

OHIO SCHOOL EMPLOYEES RETIREMENT SYSTEM

The Report of the  
ANNUAL ACTUARIAL VALUATION  
June 30, 1981

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Report of Actuarial Valuation of Ohio SERS

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June 1, 1982

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

Ladies and Gentlemen:

Submitted in this report are the results of the June 30, 1981 actuarial valuation of the Ohio School Employees Retirement System, as amended.

The necessary statistical data on which the valuation was based was furnished by your Director and his staff.

Their cooperation in furnishing the materials needed for this valuation is acknowledged with appreciation.

The actuarial assumptions used in making the valuation are shown in the Appendix of this report. The non-economic assumptions are from the June 30, 1980 revised actuarial valuation, and the economic assumptions were established for the June 30, 1981 actuarial valuation.

Your attention is directed particularly to:

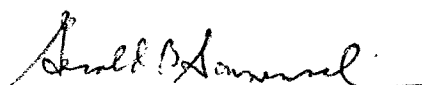
Computed Employer Contribution Rates on page 25;

Financial Principles on pages 4 through 7;

Solvency Tests on page 28;

COMMENTS on pages 3A - 3C.

Respectfully submitted,

  
Gerald B. Sonnenschein

  
Richard G. Roeder

GBS:jmw

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.

SERS Status. Based upon the results of the June 30, 1981 actuarial valuation, the general financial objective of level-contribution-percent financing will be satisfied if future financial experiences are as assumed.

Investment return and employee pay increases are particularly important risk areas.

Gain/Loss Annual Analysis. To keep closer watch of the relationship between actual experience and assumed experience in each major risk area, an annual Gain/Loss Analysis is being established. This program intends to provide annual information about experience in an understandable form.

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Health Care Benefits. The financial development of this program is cause for concern.

Initially, beginning in 1974, 0.75% was the contribution rate established for Health Care Benefits, and included in a total Employer Rate of 12.50%. Health Care contribution rates have been increased at various times since 1974.

This 1981 valuation produced a Health Care contribution rate of 4.91%, to be included in the same total Employer Rate of 12.50%.

The more contributions needed for Health Care, the less contributions available for basic retirement benefits.

Future adjustments to Health Care benefits and/or contributions are likely in order to have the program under better control.

Inflation continues to be the most threatening outside force to SERS stability (and every other public or private pension plan). For retired people, the purchasing power of their monthly benefit is reduced. Liabilities for non-retired members increase because member pay levels are increased. These inflation impairments have been covered only partially by the added investment return available from our inflated economy.

<u>Year</u> <u>Ended 6-30</u>	<u>Inflation</u> <u>(CPI)</u>	<u>Investment Return</u> <u>(Of Total Fund)</u> <u>Equal to a REAL</u> <u>RETURN OF 3% Annually</u>
1977	6.9%	9.9%
1978	7.4	10.4
1979	10.9	13.9
1980	14.3	17.3
1981	9.6	12.6

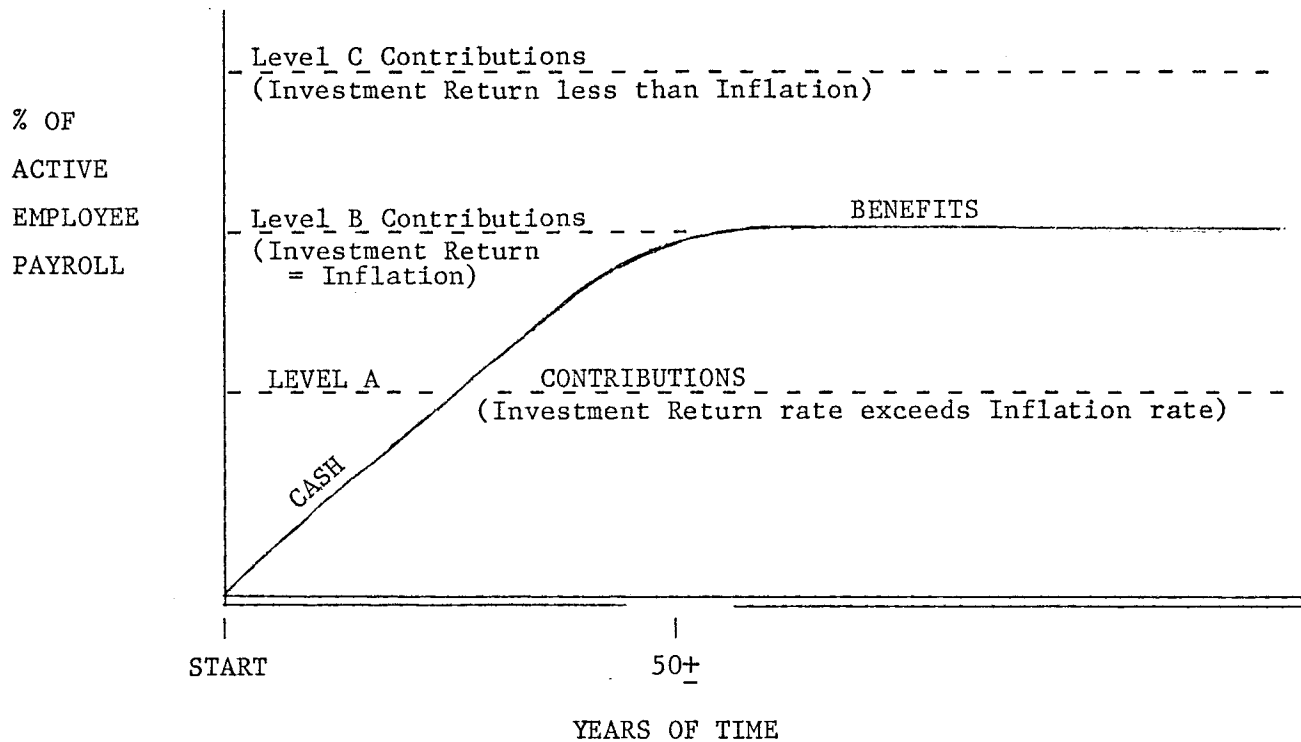
For the mathematics of level cost financing to work, the investment return rate must be more than the inflation rate. This has not been possible in recent years, because of the disturbances in the investment market places caused by inflation. The destructiveness of inflation is immense. Inflation is the enemy over which SERS has no direct control.

<u>Type of Activity</u>	<u>The Investment Universe</u>		
	<u>Annual Return Over Last</u> <u>Five</u> <u>Years</u>	<u>Annual Return Over Last</u> <u>Ten</u> <u>Years</u>	<u>10 YEAR</u> <u>REAL</u> <u>RETURN</u>
Bank Bond Fund Yardstick	2.9%	4.8%	-3.7%
Salomon Brothers Long-Term Bonds	-1.4	2.4	-6.1
Consumer Price Index (Inflation)	10.0	8.5	
Total Equity Yardstick	10.2	5.4	-3.1
Standard & Poor's 500 Stocks	8.8	6.6	-1.9

(Information from reports of Hamilton, Johnston & Co., Inc., N.Y.C.)

THE EFFECT ON LEVEL CONTRIBUTION RATES  
OF THE RELATIONSHIP BETWEEN INVESTMENT RETURN & INFLATION

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"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?

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 byproduct 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 byproduct 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 him, the actuary determines the contribution rates to support the benefits, by means of an actuarial valuation and a funding method.

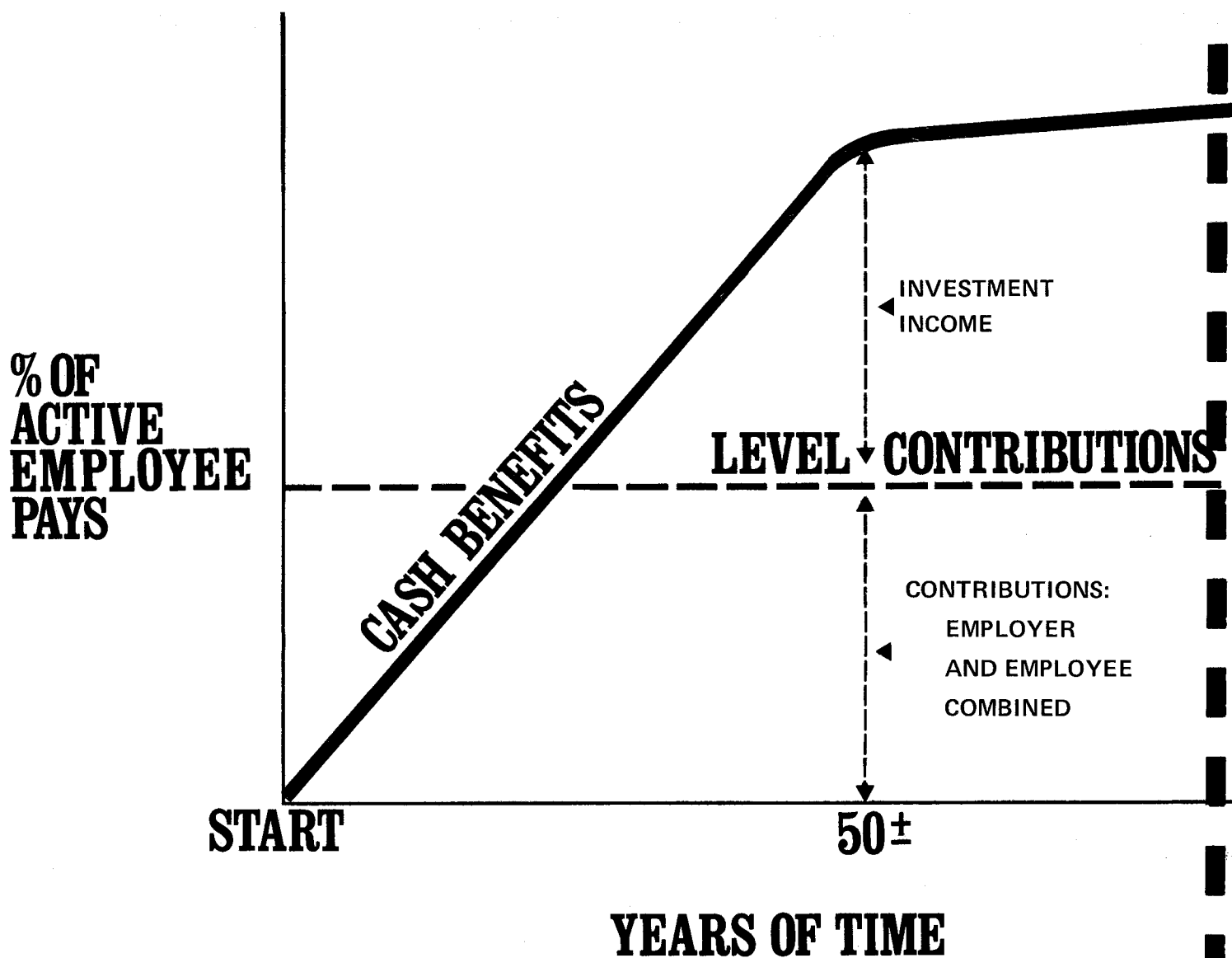
An actuarial valuation has a number of ingredients such as: the rate of investment return which plan assets will earn; the rates of withdrawal of active members who leave covered employment before qualifying for any monthly benefit; the rates of mortality; the rates of disability; the rates of pay increases; 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.





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

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

- Rates of withdrawal of active members (turnover);
- Rates of mortality;
- Rates of disability;
- Ages at actual retirement;
- Rates of pay increase;
- Investment income;
- Change in active member group size.

THE ACTUARIAL VALUATION PROCESS

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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.

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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

School Employees Retirement System of Ohio

Outline of Benefit Eligibility and Amounts

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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. A retiring member's service allowance is equal to total Ohio service credit times the greater of \$86, or 2.0% of FAS. The allowance is then adjusted by factors based on attained age or years of service as determined in the following schedule:

<u>Attained Birthday</u>	OR	<u>Years of Total Service Credit</u>	<u>Percentage of Base Amount</u>
58		25	75%
59		26	80
60		27	85
61		28	88
62		29	90
63		30	91
64		31	94
65		32	95
		33	97
		34 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, but before attaining age 60, a member will receive a disability allowance 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. Maximum allowance is 75% of FAS, minimum allowance is 30% of FAS.

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 62.

(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 \$500 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 recomputed to be equal to the initial allowance increased by 3.0% for each completed year of retirement. The maximum recomputed allowance equals the initial allowance adjusted for increases in the Consumers Price Index. The minimum recomputed allowance equals the initial allowance.

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.

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Health Care Insurance. Health insurance premiums are paid on behalf of each individual receiving a monthly allowance from SERS. Spouses and children may be covered. If the retirant or survivor elects to cover his dependents, the monthly retirement allowance is reduced by approximately one-half the premium for dependent coverage.

Medicare Part B. Each retirant or survivor is reimbursed for Part B Medicare premiums.

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Member contributions. Each member contributes 8% of his pay, by payroll deductions. 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.

Employer contributions. Each employer contributes the remaining amount necessary to finance SERS benefits. Employer contributions are expressed as percent of member covered payroll. The maximum statutory rate is 14%.

Retired members and survivors included in the valuation totaled 30,519. The 28,435 retirants and beneficiaries as of June 30, 1981 were receiving annual benefits totaling \$62,776,287 from the Annuity and Pension Reserve Fund. The 2,084 survivors as of June 30, 1981 were receiving annual benefits totaling \$4,475,051 from the Survivor Benefit Fund.

Schedule 1.

Annuity and Pension Reserve Fund

Retirants and Beneficiaries June 30, 1981

Type of Benefit, Annual Amount and Actuarial Liabilities

<u>Group</u>	<u>Number</u>	<u>% of Current Total \$</u>			<u>Current Total \$</u>	<u>Actuarial Liabilities*</u>
		<u>Base Allowances</u>	<u>H.B. 204 and 284</u>	<u>Post-Retire. Pension Increases</u>		
<u>SUPERANNUATION RETIREMENT</u>						
Straight Life Allowance - Benefit Terminating at Death						
Men	5,075	86.8%	3.8%	9.4%	\$12,768,881	\$104,717,073
Women	12,685	87.0	3.9	9.1	22,989,797	237,940,738
Totals	17,760				35,758,678	342,657,811
Option 1 and 2 Allowances - Joint and Survivor Benefits						
Men	3,780	91.9	1.4	6.7	11,676,128	139,531,054
Women	1,807	92.3	1.3	6.4	3,229,794	40,546,644
Totals	5,587				14,905,922	180,077,698
Option 3 Allowance - Life Benefits With Guaranteed Periods						
Men	631	91.1	1.1	7.8	1,723,892	17,333,968
Women	577	91.7	1.1	7.2	982,202	11,720,803
Totals	1,208				2,706,094	29,054,771
Allowance to Survivor Beneficiary of Deceased Superannuation Retirant Who Elected Option 1, or 2 - Life Benefit						
Men	104	80.9	7.4	11.7	131,257	1,052,223
Women	1,353	78.6	9.5	11.9	2,484,476	21,620,579
Totals	1,457				2,615,733	22,672,802
Allowance to Survivor Beneficiary of Deceased Superannuation Retirant Who Elected Option 3 - Guaranteed Period Only						
Men	28	89.8	1.5	8.7	34,216	141,558
Women	148	87.3	2.2	10.5	303,652	1,029,522
Totals	176				337,868	1,171,080

\* Includes effect of H.B. 126

(Schedule 1 completed on page 13)

Schedule 1. - completed

Annuity and Pension Reserve Fund

Retirants and Beneficiaries June 30, 1981

Type of Benefit, Annual Amount and Actuarial Liabilities

<u>Group</u>	<u>Number</u>	<u>% of Current Total \$</u>			<u>Current Total \$</u>	<u>Actuarial Liabilities*</u>
		<u>Base Allowances</u>	<u>H.B. 204 and 284</u>	<u>Post-Retire. Pension Increases</u>		
Total for Superannuation Allowances Being Paid						
Men	9,618	89.1%	2.6%	8.3%	\$26,334,374	\$262,775,876
Women	16,570	87.1	4.0	8.9	29,989,921	312,858,286
Totals	26,188				56,324,295	575,634,162

DISABILITY RETIREMENT

Straight Life Allowance - Benefit Terminating at Death

Men	996	90.4	1.8	7.8	3,747,126	38,513,727
Women	1,251	90.1	2.2	7.7	2,704,866	30,332,309
Totals	2,247				6,451,992	68,846,036

TOTAL BENEFITS BEING PAID FROM ANNUITY AND PENSION RESERVE FUND

Men	10,614	89.3	2.5	8.2	30,081,500	301,289,603
Women	17,821	87.3	3.8	8.9	32,694,787	343,190,595
Totals	28,435				62,776,287	644,480,198

\* Includes effect of H.B. 126



Schedule 2.

Annuity and Pension Reserve Fund

Retirants June 30, 1981

Current Annual Total \$ By Attained Ages

Attained Ages	Superannuation		Disability		Totals	
	No.	Annual Total \$	No.	Annual Total \$	No.	Annual Total \$
30-34		\$	5	\$ 30,741	5	\$ 30,741
35-39			30	144,017	30	144,017
40-44			67	302,760	67	302,760
45-49	4	34,778	133	527,935	137	562,713
50-54	54	451,027	320	1,075,617	374	1,526,644
55-59	267	1,686,354	547	1,727,082	814	3,413,436
60-64	3,860	8,664,350	658	1,671,172	4,518	10,335,522
65-69	7,342	15,627,324	309	625,241	7,651	16,252,565
70-74	6,129	12,605,360	115	217,354	6,244	12,822,714
75-79	3,772	7,573,551	52	104,406	3,824	7,677,957
80-84	1,807	3,748,391	9	16,030	1,816	3,764,421
85-89	967	2,103,016	2	9,637	969	2,112,653
90-94	298	715,298			298	715,298
95-99	55	161,245			55	161,245
Totals	24,555	\$53,370,694	2,247	\$6,451,992	26,802	\$59,822,686

Schedule 3.

Annuity and Pension Reserve Fund

Beneficiaries June 30, 1981

Current Annual Total \$ By Attained Ages

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Attained Ages	Life Annuities		Periods Certain		Totals	
	No.	Annual Total \$	No.	Annual Total \$	No.	Annual Total \$
15-19	1	\$ 4,684		\$	1	\$ 4,684
40-44	1	350			1	350
50-54	3	11,384			3	11,384
55-59	10	36,962			10	36,962
60-64	37	77,949	8	13,276	45	91,225
65-69	191	336,200	43	100,704	234	436,904
70-74	327	532,807	66	117,228	393	650,035
75-79	387	656,034	52	95,193	439	751,227
80-84	251	462,507	7	11,467	258	473,974
85-89	147	285,594			147	285,594
90-94	74	138,245			74	138,245
95-99	27	70,554			27	70,554
99-100	<u>1</u>	<u>2,463</u>	<u>—</u>	<u>—</u>	<u>1</u>	<u>2,463</u>
Totals	1,457	\$2,615,733	176	\$337,868	1,633	\$2,953,601

Schedule 4.

Survivor Benefit Fund  
Beneficiaries June 30, 1981

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<u>Group</u>	<u>Number</u>	<u>% of Current Total \$</u>			<u>Current Total \$</u>	<u>Actuarial Liabilities*</u>
		<u>Basic Allowances</u>	<u>H.B. 204 and 284</u>	<u>Post-Retire. Increases</u>		
Men	387	93.4%	0.5%	6.1%	\$ 673,337	\$ 6,721,984
Women	1,697	87.9	1.9	10.2	3,801,714	42,626,920
Totals	2,084				\$4,475,051	\$49,348,904

\* Includes effect of H.B. 126

Schedule 5.

Survivor Benefit Fund

Beneficiaries June 30, 1981

By Attained Ages

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<u>Attained Ages</u>	<u>No.</u>	<u>Annual Allowances</u>
15-19	20	\$ 55,197
20-24	4	12,279
25-29	5	15,142
30-34	3	14,229
35-39	6	24,960
40-44	4	13,236
45-49	20	63,834
50-54	72	226,751
55-59	181	441,360
60-64	337	776,351
65-69	521	993,191
70-74	393	729,565
75-79	297	593,441
80-84	135	301,300
85-89	67	170,097
90-94	17	40,246
95-99	<u>2</u>	<u>3,872</u>
Totals	2,084	\$4,475,051

Active members included in the valuation totaled 102,908, involving an annual payroll totaling \$655,572,474. A small number of the records we received were incomplete and, therefore, are not included in the following tables. You will note, therefore, that all tables except for members by pay include 102,746 members with a payroll of \$655,483,198.

Active Members in Valuation June 30, 1981

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<u>Groups</u>	<u>Number</u>	<u>Annual Payroll</u>	<u>Average Pay</u>
Men	28,929	\$266,173,078	\$9,201
Women	<u>73,817</u>	<u>389,310,120</u>	<u>5,274</u>
Totals	102,746	\$655,483,198	\$6,380

Also included in the valuation were 6,788 inactive members eligible for deferred retirement allowances, and 99,062 inactive members eligible for a contribution refund only.

Schedule 6.

Ohio School Employees Retirement System  
 Female Active Members as of June 30, 1981  
 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	665							665	\$ 2,737,137
20-24	3,288	167						3,455	17,612,008
25-29	4,173	614	87					4,874	24,574,632
30-34	7,343	1,136	252	33				8,764	37,661,641
35-39	7,918	2,611	588	73	15			11,205	49,372,384
40-44	5,731	3,684	1,828	195	45	17		11,500	59,302,314
45-49	3,822	3,273	2,680	653	87	29	10	10,554	58,984,208
50-54	2,734	2,475	2,889	1,329	357	75	21	9,880	58,634,234
55-59	1,718	1,777	2,401	1,605	657	155	36	8,349	52,109,089
60	195	212	309	224	128	46	7	1,121	7,425,828
61	165	157	205	176	74	39	8	824	5,259,276
62	103	133	197	132	92	33	5	695	4,734,786
63	89	96	141	90	60	40	8	524	3,291,727
64	72	63	99	74	41	13	13	375	2,288,222
65	64	55	59	57	35	19	6	295	1,638,171
66	44	32	61	47	27	16	2	229	1,260,880
67	35	31	46	28	18	15	2	175	977,876
68	28	15	40	27	18	3		131	635,432
69	26	10	11	11	9	3	3	73	354,555
70 & Over	49	24	32	9	10	2	3	129	455,720
<b>Totals</b>	<b>38,262</b>	<b>16,565</b>	<b>11,925</b>	<b>4,763</b>	<b>1,673</b>	<b>505</b>	<b>124</b>	<b>73,817</b>	<b>\$389,310,120</b>

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

Age: 43.0 years.

Service: 6.3 years.

Annual Pay: \$5,274.

Schedule 7.

Ohio School Employees Retirement System

Male Active Members as of June 30, 1981

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	732							732	\$ 3,428,214
20-24	3,148	186						3,334	22,536,354
25-29	2,910	650	78					3,638	27,851,174
30-34	2,366	661	270	13				3,310	26,916,967
35-39	1,573	472	310	127	17			2,499	21,019,811
40-44	1,342	524	366	258	109	18		2,617	24,202,440
45-49	1,070	590	451	285	220	93	6	2,715	28,452,207
50-54	1,063	655	591	358	273	175	48	3,163	34,517,136
55-59	1,048	720	592	431	363	216	104	3,474	40,467,201
60	171	154	115	92	83	40	22	677	8,182,877
61	127	117	100	85	53	35	23	540	6,389,992
62	126	98	92	61	53	28	20	478	5,523,663
63	105	73	74	67	38	27	18	402	4,398,520
64	83	65	60	55	27	30	11	331	3,624,348
65	71	47	36	27	24	15	9	229	2,237,206
66	64	41	41	13	17	11	8	195	1,888,303
67	64	17	30	23	21	8	6	169	1,522,161
68	46	24	19	18	14	3	6	130	1,215,782
69	30	19	7	11	6	2	1	76	595,688
70 & Over	102	61	29	10	14	3	1	220	1,203,034
<b>Totals</b>	<b>16,241</b>	<b>5,174</b>	<b>3,261</b>	<b>1,934</b>	<b>1,332</b>	<b>704</b>	<b>283</b>	<b>28,929</b>	<b>\$266,173,078</b>

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

Age: 41.6 years.

Service: 6.7 years.

Annual Pay: \$9,201.

Schedule 8.

Ohio School Employees Retirement System

Active Members as of June 30, 1981

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	1,397							1,397	\$ 6,165,351
20-24	6,436	353						6,789	40,148,362
25-29	7,083	1,264	165					8,512	52,425,806
30-34	9,709	1,797	522	46				12,074	64,578,608
35-39	9,491	3,083	898	200	32			13,704	70,392,195
40-44	7,073	4,208	2,194	453	154	35		14,117	83,504,754
45-49	4,892	3,863	3,131	938	307	122	16	13,269	87,436,415
50-54	3,797	3,130	3,480	1,687	630	250	69	13,043	93,151,370
55-59	2,766	2,497	2,993	2,036	1,020	371	140	11,823	92,576,290
60	366	366	424	316	211	86	29	1,798	15,608,705
61	292	274	305	261	127	74	31	1,364	11,649,268
62	229	231	289	193	145	61	25	1,173	10,258,449
63	194	169	215	157	98	67	26	926	7,690,247
64	155	128	159	129	68	43	24	706	5,912,570
65	135	102	95	84	59	34	15	524	3,875,377
66	108	73	102	60	44	27	10	424	3,149,183
67	99	48	76	51	39	23	8	344	2,500,037
68	74	39	59	45	32	6	6	261	1,851,214
69	56	29	18	22	15	5	4	149	950,243
70 & Over	151	85	61	19	24	5	4	349	1,658,754
<b>Totals</b>	<b>54,503</b>	<b>21,739</b>	<b>15,186</b>	<b>6,697</b>	<b>3,005</b>	<b>1,209</b>	<b>407</b>	<b>102,746</b>	<b>\$655,483,198</b>

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

Age: 42.6 years.

Service: 6.4 years.

Annual Pay: \$6,380.



Schedule 9.

Active Members as of June 30, 1981 by Annualized Pay

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<u>Annualized Pay</u>	<u>Number of Active Members</u>		
	<u>Men</u>	<u>Women</u>	<u>Total</u>
Less than \$1,000	2,875	7,625	10,500
\$1,000 but less than \$2,000	1,714	8,180	9,894
\$2,000 but less than \$3,000	1,747	7,033	8,780
\$3,000 but less than \$4,000	1,654	7,405	9,059
\$4,000 but less than \$5,000	1,745	9,175	10,920
\$5,000 but less than \$6,000	1,641	8,766	10,407
\$6,000 but less than \$7,000	1,183	6,065	7,248
\$7,000 but less than \$8,000	905	4,220	5,125
\$8,000 but less than \$9,000	870	3,273	4,143
\$9,000 but less than \$10,000	1,055	3,339	4,394
\$10,000 but less than \$12,000	3,678	4,664	8,342
\$12,000 but less than \$14,000	3,863	2,578	6,441
\$14,000 but less than \$16,000	2,321	786	3,107
\$16,000 but less than \$18,000	1,385	388	1,773
\$18,000 but less than \$20,000	899	185	1,084
\$20,000 but less than \$25,000	872	161	1,033
\$25,000 but less than \$30,000	336	39	375
\$30,000 and over	<u>268</u>	<u>15</u>	<u>283</u>
Totals	29,011	73,897	102,908

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

Schedule 10.

Actuarial Accrued Liabilities June 30, 1981

<u>Future System Payments</u>	<u>Actuarial Accrued Liabilities</u>
Service annuities likely to be paid present active members	\$ 799,361,542
Disability annuities likely to be paid present active members who become permanently disabled	17,753,618
Survivor annuities likely to be paid to widows and children of present active members who die before retiring	23,548,078
Probable refunds of member contributions	11,077,225
\$500 death benefits likely to be paid for death after retirement	1,573,570
Pending refunds and deferred annuities likely to be paid to members currently inactive	30,285,765
Annuities to retirants and survivors in payment status	713,075,201
Health care premiums likely to be paid for active, inactive and retired members	<u>428,071,094</u>
Totals	\$2,024,746,093

REPORTED ASSETS

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The accrued assets at June 30, 1981 were reported to be \$1,087,493,987.

Fund	Amount
Employees' Savings Fund	\$ 298,254,671
Employers Trust Fund	12,029,542
Annuity and Pension Reserve	690,852,661
Survivors Benefit Fund	72,440,745
Present Value of future State Contributions for House Bills 284 and 204	13,916,368
Total	\$1,087,493,987

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Schedule 11.

ACTUARIAL ACCRUED LIABILITIES: COMPUTED & UNFUNDED

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	Basic Benefits	Health Care	TOTAL
Computed accrued liabilities	\$1,596,674,999	\$428,071,094	\$2,024,746,093
Reported assets	1,016,700,882	70,793,105	1,087,493,987
Unfunded Accrued Liabilities	\$ 579,974,117	\$357,277,989	\$ 937,252,106

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Unfunded actuarial liabilities, \$937,252,106, were amortized over a period of years sufficient to produce the total Employer Contribution Rate of 12.50% of payroll. The amortization period was computed to be 43 years (next whole year).

Schedule 12.

COMPUTED EMPLOYER CONTRIBUTION RATE

June 30, 1981

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<u>Item</u>	<u>Contributions Expressed as Percents of Payroll</u>	
	<u>Health &amp; Medicare Premiums</u>	<u>Total</u>
Current cost:		
Service allowances		9.06%
Disability allowances		.58
Survivor benefits (SB Fund)		.42
\$500 death benefit		.03
Health & Medicare Premiums	2.70%	<u>2.70</u>
Total		12.79
Member contributions:		8.00
Less: Future refunds		<u>1.91</u>
Available for annuities		6.09
		<hr/>
Employer Current Cost	2.70	6.70
Unfunded Accrued Liabilities:		
(43 year amortization)	<u>2.21</u>	<u>5.80</u>
COMPUTED EMPLOYER CONTRIBUTIONS	<u>4.91%</u>	<u>12.50%</u>

MEANING OF "UNFUNDED ACCRUED LIABILITIES"

Almost every pension plan (public or private) has "unfunded accrued liabilities", so whatever they are, they aren't rare. Since the term is not part of everyday conversation, it needs some definition.

"Accrued liabilities" are the present value \$ of plan promises to pay benefits in the future based upon service already rendered --- a liability has been established ("accrued") because the service has been rendered, but the resulting monthly cash benefit may not be payable until years in the future. Accrued liabilities \$ are the result of complex mathematical calculations, which are made annually by the plan's actuary (which is the name given to the specialist who makes such calculations).

If "accrued liabilities" at any time exceed the plan's accrued assets (cash & investments), the difference is "unfunded accrued liabilities". This is the common condition. If the plan's assets equalled the plan's "accrued liabilities", the plan would be termed "fully funded". This is a rare condition.

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Each time a plan adds a new benefit which applies to service already rendered, an "accrued liability" is created, which is also an "unfunded accrued liability" because the plan can't print instant cash to cover the accrued liability. Payment for such unfunded accrued liabilities is spread over a period of years, commonly in the 25-60 year range.

Unfunded accrued liabilities can occur in another way: if actual financial experience is less favorable than assumed financial experience, the difference is added to unfunded accrued liabilities. In plans where plan benefits are directly related to an employee's pay near time of retirement (a common plan provision) rather than his average pay throughout his working career, unfunded accrued liabilities have been increasing in recent years because unexpected rates of pay increase have created additional accrued liabilities which could not be matched by reasonable investment results. Some of these unexpected pay increases are the direct result of inflation, which is a very destructive force on financial stability.

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The existence of unfunded accrued liabilities is not bad, then (any more than a mortgage on your house is "bad"), but the changes from year to year in amount of unfunded accrued liabilities are important --- "bad" or "good" or somewhere in between.

Nor are unfunded accrued liabilities a bill payable immediately (any more than your total mortgage is payable immediately), but it is important that policy-makers prevent the amount from becoming unreasonably high and it is vital that your plan have a sound method for making payments toward them so that they are controlled. The existence of large amounts of unfunded accrued liabilities indicates that total contributions in past years were less than level --- an almost certain history if retired life liabilities are not fully funded now.

UNFUNDED ACTUARIAL ACCRUED LIABILITIES

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Each time the employer adopts a higher level of benefit, unfunded liabilities are created. Level-contribution financing requires that these additional liabilities be financed systematically over a period of future years.

In an inflationary economy the value of dollars is decreasing. This environment results in employee pays increasing in dollar amounts, retirement benefits increasing in dollar amounts, and then, unfunded accrued liabilities increasing in dollar amounts, all at a time when the actual substance of these items may be decreasing. Looking at just the dollar amounts of unfunded accrued liabilities can be misleading. Unfunded accrued liability dollars divided by active employee payroll provides an index which helps understanding. The smaller the ratio of unfunded liabilities to active member payroll, the stronger the system. Observation of this relative index over a period of years will give an indication of whether the system is becoming financially stronger or weaker.

Schedule 13.

Unfunded Actuarial Accrued Liabilities

(\$ in Millions)

<u>June 30</u>	<u>Computed Actuarial Accrued Liabilities</u>	<u>Valuation Assets</u>	<u>Unfunded Actuarial Accrued Liabilities (UAAL)</u>	<u>Active Member Payroll</u>	<u>UAAL ÷ Active Member Payroll</u>
1981*	\$2,025	\$1,088	\$937	\$656	1.43

\* Revised financial assumptions.

SOLVENCY TESTS

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 solvency test.

A short term solvency test is one means of checking a system's progress under its funding program. In a short term solvency 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 14.

Short Term Solvency Test

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<u>June 30</u>	<u>Computed Actuarial Accrued Liabilities</u>			<u>Valuation Assets</u>	<u>Portion of Accrued Liabilities Covered by Assets</u>		
	(1) <u>Member Contr.</u>	(2) <u>Retired Lives</u> (\$ in Millions)	(3) <u>Present Members (Employer Financed Portion)</u>		(1)	(2)	(3)
1981*	\$298	\$959	\$768	\$1,088	100%	82%	0%

\* Revised financial assumptions.

APPENDIX

SUMMARY OF

ASSUMPTIONS USED FOR SERS ACTUARIAL VALUATIONS

Assumptions Adopted by Board of Trustees After Consulting With Actuary

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The actuarial assumptions used in making the valuation are shown in this Appendix of the report. The non-economic assumptions are from the June 30, 1980 revised actuarial valuation, and the economic assumptions were established for the June 30, 1981 actuarial valuation.

The investment return rate used in making the valuations was 7.5% per year, compounded annually (net after administrative expenses). The real rate of return is the portion of total investment return which is more than the inflation rate. Considering other financial assumptions, the 7.5% investment return rate translates to an assumed real rate of return of 3%.

Pay increase assumptions for individual active members are shown for sample ages in Schedule 15. Part of the assumption for each age is for merit and/or seniority increase, and the other 4.5% recognizes inflation.

Total active member payroll is assumed to increase 4.5% annually, which is the portion of the individual pay increase assumptions attributable to inflation.

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

The mortality table, for post-retirement mortality, used in evaluating allowances to be paid was the 1955 American Annuity Table, set ahead 1 year for men and set back 5 years for women. Related values are shown in Schedule 18.



The probabilities of retirement with an age and service allowance are shown in Schedule 17.

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 16.

Special assumptions for the Health Care Coverage are shown in Schedule 19.

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 instalments throughout the employer fiscal year.

Present assets (cash & investments) were valued at cost.

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.

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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 15.

Pay Increase Assumptions for an Individual Member

<u>Sample Ages</u>	<u>Increase Next Year</u>		
	<u>Merit &amp; Seniority</u>	<u>Base (Economy)</u>	<u>Total</u>
20	3.0%	4.5%	7.5%
25	2.7	4.5	7.2
30	2.3	4.5	6.8
35	2.1	4.5	6.6
40	1.8	4.5	6.3
45	1.5	4.5	6.0
50	1.0	4.5	5.5
55	0.5	4.5	5.0
60	0.0	4.5	4.5
65	0.0	4.5	4.5

Schedule 16.

Separations From Active Employment Before Age & Service Retirement

<u>Sample Ages</u>	<u>Percent of Active Members Separating Within the Next Year</u>					
	<u>Men</u>			<u>Women</u>		
	<u>Death</u>	<u>Disability</u>	<u>Other</u>	<u>Death</u>	<u>Disability</u>	<u>Other</u>
20	0.04%	0.00%	13.91%	0.01%	0.00%	11.57%
25	0.05	0.00	10.67	0.02	0.00	8.94
30	0.05	0.01	6.55	0.02	0.00	6.59
35	0.05	0.04	5.43	0.03	0.01	5.82
40	0.07	0.10	4.64	0.04	0.05	5.07
45	0.13	0.18	3.84	0.05	0.08	4.31
50	0.21	0.33	3.06	0.14	0.15	3.55
55	0.43	0.63	2.27	0.23	0.47	2.79
60	0.85	--	2.02	0.32	--	2.46
65	1.11	--	2.02	0.42	--	2.46

Schedule 17.

Rates of Retirement (%) - Men

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<u>Sample Ages</u>	<u>Years of Service</u>		
	<u>30 or more</u>	<u>25-29</u>	<u>Under 25</u>
50	13.5%	-- %	-- %
55	13.5	4.0	--
60	13.5	6.0	6.0
65	32.0	18.0	20.0
70	28.0	28.0	20.0
75	28.0	28.0	20.0
80	100.0	100.0	100.0

Rates of Retirement (%) - Women

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<u>Sample Ages</u>	<u>Years of Service</u>		
	<u>30 or more</u>	<u>25-29</u>	<u>Under 25</u>
50	10.0%	-- %	-- %
55	13.0	7.0	--
60	23.0	15.0	13.0
65	29.0	19.0	19.0
70	29.0	19.0	17.0
75	29.0	19.0	17.0
80	100.0	100.0	100.0

Schedule 18.

Single Life Retirement Values

<u>Sample Attained Ages</u>	<u>Present Value of \$1 Monthly For Life Increasing 3.0% Annually (1st Increase After 1 Year)</u>		<u>Future Life Expectancy (Years)</u>		<u>Expected Total Lifetime</u>	
	<u>Men</u>	<u>Women</u>	<u>Men</u>	<u>Women</u>	<u>Men</u>	<u>Women</u>
	50	\$169.59	\$184.56	27.05	32.39	77.05
55	154.57	172.31	22.79	27.93	77.79	82.93
60	137.64	157.75	18.80	23.62	78.80	83.62
65	119.79	141.13	15.22	19.57	80.22	84.57
70	101.70	123.40	12.07	15.90	82.07	85.90
75	84.10	105.30	9.38	12.66	84.38	87.66
80	67.68	87.55	7.14	9.88	87.14	89.88
85	53.00	70.84	5.32	7.55	90.32	92.55

<u>Sample Attained Ages</u>	<u>Portion of Age 60 Lives Still Alive</u>		<u>\$1,000 Benefit Awarded at Age 60 Increasing 3% Annually</u>
	<u>Men</u>	<u>Women</u>	
60	100%	100%	\$1,000
65	89	96	1,150
70	77	89	1,300
75	62	78	1,450
80	44	64	1,600
85	26	47	1,750

Schedule 19.

Additional Assumptions for Health Care Coverages

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Premium rates:

<u>Status</u>	<u>Monthly Rate</u>
Benefit Recipient below age 65	\$123.69
Spouse below age 65	65.70
Children	19.41
Benefit recipient above age 65 and eligible for Medicare	36.42
Spouse above age 65 and eligible for Medicare	20.21

Availability of Medicare Coverage: All benefit recipients were assumed to be eligible for Medicare on attainment of age 65, or immediately if retired for disability.

Election of Joint and Survivor Benefits: 25% of eligible retirants are assumed to elect a joint and survivor form of payment. Survivors of these retirants will receive fully paid health care for the remainder of their lives.

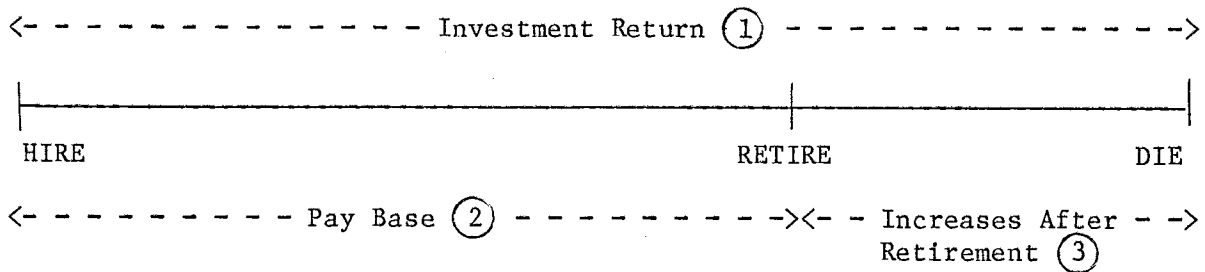
Election of Spouse Health Care Coverage: 25% of retirants are assumed to elect to cover spouses for health care. The System will pay approximately one-half the premium for dependents during the life of the retirant.

Medicare Part B Premium: \$11 per month.

Premium Increases: Premiums are assumed to increase 4.5% annually, which is the portion of the individual pay increase assumptions attributable to inflation.

RELATIONSHIP OF ECONOMIC ASSUMPTIONS  
IN COMPUTING CONTRIBUTIONS TO A RETIREMENT SYSTEM

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- 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. A 1% increase in this assumption, however, does not increase contributions by as much as a 1% increase in Investment Return reduces computed contributions, because the Pay Base assumption operates only over an employee's lifetime to retirement.
- ③ Increases After Retirement. An increase in this element increases computed contributions.

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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 -- significantly.

Where benefits are fixed dollar amounts, computed contributions are significantly reduced if Investment Return is increased.