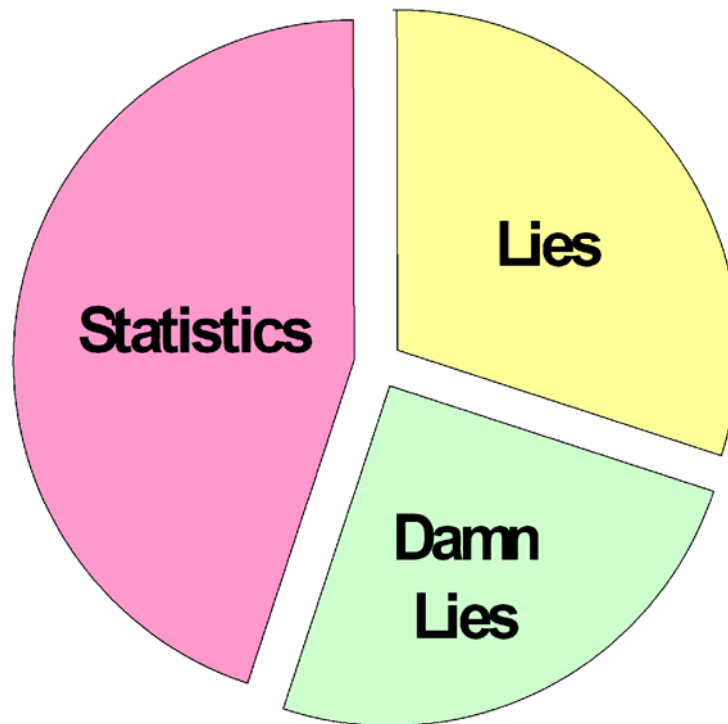


Lies, Damn Lies, and Actuarial Statistics



Actuarial v. Market Value of Pension Fund Assets

**It's Dangerous to Confuse the Two
As Mendocino County Officials Are Doing**

September 9, 2009

Copyright YourPublicMoney.Com, 2009

I. CALCULATING THE PENSION FUND’S FINANCIAL POSITION	1
II. THE NEED FOR THE “ACTUARIAL VALUE OF ASSETS”	2
A. Only the County is Obligated to Eliminate Unfunded Pension Obligations	2
B. The Problem Created by Stock Market Volatility	2
III. CALCULATING MARKET VALUE AND ACTUARIAL VALUE OF ASSETS	2
A. Market Value	2
B. Actuarial Value	2
1. Smoothing	2
2. Corridor Limits - A Limit on Smoothing	2
IV. THE TWO VALUES COMPARED	3
V. THE 800 POUND GORILLA	4
VI. ABUSE OF THE ACTUARIAL VALUE	4
A. Hiding the Financial Truth from Citizens	4
1. Actuarial v. Market Value	4
2. The Pension Fund and the County are Two Different Entities	5
3. The Real County Pension Debt	5
4. “Not Telling the Truth” v. “Lying”	5
B. Basing Decisions on Very Distorted Pension Asset Values	6

Lies, Damn Lies, and Actuarial Statistics¹

Actuaries² produce “Actuarial Valuations” for Pension Funds and Funds for other Retiree Benefits. One aspect of such Valuations is determining how much the Fund is worth compared to the amount of money it needs to be able to pay all the pensions that have already been earned by employees in the past. The entire Actuarial process covers a lot of topics; this paper focuses only on:

- How Pension Fund Assets are valued
- How that affects the calculation of the Pension Fund’s financial position
- And thereby affects the amount the County has to pay to the Pension Fund

I. CALCULATING THE PENSION FUND’S FINANCIAL POSITION

The financial position of the County’s Pension Fund is determined by:

$$\begin{array}{r} \text{Pension Fund Assets} \\ - \text{Pension Fund Obligations} \\ \hline \text{Unfunded or Over-Funded Pension Obligations} \end{array}$$

If Assets are less than Obligations, there is an “Unfunded Obligation”. If greater, the Fund is “Over-Funded”. Actuaries use two different values for Pension Fund Assets:

- Market Value of Assets
- Actuarial Value of Assets

Therefore there are two values for Unfunded (or Over-Funded) Pension Obligations. This table shows their estimated values as of 6/30/09 (Based on the Pension Fund Actuary’s estimates as of 5/31/09.):

**Table I - Estimated Unfunded Pension Obligations
6/30/09**

	<u>Market Value</u>	<u>Actuarial Value</u>
Pension Fund Assets	\$274 million	\$329 million
Less Total Obligations	<u>- 387 million</u>	<u>- 387 million</u>
Unfunded Pension Obligations	(\$113 million)	(\$58 million)

The Actuarially Valued Unfunded Obligation is about \$58 million whereas the “real” Market Value Unfunded Obligations is about \$113 million - nearly twice as much.

So - which is it? Are the Pension Fund’s Assets worth \$274 million or \$329 million? The answer is obvious - the Pension Fund’s Market Value of \$274 million is the true value of the Pension Fund’s Assets.

Then why do Actuaries create an Actuarial Value of Assets?

¹ “There are three kinds of lies: lies, damned lies, and statistics” - attributed to 19th century British Prime Minister Benjamin Disraeli.

² Professional statisticians who specialize in the math of life events: births, deaths, age of retirement, etc.

II. THE NEED FOR THE “ACTUARIAL VALUE OF ASSETS”

A. Only the County is Obligated to Eliminate Unfunded Pension Obligations

Both the County and its employees make annual contributions to the Pension Fund. These are intended only to fund the pensions that are being earned by employees that year.

But if an Unfunded Pension Obligation develops that is large enough to threaten the Pension Fund’s ability to pay future pensions only the County is obligated to eliminate it by making additional payments. It’s this second kind of payment - the “Unfunded Obligation Amortization” payment - that creates the need for a modified value of the Pension Fund’s Assets - the “Actuarial Value of Assets”.

B. The Problem Created by Stock Market Volatility

Since 1950 the S&P 500 stock market index grew an average of 0.7% a month. Its biggest one month gain was 16.3% in October 1974; the biggest one month loss was -21.8% in October 1987.

The stock market is notoriously volatile. If the Actuary used the Market Value of Assets to determine the value of the County’s Unfunded Obligation Amortization payments those payments would often change radically from year to year. This would play havoc with budget stability from year to year.

Pension Funds are long-lived financial entities. The point is to maintain the Fund’s financial strength over the long run rather than immediately correct small short falls. Right or wrong, Actuaries decided that over the long run the damage to year to year government budgetary stability would cause more harm than misstating the Value of Pension Fund Assets, within limits.

Actuaries developed a formula to “slow down” the rate of change of the County’s required payments. This is a reasonable objective **as long as the use of the modified Actuarial Value doesn’t lead to a dangerous distortion of real Asset Value or obscure poor performance.**

III. CALCULATING MARKET VALUE AND ACTUARIAL VALUE OF ASSETS

A. Market Value

The Market Value of the Pension Fund’s Assets is what they are really worth. It’s what the Fund has to invest, pay pensions, and pay expenses. Most of the Assets are investments - stocks, bonds, real estate, etc. Their Market Value is what they could be sold for. It’s easy to establish what stocks and bonds are worth - it’s what they are selling for in the market. For real estate an estimate or appraisal is needed.

B. Actuarial Value

An Actuary modifies the Market Value to produce the Actuarial Value of Assets using two formulas:

1. Smoothing

MCERA uses a five year smoothing period. The amount that its actual returns are more or less than its target in any year is recognized in that and the following four years in equal amounts - 20% a year. This is what “slows down” the changes in the County’s Unfunded Pension Amortization Payments.

2. Corridor Limits - A Limit on Smoothing

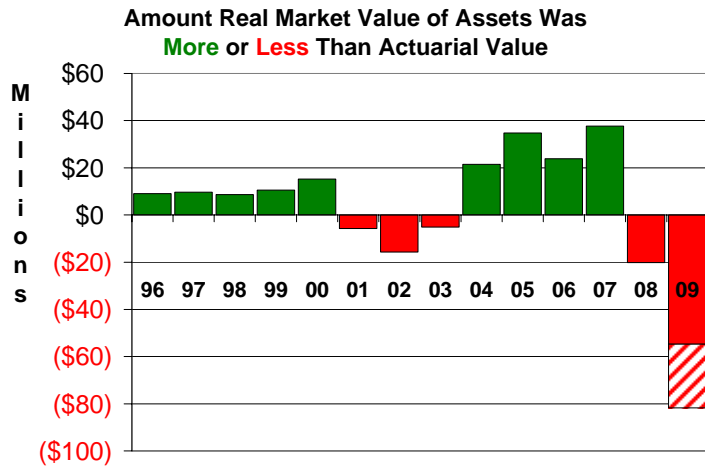
This limits how much the Actuarial Value of Assets may differ from the Market Value. At this time the Corridor Limit is 20%. The Actuarial Value can’t be more than 20% different from the real Market Value.

IV. THE TWO VALUES COMPARED

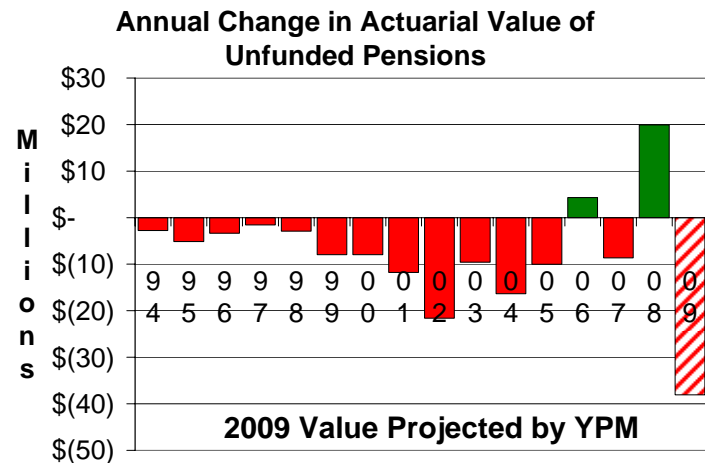
The gap between Actuarial and Market Value of Pension Assets is the largest it's ever been.

This graph shows the amount that the Market Value was more or less than the Actuarial Value. For the first time in decades the 20% Corridor Limit (described above) prevented the "Smoothed Value" from being used. If there had been no Corridor Limit, the Market Value of Assets would have been \$355 million. But that's more than 20% of the Market Value. Therefore the Actuarial Value was reduced to \$329 million - 20% more than the Market Value of \$274 million.

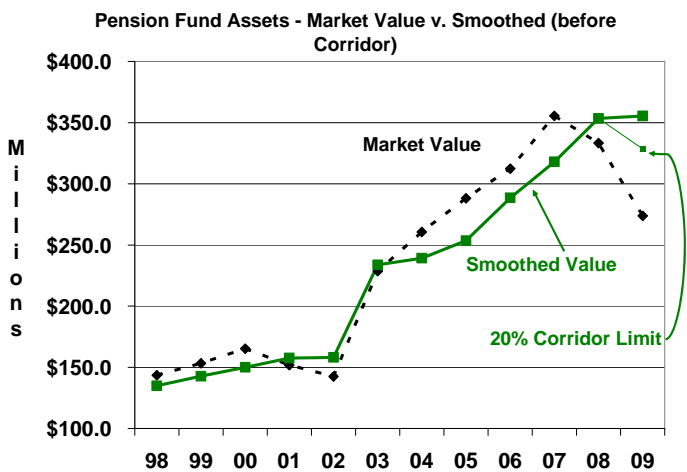
If the \$355 million value had been used the difference between Actuarial and Market Values would have been about \$80 million - shown by the stripped part of the bar for 2009.



NOTE: Don't think that the "green" shown in most years on the first graph means things were "OK". This second graph shows how much Unfunded Pension increased (red) or decreased (green) from 1994. It increased - got worse - in 14 of these 16 years. And as you can see - the "most worse" it got was in the last fiscal year - 2008-2009. (Also note this is based on the Actuarial Value of Assets. If this graph were based on the Market Value - the "plunge" in 2009 would be much worse.)



The next graph shows the Market Value (dashed line) and the Smoothed Value (solid green line). It also shows how the Corridor Limit produced a lower Actuarial Value than the Smoothed Value in 2009.



V. THE 800 POUND GORILLA

A separate paper bearing this title explains this concept more fully. Basically, the true Market Value of its Assets is what the Pension Fund has to invest. **It can't earn investment returns on money it doesn't have.** The June 2009 Market Value of Pension Assets is estimated to be about \$113 million less than total Pension Obligations. Even if the County earns 8% on the \$275 million it has, total earnings will be \$9 million short (8% of the \$113 million deficit).

When the Market Value is not hugely different from the Total Pension Obligations, particularly if the Market Value occasionally is higher than the Total Obligation from time to time, then the inability to earn investment returns on the amount the Market Value is less than Total Obligations may well not be significant over time.

But when the difference is as large as it is today - \$113 million - there is a huge impact on the County's debt. **The economic reality is that the \$113 million Unfunded Obligation will grow 8% a year unless it is eliminated.** In a matter of just a few years that would be a huge increase in debt.

VI. ABUSE OF THE ACTUARIAL VALUE

A. Hiding the Financial Truth from Citizens

John Dickerson, publisher of YourPublicMoney.Com, attended a recent meeting attended by several County and MCERA officials. The purpose of the meeting was for them to explain the County's debt. The officials passed out a table showing the "Funding Ratio" for 20 independent County Pension Funds in California. The Funding Ratio is the percent Pension Fund Assets are of Total Pension Obligations.

It showed Mendocino's Pension Fund had a 94.5% Funding Ratio as of June 2008 - tied for 3rd place. This supposedly showed how well Mendocino was doing compared to other counties.

But there's a huge problem - this number ignores two things:

- \$45 million of the Pension Fund's \$56 million 2008 shortfall was not included
- Mendocino County owed \$95 million on Pension Bonds

The County's Pension Funding Ratio was 65% on that date - 30% less than the value officials reported to citizens at the meeting.

How can these numbers be so different? The answer lies in two things:

- The difference between Actuarial and Market Value of Assets
- The Pension Fund and the County are two different entities

1. Actuarial v. Market Value

The difference between these two values is explained above.

The Pension Fund's target in 2008 was an 8% investment return on assets. Based on average of the Actuarial Value of Assets during the year, the target was \$28 million. Instead the Fund lost \$28 million. That means the Fund's returns were \$56 million less than target.

The Fund was coming off 4 pretty good years in which it exceeded its targets.

The Smoothing process added only 20% of 2008's under-target returns into the 2008 Actuarial Value. But it added 40% of 2007's over target returns, 60% of 2006, 80% of 2005 and all of 2004.

Therefore most of the “over-target” returns of the previous four years were included in the 2008 Actuarial Value, but 80% of the under-target” returns for 2008 was not included. The amount of “under-target” returns not included in the 2008 Actuarial Value was \$44 million.

The result is that the real Market Value of Assets was \$21 million less than the calculated Actuarial Value. This means on a real asset value basis the Funding Ratio was 89%, not 94.5%. If the Fund’s losses had not been so deep in 2009, this difference would not be significant.

2. The Pension Fund and the County are Two Different Entities

However, even if we assume the 94.5% is a reasonably accurate reflection of the Pension Fund’s financial position, it is absolutely a distortion to in any way suggest that value is also the County’s funding position vis a vis its Pension Obligations.

The County borrowed a net of nearly \$110 million by selling Pension Obligation Bonds in 1996 and 2002. It borrowed that money to eliminate earlier Unfunded Pensions. The Pension Fund got the cash, which made its Funding Ratio pretty good.

But the County didn’t get the money - it got the debt. All it did was restructure its debt from Unfunded Pension Obligations to Pension Obligation Bonds. The source of the debt - Unfunded Pensions - is the same, it’s just in a different form.

The County owed about \$95 million on those Bonds at the end of the 2008 fiscal year. This amount must be added to the Unfunded Obligation at that time to determine the total amount the County still owes because of Unfunded Obligations.

3. The Real County Pension Debt

The County had two types of debt that, added together comprise its total debt that was caused by Unfunded Pensions - the balance of Unfunded Pensions and the balance remaining on Pension Obligation Bonds. That means the County’s pension debt at the end of fiscal year 2008 was either \$115 million or \$126 million depending on which value of Pension Fund Assets is used.

That produces a Funding Ratio of around 65%.

4. “Not Telling the Truth” v. “Lying”

There’s a difference between the lying and not telling the truth. Often it’s a critical difference. But in some circumstances it’s just about the same thing.

County officials passed the table out that showed the Pension Fund’s Funding Ratio was 94.5%, and said “that’s pretty good”. But did the citizens at the meeting get a complete understanding of the County’s financial position at that time regarding Unfunded Pensions? No.

These citizens have plenty to pay attention to in their own lives. They should not be expected to know the difference between the Market and Actuarial Value of Pension Fund Assets. And through no fault of their own, people who haven’t spent a lot of time focusing on the County’s finances would usually not realize they need to consider the balance of Pension Bonds in order to calculate the County’s Pension Debt Financial Position.

So on the face of it, most citizens would be likely to conclude things are in pretty good shape - the Funding Ratio is 94.5% after all.

The “untruth” lies not in what the County officials said - it’s in what they didn’t say.

County officials have a duty to make sure citizens who want to know the real financial condition of the County have the basic information they need to do so. The way officials talked about the Funding Ratio in this meeting in effect deceived those citizens because it left too much that is important unsaid and unexplained.

B. Basing Decisions on Very Distorted Pension Asset Values

In addition to communicating with citizens, County officials also make important financial decisions.

The County just established its fiscal year 2009-2010 Annual Budget. How did the reality of the Unfunded Pensions impact that budget?

Even though the budget is for July 2009 through June 2010, the County didn't consider what the Unfunded Obligation as of the beginning of July was because the final Actuarial Valuation for the Pension Fund as of that date was not yet available. Therefore the County only considered the June 30 2008 Unfunded Obligation in calculating what it needed to do financially in 2009-2010. Further, it only looked at the Actuarial Value of Unfunded Obligations.

Here's a comparison (assuming the Actuary's estimates for the end of fiscal year 09 are accurate):

	Total Obligations	Pension Fund Asset Value		Funding Ratio Based on ...	
		Actuarial Value	Market Value	Actuarial Value	Market Value
June 2008	\$374 million	\$353 million	\$333 million	94.5%	89.1%
June 2009	387 million	328 million	274 million	84.9%	70.7%

The Funding Ratio the County is using for the 09-10 Budget is the June 2008 value of 94.5%. This is above the trigger that would require the County to make payments this year toward Unfunded Obligations. Therefore there will be no additional payments to the Fund.

But as said before, the core purpose of the Actuarial Value is to prevent unnecessary radical changes in year to year Unfunded Obligation amortization payments. This is a reasonable objective **as long as the use of the modified Actuarial Value doesn't lead to a dangerous distortion of real Asset Value or obscure poor performance.**

The true Market Value of the Fund's Unfunded Obligations as of June 30, 2009 is 6 times more than the Actuarial Value of Unfunded Obligations were 1 year before.

Because the County only looked at the 94.5% Actuarial Funding Ratio for 2008, it made no attempt to reduce the real Unfunded Obligations in the current fiscal year's budget. But those Unfunded Obligations based on the Market Value of the Pension Fund's Assets are going to grow about 8% a year until they are eliminated. The most likely result is they will increase \$9 million or more this year.

County officials are glad they don't have to cut as much from this year's budget than they would have had they used the current market value of Unfunded Obligations. But how much will they have to cut next year - and thereafter?

They have once again pushed the crisis farther into the future, and as a result the crisis will be worse when it comes. The use of Actuarial Value in this situation enabled County officials to do so.

As bad as the County Budget seems this year - wait until next year. It will be far, far worse.