

## Questions to Discuss in the 3/18/09 Meeting

March 12, 2009

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**John G Dickerson**

## The Questions

These are the questions that appear **in red** in the text below. They are shown here as a convenience.

**Question 1: Do you agree or disagree with this statement - In most years since 1997 MCERA's Returns on Assets has been significantly below its targeted Rate of Return (or "Interest Rate") of 8%, and the overall return over those years was significantly below 8%?**

**Question 2: Do you agree or disagree with this statement?**

*Based on the 10-year data from SCO and the response of the SCO Analyst, as well as the findings in MCERA Returns on Assets on page 3 of this memo, it is "logical and reasonable" to conclude that MCERA had the lowest return on investment of any County Retirement System during these years. The possible errors in the Yield on Assets method might have been great enough for MCERA's actual ROI to have been higher than the 2<sup>nd</sup> lowest County - San Luis Obispo. But it is extremely unlikely MCERA's actual ROI could have been higher than any other of the County systems.*

**Question3: Were the Investment Incomes of the 2 funds (Pensions and Healthcare) reported during these years (1998 - 2002) accurate?**

**Question4: Why are the Returns on Investment so wildly different between the Pension and Healthcare Funds?**

**Question 5: Are the figures above (about the cash flow for Healthcare from 1998 through 2007) correct?**

**Question 6: What was the Source of Funds for the net of \$15.4 million of Retiree Healthcare Payments?**

**Question 7: Why did MCERA's audited financial statements combine the healthcare fund with the pension fund in 2003?**

**Question 8: Why hasn't MCERA complied with the request of the SCO since 2003 to cease this practice and to report the two funds separately?**

**Question 9: Would MCERA's UAAL have increased in 13 of these 15 years (1994 - 2008) without the POBs - assuming all other things remained the same?**

**Question 10: What is the "Corridor Limit" and what would happen if the calculated VA (Valuation Assets) was higher than the upper Corridor Limit?**

**Question 11: Has MCERA made projections of the UAAL as of 6/30/2009?**

**Question 12: Do you believe the above projected required payments (on page 8) that would begin in fiscal year 2009-10 are not accurate, and if so, why?**

## I. MCERA RETURNS ON ASSETS

The table below shows 5 values for MCERA's Return on Assets from 1997 through 2005: 1) Yield on Assets as reported by the State Controllers Office, 2) Return on Net Assets I calculated from MCERA's audited statements, and 3) the 3 values of Net Return on Assets as shown in MCERA's 2008 Actuarial Report. (Further information about how these values were derived and the data are in Attachments VIII.AA and B- including why the 1997 value for MCERA Audits is in **blue** - it's the average of the other 4 values for that year.)

The average of each series of calculations of returns is shown on the Average row. The amount the average for each series was under MCERA's 8% target Rate of Return (Interest Rate) is shown on the last row.

**Table 1 - MCERA Return on Assets**

	From MCERA Audits	SCO Reported	6/08 Actuarial Report		
			Book	Market Value	Actuarial Value
1997	12.9%	16.6%	7.9%	16.3%	10.9%
1998	9.3%	5.2%	10.4%	9.9%	11.1%
1999	6.8%	7.9%	6.4%	7.0%	8.5%
2000	10.6%	13.3%	14.3%	11.3%	7.4%
2001	-8.1%	-9.3%	9.5%	-7.6%	5.0%
2002	-6.3%	-7.0%	0.0%	-6.1%	1.0%
2003	4.1%	4.4%	1.7%	4.5%	0.5%
2004	14.3%	15.7%	1.8%	15.1%	2.5%
2005	8.9%	9.6%	2.5%	9.7%	3.6%
Average	5.8%*	6.3%	6.1%	6.7%	5.6%
Target	8.0%	8.0%	8.0%	8.0%	8.0%
Under	(2.2%)	(1.7%)	(1.9%)	(1.3%)	(2.4%)
Under/Target	(28%)	(22%)	(24%)	(17%)	(30%)

The Actuary reported on page 16 of the 6/30/08 valuation that the 12 year compound average Net Returns (1997 - 2008) was 6.3% based on Market Value, 5.9% based on Actuarial Value, and 6.1% based on Book Value.

**Question 1: Do you agree or disagree with this statement - In most years since 1997 MCERA's Returns on Assets have been significantly below its targeted Rate of Return (or "Interest Rate") of 8%, and the overall return over those years was significantly below 8%?**

## II. RETURNS FOR 21 NON-CALPERS COUNTY RETIREMENT FUNDS

This table summarizes some of the analysis shown in Attachment A based on the SCO data for 1996 through 2005:

Table 2 - MCERA Average Yield on Assets Compared

	10 Yr Average	Nominal Difference	Difference/ MCERA
<b>MCERA</b>	<b>6.6%</b>		
<b>San Luis Obispo</b>	<b>7.0%</b>	<b>(0.4%)</b>	<b>(6.1%)</b>
<b>MCERA Target Return</b>	<b>8.0%</b>	<b>(1.4%)</b>	<b>(17.3%)</b>
<b>San Mateo</b>	<b>8.3%</b>	<b>(1.7%)</b>	<b>(25.8%)</b>
<b>Average of 21 County Systems</b>	<b>9.7%</b>	<b>(3.1%)</b>	<b>(47.0%)</b>

Beginning on 11/1/08 I exchanged a series of emails and memos with the Public Retirement Systems Analyst in the Local Government Reporting section of the State Controllers Office. I wanted to determine if I copied the SCO data correctly, to clarify what the "Yield on Assets" formula is, and what its possible range of error might be.

The Analyst confirmed I correctly copied the SCO Yield on Assets data, and that it is the best data they provide to compare Retirement Systems returns. However, because it is a "simplified" formula, and also because of occasional misreporting from Retirement Systems that isn't caught by SCO, there is a possible range of error in the method.

After a number of exchanges, I sent an email to the Analyst on 12/7/08 that I believed summarized the conclusions of our exchanges. She responded. (The content of that email and her response is Attachment Three to this paper.)

This is the concluding paragraph of my email:

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Conclusion: I believe it is fair and statistically accurate to say that the possible errors in the Yield on Assets method might have been great enough for MCERA's actual ROI to have been higher than the 2<sup>nd</sup> lowest County - San Luis Obispo. But it is extremely unlikely MCERA's actual ROI could have been higher than any other of the County systems. The error would have to be more than 25% for MCERA's actual ROI to have been equal to San Mateo. This seems highly unlikely to me (although in the statistical universe even million to 1 chances sometimes occur).

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The Public Retirement Systems Analyst replied by email on 12/11/08:

"With regards to your summary below (above in this memo), your reasoning seems logical and reasonable".

### Question 2: Do you agree or disagree with this statement?

*Based on the 10-year data from SCO and the response of the SCO Analyst, as well as the findings in MCERA Returns on Assets on page 3 of this memo, it is "logical and reasonable" to conclude that MCERA had the lowest return on investment of any County Retirement System during these years. The possible errors in the Yield on Assets method might have been great enough for MCERA's actual ROI to have been higher than the 2<sup>nd</sup> lowest County - San Luis Obispo. But it is extremely unlikely MCERA's actual ROI could have been higher than any other of the County systems.*

### III. HEALTHCARE AND PENSION FUNDS' RETURNS ON ASSETS

This table shows the Net Investment Income, the Average of the Beginning and Ending value of Net Assets, and the Beginning Value of Net Assets for the Retirement and Healthcare funds and MCERA as a whole for the first 5 years of this period as shown on MCERA's audited statements. These are the years before the two funds were co-mingled in the statements:

Table 3 - Returns on Assets - Pensions and Healthcare

	<u>1998</u>	<u>1999</u>	<u>2000</u>	<u>2001</u>	<u>2002</u>
<b>Net Investment Income</b>					
Healthcare	6,721,779	(5,148)	(1,604,495)	2,504,434	1,385,086
Pensions	6,170,087	10,052,540	18,356,026	(15,266,240)	(10,594,691)
Total	12,891,866	10,047,392	16,751,531	(12,761,806)	(9,209,605)
<b>Average Net Assets</b>					
Healthcare	4,722,431	6,975,155	4,686,257	3,660,786	3,789,487
Pensions	133,927,604	140,163,341	152,939,326	154,332,320	142,713,792
Total	138,650,035	147,138,495	157,625,583	157,993,106	146,503,278
<b>Beginning Value of Net Assets</b>					
Healthcare	1,789,949	7,654,912	6,295,397	3,077,116	4,244,456
Pensions	132,115,943	135,739,265	144,587,416	161,291,236	147,373,404
Total	133,905,892	143,394,177	150,882,813	164,368,352	151,617,860

The table below shows the "Return on Assets" for each of the 2 funds and the difference between them calculated by dividing Net Investment Income first by the Average Value of Net Assets, and second by the value of the Beginning Net Assets.

Table 4 - Differences in Returns for the Two Funds

	<u>1998</u>	<u>1999</u>	<u>2000</u>	<u>2001</u>	<u>2002</u>
<b>Return on Average Net Assets</b>					
Health Care	142.3%	-0.1%	-34.2%	68.4%	36.6%
Pension	4.6%	7.2%	12.0%	-9.9%	-7.4%
<b>Difference</b>	<b>137.7%</b>	<b>-7.2%</b>	<b>-46.2%</b>	<b>78.3%</b>	<b>44.0%</b>
<b>Return on Beginning Assets</b>					
Health Care	375.5%	-0.1%	-25.5%	81.4%	32.6%
Pension	4.7%	7.4%	12.7%	-9.5%	-7.2%
<b>Difference</b>	<b>370.9%</b>	<b>-7.5%</b>	<b>-38.2%</b>	<b>90.9%</b>	<b>39.8%</b>

Question3: Were the Investment Incomes of the 2 funds reported during these years accurate?

Question4: Why are the Returns on Investment so wildly different between the Pension and Healthcare Funds?

#### IV. TEN YEAR HEALTHCARE FLOWS - MCERA AUDITED STATEMENTS

I have MCERA's audited statements back to fiscal year 1998. This table shows the "Ten Year Financial Flows" from 7/1/97 through 6/30/07 for Healthcare without the Net Investment Income reported in the Healthcare Fund for the first 5 years:

<b>Beginning Healthcare Fund Net Assets</b>	1,766,988
<b>Reimbursements from County</b>	
<b>Healthcare Payments</b>	5,026,392
<b>Administrative Expenses</b>	27,985
<b>Healthcare Fund Assets Available</b>	<u>6,821,365</u>
<b>Total Healthcare Premiums Paid</b>	<u>(22,223,090)</u>
<b>Difference</b>	<u>(15,401,725)</u>

I have not included healthcare fund returns on investment as reported in the first 5 years; based on the analysis in item 3 above, there are significant concerns about the accuracy of the reported numbers.

**Question 5: Are the figures above correct?**

**Question 6: What was the Source of Funds for the net of \$15.4 million of Retiree Healthcare Payments?**

#### V. COMINGLING HEALTHCARE AND PENSION FUNDS IN AUDITED STATEMENTS

From 1998 through 2002 the two main reports in MCERA's audited financial reports - Changes in Plan Net Assets and Statement of Plan Net Assets - were reported for both the Retirement Fund and the Retiree Healthcare Fund. Then beginning in 2003 these two funds were no longer reported separately.

I exchanged a series of emails with the Public Retirement Systems Analyst in the Local Government Reporting Section of the State Controllers Office. In one email she stated:

*In 2001 and 2002 the healthcare fund was reported separately in MCERA's audited financial statements... But starting in 2003 they were combined with the pension benefits into one column.*

*..., since 2003 we have been asking to have the two plans shown separately as they did in prior years and not commingled. As of 2007, the two plans are still commingled.*

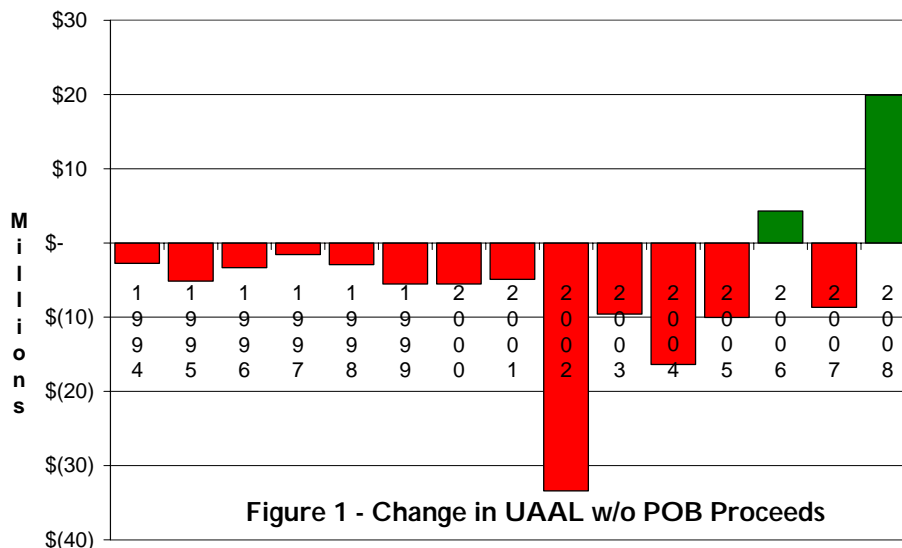
**Question 7: Why did MCERA's audited financial statements combine the healthcare fund with the pension fund in 2003?**

**Question 8: Why hasn't MCERA complied with the request of the SCO since 2003 to cease this practice and to report the two funds separately?**

## VI. MCERA AND UAAL'S

If we don't consider the proceeds of the POBs, the value of the UAAL increased every year from 1993 through 2004 - 12 years in a row - and in 2007. It decreased in 2006 and 2008 - 2 out of 15 years. The calculations are shown in Attachment D.

**Question 9: Would MCERA's UAAL have increased in 13 of these 15 years without the POBs - assuming all other things remained the same?**



## VII. UAAL AS OF JUNE 30, 2009

See Attachment E for the calculations for this entire section.

### A. Projected Actuarially Accrued Liability (AAL)

I performed a "regression analysis" on the values of the AAL from 1993 through 2008. The AAL has grown in a remarkably consistent pattern. The "R squared" value of the curve was over 95%, which means the confidence level in this formula's projections for the next few years is very high, so long as there are no radical changes in the underlying realities that drive the growth of AAL.

This "best fit" formula projected an AAL of \$416.0 million as of 6/30/09.

### B. Projected Actuarially Valued Assets (VA)

The Actuary calculated the VA as of June 30, 2008 to be \$356.7 million before allowing for Reserves. After Reserves the Value was \$353.4 million.

I projected the Market Value of Assets as of June 30, 2009 would be \$254.9 million. This is based on figures from the 2008 Actuarial Study and MCERA's internal 12/31/08 financial statements. A major assumption is that MCERA's investments won't gain or lose any value in the market from 1/1/09 through 6/30/09. In other words, the \$74.6 million investment loss experienced in the first 6 months of the fiscal year will be the loss for the full fiscal year.

I "plugged" those assumptions into the Actuarial formula used to derive the VA. The result was complicated because the projected VA (\$360.8 million) was higher than the upper value of the "Corridor Limit" (\$305.9 million). I don't know what the impact of that result is. I used the two values for the VA - my calculated \$360.8 million (best case) and the Corridor Limit of \$305.9 million (worst case).

**Question 10: What is the "Corridor Limit" and what would happen if the calculated VA was higher than the upper Corridor Limit?**

### C. Projected June 30, 2009 UAAL

This table shows my projected calculation (in \$ millions) of the UAAL based on the calculations in parts A and B of this section as shown in Attachment Four.

	<u>Best</u>	<u>Worst</u>
Actuarial Value of Assets	\$357.5	\$305.9
Actuarially Accrued Liability	416.0	416.0
UAAL	(\$58.5)	(\$110.0)
 Funded Ratio	 86%	 74%

According to the 6/08 Actuarial Study (page 22):

*The funding agreement between the County and the Association requires the County to amortize the UAAL that is in excess of 9% of the total actuarial accrued liability.*

...

*It is our understanding that there is agreement that the plan should be funded to 100% of the AAL over the next 10 years, by targeting 91% of the AAL this year, 92% next year, etc.*

Instead of 92%, the Funded Ratio would be from 74% to 86%. This would trigger a 10 year amortization of the "excess UAAL". This next table shows the yearly payments required assuming 8% interest. It also shows the payments required to amortize the entire UAAL over 10 years and 20 years, again assuming 8% interest.

	<u>Best</u>	<u>Worst</u>
Payment on Excess UAAL		
Assume 10 Yr Amort, 8% Interest	\$3.1	\$10.8
 If Entire UAAL were Amortized		
10 Years	\$8.7	\$16.4
20 Years	\$5.6	\$11.2

**Question 11: Has MCERA made projections of the UAAL as of 6/30/2009?**

**Question 12: Do you believe the above projected required payments that would begin in fiscal year 2009-10 are not accurate, and if so, why?**



## VIII. ATTACHMENTS

### A. State Controllers Office Reported Yield on Assets

I attached the table below to my October 16, 2008 *Mendocino County's Long-Term Debt* Report as "Table 6" on page 38. The data was obtained from the State Controllers Office *Public Retirement Systems Annual Reports*, and was for the most recent 10 years that were then available from SCO (1996 - 2005).

<b>Yield on Investments</b>											
<b>21 "Independent" County Retirement Systems</b>											
<b>Based on State Controllers Office Data</b>											
	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	Average
Tulare	21.1%	17.4%	17.8%	12.7%	23.8%	-3.1%	-3.2%	3.1%	17.40%	11.70%	11.9%
San Diego	16.6%	19.8%	15.3%	12.4%	16.0%	-7.2%	-3.2%	5.2%	23.50%	15.90%	11.4%
Stanislaus	14.5%	25.7%	15.1%	12.0%	7.5%	8.4%	-4.7%	6.7%	18.80%	9.40%	11.3%
Imperial	16.4%	20.6%	18.9%	10.6%	19.0%	-5.7%	-3.2%	7.0%	16.90%	9.30%	11.0%
Alameda	11.4%	14.6%	20.4%	17.0%	15.2%	0.6%	-2.8%	-7.1%	26.30%	12.20%	10.8%
San Joaquin	9.4%	14.5%	18.6%	11.2%	15.0%	4.3%	0.7%	-5.2%	26.60%	12.60%	10.8%
Marin	21.6%	22.7%	18.0%	10.5%	11.6%	-3.0%	-6.4%	1.4%	19.10%	10.40%	10.6%
Contra Costa	9.4%	16.0%	21.5%	15.1%	15.8%	1.3%	-3.7%	-10.5%	24.40%	13.10%	10.2%
Ventura	13.0%	20.7%	20.0%	12.9%	8.1%	0.3%	-6.7%	4.5%	16.80%	9.60%	9.9%
Sonoma	9.0%	16.7%	21.5%	15.6%	15.9%	0.2%	-6.5%	-11.9%	26.70%	11.90%	9.9%
Los Angeles	14.4%	17.4%	15.4%	13.8%	16.2%	-7.4%	-5.3%	3.9%	16.30%	11.90%	9.7%
Santa Barbara	14.7%	20.3%	19.3%	10.9%	6.7%	-2.9%	-4.8%	5.0%	16.30%	10.40%	9.6%
Orange	11.7%	13.5%	16.2%	13.4%	16.7%	1.4%	-2.7%	-5.6%	19.30%	11.80%	9.6%
Merced	10.5%	25.8%	15.0%	11.8%	11.2%	-2.9%	-4.8%	5.5%	13.70%	9.70%	9.6%
San Bernardino	9.7%	18.9%	16.9%	14.6%	11.3%	-2.3%	-4.6%	1.2%	16.60%	10.40%	9.3%
Kern	13.3%	19.6%	14.0%	11.8%	9.6%	-5.8%	-4.6%	5.9%	17.10%	11.40%	9.2%
Sacramento	9.6%	20.6%	18.2%	12.1%	10.3%	-5.4%	-5.4%	3.5%	16.60%	11.00%	9.1%
Fresno	11.4%	21.1%	20.2%	8.0%	9.2%	-1.6%	-3.5%	2.1%	13.00%	10.30%	9.0%
San Mateo	10.1%	18.4%	17.2%	7.5%	10.3%	-4.5%	-6.1%	3.6%	16.00%	10.20%	8.3%
San Luis Obispo	8.1%	6.0%	12.0%	12.4%	6.0%	4.4%	0.2%	-3.8%	16.60%	8.00%	7.0%
Mendocino	9.8%	16.6%	5.2%	7.9%	13.3%	-9.3%	-7.0%	4.4%	15.70%	9.60%	6.6%
<b>AVERAGE</b>	12.7%	18.4%	17.0%	12.1%	12.8%	-1.9%	-4.2%	0.9%	18.7%	11.0%	9.7%
<b>Mendocino Over or Under</b>											
Average	-23%	-10%	-69%	-35%	4%	-386%	-66%	389%	-16%	-13%	-32%
Target	23%	108%	-35%	-1%	66%	-216%	-188%	-45%	96%	20%	-17%

## **B. Calculations of Return on Assets**

I used the SCO data for MCERA in Table 1 - MCERA Return on Assets.

A table titled "Net Return on Assets vs. Increase in Consumer Price Index" is on page 16 of the *Mendocino County Employees' Retirement Association - Report on the Actuarial Valuation as of June 30, 2008*. The table has 3 calculations of MCERA's Net Return on Assets based on Book Value, Market Value, and Actuarial Value. The values for Market and Actuarial Value only go back to 1997 - I can't compare 1995 and 1996 to the SCO data.

I have now calculated Returns on Net Assets for MCERA as a whole using numbers reported in MCERA's audited financial statements for 1998 through 2007. The formula used was "Net Investment Income/Average Net Assets" with Average Net Assets being the average of the value of Net Assets at the beginning and the ending of each year.

I started Table 1 - MCERA Return on Assets on page 3 of this memo for the year 1997. I didn't have the Actuary's calculations of Net Return on Assets based on Market and Actuarial Value, nor did I have MCERA's 1996 audited financial statements. However, I did have the Actuary's 3 values for 1997. Therefore I started the table with that year. However, I didn't have MCERA's 1997 audited statement so I couldn't directly calculate Net Return on Assets for that year. I inserted the average of the other 4 Return on Assets values (in blue in the table). Therefore that year is an estimate - not an actually calculated value.

## **C. Emails - John Dickerson - SCO Analysis**

Text of email message sent by John Dickerson to the Public Retirement Systems Analyst in the Local Government Reporting Section of the State Controllers Office, and her response.

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**From:** John Dickerson [mailto:JohnCGD@comcast.net]  
**Sent:** Sunday, December 07, 2008 11:24 AM  
**To:** Wurst, Sharon  
**Subject:** A weekend of pondering

Sharon

As I was raking leaves this weekend I mulled over your memo. To boil it all down to a "take away" message, I believe this is consistent with what you have said:

I think it's fair to make these two statements:

1. Regardless of its theoretical flaws, the Yield on Asset Method (YA) is the method chosen by SCO to report the relative investment performance of the 21 "non-CalPERS" County retirement systems. As such, it is fair for citizens to use these numbers to compare these systems - subject to understanding the possible errors inherent in the YA method.
2. It appears I correctly copied SCO's reported YA data for these 21 County systems for the 10 years 1996 - 2005.

The critical issue becomes the degree of possible error between the Yield on Assets values and the actual Rates of Return. YA is an approximation of the Rate or Return earned on investments (ROI). The possible errors of this method are of two main kinds:

- Possible errors of reporting by the County systems (example - comingling healthcare and pension assets)
- Possible errors inherent in the YA method itself

This table shows the average YA for Mendocino, the average YA for the next 2 lowest County systems, and the average for all 21 County systems over those 10 years. How big would the error of the YA method have to be for Mendocino to have had an ROI greater than these other systems, or equal to the average of all 21?

	10 Yr Average	Nominal Difference	Difference/ MCERA
Mendocino	6.6%		
San Luis Obispo	7.0%	0.4%	6.1%
San Mateo	8.3%	1.7%	25.8%
Average of 21 County Systems	9.7%	3.1%	47.0%

In order for MCERA's actual ROI to equal SLO, the error would have to be  $0.4\%/6.6\% = 6.1\%$ . To equal San Mateo, the error would have to be  $1.7\%/6.6\% = 25.8\%$ . To have been the average for all 21, the error would have had to have been  $3.1\%/6.6\% = 47.0\%$ .

**Conclusion:** I believe it is fair and statistically accurate to say that the possible errors in the Yield on Assets method might have been great enough for MCERA's actual ROI to have been higher than the 2<sup>nd</sup> lowest County - San Luis Obispo. But it is extremely unlikely MCERA's actual ROI could have been higher than any other of the County systems. The error would have to be more than 25% for MCERA's actual ROI to have been equal to San Mateo. This seems highly unlikely to me (although in the statistical universe even 1 out of a million chances sometimes occur).

I hope it's "fair" of me to ask - does this make sense to you?

Thanks Sharon

John Dickerson

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This is the Analyst's response:

"With regards to your summary below (above in this paper), your reasoning seems logical and reasonable. Remember too, that the reason we use the AY is so we can also compare the defined contribution systems. If we were only interested in presenting the defined benefit systems, we would have been showing the actual ROI all this time. Again, we hope to include the actual ROI for defined benefit systems starting with the 06/07 publication."

## D. Historical MCERA UAALs

This table shows the values of MCERA's Actuarial Value of Assets (Assets), Accrued Liabilities (Liability), and the balance of the Unfunded Actuarially Accrued Liability (UAAL) from 1993 through 2006 as reported by the SCO:

	\$Millions													
	<u>1993</u>	<u>1994</u>	<u>1995</u>	<u>1996</u>	<u>1997</u>	<u>1998</u>	<u>1999*</u>	<u>2000</u>	<u>2001</u>	<u>2002</u>	<u>2003</u>	<u>2004</u>	<u>2005</u>	<u>2006</u>
Assets	72.1	76.0	79.3	85.0	124.3	134.8	138.8	142.8	150.1	158.1	233.8	239.2	253.5	288.5
Liabilities	105.9	112.5	121.0	130.0	140.8	154.3	163.8	173.3	185.4	226.9	243.3	265.1	289.5	320.1
UAAL	<u>(33.8)</u>	<u>(36.6)</u>	<u>(41.7)</u>	<u>(45.0)</u>	<u>(16.5)</u>	<u>(19.4)</u>	<u>(28.9)</u>	<u>(30.5)</u>	<u>(35.4)</u>	<u>(68.8)</u>	<u>(9.6)</u>	<u>(26.0)</u>	<u>(36.0)</u>	<u>(31.7)</u>
Change		(2.8)	(5.1)	(3.3)	28.5	(2.9)	(9.5)	(1.6)	(4.9)	(33.4)	59.2	(16.4)	(10.0)	4.3

\* SCO did not receive a 1999 Actuarial Report. I added half the change between 1998 and 2000 to the 1998 values to estimate 1999.

The County has sold two issuances of Pension Obligation Bonds (1996 and 2002). MCERA received most of the proceeds - \$30.1 million in 1996-97 and \$76.3 million in 2002-03, for a total of \$106.4 million. The table below shows the value of Assets after deducting the proceeds of the POBs. This is what MCERA's Actuarial Valuation would have looked like without the POBs (assuming all other things remained equal).

	<u>1993</u>	<u>1994</u>	<u>1995</u>	<u>1996</u>	<u>1997</u>	<u>1998</u>	<u>1999</u>	<u>2000</u>	<u>2001</u>	<u>2002</u>	<u>2003</u>	<u>2004</u>	<u>2005</u>	<u>2006</u>
Assets	72.1	76.0	79.3	85.0	124.3	134.8	138.8	142.8	150.1	158.1	233.8	239.2	253.5	288.5
- POB					30.1	30.1	30.1	30.1	30.1	30.1	106.4	106.4	106.4	106.4
Assets	72.1	76.0	79.3	85.0	94.2	104.7	108.7	112.7	119.9	128.0	127.4	132.8	147.1	182.0
Liabilities	105.9	112.5	121.0	130.0	140.8	154.3	163.8	173.3	185.4	226.9	243.3	265.1	289.5	320.1
UAAL	<u>(33.8)</u>	<u>(36.6)</u>	<u>(41.7)</u>	<u>(45.0)</u>	<u>(46.6)</u>	<u>(49.5)</u>	<u>(65.1)</u>	<u>(60.6)</u>	<u>(65.5)</u>	<u>(98.9)</u>	<u>(116.0)</u>	<u>(132.4)</u>	<u>(142.4)</u>	<u>(138.1)</u>
Change		(2.8)	(5.1)	(3.3)	(1.6)	(2.9)	(9.5)	(1.6)	(4.9)	(33.4)	(17.1)	(16.4)	(10.0)	4.3

## E. Calculations for Projected UAAL as of June 30, 2009

### 1. Actuarially Accrued Liabilities

This is a graph of the Actuarially Accrued Liability (AAL) since 1993 (the blue line) and a "statistically best fit" (regression analysis) curve for those Liabilities. This curve is projected out for the next 5 years (the dotted red line).

The growth of AAL has been remarkably consistent statistically.

The "R squared" value of this statistically-fitted line is 99.5. "R squared" is a statistical measure of how well a regression line approximates real data points. It is a descriptive measure between zero and one, indicating how good one value is at predicting another. The

closer the formula's R squared is to 1, the higher the confidence level in the prediction. This is a highly dependable projection, so long as there are no radical changes in the underlying realities that drive the growth of AAL.

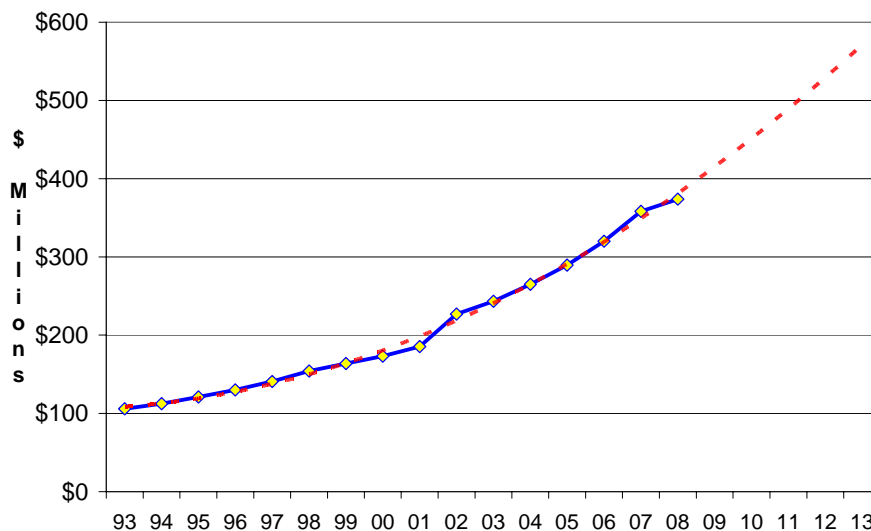


Figure 2 - Actual and Projected Actuarially Accrued Liability

This table shows the values for the graph above comparing actual AAL with the values produced by the regression analysis curve:

	<u>1993</u>	<u>1994</u>	<u>1995</u>	<u>1996</u>	<u>1997</u>	<u>1998</u>	<u>1999</u>	<u>2000</u>	<u>2001</u>	<u>2002</u>	<u>2003</u>	<u>2004</u>	<u>2005</u>	<u>2006</u>	<u>2007</u>	<u>2008</u>
Actual	106	113	121	130	141	154	164	173	185	227	243	265	289	320	358	374
Projected	109	113	119	127	138	150	164	180	198	218	241	265	291	319	349	382
Difference	3	1	(2)	(3)	(3)	(5)	0	7	13	(9)	(3)	(0)	2	(1)	(9)	8

## 2. Actuarial Valuation of Assets

### a) June 30, 2008 Valuation

The June 30, 2008 Actuarial Report shows the Actuary's calculation of the Value of MCERA's Assets. It is based on a "smoothing" policy adopted by MCERA as on 6/30/05. The difference between the expected and actual investment return (net of expenses) is spread over 5 years. (I think it's odd the formula uses the difference between the actual and expected returns. However, this is the adopted system.)

This table shows the Actuary's calculations as of June 2008.

**Table 5 - Actuarial Calculation - Net Actuarial Asset Value - 6/30/2008**

STEP	Investment Return				Deferred Earnings			
	Contributions	Benefit Payments	Expected	Actual	Above/ Below Expected	Portion	Amount	
1								
	2005	13.5	15.3	20.5	24.9	4.3	0.2	0.9
	2006	13.5	18.4	22.2	31.0	8.8	0.4	3.5
	2007	13.7	18.3	24.3	51.0	26.7	0.6	16.0
	2008	13.8	20.7	28.0	(28.2)	(56.1)	0.8	(44.9)
	Total							(24.5)
2	Market Value of Assets - 6/30/08							332.2
3	Actuarial Value of Assets - 6/30/08							356.7
4	"Corridor Limit" Test							
	a. 80% of Net Market Value							265.8
	b. 120% of Net Market Value							398.6
5	Actuarial Value of Assets - Didn't "Violate" Corridor Limits Test							356.7
6	Less-Reserves							3.3
7	Net Actuarial Value of Assets - 6/30/08							353.4

Step 1 calculates the amount the smoothing technique defers for recognition in future years. The total deferred is a loss of \$24.5 million. Step 2 is the Market Value of the Assets. Step 3 subtracts the amount deferred to future years from the Market Value. Note that by subtracting the deferred net loss of (\$24.5 million), the Value calculated in Step 3 is \$24.5 million more than the Market Value.

Step 4 is some sort of "limiting test". The Actuarial Value of the Assets is probably not supposed to be "outside" this "Corridor Limit". In this case it isn't, and so Step 5 uses the same value as Step 3. Step 6 deducts various Reserves, almost all of which is a "Contingency Reserve". This leaves a calculated Net Value in Step 7 of \$353.4 million.

## b) Projected June 30, 2009 Valuation

The Actuarial Valuation for 6/30/08 reports the Market Value of Assets as of that date was \$332.2 million.

I have an internal financial statement for MCERA as of 12/31/08. It indicates the Market Value of Investments as of 7/1/08 was \$310.9 million. That suggests the other Assets (cash, receivables, and equipment) was \$21.3 million (\$332.2 million - \$310.9 million). If so, other Assets would have been about 6.4% of Total Assets. This compares with an average of 8.2% over the previous 10 years, with a range of from about 3% up to 18%. While the estimated Other Assets of 6.4% of Total Assets is on the low side of historical values, it's within a reasonable range.

This table shows my calculation of MCERA's Assets as of these two dates:

	7/1/2008	12/31/2008	Change
Other Assets	21.3	22.6	1.3
Investments	310.9	236.3	(74.6)
	<u>332.2</u>	<u>258.9</u>	<u>(73.3)</u>

For this calculation I assume there will be no change in the Market Value of these Investments from January through June 2009.

As shown below, I project Contributions in the year to be \$14 million, and benefit payments to be \$22 million. For this calculation I'll assume half occurred by 12/31. If so there would be a net decrease of assets of \$4 million during the last 6 months of this fiscal year. That would mean the Market Value of Total Assets as of 6/30/09 would be \$254.9 million. That's the number I "plug" into the calculation.

This is my projection of the Actuarial Valuation of Assets (AAL) as of 6/30/09 (see Attachment Four for an explanation of how the Market Value of Assets and the 2009 Step 1 values were derived):

STEP		Contri- butions	Benefit Payments	Investment Return Expected	Actual	+ or - Expected	Deferred Earnings Portion	Amount
1								
	2005	13.5	15.3	20.5	24.9	4.3	0%	0.0
	2006	13.5	18.4	22.2	31.0	8.8	20%	1.8
	2007	13.7	18.3	24.3	51.0	26.7	40%	10.7
	2008	13.8	20.7	28.0	(28.2)	(56.1)	60%	(33.7)
	2009	14.0	22.0	28.5	(77.3)	(105.8)	80%	(84.7)
	Total							(105.9)
2	Market Value of Assets - 6/30/09							254.9
3	Actuarial Value of Assets - 6/30/09 "Corridor Limit"							360.8
4	Test							
	a. 80% of Net Market Value							203.9
	b. 120% of Net Market Value							305.9
5	<b>Corridor Limits Test FAILED, but Use Value Anyway</b>							<b>360.8</b>
6	Less-Reserves							3.3
7	Net Actuarial Value of Assets - 6/30/09							<b>357.5</b>
	<b>Now Assume Valuation Must Be Within Corridor Limits</b>							<b>305.9</b>
6	Less-Reserves							Disregard
7	Net Actuarial Value of Assets - 6/30/09							<b>305.9</b>

Depending on the affect of the Corridor Limit, this projects the AAL to be a high of \$357.5 million to a low of \$305.9 million.