

**FRESNO COUNTY EMPLOYEES'
RETIREMENT ASSOCIATION**

**Review of Economic Actuarial Assumptions
for the June 30, 2010 Actuarial Valuation**



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May 25, 2010

Board of Retirement
Fresno County Employees' Retirement Association
1111 H Street
Fresno, CA 93721

**Re: Review of Economic Actuarial Assumptions
for the June 30, 2010 Actuarial Valuation**

Dear Members of the Board:

We are pleased to submit this report of our review of the June 30, 2010 economic actuarial assumptions for the Fresno County Employees' Retirement Association. This report includes our recommendations and the analysis supporting their development.

Please note that we have also reviewed the non-economic actuarial experience for the three-year period from July 1, 2006 to June 30, 2009. Based on that review, the results and the associated assumptions recommended for the June 30, 2010 valuation are provided in a separate report.

We are Members of the American Academy of Actuaries and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion herein.

We look forward to reviewing this report with you and answering any questions you may have.

Sincerely,

Handwritten signature of Paul Angelo in black ink.

Paul Angelo, FSA, EA, MAAA, FCA
Senior Vice President and Actuary

Handwritten signature of Andy Yeung in black ink.

Andy Yeung, ASA, EA, MAAA
Vice President and Associate Actuary

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I. INTRODUCTION, SUMMARY, AND RECOMMENDATIONS

To project the cost and liabilities of the Pension Fund, assumptions are made about all future events that could affect the amount and timing of the benefits to be paid and the assets to be accumulated. Each year actual experience is compared against the projected experience, and to the extent there are differences, the future contribution requirement is adjusted.

If assumptions are changed, contribution requirements are adjusted to take into account a change in the projected experience in all future years. There is a great difference in both philosophy and cost impact between recognizing the actuarial deviations as they occur annually and changing the actuarial assumptions. Adjusting contributions as gains or losses occur without making a change in the assumptions is appropriate if the deviation from projections is considered temporary and if, over the long run, experience is expected to return to what was originally assumed. Changing assumptions reflects a basic change in thinking about the future, and it has a much greater effect on the current contribution requirements than the gain or loss for a single year.

The use of realistic actuarial assumptions is important to maintain adequate funding, while fulfilling benefit commitments to participants already retired and to those near retirement. The actuarial assumptions do not determine the “actual cost” of the plan. The actual cost is determined solely by the benefits and administrative expenses paid out, offset by investment income received. However, it is desirable to estimate as closely as possible what the actual cost will be so as to permit an orderly method for setting aside contributions today to provide benefits in the future, and to maintain equity among generations of participants and taxpayers.

This study was undertaken in order to review the economic actuarial assumptions. The study was performed in accordance with Actuarial Standard of Practice (ASOP) No. 27, “Selection of Economic Assumptions for Measuring Pension Obligations.” This Standard of Practice puts forth guidelines for the selection of the economic actuarial assumptions utilized in a pension plan actuarial valuation.

We are recommending changes in the economic assumptions currently used by the Board. Our recommendations for the economic actuarial assumptions for the June 30, 2010 Actuarial Valuation are as follows:

Investment Return - The estimated average future net rate of return on current and future assets of the Association as of the valuation date. This rate is used to discount liabilities.

Recommendation: *Reduce the current 8.00% investment return assumption to 7.75% per annum.*

Inflation – Future increases in the cost-of-living index which drives investment returns and active member salary increases, as well as COLA increases to retired employees.

Recommendation: *Reduce the current 3.75% inflation assumption to 3.50% per annum.*

Individual Salary Increases - Increases in the salary of a member between the date of the valuation to the date of separation from active service. This assumption has three components:

- Inflationary salary increases.
- Real “across the board” salary increases.
- Promotional and merit increases.

Recommendation: *Reduce the current inflationary salary increase assumption from 3.75% to 3.50% per annum consistent with our recommended general inflation assumption but increase the real “across the board” salary increase assumption from 0.25% to 0.50%. This means that the combined inflationary and real “across the board” salary increases will remain unchanged at 4.00% per annum. The recommended promotional and merit increase assumptions are provided in our June 30, 2009 triennial experience study report.*

Section II provides some background on basic principles and the methodology used for the review of the economic actuarial assumptions. A detailed discussion of each of the economic assumptions and reasons behind the recommendations is found in Section III.

II. BACKGROUND AND METHODOLOGY

In this report, we analyzed the “economic” assumptions only. Our analysis of the “non-economic” assumptions for the June 30, 2010 valuation will be provided in a separate report. The primary economic assumptions reviewed are inflation, investment return and salary increases.

Economic Assumptions

Economic assumptions consist of:

Inflation - Increases in the price of goods and services. The inflation assumption reflects the basic return that investors expect from securities markets. It also reflects the expected basic salary increase for active employees and drives increases in the allowances of retired members.

Investment Return – Expected long term rate of return on the Association’s investments after expenses. This assumption has a significant impact on contribution rates.

Salary Increases – In addition to inflationary increases, it is assumed that salaries will also grow by “across the board” real pay increases in excess of price inflation. It is also assumed that employees will receive raises above these average increases as they advance in their careers. These are commonly referred to as promotional and merit increases. Payments to amortize any Unfunded Actuarial Accrued Liability (UAAL) are assumed to increase each year by the price inflation rate plus any “across the board” pay increases that are assumed.

The setting of these assumptions is described in Section III.

III. ECONOMIC ASSUMPTIONS

The investment return assumption is comprised of two components: (i) Inflation; and (ii) Real Rate of Investment Return.

Inflation

Unless an investment grows at least as fast as prices increase, investors will experience a reduction in the inflation-adjusted value of their investment. There may be times when “riskless” investments return more or less than inflation, but over the long term, investment market forces will generally require an issuer of fixed income securities to maintain a minimum return which protects investors from inflation.

The inflation assumption is long term in nature, so it is set using primarily historical information. Following is an analysis of 15 and 30 year moving averages of historical inflation rates:

Historical Consumer Price Index – 1930 to 2009

(U.S. City Average - All Urban Consumers)

	<u>25th Percentile</u>	<u>Median</u>	<u>75th Percentile</u>
15 year moving averages	2.7%	3.5%	4.8%
30 year moving averages	3.3%	4.3%	5.0%

The average inflation rates have continued to decline gradually over the last several years due to the relatively low inflationary period in the 1990s and early 2000s. However, the inflation rates for the past few years have started to show some increase. Also, the 15-year averages during the period are lower as they do not include the high inflation years of the mid-1970s and early 1980s.

FCERA’s investment consultant, Wurts & Associates, anticipates an annual inflation rate of 3.25%. Note that, in general, investment consultants use a time horizon for this assumption that is shorter than the time horizon we use for the actuarial valuation.

In the 2009 public fund survey published by the National Association of State Retirement Administrators, the median inflation assumption used by 113 large public retirement funds in their 2008 valuations has remained unchanged from the 3.50% used in the 2007 valuations.

Based on all of the above information, we recommend that the current 3.75% annual inflation assumption be reduced to 3.50% for the June 30, 2010 actuarial valuation.

Retiree Cost-of-Living Increases

In our last review of the economic assumptions as of June 30, 2007, consistent with the 3.75% annual inflation assumption adopted by the Board for that valuation, the Board adopted a 3.00% retiree cost-of-living adjustment for all General and Safety.

We are recommending that the current retiree cost-of-living assumption (i.e., 3.00% per year) be continued in the June 30, 2010 valuation.

Real Rate of Investment Return

This component represents the portfolio's incremental investment market returns over inflation. Theory has it that, as an investor takes a greater investment risk, the return on the investment is expected to also be greater, at least in the long run. This additional return is expected to vary by asset class and empirical data supports that expectation. For that reason, the real rate of return assumptions are developed by asset class. Therefore, the real rate of return assumption for a retirement association's portfolio will vary with the Board's asset allocation among asset classes.

Following is the Association's most recently adopted target asset allocation and the assumed real rate of return assumptions by asset class. The first column of real rate of return assumptions are determined by netting Wurts' total 2010 return assumptions by their assumed 3.25% for inflation. The second column of returns represents the average of a sample of real rate of return assumptions. The sample includes the expected annual real rates of return provided to us by Wurts and by eight other investment advisory firms retained by Segal's California public sector clients and are based on projected arithmetic returns provided by the investment advisory firms. We believe these averages are a reasonable forecast of long term future market returns. The Wurts assumptions are used for FCERA's Hedge Funds, Alternative Investment – TALF and Private Equity.

FCERA’s Target Asset Allocation and Assumed Arithmetic Real Rate of Return Assumptions by Asset Class and for the Portfolio

<u>Asset Class</u>	<u>Percentage of Portfolio</u>	<u>Wurts’ Assumed Real Rate of Return⁽¹⁾</u>	<u>Average from a Sample of Consultants to Segal’s Public Sector Clients’ Real Rates of Return⁽²⁾</u>
Large Cap U.S. Equity	24%	6.03%	6.45%
Small Cap U.S. Equity	8%	6.67%	6.98%
Developed International Equity	18%	6.92%	6.95%
Emerging Markets Equity	2%	10.17%	9.29%
U.S. Core Fixed Income	14%	0.63%	1.77%
Opportunistic Fixed Income	6%	4.35%	5.04%
Global Fixed Income	1%	1.65%	1.81%
Hedge Funds	4%	4.50%	4.50% ⁽³⁾
TIPS	2%	1.72%	1.94%
Alternative Investment - TALF	5%	7.00%	7.00% ⁽³⁾
Commodities	3%	5.95%	5.66%
Real Estate	6%	4.66%	4.83%
Private Equity	<u>7%</u>	<u>10.17%</u>	<u>10.17%</u> ⁽³⁾
Total Portfolio	100%	5.53%	5.85%

- (1) Derived by netting Wurts’ 2010 rate of return assumptions by their assumed 3.25% inflation rate.
- (2) Including the county retirement associations of Fresno, Sacramento, Orange, San Bernardino, Alameda, Contra Costa, San Diego, the LA City Employees’ Retirement System and the City of Fresno Retirement Systems.
- (3) Wurts’ assumption is used for these asset classes to more closely reflect the underlying investments made specifically for FCERA.

Please note that the above are representative of “indexed” returns and do not include any additional returns (“alpha”) from active management. This is consistent with the Actuarial Standard of Practice No. 27, Section 3.6.3.e, which states:

“Investment Manager Performance - Anticipating superior (or inferior) investment manager performance may be unduly optimistic (pessimistic). Few investment managers consistently achieve significant above-market returns net of expenses over long periods.”

The following are some observations about the returns provided above:

1. The investment consultants to our California public sector clients have each provided us with their expected real rates of return for each asset class, over various future periods of time. However, in general, the returns available from investment consultants are projected over time periods shorter than the durations of a retirement plan's liabilities.
2. Using a sample average of expected real rates of return allows the Association's investment return assumption to reflect a broader range of capital market information and should help reduce year to year volatility in the Association's investment return assumption.
3. Therefore, we recommend that the 5.85% portfolio real rate of return be used to determine the Association's investment return assumption. This is 0.06% lower than the return we used three years ago to prepare the recommended investment return assumption for the June 30, 2007 valuation. This is caused by less optimistic assumptions provided by the investment consultants for certain asset classes that are offset somewhat by the changes made to the asset allocation.

Association Expenses

The real rate of return assumption for the portfolio needs to be adjusted for administrative and investment expenses expected to be paid from investment income.

The following table provides these expenses in relation to the actuarial value of assets for the five years ending June 30, 2009.

Administrative and Investment Expenses as a Percentage of Actuarial Value of Assets
(All dollars in 000's)

FYE	Actuarial Value of Assets	Administrative Expenses	Investment Expenses	Administrative %	Investment %	Total %
2005	\$2,337,311	\$2,484	\$8,883	0.11%	0.38%	0.49%
2006	2,462,841	2,865	10,228	0.12	0.42	0.54
2007	2,692,591	3,299	11,739	0.12	0.44	0.56
2008	2,942,900	3,569	13,191	0.12	0.45	0.57
2009	2,940,486	3,855	10,092	0.13	0.34	0.47
					Average	0.53%

The average expenses percentage over this five year period is 0.53%. Based on this experience, we believe a future expense assumption of 0.55% is reasonable. This assumption is higher than the 0.50% assumption used in our last review and will be re-examined as new data becomes available.

Risk Adjustment

The real rate of return assumption for the portfolio is adjusted to reflect the potential risk of shortfalls in the return assumptions. The Association's asset allocation determines this portfolio risk, since risk levels also are expected to vary by asset class. This portfolio risk is incorporated into the real rate of return assumption through a risk adjustment.

The purpose of the risk adjustment is to increase the likelihood of achieving the actuarial investment return assumption in the long term. The 5.85% expected real rate of return developed earlier in this report was based on expected mean or average returns. This means there is a 50% chance of the actual return being at least as great as the average. The risk adjustment is intended to increase that probability.

Three years ago, the Board adopted an investment return assumption of 8.00%. Together with an annual standard deviation of 11.28% (provided by Wurts), that return implied a risk adjustment of 1.16%, reflecting a confidence level of 65% that the actual average

return over 15 years would not fall below the assumed return, assuming that the distribution of returns over that period follows the normal statistical distribution.¹

If we use the same 65% confidence level to set this year's risk adjustment (based on a portfolio return standard deviation of 10.77%, provided by Wurts), the result is a risk adjustment of 1.11%. Together with the other investment return components developed above, this would result in an investment return assumption of 7.69%.

Alternatively, if we use a risk adjustment of 1.05% (corresponding to a confidence level of 64%), together with the other investment return components, this produces a net investment return assumption of 7.75%, which while greater than 7.69% is still lower than the current assumption of 8.00%.

As we have discussed in prior years, the risk adjustment model and associated confidence level is most useful as a means for comparing how the Association has positioned itself over periods of time. The use of a lower 64% confidence level should be considered in context with other factors, including:

- As noted above, the confidence level is more of a relative measure than an absolute measure, and so can be reevaluated and reset for future comparisons.
- The confidence level is based on the standard deviation of the portfolio that is determined and provided to us by Wurts. The standard deviation is a statistical measure of the future volatility of the portfolio and so is itself based on assumptions about future portfolio volatility and can be considered somewhat of a "soft" number.
- A lower level of inflation should reduce the overall risk of failing to meet the investment return assumption. Lowering the confidence level to some extent could be justified as consistent with the change in the inflation assumption.

¹ The theory that long term investment returns follow a Normal distribution is debatable; however, we believe the Normal distribution assumption is not unreasonable for purposes of setting the risk adjustment.

- As with any model, the results of the risk adjustment model should be evaluated for reasonableness and consistency. This is discussed in the following “Test of Risk Adjustment” section, including (1) a discussion of the relationship between the inflation assumption and the risk adjustment and (2) a comparison with assumptions adopted by similarly situated public sector retirement sections.

Taking into account the factors above, our recommendation is for a change in the net investment return assumption from 8.00% to 7.75%. Again, this return implies a risk adjustment of 1.05%, reflecting a confidence level of 64% that the actual average return over 15 years would not fall below the assumed return.

Recommended Investment Return Assumption

The following table summarizes the components of the investment return assumption developed in the previous discussion.

Calculation of Investment Return Assumption	
Assumption Component	Recommended Value
Inflation	3.50%
Plus Portfolio Real Rate of Return	5.85%
Minus Expense Adjustment	(0.55%)
Minus Risk Adjustment	<u>(1.05%)</u>
Total	7.75%

Based on this analysis, we recommend that the investment return assumption be reduced from 8.00% to 7.75% per annum.

Test of Risk Adjustment

The original development of the risk adjustment component of our investment earnings assumption model arose from our experience with many retirement boards over many years. Quite simply, combining the boards’ inflation assumption with the real return and expense components produced – and produces – a substantially higher assumed return than

what the boards actually adopt, regardless of the consulting actuary or the methods involved in the process.

In addition to the generally risk adverse attitude of retirement boards noted above, we believe another reason for this involves the inflation assumption. As noted earlier, the inflation assumption for actuarial valuations is generally longer term than that used by investment consultants. For many years, that has lead to higher actuarial valuation inflation assumptions. A higher inflation assumption has a conservative effect - higher current cost - on the wage increase and COLA assumption, but is less conservative as part of the investment earnings assumption. In effect, the risk adjustment compensates for this by offsetting the effect of the higher inflation assumption on assumed investment earnings.

One way to test the reasonableness of the risk adjustment incorporated in our recommendation is to compare our risk adjusted investment return against the expected net investment return that would result from using the average of all the capital market assumptions -- including the lower inflation assumption -- of the investment consultants in our sample.

Here is the comparison. It shows that the difference between our recommended return and that derived using the average of all the capital market assumptions of the investment consultants in our sample comes from the inflation assumptions and the risk adjustment.

<u>Assumption Element:</u>	<u>Risk Adjusted Method</u>	<u>Average of Investment Consultant Sample</u>	<u>Difference</u>
Inflation	3.50%	2.73%	0.77%
Risk Adjustment	(1.05%)	0.00%	(1.05%)
Real Rate of Return	5.85%	5.85%	0.00%
Expenses	<u>(0.55%)</u>	<u>(0.55%)</u>	<u>0.00%</u>
Total	7.75%	8.03%	(0.28%)

The 0.28% (28 basis points) difference between the two calculations represents about a 4% higher confidence level under the higher inflation, risk adjusted method, as compared to the lower inflation result without the risk adjustment. This means that the risk adjustment provides a higher confidence level even under the lower inflation scenario assumed by the investment consultants.

Comparing with Other Public Retirement Systems

One final test of the recommended investment return assumption is to compare it against those used by other public retirement systems, both in California and nationwide.

We note that this 7.75% investment return assumption is within the most common range for this assumption among most California public sector retirement systems. That range, with few exceptions, is from 7.75% to 8.00%. In particular two of the largest California systems, CalPERS and LACERA, use a 7.75% earnings assumption.

The following table compares the FCERA recommended net investment return assumptions against those of the nationwide public retirement systems that participated in the National Association of State Retirement Administrators (NASRA) public fund survey published in 2009:

Assumption	FCERA	NASRA Public Fund Survey Published in 2009		
		Low*	Median	High*
Net Investment Return	7.75%	7.25%	8.00%	8.50%
* After eliminating very lowest and highest as outliers				

As you can see, the recommended return assumption is below the median. The detailed survey results show 49 systems at 8.00%, 28 at 7.50% or 7.75%, and 30 at 8.25% or 8.50%. The survey also notes that “as with inflation assumptions, investment return assumptions for many plans have been reduced in recent years.”

The recommended assumption of 7.75% continues to provide for some risk margin within the risk adjustment model and is consistent with the Association's current practice relative to other public systems.

Salary Increase Assumption

Salary increases impact plan costs in two ways: (i) by increasing members' benefits (since benefits are a function of the members' highest average pay) and future normal cost collections; and (ii) by increasing total active member payroll which in turn generates higher UAAL amortization payments (or higher amortization credits if the UAAL is negative). These two impacts are discussed separately below.

As an employee progresses through his or her career, increases in pay are expected to come from three sources:

1. Inflation – Unless pay grows at least as fast as consumer prices grow, employees will experience a reduction in their standard of living. There may be times when pay increases lag or exceed inflation, but over the long term, labor market forces will require an employer to maintain its employees' standards of living.

As discussed earlier in this report, we are recommending that the assumed rate of inflation be reduced from 3.75% to 3.50% per annum. This inflation component will be used as part of the salary increase assumption.

2. Real "Across the Board" Pay Increases – These increases are sometimes termed productivity increases since they are considered to be derived from the ability of an organization or an economy to produce goods and services in a more efficient manner. As that occurs, at least some portion of the value of these improvements can provide a source for pay increases. These increases are typically assumed to extend to all employees "across the board." The State and Local Government Workers Employment Cost Index produced by the Department of Labor provides evidence that real "across the board" pay increases have averaged about 0.7% - 1.0% annually during the last 10 - 20 years.

The most recent salary increase experience indicates that actual average salary increases were higher than the actual change in CPI for most years:

<u>Valuation Date</u>	<u>Actual Average Increase⁽¹⁾</u>	<u>Actual Change in CPI⁽²⁾</u>
June 30, 2006	6.44%	3.42%
June 30, 2007	5.85%	3.17%
June 30, 2008	5.74%	3.49%
June 30, 2009	<u>4.11%</u>	<u>-0.38%</u>
Average	5.54%	2.43%

(1) Reflects the increase in average salary for members at the beginning of the year versus those at the end of the year. It does not reflect the average salary increases received by members who worked the full year.

(2) Based on the change in the annual average CPI for the Western Region compared to the prior year.

We recommend increasing the real “across the board” salary increase assumption from 0.25% to 0.50% for the June 30, 2010 actuarial valuation so that the combined inflation and “across the board” salary increase assumption remains unchanged at 4.00%.

- Promotional and Merit Increases – As the name implies, these increases come from an employee’s career advances. This form of pay increase differs from the previous two, since it is specific to the individual. For FCERA, there are service specific promotional and merit increases. We have reviewed this promotional and merit component as part of the triennial experience study as of June 30, 2009.

Recommended promotional and merit assumptions are provided as part of our triennial experience study as of June 30, 2009.

All three of these forces are incorporated into a salary increase assumption that is applied in the actuarial valuation to project future benefits and future normal cost contribution collections.

Active Member Payroll

Projected active member payrolls are used to develop the UAAL contribution rate. Future values are determined as a product of the number of employees in the workforce and the average pay for all employees. The average pay for all employees increases only by inflation and real “across the board” pay increases. The promotional and merit increases are not an influence, because this average pay is not specific to an individual.

For the June 30, 2010 valuation, we recommend that the active member payroll increase assumption remain unchanged at 4.00% annually, consistent with the combined inflation and “across the board” salary increase assumptions. This is the same as the prior valuation.

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