MONTANA LEGISLATIVE BRANCH

Legislative Fiscal Division

Room 110 Capitol Building * P.O. Box 201711 * Helena, MT 59620-1711 * (406) 444-2986 * FAX (406) 444-3036

Legislative Fiscal Analyst
CLAYTON SCHENCK

DATE: November 19, 2009

TO: Legislative Finance Committee

FROM: Jon Moe, Fiscal Specialist

RE: Retirement Systems Unfunded Liability - Update

INTRODUCTION

The purpose of this memorandum is to provide a brief update on the status and condition of the unfunded actuarial liability (UAL) of the state's retirement systems. Statute requires that an actuarial valuation be completed each year for each retirement plan. There are nine:

- Teachers' Retirement System (TRS)
- Public Employees' Retirement System (PERS - defined benefits plan)
- Sheriffs' Retirement System (SRS)
- Game Wardens and Peace Officers' Retirement System (GWPORS)
- Highway Patrol Officers' Retirement System (HPORS)
- Municipal Police Officers' Retirement System (MPORS)
- Firefighters' Unified Retirement System (FURS)
- Judges' Retirement System (JRS)
- Voluntary Firefighters' Compensation Act (VFCA)

The valuations, which examine each plan as of June 30 of each fiscal year, typically are completed by about October 1. I have reviewed the valuations for each plan. Key data is summarized for the June 30, 2009 reports in Attachment A. Attachment A also shows data for the previous three valuations (2006, 2007, and 2008) for comparison purposes.

The Constitution requires that the public retirement systems "be funded on an actuarially sound basis." Statute (19-2-409, MCA) defines "actuarially sound basis" as meaning that contributions to each retirement plan must be sufficient to pay the full actuarial cost of the plan. Statute goes on to provide that, for a defined benefit plans, "the full actuarial cost includes both the normal cost of providing benefits as they accrue in the future and the cost of amortizing unfunded liabilities over a scheduled period of no more than 30 years". Based upon the most recent valuations, these requirements are not being met for four retirement plans (the first four in the list above).

POINTS TO CONSIDER

There are several points that are raised to provide some perspective to the numbers provided in Attachment A. Each is discussed briefly below.

VALUATIONS ARE SNAPSHOTS

The actuarial valuations of the retirement plans are snapshots of those plans as of June 30. Changes in the equity market that have occurred since June 30 are not reflected in these valuations. The equity markets have recovered somewhat since June 30 (for example, as indicators, the Dow Jones and the S&P increased over 16 percent in the period from July 1 to October 1). If the valuations were done as of September 30, improvement is likely. However, it is important to recognize that the equity markets are still very fragile and that the pension plans still have a long way to go.

ACTUARIAL VALUE VERSUS MARKET VALUE

Attachment A shows both the actuarial value and the market value of each plans assets, and that there is a significant difference between them. Market value is the fair value of assets that could be acquired by exchanging them on the open market. Actuarial value includes the technique of "smoothing" which reflects the fact that gains or losses of a given year are spread over a four year period. Therefore, the actuarial value in the 2009 valuation includes only one-fourth of the loss in value experienced during FY 2008 and FY 2009 and one-fourth of gains experienced 2007. Actuarial value is much higher than the market value because there are significant unrecognized losses that will be included in future valuations. (In better times, the opposite can be true. Market value can be greater than actuarial value.)

ACTUARIAL SOUNDNESS

The legislature has established in statute that actuarial soundness is dependent upon the ability of retirement plan's employee and employer contributions being sufficient to cover "normal costs" and provide a revenue stream that can theoretically eliminate the unfunded actuarial liability of the plan within 30 years. As of the June 2009 actuarial valuation, five of the nine retirement plans met this test. Four plans, as mentioned earlier do not: TRS, PERS, SRS, and GWPORS. In each case, the valuation reports indicate that not only does the amortization exceed the 30-year threshold, but they cannot be amortized in any number of years.

Both the TRS board and the PERS board have a policy that provides that if the board receives two consecutive "negative" reports, it has an obligation to recommend funding increases or other benefit changes to the legislature to address plan sustainability.

INVESTMENT RETURNS ASSUMPTION

The Teachers' Retirement System board uses an assumption of 7.75 percent for investment returns and the Public Employee Retirement System board uses 8.0 percent. The market value of the nine plans in total dropped 22.1 percent from June 30, 2008 to June 30, 2009, 20.67 percent of which was due to investment performance and the markets. To recover lost asset value, these

plans will have to average well over 9 percent in investment returns over a period of many years. This will depend too on how well the current market recovery continues this year.

FUNDED RATIO

Another key indicator of the status of a pension plan is the funded ratio. The funded ratio shows the percentage that the actuarial value of assets is of the actuarial liability. The ultimate goal of the retirement systems is to be 100 percent funded or more. Ideally, a funding ratio of 110 percent or more would provide a cushion against volatile markets. Currently, the funded ratio of the nine plans ranges from 62.1 percent for the MPORS to 147.9 percent for the JRS. The two largest plans, PERS and TRS, have funding ratios of 83.5 and 66.2 percent, respectively. The significance of this ratio, however, is dependent upon another factor. Are the total contributions to each pension plan sufficient to pay the "normal costs" plus pay down the unfunded liability? The MPORS at 62.1 percent has sufficient contributions, evidenced by its 22.1 year amortization period. The TRS at 66.2 percent does not have sufficient contributions, evidenced by the fact that its unfunded liability cannot be amortized within 30 years.

TOTAL UNFUNDED ACTUARIAL LIABILITY

The total unfunded actuarial liability of the nine retirement plans is about $2.5 billion. The TRS plan is $1.4 billion of that total and the PERS plan is about $800 million underfunded as of the June 30 valuation. Again, this does not reflect the gains in market value that have occurred since June 30.

WORK OF THE SAVA COMMITTEE

BACKGROUND[1]

House Bill 659, enacted by the 2009 Legislature, requires the State Administration and Veterans' Affairs Interim Committee (SAVA) to examine and recommend funding and benefit changes to the state's public employees' and teachers' retirement systems.

To fulfill the requirements of HB 659, SAVA must:

- Review current trends and best practices in public retirement plan design and funding
- Examine options for changes to each of the 8 [defined benefit] retirement systems administered by the Public Employees Retirement Board

In addition and more specifically for the Teachers' Retirement System (TRS), SAVA must compare and contrast options for a redesign of the system and develop legislation to implement that redesign. Any redesign of TRS generated by the committee must:

- Ensure members will have a guaranteed benefit in retirement
- Provide that employers and employees share the risk of actuarial gains and losses and allow for adjustment of contributions to meet that requirement
- Be sustainable and funded on an actuarially sound basis
- Provide benefits designed to attract qualified and competent employees

[1] Much of this section is an excerpt from Legislative Branch website information concerning the SAVA interim committee activities.

- Comply with the Internal Revenue Code governing tax-qualified public pension plans
- Keep the Teachers' Retirement Board as the administrator of the system and the Board of Investments as the investor of the plan's assets; and
- Provide a foundation for financial security

STATUS OF SAVA WORK

As of this writing, the staff of the SAVA committee upon direction from the committee is in the process of issuing a Request for Proposal (RFP) for services in the area of retirement plan design. The SAVA committee has indicated that it intends to seek assistance from a contractor to develop proposed plan changes and that it will seek the assistance of the respective boards' actuaries in determining the cost of those proposed changes.

In addition, proposed changes can come from various other sources, including the respective boards of TRS and PERS, employee groups, unions, etc. These proposals are required to be provided to the SAVA committee for review in the spring of 2010. The deadline for submitting these proposals was set at March 31, 2010, except that the proposals from TRS and PERS are requested by May 28th.

There have been several ideas proposed by the committee that may be included in the plan redesign process. It is expected that a contractor will be on board early in 2010 with a goal of having recommendations for the SAVA committee by early summer. Throughout that process, the SAVA committee will be considering ideas that, when they all come together, might be combined into one or a few proposals that can be "costed-out" by the retirement plan actuaries.

FINANCIAL MARKETS AND PENSION INVESTMENTS

Carroll South, Executive Director of the Montana Board of Investments, provided a report to the SAVA committee that discusses the investment perspective of the retirement system picture. Highlights of the report follow. The eight-page memo by Mr. South to the SAVA committee is Attachment B.

- The asset value of the retirement plans declined significantly in FY 2009. Diversification of investments did little to mitigate losses. Nearly all types of investments suffered in a big way.
- In response to the market meltdown, the investments were "rebalanced" within the broad investment parameters that are established by the Board of Investments (BOI), consistent also with the investors' ideal of buying low and selling high.
- The market value of the nine retirement fund assets, which reached an all-time high of $8.5 billion in October 2007, dropped below $6.0 billion as of June 2009. The market value has steadily increased since the March 2009 low.
- It is important to note that although the investment returns of the last 15 years have not met the assumption level of the retirement plans (8 percent for PERS and 7.75 percent for TRS) primarily due to FY 2009 performance, a look at 30-year performance shows that investment returns have easily exceeded the assumption levels.
- Starting at the June 30, 2009 level, future returns of 9.8 percent for PERS and 9.4 percent for TRS would be required over a 30-year period to get back on track. A continued strong recovery in the current fiscal year would lower those return percentages.

- While the focus of the legislature is typically on the unfunded liabilities and the length of time required to amortize the liability, the BOI must concern itself with the cash flow needed to fund benefits and administration of the plans. Because the amount needed for benefits/administration is growing at a faster rate than contributions to the plans, there is a widening gap representing a negative cash flow, a long-term problem for the plans. To ensure that there is sufficient cash available to fund benefits, the BOI may need to change the mix of investments (i.e., less stocks and more bonds), a move that may make it more difficult to meet the actuarial investment return assumptions.

Pension Plan Unfunded Actuarial Liability
2009 Actuarial Valuation versus 2006, 2007 & 2008 Actuarial Valuations
(Dollars in Millions)

	TRS	PERS-DB	SRS	GWPORS	HPORS	MPORS	FURS	JRS	VFCA
2009 Valuation (as of 6/30/2009)									
Actuarial Accrued Liability (AAL)	$4,173.8	$4,792.8	$223.9	$92.2	$137.8	$345.3	$306.2	$41.8	$33.5
Actuarial Value of Assets (AVA)	2,762.2	4,002.2	200.7	81.2	99.6	214.3	209.8	61.9	27.2
Unfunded Actuarial Liability/(Surplus)	$1,411.6	$790.6	$23.2	$11.0	$38.2	$131.0	$96.4	($20.1)	$6.3
Funded Ratio (AVA/AAL)	66.2%	83.5%	89.6%	88.1%	72.3%	62.1%	68.5%	147.9%	81.2%
Years to Amortize Unfunded Liability	Does not amortize	Does not amortize	Does not amortize	Does not amortize	21.5 yrs	22.1 yrs	12.7 yrs	0 years	6.9 yrs
Net Statutory Funding Rate [b]	17.110%	14.030%	19.360%	19.560%	45.380%	52.780%	57.660%	32.810%	[a]
Normal Cost Rate	10.690%	12.160%	19.410%	18.530%	22.350%	26.820%	26.340%	25.900%	
Available for Amortization	6.420%	1.870%	-0.050%	1.030%	23.030%	25.960%	31.320%	6.910%	
Projected 30-yr Level Funding Rate	21.220%	16.420%	21.890%	20.250%	41.120%	48.330%	43.690%	-0.450%	
Projected Shortfall	4.110%	2.350%	2.530%	0.690%	-4.260%	-4.450%	-13.970%	-33.260%	
Market Value of Assets	$2,301.8	$2,998.6	$151.5	$61.9	$74.6	$162.1	$159.3	$46.6	$20.4
Ratio of Actuarial Value to Market Value	120.0%	133.5%	132.5%	131.2%	133.5%	132.2%	131.7%	132.8%	133.2%
Change in Market Value from 2008	-23.1%	-22.2%	-19.8%	-15.4%	-22.5%	-19.2%	-18.2%	-20.7%	-21.4%
2008 Valuation (as of 6/30/2008)									
Actuarial Accrued Liability	$3,953.7	$4,504.7	$204.5	$83.4	$134.7	$327.5	$287.2	$39.4	$32.7
Actuarial Value of Assets	3,159.1	4,065.3	199.4	77.5	101.5	212.3	206.1	62.0	27.5
Unfunded Actuarial Liability/(Surplus)	$794.6	$439.4	$5.1	$5.9	$33.2	$115.2	$81.1	($22.6)	$5.2
Funded Ratio	79.9%	90.2%	97.5%	92.9%	75.4%	64.8%	71.8%	157.4%	84.1%
Years to Amortize Unfunded Liability	31.3 yrs	24.8 yrs	16.3 yrs	13.0 yrs	17.4 yrs	18.6 yrs	11.3 yrs	n/a	5.0 yrs
Market Value of Assets	$2,993.4	$3,852.5	$188.8	$73.2	$96.3	$200.5	$194.8	$58.8	$26.0
Ratio of Actuarial Value to Market Value	105.5%	105.5%	105.6%	105.9%	105.4%	105.9%	105.8%	105.4%	105.8%
2007 Valuation (as of 6/30/2007)									
Actuarial Accrued Liability	$3,775.1	$4,201.2	$189.0	$73.0	$128.3	$310.4	$269.4	$36.9	$31.6
Actuarial Value of Assets	3,006.2	3,825.2	183.9	68.8	95.8	198.3	188.5	57.8	25.9
Unfunded Actuarial Liability/(Surplus)	$768.9	$376.0	$5.1	$4.2	$32.5	$112.1	$80.9	($20.9)	$5.7
Funded Ratio	79.6%	91.1%	97.3%	94.2%	74.7%	63.9%	70.0%	156.6%	82.0%
Years to Amortize Unfunded Liability	28.6 yrs	21.9 yrs	19.6 yrs	11.3 yrs	19.1 yrs	20.5 yrs	12.9 yrs	n/a	5.1 yrs
2006 Valuation (as of 6/30/2006)									
Actuarial Accrued Liability	$3,608.9	$3,919.3	$171.8	$64.2	$112.0	$291.1	$255.5	$37.2	$31.9
Actuarial Value of Assets	2,745.8	3,459.1	163.0	58.8	87.2	175.9	167.3	51.8	23.2
Unfunded Actuarial Liability/(Surplus)	$863.1	$460.2	$8.8	$5.4	$24.8	$115.2	$88.2	($14.6)	$8.7
Funded Ratio	76.1%	88.3%	94.9%	91.6%	77.9%	60.4%	65.5%	139.2%	72.7%
Years to Amortize Unfunded Liability	Does not amortize	Does not amortize	Does not amortize	32.4 yrs	18 yrs	21.4 yrs	15.5 yrs	n/a	9.6 yrs

Notes [a] Contibutions are not expressed as a percent of wages but rather are a portion of the fire insurance premiums collected by the state.
[b] The statutory funding rate for the PERS-DB system is 14.07% but is reduced to a net figure by the transfer of .04% to an benefits education fund.

Key
TRS - Teachers' Retirement System
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VFCA - Volunteer Firefighters' Compensation Act

This table shows the valuation for 2009 only, simply to provide a larger print version.

(Dollars in Millions)

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Change in Market Value from 2008	-23.1%	-22.2%	-19.8%	-15.4%	-22.5%	-19.2%	-18.2%	-20.7%	-21.4%

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Attachment B

MEMORANDUM

Montana Board of Investments
Department of Commerce
2401 Colonial Drive, 3rd Floor
Helena, MT 59601 (406) 444-0001

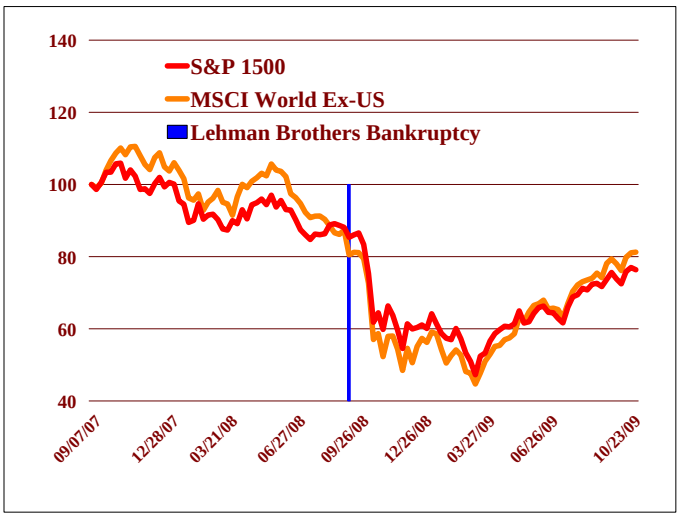
To: State Administration and Veterans' Affairs Committee

From: Carroll South, Executive Director

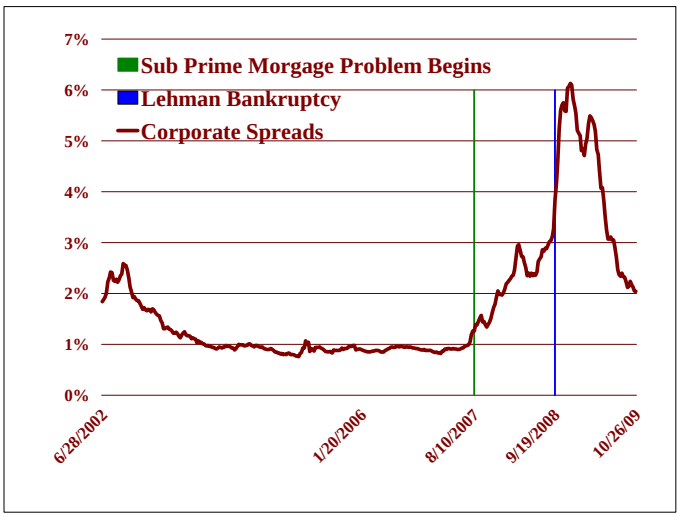
Date: October 29, 2009

Subject: Financial Markets and Pensions Investments

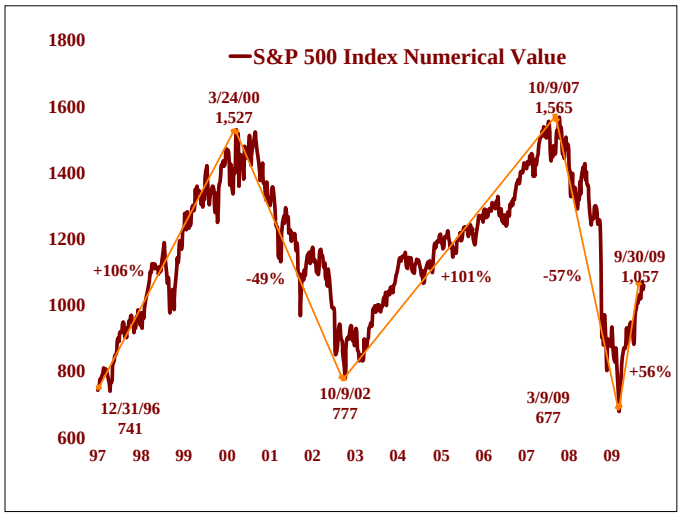
What Happened to the Financial Markets?



The recent trauma in the financial markets, called the worst since the Great Depression, has taken its toll on the asset values of all public and corporate retirement plans, particularly those with a large allocation to public equities. The adjacent chart depicts the performance of the Standard and Poor's (S&P) 1500 Index and the Morgan Stanley World Index (MSCI) excluding US Stocks. Together these indexes represent nearly all publicly-traded stocks in developed and emerging markets. Due to the global nature of the market meltdown there was very little difference between the performance of the US and international stock markets during the period. The public equity markets fell precipitously after the Lehman Brothers bankruptcy depicted as the blue bar in the chart.



The meltdown was not much kinder to investors who held significant allocations of corporate bonds when the trauma began. The adjacent chart depicts the "yield spread" of investment grade corporate bonds to US Government bonds of similar maturity. Corporate bond holders saw the prices of their bonds plummet (and yields go up) as investors flocked to less "risky" investments. The rush to safety forced prices up and yields down on 90-day US Treasury Bills, considered to be the safest investment. There were two days in December 2008 when the yield on these bills was negative, meaning investors were willing to "pay" the federal government to keep their money safe. The chart also shows the reaction of the credit markets to two major events – the first hint of subprime mortgage problems and the Lehman Brothers bankruptcy.



Major domestic public asset class returns have been tracked by Morningstar from January 1926 through December 2008, a period that includes the Great Depression and most of the recent market meltdown. During the period, large company US stocks returned 9.6 percent annually. However during the past 12 years, large company US stocks as represented by the S&P 500 Index have struggled to just break even as depicted in the adjacent chart. For any public retirement plan with significant allocations to public equities, this under performance (by historical standards) has seriously damaged funding ratios and increased unfunded liabilities. The chart depicts price movement only and does not include the reinvestment of dividends.

A cardinal rule of investing has historically been diversification – the theory being that when one asset class declines, others less correlated may actually increase (or at least not decline as much) and offset the decline. But, during fiscal year 2009, diversification did not help. Even alternative investments, such as private equity and real estate, provided no relief as they followed the public markets down. Hedge funds, once called "absolute return" funds, also suffered as they were forced to reduce leverage and sell assets to satisfy redemption demands.

Investment Type	4th Q FY 2009	Fiscal 2009	1st Q FY 2010
Short Term Investment Pool	0.33%	2.08%	0.24%
Bond Pool	4.98%	2.53%	5.91%
Domestic Equity Pool	16.24%	-27.24%	16.12%
International Equity Pool	25.84%	-35.17%	19.62%
Private Equity Pool	-7.88%	-25.09%	3.43%
Real Estate Pool	-20.07%	-27.84%	-5.04%

Nearly all state retirement fund assets are invested in the six pools shown in the adjacent table. Public equity, private equity, and real estate all plunged dramatically during the year. While the bond pool had a small positive performance, its performance trailed the aggregate bond index by 3.5 percent due to its large holdings of corporate bonds at the beginning of the year. As the previous yield spread chart illustrates, corporate bond investors were punished by the credit crisis. There were times during the year when investment grade corporate bonds held in the pool were priced at 80 cents on the dollar or less. The only good news is that the performance in the last quarter of fiscal year 2009 and the first quarter of 2010 has slowly started to rebuild retirement assets.

How Did the Board Respond to the Market Meltdown?

The Board sets broad investment parameters for retirement assets and delegates to staff the day-to-day management of the assets and the responsibility for keeping assets within the Board-approved ranges. The broad ranges for allocation to each of the six pools are set at the retirement fund level and allocations are further refined within each pool by the Board's adoption of an Investment Policy Statement. In investment-speak, the process of "keeping assets within approved ranges" is called rebalancing. Given the recent roller coaster performance of the equity markets, the most volatile range to manage has been the total equity allocation at 60.0 to 70.0 percent of assets and the various equity components within the allocation.

Retirement Funds Approved Ranges

FIXED INCOME:	**Range**
Retirement Funds Bond Pool	22-32%
Short-Term Investment Pool (STIP)	1-5%
TOTAL FIXED-INCOME	**25-35%**
EQUITY:	
Domestic Equity Pool	30-50%
International Equity Pool	15-30%
Private Equity Pool	9-15%
TOTAL EQUITY	**60-70%**
REAL ESTATE:	
Real Estate Pool	4-8%
TOTAL REAL ESTATE	**4-8%**
TOTAL PORTFOLIO	**100.0%**

When the equity markets take off and other assets do not, total equities may exceed 70.0 percent, at which time equities would be sold and non-equity assets purchased. Conversely, when equity markets fall significantly as they did last fiscal year and equity exposure nears the bottom of the range, non-equity assets would be sold and equities purchased. This somewhat counterintuitive process brings discipline to the investment process and, at least in theory, conforms to the investor's ideal of buying low and selling high.

Total Equities

09/30/08	65.97%
10/31/08	63.04%
11/30/08	61.60%
12/31/08	62.30%
01/31/09	61.35%
02/28/09	59.44%
03/31/09	60.59%
04/30/09	62.57%
05/31/09	63.82%
06/30/09	63.66%
07/31/09	65.03%
08/31/09	65.89%
09/30/09	65.88%

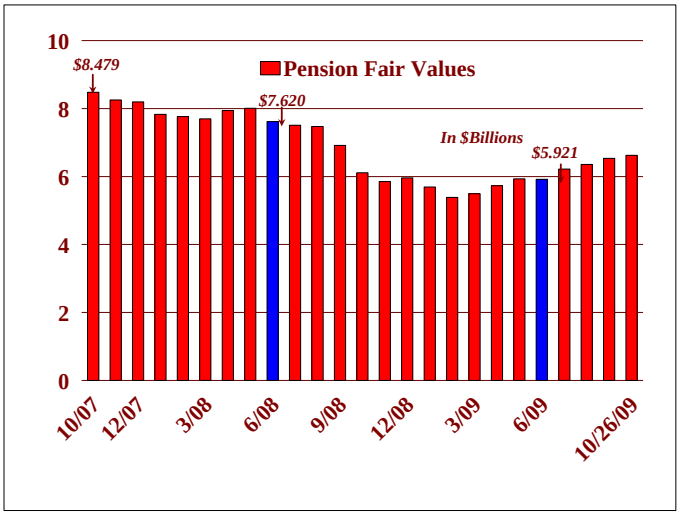
The table at left shows the declining total equity exposure during a 13-month period covering the worst of the equity market decline. During fiscal 2009, $181.6 million in fixed-income investments were sold and a net $173.6 million was pumped into international equity and private equity. During the fiscal year, staff also added $72.9 million to private real estate in a continuing effort to ramp up real estate exposure. Increased cash investments in private equity and private real estate are required to fund capital calls for earlier commitments. As part of the monthly rebalancing process, staff must ensure that adequate cash is available in the private equity and real estate pools to fund the capital calls.

During fiscal years 2007 and 2008 when the stock markets were taking off $292.5 million in stock investments were sold and $105.4 million in fixed income investments purchased to bring the assets back into balance. Staff has discussed the market trauma with the Board and recommended that major asset allocations revisions not be made during periods of extreme market volatility.

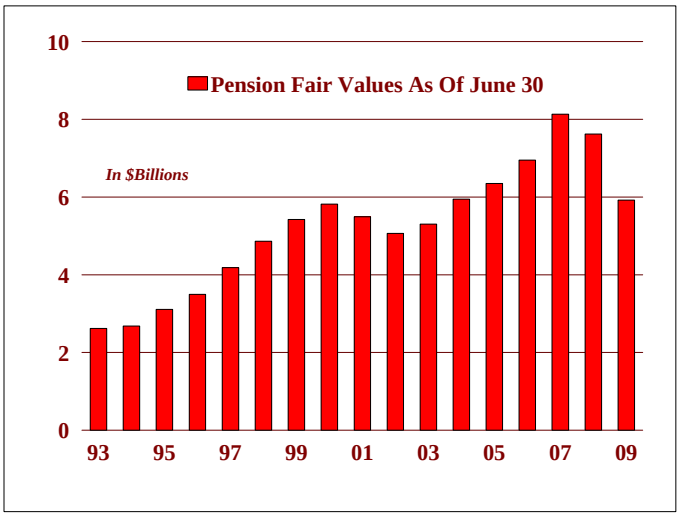
Asset Allocation 10/26/09

Pool Type	**Fair Value**	**% Total**
Short Term	132,040,119	1.99%
Bonds	1,836,128,880	27.72%
Domestic Equity	2,417,181,257	36.49%
International Equity	1,195,861,153	18.05%
Private Equity	725,780,019	10.96%
Real Estate	317,133,575	4.79%
Total	**6,624,125,004**	**100.00%**

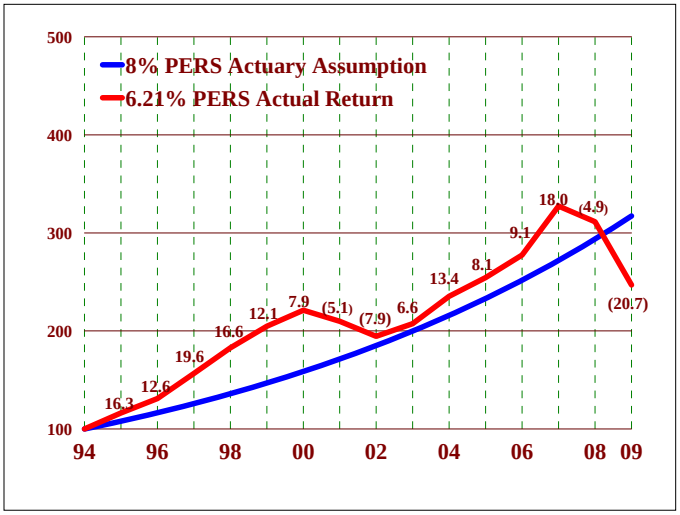
How Has the Financial Market Meltdown Impacted Retirement Assets?



The market value of the state's nine retirement fund assets reached an all time high of $8.5 billion in October 2007, but has dropped significantly since then as depicted in the chart at right. The blue bars represent the "slice in time" values captured in the annual actuarial valuations of the retirement funds. It is important to note that the asset values are based on close-of-business-day prices of the underlying investments in the six pools. The values could include significant amounts of unrealized gains/losses depending upon market conditions. The entire decline in assets cannot be solely attributed to financial market declines because some investment income has been used to pay benefits and has been removed from the asset base.



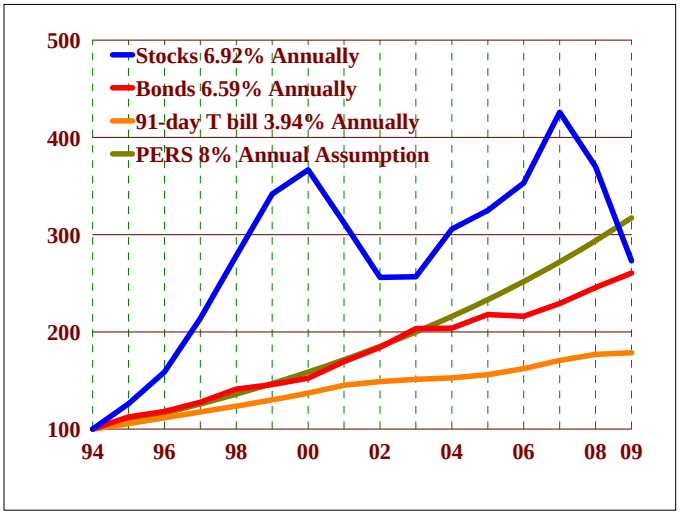
The chart at left shows longer-term impacts of financial market performance on the nine retirement fund assets beginning June 30, 1993. During the 1990's, strong stock market performance increased assets rapidly, but the assets followed the stock markets down in fiscal years 2001 and 2002. By fiscal 2004 the assets had recovered and began growing again. From the low point of fiscal 2002, there were five solid years of gains before the assets declined precipitously during the past two years. The market value of retirement fund assets is very sensitive to financial market performance and can move up and down erratically.

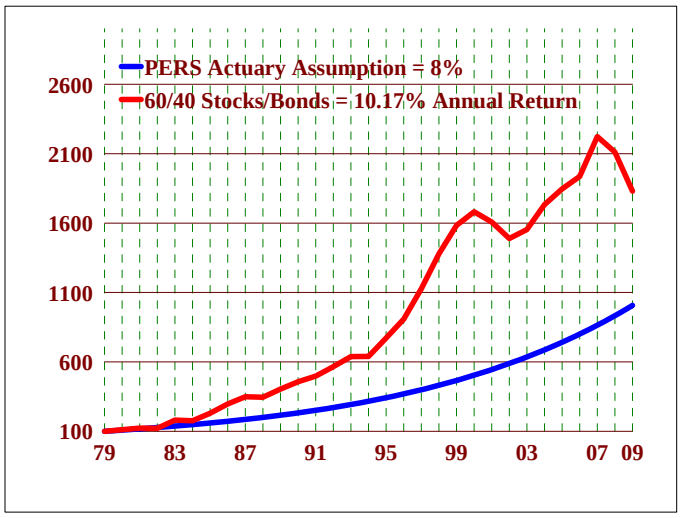


A more meaningful way to evaluate investment performance rather than absolute dollar value of assets is to utilize a total rate of return calculation that ignores non-investment related cash flows, such as benefit payments. The Board's custodial bank has calculated total rates of returns since fiscal 1995. The red line in the chart at right depicts the actual annual total rate of return for the PERS from fiscal year 1995 through fiscal year 2009. The blue line depicts the PERS actuarial return assumption of 8.0 percent. Despite the volatility of the financial markets, the actual returns had exceeded the actuarial assumption through fiscal year 2008. However, the negative

20.7 percent performance in 2009 significantly lowered the annualized return during the 15-year period. While the actuarial assumptions expected an 8.0 percent annual return, the actual return during the period was 6.21 percent annually.

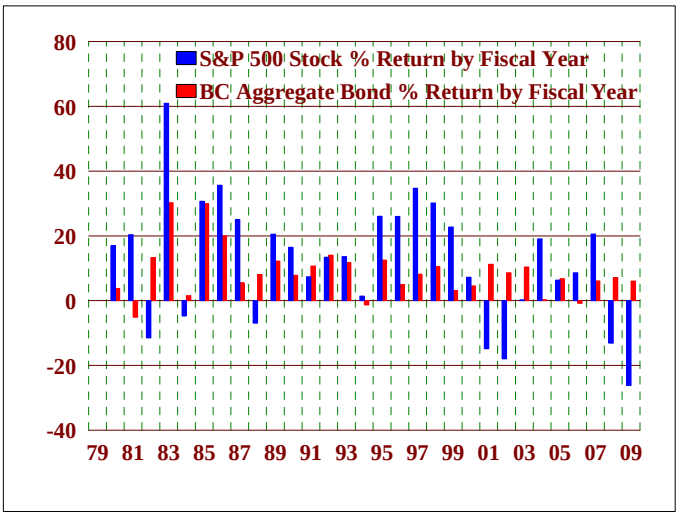
Was there anything the Board could have done differently during the period to meet the 8.0 percent actuarial return assumption? The adjacent chart shows the returns for three major public asset classes during the period compared to the PERS actuarial return assumption. Stocks are represented by the Standard & Poor's (S&P) 500 Index, which tracks approximately 75.0 percent of the US stock market value. Bonds are represented by the Barclays Aggregate Index that tracks approximately 8,820 US Government, securitized, and domestic corporate bonds. The 90-day US Treasury Bill is considered to be the safest, least volatile investment. Investing in any combination of these assets would not have met the 8.0 percent actuarial assumption during the period.





Because defined benefit retirement systems are long-term obligations and unfunded liabilities may be amortized over a 30-year period, it is reasonable to review investment returns over the same time horizon. Although major bond/stock asset class returns did not meet the actuarial return assumptions during the last 15 years, their returns were well in excess of the actuarial assumptions during the past 30 years. The adjacent chart depicts the returns of an asset allocation of 60.0 percent to the S&P500 Index and 40.0 percent to the Barclays Aggregate Index during the 30-year period ending June 30, 2009. This 60/40 asset mix would have returned 10.17 percent annually during the period.

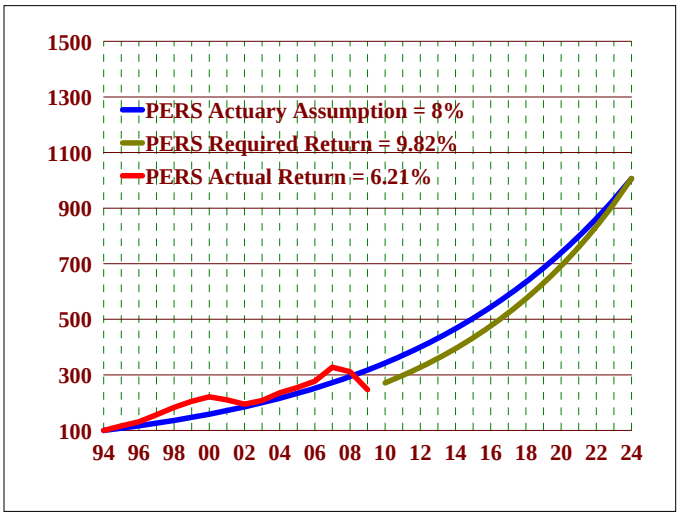
Future retirement fund investment returns will be at the mercy of the financial markets as they have in the past. The peak-to-trough price decline in the S&P500 index of 57.0 percent during the recent bear market was the worst since the stock market decline of the Great Depression. Unless there is a healthy stock market recovery soon, it will be difficult to meet an 8.0 percent actuarial return assumption in any 30-year period that includes the recent market trauma. As the adjacent chart shows, some recovery has usually occurred within a year or two after negative



performance but it is too early to predict when and how much the markets will rebound. However, just gaining back the loss of the last two years, while helpful, will not get the retirement fund assets back on track. The unfunded liabilities of the systems are based on PERS assets returning 8.0 percent annually and TRS assets returning 7.75 percent annually. When they return less, an "actuarial investment loss" occurs that increases the unfunded liabilities.

Can We Get There From Here?

Starting from the low point of June 30, 2009 it would require a future 9.8 percent annual return on PERS assets going forward to meet the 8.0 percent actuarial return assumption during the 30-year period beginning in 1995. A lower 9.4 percent annual return would be required for TRS due to its lower return assumption. If there is a sharp stock market rebound and the assets recover their two-year losses by June 30, 2010, an annual return of 8.4 percent on PERS assets would be required during the remaining period to get back on track.



The compounding that helps build assets when returns are positive does just the opposite when returns are negative. If the stock markets fall 50.0 percent, they must gain 100.0 percent to get back to their initial value. Even though the retirement fund actuaries "smooth" assets over several years to address the volatility of the financial markets, the significant "actuarial" investment losses of the past two years will linger for some time.

Can we get back on track, and if so, how and when? Major domestic public asset class returns have been tracked by Morningstar from January 1926 through December 2008, a period that includes the Great Depression and most of the recent market meltdown. If history repeats and these long-term annual returns carry forward, a 60/40 large stock/bond asset allocation would return just slightly more than 8.0 percent annually but would not compensate for the recent investment losses. Current forward-looking consultant estimates predict lower stock and bond returns than these historical numbers, making even an 8.0 percent annual return unlikely going forward with investments in only large company stocks and bonds.

Morningstar Historical Records	
Large Company Domestic Stock	9.6%
Small Company Domestic Stock	11.7%
Long-Term Corporate Bonds	5.9%
Long-Term Government Bonds	5.7%
Intermediate-Term Government Bonds	5.4%
US Treasury Bills	3.7%

The Board diversifies retirement fund assets beyond stock and bonds to increase returns while diversifying risk. The current ranges for assets approved by the Board are:

- International large and small company stock 15-30%
- Domestic large, mid, and small company stock 30-50%
- Government/corporate bonds, high yield bonds, and foreign bonds 22-32%
- Private equity, including distressed debt 9-15%
- Private real estate, including core, value-added, and opportunistic 4-8%

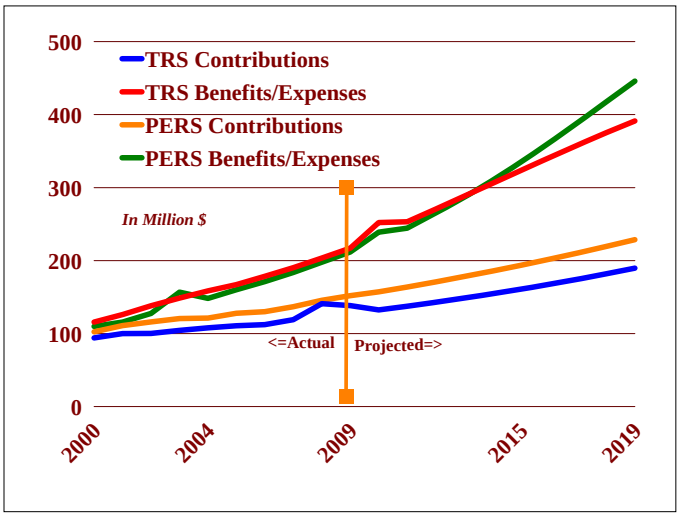
Investment returns at or near the actuarial return assumptions of the retirement funds will only be achieved by maintaining a healthy allocation to international equity, private equity, and private real estate investments. The forward-looking estimated returns for these asset classes are in excess of the actuarial return assumptions. It is important to understand that the return assumptions cannot be met without incurring investment risk and volatility. If the assumptions are not met, the unfunded liabilities will increase. A "risk free" portfolio of US Treasury Bills has returned only 3.7 percent annually since 1926, well short of the return assumptions requirements.

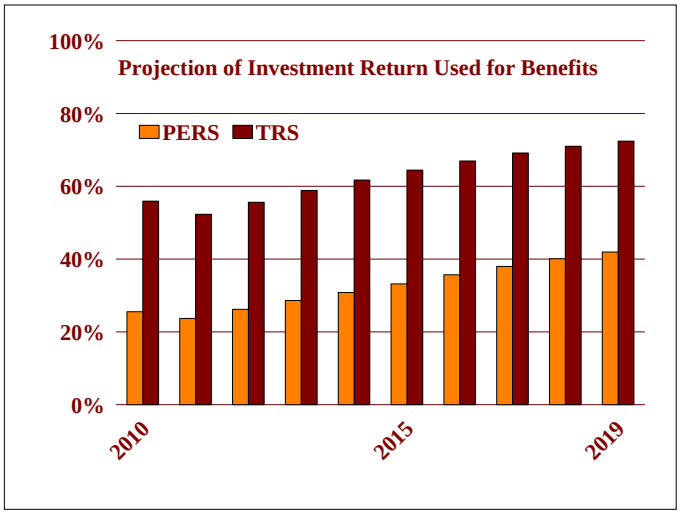
Will Growing Negative Cash Flow Eventually Impact Returns?

Defined benefit retirement fund assets are generated by "positive" cash flow – the excess of contributions received over benefits/expenses paid – plus investment income not used to pay benefits. When a defined benefit retirement system is created, the employer and employees begin contributing to the system and since there are no retirees drawing benefits in the early years, the contributions accumulate and are invested. Even after the original employees begin to retire there will be positive cash flow because there will be more contributing employees than retirees collecting benefits. The positive cash flow will continue to build the assets into a "nest egg" used to pay benefits for employees not yet retired. As long as contributions exceed benefits paid, the income on the assets is reinvested and adds to the growth of the assets. However, as defined benefit systems mature, the ratio of retirees to contributing employees increases and the positive cash flow eventually turns "negative" – benefit payments exceed contributions. When this occurs, a portion of investment income must be used to pay benefits and is not available for reinvestment in the pool of assets.

Historically, legislative scrutiny of the state's defined benefit retirement funds has focused on unfunded liabilities and the length of time required to amortize the liability. In order to be actuarially sound the unfunded liability must be amortized in 30 years or less with the contribution revenue stream. However, this analysis does not provide the type of information the Board needs to carry out its mission. Whether there is an unfunded liability or not, the Board must prudently invest retirement fund assets in an attempt to meet the actuarial returns assumptions, while ensuring that sufficient cash is generated by the invested assets to pay monthly benefits. In order to carry out this mission, the Board must be able to ascertain with some certainty the future impact of negative cash flow on the management of the assets.

The adjacent chart depicts the actual and projected growth of PERS/TRS contributions and benefit/expenses from fiscal 2000 through fiscal 2019 as supplied by the systems' actuaries. The spread between the growth of contributions and benefits widens over the 20-year period because the contribution revenue stream does not grow at the same rate as benefit/administrative expenditures. The gap between the contribution/benefit lines represents "negative cash flow" that must be filled with cash generated by the invested assets, either by current interest/dividend income (cash) or the sale of assets to generate cash.





The table at right depicts the percentage of investment return that would be used to fill the gap between PERS/TRS contributions and benefits. The return is calculated based on the "actuarial" value of assets on June 30, 2009, of $4,002,212,253 for PERS and $2,762,194,000 for TRS as provided by the systems' acturaries. Annual investment returns are 8.0 percent for PERS and 7.75 percent for TRS as embodied in the actuarial valuations. To fully understand the implication of this chart one must differentiate "return" from "cash", as they are not interchangeable. The term "return" as used by the actuaries and the Board is actually a total rate of return calculation, which is the combination of current income (cash) from dividend/interests and price appreciation/depreciation. The retirement assets cannot be invested in any type of configuration that will spin off 8.0 percent or 7.75 percent of free cash flow for benefit payments.

Over long periods of time, current income (cash) from bonds will usually track fairly close to the bond total rate of return. In contrast, most of the return on stocks derives from price appreciation (or depreciation) and the current income (cash) from dividends is a small portion of the total return. For example, if the stock portion of the assts returns 10.0 percent for the year, only 2.0 percent to 3.0 percent of the return would be comprised of cash dividends that could be used to pay benefits. The remaining return would be price appreciation which could only be converted to cash by selling stock and capturing a realized gain. With 55.0 percent to 60.0 percent of retirement assets invested in stock, this "cash" requirement will become more critical as the cash required to pay benefits continues to consume an ever increasing portion of the investment return, much of which is price appreciation. If the current cash flow from interest and dividends is not sufficient to pay benefits, assets will have to be sold to generate cash.

This growing cash flow requirement for benefit payments could at some point in the future necessitate a change in the asset mix with a higher allocation to cash-generating investments, such as bonds, and a reduction in stock. Should this become necessary, the trade off will be an increase in cash flow generated by the assets, but reduced returns, which may make it more difficult to meet the actuarial investment return assumptions.

Despite the havoc wreaked on retirement assets by the recent financial system meltdown it is important to keep things in perspective. Defined benefit obligations are very long-term and if history repeats there will be bad years and good years as the plans mature. It was just two short years ago this month that the retirement assets reached their highest value in history. Eighteen months later, the asset values had declined to 2003 levels. However, it is important to understand what these values actually mean. They are not hard "money in the bank" assets but simply slice-in-time values of the various assets held in the funds' investment portfolios that may contain several hundred million dollars of unrealized gains that can disappear as quickly as they appear. On the next business day after the slice-in-time snapshot, the asset values will change, sometimes up – sometimes down. Whatever impact the financial markets may have on retirement fund asset values, the Board's responsibility is to ensure that the assets are invested prudently and that there is always sufficient cash to pay monthly benefits for retired members.