

OHIO SCHOOL EMPLOYEES RETIREMENT SYSTEM

The Report of the  
ANNUAL ACTUARIAL VALUATION  
June 30, 1982

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Report of Annual Actuarial Valuation of Ohio SERS

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January 5, 1983

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, 1982 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:

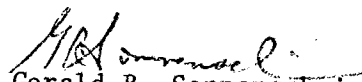
Computed Employer Contribution Rates on page 25;

Financial Principles on pages 6-7;

Solvency Tests on page 28;

COMMENTS on pages 3A - 3C.

Respectfully submitted,

  
Gerald B. Sonnenschein

  
Richard G. Roeder

GBS:jg

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, 1982 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 and health care are particularly important risk areas.

A lengthening of the amortization period (page 24 has detail) indicates a slight weakening of financial strength.

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 1982 valuation produced a Health Care contribution rate of 4.22%, to be included in the same total Employer Rate of 12.50%. The 4.22% is less than the 1981 rate of 4.91%, because of a reduction in Health Care benefits (introduction of an annual deductible).

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.

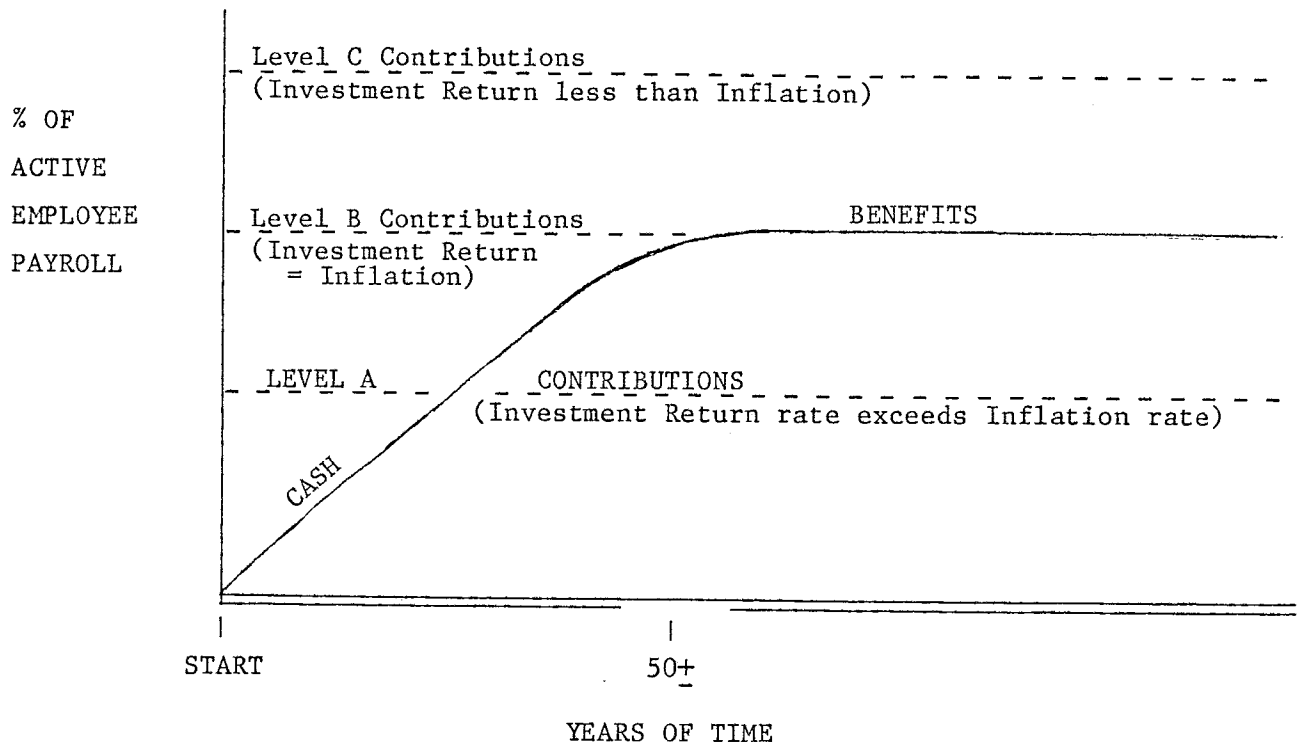
<u>Year Ended 6-30</u>	<u>Inflation (CPI)</u>	<u>Investment Return (Of Total Fund) Equal to a REAL RETURN OF 3% Annually</u>
1978	7.4%	10.4%
1979	10.9	13.9
1980	14.3	17.3
1981	9.6	12.6
1982	7.1	10.1

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 (years ended 8/31/82)</u>		
	<u>Annual Return Over Last</u>		<u>10 YEAR</u>
	<u>Five Years</u>	<u>Ten Years</u>	<u>REAL RETURN</u>
Bank Bond Fund Yardstick	5.7%	6.3%	-2.5%
Salomon Brothers Long-Term Bonds	2.2	4.7	-4.1
Consumer Price Index (Inflation)	9.8	8.8	
Total Equity Yardstick	11.4	4.4	-4.4
Standard & Poor's 500 Stocks	9.8	5.4	-3.4

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

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?

Financial Principles and Operational Techniques of Ohio SERS

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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.

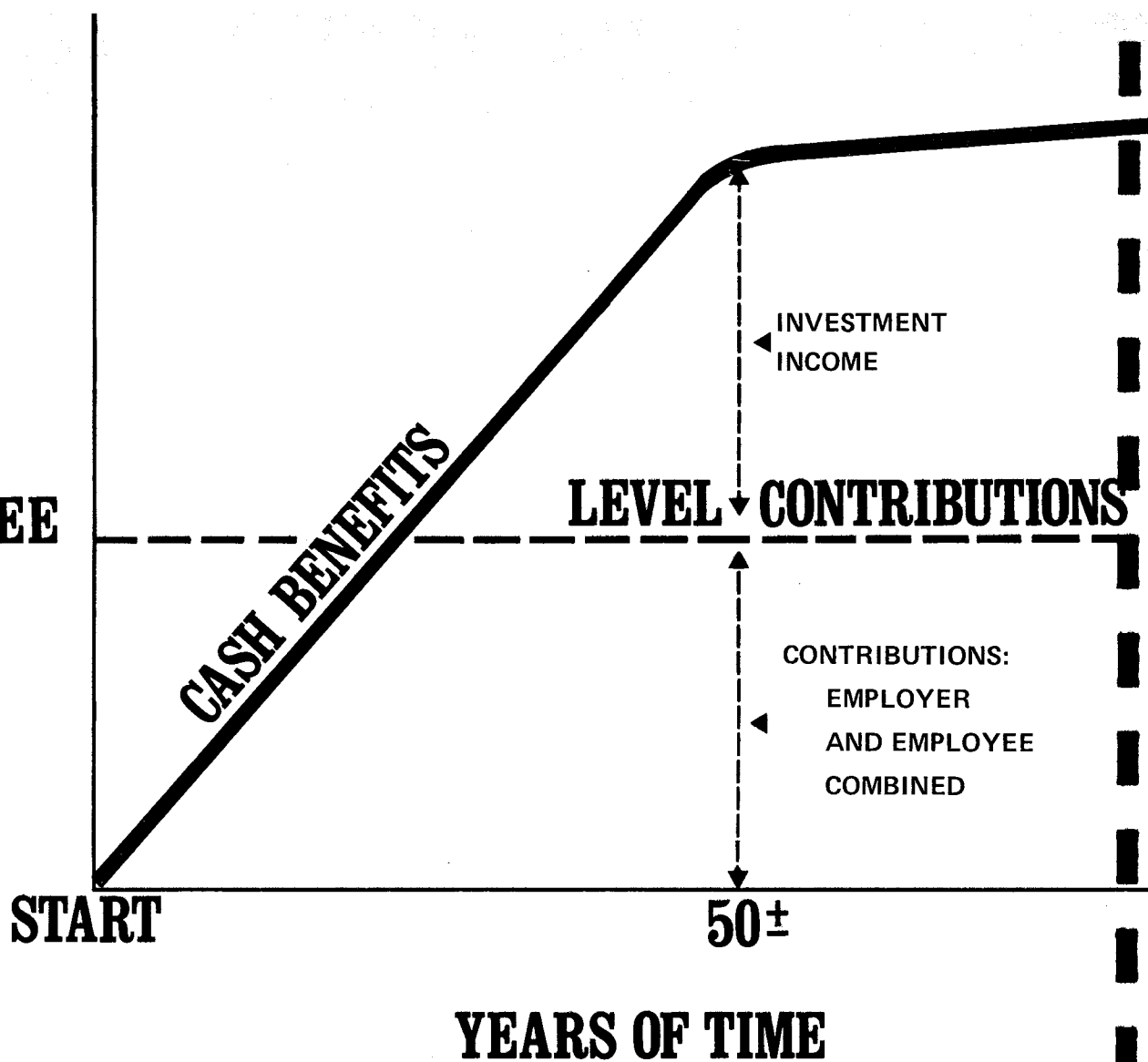
In making an actuarial valuation, assumptions must be made as to what the above rates will be, for the next year and for decades in the future. The assumptions are established by the Retirement Board after consulting with the actuary.

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.



**% OF  
ACTIVE  
EMPLOYEE  
PAYS**



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

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

- 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

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

(outline last changed 6/30/82)

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			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, 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. 10 years of service credit required. 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.

The premiums provide coverages which may be changed from time to time. Effective 1/1/83 an annual deductible was introduced.

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. This rate was established by the Board of Trustees. 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 percents of member covered payroll. The maximum statutory rate is 14%. The present 12.50% employer rate was established by the Board of Trustees.

retired members and survivors included in the valuation totaled 32,875. The 30,318 retirants and survivors of retirants as of July 1, 1982 were receiving annual benefits totaling \$75,657,977 from the Annuity and Pension Reserve Fund. The 2,557 survivors of deceased active members as of July 1, 1982 were receiving annual benefits totaling \$6,384,407 from the Survivor Benefit Fund.

Schedule 1.

Annuity and Pension Reserve Fund

Retirants and Beneficiaries June 30, 1982

Type of Benefit, Annual Amount and Actuarial Liabilities

Group	Number	% of Current Total \$			Current Total \$	Actuarial Liabilities*
		Base Allowances	H.B. 204 and 284	Post-Retire. Increases		
<u>SUPERANNUATION RETIREMENT</u>						
Straight Life Allowance - Benefit Terminating at Death						
Men	6,208	77.8%	3.7%	18.5%	\$15,856,062	\$123,959,052
Women	12,108	80.7	2.5	16.8	25,835,288	262,719,110
Totals	<u>18,316</u>				<u>41,691,350</u>	<u>386,678,162</u>
Option II Allowance - Joint and Survivor Benefits						
Men	4,172	85.7	1.1	13.2	14,502,197	173,289,493
Women	2,053	86.3	0.9	12.8	4,207,721	51,725,831
Totals	<u>6,225</u>				<u>18,709,918</u>	<u>225,015,324</u>
Option III Allowance - Life Benefits With Guaranteed Periods						
Men	1,061	79.8	2.2	18.0	2,974,712	30,315,688
Women	642	80.2	1.8	18.0	1,314,419	14,970,123
Totals	<u>1,703</u>				<u>4,289,131</u>	<u>45,285,811</u>
Allowance to Survivor Beneficiary of Deceased Superannuation Retirant Who Elected Option II - Life Benefit						
Men	126	74.3	5.4	20.3	176,623	1,350,977
Women	1,444	71.3	7.6	21.1	3,024,557	24,736,289
Totals	<u>1,570</u>				<u>3,201,180</u>	<u>26,087,266</u>
Allowance to Survivor Beneficiary of Deceased Superannuation Retirant Who Elected Option III - Guaranteed Period Only						
Men	32	82.2	0.8	17.0	45,949	167,334
Women	121	80.2	1.5	18.3	268,346	743,936
Totals	<u>153</u>				<u>314,295</u>	<u>911,270</u>

\* Includes lump sum death benefit.

Schedule 1. - completed

Annuity and Pension Reserve Fund

Retirants and Beneficiaries June 30, 1982

Type of Benefit, Annual Amount and Actuarial Liabilities

Group	Number	% of Current Total \$			Current Total \$	Actuarial Liabilities*
		Base Allowances	H.B. 204 and 284	Post-Retire. Increases		
Total for Superannuation Allowances Being Paid						
Men	11,599	81.4%	2.4%	16.2%	\$33,555,543	\$329,082,544
Women	16,368	80.5	2.7	16.8	34,650,331	354,895,289
Totals	27,967				68,205,874	683,977,833

DISABILITY RETIREMENT

Straight Life Allowance - Benefit Terminating at Death

Men	1,064	84.9	1.6	13.5	4,327,592	42,870,956
Women	1,287	85.2	1.7	13.1	3,124,511	34,092,835
Totals	2,351				7,452,103	76,963,791

TOTAL BENEFITS BEING PAID FROM ANNUITY AND PENSION RESERVE FUND

Men	12,663	81.8	2.3	15.9	37,883,135	371,953,500
Women	17,655	80.9	2.6	16.5	37,774,842	388,988,124
Totals	30,318				75,657,977	760,941,624

\* Includes lump sum death benefit.



Schedule 2.

Annuity and Pension Reserve Fund

Retirants June 30, 1982

Current Annual Total \$ By Attained Ages

Attained Ages	Superannuation		Disability		Totals	
	No.	Annual Total \$	No.	Annual Total \$	No.	Annual Total \$
30-34		\$	6	\$ 40,067	6	\$ 40,067
35-39			25	137,286	25	137,286
40-44			59	250,948	59	250,948
45-49	19	41,012	143	643,219	162	684,231
50-54	226	1,107,580	303	1,126,156	529	2,233,736
55-59	661	3,051,239	556	1,931,566	1,217	4,982,805
60-64	4,223	10,772,304	691	2,019,073	4,914	12,791,377
65-69	7,751	18,673,481	363	852,096	8,114	19,525,577
70-74	6,222	14,411,241	134	286,412	6,356	14,697,653
75-79	3,825	8,604,221	58	132,380	3,883	8,736,601
80-84	1,978	4,512,191	11	22,156	1,989	4,534,347
85-89	964	2,470,723	2	10,744	966	2,481,467
90-94	316	858,770			316	858,770
95-99	59	187,637			59	187,637
Totals	26,244	\$64,690,399	2,351	\$7,452,103	28,595	\$72,142,502

Schedule 3.

Annuity and Pension Reserve Fund

Survivors of Retirants June 30, 1982

Current Annual Total \$ By Attained Ages

Attained Ages	Life Annuities		Periods Certain		Totals	
	No.	Annual Total \$	No.	Annual Total \$	No.	Annual Total \$
15-19	2	\$ 7,574		\$	2	\$ 7,574
40-44	1	381			1	381
50-54	2	2,671			2	2,671
55-59	8	37,998	1	4,273	9	42,271
60-64	44	112,724	5	9,312	49	122,036
65-69	201	403,376	37	73,267	238	476,643
70-74	347	681,301	62	137,331	409	818,632
75-79	403	745,737	41	82,463	444	828,200
80-84	275	577,820	7	7,649	282	585,469
85-89	182	394,030			182	394,030
90-94	68	144,228			68	144,228
95-99	36	87,491			36	87,491
100+	<u>1</u>	<u>5,849</u>			<u>1</u>	<u>5,849</u>
Totals	1,570	\$3,201,180	153	\$314,295	1,723	\$3,515,475

Schedule 4.

Survivor Benefit Fund

Beneficiaries June 30, 1982

Annual Amounts and Actuarial Liabilities

<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>		
Single Survivor Cases						
Men	420	87.4%	0.4%	12.2%	\$ 739,833	\$ 7,596,009
Women	<u>1,795</u>	80.8	1.6	17.6	<u>4,338,241</u>	<u>46,271,591</u>
Totals	<u>2,215</u>				<u>\$5,078,074</u>	<u>\$53,867,600</u>
Multiple Survivor Cases						
Men	125	98.9%	0.0%	1.1%	\$ 364,222	\$ 3,018,037
Women	<u>217</u>	97.8	0.1	2.1	<u>942,111</u>	<u>7,809,204</u>
Totals	<u>342</u>				<u>\$1,306,333</u>	<u>\$10,827,241</u>
Total Benefits Being Paid From Survivor Benefit Fund						
Men	545	91.2%	0.3%	8.5%	\$1,104,055	\$10,614,046
Women	<u>2,012</u>	83.8	1.3	14.9	<u>5,280,352</u>	<u>54,080,795</u>
Totals	<u>2,557</u>				<u>\$6,384,407</u>	<u>\$64,694,841</u>

Also included in the valuation were 264 persons eligible to receive survivor benefits upon expiration of the "blackout" period. Annual deferred benefits totaled \$394,446. Actuarial liabilities totaled \$3,544,632.

Schedule 5.

Survivor Benefit Fund

Survivors of Deceased Active Members June 30, 1982

Current Annual Total \$ By Attained Ages

Attained Ages	Single Survivor Cases		Multiple Survivor Cases		Totals	
	No.	Annual Total \$	No.*	Annual Total \$	No.	Annual Total \$
15-19	64	\$ 118,078	31	\$ 97,827	95	\$ 215,905
20-24	24	45,054	2	6,318	26	51,372
25-29	3	5,349	4	16,971	7	22,320
30-34	1	2,081	12	49,934	13	52,015
35-39	1	1,986	19	94,732	20	96,718
40-44	3	6,210	31	132,145	34	138,355
45-49	7	16,300	47	191,158	54	207,458
50-54	65	194,916	74	288,800	139	483,716
55-59	162	419,007	62	218,289	224	637,296
60-64	373	907,974	35	128,877	408	1,036,851
65-69	530	1,166,748	14	45,851	544	1,212,599
70-74	411	842,491	5	16,140	416	858,631
75-79	324	718,653	4	12,419	328	731,072
80-84	149	365,171	1	3,214	150	368,385
85-89	76	209,399	1	3,658	77	213,057
90-94	20	54,991			20	54,991
95-99	2	3,666			2	3,666
<b>Totals</b>	<b>2,215</b>	<b>\$5,078,074</b>	<b>342</b>	<b>\$1,306,333</b>	<b>2,557</b>	<b>\$6,384,407</b>

\* Includes primary recipient only.

Active members included in the valuation totaled 85,924, involving an annual payroll totaling \$652,539,662. A small number of the records we received were incomplete and are not included in the following tables. Therefore, all tables except for members by pay include 85,883 members with a payroll of \$652,224,795.

Active Members in Valuation June 30, 1982

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<u>Groups</u>	<u>Number</u>	<u>Annual Payroll</u>	<u>Average Pay</u>
Men	24,003	\$266,989,755	\$11,123
Women	<u>61,880</u>	<u>385,235,040</u>	6,226
Totals	85,883	\$652,224,795	\$ 7,594

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Reporting of active members. The persons included as active members in this June 30, 1982 valuation are those who had any covered pay in either May or June and were listed as active in SERS records. These 85,924 persons are a reasonable approximation of the persons covered during the year ended June 30; excluding the summer months of July and August, the persons contributing during a month ranged from a high of 86,601 (November) to a low of 81,424 (September).

This definition is different from the definition previously used. The previous definition would have reported 95,854 persons as active members, a decrease from the previous year's 102,908.

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Also included in the valuation were 8,321 inactive members eligible for deferred retirement allowances, and 113,923 inactive members eligible for a contribution refund only.

Schedule 6.

Ohio School Employees Retirement System

Total Active Members as of June 30, 1982

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	245							245	\$ 1,088,012
20-24	3,315	163						3,478	24,408,371
25-29	4,575	1,247	85					5,907	47,678,641
30-34	5,925	1,537	553	34				8,049	56,899,745
35-39	6,971	2,783	769	196	15			10,734	67,078,231
40-44	5,763	3,909	1,939	447	140	20		12,218	81,705,274
45-49	3,854	3,725	3,124	921	257	121	8	12,010	89,592,096
50-54	2,859	3,035	3,326	1,690	531	243	60	11,744	93,642,863
55-59	2,151	2,374	2,943	2,175	997	393	163	11,196	96,685,417
60	338	384	498	444	256	107	37	2,064	18,681,326
61	269	377	467	376	209	95	29	1,822	16,947,227
62	218	339	353	320	211	99	32	1,572	15,102,104
63	153	195	254	208	117	77	36	1,040	9,954,863
64	135	183	241	190	137	62	33	981	9,431,163
65	117	149	182	144	91	59	38	780	7,068,349
66	89	95	113	94	60	44	19	514	4,539,068
67	66	98	79	75	54	26	19	417	3,413,532
68	59	58	80	61	38	26	14	336	2,873,431
69	57	39	70	44	40	17	10	277	2,199,100
70 & Over	124	114	103	69	50	25	14	499	3,235,982
<b>Totals</b>	<b>37,283</b>	<b>20,804</b>	<b>15,179</b>	<b>7,488</b>	<b>3,203</b>	<b>1,414</b>	<b>512</b>	<b>85,883</b>	<b>\$652,224,795</b>

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

Age: 45.1 years.

Service: 7.7 years.

Annual Pay: \$7,594.

Schedule 7.

Ohio School Employees Retirement System  
 Women Active Members as of June 30, 1982  
 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	117							117	\$ 464,335
20-24	1,615	87						1,702	10,483,633
25-29	2,509	540	45					3,094	20,223,864
30-34	4,263	889	247	25				5,424	29,495,542
35-39	5,768	2,280	459	82	11			8,600	44,824,149
40-44	4,749	3,442	1,613	187	46	9		10,046	58,270,223
45-49	2,985	3,151	2,721	625	71	36	6	9,595	61,129,322
50-54	2,063	2,441	2,794	1,344	296	59	22	9,019	59,961,942
55-59	1,310	1,751	2,317	1,771	665	171	45	8,030	55,965,246
60	175	249	399	346	186	55	13	1,423	10,279,881
61	128	240	344	280	143	44	10	1,189	8,813,282
62	104	185	248	220	132	50	8	947	7,052,217
63	73	103	176	139	69	46	12	618	4,526,024
64	48	106	153	134	88	39	5	573	4,254,209
65	49	74	124	77	57	35	16	432	2,947,182
66	39	45	71	59	39	21	6	280	1,821,661
67	24	48	58	47	35	14	11	237	1,543,847
68	20	31	42	46	24	14	3	180	1,140,782
69	22	19	50	25	18	13	4	151	924,791
70 & Over	45	36	52	42	25	16	7	223	1,112,908
<b>Totals</b>	<b>26,106</b>	<b>15,717</b>	<b>11,913</b>	<b>5,449</b>	<b>1,905</b>	<b>622</b>	<b>168</b>	<b>61,880</b>	<b>\$385,235,040</b>

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

Age: 45.4 years.

Service: 7.6 years.

Annual Pay: \$6,226.

Schedule 8.

Ohio School Employees Retirement System

Men Active Members as of June 30, 1982

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	128							128	\$ 623,677
20-24	1,700	76						1,776	13,924,738
25-29	2,066	707	40					2,813	27,454,777
30-34	1,662	648	306	9				2,625	27,404,203
35-39	1,203	503	310	114	4			2,134	22,254,082
40-44	1,014	467	326	260	94	11		2,172	23,435,051
45-49	869	574	403	296	186	85	2	2,415	28,462,774
50-54	796	594	532	346	235	184	38	2,725	33,680,921
55-59	841	623	626	404	332	222	118	3,166	40,720,171
60	163	135	99	98	70	52	24	641	8,401,445
61	141	137	123	96	66	51	19	633	8,133,945
62	114	154	105	100	79	49	24	625	8,049,887
63	80	92	78	69	48	31	24	422	5,428,839
64	87	77	88	56	49	23	28	408	5,176,954
65	68	75	58	67	34	24	22	348	4,121,167
66	50	50	42	35	21	23	13	234	2,717,407
67	42	50	21	28	19	12	8	180	1,869,685
68	39	27	38	15	14	12	11	156	1,732,649
69	35	20	20	19	22	4	6	126	1,274,309
70 & Over	79	78	51	27	25	9	7	276	2,123,074
<b>Totals</b>	<b>11,177</b>	<b>5,087</b>	<b>3,266</b>	<b>2,039</b>	<b>1,298</b>	<b>792</b>	<b>344</b>	<b>24,003</b>	<b>\$266,989,755</b>

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

Age: 44.4 years.

Service: 8.0 years.

Annual Pay: \$11,123.



Schedule 9.

Active Members as of June 30, 1982 by Annual Pay

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<u>Annual Pay</u>	<u>Number of Active Members</u>			<u>Portion of Total Number</u>	
	<u>Men</u>	<u>Women</u>	<u>Total</u>	<u>This Group</u>	<u>Cumulative</u>
Less than \$1,000	1,213	3,839	5,052	6%	6%
\$1,000 - \$1,999	920	5,447	6,367	7	13
\$2,000 - \$2,999	1,084	4,868	5,952	7	20
\$3,000 - \$3,999	1,162	5,344	6,506	8	28
\$4,000 - \$4,999	1,232	6,642	7,874	9	37
\$5,000 - \$5,999	1,220	7,799	9,019	10	47
\$6,000 - \$6,999	1,029	6,200	7,229	8	56
\$7,000 - \$7,999	734	4,443	5,177	6	62
\$8,000 - \$8,999	557	3,460	4,017	5	67
\$9,000 - \$9,999	741	2,905	3,646	4	71
\$10,000 - \$11,999	2,564	5,126	7,690	9	80
\$12,000 - \$13,999	3,690	3,202	6,892	8	88
\$14,000 - \$15,999	3,105	1,554	4,659	5	93
\$16,000 - \$17,999	1,727	481	2,208	3	96
\$18,000 - \$19,999	1,160	248	1,408	2	97
\$20,000 - \$24,999	1,119	258	1,377	2	99
\$25,000 - \$29,999	409	69	478	1	100
\$30,000 and over	<u>357</u>	<u>16</u>	<u>373</u>	0	100
Totals	24,023	61,901	85,924		

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

Schedule 10.

Actuarial Accrued Liabilities June 30, 1982

<u>Present Value Of</u>	<u>Actuarial Accrued Liabilities</u>	
	<u>Health Care</u>	<u>Total</u>
Future monthly benefits and death benefits to present retirants and survivors	\$242,547,183	\$1,071,728,280
-----		
Monthly benefits and refunds to present inactive members	30,397,532	84,666,139
-----		
Service allowances and health care benefits to present active members	162,264,504	1,043,675,224
Disability allowances to present active members		17,960,683
Death-after-retirement benefit (\$500) on behalf of present active members		1,625,488
Survivor benefits on behalf of present active members who die before retiring		25,400,520
Refunds of member contributions of present active members		11,456,812
Benefits for present active members	162,264,504	1,100,118,727
-----		
Benefits For Present Covered Persons	\$435,209,219	\$2,256,513,146

REPORTED ASSETS

The accrued assets at June 30, 1982 were reported to be \$1,201,845,627.

Fund	Amount
Annuity and Pension Reserve Fund	\$ 826,078,233
Present Value of Future State Contributions for House Bills 284 and 204	12,453,008
Reserve For Statutory Fund Deficiency Net	(150,739,489)
Survivors Benefit Fund	\$ 723,791,752
Employees Savings Fund	79,314,536
Employers Trust Fund	324,180,388
Total	74,558,951
	\$1,201,845,627

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Schedule 11.

ACTUARIAL ACCRUED LIABILITIES: COMPUTED & UNFUNDED

	Basic Benefits	Health Care	TOTAL
Computed accrued liabilities	\$1,821,303,927	\$435,209,219	\$2,256,513,146
Reported assets	<u>1,115,541,186</u>	<u>86,304,441</u>	<u>1,201,845,627</u>
Unfunded Accrued Liabilities	\$ 705,762,741	\$348,904,778	\$1,054,667,519

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Unfunded actuarial liabilities, \$1,054,667,519, were amortized over a period of years sufficient to produce the previously established Employer Contribution Rate of 12.50% of payroll. The amortization period was computed to be 49 years (next whole year). If last year's definition of "active members" had been used (page 18 has detail), the period would be 47 years.

A year ago the period was 43 years.

Schedule 12.

COMPOSITION OF EMPLOYER CONTRIBUTION RATE

Established By Statute & Board Action

& COMPUTED AMORTIZATION PERIOD

June 30, 1982

<u>Contributions For</u>	<u>Contributions Expressed as Percents of Payroll</u>	
	<u>Health &amp; Medicare Premiums</u>	<u>Total</u>
Current cost:		
Service allowances		9.29%
Disability allowances		.59
Survivor benefits (SB Fund)		.43
\$500 death benefit		.03
Health & Medicare Premiums	2.19%	2.19
Total		<u>12.53</u>
Member contributions:		8.00
Less: Future refunds		<u>1.82</u>
Available for allowances		6.18
	-----	-----
Employer Current Cost	2.19	6.35
Unfunded Accrued Liabilities, Over 49 future years	<u>2.03</u>	<u>6.15</u>
EMPLOYER CONTRIBUTION RATE	<u>4.22%</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 employe'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

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
1982#	2,257	1,202	1,055	652	1.62

\* Revised financial assumptions.

# Revised method of determining active members & related payroll. Previous method would have produced an index of 1.58.

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

<u>June 30</u>	<u>Computed Actuarial Accrued Liabilities</u>			<u>Valuation Assets</u>	<u>Portion of Accrued Liabilities Covered by Assets</u>		
	<u>(1) Member Contr.</u>	<u>(2) Retired Lives (\$ in Millions)</u>	<u>(3) Present Members (Employer Financed Portion)</u>		<u>(1)</u>	<u>(2)</u>	<u>(3)</u>
1981*	\$298	\$ 959	\$768	\$1,088	100%	82%	0%
1982	324	1,072	861	1,202	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.

. . . . . Economic Assumptions . . . . .

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.

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

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

Special assumptions for Health Care Coverages are shown in Schedule 19.

. . . . . Non-Economic Assumptions . . . . .

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.

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 System fiscal year.

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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

Sample Ages	Increase Next Year		
	Merit & Seniority	Base (Economy)	Total
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

Sample Ages	Percent of Active Members Separating Within the Next Year					
	Men			Women		
	Death	Disability	Other	Death	Disability	Other
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.

Probabilities of Age & Service Retirement

Men Members

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Sample Ages	Percent of Eligible Active Members Retiring Within Next Year Years of Service		
	<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

Women Members

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Sample Ages	Percent of Eligible Active Members Retiring Within Next Year Years of Service		
	<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 Rates Reported 12/1/82*</u>
Benefit Recipient below age 65	\$117.82
Spouse below age 65**	57.34
Benefit recipient above age 65 and eligible for Medicare	25.97
Spouse above age 65 and eligible for Medicare**	7.74
Mail order prescription service	3.05

\* Based on deductible effective January 1, 1983.

\*\* Employer portion.

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.

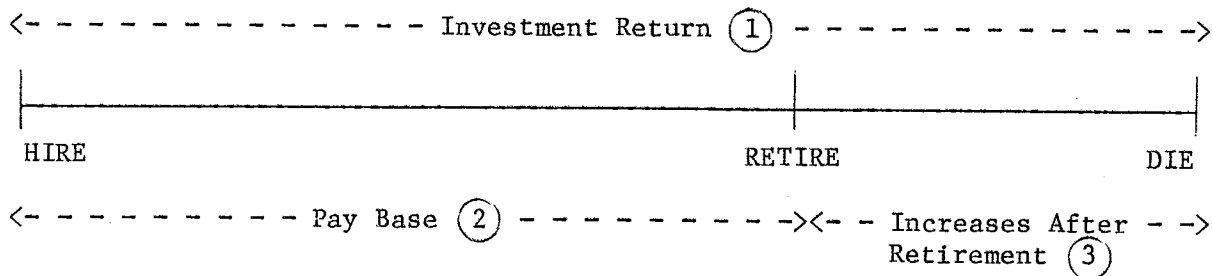
Election of Spouse Health Care Coverage: 25% of retirants are assumed to elect to cover spouses for health care. The System will pay approximately one-half the premium for dependents during the life of the retirant.

Medicare Part B Premium: \$12.20 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.