	Actuarial % of RI
Connecticut (Tier II)	$ 26,801.00	6	58.00%	$358,664.00	4	57.40%
Maine (Tier I)	$ 37,275.00	2	80.70%	$524,735.00	2	84.00%
Massachusetts	$ 31,500.00	3	68.20%	$354,041.00	5	56.70%
New Hampshire	$ 29,810.00	5	64.50%	$345,797.00	6	55.30%
Rhode Island (SchedA)	**$ 46,200.00**	**1**	**100.00%**	**$624,759.00**	**1**	**100.00%**
Vermont	$ 30,660.00	4	66.40%	$372,486.00	3	59.60%
Average (NO RI)	**$ 31,209.00**		**67.60%**	**$391,145.00**		**62.60%**

Source: Re-creation of Gabriel, Roeder Smith & Company, Correspondence December 11, 2007 to Rhode Island General Treasurer

As one can see, the benefits of the Rhode Island pension plan are much more generous including both a higher annual benefit than the average New England state, and a cost-of-living adjustment, not depicted here, of 3% annually. As mentioned before, these factors have contributed to the fund's unfunded liability growing to over $7 billion. Lawmakers have finally realized that this is a serious problem, and if not taken care of immediately, will impact the budget, taxpayers, and employees very unfavorably. Please refer to Appendix B – Rhode Island State Employee Retirement Provisions, for a detailed description of the benefit provisions.

In response to the pension crisis Governor Carcieri has come up with a list of proposals he would like to see implemented over the next few years in order to battle the ever-increasing unfunded liability and the failures to make the funding ratio above 80%. Listed below are his proposals:

- Eliminate COLA for employees retiring after April 1, 2009
- Establish a minimum retirement age of 59 for those retiring after April 1, 2009
- Change State Police benefit calculations
- Change the maximum benefit for employees and teachers retiring on accidental disability
- Reduce employer contributions

As a result of not keeping the funding ratio above 80%, the state of Rhode Island is required to develop a timetable for which the unfunded liability will be paid off. Accordingly, the government has established a closed period of 30 years to amortize the unfunded liability (Rhode Island Public Expenditure Council). These proposals, along with some from other states and some financial professionals will be evaluated to determine what solutions are best suited to the specific case of Rhode Island.

RESEARCH METHODOLOGY

What Data will be Gathered?

To complete my research and test the feasibility of different solutions to the situation of the Rhode Island government, all proposed solutions must be gathered and evaluated to determine whether or not they hold merit at first glance. Gathering the research data will consist of examining case studies completed on states throughout the United States also experiencing pension fund problems and gathering commentary of financial professionals. Those that do hold merit will be compiled into a list and run through both qualitative and quantitative analysis.

Analysis of Data Gathered

The qualitative analysis will include such responses by financial professionals about the positives and negatives of each proposed solution as well as how they have affected other pension systems that have implemented them. The quantitative analysis will include a statistical budgeting model that will examine the ability of each solution to draw down the unfunded liability.

Hypothesis

I will continue to adhere to my original hypothesis that reducing investment return assumptions, reducing pension benefits of those employees not yet retired but still under the defined benefit plan, increasing the minimum age and years of service requirements, eliminating COLA, and requiring all new employees to participate in a defined contribution plan, will help to alleviate the unfunded pension liability of Rhode Island by the year 2030 if implemented in 2011.

Statistical Assumptions

To complete the quantitative tests needed to provide sound recommendations several assumptions must be made. In developing the pension calculator used to show the present value of the unfunded liability of a typical new hire, ten different assumptions are taken into account. First, it is assumed that every new hire will be twenty-one years old. Next, the starting salary for a female will be $35,000 annually, while a male's will be $38,000 annually. There is a difference in income to account for both a disparity in life expectancy and the fact that females on average still are underpaid when compared to men in the same position. The salaries must then have an annual growth expectancy, which for the first ten years will be at 8% annually, and 3% thereafter. Based on the ERSRI website, teachers, state employees, and municipal employees must serve a minimum of 38 years in the workforce to earn a full pension; police and firefighters must serve a minimum of 34 years (Employee Retirement System of Rhode Island). The time spent in retirement also differs for females and males as the life expectancy of females is 80 years and for males, 74 years. Next, and also obtained from the ERSRI website, is the percentage of annual salary contributed to the pension plan. For teachers, the annual contribution is 9.5%; state employees 8.75%; police & fire 7%; and municipal employees 6% (Employee Retirement System of Rhode Island). As mentioned earlier in the paper, pension expenditures are consuming a large portion of Rhode Island's general budget. On average, the state has been contributing approximately 25% of an employee's annual salary to the pension system, which is our next assumption in the model. It is also assumed that the fund will have a return on investment of 8.25%, as has been the actuarial assumption over the past 10 years. Next, the ERSRI has determined that a full pension benefit will be 75% of the final three years' salary of the respective employee

(Employee Retirement System of Rhode Island). Lastly, this benefit is assumed to grow at a rate of 3% annually to account for cost of living adjustments (COLA) (Employee Retirement System of Rhode Island).

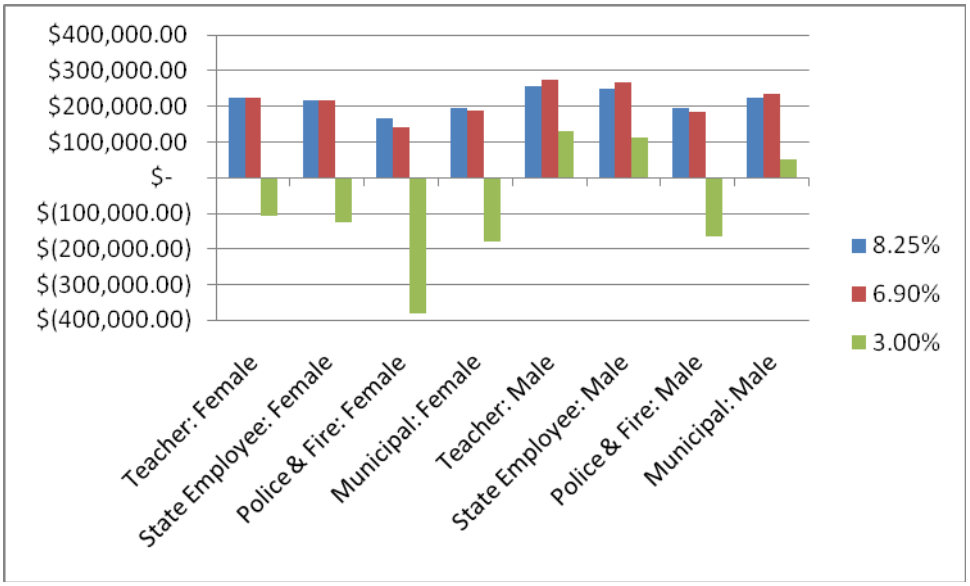
PROPOSED CHANGES

After evaluating the merits of all proposed changes to the pension system, it has been determined that five in particular are the most substantive. These five changes are the ones proposed in the hypothesis, and detailed below will be the quantitative analysis of their monetary effect on the unfunded liability.

Reduce Return on Investment Assumptions

To paint a clear initial picture of the budgetary pressures put on by assuming new pensions, a baseline present value of the unfunded liability of eight new hires was obtained. This test assumed three different rates of return: the currently assumed actuarial return of 8.25%, the proposed actuarial change to 6.9%, and the actual return over the past five years of 3%. The three tables, which take into account the fiscally constraining 25% state contribution, will show the effects of misjudged assumptions about return on investment. Graphed out below are the new hires and their corresponding present value excess (unfunded) liabilities:

Figure 7. Present Values of Excess (Unfunded) Liabilities at Varying Rates of Return

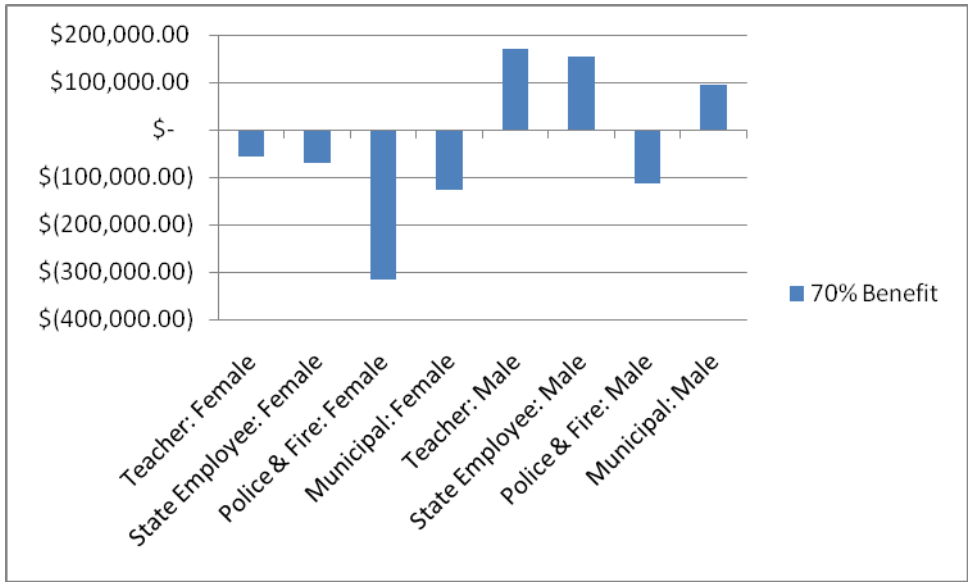


As one can see, the 8.25% annualized return provides for a very nice picture. In every case, each additional hire would be excessively funded by more than $150,000 at present value. To explain more clearly, this means that if the state contributed the 25%, the employee contributed their respective percentage, and the contributions were invested and received a return of 8.25% annually, the state would be able to take $150,000 immediately and use it to draw down the existing $7 billion liability. However, at the 3% annualized rate, the true return shows how strong an impact actuarial assumptions have concerning rates of return. In five of the eight instances, the new hire will add an additional amount of unfunded liability to the state pension plan's overall liability. The best case scenario – male teachers – would be excessively funded by $128,000 while the worst case scenario – female police & fire – would be underfunded by $379,000. If the state is assuming an 8.25% return and actually only receiving 3%, it will contribute less than it needs to in order to maintain a manageable deficit. As such, the plan's unfunded liability continues to grow.

Reduce Full Benefit to 70%

A second proposed change has been to cut the full benefit of 75% of the final three years' salary to 70%. The main argument behind this proposition is that public employees in Rhode Island enjoy the most generous of benefit packages in all of New England. As was previously mentioned in the paper, Rhode Island ranks first in annual benefit in dollars – almost $10,000 more per year than any other New England state. Cutting down the state's benefit package could reasonably be argued as a means for saving the state money when making new hires. Depicted on the next page is a graph of the present value excess (unfunded) liabilities at a 70% full benefit. This test assumes the actual return of 3% and a state contribution of 25%. Again in five of the eight cases, the new hire would bring on additional unfunded liability to the plan, showing that this option cannot – as was the case with lowering investment return assumptions – be a standalone option.

Figure 8. Present Value of Excess (Unfunded) Liability at 70% Full Benefit



However, a few problems do exist with this proposed change. First, as stated in the contracts Rhode Island has with its public employees, the benefits of existing pension holders cannot be changed. If the state wanted to or did in fact do so, it would be in breach of contract and would likely incur a great deal of litigation from unions and other labor-related organizations. Second, the tax rates paid by Rhode Island residents are much higher than their neighboring states. For example, as of 2007 Rhode Island has the "seventh highest tax burden in the country," compared to Massachusetts which is ranked 34th, and Connecticut which is ranked 11th (Downing). Neighboring states have made themselves more tax-competitive compared to Rhode Island, and the fear is that residency and employment in the state will diminish if higher pension benefits are not offered. And as previously mentioned, it is easier to just offer higher retirement benefits than it is to be more fiscally responsible across the board so that taxes can be lowered. Lastly, the percentages of salary that are contributed by the employees are higher than those contributed by neighboring states' employees. Dennis Grilli, executive director of the largest state employee union — Council 94, American Federation of State, County and Municipal Employees — said, "state workers here contribute more out of their own paychecks than their counterparts in most other states, including Connecticut where employees hired since 1997 pay 2 percent; Maine, 7.65 percent; Vermont, 3.35 percent and

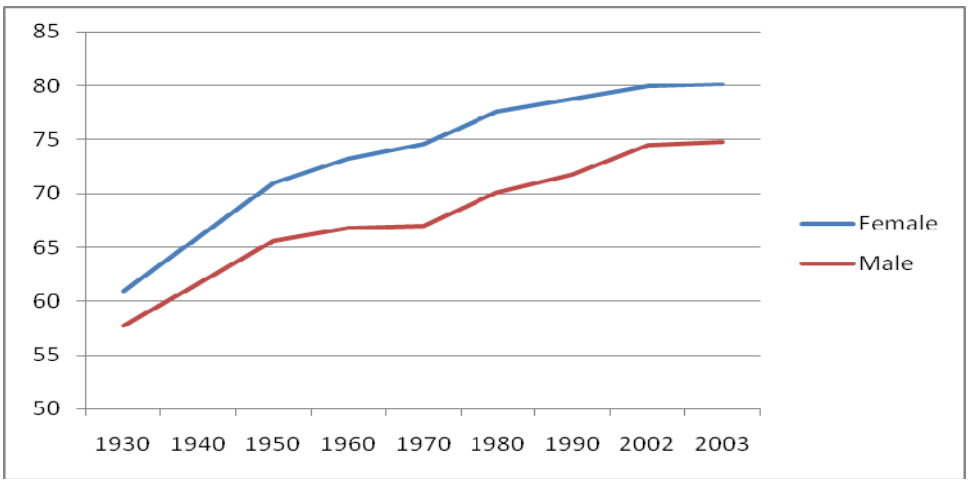
Massachusetts, where the employee contribution rate ranges from 5 percent to 9 percent, according to the Rhode Island treasurer's office (Gregg)." The fact that only Massachusetts rivals the amount Rhode Island employees have to pay, makes it quite hard for public officials to argue in favor of reducing the percentage benefit.

Increase Minimum Retirement Age to 63

The third proposed change is to increase the minimum retirement age to 63 years old. For many private sector employees to receive their full benefit from their main source of retirement – Social Security – they have to wait until they are at least age 65 (Social Security.gov). For a new hire that would fit into the model that is being statistically tested, the minimum age at which he/she could retire and receive their full Social Security benefit would be age 67. Some private sector employees may be able to take their retirement earlier than these ages because of their accumulated 401(k) or other defined contribution plan; although they would incur a reduced benefit from Social Security. However, this does not create any kind of problem for the employer. In the case of the public sector, it does. If a private sector employee has not accumulated enough money to take an early retirement and have it last until death, he/she is on the hook. In the public sector, though the employee's benefit will be reduced, the state employer is still required to pay that benefit until the death of the employee. In other words, the state is responsible for making payments for a longer period than it had originally expected. If the state has not made the required contributions in the past, as was shown in the case of Rhode Island earlier in the study, it is going to experience an even greater deficit now that the contribution time period has been cut short.

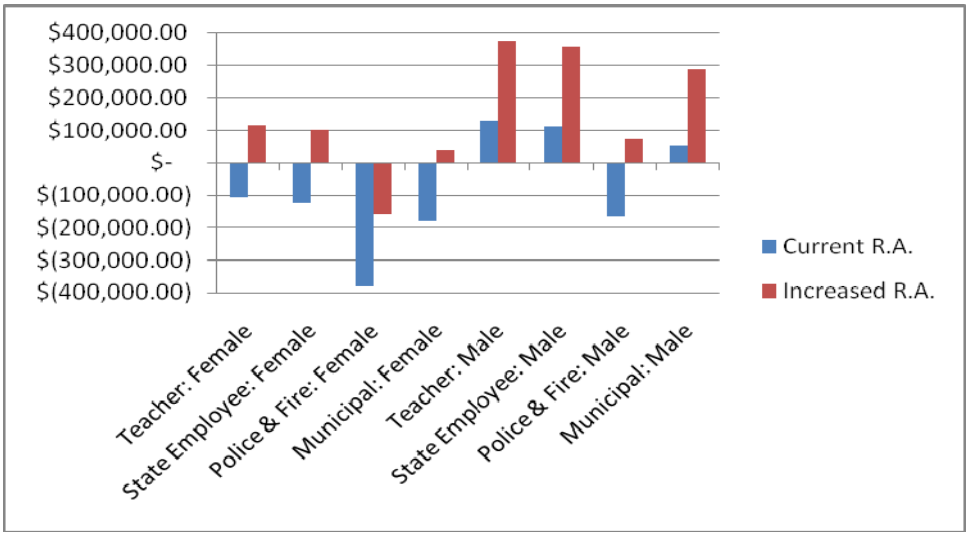
Modern advances in healthcare are also contributing to greater deficits in the Rhode Island pension plan. According to Laura B. Shrestha, of the Domestic Social Policy Division of Congress, the average life expectancy for males in the United States has increased by almost 30%, and females by 31.5% (Shrestha). Shown on the next page is a graphical representation of the increases in life expectancy for males and females in the U.S. over the past 70 years.

Figure 9. Life Expectancies of U.S. Males and Females from 1930 - 2003



What this graph shows is that more retirees are spending a greater amount of time in retirement. As such, they require a larger retirement pool to draw from because they are collecting from the pensions for a longer period of time. This puts an additional strain on the government of Rhode Island, which in accordance with increasing life expectancies, should have been increasing the retirement age proportionally over a period of time. The graph below shows how an additional four years in the workforce for each of the eight employees could result in present value surpluses for the state's pension plan.

Figure 10. Present Value Excess (Unfunded) Liabilities - Current vs. Increased Retirement Age



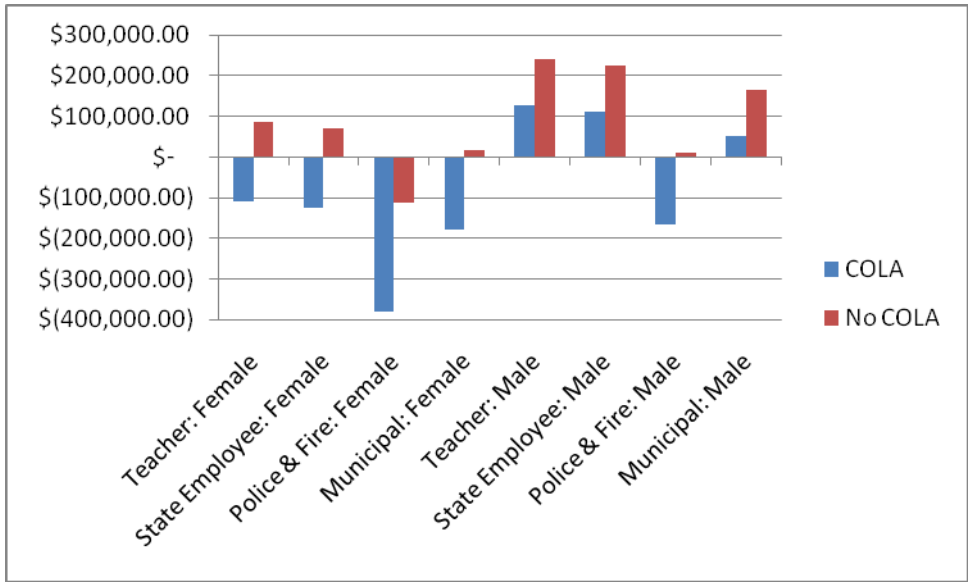
As one can see, at the current retirement age, five of the eight instances provide for an unfunded liability. However, increasing the minimum retirement age by four years leaves only one instance with an unfunded liability – female police & fire employees. This future liability would be more than covered by the surpluses in the other seven situations. In fact, increasing the minimum retirement age by four years would net an average present value savings of almost 200% per employee.

Eliminate or Reduce Cost of Living Adjustments

In a defined contribution plan, any increase in costs of living or inflation must be met with an increase in investment returns if the value of the fund is expected to remain stable. However, in the state of Rhode Island's defined benefit plan, yearly cost of living adjustments equal to 3% of the annual retirement benefit are automatically given to retirees. If it was assumed that a typical Rhode Island worker retired with an annual benefit of $46,200 – the average as shown in Figure 6 – Ranking of Benefits for New England States – a 3% yearly COLA increase would net that retiree an annual benefit at his time of death that was 75% larger than the $46,200 benefit. This is very constraining on the government's budget when it is accounted for *all* the current retirees in the state. This, however, is not the main problem with COLA benefits.

What the statistical model does not take into account is that more often than not, a salary increase cannot be given to all employees every year, much to their dismay. Instead what is normally given is an increase in retirement benefits, as the effect of these raises will frequently not be felt by the politician giving them out. The problem with doing this in a fiscally constrained state is that the increases in benefits are not typically met with increases in the contribution rate. If you recall Figure 4 – Funded Ratio Trends for Rhode Island, each class of employee is seeing a decrease in their funded ratio. What this means is that either benefits are increasing, market returns are decreasing, or contribution rates are decreasing. In the case of Rhode Island over the past five years, it is all of them. Shown on the next page is a graph that displays just how constraining the COLA benefits are when they are not met with any substantial growth in the contribution rate.

Figure 11. Present Value Excess (Unfunded) Liabilities – COLA vs. No COLA



In most cases, the elimination of COLA benefits would save the state nearly 150% of the retirement cost per employee. In fact, in seven of the eight cases it would allow them to draw down the liability.

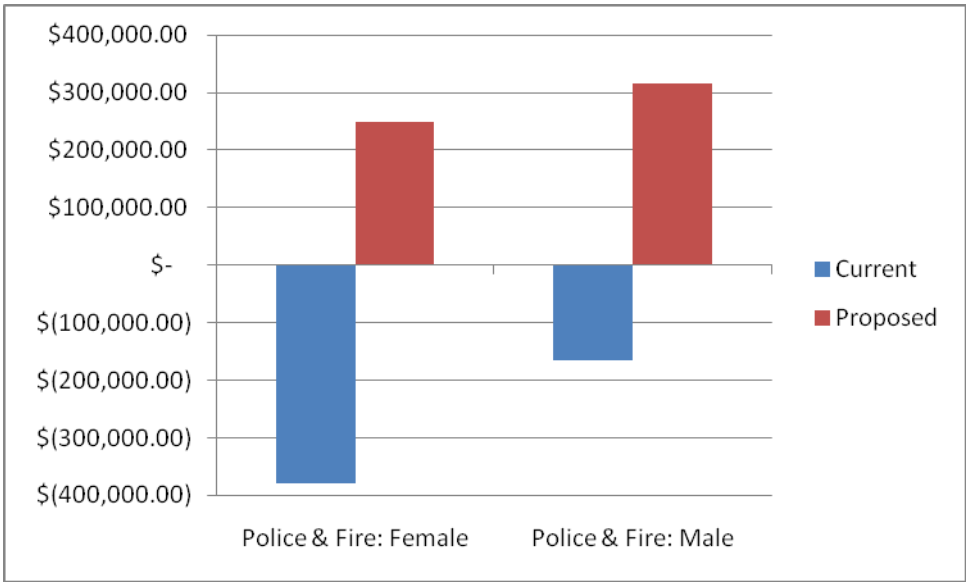
The argument of whether or not the market returns on investments can sustain the program is a valid one though, and one in support of COLA benefits. As we have seen over the past two years, the market can sometimes be quite a tumultuous arena. Forty percent losses on state retirement values will certainly put a damper on any fund's unfunded liability; and even though most politicians recognize the constraining effects of cost of living adjustments, they argue they are necessary for stabilization of the fund. What is therefore being proposed by the Rhode Island legislature is to cap the COLA benefits. A House of Representatives proposal would "limit the annual increases to the first $35,000 in retirement pay, and retirees would have to reach age 65 to qualify (Peoples, Gregg and Edgar)." This is a proposal that this paper could agree with for two reasons. First, if the $46,200 average annual benefit was reduced to $35,000 for COLA benefit purposes, the state would save the 3% on the $11,200 above the limit. Second, it would save six years in COLA benefits by increasing the minimum age to 65. COLA benefits accounted for $150.2 million of the pension benefits in 2009 though, leaving it still to be debated whether or not they should be eliminated.

Increase Police & Fire Contribution Rates to 9%

The last proposed change presented in this study is to increase the employee contribution rate to nine percent for police and fire employees. Police and fire employees are a special situation, and there are three basic arguments behind this suggestion. First, the duties required of a polic and/or fire employee are more often than not very physically demanding. The rigors of training as well as everyday work can take a toll on an employee's body, and as such can wear them down at a much faster pace than an employee in another line of work. The minimum retirement age for police and fire employees is therefore four years lower than those of teachers, state, and municipal employees. This affords the state the certainty that those police and fire employees in the field will be able to complete their duties to the best of their abilities. What it gives the employees is four more years in retirement. For the pension program to be adequately funded, one would expect three things: higher contribution rates from the employees, lower retirement benefits, and a greater percent contributed by the state. However, none of these three expectations are met. In fact, the contribution rate from the employees are 2 ½% lower than that of teachers, the benefit is still 75% of the final three years of salary, and the average contribution from the state remains in the vicinity of 20-30% (Employee Retirement System of Rhode Island).

The next graph details how a change in this policy can save the state a great deal of money, just like the proposals made earlier in the study. The assumptions behind these figures differ slightly from the assumptions made in the previous suggestions. First, it is assumed that they will be working four years longer – in accordance with the third change of raising the minimum retirement age. Second, it is assumed that they will be making a nine percent contribution to their retirement on an annual basis instead of the current seven percent. Third, they will be receiving a five percent return on investment – a return that will later be assumed in all the other cases in the study as well. Fourth, they will only be receiving 70% of the final three years of salary in accordance with the second proposed change. And lastly, they will not be receiving any COLA benefits in any years of retirement.

Figure 12. Present Value Excess (Unfunded) Liabilities – Police and Fire Employees

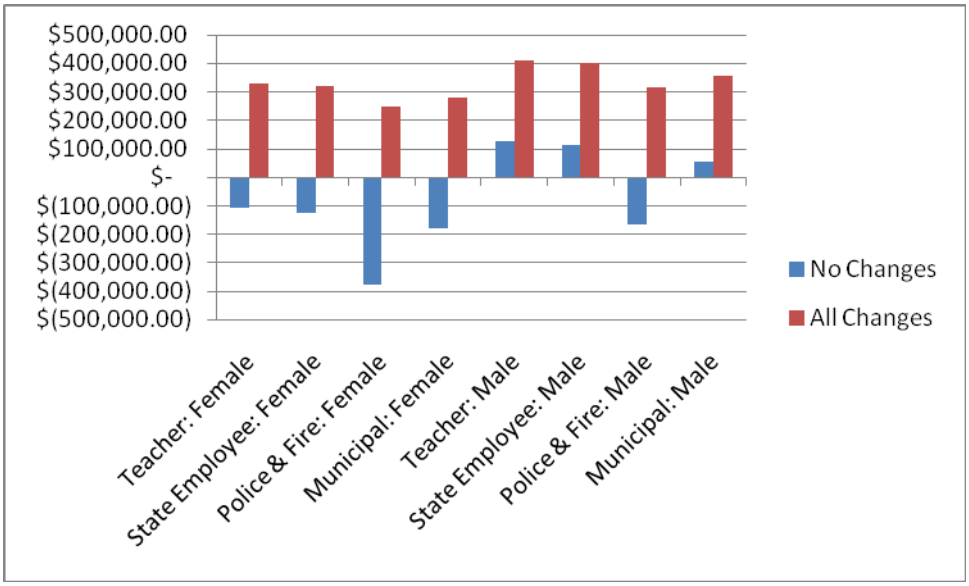


The adjustments made in this graph reflect some of the proposals set forth by Governor Carcieri in his call for pension reform. As one can see from both this graph and the previous ones, the police & fire pension program is not only constraining itself but the entire pension system in Rhode Island. It can therefore be argued that for the unfunded liability to be drawn down to a manageable and acceptable percentage the police and fire system must first be met with some serious changes.

All Proposed Changes

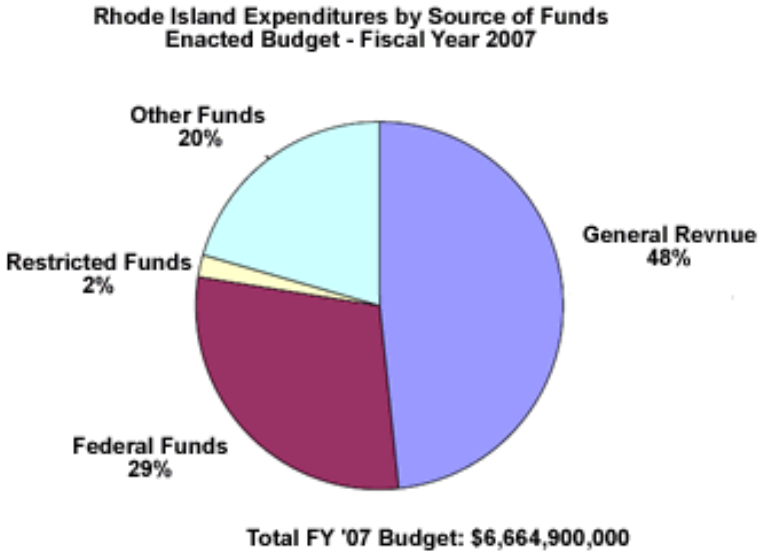
The last statistical piece of the study will present how all the proposed changes, used in conjunction with each other, could benefit the state's unfunded liability. Here it will be shown how the implementation of these proposed changes can not only provide the state with a quite considerable savings at a 25% contribution, but can actually reduce the state's contribution to 7.5% - while still maintaining a surplus for each new hire. As stated in the police and fire proposal a return of five percent will be assumed for all investments as this is more typical of the fund's performance over a longer period of time. Otherwise, the assumptions made will adhere to the changes proposed throughout this study.

Figure 13. Present Value Excess (Unfunded) Liabilities – All Proposed Changes, 25% Contribution



The implementation of the proposed changes presented throughout this paper would allow the state the ability to draw down the unfunded liability at a much quicker rate than it would by only increasing the amount that is paid into the fund each year – essentially those tax increases pushed onto the Rhode Island residents. As of 2007, Rhode Island was required to pay pension contributions amounting to 5.9% of general revenue expenditures. According to the State Budget Guide, that was over $188 million in expenses (Rhode Island KIDS COUNT). By passing legislation that puts these proposed changes into practice the state could reduce its contribution to at least 7.5%. This would save the state $144 million per year in pension expenses. Though this couldn't be done immediately because of the $7 billion in the current unfunded liability that needs to be taken care of, the state could realistically lower its contribution rate within the last five to ten years of its thirty year payment plan.

Figure 14. Rhode Island Expenditures by Source of Funds – Fiscal Year 2007



FINAL RECOMMENDATIONS

The final question to be asked is whether or not all these changes are necessary in order to diminish the state's unfunded liability. The answer is that because benefits have been continually increased and the need for higher contribution rates has been consistently ignored, the state finds itself in a predicament that must be met with tough policies. Many of the changes proposed in this study would not be encouraged by employees who were given a contractual right to the benefits they were promised upon their hiring. However, in order for the state to be sustainable while maintaining a decent credit rating, all of the proposed changes in this paper must be implemented immediately. The only exception would be to cap the COLA benefit at 3% of the first $35,000 in annual retirement income, and not grant that opportunity until the retiree reached age 65. Eliminating any of the other proposed changes from the pension system would negatively and prohibitively affect the state's unfunded liability.

The last recommendation to be made would be to switch the pension system over to a defined contribution plan, as stated earlier in the paper. In making this recommendation I would refer

back to a statement made earlier in the discussion, "Under these plans, the risk falls upon the employee as the funds that are in the account at the time of retirement is the amount which the employee can retire on. Under no circumstances is the employer obligated to make extra contributions in order to raise the value of the plan to a certain level."

The risk of these plans falls on the employee, and with the inability of the Rhode Island government to make the tough decisions when needed in order to reduce risk, it can definitely be argued that the state should move to a defined contribution system. Also, changing to this type of plan would reduce contribution levels from the state, therefore saving taxpayers an enormous amount of money as well.

This study has shown that a whirlwind of factors including a market that tanked over the past two years, a slew of government officials that ignored warning signs, changing demographics, and a lackadaisical approach to pleasing employees while controlling risk led to the current crisis facing the Rhode Island state pension system. Current state employees should be outraged and demanding for reform; for without it they can realistically expect a situation later in life where they are struggling to survive on an income not commensurate with the effort they gave the state over their working lives. Yes, these proposed changes will not be easy to swallow. However, the statistical analysis performed in this study has shown the necessity of them.

APPENDICES

Appendix A - ERSRI Performance History Benchmarked Against S&P 500

Appendix B – Rhode Island State Employee Retirement Provisions

Appendix C – Present Value Excess (Unfunded) Liability – 8.25% Return, No State Contribution

Appendix D – Present Value Excess (Unfunded) Liability – 6.9% Return, No State Contribution

Appendix E – Present Value Excess (Unfunded) Liability – 3.0% Return, No State Contribution

Appendix F – Present Value Excess (Unfunded) Liability – 8.25% Return, 25% State Contribution

Appendix G – Present Value Excess (Unfunded) Liability – 6.9% Return, 25% State Contribution

Appendix H – Present Value Excess (Unfunded) Liability – 3.0% Return, 25% State Contribution

Appendix I – Present Value Excess (Unfunded) Liability – 70% Full Benefit

Appendix J – Present Value Excess (Unfunded) Liability – 4 Year Increased Retirement Age

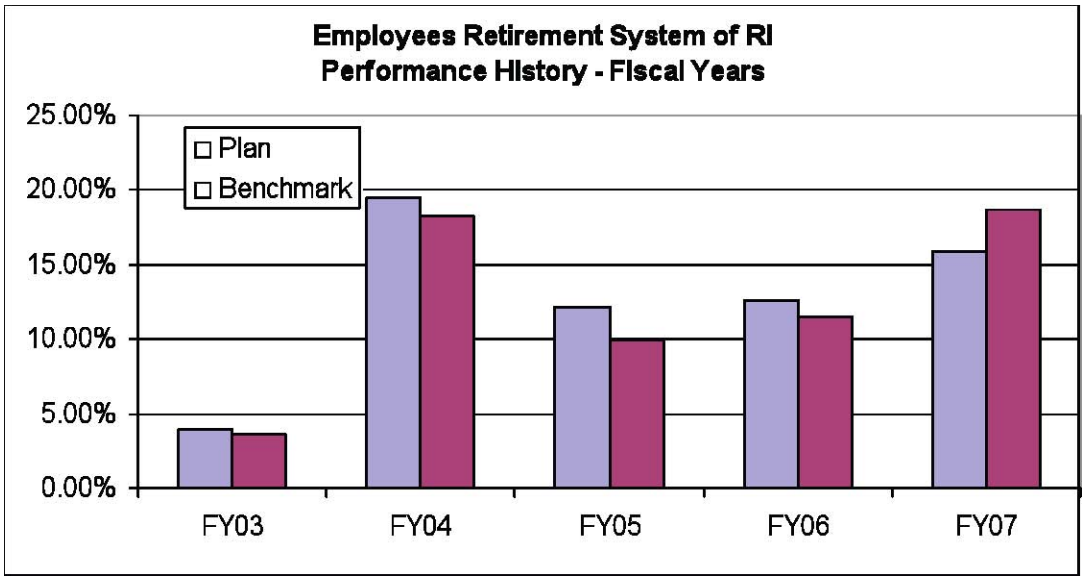
Appendix K – Present Value Excess (Unfunded) Liability – No COLA Benefits

Appendix L – Present Value Excess (Unfunded) Liability – 9% Contribution Rate – Police & Fire Employees

Appendix M – Present Value Excess (Unfunded) Liability – All Proposed Changes

Appendix N – Present Value Excess (Unfunded) Liability – All Proposed Changes, 7.5% State Contribution

Appendix A – ERSRI Performance History Benchmarked Against S&P 500



Plan is blue, Benchmark is purple

Source: 2007 Annual Report – Employee's Retirement System of Rhode Island

Appendix B – Rhode Island State Employee Retirement Provisions

Provisions	Schedule A	Schedule B
Social Security Coverage	Yes	Yes
Vesting Requirement	10 years	10 years
Average Final Compensation	Highest 3 consec. Years	Highest 3 consec. Years
Normal Retirement Age	60/10; 00/28	65/10; 59/29
Formula Calculation		
Years 1-10	1.70%	1.60%
Years 11-20	1.90%	1.80%
Years 21-25	3.00%	2.00%
Years 26-30	3.00%	2.25%
Years 31-34	3.00%	2.50%
Year 35	2.00%	2.50%
Years 36-37	0.00%	2.50%
Year 38	0.00%	2.25%
Maximum Benefit	80.00%	75.00%
Early Retirement Option	None	55/20
Formula Calculation	NA	Actuarial
COLA	3.0% Fixed	100% of CPI or 3% max, whichever is lower
COLA Delay	2.5 years	3.0 years

Appendix C - Present Value Excess (Unfunded) Liability – 8.25% Return, No State Contribution

Teacher (Female)		Teacher (Male)	
Today's Age	21	Today's Age	21
Today's Salary	$35,000.00	Today's Salary	$38,000.00
Growth in Salary 1-10	8.00%	Growth in Salary 1-10	8.00%
Growth in Salary Remainder	3.00%	Growth in Salary Remainder	3.00%
T years in Work Force	38	T years in Work Force	38
Last Year of Work	59	Last Year of Work	59
Life Expectancy	80	Life Expectancy	74
Proportion Invested	9.50%	Proportion Invested	9.50%
Return on Investment	8.25%	Return on Investment	8.25%
Retirement Benefit	75.00%	Retirement Benefit	75.00%
COLA	3.00%	COLA	3.00%
PV of Excess (Unfunded) Liability	$ 8,800.11	PV of Excess (Unfunded) Liability	$24,496.71

State Employee (Female)		State Employee (Male)	
Today's Age	21	Today's Age	21
Today's Salary	$35,000.00	Today's Salary	$38,000.00
Growth in Salary 1-10	8.00%	Growth in Salary 1-10	8.00%
Growth in Salary Remainder	3.00%	Growth in Salary Remainder	3.00%
T years in Work Force	38	T years in Work Force	38
Last Year of Work	59	Last Year of Work	59
Life Expectancy	80	Life Expectancy	74
Proportion Invested	8.75%	Proportion Invested	8.75%
Return on Investment	8.25%	Return on Investment	8.25%
Retirement Benefit	75.00%	Retirement Benefit	75.00%
COLA	3.00%	COLA	3.00%
PV of Excess (Unfunded) Liability	$ 2,351.28	PV of Excess (Unfunded) Liability	$17,495.13

Police & Fire (Female)		Police & Fire (Male)	
Today's Age	21	Today's Age	21
Today's Salary	$ 35,000.00	Today's Salary	$ 38,000.00
Growth in Salary 1-10	8.00%	Growth in Salary 1-10	8.00%
Growth in Salary Remainder	3.00%	Growth in Salary Remainder	3.00%
T years in Work Force	34	T years in Work Force	34
Last Year of Work	55	Last Year of Work	55
Life Expectancy	80	Life Expectancy	74
Proportion Invested	7.00%	Proportion Invested	7.00%
Return on Investment	8.25%	Return on Investment	8.25%
Retirement Benefit	75.00%	Retirement Benefit	75.00%
COLA	3.00%	COLA	3.00%
PV of Excess (Unfunded) Liability	$(39,893.17)	PV of Excess (Unfunded) Liability	$(28,370.28)

Municipal (Female)		Municipal (Male)	
Today's Age	21	Today's Age	21
Today's Salary	$ 35,000.00	Today's Salary	$ 38,000.00
Growth in Salary 1-10	8.00%	Growth in Salary 1-10	8.00%
Growth in Salary Remainder	3.00%	Growth in Salary Remainder	3.00%
T years in Work Force	38	T years in Work Force	38
Last Year of Work	59	Last Year of Work	59
Life Expectancy	80	Life Expectancy	74
Proportion Invested	6.00%	Proportion Invested	6.00%
Return on Investment	8.25%	Return on Investment	8.25%
Retirement Benefit	75.00%	Retirement Benefit	75.00%
COLA	3.00%	COLA	3.00%
PV of Excess (Unfunded) Liability	$(21,294.42)	PV of Excess (Unfunded) Liability	$ (8,177.35)

Appendix D - Present Value Excess (Unfunded) Liability – 6.9% Return, No State Contribution

Teacher (Female)		Teacher (Male)	
Today's Age	21	Today's Age	21
Today's Salary	$ 35,000.00	Today's Salary	$ 38,000.00
Growth in Salary 1-10	8.00%	Growth in Salary 1-10	8.00%
Growth in Salary Remainder	3.00%	Growth in Salary Remainder	3.00%
T years in Work Force	38	T years in Work Force	38
Last Year of Work	59	Last Year of Work	59
Life Expectancy	80	Life Expectancy	74
Proportion Invested	9.50%	Proportion Invested	9.50%
Return on Investment	6.90%	Return on Investment	6.90%
Retirement Benefit	75.00%	Retirement Benefit	75.00%
COLA	3.00%	COLA	3.00%
PV of Excess (Unfunded) Liability	$(33,821.54)	PV of Excess (Unfunded) Liability	$ (6,405.06)

State Employee (Female)		State Employee (Male)	
Today's Age	21	Today's Age	21
Today's Salary	$ 35,000.00	Today's Salary	$ 38,000.00
Growth in Salary 1-10	8.00%	Growth in Salary 1-10	8.00%
Growth in Salary Remainder	3.00%	Growth in Salary Remainder	3.00%
T years in Work Force	38	T years in Work Force	38
Last Year of Work	59	Last Year of Work	59
Life Expectancy	80	Life Expectancy	74
Proportion Invested	8.75%	Proportion Invested	8.75%
Return on Investment	6.90%	Return on Investment	6.90%
Retirement Benefit	75.00%	Retirement Benefit	75.00%
COLA	3.00%	COLA	3.00%
PV of Excess (Unfunded) Liability	$(41,586.01)	PV of Excess (Unfunded) Liability	$(14,835.06)

Police & Fire (Female)		Police & Fire (Male)	
Today's Age	21	Today's Age	21
Today's Salary	$ 35,000.00	Today's Salary	$ 38,000.00
Growth in Salary 1-10	8.00%	Growth in Salary 1-10	8.00%
Growth in Salary Remainder	3.00%	Growth in Salary Remainder	3.00%
T years in Work Force	34	T years in Work Force	34
Last Year of Work	55	Last Year of Work	55
Life Expectancy	80	Life Expectancy	74
Proportion Invested	7.00%	Proportion Invested	7.00%
Return on Investment	6.90%	Return on Investment	6.90%
Retirement Benefit	75.00%	Retirement Benefit	75.00%
COLA	3.00%	COLA	3.00%
PV of Excess (Unfunded) Liability	$(102,672.63)	PV of Excess (Unfunded) Liability	$(81,157.68)

Municipal (Female)		Municipal (Male)	
Today's Age	21	Today's Age	21
Today's Salary	$ 35,000.00	Today's Salary	$ 38,000.00
Growth in Salary 1-10	8.00%	Growth in Salary 1-10	8.00%
Growth in Salary Remainder	3.00%	Growth in Salary Remainder	3.00%
T years in Work Force	38	T years in Work Force	38
Last Year of Work	59	Last Year of Work	59
Life Expectancy	80	Life Expectancy	74
Proportion Invested	6.00%	Proportion Invested	6.00%
Return on Investment	6.90%	Return on Investment	6.90%
Retirement Benefit	75.00%	Retirement Benefit	75.00%
COLA	3.00%	COLA	3.00%
PV of Excess (Unfunded) Liability	$(70,055.74)	PV of Excess (Unfunded) Liability	$(45,745.05)

Appendix E – Present Value Excess (Unfunded) Liability – 3.0% Return, No State Contribution

Teacher (Female)		Teacher (Male)	
Today's Age	21	Today's Age	21
Today's Salary	$ 35,000.00	Today's Salary	$ 38,000.00
Growth in Salary 1-10	8.00%	Growth in Salary 1-10	8.00%
Growth in Salary Remainder	3.00%	Growth in Salary Remainder	3.00%
T years in Work Force	38	T years in Work Force	38
Last Year of Work	59	Last Year of Work	59
Life Expectancy	80	Life Expectancy	74
Proportion Invested	9.50%	Proportion Invested	9.50%
Return on Investment	3.00%	Return on Investment	3.00%
Retirement Benefit	75.00%	Retirement Benefit	75.00%
COLA	3.00%	COLA	3.00%
PV of Excess (Unfunded) Liability	$(607,036.71)	PV of Excess (Unfunded) Liability	$(412,051.39)

State Employee (Female)		State Employee (Male)	
Today's Age	21	Today's Age	21
Today's Salary	$ 35,000.00	Today's Salary	$ 38,000.00
Growth in Salary 1-10	8.00%	Growth in Salary 1-10	8.00%
Growth in Salary Remainder	3.00%	Growth in Salary Remainder	3.00%
T years in Work Force	38	T years in Work Force	38
Last Year of Work	59	Last Year of Work	59
Life Expectancy	80	Life Expectancy	74
Proportion Invested	8.75%	Proportion Invested	8.75%
Return on Investment	3.00%	Return on Investment	3.00%
Retirement Benefit	75.00%	Retirement Benefit	75.00%
COLA	3.00%	COLA	3.00%
PV of Excess (Unfunded) Liability	$(621,978.94)	PV of Excess (Unfunded) Liability	$(428,274.38)

Police & Fire (Female)		Police & Fire (Male)	
Today's Age	21	Today's Age	21
Today's Salary	$ 35,000.00	Today's Salary	$ 38,000.00
Growth in Salary 1-10	8.00%	Growth in Salary 1-10	8.00%
Growth in Salary Remainder	3.00%	Growth in Salary Remainder	3.00%
T years in Work Force	34	T years in Work Force	34
Last Year of Work	55	Last Year of Work	55
Life Expectancy	80	Life Expectancy	74
Proportion Invested	7.00%	Proportion Invested	7.00%
Return on Investment	3.00%	Return on Investment	3.00%
Retirement Benefit	75.00%	Retirement Benefit	75.00%
COLA	3.00%	COLA	3.00%
PV of Excess (Unfunded) Liability	$(823,535.56)	PV of Excess (Unfunded) Liability	$(647,107.28)

Municipal (Female)		Municipal (Male)	
Today's Age	21	Today's Age	21
Today's Salary	$ 35,000.00	Today's Salary	$ 38,000.00
Growth in Salary 1-10	8.00%	Growth in Salary 1-10	8.00%
Growth in Salary Remainder	3.00%	Growth in Salary Remainder	3.00%
T years in Work Force	38	T years in Work Force	38
Last Year of Work	59	Last Year of Work	59
Life Expectancy	80	Life Expectancy	74
Proportion Invested	6.00%	Proportion Invested	6.00%
Return on Investment	3.00%	Return on Investment	3.00%
Retirement Benefit	75.00%	Retirement Benefit	75.00%
COLA	3.00%	COLA	3.00%
PV of Excess (Unfunded) Liability	$(676,767.11)	PV of Excess (Unfunded) Liability	$(487,758.68)

Appendix F – Present Value Excess (Unfunded) Liability – 8.25% Return, 25% State Contribution

Teacher (Female)		Teacher (Male)	
Today's Age	21	Today's Age	21
Today's Salary	$ 35,000.00	Today's Salary	$ 38,000.00
Growth in Salary 1-10	8.00%	Growth in Salary 1-10	8.00%
Growth in Salary Remainder	3.00%	Growth in Salary Remainder	3.00%
T years in Work Force	38	T years in Work Force	38
Last Year of Work	59	Last Year of Work	59
Life Expectancy	80	Life Expectancy	74
Employee Contribution	9.50%	Employee Contribution	9.50%
State Contribution	25.00%	State Contribution	25.00%
Return on Investment	8.25%	Return on Investment	8.25%
Retirement Benefit	75.00%	Retirement Benefit	75.00%
COLA	3.00%	COLA	3.00%
PV of Excess (Unfunded) Liability	$223,761.02	PV of Excess (Unfunded) Liability	$257,882.84

State Employee (Female)		State Employee (Male)	
Today's Age	21	Today's Age	21
Today's Salary	$ 35,000.00	Today's Salary	$ 38,000.00
Growth in Salary 1-10	8.00%	Growth in Salary 1-10	8.00%
Growth in Salary Remainder	3.00%	Growth in Salary Remainder	3.00%
T years in Work Force	38	T years in Work Force	38
Last Year of Work	59	Last Year of Work	59
Life Expectancy	80	Life Expectancy	74
Employee Contribution	8.75%	Employee Contribution	8.75%
State Contribution	25.00%	State Contribution	25.00%
Return on Investment	8.25%	Return on Investment	8.25%
Retirement Benefit	75.00%	Retirement Benefit	75.00%
COLA	3.00%	COLA	3.00%
PV of Excess (Unfunded) Liability	$217,312.19	PV of Excess (Unfunded) Liability	$250,881.25

Police & Fire (Female)		Police & Fire (Male)	
Today's Age	21	Today's Age	21
Today's Salary	$ 35,000.00	Today's Salary	$ 38,000.00
Growth in Salary 1-10	8.00%	Growth in Salary 1-10	8.00%
Growth in Salary Remainder	3.00%	Growth in Salary Remainder	3.00%
T years in Work Force	34	T years in Work Force	34
Last Year of Work	55	Last Year of Work	55
Life Expectancy	80	Life Expectancy	74
Employee Contribution	7.00%	Employee Contribution	7.00%
State Contribution	25.00%	State Contribution	25.00%
Return on Investment	8.25%	Return on Investment	8.25%
Retirement Benefit	75.00%	Retirement Benefit	75.00%
COLA	3.00%	COLA	3.00%
PV of Excess (Unfunded) Liability	$166,318.75	PV of Excess (Unfunded) Liability	$195,516.95

Municipal (Female)		Municipal (Male)	
Today's Age	21	Today's Age	21
Today's Salary	$ 35,000.00	Today's Salary	$ 38,000.00
Growth in Salary 1-10	8.00%	Growth in Salary 1-10	8.00%
Growth in Salary Remainder	3.00%	Growth in Salary Remainder	3.00%
T years in Work Force	38	T years in Work Force	38
Last Year of Work	59	Last Year of Work	59
Life Expectancy	80	Life Expectancy	74
Employee Contribution	6.00%	Employee Contribution	6.00%
State Contribution	25.00%	State Contribution	25.00%
Return on Investment	8.25%	Return on Investment	8.25%
Retirement Benefit	75.00%	Retirement Benefit	75.00%
COLA	3.00%	COLA	3.00%
PV of Excess (Unfunded) Liability	$193,666.49	PV of Excess (Unfunded) Liability	$225,208.78

Appendix G – Present Value Excess (Unfunded) Liability – 6.9% Return, 25% State Contribution

Teacher (Female)		Teacher (Male)	
Today's Age	21	Today's Age	21
Today's Salary	$ 35,000.00	Today's Salary	$ 38,000.00
Growth in Salary 1-10	8.00%	Growth in Salary 1-10	8.00%
Growth in Salary Remainder	3.00%	Growth in Salary Remainder	3.00%
T years in Work Force	38	T years in Work Force	38
Last Year of Work	59	Last Year of Work	59
Life Expectancy	80	Life Expectancy	74
Employee Contribution	9.50%	Employee Contribution	9.50%
State Contribution	25.00%	State Contribution	25.00%
Return on Investment	6.90%	Return on Investment	6.90%
Retirement Benefit	75.00%	Retirement Benefit	75.00%
COLA	3.00%	COLA	3.00%
PV of Excess (Unfunded) Liability	$224,994.18	PV of Excess (Unfunded) Liability	$274,594.86

State Employee (Female)		State Employee (Male)	
Today's Age	21	Today's Age	21
Today's Salary	$ 35,000.00	Today's Salary	$ 38,000.00
Growth in Salary 1-10	8.00%	Growth in Salary 1-10	8.00%
Growth in Salary Remainder	3.00%	Growth in Salary Remainder	3.00%
T years in Work Force	38	T years in Work Force	38
Last Year of Work	59	Last Year of Work	59
Life Expectancy	80	Life Expectancy	74
Employee Contribution	8.75%	Employee Contribution	8.75%
State Contribution	25.00%	State Contribution	25.00%
Return on Investment	6.90%	Return on Investment	6.90%
Retirement Benefit	75.00%	Retirement Benefit	75.00%
COLA	3.00%	COLA	3.00%
PV of Excess (Unfunded) Liability	$217,229.71	PV of Excess (Unfunded) Liability	$266,164.86

Police & Fire (Female)		Police & Fire (Male)	
Today's Age	21	Today's Age	21
Today's Salary	$ 35,000.00	Today's Salary	$ 38,000.00
Growth in Salary 1-10	8.00%	Growth in Salary 1-10	8.00%
Growth in Salary Remainder	3.00%	Growth in Salary Remainder	3.00%
T years in Work Force	34	T years in Work Force	34
Last Year of Work	55	Last Year of Work	55
Life Expectancy	80	Life Expectancy	74
Employee Contribution	7.00%	Employee Contribution	7.00%
State Contribution	25.00%	State Contribution	25.00%
Return on Investment	6.90%	Return on Investment	6.90%
Retirement Benefit	75.00%	Retirement Benefit	75.00%
COLA	3.00%	COLA	3.00%
PV of Excess (Unfunded) Liability	$142,320.34	PV of Excess (Unfunded) Liability	$184,834.69

Municipal (Female)		Municipal (Male)	
Today's Age	21	Today's Age	21
Today's Salary	$ 35,000.00	Today's Salary	$ 38,000.00
Growth in Salary 1-10	8.00%	Growth in Salary 1-10	8.00%
Growth in Salary Remainder	3.00%	Growth in Salary Remainder	3.00%
T years in Work Force	38	T years in Work Force	38
Last Year of Work	59	Last Year of Work	59
Life Expectancy	80	Life Expectancy	74
Employee Contribution	6.00%	Employee Contribution	6.00%
State Contribution	25.00%	State Contribution	25.00%
Return on Investment	6.90%	Return on Investment	6.90%
Retirement Benefit	75.00%	Retirement Benefit	75.00%
COLA	3.00%	COLA	3.00%
PV of Excess (Unfunded) Liability	$188,759.98	PV of Excess (Unfunded) Liability	$235,254.87

Appendix H – Present Value Excess (Unfunded) Liability – 3.0% Return, 25% State Contribution

Teacher (Female)		Teacher (Male)	
Today's Age	21	Today's Age	21
Today's Salary	$ 35,000.00	Today's Salary	$ 38,000.00
Growth in Salary 1-10	8.00%	Growth in Salary 1-10	8.00%
Growth in Salary Remainder	3.00%	Growth in Salary Remainder	3.00%
T years in Work Force	38	T years in Work Force	38
Last Year of Work	59	Last Year of Work	59
Life Expectancy	80	Life Expectancy	74
Employee Contribution	9.50%	Employee Contribution	9.50%
State Contribution	25.00%	State Contribution	25.00%
Return on Investment	3.00%	Return on Investment	3.00%
Retirement Benefit	75.00%	Retirement Benefit	75.00%
COLA	3.00%	COLA	3.00%
PV of Excess (Unfunded) Liability	$(108,962.46)	PV of Excess (Unfunded) Liability	$128,714.94

State Employee (Female)		State Employee (Male)	
Today's Age	21	Today's Age	21
Today's Salary	$ 35,000.00	Today's Salary	$ 38,000.00
Growth in Salary 1-10	8.00%	Growth in Salary 1-10	8.00%
Growth in Salary Remainder	3.00%	Growth in Salary Remainder	3.00%
T years in Work Force	38	T years in Work Force	38
Last Year of Work	59	Last Year of Work	59
Life Expectancy	80	Life Expectancy	74
Employee Contribution	8.75%	Employee Contribution	8.75%
State Contribution	25.00%	State Contribution	25.00%
Return on Investment	3.00%	Return on Investment	3.00%
Retirement Benefit	75.00%	Retirement Benefit	75.00%
COLA	3.00%	COLA	3.00%
PV of Excess (Unfunded) Liability	$(123,904.69)	PV of Excess (Unfunded) Liability	$112,491.95

Police & Fire (Female)		Police & Fire (Male)	
Today's Age	21	Today's Age	21
Today's Salary	$ 35,000.00	Today's Salary	$ 38,000.00
Growth in Salary 1-10	8.00%	Growth in Salary 1-10	8.00%
Growth in Salary Remainder	3.00%	Growth in Salary Remainder	3.00%
T years in Work Force	34	T years in Work Force	34
Last Year of Work	55	Last Year of Work	55
Life Expectancy	80	Life Expectancy	74
Employee Contribution	7.00%	Employee Contribution	7.00%
State Contribution	25.00%	State Contribution	25.00%
Return on Investment	3.00%	Return on Investment	3.00%
Retirement Benefit	75.00%	Retirement Benefit	75.00%
COLA	3.00%	COLA	3.00%
PV of Excess (Unfunded) Liability	$(379,083.78)	PV of Excess (Unfunded) Liability	$(164,559.63)

Municipal (Female)		Municipal (Male)	
Today's Age	21	Today's Age	21
Today's Salary	$ 35,000.00	Today's Salary	$ 38,000.00
Growth in Salary 1-10	8.00%	Growth in Salary 1-10	8.00%
Growth in Salary Remainder	3.00%	Growth in Salary Remainder	3.00%
T years in Work Force	38	T years in Work Force	38
Last Year of Work	59	Last Year of Work	59
Life Expectancy	80	Life Expectancy	74
Employee Contribution	6.00%	Employee Contribution	6.00%
State Contribution	25.00%	State Contribution	25.00%
Return on Investment	3.00%	Return on Investment	3.00%
Retirement Benefit	75.00%	Retirement Benefit	75.00%
COLA	3.00%	COLA	3.00%
PV of Excess (Unfunded) Liability	$(178,692.85)	PV of Excess (Unfunded) Liability	$ 53,007.66

Appendix I – Present Value Excess (Unfunded) Liability – 70% Full Benefit

Teacher (Female)		Teacher (Male)	
Today's Age	21	Today's Age	21
Today's Salary	$ 35,000.00	Today's Salary	$ 38,000.00
Growth in Salary 1-10	8.00%	Growth in Salary 1-10	8.00%
Growth in Salary Remainder	3.00%	Growth in Salary Remainder	3.00%
T years in Work Force	38	T years in Work Force	38
Last Year of Work	59	Last Year of Work	59
Life Expectancy	80	Life Expectancy	74
Employee Contribution	9.50%	Employee Contribution	9.50%
State Contribution	25.00%	State Contribution	25.00%
Return on Investment	3.00%	Return on Investment	3.00%
Retirement Benefit	70.00%	Retirement Benefit	70.00%
COLA	3.00%	COLA	3.00%
PV of Excess (Unfunded) Liability	$(55,875.46)	PV of Excess (Unfunded) Liability	$169,884.45

State Employee (Female)		State Employee (Male)	
Today's Age	21	Today's Age	21
Today's Salary	$ 35,000.00	Today's Salary	$ 38,000.00
Growth in Salary 1-10	8.00%	Growth in Salary 1-10	8.00%
Growth in Salary Remainder	3.00%	Growth in Salary Remainder	3.00%
T years in Work Force	38	T years in Work Force	38
Last Year of Work	59	Last Year of Work	59
Life Expectancy	80	Life Expectancy	74
Employee Contribution	8.75%	Employee Contribution	8.75%
State Contribution	25.00%	State Contribution	25.00%
Return on Investment	3.00%	Return on Investment	3.00%
Retirement Benefit	70.00%	Retirement Benefit	70.00%
COLA	3.00%	COLA	3.00%
PV of Excess (Unfunded) Liability	$(70,817.69)	PV of Excess (Unfunded) Liability	$153,661.46

Police & Fire (Female)		Police & Fire (Male)	
Today's Age	21	Today's Age	21
Today's Salary	$ 35,000.00	Today's Salary	$ 38,000.00
Growth in Salary 1-10	8.00%	Growth in Salary 1-10	8.00%
Growth in Salary Remainder	3.00%	Growth in Salary Remainder	3.00%
T years in Work Force	34	T years in Work Force	34
Last Year of Work	55	Last Year of Work	55
Life Expectancy	80	Life Expectancy	74
Employee Contribution	7.00%	Employee Contribution	7.00%
State Contribution	25.00%	State Contribution	25.00%
Return on Investment	3.00%	Return on Investment	3.00%
Retirement Benefit	70.00%	Retirement Benefit	70.00%
COLA	3.00%	COLA	3.00%
PV of Excess (Unfunded) Liability	$(315,884.97)	PV of Excess (Unfunded) Liability	$(112,411.59)

Municipal (Female)		Municipal (Male)	
Today's Age	21	Today's Age	21
Today's Salary	$ 35,000.00	Today's Salary	$ 38,000.00
Growth in Salary 1-10	8.00%	Growth in Salary 1-10	8.00%
Growth in Salary Remainder	3.00%	Growth in Salary Remainder	3.00%
T years in Work Force	38	T years in Work Force	38
Last Year of Work	59	Last Year of Work	59
Life Expectancy	80	Life Expectancy	74
Employee Contribution	6.00%	Employee Contribution	6.00%
State Contribution	25.00%	State Contribution	25.00%
Return on Investment	3.00%	Return on Investment	3.00%
Retirement Benefit	70.00%	Retirement Benefit	70.00%
COLA	3.00%	COLA	3.00%
PV of Excess (Unfunded) Liability	$(125,605.86)	PV of Excess (Unfunded) Liability	$ 94,177.16

Appendix J – Present Value Excess (Unfunded) Liability – 4 Year Increased Retirement Age

Teacher (Female)		Teacher (Male)	
Today's Age	21	Today's Age	21
Today's Salary	$ 35,000.00	Today's Salary	$ 38,000.00
Growth in Salary 1-10	8.00%	Growth in Salary 1-10	8.00%
Growth in Salary Remainder	3.00%	Growth in Salary Remainder	3.00%
T years in Work Force	42	T years in Work Force	42
Last Year of Work	63	Last Year of Work	63
Life Expectancy	80	Life Expectancy	74
Employee Contribution	9.50%	Employee Contribution	9.50%
State Contribution	25.00%	State Contribution	25.00%
Return on Investment	3.00%	Return on Investment	3.00%
Retirement Benefit	75.00%	Retirement Benefit	75.00%
COLA	3.00%	COLA	3.00%
PV of Excess (Unfunded) Liability	$116,713.68	PV of Excess (Unfunded) Liability	$373,734.75

State Employee (Female)		State Employee (Male)	
Today's Age	21	Today's Age	21
Today's Salary	$ 35,000.00	Today's Salary	$ 38,000.00
Growth in Salary 1-10	8.00%	Growth in Salary 1-10	8.00%
Growth in Salary Remainder	3.00%	Growth in Salary Remainder	3.00%
T years in Work Force	42	T years in Work Force	42
Last Year of Work	63	Last Year of Work	63
Life Expectancy	80	Life Expectancy	74
Employee Contribution	8.75%	Employee Contribution	8.75%
State Contribution	25.00%	State Contribution	25.00%
Return on Investment	3.00%	Return on Investment	3.00%
Retirement Benefit	75.00%	Retirement Benefit	75.00%
COLA	3.00%	COLA	3.00%
PV of Excess (Unfunded) Liability	$100,162.78	PV of Excess (Unfunded) Liability	$355,765.20

Police & Fire (Female)		Police & Fire (Male)	
Today's Age	21	Today's Age	21
Today's Salary	$ 35,000.00	Today's Salary	$ 38,000.00
Growth in Salary 1-10	8.00%	Growth in Salary 1-10	8.00%
Growth in Salary Remainder	3.00%	Growth in Salary Remainder	3.00%
T years in Work Force	38	T years in Work Force	38
Last Year of Work	59	Last Year of Work	59
Life Expectancy	80	Life Expectancy	74
Employee Contribution	7.00%	Employee Contribution	7.00%
State Contribution	25.00%	State Contribution	25.00%
Return on Investment	3.00%	Return on Investment	3.00%
Retirement Benefit	75.00%	Retirement Benefit	75.00%
COLA	3.00%	COLA	3.00%
PV of Excess (Unfunded) Liability	$(158,769.88)	PV of Excess (Unfunded) Liability	$ 74,638.31

Municipal (Female)		Municipal (Male)	
Today's Age	21	Today's Age	21
Today's Salary	$ 35,000.00	Today's Salary	$ 38,000.00
Growth in Salary 1-10	8.00%	Growth in Salary 1-10	8.00%
Growth in Salary Remainder	3.00%	Growth in Salary Remainder	3.00%
T years in Work Force	42	T years in Work Force	42
Last Year of Work	63	Last Year of Work	63
Life Expectancy	80	Life Expectancy	74
Employee Contribution	6.00%	Employee Contribution	6.00%
State Contribution	25.00%	State Contribution	25.00%
Return on Investment	3.00%	Return on Investment	3.00%
Retirement Benefit	75.00%	Retirement Benefit	75.00%
COLA	3.00%	COLA	3.00%
PV of Excess (Unfunded) Liability	$ 39,476.14	PV of Excess (Unfunded) Liability	$289,876.85

Appendix K – Present Value Excess (Unfunded) Liability – No COLA Benefits

Teacher (Female)		Teacher (Male)	
Today's Age	21	Today's Age	21
Today's Salary	$ 35,000.00	Today's Salary	$ 38,000.00
Growth in Salary 1-10	8.00%	Growth in Salary 1-10	8.00%
Growth in Salary Remainder	3.00%	Growth in Salary Remainder	3.00%
T years in Work Force	38	T years in Work Force	38
Last Year of Work	59	Last Year of Work	59
Life Expectancy	80	Life Expectancy	74
Employee Contribution	9.50%	Employee Contribution	9.50%
State Contribution	25.00%	State Contribution	25.00%
Return on Investment	3.00%	Return on Investment	3.00%
Retirement Benefit	75.00%	Retirement Benefit	75.00%
COLA	0.00%	COLA	0.00%
PV of Excess (Unfunded) Liability	$ 85,280.02	PV of Excess (Unfunded) Liability	$240,034.28

State Employee (Female)		State Employee (Male)	
Today's Age	21	Today's Age	21
Today's Salary	$ 35,000.00	Today's Salary	$ 38,000.00
Growth in Salary 1-10	8.00%	Growth in Salary 1-10	8.00%
Growth in Salary Remainder	3.00%	Growth in Salary Remainder	3.00%
T years in Work Force	38	T years in Work Force	38
Last Year of Work	59	Last Year of Work	59
Life Expectancy	80	Life Expectancy	74
Employee Contribution	8.75%	Employee Contribution	8.75%
State Contribution	25.00%	State Contribution	25.00%
Return on Investment	3.00%	Return on Investment	3.00%
Retirement Benefit	75.00%	Retirement Benefit	75.00%
COLA	0.00%	COLA	0.00%
PV of Excess (Unfunded) Liability	$ 70,337.79	PV of Excess (Unfunded) Liability	$223,811.29

Police & Fire (Female)		Police & Fire (Male)	
Today's Age	21	Today's Age	21
Today's Salary	$ 35,000.00	Today's Salary	$ 38,000.00
Growth in Salary 1-10	8.00%	Growth in Salary 1-10	8.00%
Growth in Salary Remainder	3.00%	Growth in Salary Remainder	3.00%
T years in Work Force	34	T years in Work Force	34
Last Year of Work	55	Last Year of Work	55
Life Expectancy	80	Life Expectancy	74
Employee Contribution	7.00%	Employee Contribution	7.00%
State Contribution	25.00%	State Contribution	25.00%
Return on Investment	3.00%	Return on Investment	3.00%
Retirement Benefit	75.00%	Retirement Benefit	75.00%
COLA	0.00%	COLA	0.00%
PV of Excess (Unfunded) Liability	$(111,204.60)	PV of Excess (Unfunded) Liability	$ 10,266.14

Municipal (Female)		Municipal (Male)	
Today's Age	21	Today's Age	21
Today's Salary	$ 35,000.00	Today's Salary	$ 38,000.00
Growth in Salary 1-10	8.00%	Growth in Salary 1-10	8.00%
Growth in Salary Remainder	3.00%	Growth in Salary Remainder	3.00%
T years in Work Force	38	T years in Work Force	38
Last Year of Work	59	Last Year of Work	59
Life Expectancy	80	Life Expectancy	74
Employee Contribution	6.00%	Employee Contribution	6.00%
State Contribution	25.00%	State Contribution	25.00%
Return on Investment	3.00%	Return on Investment	3.00%
Retirement Benefit	75.00%	Retirement Benefit	75.00%
COLA	0.00%	COLA	0.00%
PV of Excess (Unfunded) Liability	$ 15,549.62	PV of Excess (Unfunded) Liability	$164,326.99

Appendix L – Present Value Excess (Unfunded) Liability – 9% Contribution Rate – Police & Fire Employees

Police & Fire (Female)		Police & Fire (Male)	
Today's Age	21	Today's Age	21
Today's Salary	$ 35,000.00	Today's Salary	$ 38,000.00
Growth in Salary 1-10	8.00%	Growth in Salary 1-10	8.00%
Growth in Salary Remainder	3.00%	Growth in Salary Remainder	3.00%
T years in Work Force	38	T years in Work Force	38
Last Year of Work	59	Last Year of Work	59
Life Expectancy	80	Life Expectancy	74
Employee Contribution	9.00%	Employee Contribution	9.00%
State Contribution	25.00%	State Contribution	25.00%
Return on Investment	5.00%	Return on Investment	5.00%
Retirement Benefit	70.00%	Retirement Benefit	70.00%
COLA	0.00%	COLA	0.00%
PV of Excess (Unfunded) Liability	$ 248,057.80	PV of Excess (Unfunded) Liability	$315,849.21

Appendix M – Present Value Excess (Unfunded) Liability – All Proposed Changes

Teacher (Female)		Teacher (Male)	
Today's Age	21	Today's Age	21
Today's Salary	$ 35,000.00	Today's Salary	$ 38,000.00
Growth in Salary 1-10	8.00%	Growth in Salary 1-10	8.00%
Growth in Salary Remainder	3.00%	Growth in Salary Remainder	3.00%
T years in Work Force	42	T years in Work Force	42
Last Year of Work	63	Last Year of Work	63
Life Expectancy	80	Life Expectancy	74
Employee Contribution	9.50%	Employee Contribution	9.50%
State Contribution	25.00%	State Contribution	25.00%
Return on Investment	5.00%	Return on Investment	5.00%
Retirement Benefit	70.00%	Retirement Benefit	70.00%
COLA	0.00%	COLA	0.00%
PV of Excess (Unfunded) Liability	$330,791.74	PV of Excess (Unfunded) Liability	$411,514.47

State Employee (Female)		State Employee (Male)	
Today's Age	21	Today's Age	21
Today's Salary	$ 35,000.00	Today's Salary	$ 38,000.00
Growth in Salary 1-10	8.00%	Growth in Salary 1-10	8.00%
Growth in Salary Remainder	3.00%	Growth in Salary Remainder	3.00%
T years in Work Force	42	T years in Work Force	42
Last Year of Work	63	Last Year of Work	63
Life Expectancy	80	Life Expectancy	74
Employee Contribution	8.75%	Employee Contribution	8.75%
State Contribution	25.00%	State Contribution	25.00%
Return on Investment	5.00%	Return on Investment	5.00%
Retirement Benefit	70.00%	Retirement Benefit	70.00%
COLA	0.00%	COLA	0.00%
PV of Excess (Unfunded) Liability	$319,617.07	PV of Excess (Unfunded) Liability	$399,381.97

Police & Fire (Female)		Police & Fire (Male)	
Today's Age	21	Today's Age	21
Today's Salary	$ 35,000.00	Today's Salary	$ 38,000.00
Growth in Salary 1-10	8.00%	Growth in Salary 1-10	8.00%
Growth in Salary Remainder	3.00%	Growth in Salary Remainder	3.00%
T years in Work Force	38	T years in Work Force	38
Last Year of Work	59	Last Year of Work	59
Life Expectancy	80	Life Expectancy	74
Employee Contribution	9.00%	Employee Contribution	9.00%
State Contribution	25.00%	State Contribution	25.00%
Return on Investment	5.00%	Return on Investment	5.00%
Retirement Benefit	70.00%	Retirement Benefit	70.00%
COLA	0.00%	COLA	0.00%
PV of Excess (Unfunded) Liability	$248,057.80	PV of Excess (Unfunded) Liability	$315,849.21

Municipal (Female)		Municipal (Male)	
Today's Age	21	Today's Age	21
Today's Salary	$ 35,000.00	Today's Salary	$ 38,000.00
Growth in Salary 1-10	8.00%	Growth in Salary 1-10	8.00%
Growth in Salary Remainder	3.00%	Growth in Salary Remainder	3.00%
T years in Work Force	42	T years in Work Force	42
Last Year of Work	63	Last Year of Work	63
Life Expectancy	80	Life Expectancy	74
Employee Contribution	6.00%	Employee Contribution	6.00%
State Contribution	25.00%	State Contribution	25.00%
Return on Investment	5.00%	Return on Investment	5.00%
Retirement Benefit	70.00%	Retirement Benefit	70.00%
COLA	0.00%	COLA	0.00%
PV of Excess (Unfunded) Liability	$278,643.28	PV of Excess (Unfunded) Liability	$354,896.14

Appendix N – Present Value Excess (Unfunded) Liability – All Proposed Changes, 7.5% State Contribution

Teacher (Female)		Teacher (Male)	
Today's Age	21	Today's Age	21
Today's Salary	$ 35,000.00	Today's Salary	$ 38,000.00
Growth in Salary 1-10	8.00%	Growth in Salary 1-10	8.00%
Growth in Salary Remainder	3.00%	Growth in Salary Remainder	3.00%
T years in Work Force	42	T years in Work Force	42
Last Year of Work	63	Last Year of Work	63
Life Expectancy	80	Life Expectancy	74
Employee Contribution	9.50%	Employee Contribution	9.50%
State Contribution	7.50%	State Contribution	7.50%
Return on Investment	5.00%	Return on Investment	5.00%
Retirement Benefit	70.00%	Retirement Benefit	70.00%
COLA	0.00%	COLA	0.00%
PV of Excess (Unfunded) Liability	$ 70,049.44	PV of Excess (Unfunded) Liability	$128,422.83

State Employee (Female)		State Employee (Male)	
Today's Age	21	Today's Age	21
Today's Salary	$ 35,000.00	Today's Salary	$ 38,000.00
Growth in Salary 1-10	8.00%	Growth in Salary 1-10	8.00%
Growth in Salary Remainder	3.00%	Growth in Salary Remainder	3.00%
T years in Work Force	42	T years in Work Force	42
Last Year of Work	63	Last Year of Work	63
Life Expectancy	80	Life Expectancy	74
Employee Contribution	8.75%	Employee Contribution	8.75%
State Contribution	7.50%	State Contribution	7.50%
Return on Investment	5.00%	Return on Investment	5.00%
Retirement Benefit	70.00%	Retirement Benefit	70.00%
COLA	0.00%	COLA	0.00%
PV of Excess (Unfunded) Liability	$ 58,874.77	PV of Excess (Unfunded) Liability	$116,290.33

Police & Fire (Female)		Police & Fire (Male)	
Today's Age	21	Today's Age	21
Today's Salary	$ 35,000.00	Today's Salary	$ 38,000.00
Growth in Salary 1-10	8.00%	Growth in Salary 1-10	8.00%
Growth in Salary Remainder	3.00%	Growth in Salary Remainder	3.00%
T years in Work Force	38	T years in Work Force	38
Last Year of Work	59	Last Year of Work	59
Life Expectancy	80	Life Expectancy	74
Employee Contribution	9.00%	Employee Contribution	9.00%
State Contribution	7.50%	State Contribution	7.50%
Return on Investment	5.00%	Return on Investment	5.00%
Retirement Benefit	70.00%	Retirement Benefit	70.00%
COLA	0.00%	COLA	0.00%
PV of Excess (Unfunded) Liability	$ 4,545.54	PV of Excess (Unfunded) Liability	$ 51,464.47

Municipal (Female)		Municipal (Male)	
Today's Age	21	Today's Age	21
Today's Salary	$ 35,000.00	Today's Salary	$ 38,000.00
Growth in Salary 1-10	8.00%	Growth in Salary 1-10	8.00%
Growth in Salary Remainder	3.00%	Growth in Salary Remainder	3.00%
T years in Work Force	42	T years in Work Force	42
Last Year of Work	63	Last Year of Work	63
Life Expectancy	80	Life Expectancy	74
Employee Contribution	6.00%	Employee Contribution	6.00%
State Contribution	7.50%	State Contribution	7.50%
Return on Investment	5.00%	Return on Investment	5.00%
Retirement Benefit	70.00%	Retirement Benefit	70.00%
COLA	0.00%	COLA	0.00%
PV of Excess (Unfunded) Liability	$ 17,900.98	PV of Excess (Unfunded) Liability	$ 71,804.50

REFERENCES

Aubry, Jean-Pierre, et al. "Why Don't Some States and Localities Pay Their Required Pension Contributions." May 2008. Center for Retirement Research at Boston College. August 2009.

Boston College. Center for Retirement Research. 2009. <http://crr.bc.edu/>.

Brainard, Keith. "Public Fund Survey, Summary of Findings, FY 2003." September 2004. National Association of State Retirement Administrators. November 2009 <http://www.publicfundsurvey.org/SurveyFindingsFY03.pdf>.

Craig, Lee. "Public Sector Pensions in the United States." 16 March 2003. EH.net Encyclopedia. September 2009 <http://eh.net/encyclopedia/article/craig.pensions.public.us>.

Downing, Neil. "Projo.com." 10 July 2007. R.I. Taxes Rising, Now Seventh in the Country. 10 March 2010 <http://www.projo.com/news/content/projo_07102007_ndown.5f1e041a.html>.

Employee Retirement System of Rhode Island. Frequently Asked Questions. 2001. 15 November 2009 <http://www.ersri.org/public/help/faqs/>.

Employees' Retirement System of Rhode Island. 2007 Annual Report. Annual Pension Report. Providence, 2007.

Gregg, Katherine. "State Pension Costs Studied." 25 January 2008. Projo.com. 28 January 2010 <http://www.projo.com/news/content/pension_01-25-08_3U8O7N2_v27.287888b.html>.

Hayllar, Ben. "Addressing Unfunded Pension Liability: Pension Bonds in the City of Philadelphia." December 1999. BNet/Find Articles. September 2009 <http://findarticles.com/p/articles/mi_hb6642/is_6_15/ai_n28748174/>.

Mendel, Ed. "Using Pension Funds to Shrink the Budget Gap." 24 May 2009. Calpensions. November 2009 <http://calpensions.com/2009/05/24/using-pension-funds-to-shrink-the-budget-gap/>.

Munnell, Alicia H, et al. "Why Don't Some States and Localities Pay Their Required Pension Contributions?" Center for Retirement Research at Boston College: State and Local Pension Plans. May 2008.

Passantino, George and Adam B Summers. "The Gathering Pension Storm: How Government Pension Plans are Breaking the Bank and Strategies for Reform." June 2005. Reason Foundation. September 2009 <http://reason.org/files/fdc15a51e854e26460feefba6c302a9c.pdf>.

Penner, Rudolph G, Pamela Perun and C. Eugene Steuerle. "Legal and Institutional Impediments to Partial Retirement and Part-Time Work by Older Workers." 20 November 2002. The Urban Institute. November 2009 <http://www.urban.org/UploadedPDF/410587_SloanFinal.pdf>.

Peoples, Steve, Katherine Gregg and Randall Edgar. "House OKs $52-million cut in local, school aid." 14 April 2010. Projo.com. 16 April 2010 <http://www.projo.com/news/content/HOUSE_BUDGET_VOTE_04-14-10_DVI4094_v13.3c0b537.html>.

Rhode Island KIDS COUNT. "Rhode Island Budget Snapshots for Fiscal Year 2007." 2007. Rhode Island KIDS COUNT. 28 January 2010 <http://www.rikidscount.org/matriarch/MultiPiecePage.asp_Q_PageID_E_671_A_PageName_E_BudgetSnapshot07>.

Rhode Island Public Expenditure Council. "Comments on Your Government: Rhode Island's State Pension System." 16 February 2009. Projo.com. November 2009 <http://www.projo.com/news/2009/pdf/0216_RIPEC_report.pdf>.

Shrestha, Laura B. "Life Expectancy in the United States." Report for Congress. 2006.

Social Security.gov. "Retirement Benefits by Year of Birth." 26 January 2010. Social Security Online. 28 January 2010 <http://www.socialsecurity.gov/retire2/agereduction.htm>.