

**SAN DIEGO COUNTY EMPLOYEES  
RETIREMENT ASSOCIATION**

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



**100 Montgomery Street, Suite 500  
San Francisco, CA 94104**

COPYRIGHT © 2010  
ALL RIGHTS RESERVED  
MAY 2010



THE SEGAL COMPANY  
100 Montgomery Street, Suite 500 San Francisco, CA 94104-4308  
T 415.263.8200 F 415.263.8290 www.segalco.com

May 24, 2010

Board of Retirement  
San Diego County Employees Retirement Association  
2275 Rio Bonito Way, Suite 200  
San Diego, California 92108-1685

**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 San Diego County Employees Retirement Association. This report includes our recommendations and the analysis supporting their development.

The non-economic actuarial assumptions were reviewed in our triennial experience study for the period July 1, 2006 through June 30, 2009. Any changes to either the economic or non-economic actuarial assumptions adopted by the Board of Retirement will be applied in the June 30, 2010 valuation.

We are Members of the American Academy of Actuaries and we 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,

---

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

---

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

CZI/hy

5078782v2/05536.107



## TABLE OF CONTENTS

	Page
I. INTRODUCTION, SUMMARY, AND RECOMMENDATIONS .....	1
II. BACKGROUND AND METHODOLOGY .....	3
III. ECONOMIC ASSUMPTIONS .....	4

## 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.

Please note that the investment return assumption recommended in this report has been developed without taking into consideration the impact of any future allocations of “excess earnings” as described in the Board’s interest crediting and excess earnings policy.

Our recommendations for the economic actuarial assumptions for the June 30, 2010 Actuarial Valuation are as follows:

**Investment Return** - The estimated average future rate of return, net of expenses, on current and future assets of the Association. This rate is used to discount future cash flows to determine costs and liabilities.

**Recommendation:** *Reduce the current annual investment return assumption of 8.25% to 8.00%, based on our recommended inflation assumption, updated market index returns and the Association's asset allocation. While the 8.00% assumption recommended for the June 30, 2010 valuation is the same as the assumption we recommended to the Board in our last review for the June 30, 2007 valuation, the basis for this recommendation now reflects the new leveraged asset allocation.*

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

**Recommendation:** *Reduce the rate from 3.75% per annum 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, and
- Promotional and merit increases.

**Recommendation:** *Reduce the current inflationary salary increase from 3.75% to 3.50%. Increase the current real “across the board” salary increase assumption from 0.50% to 0.75%. The combined inflationary and real “across the board” salary increases will remain unchanged at 4.25%. Use the promotional and merit increases recommended in the June 30, 2009 triennial experience study for the June 30, 2010 valuation. Please note that the new promotional and merit increase assumption ranges from 0.75% to 6.00% for General and 1.25% to 8.00% for Safety.*

Section II provides some background on the basic principles and 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. 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 that are assumed as a result of labor’s share of productivity gains. 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 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:

<b>Historical Consumer Price Index – 1930 to 2009</b>			
<b>(U.S. City Average - All Urban Consumers)</b>			
	<u>25<sup>th</sup> Percentile</u>	<u>Median</u>	<u>75<sup>th</sup> 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 later of 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.

SDCERA’s investment consultant, Ennis Knupp, anticipates an annual inflation rate of 2.4%. Note that, in general, the investment consultants’ time horizon for this assumption 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 this information, we recommend that the current 3.75% annual inflation assumption be reduced to 3.50% for the June 30, 2010 actuarial valuation. For members not in Tier B, we recommend maintaining the 3.0% assumption currently used to project the maximum 3% post-retirement COLA benefit for the June 30, 2010 actuarial valuation. For members in Tier B, we recommend maintaining the 2.0% assumption currently used to project the maximum 2% post-retirement COLA benefit for the June 30, 2010 actuarial 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 system's portfolio will vary with the Board's asset allocation among asset classes.

The next page shows the Association's current target asset allocation and the average assumed real rate of return assumptions by asset class. The column of return assumptions (except for Natural Resources and Other Real Assets, Hedge Funds – Macro, Hedge Funds – Relative Value and Private Equity) 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 Ennis Knupp and by eight other investment advisory firms retained by Segal's public sector clients. We believe these assumptions reasonably reflect a consensus forecast of long term future real market returns. The Ennis Knupp assumptions are used for SDCERA's Natural Resources and Other Real Assets, Hedge Funds – Macro, Hedge Funds – Relative Value and Private Equity because these asset classes may not be comparable to asset classes at other systems.

**SDCERA Target Asset Allocation as of June 30, 2010 and Assumed Real Rate of Return  
Assumptions by Asset Class and for the Portfolio**

<u>Asset Class</u>	<u>Percentage of Portfolio</u>	<u>Average Assumed Real Rate of Return from a Sample of Consultants to Segal's Public Sector Clients<sup>(1)</sup></u>
Global Equity (U.S. and Non-U.S. Developed)	20.0%	6.70%
Emerging Market Equity	5.0%	9.10%
High Yield Bonds	5.0%	4.90%
TIPS	5.0%	1.93%
Emerging Market Debt	10.0%	5.23%
US Treasuries	40.0%	1.80%
Real Estate	10.0%	4.83%
Natural Resources and Other Real Assets	10.0%	2.70% <sup>(2)</sup>
Hedge Funds – Macro	10.0%	3.00% <sup>(2)</sup>
Hedge Funds – Relative Value	10.0%	3.60% <sup>(2)</sup>
Private Equity	<u>10.0%</u>	<u>12.00%</u> <sup>(2)</sup>
<b>Total</b>	<b>135.0%</b> <sup>(3)</sup>	<b>5.99%</b> <sup>(4), (5)</sup>

<sup>(1)</sup> Including Counties of San Diego, Alameda, Contra Costa, San Bernardino, Orange, Sacramento, and Fresno, City of Fresno and LA City Employees Retirement Systems.

<sup>(2)</sup> Ennis Knupp's assumptions are used for these asset classes to more closely reflect the underlying investments made specifically for SDCERA.

<sup>(3)</sup> The total portfolio asset allocation is greater than 100% to reflect the portfolio's leveraged asset allocation.

<sup>(4)</sup> Return is calculated before deducting the cost of leverage. See Note 3 on the following page for a discussion of the cost of leverage.

<sup>(5)</sup> If we use only Ennis Knupp assumptions for all asset classes, the real rate of return is 5.60%.

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 and our conclusions from the above analysis:

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 an average of expected real rate of returns allows the Association’s investment return assumption to include a broader range of capital market information and should help produce a more stable investment return assumption.
3. The Association has adopted a new investment portfolio strategy that allows for leverage by allocating 40% of its investments to U.S. Treasuries. This results in a total portfolio return of 5.99% that can be achieved only with an allocation of 135% of its current assets, i.e., before reflecting the cost of providing leverage. It is our understanding that there is no cash outlay associated with the financial futures that are an integral component of the leverage portfolio. However, in developing our net investment return assumption, we have approximated the cost of providing the 35% leverage by deducting the return on cash equal to 35% of plan assets at the assumed real rate of return for cash of 0.45% (based on the sample of real rate of return assumptions used by Segal’s California public sector clients) or 0.16%. This then results in a total portfolio return of 5.83% after deducting the cost of leverage. This is summarized later in our development of the net investment return assumption.
4. Therefore, we recommend that the 5.99% and 5.83% portfolio real rates of return (before and after reflecting the cost of leverage) be used to determine the Association’s investment return assumption. This leveraged rate of 5.83% is 0.13% higher than the return that was calculated three years ago

### ***Association Expenses***

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

Based on information provided by the Association, we have provided in the following table the administrative expenses in relation to the actuarial value of assets for the five years ending June 30, 2009.

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

Year Ending June 30	Actuarial Value of Assets*	Administrative Expenses	Administrative %
2005	\$5,524,801	\$7,491	0.14%
2006	5,947,256	8,034	0.14%
2007	6,608,148	10,249	0.16%
2008	7,539,284	10,511	0.14%
2009	8,507,057	10,107	<u>0.12%</u>
Average			0.14%

\* As of beginning of plan year.

The average administrative expense over this five year period is 0.14%. Although the Association has provided information on its investment expenses over the five year period from July 1, 2005 to June 30, 2009, we have not used those expenses in developing the investment expense assumption. This is because the expenses for the past several years were calculated under the alpha investment strategy and not the leveraged strategy that the Board has recently adopted. It is our understanding from discussions with Ennis Knupp and SDCERA staff that future investment expenses may be lowered as more passive strategies may be utilized. However, the lower expense may be offset somewhat by the hedge fund strategies. From these discussions, we understand that a continuation of the current combined 1.00% administrative and investment expense assumption should continue to be reasonable until actual experience is available.

### ***Risk Adjustment***

The real rate of return assumption for the portfolio generally is adjusted to reflect the potential risk of shortfalls in the return assumptions. The Association's asset allocation also determines this portfolio

risk, since risk levels are also 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 5.99% and 5.83% gross and net of leverage expected real rates of return developed earlier in this report were based on expected mean or average arithmetic returns. This means there is a roughly 50% chance of the actual return in each year 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 8.25%. However, based on our recommended 8.0% assumption from that review, there was an implied risk adjustment of 0.45% reflecting a confidence level of about 56% that the actual average return over 15 years would not fall below the assumed return. This was based on a portfolio standard deviation of 11.1% provided by Rocaton, and it assumed that the distribution of returns over that period followed the normal statistical distribution<sup>1</sup>. If we use the same 56% confidence level to set this year's risk adjustment (based on an annual portfolio return standard deviation of 10.0% provided by Ennis Knupp), the result is a risk adjustment of 0.40%.

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 themselves over periods of time. Continued use of the 56% confidence level should be considered in context with other factors, including:

- The confidence level generally used by Segal's other California public retirement clients is in the range of 55% to 60%. However, 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 Ennis Knupp. 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. This is especially true for the new leveraged asset

---

<sup>1</sup> 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.

allocation, where the relatively low standard deviation is based on a high assumed negative correlation between the leveraging asset class and the rest of the portfolio.

- 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 the same 8.00% net investment return assumption that we recommended to the Board in our last review for the June 30, 2007 valuation. This recommended return assumption implies a risk adjustment of 0.33%, reflecting a confidence level of 55% that the actual average return over 15 years would not fall below the assumed return.

***Recommended Investment Return Assumption***

The following table provides the calculated net investment return assumption that results from the previous discussion.

<b>Calculation of Net Investment Return Assumption</b>	
Assumption Component	Recommended Value
Inflation	3.50%
Plus Portfolio Real Rate of Return (“indexed”)	5.99%
Minus Cost of Providing Leverage	(0.16%)
Minus Expense Adjustment	(1.00%)
Minus Risk Adjustment	<u>(0.33%)</u>
Total	8.00%

**Based on this analysis, we recommend that the net investment return assumption be set at 8.00%, based on market index returns including reflection of the leverage portfolio.**

Comment on the use of “portfolio leverage” versus “alpha” returns. Please note that our investment return assumption recommendation of 8.00% is based on the leveraged asset allocation strategy adopted by the Board this year. In the past, we have recommended an 8.00% investment return assumption based on “indexed” returns and the Board has adopted a higher investment return assumption of 8.25% based on the anticipation of achieving “alpha” returns greater than the “indexed” returns on which our recommendations have been based. Because the current leveraged asset allocation

strategy makes no comparable distinction between “alpha” versus “indexed” return strategies and since our analysis of the investment return assumption does incorporate the “portfolio leverage” strategy, our investment return recommendation of 8.00% now incorporates all aspects of the asset allocation strategy.

### ***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 board’s 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.

The table in the following page shows 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	-0.33%	0.00%	-0.33%
Real Rate of Return (Net of Leverage)	5.83%	5.83%	0.00%
Expenses	<u>-1.00%</u>	<u>-1.00%</u>	<u>0.00%</u>
Total	8.00%	7.56%	+0.44%

The 0.44% (44 basis points) difference between the two calculations represents about 6% higher confidence level under the higher inflation, risk adjusted method, as compared to the lower inflation result without the risk adjustment.

### ***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 8.00% 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 SDCERA recommended net investment return assumption 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	SDCERA	NASRA Public Fund Survey Published in 2009		
		Low*	Median	High*
Net Investment Return	8.00%	7.25%	8.00%	8.50%
* After eliminating very lowest and highest as outliers				

As you can see, the recommended return assumption is at 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 8.00% provides 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 in this and the following sections.

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 may require an employer to maintain its employees’ standards of living.

**As discussed earlier in this report, we recommend reducing the assumed rate of inflation from 3.75% to 3.50%. This inflation component will be used as part of the salary increase assumption.**

2. Real “Across the Board” Pay Increases – These increases are typically 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 above inflation 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 generally higher than the expected average increases:

<u>Valuation Date</u>	<u>Actual Average Increase</u>	<u>Actual Change in CPI*</u>
June 30, 2009	1.4%	0.0%
June 30, 2008	5.0%	3.9%
June 30, 2007	6.8%	2.3%
June 30, 2006	3.4%	3.4%
June 30, 2005	<u>4.9%</u>	<u>3.7%</u>
Average	4.3%	2.7%

\* Based on the change in the annual CPI for the San Diego area compared to the prior year.

**We recommend that the current real “across the board” assumption of 0.50% be increased to 0.75% for the June 30, 2010 valuation. This means that the combined inflation and real “across the board” pay increase assumption will remain unchanged at 4.25%.**

3. 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 SDCERA, this assumption is structured as a function of an employee’s service and is derived from employee specific information as part of the triennial experience study. The assumed increases range from 0.75% to 6.00% for General members and 1.25% to 8.00% for Safety members.

**The promotional and merit assumptions recommended in the June 30, 2009 triennial experience study, if adopted by the Board, will be used for the June 30, 2010 valuation.**

***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 merit and promotional increases are not an influence, because this average pay is not specific to an individual.

**The active member payroll increase assumption to be used in the June 30, 2010 valuation is unchanged at 4.25%, consistent with the combined inflation and “across the board” salary increase assumptions.**

5078782v2/05536.107