SCHOOL EMPLOYEES RETIREMENT
SYSTEM OF OHIO

The Report of the
ANNUAL BASIC BENEFITS
ACTUARIAL VALUATION
June 30, 1998

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Report of Annual Basic Benefits Actuarial Valuation of Ohio SERS

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December 10, 1998

The Board of Trustees
School Employees Retirement System of Ohio
Columbus, Ohio

Ladies and Gentlemen:

Presented in this report are the results of the annual basic benefits actuarial valuation of the School Employees Retirement System of Ohio.

The date of the valuation was June 30, 1998.

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

Your attention is directed particularly to the comments on page 3 and the presentation of contribution rates on page 28. Also note that the valuation reflects the changes in benefit provisions pursuant to H.B. 673.

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 with experience in performing valuations for public retirement systems.

The valuation was prepared in accordance with the principles of practice prescribed by the Actuarial Standards Board.

The actuarial calculations were performed by qualified actuaries according to generally accepted actuarial procedures and methods. The calculations are based on the current provisions of the system, and on actuarial assumptions that are, in the aggregate, internally consistent and reasonably based on the actual experience of the system.

Respectfully submitted,

Thomas J. Cavanaugh, F.S.A.
Senior Consultant & Actuary

Michael L. Falco, A.S.A.
Actuary

TJC/ks

COMMENTS

General Financial Objective. A sound general financial objective for any public employee retirement plan is to establish and receive contributions which, expressed as percents of active member payroll, will remain approximately level from generation to generation of citizens.

In order to determine SERS present financial position and level contribution rates for the future, annual actuarial valuations are made.

Assumptions concerning future financial experiences are needed for an actuarial valuation. These assumptions are established by the Board after consulting with the actuary.

A program of annual actuarial gain/loss analysis is in operation; these analyses determine the relationship between assumed financial experience and actual experience, for each major risk area.

Plan Amendments. There were changes made since the last valuation, as stipulated in House Bill 673. For current active members, the benefit accrual rate was increased to 2.5% for each year of service over 30 years. For current and future retirees, the post-retirement death benefit was increased to $1,000. For current and future retirants and survivors who receive the Medicare Part-B reimbursement, the reimbursement amount was increased to $31.80 per month. In addition, those receiving Medicare Part-B reimbursements on June 30, 1998 will receive a single, lump sum payment to cover the retroactive application of this bill. The payment will equal $7.00 (the monthly difference) for each month of retirement from the date the member initially became eligible for the Medicare Part-B reimbursement (but not earlier than January 1, 1992).

Statutory Employer Contribution Rate. The 14% of pay rate is now being allocated by SERS policy decision as follows: to Basic Benefits including the Medicare Part-B supplement, the rate which will amortize unfunded actuarial accrued liabilities over 21 years, and to Health Care Benefits, the remainder of employer contributions. Health Care Benefits are covered in a separate valuation report.

On the basis of the 1998 valuation and the Basic Benefits and allocated contribution rates then in effect, it is our opinion that the Basic Benefits portion of SERS is in sound condition in accordance with actuarial principles of level cost financing. Supporting information is on page 28 and on page 29.

FINANCIAL PRINCIPLES

Promises Made, and To Be Paid For. As each year is completed, SERS in effect hands an "IOU" to each member then acquiring a year of service credit -- the "IOU" says: "The School Employees Retirement System of Ohio owes you one year's worth of retirement benefits, payments in cash commencing when you qualify for retirement."

The related key financial questions are:

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 Ohio at the time the IOU becomes a cash demand, years and often decades later?

The law governing SERS financing intends that this year's taxpayers contribute the money to cover the IOUs being handed out this year. By following this principle, the employer contribution rate will remain approximately level from generation to generation --- our children and our grandchildren will contribute the same percents of active payroll we contribute now.

(There are systems which have a design for deferring contributions to future taxpayers, lured by a lower contribution rate now and putting aside the consequence that the contribution rate must then relentlessly grow much greater over decades of time -- consume now and let your children face your financial pollution after you retire.)

An inevitable by-product of the level-cost design is the accumulation of reserve assets for decades and the income produced when the assets are invested. Invested assets are a by-product and not the objective. Investment income becomes in effect the 3rd contributor for benefits to employees and is interlocked with the contribution amounts required from employees and employers.

Translated to actuarial terminology, this level-cost objective means that the contribution rates must total at least the following:

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

... plus ...

Interest on Unfunded Accrued Liabilities (unfunded accrued liabilities are the difference between: liabilities for service already rendered; and the accrued assets of SERS).

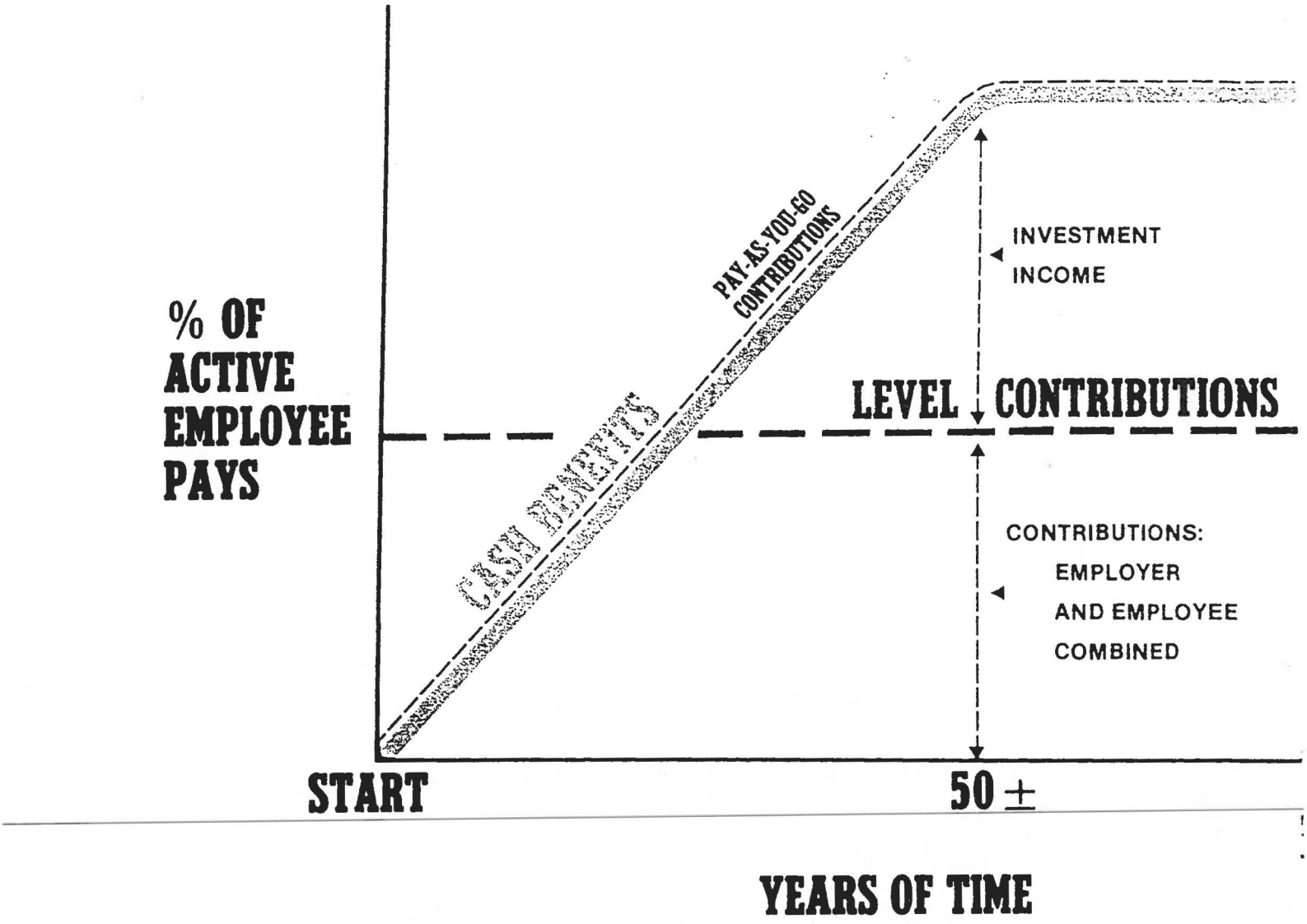
Computing Contributions to Support Fund Benefits. From a given schedule of benefits and from the employee data and asset data furnished by the plan sponsor, the actuary determines the contribution rates to support the benefits, by means of an actuarial valuation and a funding method.

An actuarial valuation has a number of ingredients such as: the rate of investment return 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 pay increases; and the assumed age or ages at actual retirement.

In making an actuarial valuation, assumptions must be made as to what the above rates will be, for the next year and for decades in the future. The assumptions are established by the Retirement Board after consulting with the actuary.

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 the assumptions or the skill of the actuary and the millions of calculations he made. The future can be predicted with considerable but not 100% precision, except for inflation which defies reliable prediction.

SERS 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.



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

The financing diagram on the opposite page shows the relationship between the two fundamentally different philosophies of paying for retirement benefits: the method where contributions match cash benefit payments (or barely exceed cash benefit payments, as in the Federal Social Security program) and is thus an increasing contribution method; and the level contribution method, which equalizes contributions between the generations.

The actuarial valuation is the mathematical process by which the level contribution rate is determined, and the flow of activity constituting the valuation may be summarized as follows:

A. Covered Person Data, furnished by plan administrator

Retired lives now receiving benefits

Former employees with vested benefits not yet payable

Active employees

B. + Asset data (cash & investments), furnished by plan administrator

C. + Assumptions concerning future financial experiences in various risk areas, which assumptions are established by the Board of Trustees after consulting with the actuary

D. + The funding method for employer contributions (the long-term planned pattern for employer contributions)

E. + Mathematically combining the assumptions, the funding method, and the data

F. = Determination of:

Plan financial position and/or

New Employer Contribution Rate

DATA FURNISHED

Retired members and survivors included in the valuation totaled 55,563. The 52,030 retirants and survivors of retirants as of June 30, 1998 were receiving annual benefits totaling $312,834,261 from the Annuity and Pension Reserve Fund. The 3,533 survivors of deceased active members as of June 30, 1998 were receiving annual benefits totaling $15,437,525 from the Survivor Benefit Fund.

Schedule 1.

Annuity and Pension Reserve Fund

Retirants and Beneficiaries June 30, 1998

Type of Benefit, Annual Amount and Basic Benefit Actuarial Liabilities

Group	Number	% of Current Total $			Current Total $	Actuarial Liabilities*
		Base Allowances	H.B. 204 and 284	Post-Retirement Increases		
SUPERANNUATION RETIREMENT						
Straight Life Allowance - Benefit Terminating at Death						
Men	4,188	78.5%	0.1%	21.4%	$ 31,218,172	$ 237,052,906
Women	23,692	80.4	0.1	19.5	115,495,475	1,067,977,092
Totals	27,880				146,713,647	1,305,029,998
Option II Allowance - Joint and Survivor Benefits						
Men	6,629	82.2	0.0	17.8	60,589,995	661,018,617
Women	7,131	86.6	0.0	13.4	41,602,231	473,956,134
Totals	13,760				102,192,226	1,134,974,751
Option III Allowance - Life Benefits With Guaranteed Periods						
Men	544	75.9	0.2	23.9	3,164,013	23,653,401
Women	967	78.0	0.2	21.8	4,002,605	36,711,229
Totals	1,511				7,166,618	60,364,630
Allowance to Survivor Beneficiary of Deceased Superannuation Retirant Who Elected Option II - Life Benefit						
Men	659	74.4	0.4	25.2	1,712,591	12,095,946
Women	3,354	71.7	0.4	27.9	14,847,349	122,170,151
Totals	4,013				16,559,940	134,266,097

* Includes allowance and lump sum death benefit, but excludes Medicare Part-B supplement.

(Schedule 1 completed on page 9)

Schedule 1. - completed

Annuity and Pension Reserve Fund

Retirants and Beneficiaries June 30, 1998

Type of Benefit, Annual Amount and Basic Benefit Actuarial Liabilities

Group	Number	% of Current Total $			Current Total $	Actuarial Liabilities*
		Base Allowances	H.B. 204 and 284	Post-Retirement Increases		
Allowance to Survivor Beneficiary of Deceased Superannuation Retirant Who Elected Option III - Guaranteed Period Only						
Men	23	81.2	0.0	18.8	$ 158,212	$ 654,105
Women	51	80.9	0.0	19.1	287,005	1,047,188
Totals	74				445,217	1,701,293
Total for Superannuation Allowances Being Paid						
Men	12,043	80.6	0.1	19.3	96,842,983	934,474,975
Women	35,195	81.1	0.1	18.8	176,234,665	1,701,861,794
Totals	47,238				273,077,648	2,636,336,769
DISABILITY RETIREMENT						
Straight Life Allowance - Benefit Terminating at Death						
Men	1,596	84.0	0.1	15.9	18,683,632	159,805,051
Women	3,196	84.3	0.1	15.6	21,072,981	203,326,979
Totals	4,792				39,756,613	363,132,030
TOTAL BENEFITS BEING PAID FROM ANNUITY AND PENSION RESERVE FUND						
Men	13,639	81.2	0.1	18.7	115,526,615	1,094,280,026
Women	38,391	81.5	0.1	18.4	197,307,646	1,905,188,773
Totals	52,030				312,834,261	2,999,468,799

* Includes allowance and lump sum death benefit, but excludes Medicare Part-B supplement.

Schedule 2.

Annuity and Pension Reserve Fund

Retirants June 30, 1998

Current Annual Total $ By Attained Ages

Attained Ages	Superannuation		Disability		Totals	
	No.	Annual Total $	No.	Annual Total $	No.	Annual Total $
Under 20						
20-24						
25-29						
30-34			18	275,815	18	275,815
35-39			77	1,152,784	77	1,152,784
40-44			170	2,470,731	170	2,470,731
45-49	20	432,465	339	4,441,821	359	4,874,286
50-54	136	3,058,028	490	5,133,510	626	8,191,538
55-59	802	11,585,188	831	7,817,108	1,633	19,402,296
60-64	4,776	38,073,415	1,035	8,422,973	5,811	46,496,388
65-69	8,623	60,555,850	771	5,097,861	9,394	65,653,711
70-74	9,918	59,758,712	511	2,723,184	10,429	62,481,896
75-79	9,022	45,331,513	362	1,631,863	9,384	46,963,376
80-84	5,883	23,906,583	146	465,325	6,029	24,371,908
85-89	2,912	9,878,065	32	90,590	2,944	9,968,655
90-94	870	2,863,216	10	33,048	880	2,896,264
95-99	164	530,929			164	530,929
100	11	47,436			11	47,436
101	5	23,089			5	23,089
102	3	9,054			3	9,054
103	3	8,872			3	8,872
104	1	3,995			1	3,995
105 & over	2	6,081			2	6,081
Totals	43,151	$ 256,072,491	4,792	$39,756,613	47,943	$ 295,829,104

Schedule 3.

Annuity and Pension Reserve Fund

Survivors of Retirants June 30, 1998

Current Annual Total $ By Attained Ages

Attained Ages	Life Annuities		Periods Certain		Totals	
	No.	Annual Total $	No.	Annual Total $	No.	Annual Total $
Under 20	4	8,402	1	5,613	5	$ 14,015
20-24	2	15,426			2	15,426
25-29	2	5,605	1	2,840	3	8,445
30-34	3	29,577	2	16,154	5	45,731
35-39	6	9,990	2	13,287	8	23,277
40-44	18	26,262	4	27,069	22	53,331
45-49	29	123,531	7	36,568	36	160,099
50-54	42	174,010	1	798	43	174,808
55-59	55	289,384	1	8,848	56	298,232
60-64	167	968,946	8	29,140	175	998,086
65-69	353	2,213,432	12	60,479	365	2,273,911
70-74	762	3,885,363	20	151,115	782	4,036,478
75-79	942	3,748,091	11	69,749	953	3,817,840
80-84	894	2,897,523	2	13,885	896	2,911,408
85-89	509	1,537,057	1	2,333	510	1,539,390
90-94	178	489,698	1	7,339	179	497,037
95-99	40	115,755			40	115,755
100	3	7,206			3	7,206
101	3	12,317			3	12,317
102						
103						
104						
105 & over	1	2,365			1	2,365
Totals	4,013	$ 16,559,940	74	$ 445,217	4,087	$ 17,005,157

Schedule 4.

Survivor Benefit Fund

Beneficiaries June 30, 1998

Annual Amounts and
Basic Benefit Actuarial Liabilities

Group	Number	% of Current Total $			Current Total $	Actuarial Liabilities*
		Base Allowances	H.B. 204 and 284	Post-Retirement Increases		
Benefits Being Paid From Survivor Benefit Fund						
Men	1,146	85.7%	0.0%	14.3%	$ 4,011,861	$ 29,601,019
Women	2,387	78.4	0.2	21.4	11,425,664	83,680,963
Totals	3,533				15,437,525	113,281,982

* Includes allowance but excludes Medicare Part-B supplement. Also includes liabilities for beneficiaries in blackout who are not represented in other statistics on this page.

Schedule 5.

Survivor Benefit Fund

Survivors of Deceased Active Members June 30, 1998

Current Annual Total $ By Attained Ages

Attained Ages	Totals	
	No.	Annual Total $
Under 20	34	$ 167,358
20-24	13	53,063
25-29	4	36,373
30-34	6	48,440
35-39	26	233,167
40-44	63	595,624
45-49	70	569,615
50-54	123	767,930
55-59	218	1,229,393
60-64	431	2,144,121
65-69	605	2,759,239
70-74	649	2,516,007
75-79	572	2,043,866
80-84	431	1,423,339
85-89	186	535,345
90-94	89	275,991
95-99	11	31,817
100		
101	1	3,490
102		
103		
104	1	3,347
105 & over		
Totals	3,533	$ 15,437,525

Active members included in the valuation totaled 106,878, involving an annual payroll totaling $1,651,883,172 . The schedules below and on the following 4 pages provide some detail from the data on active members.

Active Members in Valuation June 30, 1998

Groups	Number	Annual Payroll	Average Pay
Men	27,045	$ 579,785,549	$21,438
Women	79,833	1,072,097,623	13,429
Totals	106,878	$1,651,883,172	$15,456

Also included in the valuation were 7,049 inactive members eligible for deferred retirement allowances, 59,916 inactive members eligible for a contribution refund only (including 20,106 who had completed 1 or more years of employment before terminating), and 4,307 re-employed retirants with accumulated contributions of $6,255,446.

Schedule 6.

School Employees Retirement System of Ohio

TOTAL Active Members as of June 30, 1998

By Attained Age and Years of Service

Attained 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
Under 20	478							478	$ 1,705,207
20-24	2,383	41						2,424	19,004,232
25-29	3,574	570	44					4,188	52,189,983
30-34	5,302	1,432	608	80				7,422	98,407,693
35-39	8,890	3,138	1,604	907	99			14,638	200,310,253
40-44	9,296	4,954	2,932	1,461	873	90		19,606	290,377,405
45-49	6,104	4,485	4,118	2,024	1,000	531	57	18,319	303,103,079
50-54	3,420	2,761	3,484	2,720	1,830	652	159	15,026	265,662,545
55-59	2,126	1,603	2,156	2,362	2,509	1,260	223	12,239	218,164,077
60	311	253	334	380	478	317	72	2,145	38,185,446
61	264	240	308	300	410	306	69	1,897	33,157,552
62	243	187	255	257	308	267	70	1,587	28,083,459
63	186	157	195	229	248	262	76	1,353	23,356,120
64	197	133	152	181	195	177	73	1,108	18,524,798
65	167	102	146	151	169	151	65	951	15,203,942
66	120	90	80	102	132	109	58	691	10,642,048
67	120	69	68	74	89	99	61	580	8,410,128
68	111	55	78	72	66	78	36	496	6,680,978
69	110	74	67	36	50	60	42	439	5,513,845
70 & Over	343	217	177	127	139	137	151	1,291	15,200,382
Totals	43,745	20,561	16,806	11,463	8,595	4,496	1,212	106,878	$1,651,883,172

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

Age: 46.1 years.
Service: 9.0 years.
Annual Pay: $15,456 .

Schedule 7.

School Employees Retirement System of Ohio

MALE Active Members as of June 30, 1998

By Attained Age and Years of Service

Attained 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
Under 20	241							241	$ 863,546
20-24	1,002	21						1,023	8,690,332
25-29	1,266	230	17					1,513	22,643,272
30-34	1,296	502	277	42				2,117	40,974,977
35-39	1,469	750	677	520	57			3,473	79,244,258
40-44	1,586	783	767	697	502	53		4,388	105,487,816
45-49	1,411	780	708	570	434	284	24	4,211	101,947,746
50-54	1,092	631	575	470	323	247	80	3,418	82,804,177
55-59	877	543	560	374	274	184	92	2,904	67,647,033
60	155	104	99	79	65	22	30	554	12,281,120
61	127	118	104	73	43	37	18	520	11,167,107
62	135	92	83	63	39	28	20	460	9,698,933
63	103	78	76	55	34	24	23	393	7,881,012
64	108	70	55	52	29	21	15	350	6,802,737
65	80	63	55	35	26	18	7	284	5,345,774
66	61	47	33	28	12	6	3	190	3,126,321
67	64	40	37	17	10	8	8	184	2,693,700
68	57	34	36	18	9	11	6	171	2,555,051
69	57	42	30	6	4	5		144	1,808,913
70 & Over	183	141	86	42	21	16	18	507	6,121,724
Totals	11,370	5,069	4,275	3,141	1,882	964	344	27,045	$ 579,785,549

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

Age: 45.6 years.
Service: 8.8 years.
Annual Pay: $21,438.

Schedule 8.

School Employees Retirement System of Ohio

FEMALE Active Members as of June 30, 1998

By Attained Age and Years of Service

Attained 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
Under 20	237							237	$ 841,661
20-24	1,381	20						1,401	10,313,900
25-29	2,308	340	27					2,675	29,546,711
30-34	4,006	930	331	38				5,305	57,432,716
35-39	7,421	2,388	927	387	42			11,165	121,065,995
40-44	7,710	4,171	2,165	764	371	37		15,218	184,889,589
45-49	4,693	3,705	3,410	1,454	566	247	33	14,108	201,155,333
50-54	2,328	2,130	2,909	2,250	1,507	405	79	11,608	182,858,368
55-59	1,249	1,060	1,596	1,988	2,235	1,076	131	9,335	150,517,044
60	156	149	235	301	413	295	42	1,591	25,904,326
61	137	122	204	227	367	269	51	1,377	21,990,445
62	108	95	172	194	269	239	50	1,127	18,384,526
63	83	79	119	174	214	238	53	960	15,475,108
64	89	63	97	129	166	156	58	758	11,722,061
65	87	39	91	116	143	133	58	667	9,858,168
66	59	43	47	74	120	103	55	501	7,515,727
67	56	29	31	57	79	91	53	396	5,716,428
68	54	21	42	54	57	67	30	325	4,125,927
69	53	32	37	30	46	55	42	295	3,704,932
70 & Over	160	76	91	85	118	121	133	784	9,078,658
Totals	32,375	15,492	12,531	8,322	6,713	3,532	868	79,833	$1,072,097,623

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

Age: 46.2 years.
Service: 9.1 years.
Annual Pay: $13,429

Schedule 9.

School Employees Retirement System of Ohio

Active Members as of June 30, 1998 by Annual Pay

Annual Pay	Number of Active Members			Portion of Total Number	
	Men	Women	Total	Group	Cumulative
Less than $1,000	953	2,494	3,447	3%	3%
$1,000 - 1,999	903	2,589	3,492	3	6
2,000 - 2,999	852	3,135	3,987	4	10
3,000 - 3,999	715	3,409	4,124	4	14
4,000 - 4,999	623	3,314	3,937	4	18
5,000 - 5,999	582	3,371	3,953	4	22
6,000 - 6,999	621	3,256	3,877	4	26
7,000 - 7,999	648	3,376	4,024	4	30
8,000 - 8,999	631	3,292	3,923	4	34
9,000 - 9,999	618	3,742	4,360	4	38
10,000 - 11,999	1,369	8,199	9,568	9	47
12,000 - 13,999	1,212	7,807	9,019	8	55
14,000 - 15,999	1,048	6,530	7,578	7	62
16,000 - 17,999	882	4,887	5,769	5	67
18,000 - 19,999	998	3,831	4,829	5	72
20,000 - 24,999	3,330	7,590	10,920	10	82
25,000 - 29,999	4,205	4,769	8,974	8	90
30,000 and over	6,855	4,242	11,907	10	100
Totals	27,045	79,833	106,878		

REPORTED ASSETS

The accrued assets at June 30, 1998 were reported to be $7,457,566,095 on a market basis, and $5,704,175,595 on a cost basis.

FUND	AMOUNT	
	MARKET BASIS	COST BASIS
Annuity and Pension Reserve Fund	$3,147,021,518	$3,147,021,518
Survivors Benefit Fund	121,689,182	121,689,182
Employees Savings Fund	1,254,803,444	1,254,803,444
Employers Trust Fund	2,934,051,951	1,180,661,451
Total	$7,457,566,095	$5,704,175,595

VALUATION ASSETS

The value of accrued assets (cash & investments) as of June 30, 1998 was determined on a market related basis. The asset valuation method recognizes assumed investment income (line E3 on the following page) fully each year. Differences between actual and assumed investment income (line E4 on the following page) are phased in over a closed 4 year period. During periods when investment performance exceeds the assumed rate, the valuation assets will tend to be less than market value. During periods when investment performance is less that the assumed rate, the valuation assets will tend to be greater than market value. If assumed rates are exactly realized for 3 consecutive years, actuarial value will become equal to market value.

School Employees Retirement System of Ohio

Development of Valuation Assets

Valuation Date June 30:	1997	1998	1999	2000	2001
A. Actuarial Value Beginning of Year	$4,964,211,345	5,666,085,321			
B. Market Value End of Year	6,367,402,990	7,457,566,095			
C. Market Value Beginning of Year	5,421,677,579	6,367,402,990			
D. Cash Flow					
D1. Contributions	407,426,273	423,586,371			
D2. Benefit Payments	(432,820,102)	(470,088,924)			
D3. Administrative Expenses	(19,580,518)	(26,218,532)			
D4. Net	(44,974,347)	(72,721,085)			
E. Investment Income					
E1. Market Total: B.-C.-D4.	990,699,758	1,162,884,190			
E2. Assumed Rate	8.25%	8.25%			
E3. Amount for Immediate Recognition	428,080,459	491,752,340			
E4. Amount for Phased-in Recognition	562,619,299	671,131,850			
F. Phased-In Recognition of Investment Income					
F1. Current Year: 0.25*E4.	140,654,825	167,782,963			
F2. First Prior Year	101,240,155	140,654,825	167,782,963		
F3. Second Prior Year	76,872,884	101,240,155	140,654,825	167,782,963	
F4. Third Prior Year	0	76,872,884	101,240,155	140,654,825	167,782,963
F5. Total Recognized Investment Gain	318,767,864	486,550,827	409,677,943	308,437,788	167,782,963
G. Actuarial Value End of Year: A.+D4.+E3.+F5.	$5,666,085,321	$6,571,667,403			
H. Difference Between Market & Actuarial Values	701,317,669	885,898,692	476,220,749	167,782,962	0
I. Health Care Valuation Assets	146,383,823	160,308,371			
J. Present Value of HB284 and 204 Contributions	1,546,651	1,289,860			
K. Basic Benefits Valuation Assets: G. - I. + J.	$5,521,248,149	$6,412,648,892			

BASIC BENEFITS

School Employees Retirement System of Ohio

Outline of Benefit Eligibility and Amounts

BASIC BENEFITS

(outline last changed 6/30/98)

Service retirement. A member who (i) has attained age 60 years and has 5 or more years of total service credit, or (ii) has attained age 55 years and has 25 or more years of total service credit, or (iii) has 30 or more years of total service credit, may retire with a service retirement allowance.

Final average salary ("FAS") means the average of the annual earnings for the 3 highest years of compensation.

Service retirement allowance. For retirements after June 30, 1998, a retiring member's service allowance is equal to total Ohio service credit times the greater of $86, or 2.1% of FAS for service credit up to 30 years plus 2.5% of FAS for service credit over 30 years. The allowance is then adjusted by factors based on attained age or years of service as determined in the following schedule:

Attained Birthday	OR	Years of Total Service Credit	Percentage of Base Amount
58		25	75%
59		26	80
60		27	85
61			88
		28	90
62			91
63			94
		29	95
64			97
65		30 or more	100

Maximum allowance is 90% of FAS.

Disability retirement. Upon becoming permanently disabled, after completion of at least 5 years of total service credit, an allowance is paid as described below.

For those who were active members prior to July 29, 1992 and did not elect the benefit structure outlined below, the annual disability allowance is equal to a service retirement allowance if the member has attained age 60. For a member below age 60, the allowance is computed in the same manner as a service allowance for a 65 year old, based upon the service the member would have had if he remained in employment to age 60, with a maximum allowance of 75% of FAS and a minimum allowance of 30% of FAS.

For those who become active members after July 28, 1992 and for those who were active members prior to July 29, 1992 who so elected, an allowance is paid equal to the greater of (i) 45% of FAS, or (ii) the lesser of 60% of FAS, or total service credit multiplied by 2.1% of FAS for service credit up to 30 years plus 2.5% of FAS for service credit over 30 years. The allowance terminates upon the earliest of

a) the date the member is granted a service retirement benefit, or

b) ~~the later of the date the member attains age 65 or the date the disability allowance has been~~ paid for the minimum duration in accordance with the following schedule:

Age at Disability	Minimum Benefit Duration in Months
60 and earlier	60
61	60
62	48
63	48
64	36
65	36
66	24
67	24
68	24
69 and older	12

Death while eligible to retire. If a member dies in service after becoming eligible to retire with a service allowance and leaves a surviving spouse or other sole dependent beneficiary, the survivor receives the same amount that would have been paid had the member retired the last day of the month of death and elected the 100% joint and survivor form of payment.

Survivor (death-in-service) allowances. Upon the death of a member with at least 1-1/2 years of Ohio service credit and with at least 1/4 year of Ohio contributing service credit within the 2 1/2 years prior to the date of death, the following allowances are payable:

(a) Spouse without dependent child: A monthly allowance, commencing at age 62, or age 50 if the deceased member had 10 or more years of Ohio service credit. Allowance equals 25% of the deceased member's FAS. Minimum monthly allowance is $96, or $106 if deceased member had 10 or more years of Ohio service credit. Allowance terminates upon remarriage before age 55.

(b) Spouse with dependent child: An allowance of 40% of FAS is payable to the spouse of a deceased member while caring for 1 dependent child, with a minimum monthly allowance of $186. Allowance is 50% of FAS if 2 dependent children, or 55% of FAS if 3 dependent children, or 60% of FAS if 4 or more dependent children. Minimum monthly allowance is $236 for 2 or more children. A dependent child is defined to be an unmarried child under the age of 18, or 22 if attending an approved school.

(c) Orphans: A monthly allowance payable to each orphan child of the deceased member who is unmarried and under the age of 18, or 22 if attending an approved school. Allowances equal 25% of the deceased member's FAS for 1 child, an equal share of 40% of FAS if there are 2 children, an equal share of 50% of FAS if there are 3 children, an equal share of 55% of FAS if there are 4 children, or an equal share of 60% of final average salary if there are 5 or more children. Minimum monthly allowance is $96 for 1 child, $186 for 2 children, and $236 for 3 or more children.

(d) Dependent parent's allowance: A monthly allowance is payable to a dependent parent age 65 or more (earlier if mentally or physically incompetent) who received at least one-half support from the member during the 12 month period immediately preceding the member's death. Allowance equals 25% of FAS for 1 parent with a minimum monthly allowance of $96, and 40% of FAS shared

equally for 2 parents with minimum monthly allowances totaling $186. If there are other qualified beneficiaries, a dependent parent receives a share of a total allowance indicated as in (b) above counting all qualified beneficiaries.

Death after retirement benefit. A $1,000 benefit is paid upon the death of each retirant. Upon the death of a disability retirant, a survivor allowance (described earlier) is paid.

Post-retirement Increases. Each July after June 30, 1971 or the annual anniversary established 12 months after the initial date of retirement, each allowance is increased to be equal to the initial allowance increased by the percentage increase in the Consumer Price Index for each completed year of retirement; provided, the increased allowance cannot exceed the initial allowance adjusted for annual increases in the Consumer Price Index which do not exceed 3.0%.

Deferred benefits. If a member with at least 5 calendar years of contributing service credit leaves service before being eligible for an immediate monthly allowance and does not withdraw any part of his accumulated contributions, he will be entitled to a deferred allowance at age 60. The amount of the allowance is based on his credited service and final average salary at termination of employment.

Medicare Part-B. Effective July 1, 1998 each retirant or survivor is reimbursed $31.80 per month for Part-B Medicare premiums. Those receiving reimbursements on June 30, 1998 will receive a single, lump sum payment equal to $7.00 (the monthly difference from the previous reimbursement amount of $24.80) for each month of retirement from the date the member initially became eligible for the Medicare Part-B reimbursement (but not earlier than January 1, 1992).

Member contributions. Each member contributes 9% of his pay by payroll deductions. This rate was established by the Board of Trustees effective July 1, 1989. The maximum statutory rate is 10%.

Refund of members' accumulated contributions. In the event a member leaves service before any monthly benefits are payable on his behalf, his accumulated contributions are refunded upon application.

Employer contributions. Employer contributions are expressed as percents of member covered payroll. The maximum statutory rate for both basic and health care benefits is 14%. Whatever portion is not needed to finance basic benefits is available for health care benefits.

Re-Employed Retirants

Eligibility. Effective July 1, 1991, service retirees of SERS, or service or disability retirees of one of the other four Ohio retirement systems who are employed in a SERS-covered position are required to contribute to a money purchase annuity, a type of defined contribution plan.

Benefits. On termination of employment a re-employed retirant is eligible to receive an annuity having a reserve equal to the amount of his accumulated contributions, and an equal amount of employer contributions, plus interest to the effective date of retirement. Interest is granted on the re-employed retirant's prior fiscal year account balance, calculated using the investment return rate used for SERS actuarial valuations, compounded annually. The effective date of retirement is the first day of the month after the latest of the following:

a. the last day for which compensation was paid; or

b. attainment of age sixty-five; or

c. if a re-employed retirant has previously received a re-employed retirant benefit, completion of a period of twelve months since the effective date of that benefit.

Re-employed Retirant Annuity.

The re-employed retirant must elect to receive his benefit as a monthly annuity for life or as a lump sum payment discounted to the present value using the current actuarial assumption rate of interest, except that if his monthly annuity would be less than $25.00, he must elect to receive the lump sum payment.

Benefits payable upon death. If a re-employed retirant dies while employed, a lump sum payment of the monthly annuity, discounted to the present value using the current actuarial assumption rate of interest, will be paid to his beneficiary.

If a re-employed retirant dies while receiving a monthly annuity, a lump sum payment will be made to a beneficiary in an amount equal to the excess, if any, of the lump sum payment the re-employed retirant would have received at the effective date of retirement over the sum of the annuity payments received by the re-employed retirant to the date of death.

Member contributions. Each re-employed retirant is required to contribute 9% of his pay by payroll deductions. The maximum statutory rate is 10%.

Employer contributions. Employer contributions are expressed as percents of member covered payroll. Employers are required to contribute 14% of payroll; the statutory maximum is 14%.

Other benefits. Re-employed retirant members of SERS are not eligible to receive any of the other benefits provided to regular SERS members.

Computed actuarial accrued liabilities are one of the results of the actuarial valuation.

Schedule 10.

BASIC BENEFITS

Actuarial Accrued Liabilities June 30, 1998

Allocations Using Entry Age Actuarial Cost Method

Present Value Of	Entry Age Actuarial Accrued Liabilities
Future monthly benefits and death benefits to present retirants and survivors, including Medicare Part-B supplement	$ 3,268,710,700
Monthly benefits and refunds to present inactive members, including Medicare Part-B supplement	164,254,694
Service allowances to present active members	3,122,464,603
Disability allowances to present active members	357,530,758
Death-after-retirement benefit ($1,000) on behalf of present active members	3,648,348
Survivor benefits on behalf of present active members who die before retiring	47,363,172
Medicare part-B supplement	46,777,657
Refunds of member contributions of present active members	26,698,900
Benefits for present active members	3,604,483,438
Entry Age Liabilities for Present Covered Persons	7,037,448,832
Valuation Assets	6,412,648,892
Liabilities to be Covered by Future Contributions	624,799,940

The Employer Contribution Rate for Basic Benefits has been established by the Board as normal cost plus a 21 year amortization of unfunded actuarial accrued liabilities. Please see pages 40 and 41 for a graph showing the relationship between level cost financing and amortization periods.

Schedule 11.

BASIC BENEFITS

COMPOSITION OF EMPLOYER CONTRIBUTION RATE

Established By Statute & Board Action

June 30, 1998

Contributions For	Contributions Expressed as Percents of Payroll
Normal cost:	
Service allowances	9.69%
Disability allowances	2.35
Survivor benefits (SB Fund)	0.28
$1,000 death benefit	0.03
Medicare Part-B supplement	0.20
Total	12.55%
Member contributions:	9.00%
Less: Future refunds	1.54
Available for allowances	7.46%
Employer Normal Cost	5.09%
Unfunded Accrued Liabilities	
Minimum level % financing	1.42%
Additional amount to fund over 21 years	1.19
Total	2.61%
EMPLOYER CONTRIBUTION RATE ALLOCATED TO BASIC BENEFITS	7.70%

SHORT CONDITION TEST

If the contributions to SERS are level in concept and soundly executed, the System will pay all promised benefits when due --- the ultimate test of financial soundness. Testing for level contribution rates is the long-term test.

A short condition test is one means of checking a system's progress under its funding program. In a short condition test, the plan's present assets (cash and investments) are compared with:

1) Active member contributions on deposit;
2) The liabilities for future benefits to present retired lives;
3) The liabilities for service already rendered by active members.

In a system that has been following the discipline of level percent of payroll financing, the liabilities for active member contributions on deposit (liability 1) and the liabilities for future benefits to present retired lives (liability 2) will be fully covered by present assets (except in rare circumstances). In addition, the liabilities for service already rendered by active members (liability 3) will be partially covered by the remainder of present assets. The larger the funded portion of liability 3, the stronger the condition of the System. Liability 3 being fully funded is rare.

Schedule 12.

BASIC BENEFITS
Short Condition Test
($ in Millions)

	Computed Actuarial Accrued Liabilities				Portion of Accrued Liabilities Covered by Assets		
June 30	(1) Member Contributions	(2) Retired Lives	(3) Present Members (Employer Financed Portion)	Valuation Assets	(1)	(2)	(3)
1989	$ 627	$1,696	$1,335	$2,438	100%	100%	9%
1990	684	1,872	1,447	2,686	100	100	9
1991	749	2,025	1,491	3,015	100	100	16
1991*	749	1,973	1,624	3,015	100	100	18
1992	816	2,123	1,754	3,331	100	100	22
1993	889	2,261	1,902	3,673	100	100	27
1994	961	2,426	1,994	3,952	100	100	28
1995	1,034	2,700	2,105	4,310	100	100	27
1996	1,105	2,886	2,193	4,766	100	100	35
1996*@	1,105	2,790	2,234	4,777	100	100	39
1997	1,177	2,996	2,332	5,402	100	100	53
1997@	1,177	2,996	2,332	5,521	100	100	58
1998	1,255	3,208	2,474	6,413	100	100	79
1998#	1,255	3,269	2,513	6,413	100	100	75

* Revised assumptions.
\# Legislated benefit increases.
@ Revised asset valuation method.

School Employees Retirement System of Ohio
Supplemental Disclosure Information

June 30, 1998

Actuarial Accrued Liability

The actuarial accrued liability is a measure intended to (i) help users assess the System's funding status on a going-concern basis, and (ii) assess progress being made in accumulating sufficient assets to pay benefits when due. For the years ending June 30, 1996 and prior, the actuarial value of assets was determined on a market related basis that recognized 20% of the previously unrecognized and unanticipated gains and losses (both realized and unrealized). Beginning with the June 30, 1997 actuarial valuation, the 20% recognition of gains and losses has been increased to 25% recognition. 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 plan as of June 30, 1998. 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 8.25% per year compounded annually, (b) projected salary increases of 4.25% per year compounded annually, attributable to inflation, (c) additional projected salary increases of 1.0% to 5.0% per year, depending on age, attributable to seniority/merit, and (d) the assumption that benefits will increase 3.0% per year after retirement on a simple basis. At June 30, 1998, the unfunded actuarial accrued liability of the plan was determined as follows:

Actuarial Accrued Liability	
Active members	$3,604,483,438
Retirees and survivors currently receiving benefits	3,268,710,700
Terminated members not yet receiving benefits, including re-employed retirants	164,254,694
Total Actuarial Accrued Liability	7,037,448,832
Actuarial Value of Assets	6,412,648,892
Unfunded Actuarial Accrued Liability	$ 624,799,940

During the year ended June 30, 1998, the plan experienced a net change of $532,811,263 in the actuarial accrued liability. Of the change, $100,510,046 was attributable to plan amendments and $0 was attributable to a change in actuarial assumptions.

School Employees Retirement System of Ohio

Supplemental Disclosure Information

June 30, 1998

(continued)

Employer contribution rates are set by Act of the State Legislature. The adequacy of these rates is checked annually by an actuarial valuation. The actuarial funding method used in making these actuarial valuations is the entry age actuarial method; unfunded actuarial accrued liabilities are amortized on a closed basis as a level percent of the active member payroll, over a period of 21 years. The computed employer contribution rate, expressed as a percent of active member payroll, is designed to accumulate sufficient assets to pay benefits when due. The most recent completed actuarial valuation was based upon data as of June 30,1998.

During the year ended June 30, 1998 contributions totaling $309,786,597 -- $154,369,490 employer, $155,059,880 employee and $357,227 from the State -- were made in accordance with contributions determined by State Statute. The employer contributions consisted of $77,425,276 for normal cost and $76,944,214 for amortization of the unfunded actuarial accrued liability. Employer contributions represented 9.95% of valuation payroll.

Schedule of Employer Contributions

Fiscal Year 7-1/6-30	Valuation Date 6-30	Annual Required Contribution	Percentage Contributed
1991-92	1991	$113,268,331	100%
1992-93	1992	117,959,733	100
1993-94	1993	119,849,473	100
1994-95	1994	128,603,843	100
1995-96	1995	150,103,657	100
1996-97	1996	144,487,949	100
1997-98	1997	139,955,108	100
1998-99	1998	127,195,004	

School Employees Retirement System of Ohio

Supplemental Disclosure Information

June 30, 1998

(continued)
($ in Thousands)

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)
06/30/91#	$3,015,432	$4,346,128	69.4%	$1,330,696	$1,176,203	113.1%
06/30/92	3,331,392	4,693,284	71.0	1,361,892	1,244,301	109.5
06/30/93	3,672,662	5,051,534	72.7	1,378,872	1,312,700	105.0
06/30/94	3,951,856	5,381,465	73.4	1,429,609	1,360,887	105.0
06/30/95@	4,310,487	5,839,027	73.8	1,528,540	1,429,559	106.9
06/30/96#*	4,777,498	6,128,781	78.0	1,351,283	1,475,873	91.6
06/30/97*	5,521,248	6,504,638	84.9	983,390	1,551,609	63.4
06/30/98^	6,412,649	7,037,449	91.1	624,800	1,651,883	37.8

After change in actuarial assumptions.
* After change is asset method.
^ After change in benefit provisions.
@ Includes Medicare Part B Supplement for this year and future years.

Analysis of the dollar amounts of 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.

APPENDIX

APPENDIX

SUMMARY OF
ASSUMPTIONS USED FOR SERS BASIC BENEFITS ACTUARIAL VALUATIONS
Assumptions Adopted by Board of Trustees After Consulting With Actuary

The actuarial assumptions used in making the valuation are shown in this Appendix of the report. The assumptions were revised as set forth in the Gabriel, Roeder, Smith and Company Investigation Report dated April 11, 1996.

ECONOMIC ASSUMPTIONS . . . . . .

The investment return rate used in making the valuations was 8.25% per year, compounded annually (net after expenses). The real rate of return is the portion of total investment return which is more than the inflation rate. Based upon an assumed inflation rate of 4.25%, the 8.25% investment return rate translates to an assumed real rate of return of 4%.

Pay increase assumptions for individual active members are shown for sample ages in Schedule 13. Part of the assumption for each age is for merit and/or seniority increase, and the other 4.25% recognizes inflation.

The number of active members is assumed to continue at the present number.

Total active member payroll is assumed to increase 4.25% annually, which is the portion of the individual pay increase assumptions attributable to inflation.

NON-ECONOMIC ASSUMPTIONS . . . . . .

The mortality table used in evaluating allowances to be paid and death before retirement benefits was the 1971 Group Annuity Mortality Table projected to 1984 set back 1 year for men and women. Related values are shown in Schedule 16. For disability retirement, impaired longevity was recognized by use of special mortality tables.

The probabilities of retirement with an age and service allowance are shown in Schedule 15.

Eligibility for age and service retirement was assumed to be: age 50 with 30 or more years of service; or age 55 with 25 or more years of service, or age 60 with 5 or more years of service.

The probabilities of withdrawal from service, disablement and death-in-service are shown for sample ages in Schedule 14. For withdrawal, rates during the first three years of employment are assumed to be 1,000%, 330% and 250% (respectively) for men, and 825%, 230% and 175% for women, of those shown. Ninety percent of vested members withdrawing from service are assumed to take a refund of their contributions. It is assumed that 80% of active members are married, and men are 3 years older than their spouses.

The entry age normal actuarial cost method of valuation was used in determining liabilities and normal cost.

Differences in the past between assumed experience and actual 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 percent of payroll contributions.

Employer contribution dollars were assumed to be paid in equal installments throughout the System fiscal year.

Accrued assets (cash & investments) are valued by a market-related method. Assumed investment income is fully recognized each year. Differences between actual and assumed investment income are phased in over a closed 4 year period.

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.

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

Schedule 13.

Pay Increase Assumptions for an Individual Member

Sample Ages	Increase Next Year		
	Merit & Seniority	Base (Economy)	Total
20	5.0%	4.25%	9.25%
25	4.7	4.25	8.95
30	4.3	4.25	8.55
35	4.1	4.25	8.35
40	3.8	4.25	8.05
45	3.5	4.25	7.75
50	2.4	4.25	6.65
55	1.5	4.25	5.75
60	1.0	4.25	5.25
65	1.0	4.25	5.25

Schedule 14.

Separations From Active Employment Before Age & Service Retirement

Sample Ages	Percent of Active Members Separating Within the Next Year					
	Men			Women		
	Death	Disability	Other	Death	Disability	Other
20	0.02%	0.00%	6.09%	0.01%	0.00%	8.04%
25	0.03	0.02	6.09	0.01	0.03	8.04
30	0.04	0.10	4.60	0.02	0.03	6.31
35	0.05	0.33	4.15	0.03	0.03	4.92
40	0.08	0.36	3.42	0.04	0.14	3.95
45	0.13	0.49	3.35	0.05	0.15	3.15
50	0.24	0.80	3.06	0.08	0.48	2.67
55	0.39	1.10	2.50	0.13	0.81	2.66
60	0.60	2.75	2.20	0.21	3.25	2.66
65	0.98	0.00	2.20	0.36	0.00	2.66

Schedule 15.

Probabilities of Age & Service Retirement

Sample Ages	Percent of Eligible Active Members Retiring Within Next Year Men
50	30%
55	20
60	15
65	35
70	25
75	100

Sample Ages	Percent of Eligible Active Members Retiring Within Next Year Women
50	24%
55	18
60	30
65	30
70	38
75	100

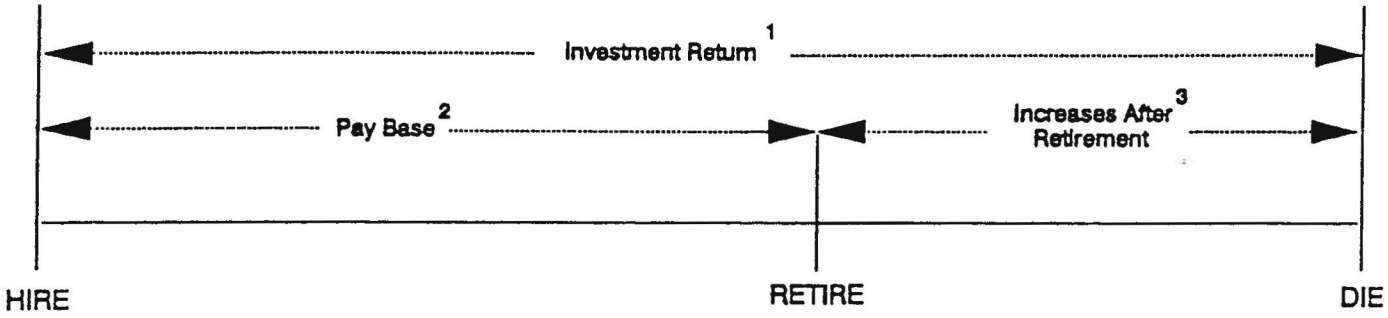
Schedule 16.

Single Life Retirement Values

Sample Ages	Present Value of $1 Monthly For Life Increasing 3.0% Annually (1st Increase After 1 Year)		Future Life Expectancy (Years)		Expected Total Lifetime	
	Men	Women	Men	Women	Men	Women
50	$161.10	$176.42	28.41	34.60	78.41	84.60
55	149.08	166.93	24.11	29.92	79.11	84.92
60	135.04	154.91	20.05	25.34	80.05	85.34
65	118.98	140.26	16.27	20.94	81.27	85.94
70	101.77	122.94	12.87	16.79	82.87	86.79
75	85.06	103.72	10.02	13.02	85.02	88.02
80	68.71	84.80	7.59	9.85	87.59	89.85
85	54.82	66.94	5.74	7.24	90.74	92.24

Sample Attained Ages	Portion of Age 60 Lives Still Alive		$1,000 Benefit Beginning at Age 60, Increasing 3% Annually
	Men	Women	
60	100%	100%	$1,000
65	93	97	1,150
70	84	93	1,300
75	69	86	1,450
80	51	73	1,600
85	32	55	1,750

Relationship of Economic Assumptions In Computing Contributions to a Retirement System



1. Investment Return

An increase in this assumption reduces computed contributions. The assumption operates over all parts of an employee's lifetime.

2. Pay Base

An increase in this assumption increases computed contributions. However, a 1% increase in this assumption, coupled with a 1% increase in Investment Return reduces computed contributions. This is because the Pay Base assumption operates only over an employee's working lifetime, while the Investment Return assumption operates over the employee's entire lifetime, and therefore has a greater effect.

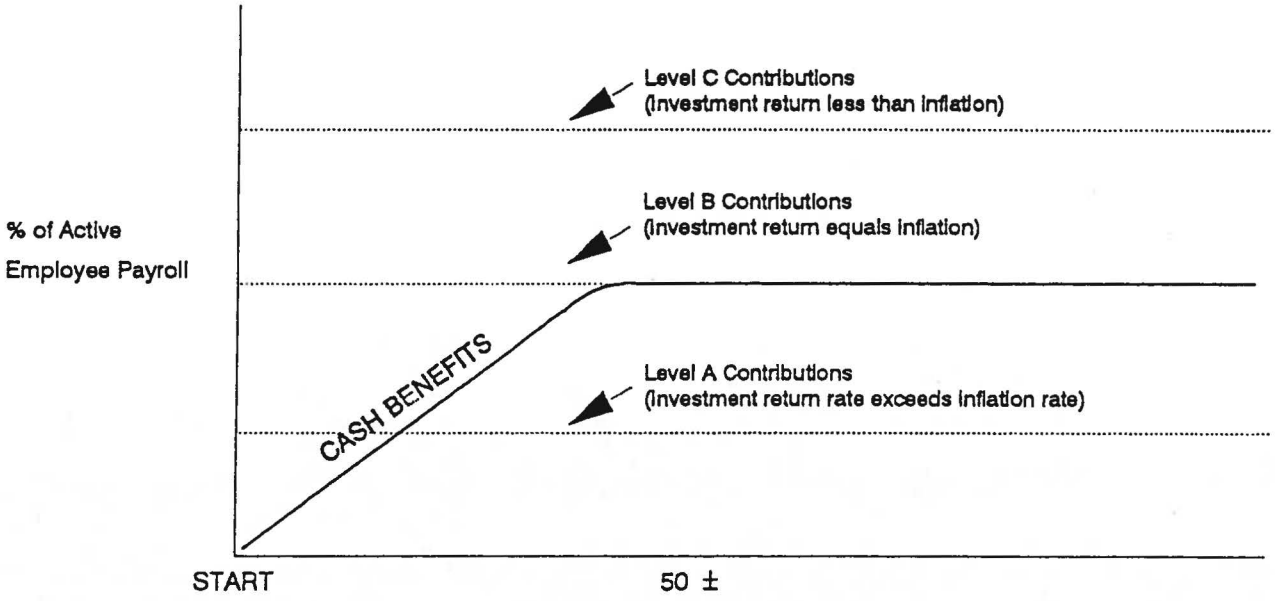
3. Increases After Retirement.

An increase in this element increases computed contributions.

If Investment Return, Pay Base, and Increases After Retirement are each increased by equal amounts, computed contributions remain the same (except in plans using Final Average Pay as a factor in computing benefits; the multi-year average used for Final Average Pay causes computed contributions to decrease slightly).

If Investment Return and Pay Base are increased by equal amounts, with no change in Increases After Retirement, computed contributions decrease — sometimes significantly. The decreases represent the projected devaluation of an employee's benefits following retirement.

The Importance of the Investment Return Rate Being More Than the Inflation Rate In Order to Achieve Practical Level Contribution Rates



"LEVEL A CONTRIBUTIONS" occur mathematically when the investment return rate from plan assets exceeds the inflation rate. The greater the excess, the lower the Level A line will be.

Historically, it is this assumed condition that has led to the development of and use of "actuarially sound" or "actuarial reserve" financing methods.

"Level B Contributions" occur mathematically when the investment return rate from plan assets equals the inflation rate.

Who would contribute a level rate which is the same as the ultimate contribution rate of "pay-as-you-go" financing?

"Level C Contributions" occur mathematically when the investment return rate from plan assets is less than the inflation rate. The greater the difference, the higher the Level C line would be.

Who would contribute at a rate always more than the benefits paid?

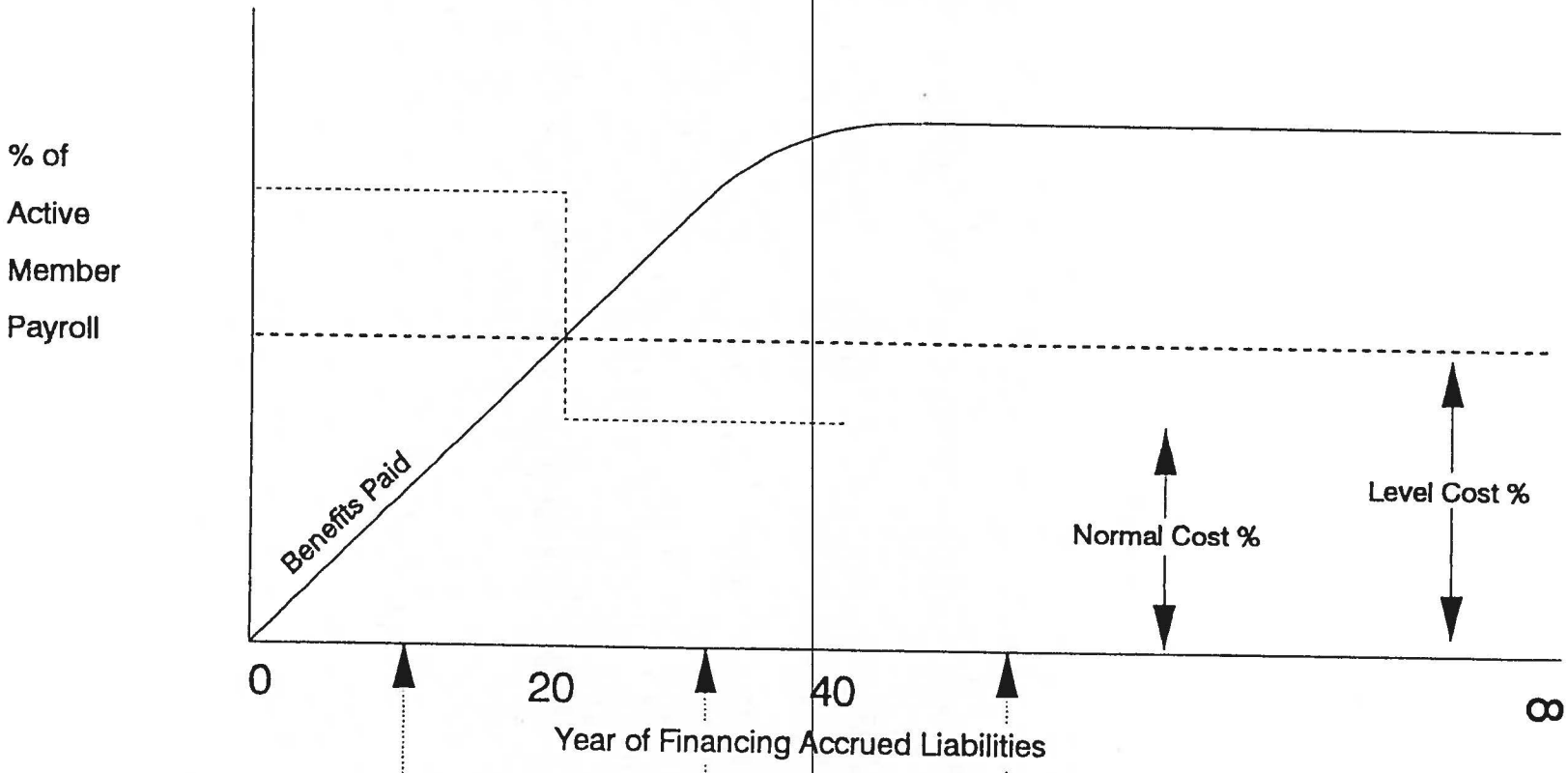
TOTAL CONTRIBUTIONS FOR RETIREMENT BENEFITS

USING ALTERNATE FINANCING FOR ACCRUED LIABILITIES:

..... LEVEL % OF PAYROLL

— — — FULL AMORTIZATION OF UAAL OVER 40 YEARS

..... FULL AMORTIZATION OF UAAL OVER 20 YEARS



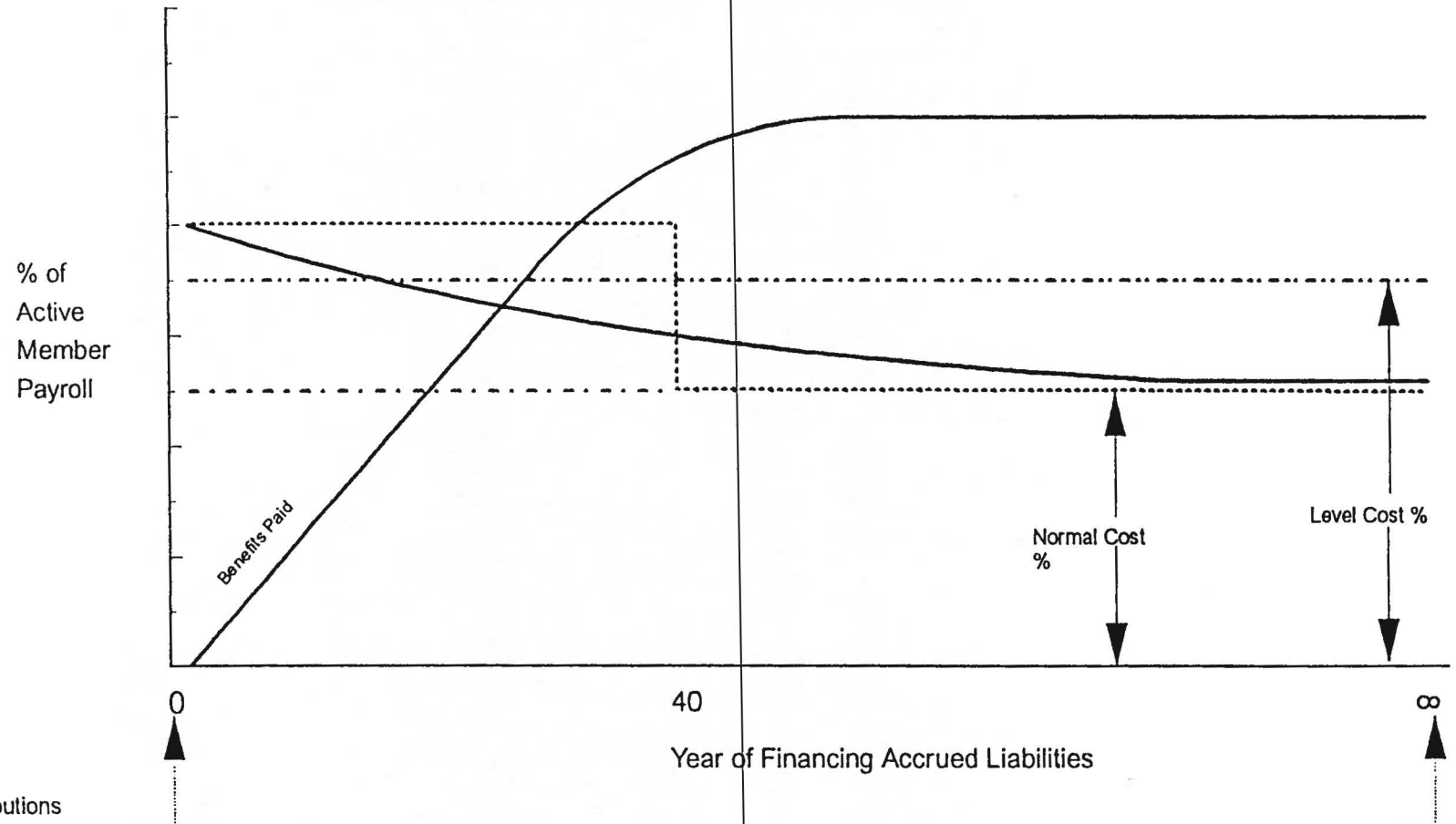
Total Contributions			
LEVEL PERCENT	7.0%	7.0%	7.0%
UAAL Over 20 Years	9.7	5.0	5.0
UAAL Over 40 Years	8.0	8.0	5.0

Gabriel, Roeder, Smith & Co.
Actuaries & Consultants

TOTAL CONTRIBUTIONS FOR RETIREMENT BENEFITS

USING ALTERNATE FINANCING FOR ACCRUED LIABILITIES ("UAAL"):

- NORMAL COST PORTION
- LEVEL % OF PAYROLL
- COMPLETE AMORTIZATION OF UAAL OVER 40 YEARS ("CLOSED" AMORTIZATION)
- PERPETUAL AMORTIZATION OF UAAL OVER 40 FUTURE YEARS ("OPEN" AMORTIZATION)



Total Contributions		
LEVEL PERCENT	7.0%	7.0%
UAAL: 40 Years Closed	8.0	5.0
UAAL: 40 Years Open	8.0	5.0

Gabriel, Roeder, Smith & Co.
Actuaries &
Consultants

Basic Series

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

Year-by-Year Total Returns (1926-1997)

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 59	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

GABRIEL, ROEDER, SMITH & COMPANY from SBBI 1998 Yearbook

Investment Return and Inflation: Past and Future

Inflation Distortions

Inflation's impact on investment return is not uniform from year to year. A common expectation for Real Investment Return (the portion of Total Return remaining after Inflation) is in the area of 3% to 4% annually.

Over the last 30 years Real Return exceeded that range on average. However, for lengthy parts of the period it was actually negative. It is very difficult to maintain a long term portfolio allocation during periods of negative real return.

Annual Investment Return (Including Income)
. . . REAL RETURN (Remainder after Inflation) . . .

No. Years Ended December	Inflation (CPI)	Cash Equiv. (T Bills)	Bonds (Long Term) US Treasury	Bonds (Long Term) Corporate (Sol. Bro)	Stocks (S & P 500)	Sample Fund A	Sample Fund B	Sample Fund C
5/1970	4.5	1.0	-4.3	-3.2	-1.1	-2.2	-1.6	-1.3
5/1975	6.9	-1.0	-0.7	-0.8	-3.5	-1.2	-1.7	-2.1
5/1980	9.2	-1.3	-6.9	-6.2	4.3	-2.6	-0.4	1.3
5/1985	4.8	5.2	11.5	12.3	9.4	10.7	10.2	9.8
5/1990	4.1	2.6	6.4	6.1	8.6	6.7	7.2	7.6
5/1995	2.8	1.5	10.0	9.1	13.4	10.0	10.8	11.3
1/1996	3.3	1.8	-4.1	-1.8	19.2	4.2	8.5	11.9
1/1997	1.7	3.5	14.0	11.0	31.2	17.2	20.9	23.6
~~30/1980~~	~~4.2~~	~~0.1~~	~~-2.0~~	~~-1.3~~	~~6.4~~	~~1.2~~	~~3.0~~	~~4.1~~
30/1997	5.3	1.4	3.1	3.3	6.5	4.3	4.9	5.4

Sample Funds
(Only three of many reasonable samples)

	A	B	C
Cash: T-Bills	10 %	10 %	10 %
Bonds: US	30	20	10
Bonds: Corp	30	20	15
Stock	30	50	65

For most pension plans, Benefit Increases After Retirement have fallen short of keeping up with inflation. The retired life group has been hurt more than the active life group. The investment return necessary for the indexing of benefits after retirement probably cannot be realized during a period of high inflation.

Changes in Economic Assumptions Within An Economic Environment of Inflation

There is powerful motivation to increase assumed Investment Return used in actuarial calculations, with or without a related increase in Employee Pay Base, because such an assumption change decreases computed contributions. A contribution rate decrease (i) offers relief for employer budget problems and/or (ii) offers a "no cost" way to provide benefit increases.

The wisdom of Investment Return assumed for the future can be determined only by future events. Will the investment record of the next 30 years be the same as the last 30 Years? Will it be like the period ended in 1980? Better? Worse? What will happen when the "Baby Boomers" start retiring?