



Missouri State Employees' Retirement System



Annual Actuarial Valuation

June 30, 2004



Gabriel, Roeder, Smith & Company
Actuaries • Consultants

Missouri State Employees' Retirement System
Annual Actuarial Valuation as of June 30, 2004

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September 22, 2004

Board of Trustees
Missouri State Employees'
Retirement System
907 Wildwood Drive
Jefferson City, Missouri 65102

Re: Actuarial Valuation as of June 30, 2004

Presented in this report are the results of the **annual actuarial valuation** of the Missouri State Employees' Retirement System. The purpose of the valuation was to measure the System's funding progress and to determine the level cost employer contribution rate for the fiscal year beginning July 1, 2005.

The date of the valuation was **June 30, 2004**.

The valuation was based upon data, furnished by the MOSERS' staff, concerning active, inactive and retired members along with pertinent financial information. The complete cooperation of the MOSERS' staff in furnishing materials requested is hereby acknowledged with appreciation.


Your attention is directed particularly to the presentation of contribution rates on page 7 and the comments on page 11.

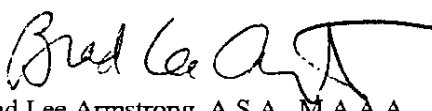
To the best of our knowledge, this report is complete and accurate. The valuation was performed by, and under the supervision of, independent actuaries who are members of the American Academy of Actuaries and who have significant experience in performing valuations for public retirement systems.

The valuation was prepared in accordance with the standards of practice prescribed by the Actuarial Standards Board. The actuarial calculations were made by qualified actuaries in accordance with generally accepted actuarial procedures and methods. The calculations are based on the provisions of the System scheduled to be in effect as of July 1, 2004, and on actuarial assumptions that are, individually and in the aggregate, internally consistent and reasonably based on the actual experience of the System.

Respectfully submitted,

GABRIEL, ROEDER, SMITH & COMPANY


Norman L. Jones, F.S.A., M.A.A.A.
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RJD:dks:kmg

Financial Principles

Financial Principles and Operational Techniques

Promises Made, and Eventually Paid. As each year is completed, MOSERS in effect hands an "IOU" to each member then acquiring a year of service credit --- the "IOU" says: "The Missouri State Employees' Retirement System owes you certain retirement benefits -- payments in cash commencing when you qualify for retirement."

The related key financial question is, which generation of taxpayers contributes the money to cover the IOU?

The present taxpayers, who receive the benefit of the member's present year of service?

Or the future taxpayers, who happen to be in Missouri at the time the IOU becomes a cash demand?

The law governing MOSERS financing intends that this year's taxpayers contribute the money to cover the IOUs being handed out this year. By following this principle, funds will be accumulated during members' working years, which, combined with income on invested assets, will be sufficient to pay benefits throughout retirement.

An inevitable by-product of this financing design is the accumulation of reserve assets, for decades, and the income produced when the assets are invested. Over time, *investment income becomes the largest contributor* toward benefits, and directly influences the contribution amount required from the employer.

In actuarial terminology, the minimum level percent of payroll contribution rate consists of:

Normal Cost (the cost of members' service being rendered this year)

... plus ...

Interest on Unfunded Actuarial Accrued Liabilities (unfunded actuarial accrued liabilities are the difference between: actuarial liabilities for members' service already rendered; and the actuarial value of MOSERS' accrued assets).

Computing Contributions To Support Funded Benefits. From a given schedule of benefits and from the member data and asset data provided, the actuary determines the contribution rates to support the benefits, by means of ***an actuarial valuation and a funding method.***

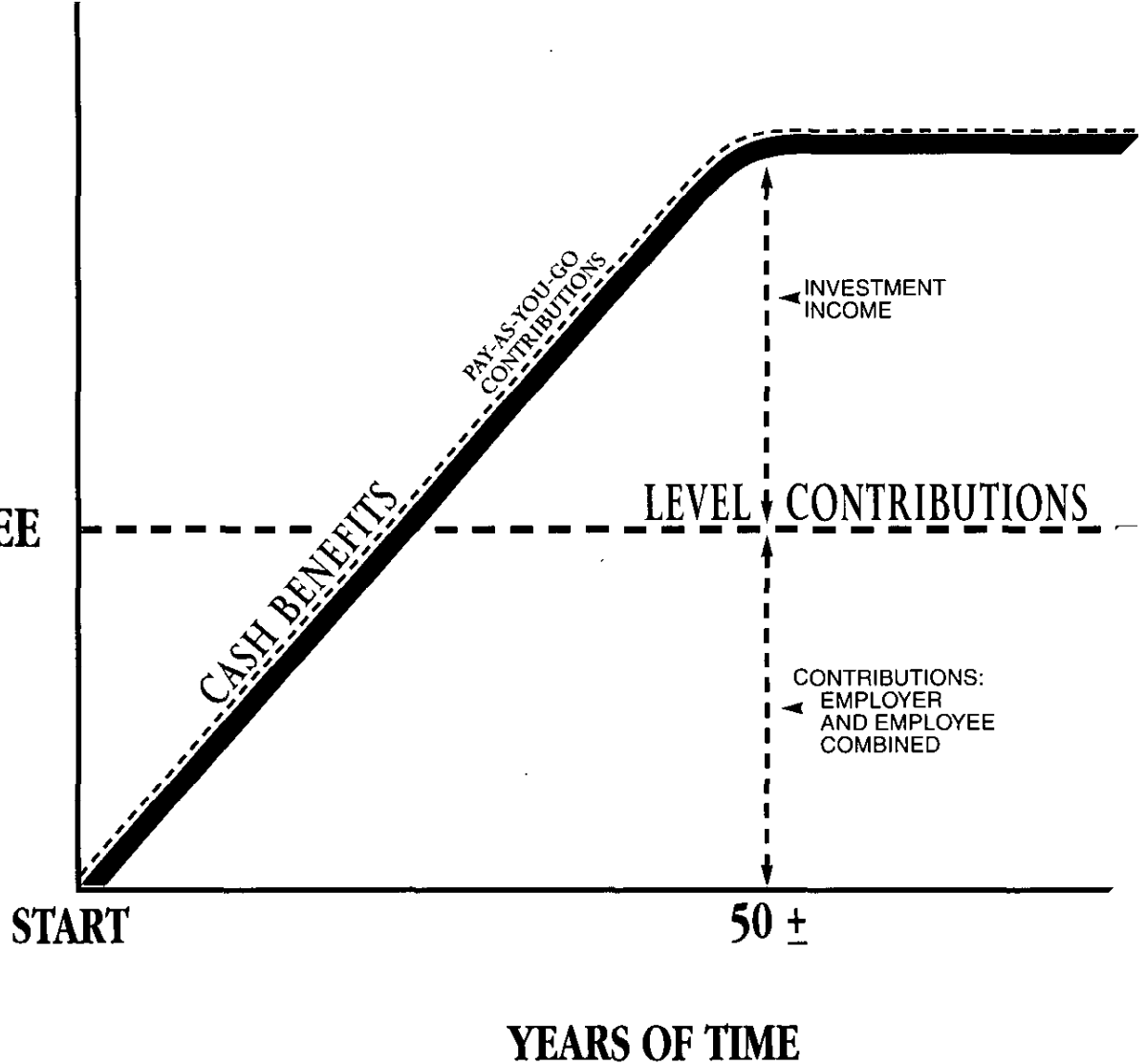
An actuarial valuation has a number of ingredients such as: the rate of investment income which plan assets will earn; the rates of withdrawal of active members who leave covered employment before qualifying for any monthly benefit; the rates of mortality; the rates of disability; the rates of salary increases; and the assumed age or ages at actual retirement.

In an actuarial valuation, assumptions are made as to what the above rates will be, for the next year and for decades in the future. Only the subsequent actual experience of the plan can indicate the degree of accuracy of the assumptions.

Reconciling Differences Between Assumed Experience and Actual Experience. Once actual experience has occurred and been observed, it will not coincide exactly with assumed experience, regardless of the wisdom of those who developed the assumptions, or the skill of the actuary and the many calculations made. The future cannot be predicted with precision.

MOSERS copes with these continually changing differences by having annual actuarial valuations. Each actuarial valuation is a complete recalculation of assumed future experience, taking into account all past differences between assumed and actual experience. The result is ***continuing adjustments in financial position, and contribution rates.***

**% OF
ACTIVE
EMPLOYEE
PAYS**



CASH BENEFITS LINE. This relentlessly increasing line is the fundamental reality of retirement plan financing. It happens each time a new benefit is added for future retirements (and happens regardless of the design for contributing for benefits).

LEVEL CONTRIBUTION LINE. Determining the level contribution line requires detailed assumptions concerning a variety of experiences in future decades, including:

Economic Risk Areas

- Rates of investment return
- Rates of pay increase
- Changes in active member group size

Non-Economic Risk Areas

- Ages at actual retirement
- Rates of mortality
- Rates of withdrawal of active members (turnover)
- Rates of disability

The Actuarial Valuation Process

An *actuarial valuation* is the mathematical process by which actuarial present values and contribution rates are determined. The flow of activity constituting the valuation may be summarized as follows:

- A. ***Census Data***, furnished by the system administrative staff, including:
 - Retired lives now receiving benefits
 - Former members with vested benefits not yet payable
 - Active members
- + B. ***Benefit Provisions*** governing future payments from the retirement system.
- + C. ***Asset data*** (cash & investments), furnished by the system administrative staff.
- + D. ***Assumptions concerning future experiences*** in various risk areas, which assumptions are established by the Board of Trustees after consulting with the actuary.
- + E. ***The funding method*** for employer contributions (the long-term planned pattern for employer contributions).
- + F. ***Mathematically combining the assumptions, the funding method, and the data.***
- = G. Determination of:
 - Plan financial position and***
 - The employer contribution rate.***

Meaning of "Unfunded Actuarial Accrued Liabilities"

"Actuarial accrued liabilities" are the portion of the present value of plan promises to pay benefits in the future which are not covered by future normal cost contributions --- a liability has been established ("accrued") because the service has been rendered but the resulting monthly cash benefit may not be payable until years in the future. Actuarial accrued liabilities are the result of complex mathematical calculations, which are made annually by the plan's actuary.

If "actuarial accrued liabilities" at any time exceed the actuarial value of the plan's accrued assets, the difference is *"unfunded actuarial accrued liabilities."* This is the common condition. If the plan's assets equaled the plan's "actuarial accrued liabilities," the plan would be termed "fully funded."

Each time a plan adds a new benefit which applies to service already rendered, an "actuarial accrued liability" is created, which is also an "unfunded actuarial accrued liability" because the plan can't print instant cash to cover the value of the new benefit promises. Payment for such unfunded actuarial accrued liabilities is spread over a period of years, commonly in the 20-30 year range.

Unfunded actuarial accrued liabilities can occur in another way: if actual financial experience is less favorable than assumed financial experience, the difference is added to unfunded actuarial accrued liabilities. In plans where benefits are directly related to an employee's pay near time of retirement, unfunded actuarial accrued liabilities increase when unexpected rates of pay increase create additional actuarial accrued liabilities which are not offset by favorable experience in other areas.

The existence of unfunded actuarial accrued liabilities is not bad, but the changes from year to year in amount of unfunded actuarial accrued liabilities are important and should be monitored.

Unfunded actuarial accrued liabilities are not a bill payable immediately but it is important that policy-makers prevent the amount from becoming unreasonably high and *it is vital for plans to have a sound method for making payments toward them* so that they will be controlled.

Valuation Results

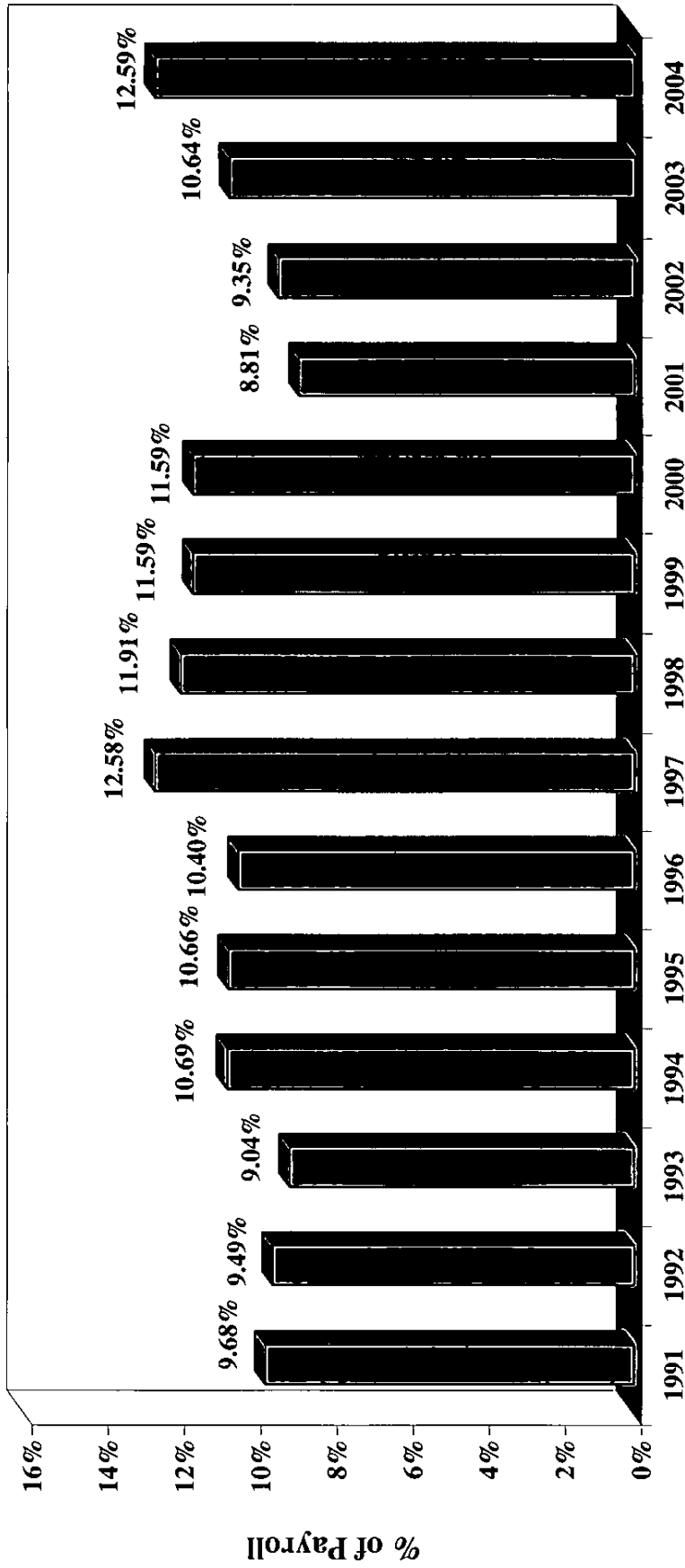
Computed Employer Contribution Rate
Expressed as Percents of Active Member Payroll

June 30, 2004

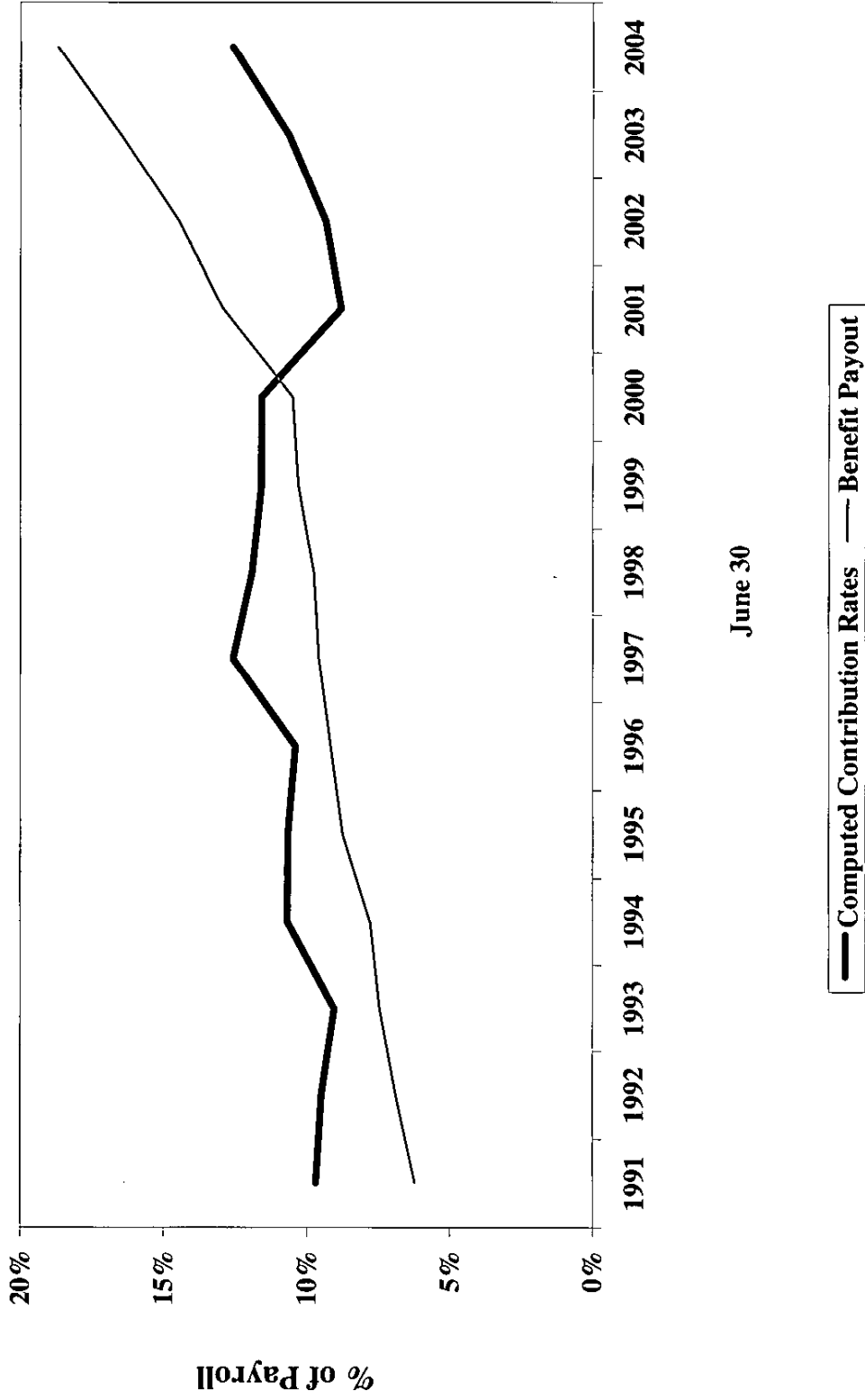
Contributions for	Contribution Expressed as Percents of Payroll
Normal Cost	
Service retirement benefits	7.74 %
Disability benefits	0.41
Survivor benefits	0.33
Administrative expenses	<u>0.33</u>
Total	8.81
Unfunded Actuarial Accrued Liabilities (UAAL) (31 year level percent-of-payroll amortization*)	<u>3.78</u>
TOTAL COMPUTED EMPLOYER CONTRIBUTION RATE	12.59 %

* This corresponds to an amortization factor of 16.92603 assuming 4.00% wage inflation. Amortization period a year ago was 32 years.

Missouri State Employees' Retirement System Computed Contribution Rates



Missouri State Employees' Retirement System Contribution Rates vs. Benefit Payout



Actuarial Present Values June 30, 2004

Actuarial Present Value, June 30, for	(1) Actuarial Present Value	(2) Portion Covered By Future Normal Cost Contributions	(3) Actuarial Accrued Liabilities (1) - (2)
Active Members			
Service retirement benefits based on service rendered before and likely to be rendered after valuation date	\$ 3,815,506,864	\$ 798,909,845	\$ 3,016,597,019
Disability benefits likely to be paid to present active members who become totally and permanently disabled	127,231,916	53,630,963	73,600,953
Survivor benefits likely to be paid to widows and children of present active members who die before retiring	142,570,386	42,274,875	100,295,511
Separation benefits likely to be paid to present active members			
Refunds of member contributions	0		
Deferred benefits	411,745,347		
Total	<u>411,745,347</u>	<u>202,308,361</u>	<u>209,436,986</u>
Active Member Totals	\$ 4,497,054,513	\$ 1,097,124,044	\$ 3,399,930,469
Members on Leave of Absence & LTD			
Service retirement benefits based on service rendered before the valuation date			98,951,934
Terminated Vested Members			
Service retirement benefits based on service rendered before the valuation date			325,376,003
Retired Lives			3,405,053,804
BackDROP Installment Payments Incurred, but not yet paid			<u>698,718</u>
TOTAL ACTUARIAL ACCRUED LIABILITY			\$ 7,230,010,928
ACTUARIAL VALUE OF ASSETS			<u>6,118,214,495</u>
UNFUNDED ACTUARIAL ACCRUED LIABILITY			<u>\$ 1,111,796,433</u>

Actuarial Valuation as of June 30, 2004 Comments

Computed Contribution Rate. The contribution rate for the fiscal year beginning July 1, 2005 was computed to be 12.59% of payroll, based upon an amortization period for the unfunded actuarial accrued liabilities (UAAL) of 31 years. This represents an increase of 1.95% in the rate computed for the fiscal year beginning July 1, 2004. Of this change, 0.47% was attributable to changes in assumptions resulting from the recently completed experience study and 1.48% is attributable to plan experience for the year ending June 30, 2004.

Experience. Experience was unfavorable this year – primarily due to continued recognition of asset losses from prior years, a higher number of service retirements than expected due in large part to the external retirement incentive, and a higher average salary increase, particularly among members affected by the pay freeze. Measured on an actuarial value basis, recognized investment return was lower than expected. In total, computed accrued liabilities exceed assets by \$1,111.8. Unless the investment markets continue to rebound and unrecognized losses are offset by future gains, MOSERS will continue to see investment losses flow into the valuation for the next two years. With \$200 + million of investment loss related to pre-2004 experience expected to be recognized in the 2005 valuation, it is likely that the next valuation will show higher unfunded liabilities and another increase in the computed contribution rate.

Additional information concerning 2004 experience is presented in the gain/loss section of this report beginning on page 16.

Conclusion. Based on the results of the June 30, 2004 regular annual actuarial valuation, it is our opinion that the Missouri State Employees' Retirement System continues to be in sound financial condition in accordance with actuarial principles of level percent-of-payroll financing.

Comparative Schedule

Valuation Date	Active Members				Retired Lives				Accrued Liability	Valuation Assets	UAAL
	Payroll		Average Salary		Number		Annual Benefits				
	Number	\$ Millions	\$	% Incr.	Retired	Active/Retired	\$ Million	% of Payroll			
1989 (2)	43,787	\$895	\$20,444	4.0 %	11,090	4.0	\$ 52.6	5.9 %	\$1,782	\$1,418	\$364
1990 (1)	46,834	994	21,229	3.8	11,495	4.1	57.3	5.8	1,861	1,587	274
1991 (2)	46,725	1,028	21,995	3.6	11,995	3.9	64.0	6.2	2,053	1,793	260
1992 (1)(2)	46,616	1,030	22,101	0.5	12,552	3.7	71.0	6.9	2,291	1,991	300
1993	47,954	1,063	22,172	0.3	13,115	3.7	79.4	7.5	2,447	2,237	210
1994 (2)	49,436	1,125	22,754	2.6	13,651	3.6	96.2	8.6	2,919	2,425	494
1995	50,524	1,199	23,730	4.3	14,384	3.5	104.9	8.8	3,151	2,649	502
1996 (1)	51,425	1,268	24,650	3.9	15,004	3.4	116.2	9.2	3,440	2,928	512
1997 (1)(2)(3)	52,737	1,360	25,782	4.6	15,609	3.4	130.4	9.6	4,484	3,581	903
1998	54,544	1,460	26,762	3.8	16,251	3.4	142.4	9.8	4,919	4,211	708
1999 (2)	56,158	1,565	27,860	4.1	17,117	3.3	161.3	10.3	5,506	4,909	597
2000 (1)	57,774	1,684	29,143	4.6	18,196	3.2	177.0	10.5	5,921	5,217	704
2001 (1)	58,431	1,758	30,090	3.3	20,237	2.9	227.4	12.9	6,065	5,881	184
2002 (4)	58,616	1,773	30,253	0.5	21,502	2.7	256.6	14.5	6,294	6,033	261
2003 (2) (4)	57,558	1,740	30,229	(0.1)	22,872	2.5	287.1	16.5	6,662	6,057	605
2004	55,914	1,737	31,074	2.8	24,757	2.3	324.6	18.7	7,158	6,118	1,039
2004 (1)	55,914	1,737	31,074	2.8	24,757	2.3	324.6	18.7	7,230	6,118	1,112

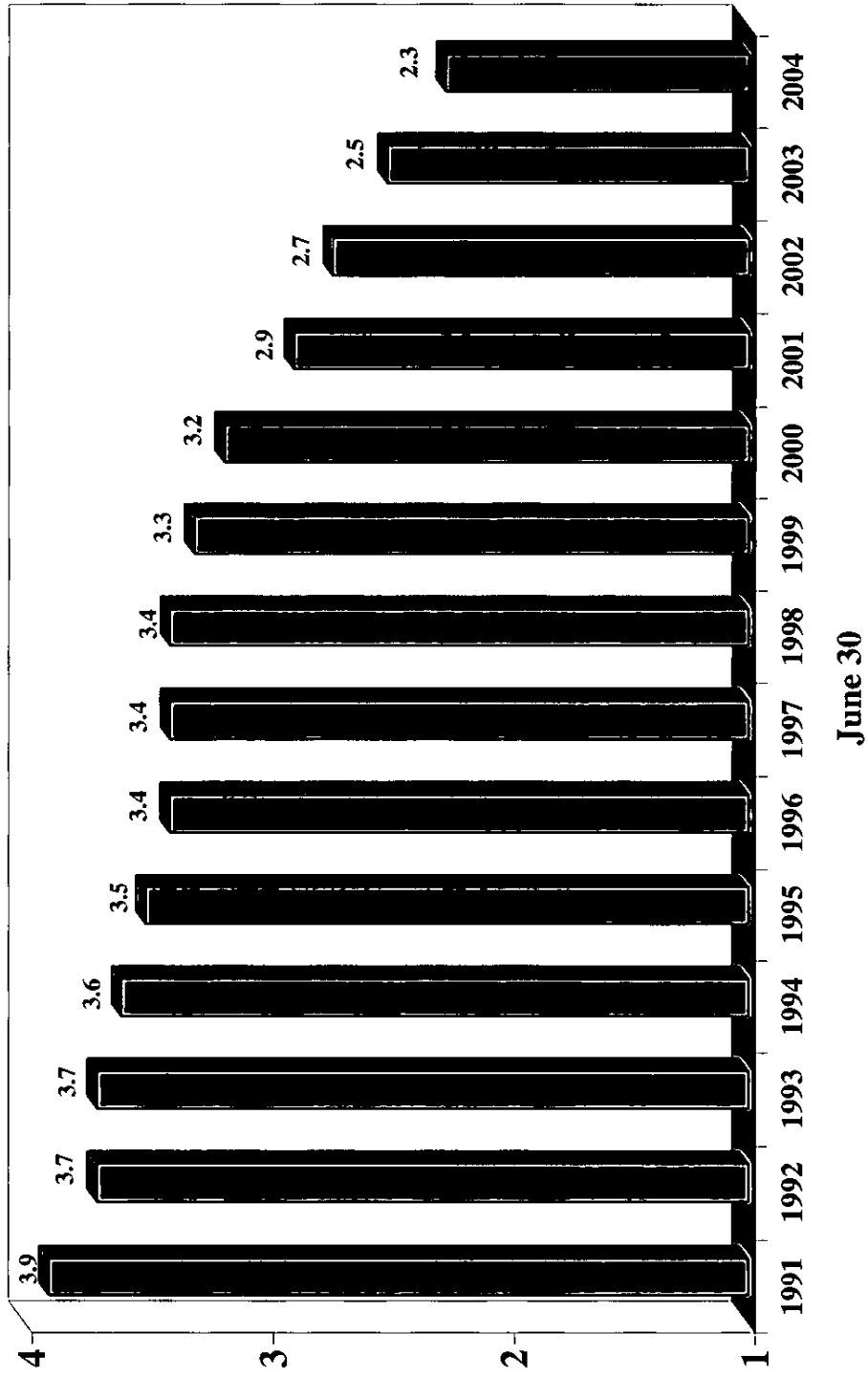
(1) After changes in assumptions.

(2) After changes in benefit provisions.

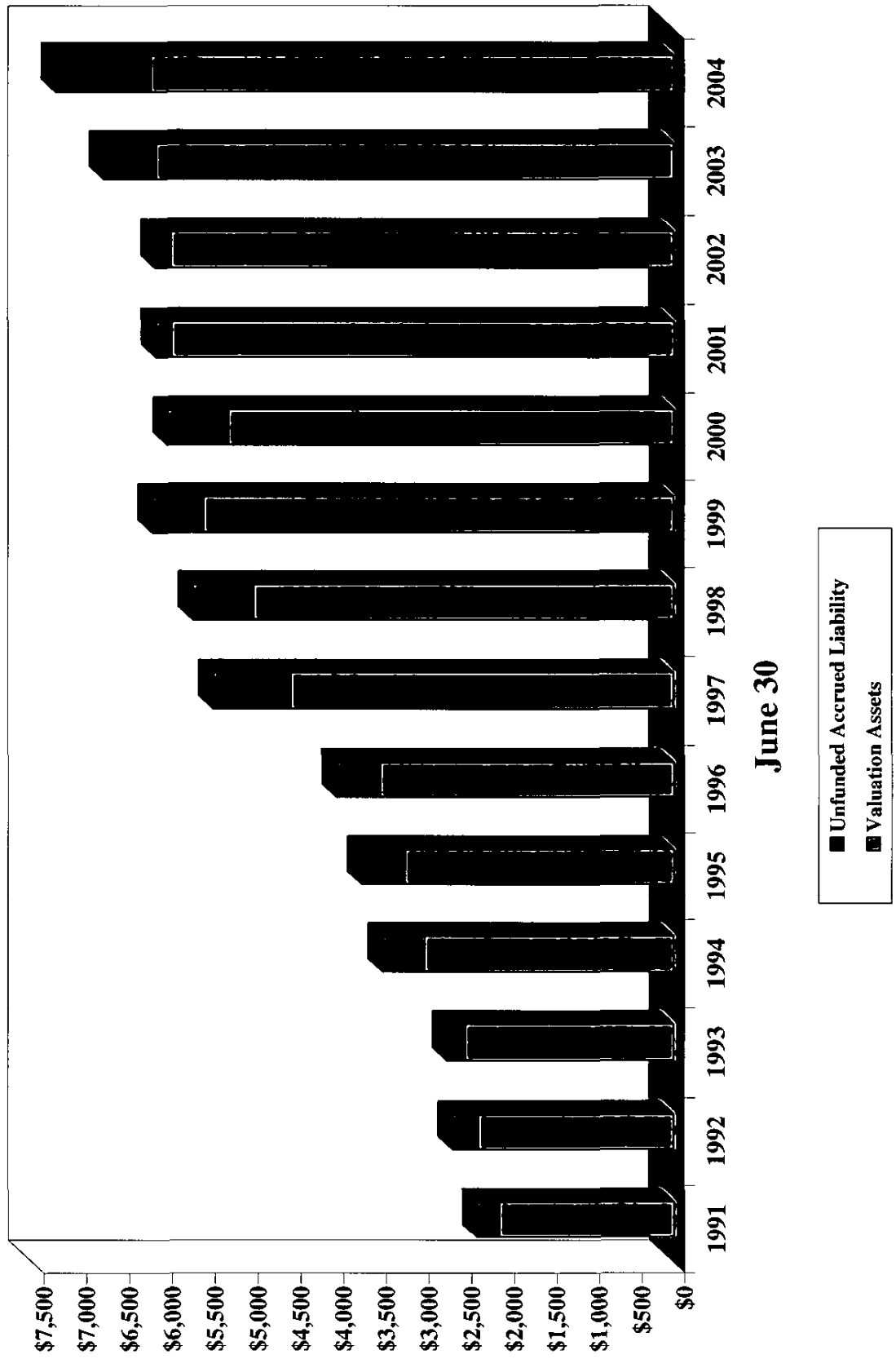
(3) After changes in asset valuation method.

(4) After changes in methods other than the asset valuation method.

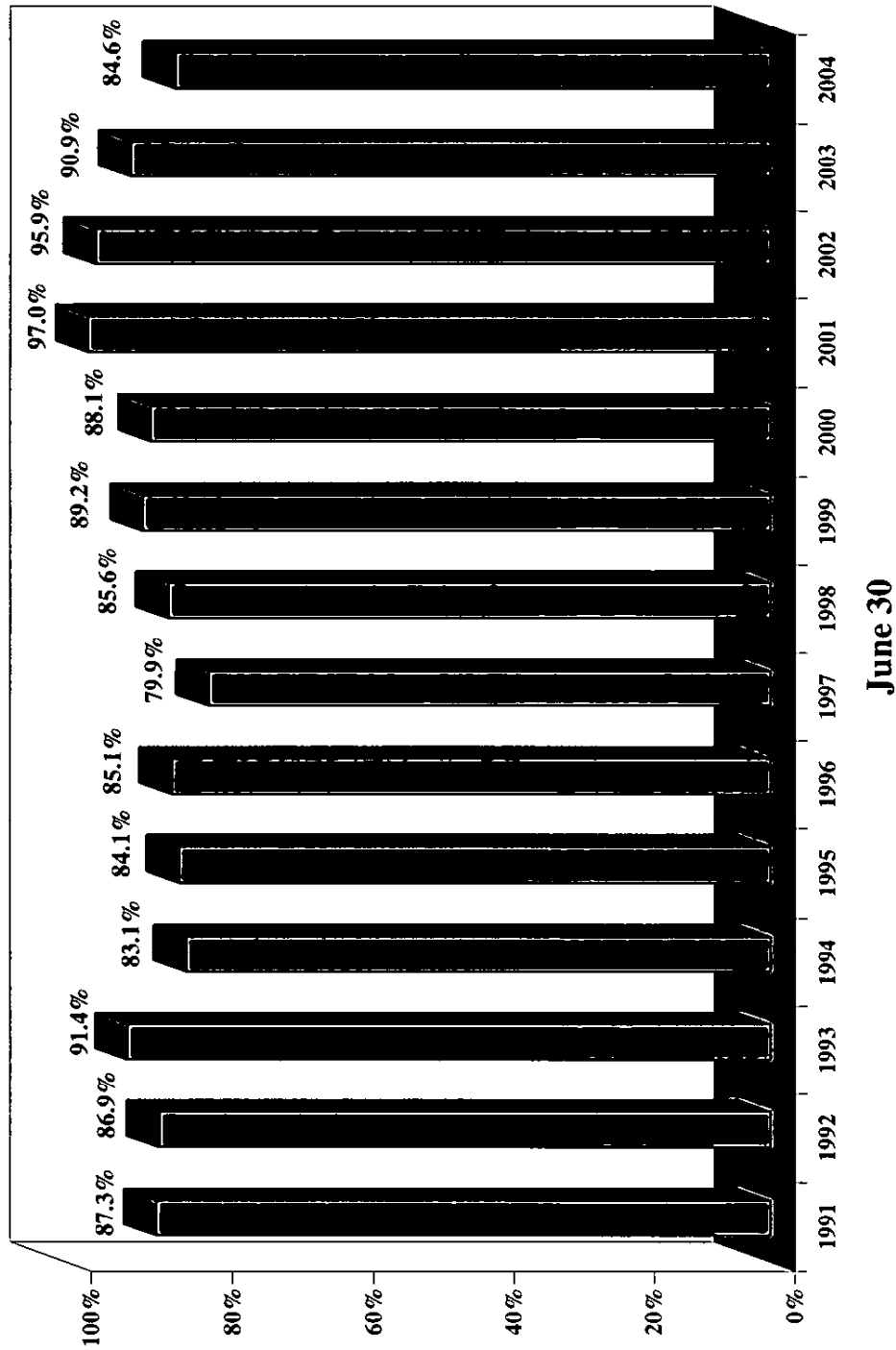
Number of Active Members Per Benefit Recipient



**Missouri State Employees' Retirement System
Actuarial Value of Assets and Actuarial Accrued Liabilities
(\$ in millions)**



Actuarial Value of Assets as Percents of Accrued Liabilities (Funded Ratio)



Gain Loss Analysis

Gain/Loss Analysis of Experience During Last Year

COMMENTS

Purpose of Gain/Loss Analysis. Regular actuarial valuations provide valuable information about the composite change in unfunded actuarial accrued liabilities – whether or not the liabilities are increasing or decreasing, and by how much. However, valuations do not show the portion of the change attributable to each risk area within the retirement system financial mechanism: the rate of investment income on plan assets; the rates of withdrawal of active members who leave covered employment; the rates of mortality; the rates of disability; the rates of salary increases; and the assumed ages at actual retirement. In an actuarial valuation, assumptions are made as to what these rates will be for the next year and for decades in the future.

The objective of a gain and loss analysis is to determine the portion of the change in unfunded actuarial accrued liabilities attributable to each risk area.

The fact that actual experience differs from assumed experience is to be expected – the future cannot be predicted with precision. Changes in the valuation assumed experience for a risk area should be made when the differences between assumed and actual experience have been observed to be sizeable and persistent. One year's gain and loss analysis may or may not be indicative of *long-term trends, which are the basis of financial assumptions.*

2003 and 2004 Data. For the 2003 and 2004 valuations, active and retired member data was reported as of May 31. It was brought forward to June 30 by adding one month of service for all active members, adding the June COLA for certain retirees, and otherwise making no other adjustments. It was assumed for valuation purposes that there was no turnover among members and no new entrants during the month of June. Financial information was reported as of June 30. It is believed that this procedure resulted in a slight overstatement of total liabilities as of June 30, 2003 and June 30, 2004.

The expected and actual numbers of retirements, deaths, and terminations found on pages 24 through 29 reflect experience over the 12 month period from May 31, 2003 through May 31, 2004.

Results from 2004 Plan Year. There was a net experience loss this year, with the largest single identifiable source being investment income less than assumed. The table below summarizes historical MOSERS economic experience:

Period	Inflation As Measured By		Interest Credited to MOSERS Funds	Real Rate of Return	
	CPI	Increase in Average Salary		Relative to CPI	Relative to Salaries
July 1, 2003 - June 30, 2004	3.3 %	4.2 %	17.2 *%	13.9 %	13.0 %
July 1, 2002 - June 30, 2003	2.1	0.6	6.8 *	4.7	6.2
July 1, 2001 - June 30, 2002	1.1	(2.1)	(6.4) *	(7.5)	(4.3)
July 1, 2000 - June 30, 2001	3.2	5.1	(2.0) *	(5.2)	(7.1)
July 1, 1999 - June 30, 2000	3.7	5.6	7.9 *	4.2	2.3
July 1, 1998 - June 30, 1999	2.0	5.4	10.9 *	8.9	5.5
July 1, 1998 - June 30, 2003	2.4	2.9	3.2 *	0.8	0.3
January 1, 1978 - December 31, 2002 @	4.4	5.1	12.2	7.8	7.1

* MOSERS approximate rate of return based on market value.

@ This information is based on national average earnings and based on market indices roughly approximating MOSERS' current investment mix. TIPS were treated as government/corporate hybrids.

The dollar amount of unfunded actuarial accrued liabilities (UAAL) is large in absolute dollars. However, the size should be viewed in the light of MOSERS' overall financial program. ***The ratio of unfunded actuarial accrued liabilities divided by active member payroll is significant.*** UAAL represent plan debt, while active member payroll is indicative of the state's capacity to amortize the UAAL – ***the ratio thus provides an index of relative condition.*** The smaller the ratio, the stronger the financial condition.

	<u>UAAL/Active Member Payroll</u>
June 30, 1995	.42
June 30, 1996 after assumption changes	.40
June 30, 1997 after changes in benefits, assumptions, methods	.66
June 30, 1998	.49
June 30, 1999 after MSEP 2000	.38
June 30, 2000 after changes in assumptions	.42
June 30, 2001 after changes in assumptions	.10
June 30, 2002 after changes in methods	.15
June 30, 2003 after changes in benefits, methods	.35
June 30, 2004 after changes in assumptions	.64

Derivation of Experience Gain (Loss)

Year Ended June 30, 2004

Actual experience will never coincide exactly with assumed experience (except by coincidence). Gains and losses may offset each other over a period of years, but sizeable year-to-year variations from assumed experience are common. Detail on the derivation of the experience gain (loss) is shown below.

	\$ Millions
(1) UAAL* at start of year	\$605.0
(2) Normal cost from last valuation	149.1
(3) Actual employer contributions	164.7
(4) Interest accrual: $(1) \times .085 + [(2) - (3)] \times (.085 / 2)$	50.8
(5) Expected UAAL before changes: $(1) + (2) - (3) + (4)$	640.2
(6) Change from any changes in benefits, assumptions, or methods	72.5
(7) Expected UAAL after changes: $(5) + (6)$	712.7
(8) Actual UAAL at end of year	1,111.8
(9) Gain(loss): $(7) - (8)$	(399.1)
(10) Gain (loss) as percent of actuarial accrued liabilities at start of year (\$6,662)	(6.0) %

* *Unfunded actuarial accrued liabilities.*

Valuation Date June 30	Actuarial Gain (Loss) As a % of Beginning Accrued Liabilities
1995	0.6 %
1996	0.4
1997	5.5
1998	5.5
1999	4.7
2000	2.7
2001	(4.4)
2002	(3.8)
2003	(6.4)
2004	(6.0)

Gains & (Losses) in Actuarial Accrued Liabilities During Plan 2003 - 2004

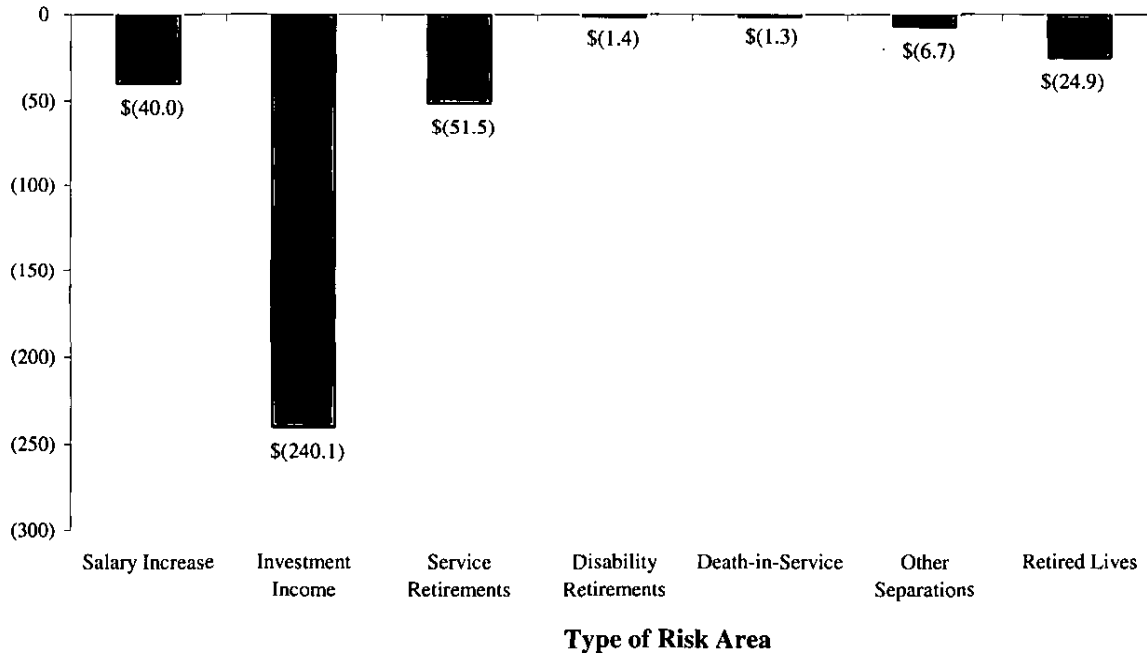
Type of Activity	\$ in Millions	-- Gain (Loss) for Year -- % of Accr. Liabilities*
<u>Decrement Experience:</u>		
<i>Service Retirements</i> . If members retire at older ages than assumed, there is a gain. If at younger ages, a loss.	\$ (51.5)	(0.8) %
<i>Disability Retirements</i> . The occurrence of a gain or loss depends upon the age at disability and the incidence of disability.	(1.4)	0.0
<i>Death-in-Service</i> . If there are fewer survivor claims than assumed at younger ages, there is a gain. If there are fewer survivor claims than assumed at older ages, there can be a loss.	(1.3)	0.0
<i>Other Separations</i> . If more actuarial liabilities are released by other separations than assumed, there is a gain. If smaller releases, a loss.	(6.7)	(0.1)
<i>Retired Lives</i> . If more deaths than assumed, there is a gain. If fewer deaths, a loss.	(24.9)	(0.4)
<u>Economic Experience:</u>		
<i>Salary Increases</i> . If there are smaller salary increases than assumed, there is a gain. If greater increases, a loss. If long service members have greater salary increases than assumed, there can be a loss even if average salary increases are less than assumed.	(40.0)	(0.6)
<i>Investment Income</i> . If there is greater investment income than assumed, there is a gain. If less income, a loss.	(240.1)	(3.6)
<i>COLAs</i> .	20.6	0.3
<u>Other:</u>		
Service credit reinstatements, service transfers, service purchases, net of contributions.	(9.6)	(0.1)
Larger than expected average compensation for new retirees.	(4.9)	(0.1)
Change in group size, data adjustments, retroactive benefit payments, option elections, and miscellaneous unidentified changes in the UAAL.	(39.3)	(0.6)
Experience Gain or (Loss) During Year	\$ (399.1)	(6.0) %

* Beginning of year accrued liabilities totaled \$6,662 million.

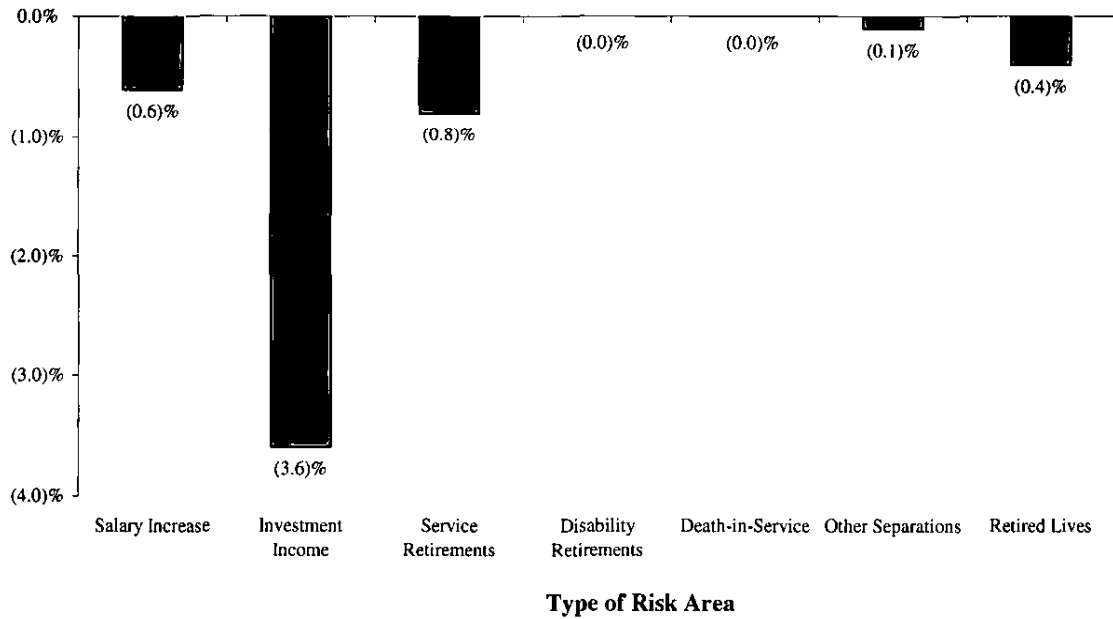
MOSERS

Gain (Loss) Analysis 2003-2004 Experience

Amount in \$ Millions



% of Actuarial Accrued Liabilities



Experience Gains & Losses By Risk Area Comparative Statement

-----\$ in Millions-----

Year Ending June 30	Gain (Loss) By Risk Area							COLAs & Retired Lives	Other	Total Exper. Gain (Loss)	Exper. Gain (Loss) as % of AAL	Accrued Liability Beginning of Year
	Salary Increases	Investments	Age & Service Retirement	Disability	Death- In- Service	Withdrawal						
1992 *	\$79.8	\$19.9	\$ (1.8)	\$0.6	\$1.6	\$ (5.5)	#	\$ (8.0)	\$86.6	4.0 %	\$2,165	
1993	66.8	54.0	(0.9)	0.8	2.4	(3.9)	#	(27.0)	92.2	4.0	2,292	
1994	42.5	(18.1)	(1.0)	0.7	2.3	(7.0)	#	52.0	71.4	2.9	2,447	
1995	16.7	12.0	(3.2)	0.5	2.5	(4.0)	#	(7.5)	17.0	0.6	2,919	
1996	24.2	63.7	(2.1)	0.6	2.9	(10.2)	\$ 7.4	(74.3) ^	12.2	0.4	3,151	
1997 *	(26.3)	260.3	(3.1)	0.5	2.6	(7.1)	14.5	(50.6)	190.8	5.5	3,440	
1998	(56.9)	325.9	9.6	0.2	(0.3)	(1.7)	16.3	(48.3)	244.8	5.5	4,484	
1999	(21.9)	299.8	(1.3)	(0.3)	(0.9)	1.7	10.5	(58.1)	229.5	4.7	4,919	
2000 *	(6.4)	162.0	1.7	(0.5)	(0.7)	8.9	18.5	(34.7)	148.8	2.7	5,506	
2001 *	(23.2)	(67.9)	(59.8)	(1.0)	(0.2)	(28.2)	(13.1)	(66.1)	(259.5)	(4.4)	5,921	
2002	115.0	(284.6)	(14.4)	(0.5)	(1.3)	(21.4)	37.1	(62.6)	(232.8)	(3.8)	6,065	
2003	7.7	(314.1)	(27.2)	(0.6)	(2.6)	(14.6)	9.6	(63.1)	(404.9)	(6.5)	6,294	
2004 *	(40.0)	(240.1)	(51.5)	(1.4)	(1.3)	(6.7)	(4.3)	(53.8)	(399.1)	(6.0)	6,662	

* Revision in assumptions.

Not identified as separate risk area. Included in "Other" category.

^ Includes (23.0) for legal settlement.

**Development of Gain (Loss)
From Investment Income
During Plan 2003 - 2004**

	Market Value	Actuarial Value
	----- \$ in millions -----	
1. Assets at June 30, 2003	\$5,191.7	\$ 6,057.3
2. Contributions and Transfers in	168.3	\$ 168.3
3. Investment Income	876.1	266.1
4. Benefit Payments	367.8	367.8
5. Administrative Expenses	5.7	5.7
6. Assets at June 30, 2004 = (1) + (2) + (3) - (4) - (5)	5,862.6	6,118.2
7. Actual Investment Increment/Mean Assets*	17.22 %	4.47 %
8. Expected Investment Increment		8.50 %
9. Investment Gain (Loss):		
a. As a % of mean assets: (7) - (8)		(4.03) %
b. \$ in millions		<u>\$ (240.1)</u>

* Based on the approximation formula: $I/[.5 \times (A+B-I)]$, where

I = Investment increment
A = Beginning of year asset value
B = End of year asset value

Salary Increases
To Members Active Both at Beginning & End of Year
During Plan 2003 - 2004

Age Groups	Number	Salary Increases	
		Actual*	Expected
Below 25	657	3.6%	4.4%
25- 29	3,147	4.8%	4.1%
30- 34	4,983	4.2%	3.8%
35- 39	5,549	4.0%	3.4%
40- 44	7,051	3.9%	3.0%
45- 49	8,132	3.8%	2.7%
50- 54	8,015	3.7%	2.4%
55- 59	5,514	4.3%	2.4%
60-64	2,400	5.0%	1.7%
65 & Over	802	5.7%	1.7%
Total	46,250		
Average		4.0%	2.8%

* Excludes new entrants and terminations.

Assumed Payroll Growth	Actual Payroll Growth		
	2004	2003	2002
4.0%	(0.1)%	(1.9)%	(0.9)%

**Active Members Who Retired With
SERVICE OR REDUCED SERVICE RETIREMENT BENEFITS
During Plan 2003 - 2004**

Ages	Men		Women		Total	
	Actual	Expected	Actual	Expected	Actual	Expected
Under 50	1	0.1	17	2.9	18	3.0
50	9	1.9	50	9.7	59	11.6
51	15	4.4	43	12.8	58	17.3
52	32	10.5	65	22.7	97	33.2
53	42	12.0	49	17.5	91	29.4
54	32	10.6	64	13.7	96	24.3
55	48	7.4	72	8.5	120	15.9
56	29	7.3	82	9.4	111	16.8
57	45	37.7	97	45.9	142	83.6
58	47	25.8	66	34.1	113	59.9
59	45	23.9	77	34.2	122	58.1
60	49	31.9	98	47.0	147	78.9
61	51	35.7	101	64.0	152	99.7
62	82	50.1	121	56.8	203	106.9
63	55	31.1	82	25.9	137	57.0
64	32	44.7	40	52.0	72	96.6
65	29	42.6	44	60.3	73	102.8
66	23	31.8	28	26.2	51	58.0
67	11	16.9	15	17.0	26	33.9
68	9	9.7	10	14.1	19	23.8
69	7	10.7	9	10.9	16	21.7
70 & Over	18	48.2	29	53.4	47	101.6
Totals	711	494.9	1,259	639.1	1,970	1,133.9

	Men	Women	Total
Average age at retirement	60.0 years	59.1 years	59.5 years
Average service at retirement	22.4 years	22.7 years	22.6 years

Active Members Who Retired With DISABILITY BENEFITS
During Plan 2003 - 2004

Ages	Men		Women		Total	
	Actual	Expected	Actual	Expected	Actual	Expected
Under 25		0.0	1	0.0	1	0.0
25- 29		0.3	2	0.2	2	0.5
30- 34	2	1.5	7	1.4	9	2.9
35- 39	4	2.7	12	4.5	16	7.2
40- 44	11	5.2	13	8.2	24	13.5
45- 49	14	9.0	19	13.0	33	22.0
50- 54	13	13.4	24	20.9	37	34.2
55- 59	14	16.3	27	23.2	41	39.5
60 & Over	2	5.6	7	8.2	9	13.8
Totals	60	54.1	112	79.5	172	133.6

	Men	Women	Total
Average age at disability	49.3 years	48.8 years	49.0 years
Average service at disability	10.7 years	10.3 years	10.4 years

**Active Members Who Died
During Plan 2003 - 2004**

Ages	Men		Women		Total	
	Actual	Expected	Actual	Expected	Actual	Expected
Under 30	2	0.2		0.3	2	0.4
30- 34	2	0.7	1	1.0	3	1.8
35- 39		1.4	2	1.7	2	3.1
40- 44	9	2.9	4	3.1	13	6.0
45- 49	8	6.3	8	5.3	16	11.6
50- 54	13	12.8	12	9.2	25	22.0
55- 59	13	15.6	9	11.4	22	27.0
60- 64	8	12.6	1	9.1	9	21.7
65 & Over	3	7.8	2	4.8	5	12.7
Totals	58	60.4	39	45.9	97	106.3

	Men	Women	Total
Average age at death	52.3 years	51.4 years	52.0 years
Average service at death	12.6 years	12.2 years	12.4 years

Of the 97 active members who died in service during 2003 - 2004, 35 members had a benefit payable to a survivor.

Active Members Who Left Active Status with a DEFERRED BENEFIT
(Retirement With Monthly Payments Beginning At Later Age)
During Plan 2003 - 2004

Ages	Men		Women		Total	
	Actual	Expected	Actual	Expected	Actual	Expected
Under 30	44	40.8	86	91.1	130	132.0
30- 34	96	99.6	199	185.7	295	285.3
35- 39	116	97.7	169	166.8	285	264.5
40- 44	113	100.6	159	183.2	272	283.8
45- 49	96	98.3	144	186.9	240	285.2
50- 54	102	84.7	134	139.0	236	223.6
55- 59	42	47.1	65	74.7	107	121.8
60 & Over	28	12.5	27	18.0	55	30.5
Totals	637	581.2	983	1,045.4	1,620	1,626.7

	Men	Women	Total
Average age at termination	43.3 years	42.0 years	42.6 years
Average service at termination	10.2 years	9.6 years	9.8 years

**Active Members Who Left Active Status with NO BENEFIT PAYABLE
(Other than Deaths)
During Plan 2003 - 2004**

Ages	Men		Women		Total	
	Actual	Expected	Actual	Expected	Actual	Expected
Under 20	0	0.0	0	0.0	0	0.0
20- 24	153	139.0	327	257.6	480	396.6
25- 29	317	304.5	496	461.2	813	765.6
30- 34	256	250.2	352	329.2	608	579.4
35- 39	183	182.6	211	266.6	394	449.2
40- 44	135	177.8	203	273.6	338	451.4
45- 49	99	153.1	161	240.1	260	393.2
50- 54	77	139.6	134	201.4	211	341.0
55- 59	57	104.2	92	142.5	149	246.7
60- 64	29	49.7	29	54.3	58	104.1
65- 69	6	9.6	7	10.0	13	19.5
70 & Over	3	4.1	5	3.3	8	7.4
Totals	1,315	1,514.3	2,017	2,239.7	3,332	3,754.0

	Men	Women	Total
Average age at termination	34.2 years	33.7 years	33.9 years
Average service at termination	2.1 years	2.2 years	2.2 years

Service at Termination	Men		Women		Total	
	Actual	Expected	Actual	Expected	Actual	Expected
0	497	507.0	718	650.6	1,215	1,157.6
1	340	382.9	485	555.2	825	938.1
2	223	299.4	416	493.3	639	792.7
3	166	244.8	280	406.2	446	651.0
4	89	80.2	118	134.4	207	214.6
5 & Over	0	0.0	0	0.0	0	0.0
Totals	1,315	1,514.3	2,017	2,239.7	3,332	3,754.0

**Comparison of Actual to Expected Deaths
Among Retired Lives
(Service Retirement Only)
As of June 30, 2004**

Age	Male Deaths			Female Deaths			Total Deaths		
	Actual	Expected	Exposure	Actual	Expected	Exposure	Actual	Expected	Exposure
50-54	4	1	336	2	2	601	6	3	937
55-59	11	8	1,009	9	9	1,489	20	17	2,498
60-64	24	20	1,467	18	20	2,224	42	40	3,691
65-69	27	37	1,605	48	32	2,431	75	69	4,036
70-74	54	52	1,385	49	44	1,995	103	96	3,380
75-79	56	57	994	42	62	1,682	98	119	2,676
80-84	46	48	519	67	64	1,084	113	112	1,603
85-89	34	31	224	63	52	568	97	83	792
90-94	19	14	75	42	30	221	61	44	296
95-99	9	4	15	18	8	38	27	12	53
100 & Up	2	1	2	5	1	4	7	2	6
Totals	286	273	7,631	363	324	12,337	649	597	19,968
Average Ages	76.5	76.1	68.2	79.3	78.2	69.1	78.1	77.3	68.8

Data Used In Valuations

**Missouri State Employees' Retirement System
 Summary of Benefit Provisions Evaluated
 June 30, 2004 Actuarial Valuation**

MSEP (Missouri State Employees' Plan)	MSEP 2000 (Missouri State Employees' Plan 2000)
<p>PARTICIPATION</p> <p>Participants include:</p> <p>All MOSERS members, vested former members, retirees and survivors who first became members prior to July 1, 2000 and who do not elect to transfer to the MSEP 2000 plan. Election is made at the time benefits commence.</p>	<p>Participants include:</p> <ol style="list-style-type: none"> (1) All new employees who first become members on or after July 1, 2000, except full-time teaching and senior administrative personnel of the regional colleges and universities hired on or after July 1, 2002 who will be participants in the Colleges and Universities Retirement Plan. (2) MSEP active members and vested former members who elect to transfer to the MSEP 2000 plan prior to retirement. (3) MSEP retirees who elect to transfer to the MSEP 2000 plan during the election window from July 1, 2000 through July 1, 2001, and their survivors.

NORMAL RETIREMENT ELIGIBILITY (unreduced benefits)**Members of the General Assembly:**

Age 55 with completion of at least 3 full biennial assemblies.

Members of the General Assembly: The earlier of attaining:

- (1) Age 55 with completion of at least 2 full biennial assemblies.
- (2) Age 50 with completion of at least 2 full biennial assemblies and with age plus credited service equal to 80 or more.

Statewide Elected Officials: The earliest of attaining:

- (1) Age 65 with at least 4 years of credited service.
- (2) Age 60 with at least 15 years of credited service.
- (3) Age 50 with age plus credited service equal to 80 or more.

Statewide Elected Officials: The earlier of attaining:

- (1) Age 55 with at least 4 years of credited service as a statewide elected official.
- (2) Age 50 with age plus credited service equal to 80 or more.

General Employees: The earliest of attaining:

- (1) Age 65 and active with at least 4 years of credited service.
- (2) Age 65 with at least five years of credited service.
- (3) Age 60 with at least 15 years of credited service.
- (4) Age 48 with age plus credited service equal to 80 or more.

General Employees: The earlier of attaining:

- (1) Age 62 with at least 5 years of credited service.
- (2) Age 48 with age plus credited service equal to 80 or more.

Uniform Water Patrol Employees: The earliest of attaining:

- (1) Age 55 and active with at least 4 years of credited service.
- (2) Age 55 with at least 5 years of credited service.
- (3) Age 48 with age plus credited service equal to 80 or more.

AVERAGE COMPENSATION USED FOR BENEFIT DETERMINATION

The average annual compensation of a member for the three consecutive years of service during which pay was highest (overtime pay is included for purposes of determining Average Compensation). Lump sum payments are excluded, but unused sick leave may be converted to additional credited service (usable only for benefit computation, not eligibility).

The average annual pay of a member for the three consecutive years of service during which pay was highest (overtime pay is included for purposes of determining Average Pay). A lump sum payment is included unless it is for unused vacation or sick leave. However, unused sick leave may be converted to additional credited service (usable only for benefit computation, not eligibility).

BENEFIT AMOUNT**Members of the General Assembly:**

\$150 per month per biennial assembly served.

Statewide Elected Officials:

- (1) Less than 12 years of credited service:
1.6% of Average Compensation times years of credited service.
- (2) 12 or more years of credited service:
50% of pay of the highest elected position held prior to retirement.

General Employees:

1.6% of Average Compensation times years of credited service.

2.1% of Average Compensation times years of credited service for any period of non-social security covered employment transferred from the Public School Retirement System.

Uniformed Water Patrol Employees:

2.13% of Average Compensation times years of credited service.

Members of the General Assembly:

1/24 of pay times first 24 years of credited service as a member of the General Assembly.

Statewide Elected Officials:

1/24 of pay (of the highest elected position held prior to retirement) times the first 12 years of credited service as a statewide elected official.

General Employees:

Life Benefit: 1.7% of Average Pay times years of credited service.

Temporary Benefit:

If member retires between ages 50 and 62 with age plus credited service equal to 80 or more, a temporary benefit is payable until the attainment of the minimum age at which reduced social security benefits are payable, in the amount of 0.8% of Average Pay times years of credited service.

Non-Social Security**Covered Service:**

2.5% of Average Pay times years of credited service for any period of non-social security covered employment transferred from the Public School Retirement System.

EARLY RETIREMENT FOR GENERAL EMPLOYEES:

Eligibility:

Age 55 with at least 10 years of credited service.

Amount:

- (1) Less than 15 years of service: Normal retirement amount actuarially reduced for years younger than age 65.
- (2) 15 years but less than 20 years of service, and less than the number of years of service necessary for age and service to total 80: Normal retirement amount actuarially reduced for years younger than age 60.
- (3) 20 or more years of service, but less than the number of years of service necessary for age and service to total 80: Normal retirement amount reduced for years younger than the 80 and out eligibility date.

VESTED DEFERED BENEFITS

Benefits for employees who terminate prior to eligibility for an immediate benefit are considered to be vested in accordance with the following schedule (benefits commence at the age the individual would have been eligible for early or normal retirement, considering years of credited service). Unused sick leave is not converted.

Years of Service	General Assembly	Statewide Elected Officials	General Employees
4		100%	100%
5			
6 (3 assemblies)	100%		

Eligibility:

Age 57 with at least 5 years of credited service.

Amount:

Normal retirement amount reduced by 1/2% for each month that retirement precedes eligibility for normal retirement.

Benefits for employees who terminate prior to eligibility for an immediate benefit are considered to be vested in accordance with the following schedule (benefits commence at age 57). Unused sick leave is converted to additional credited service.

Years of Service	General Assembly	Statewide Elected Officials	General Employees
4 (2 assemblies)	100%	100%	100%
5			
6 (3 Assemblies)	100%		
HB1455 prospectively			

DEATH PRIOR TO RETIREMENT

- (1) The surviving spouse benefit is computed as if the member had been normal retirement age on the date of death and elected the joint and 100% survivor optional form of payment, provided the member had at least 5 years of credited service and was married for at least two consecutive years immediately prior to the date of death. If no eligible spouse survives, 80% of the member's life income annuity is paid to eligible children until age 21. If the death is duty related, the service requirement is waived, and the minimum spouse benefit is 50% of current pay.
- (2) For members of the General Assembly, the surviving spouse receives 50% of the benefit the member would have received if the member had been normal retirement age on the date of death, provided the member had served in at least 3 biennial assemblies, and was married for at least two consecutive years immediately prior to the date of death. If the death is duty related, the service requirement is waived, and the minimum spouse benefit is 50% of current pay.

The surviving spouse benefit is computed as if the member had been normal retirement age on the date of death and elected the joint and 100% survivor option form of payment, provided the member had at least 5 years of credited service (2 full assemblies for a member of the General Assembly, 4 years of credited service for a statewide elected official). If no eligible spouse survives, 80% of the member's life income annuity is paid to eligible children until age 21. If the death is duty related, the service requirement is waived, and the minimum spouse benefit is 50% of current pay.

DEATH AFTER RETIREMENT

50% of the benefit the retired member was receiving on the date of death (the normal form of payment), or the benefit payable under the joint and survivor or period certain form of payment, if the member elected an optional form of payment at time of retirement and provided the member was married for at least two consecutive years prior to the date of retirement. Effective July 1, 2000, a member who is not married at retirement but marries thereafter may designate a spouse as beneficiary upon completion of one year of marriage. Additionally, a member may designate a new spouse as beneficiary upon completion of one year of marriage in the event of the death of the spouse the member was married to at the date of retirement (this provision does not apply to period certain annuities).

The benefit payable under the joint and survivor or period certain form of payment, if the member elected an optional form of payment at time of retirement. A member who is not married at retirement but marries thereafter may designate a spouse as beneficiary upon completion of one year of marriage. Additionally, a member may designate a new spouse as beneficiary upon completion of one year of marriage in the event of the death of the spouse the member was married to at the date of retirement (this provision does not apply to period certain annuities).

DISABILITY (RECIPIENTS OF LTD BENEFITS)

Normal retirement benefits become payable at the time the member is eligible for normal retirement, and are computed based on: i) the service that would have accrued to the member if active employment had continued; and ii) the member's rate of pay at the time of disability (If the member retires on or after August 28, 1999, the member's rate of pay is based on the rate of pay at the time of disability indexed to the time of benefit commencement). An exception is Uniformed Water Patrol employees who are eligible for an immediate occupational disability benefit equal to 50% of pay at time of disability.

Normal retirement benefits become payable at the time the member is eligible for normal retirement, and are computed based on: i) the service that would have accrued to the member if active employment had continued; and ii) the member's rate of pay at the time of disability indexed to the time of benefit commencement. The annual percentage increase in the pay used to compute benefits is the lesser of: i) 80% of the CPI increase and ii) 5%.

POST-RETIREMENT BENEFIT ADJUSTMENTS

Benefits are increased to retired members (including survivors) annually in accordance with the following formulas:

Increase in CPI	Formula 1 Benefit Increase	Formula 2 Benefit Increase
5.00% or less	4%	80% of CPI increase
5.01% - 6.24%	80% of CPI increase	80% of CPI increase
6.25% or more	5%	5%

Members first hired prior to August 28, 1997 receive COLAs based on Formula 1 until an aggregate increase of 65% is reached. At that point subsequent COLAs based on Formula 2 are granted.

Members first hired on or after August 28, 1997 receive COLAs based solely on Formula 2.

Statewide Elected Officials with 12 or more years of service have their benefit adjusted annually based on the increase in the pay for an active statewide elected official in the member's highest elected position.

Members who are fully vested and work beyond age 65 will have their monthly benefit increased upon retirement. The percentage increase in benefit is equal to all COLAs for the years between age 65 and date of retirement, not to exceed 65% and counts toward the Formula 1 65% maximum.

Benefits are increased to retired members (including survivors) annually in accordance with the following:

Members of the General Assembly: Benefit is adjusted annually based on the increase in the pay for an active member of the General Assembly.

Statewide Elected Officials: Benefit is adjusted annually based on the increase in the pay for an active statewide elected official in the retired member's highest elected position.

General Employees: Annual benefit percentage increase equal to the lesser of: i) 80% of the CPI increase, and ii) 5%.

POP-UP PROVISION

Benefits to members who choose a survivor form of payment and whose spouse precedes the member in death, will "pop-up" or revert to the amount the member would have received had he/she not elected a survivor option.

Same.

PORTABILITY

Purchase/Transfer Provisions (in addition to military). Effective August 28, 1999, a member may purchase up to four years of non-federal full-time Missouri public service, provided the member is not vested in another retirement system for that same service.

Purchase/Transfer Provisions (in addition to military). A member may purchase up to four years of non-federal full-time Missouri public service, provided the member is not vested in another retirement system for that same service. Local vested service credit granted after 10 years of state service if the other retirement plan agrees to transfer assets equal to the accrued liability to MOSERS.

MEMBER CONTRIBUTIONS. None.

Same.

BACK DROP. See following page.

Same.

BACK DROP

To be eligible to participate in the back DROP, a member must have been eligible to retire under normal age and/or service conditions for at least two years. A retroactive starting date is established for back DROP purposes which is the later of: 1) the member's normal retirement date or 2) five years prior to the annuity starting date under the retirement plan selected by the member.

A member may elect the back DROP period for the accumulation of the back DROP account in 12 month increments prior to their actual retirement date or back to the earliest possible date. This results in a back DROP period of two to five years depending upon the individual situation.

A theoretical back DROP account is accumulated that includes 90% of the value of the benefit payments that would have been paid during the back DROP period had the member retired at the retroactive starting date with their respective option election. These payments include applicable post-retirement benefit increases.

The member is paid the resulting lump sum value of the back DROP account as of the annuity starting date or as three equal annual installments beginning at the annuity starting date.

The annuity benefit payable from the actual retirement date is computed with years of service and average pay as of the retroactive starting date for the back DROP. Post-retirement benefit increases that occurred during the back DROP period are applied in the calculation of the monthly annuity.

Same.

**Retirants & Beneficiaries as of June 30, 2004
Tabulated by Plan Year of Retirement**

Plan Year Ended 6/30	No.	Total Annual Benefits	Average Monthly Benefit
2004 *	574	\$ 7,797,046	\$1,132
2003	2,950	45,963,192	1,298
2002	2,206	32,068,044	1,211
2001	1,899	28,908,612	1,269
2000	2,445	38,904,864	1,326
1999	1,396	18,959,820	1,132
1998	1,338	18,474,864	1,151
1997	1,195	15,967,596	1,114
1996	1,061	13,355,352	1,049
1995	1,199	15,694,320	1,091
1994	850	9,589,692	940
1993	926	11,647,068	1,048
1992	774	9,388,188	1,011
1991	774	10,089,828	1,086
1990	598	7,438,836	1,037
1989	600	6,775,128	941
1988	611	7,044,792	961
1987	483	4,566,516	788
1986	436	3,577,020	684
1985	383	3,169,320	690
1984	293	2,298,732	654
1983	306	2,478,144	675
1982	303	2,412,684	664
1981	233	1,839,528	658
1980	169	1,272,096	627
1979	126	830,436	549
1978	124	878,592	590
1977	128	878,088	572
1976	113	705,480	520
1975	75	544,224	605
1974	69	324,972	392
1973	59	368,568	521
1972	24	168,204	584
1971	12	78,072	542
1970	9	67,476	625
1969	6	43,116	599
1968	4	15,888	331
1966	3	26,784	744
1964 & PRIOR	3	15,876	441
Totals	24,757	\$324,627,058	\$1,093

* *Eleven months ended May 31, 2004.*

Benefits Payable June 30, 2004

Tabulated by Option and Type of Benefit

MSEP Benefits*

Type of Benefit	No.	Annual Funded Benefits
Service Retirement		
Life Annuity	4,597	\$ 43,112,023
50% Joint and Survivor	5,037	65,716,575
75% Joint and Survivor	8	80,310
100% Joint and Survivor	2,215	34,858,245
5 Year Certain and Life	127	1,050,943
10 Year Certain and Life	99	719,965
Survivor Beneficiary	1,589	12,663,863
Total	13,672	158,201,924
Disability Retirement	25	98,544
Death-in-Service	1,205	8,878,935
Total	14,902	\$ 167,179,403

* Count includes 9 Lincoln University members.

MSEP 2000 Benefits

Type of Benefit	No.	Annual Funded Benefits
Service Retirement		
Life Annuity	6,711	\$ 97,852,235
50% Joint and Survivor	1,401	31,092,721
100% Joint and Survivor	1,162	22,012,926
5 Year Certain and Life	57	735,302
10 Year Certain and Life	269	3,199,379
15 Year Certain and Life	141	1,350,103
Survivor Beneficiary	113	1,203,866
Total	9,854	157,446,532
Disability Retirement	0	0
Death-in-Service	1	1,123
Total	9,855	\$ 157,447,655

Total Benefits Payable June 30, 2004
Tabulated by Attained Ages of Benefit Recipients

Attained Ages	Service Retirement		Disability Retirement		Survivors and Beneficiaries		Totals	
	No.	Annual Benefits	No.	Annual Benefits	No.	Annual Benefits	No.	Annual Benefits
Under 20					85	\$ 239,593	85	\$ 239,593
20-24					15	60,121	15	60,121
25-29					9	82,891	9	82,891
30-34					12	58,649	12	58,649
35-39					28	166,815	28	166,815
40-44					50	292,573	50	292,573
45-49	19	\$ 493,896	1	\$ 1,776	97	671,566	117	1,167,238
50-54	903	23,955,242	7	35,978	202	1,676,173	1,112	25,667,393
55-59	3,012	63,445,819	8	28,308	248	2,201,804	3,268	65,675,931
60-64	4,128	57,593,468	9	32,482	290	2,913,770	4,427	60,539,720
65-69	4,226	50,091,810			415	3,727,289	4,641	53,819,099
70-74	3,581	45,014,815			441	3,540,294	4,022	48,555,109
75-79	2,783	32,254,901			482	3,430,475	3,265	35,685,376
80-84	1,782	17,740,750			322	2,240,700	2,104	19,981,450
85-89	952	8,106,286			149	1,051,303	1,101	9,157,589
90-94	354	2,522,505			51	347,799	405	2,870,304
95	34	202,656			2	5,280	36	207,936
96	20	151,603			4	23,949	24	175,552
97	12	71,175			3	10,308	15	81,483
98	4	33,897					4	33,897
99	7	45,828			1	4,131	8	49,959
100	5	40,092			1	732	6	40,824
101	2	15,984					2	15,984
102					1	1,572	1	1,572
Totals	21,824	\$ 301,780,727	25	\$ 98,544	2,908	\$ 22,747,787	24,757	\$ 324,627,058

Average age at Retirement: 60.8 years.

Average age now: 69.0 years.

Summary of Member Data Included in Valuation

June 30, 2004

Active Members

Valuation Group	Number	Payroll	Group Averages		
			Salary	Age(yrs.)	Service(yrs.)
Regular State Employees	51,551	\$ 1,533,940,962	\$ 29,756	43.6	9.7
Elected Officials	6	590,966	98,494	47.1	7.1
Legislative Clerks	79	2,037,423	25,790	54.9	13.8
Legislators	196	6,157,275	31,415	49.7	3.8
Uniformed Water Patrol	84	3,303,050	39,322	38.7	13.2
Conservation Department	1,487	54,629,009	36,738	42.5	12.7
Contract Employees	2,511	136,795,769	54,479	51.6	15.5
Total in Funding Program	55,914	\$ 1,737,454,454	\$ 31,074	44.0	10.0
Administrative Law Judges	57	\$ 4,655,340	\$ 81,673	48.8	10.2
Other Judges	391	39,878,499	101,991	53.6	11.4

Retired Lives

Type of Benefit Payment	No.	Annual Benefit	Group Averages	
			Benefit	Age(yrs.)
Retirement	21,824	\$ 301,780,727	\$ 13,828	69.3
Disability	25	98,544	3,942	57.7
Survivor of Active Member	1,206	8,880,058	7,363	58.9
Survivor of Retired Member	1,702	13,867,729	8,148	73.3
Total in Funding Program	24,757	\$ 324,627,058	\$ 13,113	69.0
Administrative Law Judges	25	\$ 910,409	\$ 36,416	73.2
Other Judges	397	18,005,774	45,355	75.7

This valuation also includes 13,796 terminated vested members, 511 members on leave and 1,055 members on long-term disability.

Active Members in Funding Program as of June 30, 2004

By Age and Years of Service*

Near Age	Years of Service to Valuation Date							Totals	
	0-4	5-9	10-14	15-19	20-24	25-29	30 plus	No.	Valuation Payroll
15-19	73							73	\$ 1,188,096
20-24	1,836	18						1,854	38,551,293
25-29	3,996	837	12					4,845	122,552,267
30-34	3,096	2,563	445	19				6,123	172,216,499
35-39	2,407	2,161	1,495	511	25			6,599	197,214,229
40-44	2,446	2,035	1,359	1,468	645	78		8,031	249,856,953
45-49	2,275	1,974	1,350	1,426	1,072	878	52	9,027	291,970,400
50-54	1,916	1,693	1,354	1,424	1,010	1,209	353	8,959	304,685,907
55-59	1,419	1,314	1,136	1,113	723	512	302	6,519	221,664,790
60	168	144	133	166	68	43	45	767	26,173,010
61	154	182	133	139	66	49	46	769	26,684,555
62	142	138	101	115	47	29	41	613	21,922,337
63	73	111	65	71	28	26	40	414	14,546,606
64	68	68	60	55	25	16	21	313	11,175,093
65	44	58	39	36	14	12	40	243	9,245,920
66	38	35	39	26	15	17	27	197	7,772,932
67	16	36	23	17	11	9	22	134	5,138,982
68	19	23	16	21	9	4	12	104	3,785,737
69	13	15	17	19	9	5	11	89	3,189,742
70 & Over	51	41	41	47	21	17	23	241	7,919,106
Totals	20,250	13,446	7,818	6,673	3,788	2,904	1,035	55,914	\$ 1,737,454,454

While not used in the financial computations, the following group averages are computed and shown because of their general interest.

Age: 44.0 years.

Service: 10.0 years.

Annual Pay: \$31,074

* A breakdown by gender is included on pages 63 and 64.

Development of Actuarial Value of Assets

Valuation Date:	2003	2004	2005	2006	2007	2008
A. Actuarial Value Beginning of Year	\$ 6,033,133,598	\$6,057,329,072				
B. Market Value End of Year	5,191,733,236	5,862,670,429				
C. Market Value Beginning of Year	5,024,940,249	5,191,733,236				
D. Cash Flow						
D1. Contributions	160,320,089	168,284,713				
D2. Benefit Payments	(321,802,953)	(367,785,861)				
D3. Administrative Expenses	(5,954,365)	(5,694,082)				
D4. Net	(167,437,229)	(205,195,230)				
E. Investment Income						
E1. Market Total: B - C - D4	334,230,216	876,132,423				
E2. Assumed Rate	8.5%	8.5%				
E3. Amount for Immediate Recognition: E2*(A+D4*.5)	505,700,274	506,152,174				
E4. Amount for Phased-In Recognition: E1 - E3	(171,470,058)	369,980,249				
F. Phased-In Recognition of Investment Income						
F1. Current Year: 0.2 * E4	(34,294,012)	73,996,050				
F2. First Prior Year	(168,872,674)	(34,294,012)	\$ 73,996,050			
F3. Second Prior Year	(110,900,885)	(168,872,674)	(34,294,012)	\$ 73,996,050		
F4. Third Prior Year		(110,900,885)	(168,872,674)	(34,294,012)	\$ 73,996,050	
F5. Fourth Prior Year			(110,900,885)	(168,872,672)	(34,294,010)	\$ 73,996,049
F6. Total Recognized Investment Gain: Sum(F1:F5)	(314,067,571)	(240,071,521)	(240,071,521)	(129,170,634)	39,702,040	73,996,049
G. Adjustment						
H. Actuarial Value End of Year: A + D4 + E3 + F6 + G						
Minimum 80% of B, Maximum 120% of B	6,057,329,072	6,118,214,495				
I. Difference Between Market & Actuarial Values: H - B	(865,595,836)	(255,544,066)				
J. Recognized Rate of Return	3.22%	4.47%				
K. Market Value Rate of Return	6.76%	17.22%				
L. Actuarial Value as a % of Market Value: H / B	117%	104%				

The actuarial value of assets recognizes assumed investment income (line E3) fully each year. Differences between actual and assumed investment income (line E4) are phased in over a closed 5-year period. During periods when investment performance exceeds the assumed rate, the actuarial value of assets will tend to be less than market value. During periods when investment performance is less than assumed, the actuarial value will tend to be greater than market value. If assumed rates are exactly realized for 4 consecutive years, the actuarial value will become equal to market value.

Asset Summary

June 30, 2004

	Market Value	Actuarial Value
1. Assets at June 30, 2003	\$5,191,733,236	\$6,057,329,072
2. Contributions and Transfers in	168,284,713	168,284,713
3. Investment Increment*	876,132,423	266,080,653
4. Benefit Payments and Transfers out	367,785,861	367,785,861
5. Administrative and Misc. Expenses	5,694,082	5,694,082
6. Assets at June 30, 2004 (1) + (2) + (3) - (4) - (5)	\$5,862,670,429	\$6,118,214,495
7. Investment Increment/Mean Assets**	17.22%	4.47%

* *Net of investment expenses.*

** *Based on the approximation formula: $I / [.5 \times (A+B-I)]$, where*

I = Investment Increment

A = Beginning of year asset value

B = End of year asset value

Cash Flow Projection

Missouri State Employees' Retirement System

The Nature of Actuarial Projections

Regular actuarial valuations measure the Retirement System's present financial position and contributions adequacy by calculating and financing the liabilities created by the present benefit program. This process involves discounting to present values the future benefit payments on behalf of present active and retired members and their survivors. However, valuations do not produce information regarding future changes in the makeup of the covered group or the amounts of benefits to be paid or investment income to be received--actuarial projections do.

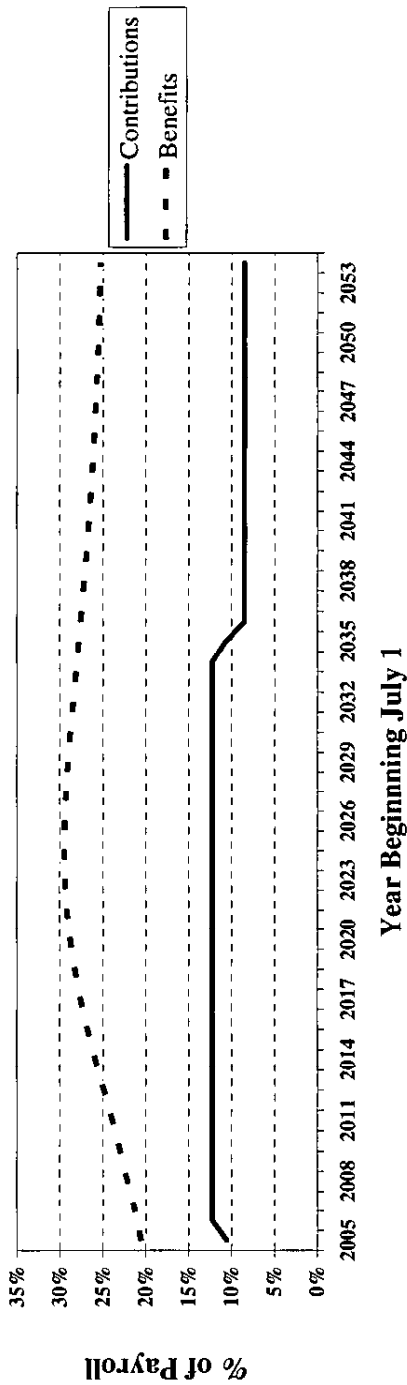
Whereas valuations provide a snapshot of the retirement system as of a given date, projections provide a moving picture. Projected active and retired groups are developed from year to year by the application of assumptions regarding pre-retirement withdrawal from service, retirements, deaths, disabilities, and the addition of new members. Projected information regarding the retired life group leads to assumed future benefit payout. Combining future benefit payments with assumed contributions and expected investment earnings produces the net cash flow of the System each year, and thus end of year asset levels.

Projections are used for many purposes. Among them are (i) developing cash flow patterns for investment policy and asset mix consideration, (ii) exploring the effect of alternative assumptions about future experience, (iii) analyzing the impact on system funding progress of changes in the workforce, and (iv) examining the potential effect of changes in benefits on system financial activity.

Projection results are useful in demonstrating changing relationships among key elements affecting system financial activity. For example: how benefits payable and system assets will grow in future decades. Projections are not predictions of specific future events and do not provide numeric precision in absolute terms. For instance, cash flow projected to occur 10 years in the future will not be exact (except by coincidence), but understanding the changed relationships between future benefit payout and future investment income can be very useful.

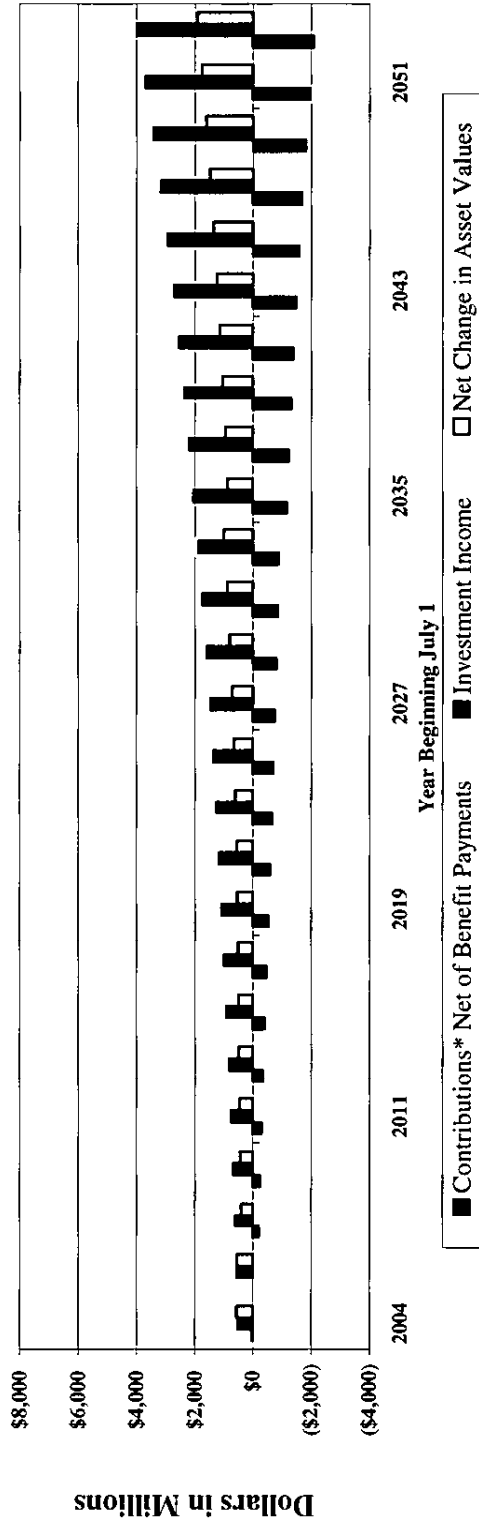
Missouri State Employees' Retirement System 50-Year Cash Flow Projection Based on Valuation Assumptions

Projected Contributions* and Benefits Expressed as Percents of Active Member Payroll



* Does not include contributions for administrative expenses.

Net Change in Asset Values



Missouri State Employees' Retirement System

Fifty-Year Cash Flow Projection (in Thousands)

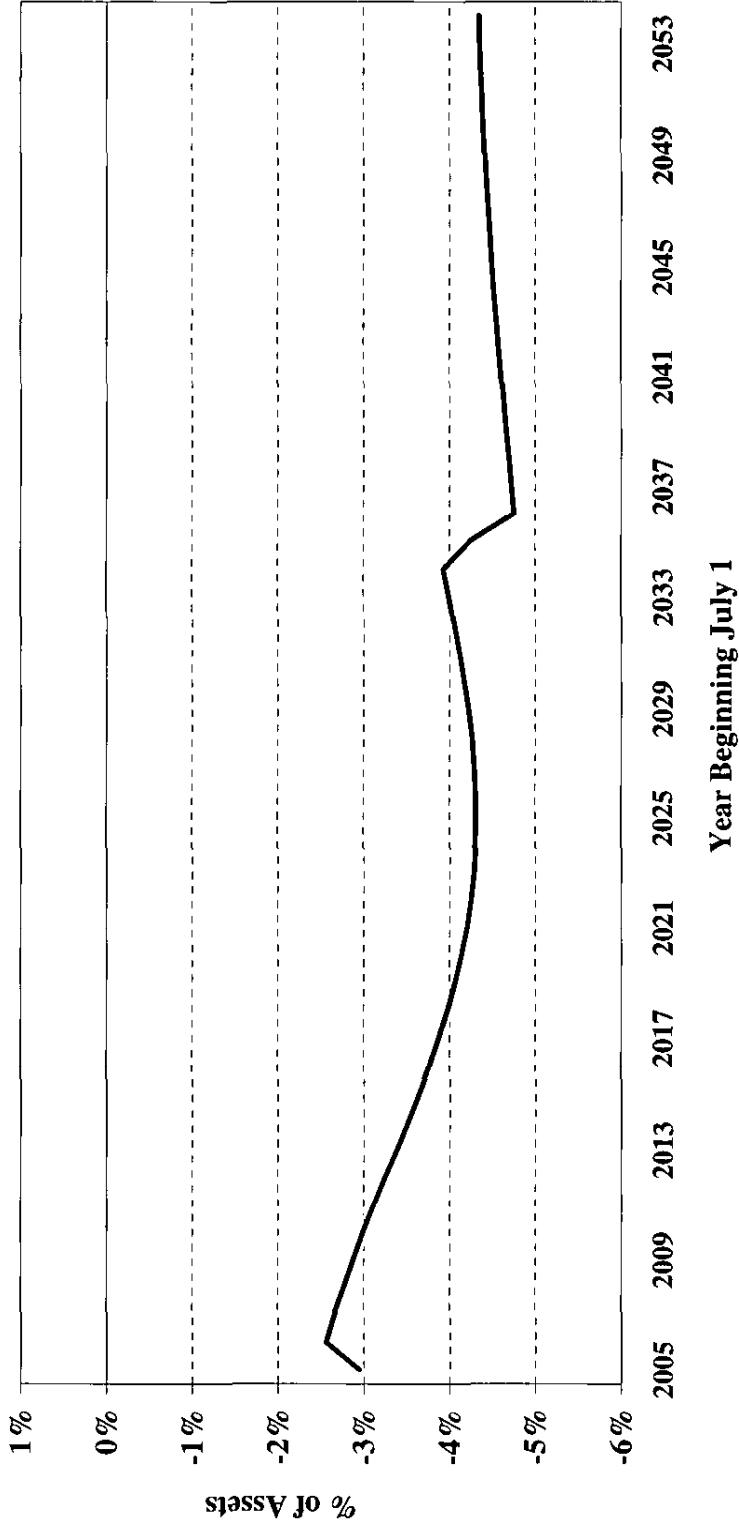
Year Ended June 30	Assets BOY	Contributions*			Benefits	Investment Income	Assets EOY	
		Normal	UAAL	Total			Inflated	2005 \$
2005	\$6,118,214	\$153,253	\$37,410	\$190,663	\$371,230	\$512,374	\$6,450,021	\$6,450,021
2006	6,450,021	159,387	71,048	230,435	395,365	541,242	6,826,333	6,563,781
2007	6,826,333	165,666	73,847	239,513	420,569	572,543	7,217,820	6,673,280
2008	7,217,820	172,113	76,720	248,833	448,452	605,031	7,623,232	6,777,025
2009	7,623,232	178,767	79,686	258,453	477,655	638,658	8,042,688	6,874,923
2010	8,042,688	185,631	82,746	268,377	508,658	673,416	8,475,823	6,966,509
2011	8,475,823	192,743	85,916	278,659	542,349	709,238	8,921,371	7,050,689
2012	8,921,371	200,131	89,209	289,340	578,706	746,020	9,378,025	7,126,528
2013	9,378,025	207,836	92,644	300,480	617,568	783,655	9,844,592	7,193,347
2014	9,844,592	215,883	96,231	312,114	657,762	822,101	10,321,045	7,251,430
2015	10,321,045	224,274	99,971	324,245	700,148	861,314	10,806,456	7,300,454
2016	10,806,456	233,067	103,891	336,958	743,528	901,269	11,301,155	7,341,015
2017	11,301,155	242,277	107,996	350,273	787,998	941,995	11,805,425	7,373,634
2018	11,805,425	251,917	112,293	364,210	833,577	983,513	12,319,571	7,398,815
2019	12,319,571	262,016	116,795	378,811	879,518	1,025,883	12,844,747	7,417,521
2020	12,844,747	272,575	121,501	394,076	925,729	1,069,208	13,382,302	7,430,717
2021	13,382,302	283,604	126,418	410,022	972,293	1,113,598	13,933,629	7,439,279
2022	13,933,629	295,128	131,555	426,683	1,018,687	1,159,198	14,500,823	7,444,335
2023	14,500,823	307,165	136,920	444,085	1,064,948	1,206,183	15,086,143	7,446,945
2024	15,086,143	319,721	142,517	462,238	1,111,239	1,254,741	15,691,883	7,448,033
2025	15,691,883	332,819	148,356	481,175	1,157,494	1,305,066	16,320,630	7,448,523
2026	16,320,630	346,478	154,444	500,922	1,203,565	1,357,392	16,975,379	7,449,367
2027	16,975,379	360,715	160,791	521,506	1,249,285	1,411,977	17,659,577	7,451,554
2028	17,659,577	375,552	167,404	542,956	1,295,239	1,469,093	18,376,387	7,455,784
2029	18,376,387	391,009	174,294	565,303	1,341,003	1,529,026	19,129,713	7,462,912
2030	19,129,713	407,095	181,465	588,560	1,386,669	1,592,106	19,923,710	7,473,718
2031	19,923,710	423,808	188,914	612,722	1,432,846	1,658,660	20,762,246	7,488,719
2032	20,762,246	441,156	196,647	637,803	1,479,987	1,728,999	21,649,061	7,508,253
2033	21,649,061	459,156	204,671	663,827	1,528,426	1,803,425	22,587,887	7,532,552
2034	22,587,887	477,832	212,996	690,828	1,578,142	1,882,260	23,582,833	7,561,869
2035	23,582,833	497,214	132,530	629,744	1,629,604	1,962,047	24,545,020	7,567,688
2036	24,545,020	517,336	0	517,336	1,682,935	2,036,788	25,416,209	7,534,896
2037	25,416,209	538,226	0	538,226	1,738,022	2,109,386	26,325,799	7,504,378
2038	26,325,799	559,914	0	559,914	1,794,983	2,185,203	27,275,933	7,476,174
2039	27,275,933	582,434	0	582,434	1,853,990	2,264,413	28,268,790	7,450,299
2040	28,268,790	605,823	0	605,823	1,915,334	2,347,194	29,306,473	7,426,714
2041	29,306,473	630,122	0	630,122	1,979,212	2,433,713	30,391,096	7,405,360
2042	30,391,096	655,370	0	655,370	2,045,762	2,524,152	31,524,856	7,386,174
2043	31,524,856	681,611	0	681,611	2,115,186	2,618,686	32,709,967	7,369,079
2044	32,709,967	708,888	0	708,888	2,187,689	2,717,498	33,948,664	7,353,980
2045	33,948,664	737,245	0	737,245	2,263,550	2,820,768	35,243,127	7,340,757
2046	35,243,127	766,725	0	766,725	2,342,975	2,928,675	36,595,552	7,329,281
2047	36,595,552	797,376	0	797,376	2,426,080	3,041,403	38,008,251	7,319,436
2048	38,008,251	829,248	0	829,248	2,513,090	3,159,137	39,483,546	7,311,097
2049	39,483,546	862,388	0	862,388	2,604,258	3,282,072	41,023,748	7,304,129
2050	41,023,748	896,850	0	896,850	2,699,832	3,410,392	42,631,158	7,298,386
2051	42,631,158	932,688	0	932,688	2,799,982	3,544,288	44,308,152	7,293,736
2052	44,308,152	969,962	0	969,962	2,904,880	3,683,959	46,057,193	7,290,050
2053	46,057,193	1,008,729	0	1,008,729	3,014,721	3,829,606	47,880,807	7,287,208
2054	47,880,807	1,049,051	0	1,049,051	3,129,699	3,981,441	49,781,600	7,285,095

* Does not include contributions for administrative expenses.

Missouri State Employees' Retirement System

50-Year Cash Flow Projection

Projected Net External Cash Flow Expressed as a Percent of Assets



Net External Cash Flow equals: i) Contributions to the plan, less ii) Benefits paid by the plan. A negative Net External Cash Flow means that benefits are being partly funded by investment income --- a natural consequence of advance funding.

**Missouri State Employees' Retirement System
Fifty-Year Cash Flow Projection
Analysis of Projected Net Cash Flow**

Year Ended June 30	External Cash Flow		Net External Cash Flow		Year Ended June 30	External Cash Flow		Net External Cash Flow	
	Inflow*	Outflow	\$	% of Assets		Inflow*	Outflow	\$	% of Assets
2005	\$190,663	\$371,230	\$ (180,567)	(2.95)%	2030	\$588,560	\$1,386,669	\$ (798,109)	(4.17)%
2006	230,435	395,365	(164,930)	(2.56)%	2031	612,722	1,432,846	(820,124)	(4.12)%
2007	239,513	420,569	(181,056)	(2.65)%	2032	637,803	1,479,987	(842,184)	(4.06)%
2008	248,833	448,452	(199,619)	(2.77)%	2033	663,827	1,528,426	(864,599)	(3.99)%
2009	258,453	477,655	(219,202)	(2.88)%	2034	690,828	1,578,142	(887,314)	(3.93)%
2010	268,377	508,658	(240,281)	(2.99)%	2035	629,744	1,629,604	(999,860)	(4.24)%
2011	278,659	542,349	(263,690)	(3.11)%	2036	517,336	1,682,935	(1,165,599)	(4.75)%
2012	289,340	578,706	(289,366)	(3.24)%	2037	538,226	1,738,022	(1,199,796)	(4.72)%
2013	300,480	617,568	(317,088)	(3.38)%	2038	559,914	1,794,983	(1,235,069)	(4.69)%
2014	312,114	657,762	(345,648)	(3.51)%	2039	582,434	1,853,990	(1,271,556)	(4.66)%
2015	324,245	700,148	(375,903)	(3.64)%	2040	605,823	1,915,334	(1,309,511)	(4.63)%
2016	336,958	743,528	(406,570)	(3.76)%	2041	630,122	1,979,212	(1,349,090)	(4.60)%
2017	350,273	787,998	(437,725)	(3.87)%	2042	655,370	2,045,762	(1,390,392)	(4.57)%
2018	364,210	833,577	(469,367)	(3.98)%	2043	681,611	2,115,186	(1,433,575)	(4.55)%
2019	378,811	879,518	(500,707)	(4.06)%	2044	708,888	2,187,689	(1,478,801)	(4.52)%
2020	394,076	925,729	(531,653)	(4.14)%	2045	737,245	2,263,550	(1,526,305)	(4.50)%
2021	410,022	972,293	(562,271)	(4.20)%	2046	766,725	2,342,975	(1,576,250)	(4.47)%
2022	426,683	1,018,687	(592,004)	(4.25)%	2047	797,376	2,426,080	(1,628,704)	(4.45)%
2023	444,085	1,064,948	(620,863)	(4.28)%	2048	829,248	2,513,090	(1,683,842)	(4.43)%
2024	462,238	1,111,239	(649,001)	(4.30)%	2049	862,388	2,604,258	(1,741,870)	(4.41)%
2025	481,175	1,157,494	(676,319)	(4.31)%	2050	896,850	2,699,832	(1,802,982)	(4.39)%
2026	500,922	1,203,565	(702,643)	(4.31)%	2051	932,688	2,799,982	(1,867,294)	(4.38)%
2027	521,506	1,249,285	(727,779)	(4.29)%	2052	969,962	2,904,880	(1,934,918)	(4.37)%
2028	542,956	1,295,239	(752,283)	(4.26)%	2053	1,008,729	3,014,721	(2,005,992)	(4.36)%
2029	565,303	1,341,003	(775,700)	(4.22)%	2054	1,049,051	3,129,699	(2,080,648)	(4.35)%

* Does not include contributions for administrative expenses.

The portion of investment income needed to pay benefits (the negative external cash flow) increases gradually and begins to level off at the end of the amortization of the unfunded accrued liabilities. After this period, it then approaches the assumed rate of 4.33% (1.085/1.040, minus 1). The remainder of the expected investment income is needed to preserve the purchasing power of the trust fund.

Appendix

Appendix
Summary of Assumptions Used
for the June 30, 2004 Actuarial Valuation

-----*Economic Assumptions*-----

The investment return rate used in the valuations was 8.5% per year, compounded annually (net after investment expenses). This assumption is used to account for the fact that equal amounts of money payable at different points in time in the future do not have the same value presently.

Pay increase assumptions for individual active members are shown for sample ages on page 53. Part of the assumption for each age is for merit and/or seniority increase, and the other 4.0% recognizes wage inflation. This assumption is used to project a member's current salary to the salaries upon which benefits will be based.

The active member payroll is assumed to increase 4.0% annually, which is the portion of the individual pay increase assumptions attributable to wage inflation.

The annual cost-of-living adjustment (COLA) is assumed to be 4.00%, on a compounded basis, when a minimum COLA of 4% is in effect. When no minimum COLA is in effect, price inflation is assumed to be 3.5% and the annual COLA is assumed to be 2.8% (80% of 3.5%), on a compounded basis.

The number of active members is assumed to remain constant although certain new hires on or after July 1, 2002 will participate in the Colleges and Universities Retirement Plan. Active and retired member data is reported as of May 31. It is assumed for valuation purposes that there is no turnover among members and no new entrants during the month of June.

-----*Non-Economic Assumptions*-----

The mortality table, for post-retirement mortality, used in evaluating allowances to be paid was the 1971 Group Annuity Mortality Table, projected to the year 2000, with a 1 year setback for men and a 7 year age setback for women. Related values are shown on page 54. This assumption is used to measure the probabilities of each benefit payment being made after retirement.

Appendix

Summary of Assumptions Used for the June 30, 2004 Actuarial Valuation (continued)

The probabilities of age and service retirement are shown on page 54. It was assumed that each member will be granted one half year of service credit for unused leave upon retirement and military service purchases.

The probabilities of withdrawal from service, disability and death-in-service are shown for sample ages on page 53. For disability retirement, impaired longevity was recognized by use of special mortality tables.

The entry age normal actuarial cost method of valuation was used in determining liabilities and normal cost. The normal cost was based on the benefit provisions affecting new employees (MSEP 2000). Differences in the past between assumed experience and actuarial experience ("actuarial gains and losses") become part of actuarial accrued liabilities. Unfunded actuarial accrued liabilities are amortized to produce payments, (principal & interest) which are level percents of payroll contributions.

Employer contribution dollars were assumed to be *paid in equal installments* throughout the employer's fiscal year.

Actuarial value of assets. Valuation assets recognize assumed investment return fully each year. Differences between actual and assumed investment return are phased in over a closed 5-year period. Valuation assets are not permitted to deviate from the market value by more than 20%.

The data about persons now covered and about present assets were furnished by the System's administrative staff. Although examined for general reasonableness, the data was not audited by the Actuary.

It is assumed that among active members 80% are married at retirement, 70% of those dying in active service are married, and men are 3 years older than their spouses.

The liabilities for active members hired on or after July 1, 2000 were based on MSEP 2000 benefits. The liabilities for active members hired before July 1, 2000 for male General Employees with an age at hire of 35 years or less, for female General Employees, for Contract Employees, for Elected and for General Assembly were based on MSEP 2000 benefits. All others were based on MSEP benefits. The backDROP was only explicitly valued for those assumed to receive MSEP 2000 benefits.

The actuarial valuation computations were made by or under the supervision of a Member of the American Academy of Actuaries (M.A.A.A.).

Separations From Active Employment Before Service Retirement & Individual Pay Increase Assumptions

June 30, 2004

Sample Ages	Years of Service	Withdrawal		Percent of Active Members Separating within the Next Year - - - - -				Disability		Pay Increase Assumptions -- For An Individual Employee --		
		Men	Women	Men	Women	Men	Women	Men	Women	Merit & Seniority** (Economy)	Base	Increase Next Year
		23.8 %	24.7 %									
	0	16.5	17.2									
	1	13.4	13.5									
	2	11.9	10.7									
	3	12.0	10.7									
	4											
	5+											
20		12.0	11.0	0.04 %	0.03 %	0.16 %	0.18 %	0.16 %	0.18 %	2.7 %	4.0 %	6.7 %
25		12.0	11.0	0.05	0.04	0.16	0.18	0.16	0.18	2.6	4.0	6.6
30		8.8	9.9	0.06	0.04	0.16	0.18	0.16	0.18	2.2	4.0	6.2
35		6.2	6.8	0.08	0.06	0.21	0.19	0.21	0.19	1.9	4.0	5.9
40		4.6	4.9	0.12	0.08	0.26	0.32	0.26	0.32	1.4	4.0	5.4
45		3.5	4.3	0.19	0.11	0.34	0.37	0.34	0.37	1.2	4.0	5.2
50		2.8	3.6	0.35	0.17	0.49	0.57	0.49	0.57	0.7	4.0	4.7
55		2.4	2.9	0.59	0.31	1.07	0.89	1.07	0.89	0.7	4.0	4.7
60		2.4	2.9	0.90	0.54	1.50	1.50	1.50	1.50	0.0	4.0	4.0
65		2.4	2.9	1.44	0.83	1.60	1.70	1.60	1.70	0.0	4.0	4.0

* 2% of the deaths in active service are assumed to be duty related.
 ** Does not apply to members of the General Assembly.

**Single Life Retirement Values
June 30, 2004**

Sample Attained Ages	Present Value of \$1/Month the First Year Increasing 4.0% / 2.8% Yearly				Future Life Expectancy (Years)			
	Service		Disability		Service		Disability	
	Men	Women	Men	Women	Men	Women	Men	Women
40	\$203.29	\$213.24	\$135.93	\$157.34	38.46	44.22	19.70	26.02
45	192.77	205.14	126.72	150.77	33.73	39.41	17.50	23.70
50	180.29	195.04	116.43	143.29	29.17	34.67	15.35	21.39
55	165.93	182.93	106.32	135.58	24.82	30.06	13.43	19.18
60	149.43	168.96	97.83	127.14	20.70	25.67	11.87	17.01
65	130.80	152.92	90.83	117.40	16.82	21.50	10.56	14.82
70	111.02	134.67	82.22	105.26	13.32	17.57	9.13	12.50
75	91.88	114.99	70.84	89.45	10.36	13.99	7.49	10.00
80	73.43	95.64	56.19	71.98	7.83	10.91	5.66	7.62
85	57.86	76.96	42.26	56.19	5.89	8.29	4.08	5.66

Percent of Eligible Active Members Retiring Next Year

Retirement Ages	Year of Eligibility		
	1st Year	2nd Year	3rd Year
48	20.0 %	10.0 %	8.0 %
49	20.0	10.0	8.0
50	20.0	10.0	8.0
51	20.0	10.0	8.0
52	20.0	10.0	8.0
53	20.0	10.0	8.0
54	20.0	10.0	8.0
55	25.0	10.0	15.0
56	20.0	10.0	15.0
57	20.0	10.0	15.0
58	20.0	10.0	15.0
59	20.0	10.0	15.0
60	25.0	10.0	15.0
61	20.0	10.0	15.0
62	30.0	15.0	35.0
63	20.0	12.0	20.0
64	20.0	12.0	20.0
65	30.0	15.0	40.0
66	20.0	12.0	25.0
67	20.0	12.0	25.0
68	20.0	12.0	25.0
69	20.0	12.0	25.0
70	20.0	12.0	25.0
71	20.0	12.0	25.0
72	20.0	12.0	25.0
73	20.0	12.0	25.0
74	20.0	12.0	25.0
75 & over	20.0	12.0	100.0

Early retirement rates were assumed to be 5.0% from ages 57-61.

Summary of Assumptions Used
June 30, 2004
Miscellaneous and Technical Assumptions

Pay Increase Timing:	Middle of (Fiscal) year.
Decrement Timing:	Decrements of all types are assumed to occur mid-year.
Eligibility Testing:	Eligibility for benefits is determined based upon the age nearest birthday and service nearest whole year on the date the decrement is assumed to occur.
Benefit Service:	Exact fractional service is used to determine the amount of the benefit payable.
Decrement Relativity:	Decrement rates are used directly from the experience study, without adjustment for multiple decrement table effects.
Decrement Operation:	Disability and mortality decrements do not operate during the first 5 years of service. Disability and withdrawal do not operate during normal retirement eligibility.
Normal Form of Benefit:	The assumed normal form of benefit is the straight life form for MSEP 2000 with 50% continuing to an eligible surviving spouse for MSEP. No adjustment has been made for post-retirement option election changes.
Loads:	No loads were used.
Incidence of Contributions:	Contributions are assumed to be received continuously throughout the year based upon the computed percent of payroll shown in this report, and the actual payroll payable at the time contributions are made. New entrant normal cost contributions are applied to the funding of new entrant benefits.

Active and retired member data was reported as of May 31, 2004. It was brought forward to June 30, 2004 by adding one month of service for all active members and the June COLA for certain retired members. It is expected that this procedure resulted in a slight overstatement of total liabilities as of June 30, 2004. Financial information continues to be reported as of June 30. This procedure was instituted to provide sufficient time for the Board of Trustees to certify the appropriate contribution rate prior to the October 1 statutory deadline.

Supplemental Disclosure Information
June 30, 2004

Actuarial Accrued Liability

The actuarial accrued liability is a measure intended to (i) help users assess the plan's funding status on a going-concern basis, and (ii) assess progress being made in accumulating sufficient assets to pay benefits when due. The actuarial value of assets is based on a method that fully recognizes expected investment return and averages unanticipated market return over a five-year period. Allocation of the actuarial present value of projected benefits between past and future service was based on service using the entry age actuarial cost method. Assumptions, including projected pay increases, were the same as used to determine the System's annual required contribution between entry age and assumed exit age. Entry age was established by subtracting credited service from current age on the valuation date.

The entry age actuarial accrued liability was determined as part of an actuarial valuation of the System as of June 30, 2004. Significant actuarial assumptions used in determining the entry age actuarial accrued liability include (a) a rate of return on the investment of present and future assets of 8.5% per year compounded annually, (b) projected salary increases of 4.0% per year compounded annually, attributable to inflation, (c) additional projected salary increases ranging from 0.0% to 2.7% per year, depending on age, attributable to seniority/merit, and (d) the assumption that benefits will increase after retirement (i) at 4.00% per year for approximately the first 12 years, 3.1% for the 13th year and 2.8% per year thereafter, or (ii) at 2.8% per year, depending upon date of hire and benefit election.

At June 30, 2004, the unfunded actuarial accrued liability of the System was determined as follows:

Actuarial Accrued Liability of System:	<u>\$ in Thousands</u>
Active members (36,014 vested, 19,900 non-vested)	\$ 3,399,930
Retirees and beneficiaries currently receiving benefits (24,757 vested)	3,405,054
Terminated members not yet receiving benefits (13,796 vested)	424,328
Future BackDROP Payments	<u>699</u>
Total Actuarial Accrued Liability	7,230,011
Actuarial Value of Assets	6,118,214
Unfunded Actuarial Accrued Liability	<u>\$ 1,111,796</u>

During the year ended June 30, 2004, the System experienced a net change of \$567,719,522 in the actuarial accrued liability of which \$72,451,329 was attributable to changes in assumptions. There were no changes in benefit provisions or actuarial methods.

**Supplemental Disclosure Information
June 30, 2004**

(continued)

Contributions Required and Contributions Made

The System's funding policy provides for periodic employer contributions at actuarially determined rates that, expressed as percentages of annual covered payroll, are designed to accumulate sufficient assets to pay benefits when due. In developing the annual required contribution shown below, the normal cost and actuarial accrued liability are determined using the entry age actuarial cost method. The unfunded actuarial accrued liability is being amortized on a closed basis as a level percent of payroll over a period of 31 years. The corresponding amortization factor is 16.92603.

During the year ended June 30, 2004 contributions totaling \$164,691,836 were made by the employer.

Schedule of Employer Contributions

Fiscal Year 7-1/6-30	Valuation Date 6/30	Annual Required Contribution		
		Percent	Dollar Amount	Percentage Contributed
1991-92	1990	9.65 %	\$ 100,672,145	100 %
1992-93	1991	9.68	102,988,219	100
1993-94	1992	9.49	106,681,308	100
1994-95	1993	9.04	108,902,372	100
1995-96	1994	10.69	137,007,112	100
1996-97	1995	10.66	146,383,371	100
1997-98	1996	10.40	152,090,687	100
1998-99	1997	12.58	197,909,834	100
1999-00	1998	11.91	202,330,547	100
2000-01	1999	11.59	209,515,026	100
2001-02	2000	11.59	215,450,128	100
2002-03	2001	8.81	156,576,150	100
2003-04	2002	9.35	164,691,836	100
2004-05	2003	10.64		
2005-06	2004	12.59		

Supplemental Disclosure Information

June 30, 2004

(concluded)

Schedule of Funding Progress

Plan Year Ended	(1) Actuarial Value of Assets	(2) Actuarial Accrued Liability (AAL) Entry Age	(3) Percent Funded (1) / (2)	(4) Unfunded AAL (2) - (1)	(5) Annual Covered Payroll	(6) Unfunded AAL as a Percentage of Covered Payroll (4) / (5)
6/30/1997 #*@	\$3,580,974,502	\$4,484,047,801	79.9 %	\$903,073,299	\$1,359,656,666	66.4 %
6/30/1998	4,210,635,094	4,918,887,183	85.6	708,252,089	1,459,712,203	48.5
6/30/1999 #	4,908,820,033	5,505,968,629	89.2	597,148,596	1,564,551,532	38.2
6/30/2000 *	5,216,897,196	5,920,684,192	88.1	703,786,996	1,683,697,080	41.8
6/30/2001 #*@	5,881,232,850	6,065,166,716	97.0	183,933,866	1,758,190,269	10.5
6/30/2002 &	6,033,133,598	6,294,272,275	95.9	261,138,677	1,773,283,484	14.7
6/30/2003 # &	6,057,329,072	6,662,291,406	90.9	604,962,334	1,739,895,364	34.8
6/30/2004 *	6,118,214,495	7,230,010,928	84.6	1,111,796,433	1,737,454,454	64.0

After changes in benefit provisions.

* After a change in assumptions.

@ After a change in asset method.

& After changes in methods other than the asset method.

Analysis of the dollar amounts of the actuarial value of assets, actuarial accrued liability, or unfunded actuarial accrued liability in isolation can be misleading. Expressing the actuarial value of assets as a percentage of the actuarial accrued liability provides one indication of the plan's funded status on a going-concern basis. Analysis of this percentage over time indicates whether the plan is becoming financially stronger or weaker. Generally, the greater this percentage, the stronger the plan. The unfunded actuarial accrued liability and annual covered payroll are both affected by inflation. Usually expressing the unfunded actuarial accrued liability as a percentage of annual covered payroll approximately adjusts for the effects of inflation and aids analysis of the progress being made in accumulating sufficient assets to pay benefits when due. Generally, the smaller this percentage, the stronger the plan.

June 30, 2004 Actuarial Valuation

Glossary

Actuarial Accrued Liability. The difference between (i) the actuarial present value of future plan benefits, and (ii) the actuarial present value of future normal cost. Sometimes referred to as "accrued liability" or "past service liability."

Accrued Service. The service credited under the plan which was rendered before the date of the actuarial valuation.

Actuarial Assumptions. Estimates of future plan experience with respect to rates of mortality, disability, turnover, retirement, rate or rates of investment income and salary increases. Decrement assumptions (rates of mortality, disability, turnover and retirement) are generally based on past experience, often modified for projected changes in conditions. Economic assumptions (salary increases and investment income) consist of an underlying rate in an inflation-free environment plus a provision for a long-term average rate of inflation.

Actuarial Cost Method. A mathematical budgeting procedure for allocating the dollar amount of the "actuarial present value of future plan benefits" between the actuarial present value of future normal cost and the actuarial accrued liability. Sometimes referred to as the "actuarial funding method."

Actuarial Equivalent. A series of payments is called an actuarial equivalent of another series of payments if the two series have the same actuarial present value.

Actuarial Present Value. The amount of funds presently required to provide a payment or series of payments in the future. It is determined by discounting the future payments at a predetermined rate of interest, taking into account the probability of payment.

Actuarial value of assets. Also referred to as funding value of assets, smoothed market value of assets, or valuation assets.

Valuation assets recognize assumed investment return fully each year. Differences between actual and assumed investment return are phased in over a closed 5-year period. This treatment helps remove the timing of investment activities from the valuation process. During periods when investment performance exceeds the assumed rate, valuation assets will tend to be less than market value. During periods when investment performance is less than the assumed rate, valuation assets will tend to be greater than market value. If assumed rates are exactly realized for 4 consecutive years, valuation assets will become equal to market value.

Amortization. Paying off an interest-bearing liability by means of periodic payments of interest and principal, as opposed to paying it off with a lump sum payment.

Experience Gain (Loss). A measure of the difference between actual experience and that expected based upon a set of actuarial assumptions during the period between two actuarial valuation dates, in accordance with the actuarial cost method being used.

Normal Cost. The annual cost assigned, under the actuarial funding method, to current and subsequent plan years. Sometimes referred to as "current service cost." Any payment toward the unfunded actuarial accrued liability is not part of the normal cost.

(continued on following page)

June 30, 2004 Actuarial Valuation

Glossary

(concluded)

Plan Termination Liability. The actuarial present value of future plan benefits based on the assumption that there will be no further accruals for future service and salary. The termination liability will generally be less than the liabilities computed on a "going concern" basis and is not normally determined in a routine actuarial valuation.

Reserve Account. An account used to indicate that funds have been set aside for a specific purpose and are not generally available for other uses.

Unfunded Actuarial Accrued Liability. The difference between the actuarial accrued liability and actuarial value of assets. Sometimes referred to as "unfunded accrued liability."

The existence of unfunded actuarial accrued liabilities is not in itself bad, any more than a mortgage on a house is bad. Unfunded actuarial accrued liabilities do not represent a debt that is payable today. What is important is the ability to amortize the unfunded actuarial accrued liabilities and the trend in their amount (after due allowance for devaluation of the dollar).

Valuation Payroll. Active member payroll that is intended to reflect the annual salary considered as covered compensation for Retirement System benefits.

**Financing Unfunded Actuarial Accrued Liabilities
Which Were Calculated Using an Inflation Assumption of 4.00% and
an Investment Return Assumption of 8.50% Compounded Annually**

*Level % of Payroll Amortization:
Closed Amortization Completed in 31 Years*

Year	Active Member Payroll	Unfunded Actuarial Accrued Liability	UAAL Adjusted for Inflation	Annual Contributions		UAAL as % of Payroll
				Dollars	% of Payroll	
-----\$ in millions-----						
1	\$1,737	\$1,112	\$1,112	\$66	3.78 %	63.99 %
2	1,807	1,138	1,094	68	3.78	62.97
3	1,879	1,163	1,076	71	3.78	61.91
4	1,954	1,188	1,056	74	3.78	60.80
5	2,033	1,212	1,036	77	3.78	59.64
6	2,114	1,235	1,015	80	3.78	58.44
7	2,198	1,257	993	83	3.78	57.18
8	2,286	1,277	971	86	3.78	55.86
9	2,378	1,296	947	90	3.78	54.49
10	2,473	1,312	922	93	3.78	53.06
11	2,572	1,326	896	97	3.78	51.57
12	2,675	1,338	869	101	3.78	50.02
13	2,782	1,346	841	105	3.78	48.39
14	2,893	1,351	811	109	3.78	46.70
15	3,009	1,352	781	114	3.78	44.93
16	3,129	1,348	749	118	3.78	43.09
17	3,254	1,340	715	123	3.78	41.16
18	3,384	1,325	680	128	3.78	39.16
19	3,520	1,305	644	133	3.78	37.07
20	3,661	1,277	606	138	3.78	34.88

**Financing Unfunded Actuarial Accrued Liabilities
Which Were Calculated Using an Inflation Assumption of 4.00% and
an Investment Return Assumption of 8.50% Compounded Annually**

*Level % of Payroll Amortization:
Closed Amortization Completed in 31 Years
(concluded)*

Year	Active Member Payroll	Unfunded Actuarial Accrued Liability	UAAL Adjusted for Inflation	Annual Contributions		UAAL as % of Payroll
				Dollars	% of Payroll	
-----\$ in millions-----						
21	\$3,807	\$1,241	\$566	\$144	3.78 %	32.60 %
22	3,959	1,197	525	150	3.78	30.23
23	4,118	1,143	482	156	3.78	27.75
24	4,282	1,077	437	162	3.78	25.16
25	4,454	1,000	390	168	3.78	22.46
26	4,632	910	341	175	3.78	19.65
27	4,817	805	290	182	3.78	16.71
28	5,010	683	237	189	3.78	13.64
29	5,210	544	181	197	3.78	10.45
30	5,419	385	124	205	3.78	7.11
31	5,635	205	63	213	3.78	3.63
32	5,861	0	0	0	0.00	0.00

Active Members in Funding Program as of June 30, 2004

By Age and Years of Service

Male

Near Age	Years of Service to Valuation Date							Totals	
	0-4	5-9	10-14	15-19	20-24	25-29	30 plus	No.	Valuation Payroll
15-19	17							17	\$ 264,536
20-24	657	3						660	14,276,479
25-29	1,557	247	3					1,807	46,866,693
30-34	1,311	898	118	3				2,330	68,276,031
35-39	947	838	544	135	3			2,467	80,042,165
40-44	967	751	558	594	140	12		3,022	103,439,697
45-49	869	790	509	628	394	207	9	3,406	122,590,148
50-54	775	629	538	658	406	512	83	3,601	137,478,930
55-59	612	541	462	487	324	262	157	2,845	110,426,792
60	85	59	63	77	30	29	28	371	14,486,899
61	77	89	54	59	21	24	31	355	13,966,217
62	73	70	39	58	20	13	30	303	12,319,848
63	28	48	24	31	14	12	30	187	7,868,759
64	31	34	27	19	11	7	14	143	6,073,695
65	18	32	21	16	8	4	30	129	5,887,793
66	23	12	18	9	8	6	19	95	4,655,806
67	7	19	9	11	4	5	12	67	2,968,415
68	7	12	9	9	4	1	3	45	2,006,920
69	7	8	7	11		2	8	43	1,877,885
70 & Over	33	24	25	25	10	6	9	132	4,984,108
Totals	8,101	5,104	3,028	2,830	1,397	1,102	463	22,025	\$ 760,757,816

While not used in the financial computations, the following group averages are computed and shown because of their general interest.

Age: 44.7 years.

Service: 10.0 years.

Annual Pay: \$34,541

Active Members in Funding Program as of June 30, 2004

By Age and Years of Service

Female

Near Age	Years of Service to Valuation Date							Totals	
	0-4	5-9	10-14	15-19	20-24	25-29	30 plus	No.	Valuation Payroll
15-19	56							56	\$ 923,560
20-24	1,179	15						1,194	24,274,814
25-29	2,439	590	9					3,038	75,685,574
30-34	1,785	1,665	327	16				3,793	103,940,468
35-39	1,460	1,323	951	376	22			4,132	117,172,064
40-44	1,479	1,284	801	874	505	66		5,009	146,417,256
45-49	1,406	1,184	841	798	678	671	43	5,621	169,380,252
50-54	1,141	1,064	816	766	604	697	270	5,358	167,206,977
55-59	807	773	674	626	399	250	145	3,674	111,237,998
0									0
60	83	85	70	89	38	14	17	396	11,686,111
61	77	93	79	80	45	25	15	414	12,718,338
62	69	68	62	57	27	16	11	310	9,602,489
63	45	63	41	40	14	14	10	227	6,677,847
64	37	34	33	36	14	9	7	170	5,101,398
65	26	26	18	20	6	8	10	114	3,358,127
66	15	23	21	17	7	11	8	102	3,117,126
67	9	17	14	6	7	4	10	67	2,170,567
68	12	11	7	12	5	3	9	59	1,778,817
69	6	7	10	8	9	3	3	46	1,311,857
70 & Over	18	17	16	22	11	11	14	109	2,934,998
Totals	12,149	8,342	4,790	3,843	2,391	1,802	572	33,889	\$ 976,696,638

While not used in the financial computations, the following group averages are computed and shown because of their general interest.

Age: 43.5 years.

Service: 10.0 years.

Annual Pay: \$28,820

Basic Series

Year-by-Year Total Returns (1926-2003)

For a type of investment,
Red means a REAL Return less than 3%
[(Total - Inflation) < 3%]

For Inflation,
RED means a purchasing power loss

Year	Large Company Stocks	Small Company Stocks	Long-Term Corporate Bonds	Long-Term Government Bonds	Intermediate Term Government Bonds	U.S. Treasury Bills	Inflation
1926	11.62	0.28	7.37	7.77	5.38	3.27	-1.49
1927	37.49	22.10	7.44	8.93	4.52	3.12	-2.08
1928	43.61	39.69	2.84	0.10	0.92	3.56	-0.97
1929	-8.42	-51.36	3.27	1.17	6.01	4.75	0.20
1930	-24.90	-38.15	7.98	4.66	6.72	2.41	-6.03
1931	-43.34	-49.75	-1.85	-5.31	-2.32	1.07	-9.52
1932	-8.19	-5.39	10.32	16.84	8.81	0.96	-10.30
1933	53.99	142.87	10.38	-0.07	1.83	0.30	0.51
1934	-1.44	24.22	13.84	10.03	9.00	0.16	2.03
1935	47.67	40.19	9.61	4.98	7.01	0.17	2.99
1936	33.92	64.80	6.74	7.52	3.06	0.18	1.21
1937	-35.03	-58.01	2.75	0.23	1.56	0.31	3.10
1938	31.12	32.80	6.13	5.53	6.23	-0.02	-2.78
1939	-0.41	0.35	3.97	5.94	4.52	0.02	-0.48
1940	-9.78	-5.16	3.39	6.09	2.96	0.00	0.96
1941	-11.59	-9.00	2.73	0.93	0.50	0.06	9.72
1942	20.34	44.51	2.60	3.22	1.94	0.27	9.29
1943	25.90	88.37	2.83	2.08	2.81	0.35	3.16
1944	19.75	53.72	4.73	2.81	1.80	0.33	2.11
1945	36.44	73.61	4.08	10.73	2.22	0.33	2.25
1946	-8.07	-11.63	1.72	-0.10	1.00	0.35	18.16
1947	5.71	0.92	-2.34	-2.62	0.91	0.50	9.01
1948	5.50	-2.11	4.14	3.40	1.85	0.81	2.71
1949	18.79	19.75	3.31	6.45	2.32	1.10	-1.80
1950	31.71	38.75	2.12	0.06	0.70	1.20	5.79
1951	24.02	7.80	-2.69	-3.93	0.36	1.49	5.87
1952	18.37	3.03	3.52	1.16	1.63	1.66	0.88
1953	-0.99	-6.49	3.41	3.64	3.23	1.82	0.62
1954	52.62	60.58	5.39	7.19	2.68	0.86	-0.50
1955	31.56	20.44	0.48	-1.29	-0.65	1.57	0.37
1956	6.56	4.28	-6.81	-5.59	-0.42	2.46	2.86
1957	-10.78	-14.57	8.71	7.46	7.84	3.14	3.02
1958	43.36	64.89	-2.22	-6.09	-1.29	1.54	1.76
1959	11.96	16.40	-0.97	-2.26	-0.39	2.95	1.50
1960	0.47	-3.29	9.07	13.76	11.76	2.66	1.48
1961	26.89	32.09	4.82	0.97	1.85	2.13	0.67
1962	-8.73	-11.90	7.95	6.89	5.56	2.73	1.22
1963	22.80	23.57	2.19	1.21	1.64	3.12	1.65
1964	16.48	23.52	4.77	3.51	4.04	3.54	1.19
1965	12.45	41.75	-0.46	0.71	1.02	3.93	1.92
1966	-10.06	-7.01	0.20	3.65	4.69	4.76	3.35
1967	23.98	83.57	-4.95	-9.18	1.01	4.21	3.04
1968	11.06	35.97	2.57	-0.26	4.54	5.21	4.72
1969	-8.50	-25.05	-8.09	-5.07	-0.74	6.58	6.11
1970	4.01	-17.43	18.37	12.11	16.86	6.52	5.49
1971	14.31	16.50	11.01	13.23	8.72	4.39	3.36
1972	18.98	4.43	7.26	5.69	5.16	3.84	3.41
1973	-14.66	-30.90	1.14	-1.11	4.61	6.93	8.80
1974	-26.47	-19.95	-3.06	4.35	5.69	8.00	12.20
1975	37.20	52.82	14.64	9.20	7.83	5.80	7.01
1976	23.84	57.38	18.65	16.75	12.87	5.08	4.81
1977	-7.18	25.38	1.71	-0.69	1.41	5.12	6.77
1978	6.56	23.46	-0.07	-1.18	3.49	7.18	9.03
1979	18.44	43.46	-4.18	-1.23	4.09	10.38	13.31
1980	32.42	39.88	-2.62	-3.95	3.91	11.24	12.40
1981	-4.91	13.88	-0.96	1.86	9.45	14.71	8.94
1982	21.41	28.01	43.79	40.36	29.10	10.54	3.87
1983	22.51	39.67	4.70	0.65	7.41	8.80	3.80
1984	6.27	-6.67	16.39	15.48	14.02	9.85	3.95
1985	32.16	24.66	30.09	30.97	20.33	7.72	3.77
1986	18.47	6.85	19.85	24.53	15.14	6.16	1.13
1987	5.23	-9.30	-0.27	-2.71	2.90	5.47	4.41
1988	16.81	22.87	10.70	9.67	6.10	6.35	4.42
1989	31.49	10.18	16.23	18.11	13.29	8.37	4.65
1990	-3.17	-21.56	6.78	6.18	9.73	7.81	6.11
1991	30.55	44.63	19.89	19.30	15.46	5.60	3.06
1992	7.67	23.35	9.39	8.05	7.19	3.51	2.90
1993	9.99	20.98	13.19	18.24	11.24	2.90	2.75
1994	1.31	3.11	-5.76	-7.77	-5.14	3.90	2.67
1995	37.43	34.46	27.20	31.67	16.80	5.60	2.54
1996	23.07	17.62	1.40	-0.93	2.10	5.21	3.32
1997	33.36	22.78	12.95	15.85	8.38	5.26	1.70
1998	28.58	-7.31	10.76	13.06	10.21	4.86	1.61
1999	21.04	29.79	-7.45	-8.96	-1.77	4.68	2.68
2000	-9.11	-3.59	12.87	21.48	12.59	5.89	3.39
2001	-11.88	22.77	10.65	3.70	7.62	3.83	1.55
2002	-22.10	-13.28	16.33	17.84	12.93	1.65	2.38
2003	28.70	60.70	5.27	1.45	2.40	1.02	1.88