

**School Employees Retirement
System of Ohio**

**The Report of the
Annual Basic Benefits Actuarial Valuation
June 30, 1999**

Gabriel, Roeder, Smith & Company

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December 10, 1999

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 (SERS).

The date of the valuation was *June 30, 1999*.

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,


Larry Langer


Kenneth G. Alberts



Norman S. Losk

LL/KGA:ct

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. The current benefit structure is outlined in the Plan Summary. There have been no changes made since the last valuation.

The Board of Trustees, at its meeting on November 15, 1999, has opted to support the following changes in the provisions of SERS:

1. Increase the benefit multiplier for each year of service up to 30 from 2.1% to 2.2%.
2. Post retirement increases would be 3% each year regardless of the change in the Consumer Price Index.
3. Medicare Part B reimbursement will be increased to \$45.50, to be applied retroactively.

The employer contribution rate to support the basic benefits of SERS including these changes would be 7.01% of pay, based on an amortization period of 25 years.

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 20 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 1999 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 pages 28 and 29.

FINANCIAL PRINCIPLES



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*.

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

[REDACTED]

[REDACTED]

Retired members and survivors included in the valuation totaled 56,632. The 52,818 retirants and survivors of retirants as of June 30, 1999 were receiving annual benefits totaling \$333,803,657 from the Annuity and Pension Reserve Fund. The 3,814 survivors of deceased active members as of June 30, 1999 were receiving annual benefits totaling \$16,777,736 from the Survivor Benefit Fund.

Schedule 1.

Annuity and Pension Reserve Fund Retirants and Beneficiaries June 30, 1999 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	4,109	78.2%	0.1%	21.7%	\$ 32,336,095	\$ 244,768,187
Women	<u>24,028</u>	80.3	0.1	19.6	<u>123,789,962</u>	<u>1,140,167,652</u>
Totals	28,137				156,126,057	1,384,935,839
Option II Allowance – Joint and Survivor Benefits						
Men	6,669	82.0	0.0	18.0	63,566,682	693,250,318
Women	<u>7,512</u>	86.7	0.0	13.3	<u>46,486,556</u>	<u>529,383,942</u>
Totals	14,181				110,053,238	1,222,634,260
Option III Allowance – Life Benefits With Guaranteed Periods						
Men	507	76.0	0.2	23.8	3,151,604	23,707,657
Women	<u>952</u>	78.2	0.1	21.6	<u>4,198,074</u>	<u>38,602,603</u>
Totals	1,459				7,349,678	62,310,260
Allowance to Survivor Beneficiary of Deceased Superannuation Retirant Who Elected Option II – Life Benefit						
Men	691	73.6	0.3	26.1	1,856,224	13,001,383
Women	<u>3,411</u>	70.8	0.3	28.8	<u>15,797,138</u>	<u>128,209,286</u>
Totals	4,102				17,653,362	141,210,669

* 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, 1999** **Type of Benefit, Annual Amount and** **Basic Benefit Actuarial Liabilities**

Group	Number	% of Current Total \$		Post-Retirement Increases	Current Total \$	Actuarial Liabilities*
		Base Allowances	H.B. 204 and 284			
Allowance to Survivor Beneficiary of Deceased Superannuation Retirant Who Elected Option III – Guaranteed Period Only						
Men	26	79.7%	0.0%	20.3%	\$ 161,661	\$ 572,383
Women	54	81.3	0.0	18.7	314,169	1,183,206
Totals	80				475,830	1,755,589
Total for Superannuation Allowances Being Paid						
Men	12,002	80.5	0.0	19.5	101,072,266	975,299,928
Women	35,957	81.0	0.1	18.9	190,585,899	1,837,546,689
Totals	47,959				291,658,165	2,812,846,617
DISABILITY RETIREMENT						
Straight Life Allowance - Benefit Terminating at Death						
Men	1,586	83.5	0.1	16.4	19,434,290	166,497,443
Women	3,273	84.1	0.1	15.8	22,711,202	219,000,563
Totals	4,859				42,145,492	385,498,006
TOTAL BENEFITS BEING PAID FROM ANNUITY AND PENSION RESERVE FUND						
Men	13,588	80.9	0.0	19.0	120,506,556	1,141,797,371
Women	39,230	81.3	0.1	18.6	213,297,101	2,056,547,252
Totals	52,818				333,803,657	3,198,344,623

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

Schedule 2.

Annuity and Pension Reserve Fund Retirants June 30, 1999 Current Annual Total \$ By Attained Age

Attained Age	Superannuation		Disability		Totals	
	No.	Annual Total \$	No.	Annual Total \$	No.	Annual Total \$
Under 20		\$		\$		\$
20-24						
25-29						
30-34			12	179,177	12	179,177
35-39			74	1,134,047	74	1,134,047
40-44	1	29,654	177	2,587,989	178	2,617,643
45-49	32	708,736	348	4,791,049	380	5,499,785
50-54	158	3,614,431	528	5,866,280	686	9,480,711
55-59	841	12,177,898	820	8,148,581	1,661	20,326,479
60-64	4,921	41,132,976	1,049	8,919,014	5,970	50,051,990
65-69	8,511	63,284,877	740	5,200,834	9,251	68,485,711
70-74	9,795	62,312,611	518	2,794,270	10,313	65,106,881
75-79	9,221	49,281,681	379	1,800,450	9,600	51,082,131
80-84	6,091	26,156,953	169	586,780	6,260	26,743,733
85-89	3,049	10,893,370	33	98,411	3,082	10,991,781
90-94	947	3,220,561	12	38,610	959	3,259,171
95-99	184	626,112			184	626,112
100	10	30,017			10	30,017
101	6	17,552			6	17,552
102	4	20,573			4	20,573
103	3	9,217			3	9,217
104	1	5,563			1	5,563
105 & Over	2	6,191			2	6,191
Totals	43,777	\$273,528,973	4,859	\$42,145,492	48,636	\$315,674,465

Schedule 3.

Annuity and Pension Reserve Fund Survivors of Retirants June 30, 1999 Current Annual Total \$ By Attained Age

Attained Age	Life Annuities		Periods Certain		Totals	
	No.	Annual Total \$	No.	Annual Total \$	No.	Annual Total \$
Under 20	4	\$ 8,606	1	\$ 5,772	5	\$ 14,378
20-24	1	14,880			1	14,880
25-29	3	6,657	1	2,905	4	9,562
30-34	3	30,252	1	12,124	4	42,376
35-39	7	11,634	3	17,970	10	29,604
40-44	16	32,383	6	40,154	22	72,537
45-49	32	124,956	7	28,769	39	153,725
50-54	49	230,060	1	821	50	230,881
55-59	60	353,370	2	10,487	62	363,857
60-64	153	883,982	8	41,620	161	925,602
65-69	348	2,182,919	18	82,819	366	2,265,738
70-74	704	3,855,275	14	83,652	718	3,938,927
75-79	989	4,196,580	16	136,980	1,005	4,333,560
80-84	941	3,282,497	1	4,222	942	3,286,719
85-89	554	1,792,141			554	1,792,141
90-94	192	511,967	1	7,535	193	519,502
95-99	40	114,635			40	114,635
100	1	2,695			1	2,695
101	2	5,334			2	5,334
102	3	12,539			3	12,539
103						
104						
105 & Over						
Totals	4,102	\$17,653,362	80	\$475,830	4,182	\$18,129,192

Schedule 4.

Survivor Benefit Fund Beneficiaries June 30, 1999 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	1,347	85.7%	0.0%	14.3%	\$ 4,717,751	\$ 34,630,360
Women	<u>2,467</u>	78.0	0.2	21.8	<u>12,059,985</u>	<u>87,055,154</u>
Totals	3,814				16,777,736	121,685,514

* 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, 1999 Current Annual Total \$ By Attained Age

Attained Age	Totals	
	No.	Annual Total \$
Under 20	34	\$ 168,204
20-24	11	55,377
25-29	2	13,933
30-34	7	72,382
35-39	20	175,942
40-44	59	578,570
45-49	66	546,404
50-54	137	978,498
55-59	231	1,243,932
60-64	488	2,442,438
65-69	646	2,928,309
70-74	712	2,806,584
75-79	626	2,247,880
80-84	456	1,547,940
85-89	208	626,033
90-94	96	299,326
95-99	14	42,577
100		
101		
102		
103		
104		
105 & Over	1	3,407
Totals	3,814	\$16,777,736

Active members included in the valuation totaled 110,175, involving an annual payroll totaling \$1,768,097,813. The schedules below and on the following 4 pages provide some detail from the data on active members.

Active Members in Valuation June 30, 1999

Groups	Number	Annual Payroll	Average Pay
Men	27,497	\$ 614,398,242	\$22,344
Women	<u>82,678</u>	<u>1,153,699,571</u>	13,954
Totals	110,175	\$1,768,097,813	\$16,048

Also included in the valuation were 7,315 *inactive members* eligible for deferred retirement allowances, 63,764 inactive members eligible for a contribution refund only (including 21,290 who had completed 1 or more years of employment before terminating), and 4,998 re-employed retirants with accumulated contributions of \$7,734,803.

Schedule 6.

School Employees Retirement System of Ohio TOTAL Active Members as of June 30, 1999 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	512							512	\$ 1,939,981
20-24	2,688	51						2,739	22,524,357
25-29	3,782	567	37					4,386	56,304,899
30-34	5,492	1,296	536	69				7,393	102,796,514
35-39	9,010	3,038	1,560	853	155			14,616	206,676,770
40-44	9,911	5,023	2,842	1,433	962	107		20,278	311,883,412
45-49	6,600	4,472	4,153	1,987	1,162	576	59	19,009	324,113,668
50-54	3,789	2,917	3,660	2,777	1,933	751	199	16,026	297,146,485
55-59	2,239	1,537	2,084	2,188	2,645	1,318	246	12,257	227,087,270
60	332	259	330	339	432	309	78	2,079	38,419,550
61	306	207	304	303	408	303	95	1,926	35,584,220
62	233	213	255	251	356	279	112	1,699	31,214,978
63	228	150	196	191	261	255	80	1,361	24,572,871
64	190	138	159	175	217	218	100	1,197	20,945,090
65	198	106	123	144	178	143	73	965	15,899,498
66	167	78	114	100	104	126	66	755	11,552,271
67	128	64	69	60	104	90	61	576	8,737,539
68	112	58	69	57	68	79	63	506	7,291,248
69	109	51	52	60	60	62	44	438	5,885,466
70 & Over	392	239	198	134	153	166	175	1,457	17,521,726
Totals	46,418	20,464	16,741	11,121	9,198	4,782	1,451	110,175	\$1,768,097,813

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: 8.9 years.

Annual Pay: \$16,048.

Schedule 7.

School Employees Retirement System of Ohio MALE Active Members as of June 30, 1999 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	252							252	\$ 925,131
20-24	1,080	22						1,102	9,872,123
25-29	1,289	231	16					1,536	23,901,938
30-34	1,317	464	240	31				2,052	42,156,870
35-39	1,459	660	625	491	84			3,319	78,417,322
40-44	1,626	762	712	673	546	62		4,381	110,785,988
45-49	1,511	758	712	577	474	318	33	4,383	109,734,918
50-54	1,186	635	598	508	360	293	98	3,678	93,719,341
55-59	881	522	505	411	279	182	94	2,874	69,691,085
60	152	121	114	79	48	35	22	571	13,225,312
61	149	96	103	76	59	21	26	530	12,104,675
62	114	113	96	63	52	24	27	489	10,920,016
63	121	75	66	51	37	23	18	391	8,332,320
64	109	73	59	45	33	25	22	366	6,976,781
65	106	61	45	46	27	13	8	306	5,748,453
66	78	47	42	24	13	16	6	226	3,908,431
67	64	34	30	15	15	7	3	168	2,668,225
68	56	34	37	15	8	7	5	162	2,288,436
69	54	30	24	19	8	9	4	148	2,223,159
70 & Over	212	150	100	47	21	12	21	563	6,797,718
Totals	11,816	4,888	4,124	3,171	2,064	1,047	387	27,497	\$614,398,242

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

Age: 45.7 years.

Service: 8.8 years.

Annual Pay: \$22,344.

Schedule 8.

School Employees Retirement System of Ohio FEMALE Active Members as of June 30, 1999 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	260							260	\$ 1,014,850
20-24	1,608	29						1,637	12,652,234
25-29	2,493	336	21					2,850	32,402,961
30-34	4,175	832	296	38				5,341	60,639,644
35-39	7,551	2,378	935	362	71			11,297	128,259,448
40-44	8,285	4,261	2,130	760	416	45		15,897	201,097,424
45-49	5,089	3,714	3,441	1,410	688	258	26	14,626	214,378,750
50-54	2,603	2,282	3,062	2,269	1,573	458	101	12,348	203,427,144
55-59	1,358	1,015	1,579	1,777	2,366	1,136	152	9,383	157,396,185
60	180	138	216	260	384	274	56	1,508	25,194,238
61	157	111	201	227	349	282	69	1,396	23,479,545
62	119	100	159	188	304	255	85	1,210	20,294,962
63	107	75	130	140	224	232	62	970	16,240,551
64	81	65	100	130	184	193	78	831	13,968,309
65	92	45	78	98	151	130	65	659	10,151,045
66	89	31	72	76	91	110	60	529	7,643,840
67	64	30	39	45	89	83	58	408	6,069,314
68	56	24	32	42	60	72	58	344	5,002,812
69	55	21	28	41	52	53	40	290	3,662,307
70 & Over	180	89	98	87	132	154	154	894	10,724,008
Totals	34,602	15,576	12,617	7,950	7,134	3,735	1,064	82,678	\$1,153,699,571

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: 9.0 years.

Annual Pay: \$13,954.

Schedule 9.

School Employees Retirement System of Ohio Active Members as of June 30, 1999 by Annual Pay

Annual Pay	Number of Active Members			Portion of Total Number	
	Men	Women	Totals	Group	Cumulative
Less than \$1,000	863	2,345	3,208	3%	3%
\$1,000 - 1,999	866	2,438	3,304	3	6
2,000 - 2,999	832	2,915	3,747	3	9
3,000 - 3,999	720	3,456	4,176	4	13
4,000 - 4,999	641	3,145	3,786	3	17
5,000 - 5,999	589	3,326	3,915	4	20
6,000 - 6,999	599	3,466	4,065	4	24
7,000 - 7,999	572	3,500	4,072	4	27
8,000 - 8,999	638	3,362	4,000	4	31
9,000 - 9,999	592	3,622	4,214	4	35
10,000 - 11,999	1,396	8,436	9,832	9	44
12,000 - 13,999	1,313	8,252	9,565	9	53
14,000 - 15,999	1,081	6,696	7,777	7	60
16,000 - 17,999	898	5,141	6,039	5	65
18,000 - 19,999	893	4,153	5,046	5	70
20,000 - 24,999	3,091	7,967	11,058	10	80
25,000 - 29,999	3,983	5,142	9,125	8	88
30,000 and over	7,930	5,316	13,246	12	100
Totals	27,497	82,678	110,175		

Reported Assets

The accrued assets at June 30, 1999 were reported to be \$8,228,792,941 on a market basis, and \$6,107,465,545 on a cost basis.

Fund	Amount	
	Market Basis	Cost Basis
Annuity and Pension Reserve Fund	\$3,417,588,024	\$3,417,588,024
Survivors Benefit Fund	133,443,577	133,443,577
Employees Savings Fund	1,341,130,567	1,341,130,567
Employers Trust Fund	3,336,630,773	1,215,302,377
Total	\$8,228,792,941	\$6,107,464,545

Valuation Assets

The value of accrued assets (cash & investments) as of June 30, 1999 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 than 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	1998	1999	2000	2001	2002
A. Actuarial Value Beginning of Year	\$5,666,085,321	\$6,571,667,403			
B. Market Value End of Year	7,457,566,095	8,228,792,941			
C. Market Value Beginning of Year	6,367,402,990	7,457,566,095			
D. Cash Flow					
D1. Contributions	423,586,371	453,262,882			
D2. Other Revenue	-	-			
D2. Benefit Payments	(470,088,924)	(532,877,112)			
D3. Expenses	(26,218,532)	(30,377,641)			
D4. Net	(72,721,085)	(109,991,871)			
E. Investment Income					
E1. Market Total: B. - C. - D4.	1,162,884,190	881,218,717			
E2. Assumed Rate	8.25%	8.25%			
E3. Amount for Immediate Recognition	491,752,340	569,256,115			
E4. Amount for Phased-in Recognition	671,131,850	311,962,602			
F. Phased-In Recognition of Investment Income					
F1. Current Year: 0.25 * E4.	167,782,963	77,990,651	\$ 77,990,651	\$ 77,990,651	\$77,990,651
F2. First Prior Year	140,654,825	167,782,963	167,782,963	167,782,963	167,782,963
F3. Second Prior Year	101,240,155	140,654,825	140,654,825	140,654,825	140,654,825
F4. Third Prior Year	76,872,884	101,240,155	101,240,155	101,240,155	101,240,155
F5. Total Recognized Investment Gain	486,550,827	487,668,594	386,428,439	245,773,614	77,990,651
G. Actuarial Value End of Year:					
(A. + D4. + E3. + F5.)	6,571,667,403	7,518,600,241			
H. Difference Between Market & Actuarial Value					
I. Health Care Valuation Assets	885,898,692	710,192,700	323,764,261	77,990,647	(3)
J. Present Value of HB 284 and 204 Contributions	160,308,371	187,969,874			
K. Basic Benefits Valuation Assets: G. - I. + J.	1,289,860	1,061,510			
L. Rate of Return	6,412,648,892	7,331,691,877			
	16.87%	15.72%			

BASIC BENEFITS

1. Basic Life Insurance: \$100,000

2. Accidental Death and Dismemberment (AD&D): \$100,000

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 Age	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 on the following page.

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 months
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, 1999 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 65, 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, 1999 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	\$3,468,662,823
Monthly benefits and refunds to present inactive members, including Medicare Part-B supplement	162,811,348
Service allowances to present active members	3,408,125,091
Disability allowances to present active members	395,910,234
Death-after-retirement benefit (\$1,000) on behalf of present active members	5,481,855
Survivor benefits on behalf of present active members who die before retiring	53,160,953
Medicare Part-B supplement	55,894,079
Refunds of member contributions of present active members	<u>(15,143,642)</u>
Benefits for present active members	3,903,428,570
Entry Age Liabilities for Present Covered Persons	7,534,902,741
Valuation Assets	<u>7,331,691,877</u>
Liabilities to be Covered by Future Contributions	203,210,864

The Employer Contribution Rate for Basic Benefits has been established by the Board as normal cost plus a 20-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, 1999

Contributions For	Contributions Expressed as Percents of Payroll
Normal Cost:	
Service allowances	9.48%
Disability allowances	2.29
Survivor benefits (SB Fund)	0.27
\$1,000 death benefit	0.03
Medicare Part-B Supplement	0.20
Total	12.27%
Member Contributions:	9.00%
Less: Future refunds	1.48
Available for allowances	7.52%
Employer Normal Cost	4.75%
Unfunded Accrued Liabilities	
Minimum level % financing	0.42%
Additional amount to fund over 20 years	0.38
Total	0.80%
EMPLOYER CONTRIBUTION RATE ALLOCATED TO BASIC BENEFITS	5.55%

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)

June 30	Computed Actuarial Accrued Liabilities			Valuation Assets	Portion of Accrued Liabilities Covered by Assets		
	(1) Member Contributions	(2) Retired Lives	(3) Present Members (Employer Financed Portion)		(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
1999	1,341	3,469	2,725	7,332	100	100	93

* Revised assumptions.

Legislated benefit increases.

@ Revised asset valuation method.

School Employees Retirement System of Ohio
Supplemental Disclosure Information
June 30, 1999

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, 1999. 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, 1999, the unfunded actuarial accrued liability of the plan was determined as follows:

Actuarial Accrued Liability

Active members	\$3,903,428,570
Retirees and survivors currently receiving benefits	3,468,662,823
Terminated members not yet receiving benefits, including re-employed retirants	<u>162,811,348</u>
Total Actuarial Accrued Liability	7,534,902,741
Actuarial Value of Assets	<u>7,331,691,877</u>
Unfunded Actuarial Accrued Liability	<u>\$ 203,210,864</u>

During the year ended June 30, 1999, the plan experienced a net change of \$497,453,909 in the actuarial accrued liability. Of the change, \$70,384,163 was attributable to a change in actuarial assumptions and/or methods.

School Employees Retirement System of Ohio

Supplemental Disclosure Information

June 30, 1999

(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 20 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, 1999.

During the year ended June 30, 1999 contributions totaling \$313,253,432 -- \$146,084,871 employer, \$166,864,847 employee and \$303,714 from the State -- were made in accordance with contributions determined by State Statute. The employer contributions consisted of \$84,080,853 for normal cost and \$62,004,018 for amortization of the unfunded actuarial accrued liability. Employer contributions represented 8.84% 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	100
1999-00	1999	98,148,589	

School Employees Retirement System of Ohio

Supplemental Disclosure Information

June 30, 1999

(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)
6/30/91#	\$3,015,432	\$4,346,128	69.4%	\$1,330,696	\$1,176,203	113.1%
6/30/92	3,331,392	4,693,284	71.0	1,361,892	1,244,301	109.5
6/30/93	3,672,662	5,051,534	72.7	1,378,872	1,312,700	105.0
6/30/94	3,951,856	5,381,465	73.4	1,429,609	1,360,887	105.0
6/30/95@	4,310,487	5,839,027	73.8	1,528,540	1,429,559	106.9
6/30/96#*	4,777,498	6,128,781	78.0	1,351,283	1,475,873	91.6
6/30/97*	5,521,248	6,504,638	84.9	983,390	1,551,609	63.4
6/30/98^	6,412,649	7,037,449	91.1	624,800	1,651,883	37.8
6/30/99+	7,331,692	7,534,903	97.3	203,211	1,768,098	11.5

After change in actuarial assumptions.

* After change in asset method.

^ After change in benefit provisions.

@ Includes Medicare Part B Supplement for this year and future years.

+ After change in method.

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

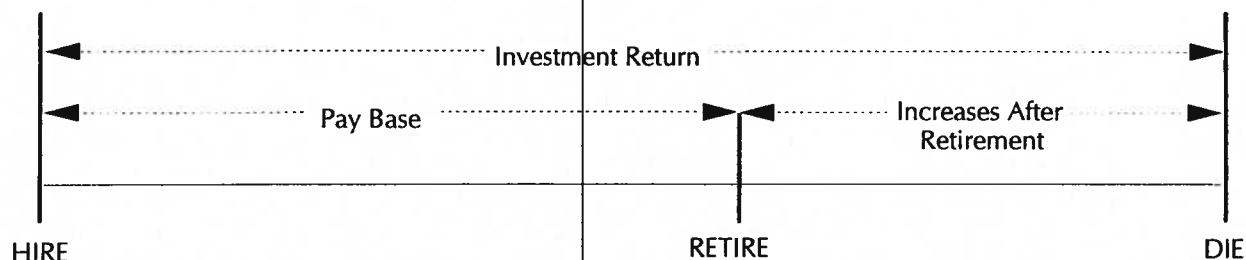
Schedule 16.

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



Investment Return

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

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.

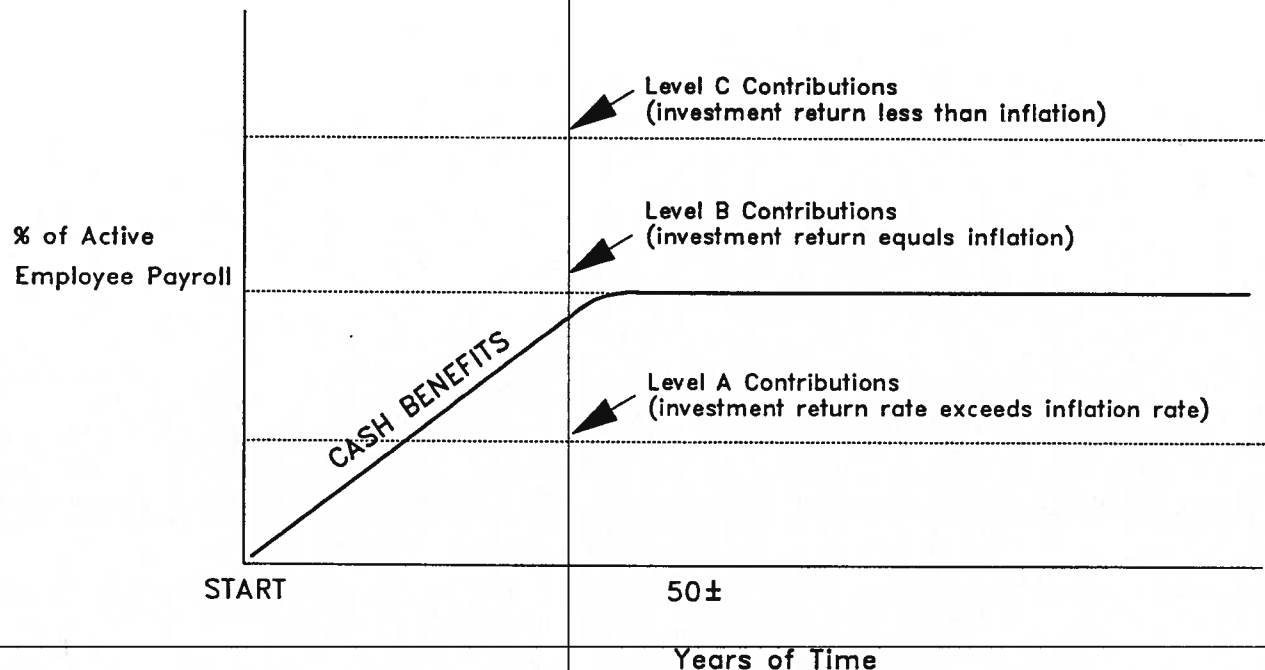
Increases After Retirement

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.

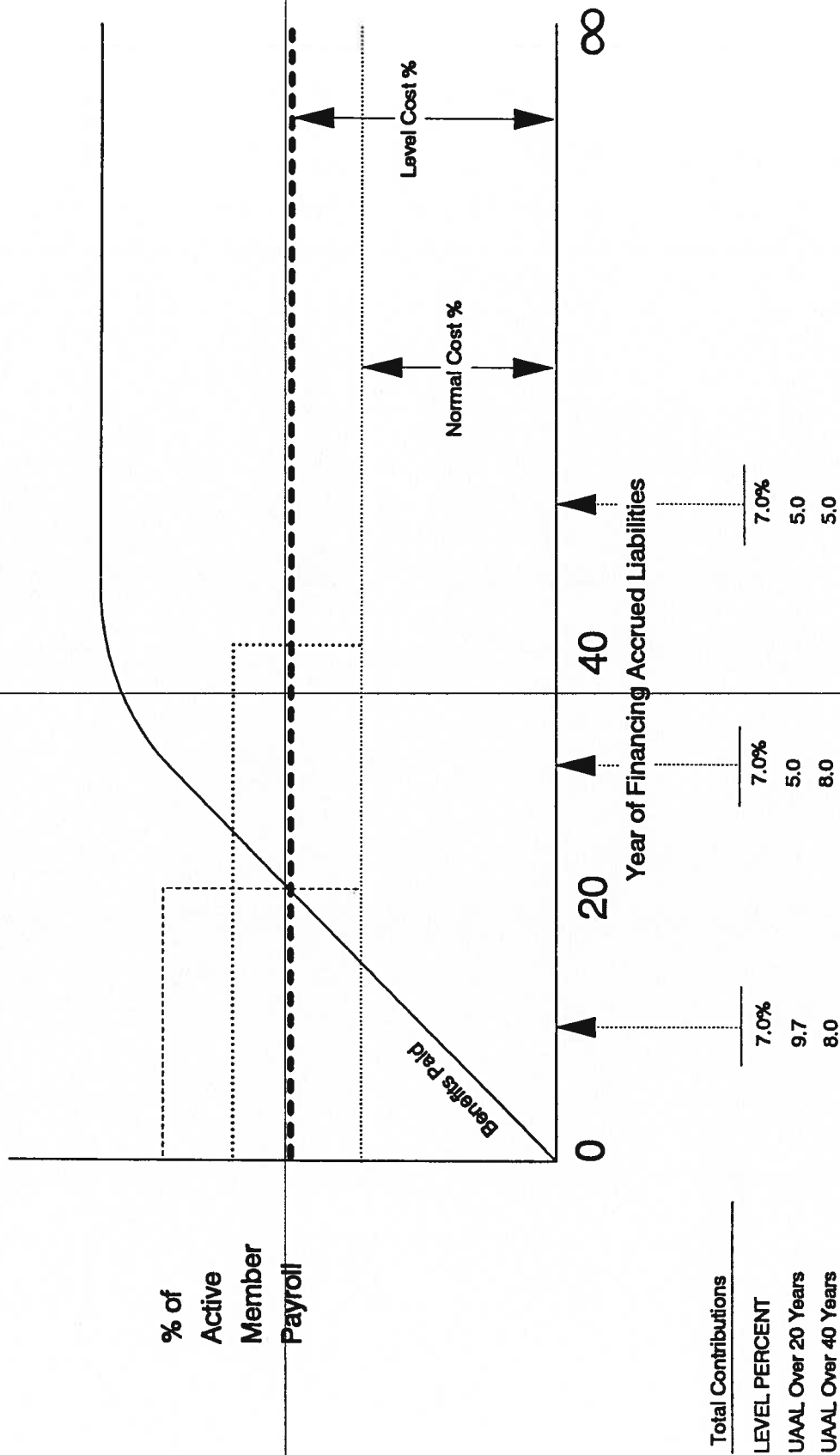
Who would contribute at a rate always more than the benefits paid?

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

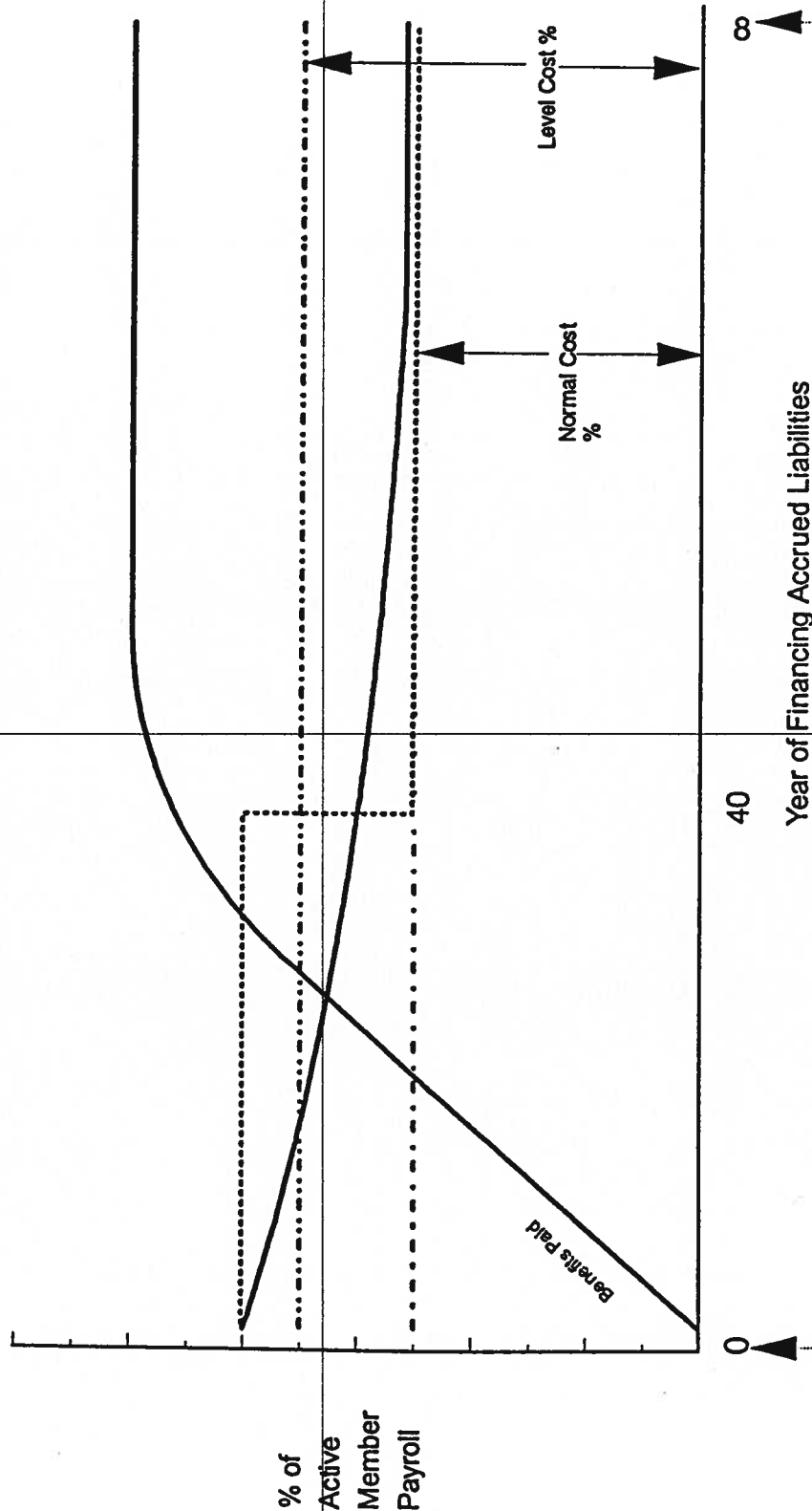


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TOTAL CONTRIBUTIONS FOR RETIREMENT BENEFITS

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%
UAAL: 40 Years Closed	8.0
UAAL: 40 Years Open	8.0

7.0%
5.0
5.0

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Basic Series

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

Year-by-Year Total Returns (1926-1998)

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	43.38	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	5.28	1.70
1998	28.58	-7.31	10.76	13.06	10.21	4.86	1.61

GABRIEL, ROEDER, SMITH & COMPANY from SBBi 1999 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)		Stocks (S & P 500)	Sample Fund		
			US Treasury	Corporate (Sol. Bro)		A	B	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
30/1998	5.2	1.5	3.7	3.7	7.1	4.8	5.4	5.9

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?

