

GABRIEL, ROEDER, SMITH & COMPANY
Actuaries & Consultants

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December 14, 1988

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

The basic financial objective of SERS is to establish and receive contributions which, expressed as percents of active member payroll, will remain approximately level from generation to generation of Ohio citizens.

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

The latest completed actuarial valuation is based upon data and assumptions as of June 30, 1988. Conditions and results are shown in our reports.

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

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

These actuarial gain/loss findings led to the adoption of substantial revised assumptions for the June 30, 1986 actuarial valuation. The assumed premiums for health care coverages are changed annually as premiums are changed by health care providers.

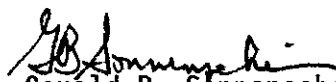
The statutory employer contribution rate is 14% of pay. An SERS policy decision now provides the following allocations: to basic benefits, the portion which will pay normal cost and 40 year amortization for unfunded actuarial accrued liabilities; and to health care benefits, the remainder of employer contributions.


On the basis of the 1988 valuation and the basic benefits and allocated contribution rates then in effect, it is our opinion that the basic benefits portion of SERS is in sound condition in accordance with actuarial principles of level cost financing.

The financial condition of health care benefits is different, and will be significantly affected by the provisions of Act 290 of 1988. Act 290 established a health care surcharge, a program to determine a minimum annual pay for use in calculating employer contribution dollars.

On the basis of the 1988 valuation and the health care benefits and allocated contribution rates then in effect, the allocated contributions are sufficient to provide level percent financing of the health care benefits as long as future health care cost inflation does not exceed future general price inflation.

Respectfully submitted,


Gerald B. Sonnenschein


Richard G. Roeder

RGR:ct

SCHOOL EMPLOYEES RETIREMENT SYSTEM OF OHIO

**The Report of the
ANNUAL ACTUARIAL VALUATION
June 30, 1988**

GABRIEL, ROEDER, SMITH & COMPANY

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November 29, 1988

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

Ladies and Gentlemen:

Submitted in this report are the results of the June 30, 1988 actuarial valuation of the School Employees Retirement System of Ohio, 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 financial assumptions used in making the actuarial valuation are shown in the Appendix of this report. The financial assumptions for Basic Benefits were revised for the June 30, 1986 valuation; the assumed premiums for Health Care coverages are changed annually as premiums are changed by health care providers (pages 44 & 45).

Your attention is directed particularly to:

COMMENTS on pages 3A - 3B.

Financial Principles on pages 4-5;

Computed Employer Contribution Rates on pages 25 & 32;

Short Condition Tests on pages 26 & 34;

Respectfully submitted,


Gerald B. Sonnenschein


Richard G. Roeder

GBS:ct

BASIC BENEFITS

COMMENTS

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

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

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

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

Act 290 of 1988. This legislation had several significant features.

The basic benefit factor was increased to 2.1% (from 2.0%) and there were one-time increases to present retired lives (5% maximum increase).

A program was established to determine a minimum annual pay for use in calculating employer contribution dollars --- a health care surcharge. This program recognizes that full health care benefits are basically intended for full time employees, and that many part time employees were receiving full time health care benefits without full time costs being paid.

For the year beginning July 1, 1989 such minimum annual pay has been set at \$7,710, applied to member pays during the year ending June 30, 1989.

Statutory Employer Contribution Rate. The 14% of pay rate is now being allocated by SERS policy decision as follows: to Basic Benefits, the rate which will amortize unfunded actuarial accrued liabilities over 40 years, and to Health Care Benefits, the remainder of employer contributions.

BASIC BENEFITS

On the basis of the 1988 valuation and the Basic Benefits and allocated contribution rates then in effect, it is our opinion that the Basic Benefits portion of SERS is in sound condition in accordance with actuarial principles of level cost financing. Supporting information is on page 25 and on page 26.

The added benefits provided by Act 290 increased the computed contribution rate and decreased the funded liability percent, both as expected.

HEALTH CARE BENEFITS

The financial development of this program has been cause for continuing concern.

Initially, beginning in 1974, 0.75% was the contribution rate established for Health Care Benefits, and included in a total Employer Rate then 12.50%. Health Care contribution rates have been increased at various times since 1974. The increases in health care costs have been substantially more than inflation increases (see pages 44 & 45).

The employer contributions now being allocated to health care benefits are sufficient to provide level cost financing of the Health Care Benefits, as long as future health care cost inflation does not exceed general price inflation. Page 32 has supporting information.

FINANCIAL PRINCIPLES

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

The related key financial questions are:

Which generation of taxpayers contributes the money to cover the IOU?

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

Or the future taxpayers, who happen to be in Ohio at the time the IOU becomes a cash demand, years and often decades later?

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

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

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

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

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

... plus ...

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

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

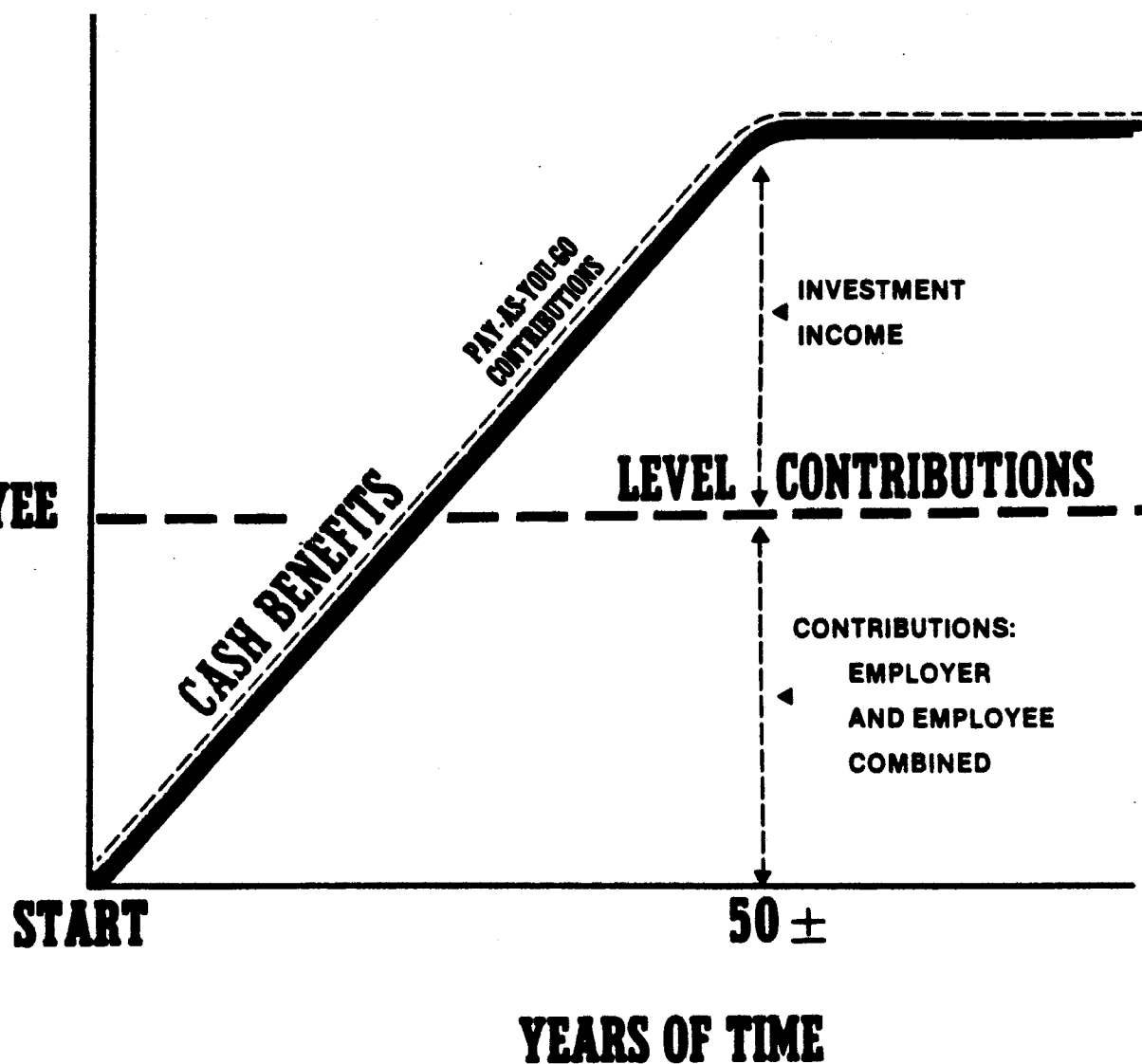
An actuarial valuation has a number of ingredients such as: the rate of investment return which plan assets will earn; the rates of withdrawal of active members who leave covered employment before qualifying for any monthly benefit; the rates of mortality; the rates of disability; the rates of pay increases;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

Economic Risk Areas

Rates of investment return

Rates of pay increase

Changes in active member group size

Non-Economic Risk Areas

Ages at actual retirement

Rates of mortality

Rates of withdrawal of active members (turnover)

Rates of disability

THE ACTUARIAL VALUATION PROCESS

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

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

A. Covered Person Data, furnished by plan administrator

Retired lives now receiving benefits

Former employees with vested benefits not yet payable

Active employees

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

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

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

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

F. = Determination of:

Plan financial position and/or

New Employer Contribution Rate

DATA FURNISHED

Retired members and survivors included in the valuation totaled 43,967. The 40,961 retirants and survivors of retirants as of June 30, 1988 were receiving annual benefits totaling \$138,147,589 from the Annuity and Pension Reserve Fund. The 3,006 survivors of deceased active members as of June 30, 1988 were receiving annual benefits totaling \$9,123,119 from the Survivor Benefit Fund.

Schedule 1.

Annuitant and Pension Reserve Fund
Retirants and Beneficiaries June 30, 1988

Type of Benefit, Annual Amount
and Basic Benefit Actuarial Liabilities

Group	Number	% of Current Total \$			Current Total \$	Actuarial Liabilities*
		Base Allowances	H.B. 204 and 284	Post-Retire. Increases		
<u>SUPERANNUATION RETIREMENT</u>						
Straight Life Allowance - Benefit Terminating at Death						
Men	4,943	84.0%	1.0%	15.0%	\$19,717,570	\$154,236,410
Women	18,730	85.1	1.0	13.9	50,611,169	518,056,788
Totals	23,673				70,328,739	672,293,198
Option II Allowance - Joint and Survivor Benefits						
Men	6,012	88.2	0.3	11.5	31,026,449	367,372,063
Women	4,042	89.4	0.2	10.4	11,423,159	143,243,318
Totals	10,054				42,449,608	510,615,381
Option III Allowance - Life Benefits With Guaranteed Periods						
Men	788	81.7	0.9	17.4	2,888,741	23,186,122
Women	948	82.5	0.9	16.6	2,360,760	24,116,800
Totals	1,736				5,249,501	47,302,922
Allowance to Survivor Beneficiary of Deceased Superannuation Retirant Who Elected Option II - Life Benefit						
Men	273	80.4	2.1	17.5	457,474	3,451,234
Women	2,022	78.9	2.5	18.6	5,374,310	49,150,723
Totals	2,295				5,831,784	52,601,957
Allowance to Survivor Beneficiary of Deceased Superannuation Retirant Who Elected Option III - Guaranteed Period Only						
Men	29	86.9	0.0	13.1	76,994	375,781
Women	90	82.2	0.1	17.7	317,580	1,347,947
Totals	119				394,574	1,723,728

* Includes allowance and lump sum death benefit.

(Schedule 1 completed on page 9)

Schedule 1. - completed

Annuity and Pension Reserve Fund

Retirants and Beneficiaries June 30, 1988

Type of Benefit, Annual Amount

and Basic Benefit 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. Increases</u>		
Total for Superannuation Allowances Being Paid						
Men	12,045	86.3%	0.6%	13.1%	\$ 54,167,228	\$ 548,621,610
Women	25,832	85.2	0.9	13.9	70,086,978	735,915,576
Totals	37,877				124,254,206	1,284,537,186

DISABILITY RETIREMENT

Straight Life Allowance - Benefit Terminating at Death

Men	1,196	86.6	0.5	12.9	7,591,902	80,425,752
Women	1,888	86.1	0.7	13.2	6,301,481	76,217,858
Totals	3,084				13,893,383	156,643,610

TOTAL BENEFITS BEING PAID FROM ANNUITY AND PENSION RESERVE FUND

Men	13,241	86.3	0.6	13.1	61,759,130	629,047,362
Women	27,720	85.3	0.9	13.8	76,388,459	812,133,434
Totals	40,961				138,147,589	1,441,180,796

* Includes allowance and lump sum death benefit.

Schedule 2.

Annuity and Pension Reserve Fund

Retirants June 30, 1988

Current Annual Total \$ By Attained Ages

Attained Ages	Superannuation		Disability		Totals	
	No.	Annual Total \$	No.	Annual Total \$	No.	Annual Total \$
25-29		\$	2	\$ 15,219	2	\$ 15,219
30-34			9	79,180	9	79,180
35-39			55	555,917	55	555,917
40-44			94	688,962	94	688,962
45-49	14	196,372	174	1,036,664	188	1,233,036
50-54	73	923,362	340	1,909,739	413	2,833,101
55-59	421	4,181,590	623	2,942,133	1,044	7,123,723
60-64	5,410	20,307,338	758	3,320,380	6,168	23,627,718
65-69	9,875	35,375,351	582	2,144,030	10,457	37,519,381
70-74	8,839	27,783,280	298	816,294	9,137	28,599,574
75-79	6,009	16,456,669	107	269,770	6,116	16,726,439
80-84	3,032	8,011,851	35	90,764	3,067	8,102,615
85-89	1,196	3,076,518	6	14,625	1,202	3,091,143
90-94	457	1,297,651	1	9,671	458	1,307,322
95-99	108	326,636			108	326,636
100	6	16,893			6	16,893
101	4	13,770			4	13,770
102	5	12,954			5	12,954
103	4	17,087			4	17,087
104	4	14,189			4	14,189
105	1	4,443			1	4,443
106	3	7,163			3	7,163
107	2	4,774			2	4,774
Totals	35,463	118,027,891	3,084	13,893,348	38,547	131,921,239

Schedule 3.

Annuity and Pension Reserve Fund

Survivors of Retirants June 30, 1988

Current Annual Total \$ By Attained Ages

Attained Ages	Life Annuities		Periods Certain		Totals	
	No.	Annual Total \$	No.	Annual Total \$	No.	Annual Total \$
Under 20		\$	2	\$ 5,263	2	\$ 5,263
20-24	2	9,039	1	2,318	3	11,357
25-29	1	624	1	830	2	1,454
30-34	5	2,904	3	5,299	8	8,203
35-39	6	22,181	3	14,881	9	37,062
40-44	9	8,706	3	11,032	12	19,738
45-49	8	29,211	3	3,659	11	32,870
50-54	21	59,591	1	1,342	22	60,933
55-59	45	126,191	5	12,609	50	138,800
60-64	179	604,067	16	66,433	195	670,500
65-69	377	1,046,226	36	106,820	413	1,153,046
70-74	568	1,342,135	32	100,156	600	1,442,291
75-79	501	1,155,496	12	63,327	513	1,218,823
80-84	334	819,053			334	819,053
85-89	156	380,056	1	608	157	380,664
90-94	69	199,564			69	199,564
95-99	13	24,207			13	24,207
100	1	2,522			1	2,522
Totals	2,295	5,831,773	119	394,577	2,414	6,226,350

Schedule 4.

Survivor Benefit Fund

Beneficiaries June 30, 1988

Annual Amounts and
Basic Benefit 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>		
Benefits Being Paid From Survivor Benefit Fund						
Men	737	88.7%	0.1%	11.2%	\$1,737,883	\$14,583,355
Women	<u>2,269</u>	82.9	0.7	16.4	<u>7,385,236</u>	<u>57,448,395</u>
Totals	<u>3,006</u>				<u>9,123,119</u>	<u>72,031,750</u>

* Includes allowance only. Also includes liabilities for beneficiaries in black-out who are not represented in other statistics on this page.

Schedule 5.

Survivor Benefit Fund

Survivors of Deceased Active Members June 30, 1988

Current Annual Total \$ By Attained Ages

<u>Attained Ages</u>	<u>No.</u>	<u>Annual Total \$</u>
Under 20	32	\$ 111,169
20-24	6	26,538
25-29	9	45,306
30-34	16	97,599
35-39	37	188,160
40-44	55	272,666
45-49	84	388,560
50-54	124	529,999
55-59	242	887,559
60-64	423	1,282,468
65-69	600	1,729,367
70-74	595	1,591,902
75-79	393	921,095
80-84	254	632,063
85-89	95	274,615
90-94	35	122,764
95-99	<u>6</u>	<u>21,289</u>
Totals	3,006	9,123,119

Active members included in the valuation totaled 90,418, involving an annual payroll totaling \$981,837,995. The schedules below and on the following 4 pages provide some detail from the data on active members.

Active Members in Valuation June 30, 1988

<u>Groups</u>	<u>Number</u>	<u>Annual Payroll</u>	<u>Average Pay</u>
Men	24,439	\$389,017,366	\$15,918
Women	<u>65,979</u>	<u>592,820,629</u>	8,985
Totals	90,418	981,837,995	10,859

Reporting of active members. The persons included as active members in this June 30, 1988 valuation are those who had any covered pay in May and were listed as active in SERS records. These 90,418 persons are a reasonable approximation of the persons covered during the year ended June 30; excluding the summer months of July and August. The SERS active members contributing during a month (ignoring July and August) ranged from a high of 91,894 (March) to a low of 83,853 (September).

Also included in the valuation were 7,360 inactive members eligible for deferred retirement allowances (including 26 whose retirement applications were pending at June 30), and 32,486 inactive members eligible for a contribution refund only (excluding those who had completed less than 1 year of employment before terminating).

7360
 43967

 51,327

School Employees Retirement System of Ohio

TOTAL Active Members as of June 30, 1988

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	\$ 567,251
20-24	1,938	115						2,053	16,319,820
25-29	3,968	1,312	126					5,406	57,849,334
30-34	6,284	2,243	987	85				9,599	101,005,519
35-39	7,852	2,983	1,290	556	31			12,712	123,997,019
40-44	6,445	4,188	2,060	765	213	17		13,688	138,853,118
45-49	4,009	3,237	3,355	1,964	393	135	5	13,098	141,934,040
50-54	2,796	2,467	3,159	2,768	1,087	242	97	12,616	146,099,838
55-59	2,074	1,832	2,129	2,641	1,827	394	147	11,044	132,675,516
60	331	301	425	501	415	87	31	2,091	25,880,747
61	290	265	297	401	326	138	43	1,760	22,179,475
62	277	182	272	386	230	87	33	1,467	18,606,714
63	213	171	251	271	159	74	34	1,173	14,373,509
64	177	122	158	228	174	84	32	975	12,668,604
65	142	83	117	180	141	80	18	761	9,326,431
66	101	61	75	86	93	34	21	471	5,325,078
67	73	51	73	84	75	33	9	398	4,124,824
68	65	56	50	49	65	22	22	329	3,616,089
69	44	24	35	35	30	14	12	194	1,971,869
70 & Over	94	66	85	77	71	39	34	466	4,463,200
		1,382	1,758	2,298	1,779	642	284		
Totals	37,290	19,759	14,944	11,077	5,330	1,480	538	90,418	981,837,995

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

Age: 45.2 years.

Service: 8.4 years.

Annual Pay: \$10,859.

SCHEDULE 7.
School Employees Retirement System of Ohio

MALE Active Members as of June 30, 1988

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	50							50	\$ 232,189
20-24	876	65						941	8,619,750
25-29	1,595	701	60					2,356	31,875,405
30-34	1,668	1,008	613	55				3,344	53,648,328
35-39	1,525	824	553	316	14			3,232	53,803,665
40-44	1,172	720	457	301	114	11		2,775	47,399,547
45-49	1,023	533	409	313	201	92	2	2,573	43,004,042
50-54	983	552	433	302	275	167	64	2,776	46,898,526
55-59	977	560	458	387	268	188	109	2,947	50,048,033
60	180	130	101	71	67	32	19	600	10,089,790
61	165	117	83	87	51	55	21	579	9,583,763
62	175	76	72	85	45	39	14	506	8,373,366
63	123	94	75	53	44	14	21	424	6,705,965
64	103	57	61	57	19	33	12	342	5,464,896
65	91	35	43	30	32	31	10	272	4,496,524
66	58	31	25	11	19	14	13	171	2,401,019
67	41	22	26	11	18	6	2	126	1,524,647
68	46	28	26	9	15	6	10	140	1,807,339
69	34	16	7	13	3	7	6	86	910,095
70 & Over	58	41	39	21	17	10	13	199	2,130,477
Totals	10,943	5,610	3,541	2,122	1,202	705	316	24,439	389,017,366

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

Age: 44.2 years.

Service: 8.1 years.

Annual Pay: \$15,918.

Schedule 8.

School Employees Retirement System of Ohio

FEMALE Active Members as of June 30, 1988

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	67							67	\$ 335,062
20-24	1,062	50						1,112	7,700,070
25-29	2,373	611	66					3,050	25,973,929
30-34	4,616	1,235	374	30				6,255	47,357,191
35-39	6,327	2,159	737	240	17			9,480	70,193,354
40-44	5,273	3,468	1,603	464	99	6		10,913	91,453,571
45-49	2,986	2,704	2,946	1,651	192	43	3	10,525	98,929,998
50-54	1,813	1,915	2,726	2,466	812	75	33	9,840	99,201,312
55-59	1,097	1,272	1,671	2,254	1,559	206	38	8,097	82,627,483
60	151	171	324	430	348	55	12	1,491	15,790,957
61	125	148	214	314	275	83	22	1,181	12,595,712
62	102	106	200	301	185	48	19	961	10,233,348
63	90	77	176	218	115	60	13	749	7,667,544
64	74	65	97	171	155	51	20	633	7,203,708
65	51	48	74	150	109	49	8	489	4,829,907
66	43	30	50	75	74	20	8	300	2,924,059
67	32	29	47	73	57	27	7	272	2,600,177
68	19	28	24	40	50	16	12	189	1,808,750
69	10	8	28	22	27	7	6	108	1,061,774
70 & Over	36	25	46	56	54	29	21	267	2,332,723
Totals	26,347	14,149	11,403	8,955	4,128	775	222	65,979	592,820,629

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

Age: 45.5 years.

Service: 8.5 years.

Annual Pay: \$8,985.

Schedule 9.

School Employees Retirement System of Ohio
Active Members as of June 30, 1988 by Annual Pay

<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	842	3,147	3,989	5%	5%
\$ 1,000 - \$ 1,999	771	4,175	4,946	5	10
2,000 - 2,999	770	4,694	5,464	6	16
3,000 - 3,999	845	3,772	4,617	5	21
4,000 - 4,999	835	3,811	4,646	5	26
5,000 - 5,999	777	3,573	4,350	5	31
6,000 - 6,999	816	4,502	5,318	6	37
7,000 - 7,999	857	4,862	5,719	6	43
8,000 - 8,999	824	5,188	6,012	7	50
9,000 - 9,999	742	4,685	5,427	6	56
10,000 - 11,999	1,133	6,295	7,428	8	64
12,000 - 13,999	933	4,626	5,559	6	70
14,000 - 15,999	1,333	3,626	4,959	6	76
16,000 - 17,999	2,307	2,995	5,302	6	82
18,000 - 19,999	2,626	2,235	4,861	5	87
20,000 - 24,999	4,419	2,707	7,126	8	95
25,000 - 29,999	1,816	618	2,434	3	98
30,000 and over	<u>1,793</u>	<u>468</u>	<u>2,261</u>	2	100
Totals	24,439	65,979	90,418		

REPORTED ASSETS

The accrued assets at June 30, 1988 were reported to be \$2,240,799,181 (cost basis).

<u>Fund</u>	<u>Amount</u>
Annuity and Pension Reserve Fund	\$1,977,725,844 1,972,224,100
Survivors Benefit Fund	119,199,574 118,904,428
Employees Savings Fund	577,028,334 577,028,334
Employers Trust Fund	(433,154,571) (428,506,292)
Total	2,240,799,181 2,239,651,064

VALUATION ASSETS

The value of accrued assets (cash & investments) as of June 30, 1988 was determined on a market related basis. The method used recognizes 20% of the previously unrecognized gains and losses (both realized and unrealized). The present value of expected future payments for House Bills 284 and 204, \$5,914,491, is added to obtain valuation assets.

Derivation of Valuation Assets

(a) Cost value June 1987	\$2,062,983,466
(b) Cost value June 1988	2,240,799,181
(c) Realized gains(losses)	7,816,188
(d) Change in cost value net of (c): (b) - (a) - (c)	169,999,527
(e) Valuation assets June 1987	2,137,564,436
(f) Preliminary valuation assets June 1988: (d) + (e)	2,307,563,963
(g) Market value June 1988	2,460,073,518
(h) Unrecognized gains(losses): (g) - (f)	152,509,555
(i) Adjustment toward market value: (.20) times (h)	30,501,911
(j) Total valuation assets: (f) + (i)	2,338,065,974
(k) Health reserve as % of cost value assets	5.9405%
(l) Health care valuation assets: (j) x (k)	138,893,909
(m) Present value of HB284 and 204 contributions	5,914,491
(n) Basic benefits valuation assets: (j) + (m) - (l)	2,205,086,556

School Employees Retirement System of Ohio

Outline of Benefit Eligibility and Amounts

BASIC BENEFITS

(outline last changed 6/30/88)

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 2.1% of FAS (effective October 1, 1988). 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 retiree. Upon the death of a disability retiree, a survivor allowance (described earlier) is paid.

Post-retirement increases.

Annual. Each July after June 30, 1971 or the annual anniversary established 12 months after the initial date of retirement, each allowance is increased to be equal to the initial allowance increased by 3.0% for each completed year of retirement; provided, the increased allowance cannot exceed the initial allowance adjusted for increases in the Consumers Price Index.

One time. Effective October 1, 1988 members who retired prior to February 1, 1983 will receive a 2% increase and members who retired from February 1, 1983 to September 1988 will receive a 5% increase.

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.

Member contributions. Each member contributes 8.75% of his pay (increasing to 9% effective July 1, 1989), by payroll deductions. This rate was established by the Board of Trustees effective July 1, 1989. The maximum statutory rate is 10%.

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

Employer contributions. Employer contributions are expressed as percents of member covered payroll. The maximum statutory rate is 14%. In addition, effective July 1, 1989, employers will pay a health care surcharge for any member whose annual pay is less than a minimum pay, determined by actuarial valuation. The surcharge is equal to 14% of the difference between the minimum pay and the member's pay, and then subject to pro-rate for partial service credit. For the year beginning July 1, 1989 the minimum annual pay is \$7,710.

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

Schedule 10.

BASIC BENEFITS

Actuarial Accrued Liabilities June 30, 1988

Allocations Using Entry Age Actuarial Cost Method

<u>Present Value Of</u>	<u>Entry Age Actuarial Accrued Liabilities</u>
Future monthly benefits and death benefits to present retirants and survivors	\$1,513,212,546

Monthly benefits and refunds to present inactive members	50,010,231

Service allowances to present active members	1,625,782,020
Disability allowances to present active members	44,413,031
Death-after-retirement benefit (\$500) on behalf of present active members	1,682,154
Survivor benefits on behalf of present active members who die before retiring	44,811,768
Refunds of member contributions of present active members	<u>27,258,533</u>
Benefits for present active members	1,743,947,506

Entry Age Liabilities For Present Covered Persons	3,307,170,283

Valuation Assets	2,205,086,556

Liabilities to be Covered By Future Contributions	1,102,083,727

The Employer Contribution Rate for Basic Benefits has been established by the Board as normal cost plus a 40 year amortization of unfunded actuarial accrued liabilities. Please see page 48 for graph showing relationship between level cost financing and amortization periods.

Schedule 11.

BASIC BENEFITS

COMPOSITION OF EMPLOYER CONTRIBUTION RATE

Established By Statute & Board Action

June 30, 1988

<u>Contributions For</u>	<u>Contributions Expressed as Percents of Payroll</u>
Normal cost:	
Service allowances	10.33%
Disability allowances	0.78
Survivor benefits (SB Fund)	0.56
\$500 death benefit	<u>0.02</u>
Total	11.69
Member contributions:	9.00
Less: Future refunds	<u>2.20</u>
Available for allowances	6.80
	<hr/>
Employer Normal Cost	4.89
Unfunded Accrued Liabilities	
Minimum level X financing	3.18
Additional amount to fund over 40 years	<u>1.51</u>
Total	4.69
<hr style="border-top: 1px dashed black;"/>	
EMPLOYER CONTRIBUTION RATE ALLOCATED TO BASIC BENEFITS	9.58
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SHORT CONDITION TEST

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

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

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

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

Schedule 12.

BASIC BENEFITS

Short Condition Test

June 30	Computed Actuarial Accrued Liabilities			Valuation Assets	Portion of Accrued Liabilities Covered by Assets		
	(1) Member Contr.	(2) Retired Lives (\$ in Millions)	(3) Present Members (Employer Financed Portion)		(1)	(2)	(3)
1981*	\$298	\$ 713	\$ 586	\$1,017	100%	100%	18%
1982	324	829	668	1,116	100	96	0
1983	352	909	726	1,221	100	96	0
1984	396	1,011	759	1,390	100	98	0
1985	433	1,126	846	1,564	100	100	1
1985*	433	1,101	888	1,564	100	100	3
1986	475	1,228	967	1,781	100	100	8
1987	524	1,341	1,034	2,007	100	100	14
1988	577	1,462	1,134	2,205	100	100	15
1988#	577	1,513	1,217	2,205	100	100	9

* Revised financial assumptions.
Legislated benefit increases.

PENSION BENEFIT OBLIGATION

- BASIC BENEFITS -

The amount shown below as the "pension benefit obligation" is a standardized disclosure measure of the present value of pension benefits, adjusted for the effects of projected salary increases, estimated to be payable in the future as a result of employee service to date. The measure is the actuarial present value of credited projected benefits and is intended to (i) help users assess the plan's funding status on a going-concern basis, (ii) assess progress being made in accumulating sufficient assets to pay benefits when due, and (iii) allow for comparisons among public employee retirement plans. The measure is independent of the actuarial funding method used to determine contributions to the plan.

The pension benefit obligation was determined as part of an actuarial valuation of the plan as of June 30, 1988. Significant actuarial assumptions used in determining the pension benefit obligation include (a) a rate of return on the investment of present and future assets of 9.5% per year compounded annually for the period July 1, 1988 through June 30, 1991 and 7.5% per year thereafter, (b) projected salary increases of 4.5% per year compounded annually, attributable to inflation, (c) additional projected salary increases ranging from 0.0% to 3.0% per year attributable to seniority/merit, varying by age, and (d) the assumption that retirement benefits will increase 3% per year after retirement.

At June 30, 1988, the unfunded pension benefit obligation was \$909,403,569, determined as follows:

Pension Benefit Obligation:

Retirees and beneficiaries currently receiving benefits and terminated employees not yet receiving benefits	\$1,557,793,737
Current employees --	
Accumulated employee contributions including allocated investment income	577,028,334
Employer financed - Vested	831,358,486
Employer financed - Non-vested	<u>50,906,458</u>
Total Pension Benefit Obligation	3,017,087,015
Net assets available for benefits, at cost (market value was \$2,313,931,687)	<u>2,107,683,446</u>
Unfunded Pension Benefit Obligation	909,403,569

During the year ended June 30, 1988 the plan experienced a net change of \$371,128,772 in the basic benefits pension benefit obligation. Of that change, \$119,766,547 was attributable to amendments.

REQUIRED SUPPLEMENTARY INFORMATION

ANALYSIS OF FUNDING PROGRESS

- BASIC BENEFITS -

(\$ amounts in Millions)

<u>Fiscal Year</u>	<u>(1) Net Assets Available for Benefits</u>	<u>(2) Pension Benefit Obligation (PBO)</u>	<u>(3) Percent Funded (1)/(2)</u>	<u>(4) Unfunded PBO (2)-(1)</u>	<u>(5) Annual Covered Payroll</u>	<u>(6) Unfunded PBO as a Percentage of Covered Payroll (4)/(5)</u>
1985	\$1,556	\$2,257	68.9%	\$701	\$804	87.2%
1986	1,747	2,511	69.6	764	869	87.9
1987	1,930	2,646	72.9	716	931	76.9
1988*	2,108	3,017	69.9	909	982	92.6

* Plan amended.

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

CONTRIBUTIONS REQUIRED AND CONTRIBUTIONS MADE

- BASIC BENEFITS -

Employer contribution rates are set by Act of the State Legislature.

The adequacy of these rates is checked annually by actuarial valuation. The actuarial funding method used in making these actuarial valuations is the entry age actuarial method; unfunded actuarial accrued liabilities are amortized as a level percent of the active member payroll, over the period of future years which produces the statutory employer contribution rate. Assuming the amortization period is reasonable, the employer contribution rate so computed, expressed as a percent of active member payroll, is designed to accumulate sufficient assets to pay benefits when due.

The most recent completed actuarial valuation was based upon data as of June 30, 1988.

During the year ended June 30, 1988 contributions totaling \$187,658,538 -- \$96,793,157 employer, \$89,667,853 employee and \$1,197,528 from the State -- were made in accordance with contributions determined by State Statute. The employer contributions consisted of ~~\$42,364,340~~ for normal cost and ~~\$14,224,517~~ for amortization of the unfunded actuarial accrued liability. Employer contributions represented 9% of covered payroll.

Significant actuarial assumptions used to compute contribution requirements were the same as those used to compute the standardized measure of the pension benefit obligation.

Employer Contribution Comparative Schedule

<u>Fiscal Year</u> <u>6/30</u>	<u>Valuation Date</u> <u>6/30</u>	<u>Contribution Rates</u> <u>As Percents of</u> <u>Valuation Payroll</u>	<u>Valuation</u> <u>Payroll</u>	<u>Dollar Contribution</u> <u>For Fiscal Year</u>
1985	1984	8.12%	\$737,375,080	\$75,682,790
1986	1985	8.13	804,230,073	87,450,445
1987	1986	9.00	869,111,274	84,047,360
1988	1987	9.00	931,385,997	96,793,157

HEALTH CARE BENEFITS

School Employees Retirement System of Ohio

Outline of Benefit Eligibility and Amounts

HEALTH CARE BENEFITS

(outline last changed 6/30/88)

Health Care Insurance. 10 years of service credit required. Health insurance premiums are paid on behalf of each qualified individual receiving a monthly allowance from SERS, qualified survivor of deceased retirant or qualified survivor of deceased employee. Beginning for members retiring July 1, 1989 and later the member will pay a portion of the medical premiums.

<u>Years of Service at Retirement</u>	<u>Member Portion</u>
10-14	75%
15-19	50
20-24	25
25 +	0

This provision will be phased-in over 5 years and will not change once a member has retired. If the retirant or survivor elects to cover his dependents, the monthly retirement allowance is reduced by 50% of the insurance premiums for the dependents. The retired member's reduction will increase from 50% to 70% during a 5 year phase-in period beginning July 1, 1989.

The premiums provide coverages which may be changed from time to time. Effective January 1, 1983 an annual deductible was introduced. The deductible was increased effective January 1, 1985 and January 1, 1988. Second opinion and pre-certification requirements went into effect January 1, 1987. Effective January 1, 1987 health care is provided to a beneficiary of a deceased retirant only if the beneficiary was the retirant's spouse or dependent child.

Medicare Part B. Each retirant or survivor is reimbursed \$24.80 per month for Part B Medicare premiums.

Mail Order Prescriptions. Health benefits include mail order prescription service with SERS paying the excess of the cost of each prescription over the base fee paid by the benefit recipient. The copayment was increased from \$1 to \$2 effective January 1, 1985 and to \$6 effective March 1, 1988.

Schedule 13.

HEALTH CARE BENEFITS

Actuarial Accrued Liabilities June 30, 1988

Allocations Using Entry Age Actuarial Cost Method

<u>Present Value Of</u>	<u>Entry Age Actuarial Accrued Liabilities</u>
Future health benefits to present retirants and survivors	\$ 583,712,872
-----	-----
Health benefits to present inactive members	31,176,004
-----	-----
Health benefits to present active members anticipated to retire with service allowance	415,693,510
Health benefits to present active members anticipated to retire with disability allowances	6,016,766
Health benefits to survivors of present active members who die before retiring	<u>14,697,433</u>
Benefits for present active members	436,407,709
-----	-----
Entry Age Liabilities For Present Covered Persons	1,051,296,585
-----	-----
Valuation Assets	138,893,909
-----	-----
Liabilities to be Covered By Future Contributions	912,402,676

The Employer Contribution Rate for Health Care Benefits has been established by the Board as the remainder of employer contributions after providing for contributions for Basic Benefits. Including the health care surcharge contribution, the allocated Health Care contribution is 5.81% of payroll. The contribution amount toward unfunded accrued liabilities is sufficient to provide level cost financing.

Schedule 14.

HEALTH CARE BENEFITS

COMPOSITION OF EMPLOYER CONTRIBUTION RATE

Established By Statute & Board Action

June 30, 1988

<u>Contributions For</u>	<u>Contributions Expressed as Percents of Payroll</u>
Normal cost:	
Service allowances	2.76%
Disability allowances	0.09
Survivor benefits (SB Fund)	<u>0.16</u>
Total	3.01

EMPLOYER CONTRIBUTION RATE ALLOCATED TO HEALTH CARE BENEFITS	5.81

Unfunded Accrued Liabilities: Total	2.80
Minimum level % financing	<u>2.63</u>
Margin for adverse experience	0.17

Schedule 15.

HEALTH CARE BENEFITS

A RELATIVE LEVEL COST INDEX*

Comparative Statement

<u>Valuation As of 6/30</u>	<u>Cost Index*</u>
1983	5.07%
1984	5.43
1985	5.40
1986	6.76
1987	7.69
1988#	6.48

* Index equals normal cost plus 50 year amortization of unfunded accrued liability (the 50 year period is subjective judgement; there are many other reasonable periods, as illustrated by the graph on page 48).

Benefit changes.

SHORT CONDITION TEST

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

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

- 1) The liabilities for future benefits to present retired lives;
- 2) 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 future benefits to present retired lives (liability 1) will be fully covered by present assets (except in rare circumstances). In addition, the liabilities for service already rendered by active members (liability 2) will be partially covered by the remainder of present assets. The larger the funded portion of liability 2, the stronger the condition of the System. Liability 2 being fully funded is rare.

Schedule 16.

HEALTH CARE BENEFITS

Short Condition 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)</u> Retired Lives (\$ in Millions)	<u>(2)</u> Present Members		<u>(1)</u>	<u>(2)</u>
1981*	\$246	\$182	\$ 71	29%	0%
1982	243	193	86	35	0
1983	304	235	103	34	0
1984	361	266	108	30	0
1985	386	295	120	31	0
1985*	391	369	120	31	0
1986	461	404	131	28	0
1987	562	489	137	24	0
1988	623	569	139	22	0
1988#	584	467	139	24	0

* Revised financial assumptions.

Benefit changes.

Schedule 17.

Composition of Health Care Costs

June 30, 1988

<u>Benefit</u>	<u>Age</u>	<u>Recipient</u>		<u>Combined</u>
		<u>Retiree</u>	<u>Other</u>	
Medical	Under 65	22%	6%	28%
Medical	65 Plus	27	6	33
Medicare B	Under 65	—	—	—
Medicare B	65 Plus	10	2	12
Prescription	Under 65	3	1	4
Prescription	65 Plus	20	3	23
Combined	Under 65	25	7	32
Combined	65 Plus	57	11	68
Combined	All	82	18	100

PENSION BENEFIT OBLIGATION

- HEALTH CARE BENEFITS -

The amount shown below as the "pension benefit obligation" is a standardized disclosure measure of the present value of pension benefits, adjusted for the effects of projected salary increases, estimated to be payable in the future as a result of employee service to date. The measure is the actuarial present value of credited projected benefits and is intended to (i) help users assess the plan's funding status on a going-concern basis, (ii) assess progress being made in accumulating sufficient assets to pay benefits when due, and (iii) allow for comparisons among public employee retirement plans. The measure is independent of the actuarial funding method used to determine contributions to the plan.

The pension benefit obligation was determined as part of an actuarial valuation of the plan as of June 30, 1988. Significant actuarial assumptions used in determining the pension benefit obligation include (a) a rate of return on the investment of present and future assets of 9.5% per year compounded annually for the period July 1, 1988 through June 30, 1991 and 7.5% per year thereafter, (b) projected salary increases of 4.5% per year compounded annually, attributable to inflation, (c) additional projected salary increases ranging from 0.0% to 3.0% per year attributable to seniority/merit, varying by age, and (d) the assumption that increases in the cost of health insurance will average 4.5% per year.

At June 30, 1988, the unfunded pension benefit obligation was \$857,750,299, determined as follows:

Pension Benefit Obligation:

Retirees and beneficiaries currently receiving benefits and terminated employees not yet receiving benefits	\$ 614,318,440
Current employees —	
Accumulated employee contributions including allocated investment income	- -
Employer financed - Vested	362,419,947
Employer financed - Non-vested	<u>14,127,647</u>
Total Pension Benefit Obligation	990,866,034
Net assets available for benefits, at cost (market value was \$146,141,831)	<u>133,115,735</u>
Unfunded Pension Benefit Obligation	857,750,299

During the year ended June 30, 1988 the plan experienced a net change of \$(14,834,387) in the health care pension benefit obligation. Of that change \$(199,273,907) was attributable to amendments.

REQUIRED SUPPLEMENTARY INFORMATION

ANALYSIS OF FUNDING PROGRESS

- HEALTH CARE BENEFITS -

(\$ amounts in Millions)

Fiscal Year	(1) Net Assets Available for Benefits	(2) Pension Benefit Obligation (PBO)	(3) Percent Funded (1)/(2)	(4) Unfunded PBO (2)-(1)	(5) Annual Covered Payroll	(6) Unfunded PBO as a Percentage of Covered Payroll (4)/(5)
1985	\$120	\$ 656	18.3%	\$536	\$804	66.7%
1986	129	830	15.5	701	869	80.7
1987	133	1,006	13.2	873	931	93.8
1988*	133	991	13.4	858	982	87.4

* Plan amended.

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

CONTRIBUTIONS REQUIRED AND CONTRIBUTIONS MADE

- HEALTH CARE BENEFITS -

Employer contribution rates are set by Act of the State Legislature.

The adequacy of these rates is checked annually by actuarial valuation. The actuarial funding method used in making these actuarial valuations is the entry age actuarial method; unfunded actuarial accrued liabilities are amortized as a level percent of the active member payroll, over the period of future years which produces the statutory employer contribution rate. Assuming the amortization period is reasonable, the employer contribution rate so computed, expressed as a percent of active member payroll, is designed to accumulate sufficient assets to pay benefits when due.

The most recent completed actuarial valuation was based upon data as of June 30, 1988.

During the year ended June 30, 1988 contributions totaling \$48,991,823 -- \$48,991,823 employer, \$0 employee -- were made in accordance with contributions determined by State Statute. The employer contributions consisted of ~~\$37,441,717~~ for normal cost and ~~\$11,550,106~~ for amortization of the unfunded actuarial accrued liability. Employer contributions represented 5% of covered payroll.

Significant actuarial assumptions used to compute contribution requirements were the same as those used to compute the standardized measure of the pension benefit obligation.

Employer Contribution Comparative Schedule

<u>Fiscal Year</u> <u>6/30</u>	<u>Valuation Date</u> <u>6/30</u>	<u>Contribution Rates</u> <u>As Percents of</u> <u>Valuation Payroll</u>	<u>Valuation Payroll</u>	<u>Dollar Contribution</u> <u>For Fiscal Year</u>
1985	1984	5.88%	\$737,375,080	\$39,066,642
1986	1985	5.87	804,230,073	43,057,551
1987	1986	5.00	869,111,274	50,986,665
1988	1987	5.00	931,385,997	48,991,823

APPENDIX

APPENDIX

SUMMARY OF

ASSUMPTIONS USED FOR SERS ACTUARIAL VALUATIONS

Assumptions Adopted by Board of Trustees After Consulting With Actuary

The actuarial assumptions used in making the valuation are shown in this Appendix of the report. The assumptions were revised as set forth in the Gabriel, Roeder, Smith and Company Investigation Report dated July 9, 1986.

ECONOMIC ASSUMPTIONS

The investment return rate used in making the valuations was 7.5% per year, compounded annually (net after administrative expenses), except that the SERS is assumed to earn 9.5% per year for the 3 years from July 1, 1988 through June 30, 1991. The real rate of return is the portion of total investment return which is more than the inflation rate. Based upon an assumed inflation rate of 4.5%, the 7.5% investment return rate translates to an assumed real rate of return of 3% (5% for the 3 years from July 1, 1988 through June 30, 1991).

Pay increase assumptions for individual active members are shown for sample ages in Schedule 18. 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 22.

NON-ECONOMIC ASSUMPTIONS

The mortality table used in evaluating allowances to be paid and death before retirement benefits was the 1971 Group Annuity Mortality Table projected to 1984 unadjusted for men and set back 1 year for women. Related values are shown in Schedule 21.

The probabilities of retirement with an age and service allowance are shown in Schedule 20.

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 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 System fiscal year.

Present assets were valued on a market related basis, recognizing 20% of previously unrecognized gains and losses each year. See page 19 for detail.

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

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

Schedule 18.

Pay Increase Assumptions for an Individual Member

<u>Sample Ages</u>	<u>Increase Next Year</u>		
	<u>Merit & 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 19.

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	0.05%	0.00%	13.91%	0.02%	0.00%	11.57%
25	0.06	0.00	10.67	0.03	0.00	8.94
30	0.07	0.01	6.55	0.04	0.00	6.59
35	0.10	0.04	5.43	0.05	0.01	5.82
40	0.15	0.10	4.64	0.07	0.05	5.07
45	0.27	0.18	3.84	0.11	0.08	4.31
50	0.49	0.33	3.06	0.17	0.15	3.55
55	0.78	0.63	2.27	0.25	0.47	2.79
60	1.21	—	2.02	0.41	—	2.46
65	1.95	—	2.02	0.73	—	2.46

Schedule 20.

Probabilities of Age & Service Retirement

<u>Sample Ages</u>	<u>Percent of Eligible Active Members Retiring Within Next Year</u>	
	<u>Men</u>	
50		15%
55		10
60		10
65		40
70		50
75		100

<u>Sample Ages</u>	<u>Percent of Eligible Active Members Retiring Within Next Year</u>	
	<u>Women</u>	
50		12%
55		18
60		25
65		35
70		50
75		100

Schedule 21.

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	\$171.18	\$191.98	27.53	34.60	77.53
55	156.74	180.48	23.28	29.92	78.28	84.92
60	140.21	166.28	19.27	25.34	79.27	85.34
65	121.85	149.39	15.55	20.94	80.55	85.94
70	102.90	129.87	12.25	16.79	82.25	86.79
75	84.92	108.66	9.50	13.02	84.50	88.02
80	67.78	88.12	7.17	9.85	87.17	89.85
85	53.37	69.03	5.43	7.24	90.43	92.24

<u>Sample Attained Ages</u>	<u>Portion of Age 60 Lives Still Alive</u>		<u>\$1,000 Benefit Beginning at Age 60, Increasing 3% Annually</u>
	<u>Men</u>	<u>Women</u>	
60	100%	100%	\$1,000
65	93	97	1,150
70	82	93	1,300
75	67	86	1,450
80	48	73	1,600
85	28	55	1,750

Schedule 22.

Additional Assumptions for Health Care Coverages

Aetna conventional premium rates:

<u>Status</u>	<u>Monthly Rates Reported</u>	
	<u>1988</u>	<u>1987</u>
Benefit Recipient below age 65	\$208.00	\$202.13
Spouse below age 65*	45.00	109.67
Benefit recipient above age 65 and eligible for Medicare	42.00	42.04
Spouse above age 65 and eligible for Medicare*	13.80	26.07

* SERS portion - 1987 figures reflect 50% SERS subsidy; 1988 figures represent 30% ultimate SERS subsidy.

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 women and 60% of eligible men 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 women retirants and 50% of men retirants are assumed to elect to cover spouses for health care. The System will pay the premium for dependents less a deduction during the life of the retirant.

Medicare Part B Premium Reimbursement: \$24.80 per month.

Mail Order Prescription Service: \$24.29 per month effective July 1, 1988 from \$19.40.

Premium Increases: Premiums and spouse coverage deductions (except for the fixed reimbursement for the Medicare Part B Premium) are assumed to increase 4.5% annually, which is the inflation rate assumed for other actuarial valuation computations.

Schedule 23.

Health Insurance Premiums

Monthly \$ Reported For Annual Actuarial Valuations

Valuation Date 6/30	Benefit Recipient		Spouse*		Mail Order Prescription	Medicare B Premiums
	Under 65	65+	Under 65	65+		
1980	\$105.36	\$31.02	\$ 8.13	\$ 2.51	\$ N/A	\$ 9.60
1981	123.69	36.42	17.87	5.44	N/A	11.00
1982#	117.82	25.97	57.34	7.74	3.05	12.20
1983@	148.10	35.63	81.09	11.03	6.27	14.60
1984#	148.10	35.63	81.09	11.03	8.83	15.50
1985#	148.10	35.63	81.09	11.03	11.24	15.50
1986#	169.86	35.33	83.38	19.35	14.55	17.90
1987@	202.13	42.04	109.67	26.07	19.40	24.80
1988#@	208.00	42.00	45.00	13.80	24.29	24.80

COMPOUND ANNUAL
RATES OF INCREASE:

Last Year	3%	0%	(59)%	(47)%	25%	0%
Last 5 Years	7	3	(11)	5	31	11
Since 6/30/80	9	4	24	24	-	13

* Employer portion.

Changes in deductible, hospital surcharge or cost containment measures.

@ Changes in deduction for dependent coverage.

INVESTMENT RETURN & INFLATION

Inflation Distortions. Inflation's impact on investment return is not even from year to year.

A common expectation for Real Investment Return (Total Return minus Inflation) is the area of 3% to 4% annually.

In the last 25 years Real Return was not only short of that mark, it was actually negative for parts of that period.

No. of Years/ Ended December	Inflation (CPI)	Annual Investment Return (including income) ...REAL RETURN (Total minus Inflation)...				
		Bonds (Long)		Cash	Stocks	A
		US Treas	Corp (Sal Bro)	Equiv (T-Bills)	(S&P 500)	Sample Fund*
5/1964	1.2%	4.0%	4.5%	1.7%	9.5%	6.5%
5/1969	3.8	-5.9	-6.0	1.2	1.2	-2.0
5/1974	6.6	0.3	0.1	-0.6	-9.0	-4.1
5/1979	8.1	-3.2	-2.3	-1.5	6.6	1.8
5/1984	6.5	3.7	4.6	4.5	8.3	6.3
-----	-----	-----	-----	-----	-----	-----
25/1984	5.2	-0.3	0.1	1.1	3.1	1.6
-----	-----	-----	-----	-----	-----	-----
1/1985	3.8	27.2	27.1	3.9	28.4	25.4
1/1986	1.1	23.3	18.7	5.0	17.3	16.7
1/1987	4.4	-7.1	-4.7	1.1	0.8	-1.6

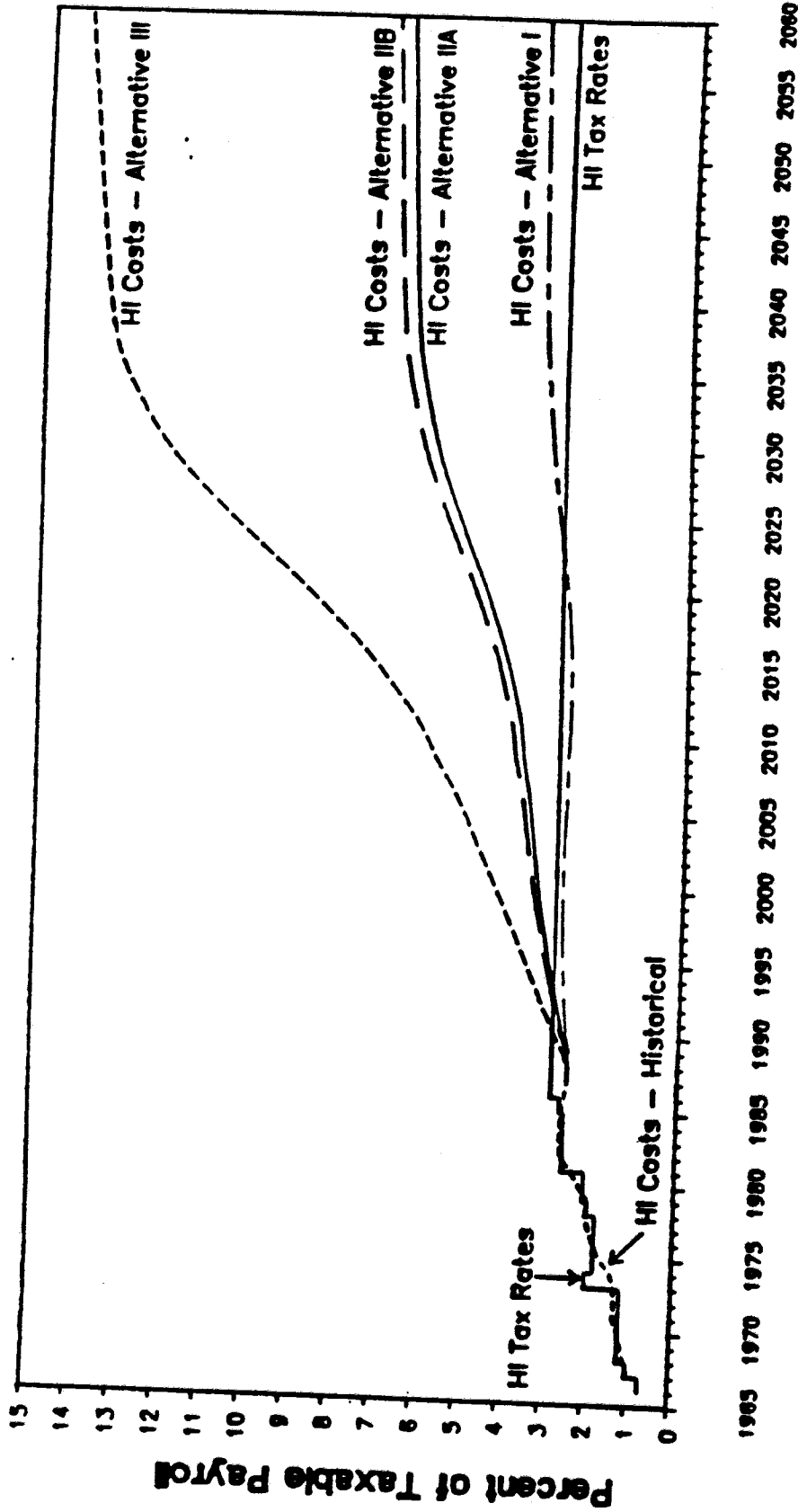
* 10% Cash Equiv + 45% Corp Bonds + 45% Stocks (only one of many reasonable samples).

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

Changes In Economic Assumptions Within An Economic Environment of Inflation. There is powerful motivation to increase assumed Investment Return used in actuarial calculations, with or without a related increase in Employee Pay Base, because such an assumption change decreases computed contributions. A contribution rate decrease (i) offers relief for employer budget problems and/or (ii) offers a "no-cost" way to provide more Benefit Increases After Retirement.

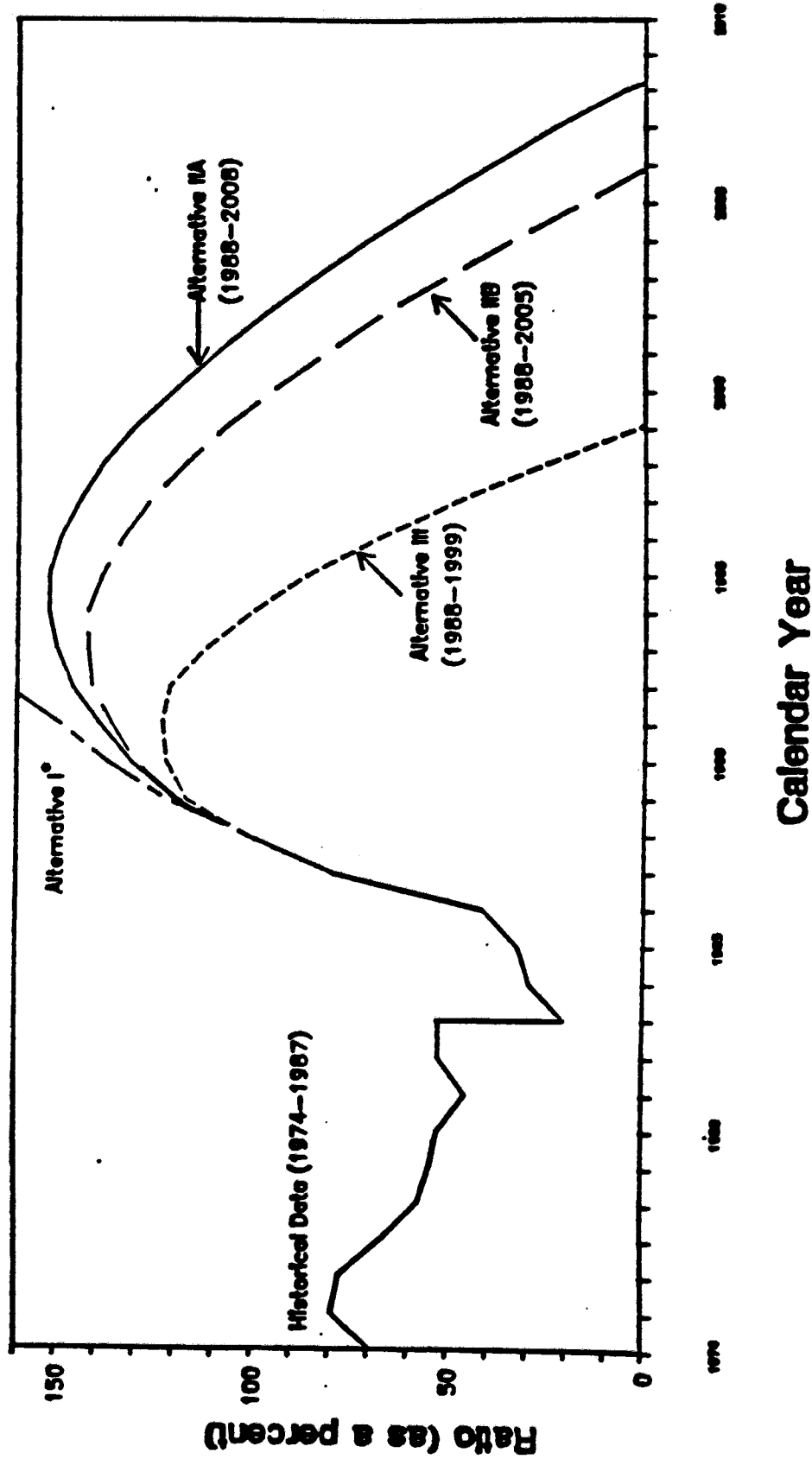
The wisdom of assumed Investment Return now can be determined only by future events. Will the investment record of the last 25 years be the same in the next 25 years? Better? Worse?

Figure 2 Estimated HI Costs and Tax Rates



Note: HI projected costs shown are expenditures attributable to insured beneficiaries only, on an incurred basis, without an allowance for building and maintaining the trust fund balance at the level of at least a half-year's outgo.

Figure 1 Short Term HI Trust Fund Ratios



* The trust fund is depleted in 2044 under alternative I.

Note: The trust fund ratio is defined as the ratio of assets at the beginning of the year to disbursements during the year.

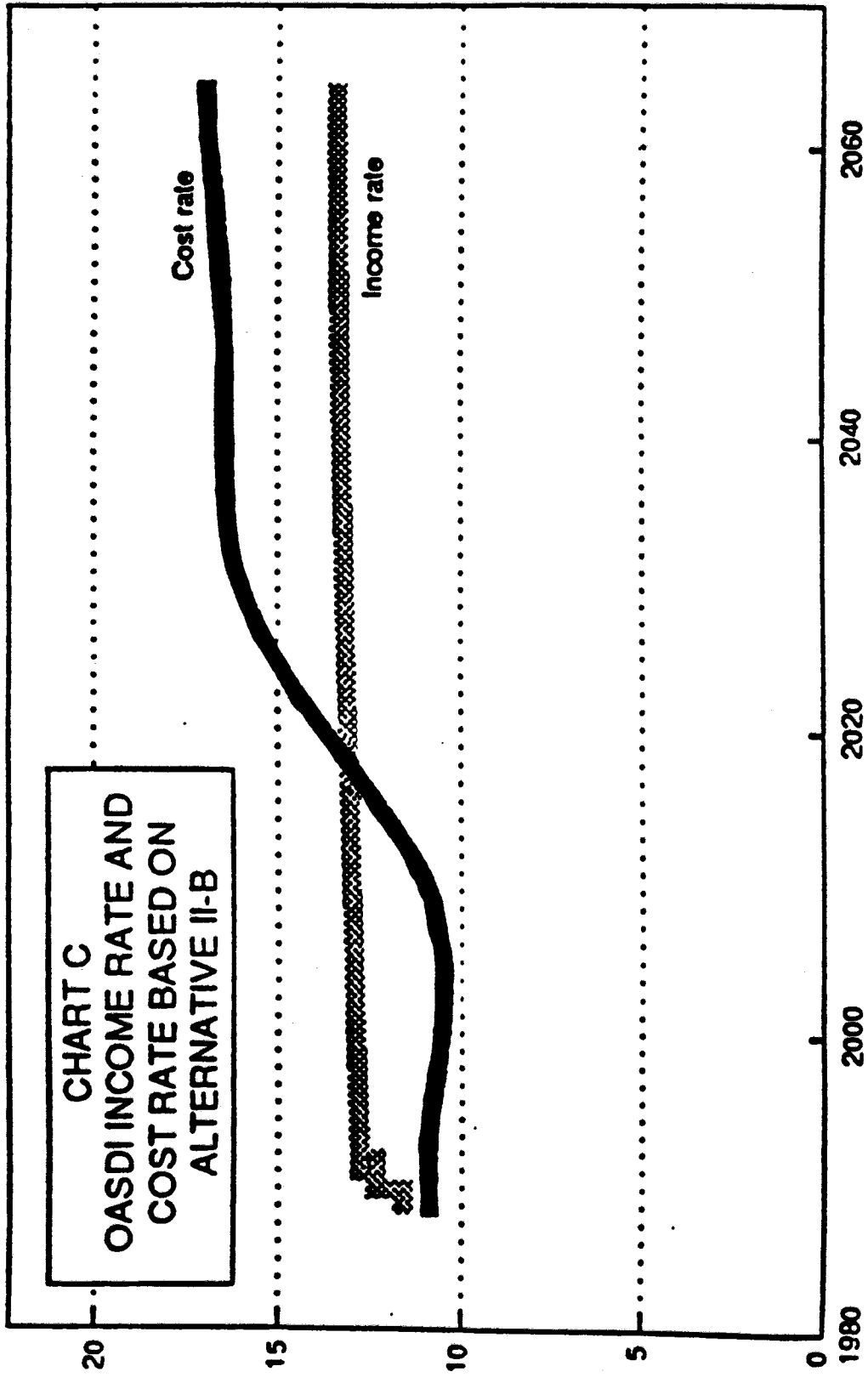
TABLE 11.—SELECTED DEMOGRAPHIC ASSUMPTIONS BY ALTERNATIVE, CALENDAR YEARS
1940-2085

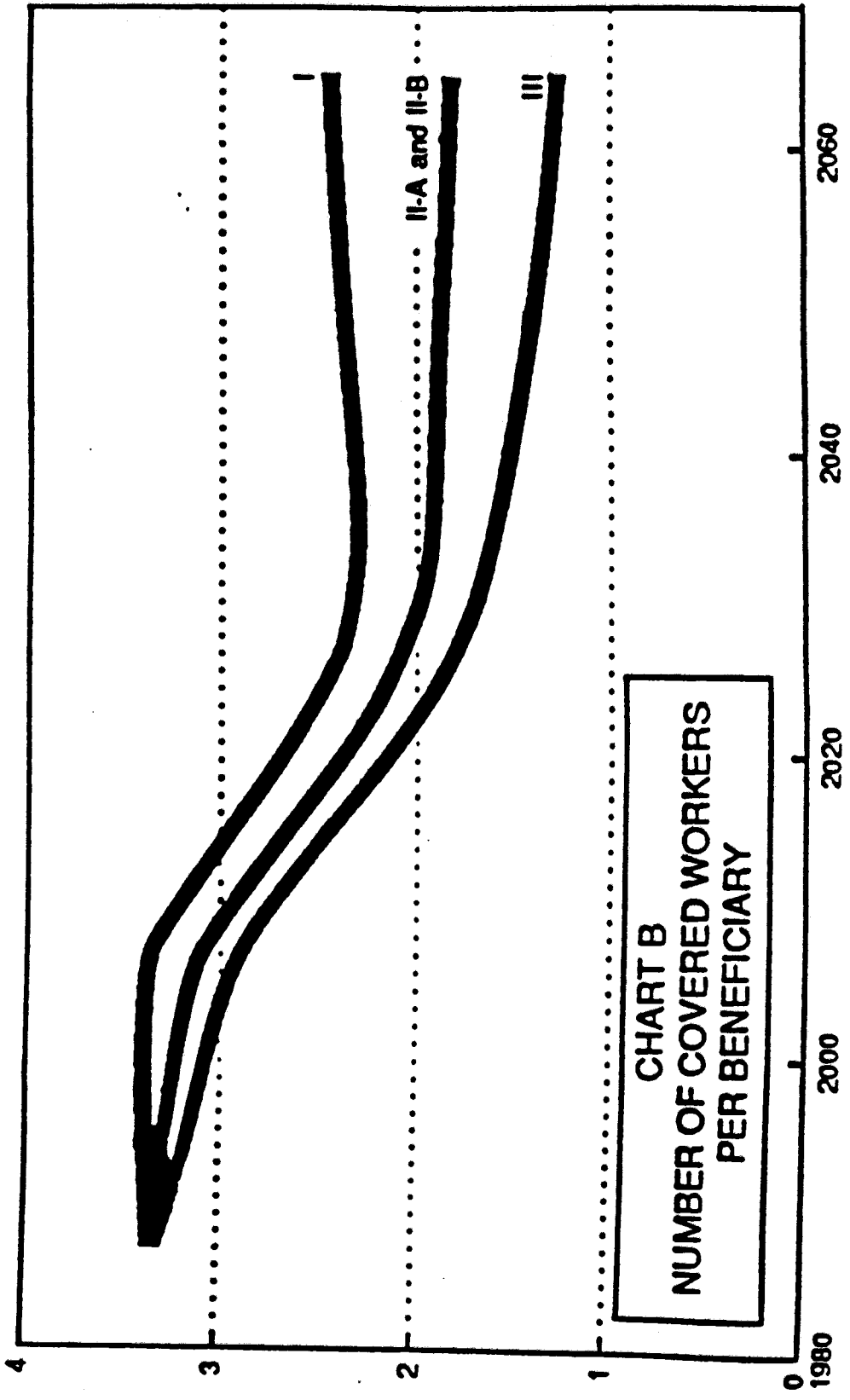
Calendar year	Total fertility rate ^a	Age-sex-adjusted death rate ^b (per 100,000)	Life expectancy ^c			
			At birth		At age 65	
			Male	Female	Male	Female
Past experience:						
1940	2.53	1,332.3	61.4	65.7	11.9	13.4
1945	2.42	1,289.4	62.9	66.4	12.6	14.4
1950	2.09	1,225.3	65.8	71.1	12.8	15.1
1955	2.00	1,134.2	66.7	72.8	12.1	15.6
1960	2.01	1,126.6	66.7	72.2	12.9	15.9
1965	2.06	1,103.8	66.8	72.8	12.9	16.3
1970	2.43	1,041.8	67.1	74.9	12.1	17.1
1975	1.77	894.0	68.7	76.6	12.7	18.0
1976	1.74	882.2	69.1	76.6	12.7	18.1
1977	1.80	886.0	69.4	77.2	12.9	18.3
1978	1.78	882.4	69.6	77.3	12.9	18.3
1979	1.82	884.2	70.0	77.7	14.2	18.6
1980	1.86	878.0	69.9	77.5	14.0	18.4
1981	1.83	883.4	70.4	77.9	14.2	18.6
1982	1.83	887.8	70.8	78.2	14.6	18.8
1983	1.81	886.0	70.9	78.1	14.3	18.8
1984	1.80	888.2	71.1	78.2	14.4	19.7
1985	1.84	889.6	71.1	78.3	14.4	19.8
1986	1.83	814.1	71.3	78.4	14.8	19.7
1987 ^d	1.87	804.6	71.3	78.5	14.8	19.8
Alternative E:						
1988	1.88	803.1	71.5	78.6	14.9	19.8
1990	1.91	799.5	71.3	78.7	14.9	19.9
1995	1.98	802.0	70.9	78.8	15.0	19.9
2000	2.04	796.2	70.9	78.9	15.0	19.9
2005	2.11	786.6	72.4	79.3	15.1	19.0
2010	2.17	736.0	73.1	79.8	15.2	19.1
2015	2.20	723.7	73.4	79.7	15.3	19.3
2020	2.20	714.4	73.5	79.9	15.4	19.4
2025	2.20	706.5	73.7	80.0	15.5	19.5
2030	2.20	698.8	73.8	80.2	15.6	19.6
2035	2.20	696.4	74.0	80.3	15.7	19.7
2040	2.20	690.2	74.1	80.4	15.8	19.8
2045	2.20	672.2	74.3	80.6	15.9	19.9
2050	2.20	664.5	74.4	80.7	16.0	20.0
2055	2.20	656.9	74.5	80.8	16.0	20.1
2060	2.20	649.5	74.7	81.0	16.1	20.3
2065	2.20	642.3	74.8	81.1	16.2	20.4
Alternative H-A and H-B:						
1988	1.87	802.9	71.8	78.7	14.9	19.9
1990	1.87	790.2	71.8	79.0	15.1	19.1
1995	1.88	783.6	71.9	79.8	15.4	19.5
2000	1.89	783.9	72.2	80.2	15.7	19.8
2005	1.88	689.9	73.9	80.7	15.9	20.0
2010	1.89	680.9	74.7	81.1	16.1	20.2
2015	1.90	682.7	75.1	81.4	16.2	20.4
2020	1.90	618.2	75.3	81.7	16.4	20.6
2025	1.90	604.5	75.6	82.0	16.6	20.9
2030	1.90	591.3	75.8	82.3	16.7	21.1
2035	1.90	578.5	76.1	82.5	16.9	21.3
2040	1.90	566.0	76.3	82.8	17.1	21.5
2045	1.90	554.0	76.6	83.1	17.2	21.7
2050	1.90	542.3	76.8	83.3	17.4	21.9
2055	1.90	531.0	77.0	83.5	17.6	22.2
2060	1.90	519.9	77.2	83.8	17.8	22.4
2065	1.90	509.3	77.5	84.1	17.9	22.5

TABLE 10.—SELECTED ECONOMIC ASSUMPTIONS BY ALTERNATIVE CALENDAR YEARS
1980-2065

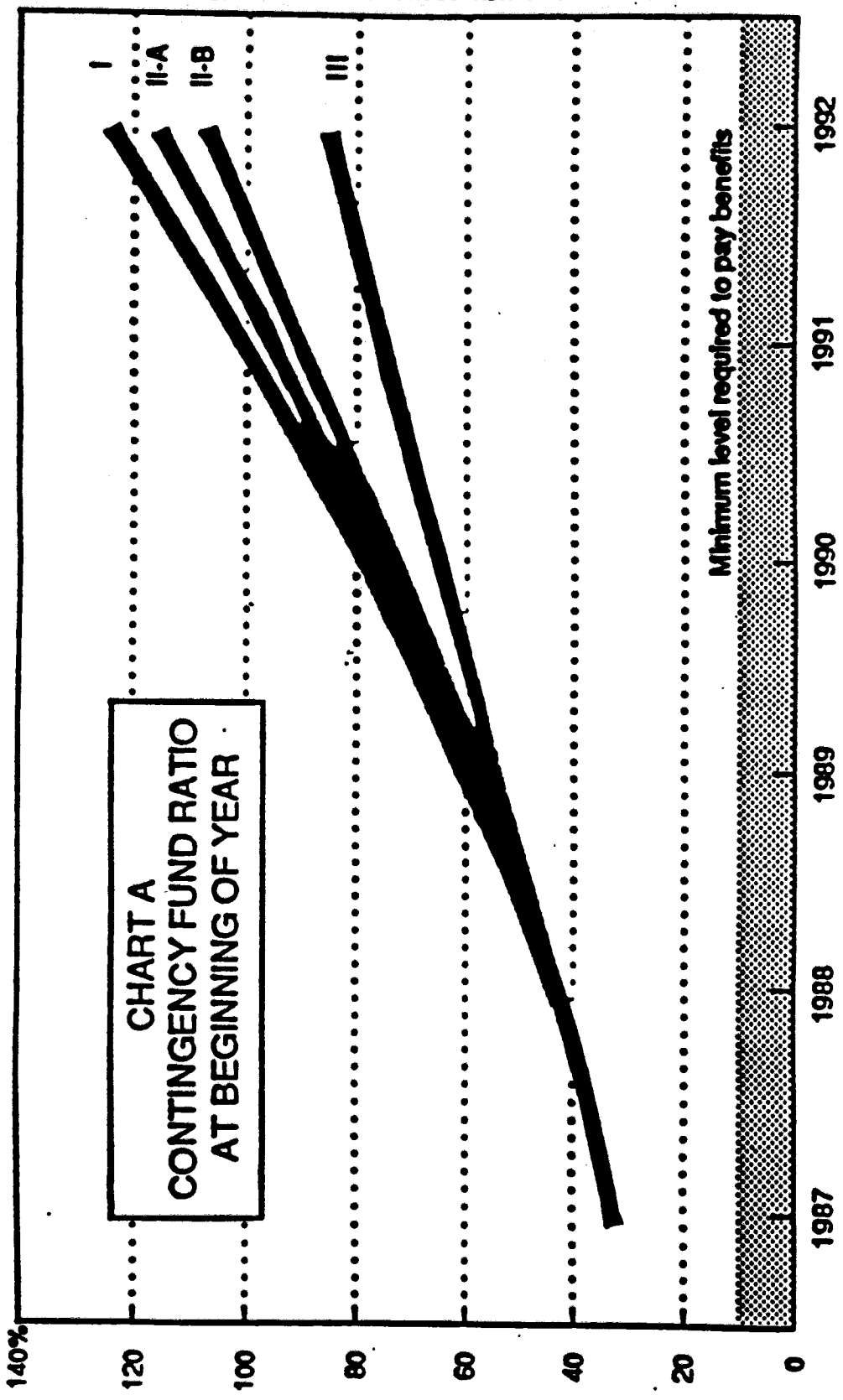
Calendar year	Average annual percentage increase in—			Real-wage differential* (percent)	Average annual interest rate† (percent)	Average annual unemployment rate‡ (percent)
	Real GNP*	Average wages in covered employment	Consumer Price Index*			
Past experience						
1980-84	2.9	2.4	1.9	2.1	2.7	2.7
1985-89	4.4	2.4	2.4	2.0	2.2	2.8
1970-74	2.4	2.3	2.1	2.2	2.7	2.4
1975	-1.3	2.7	2.1	-2.5	7.4	2.5
1976	4.9	2.5	2.7	2.8	7.1	2.7
1977	4.7	7.2	2.5	2.7	7.1	2.1
1978	2.3	2.7	7.8	2.1	2.1	2.8
1979	2.3	2.2	11.4	-2.2	11.0	7.1
1980	-1.2	2.1	12.3	-4.4	12.3	7.8
1981	2.5	2.3	12.3	-1.0	12.3	2.7
1982	2.5	2.5	12.3	2.8	11.9	2.8
1983	2.5	2.7	12.4	2.3	12.4	7.5
1984	2.5	2.3	2.5	2.7	12.5	7.2
1985	2.5	2.4	1.5	2.5	2.5	7.5
Alternative I						
1987	2.9	2.9	2.2	2.2	2.4	2.2
1988	2.5	2.4	2.2	2.2	2.4	2.2
1989	2.5	2.7	2.2	2.4	2.4	2.2
1990	2.9	2.6	2.2	2.2	7.3	2.2
1991	2.7	2.1	2.7	2.5	7.1	2.1
1992	2.5	4.6	2.2	2.4	2.4	2.1
1993	2.5	4.4	2.5	2.4	2.9	4.9
1994	2.3	4.4	2.0	2.4	4.3	4.9
1995	2.0	4.5	2.0	2.3	4.3	4.9
1996	2.0	4.5	2.0	2.3	4.3	4.8
1997	2.0	4.5	2.0	2.3	2.5	4.8
2000	2.2	4.5	2.0	2.4	2.0	2.0
2010 & later	2.8	4.4	2.0	2.4	2.0	2.0
Alternative I-A						
1987	2.9	2.0	2.2	2.2	2.4	2.2
1988	2.9	2.1	2.2	1.2	2.4	2.2
1989	2.1	2.7	2.2	2.0	2.2	2.0
1990	2.5	2.6	2.2	2.0	2.2	2.7
1991	2.4	2.2	2.2	2.0	7.2	2.5
1992	2.1	2.0	2.0	1.9	7.0	2.4
1993	2.8	4.9	2.0	1.9	2.4	2.5
1994	2.8	4.9	2.0	1.9	2.9	2.5
1995	2.7	4.9	2.0	1.9	2.7	2.5
1996	2.7	4.9	2.0	1.9	2.6	2.5
1997	2.7	4.9	2.0	1.9	2.6	2.5
2000	2.6	2.0	2.0	1.9	2.6	2.5
2010 & later	2.3	4.6	2.0	1.9	2.6	2.5
Alternative I-B						
1987	2.9	2.0	2.2	2.2	2.4	2.2
1988	2.5	4.3	2.2	2.2	2.4	2.2
1989	2.5	2.4	2.2	1.1	2.1	2.2
1990	2.5	2.4	2.2	1.1	2.9	2.1
1991	2.8	2.7	2.2	1.9	2.8	2.2
1992	2.7	2.7	2.2	1.7	7.2	2.2
1993	2.6	2.5	2.2	1.8	7.4	2.2
1994	2.4	2.5	2.2	1.8	2.9	2.2
1995	2.3	2.5	2.2	1.8	2.9	2.2
1996	2.3	2.5	2.2	1.8	2.4	2.2
1997	2.3	2.5	2.2	1.8	2.2	2.7
2000	2.2	2.5	2.2	1.4	2.0	2.2
2010 & later	1.9	4.6	2.2	1.4	2.0	2.2
Alternative II						
1987	2.9	2.0	2.2	2.2	2.4	2.2
1988	-1	2.4	2.4	-1.0	2.2	2.2
1989	2.9	2.5	2.2	-1.1	2.7	7.5
1990	2.4	2.5	2.4	-1.1	12.5	7.2
1991	1.2	2.5	2.2	-1.4	12.5	7.1
1992	-0.6	2.5	2.0	-1.2	2.7	2.2
1993	2.2	2.5	2.0	1.2	2.6	7.2
1994	2.1	2.5	2.0	1.2	7.2	7.2
1995	2.1	2.5	2.0	1.2	7.2	2.2
1996	1.9	2.5	2.0	1.2	7.2	2.2
1997	1.9	2.5	2.0	1.2	2.2	2.7
2000	1.8	2.5	2.0	1.2	2.2	7.2
2010 & later	1.3	2.5	2.0	1.2	2.2	7.2

*The real GNP (gross national product) is the total output of goods and services, expressed in 1982 dollars.
 †The Consumer Price Index is the average of the 12 monthly values of the Consumer Price Index for Urban Wage Earners and Clerical Workers (CPI-W).
 ‡The real-wage differential is the difference between the percentage increase, before rounding, in (1) average annual wages in covered employment, and (2) the average annual Consumer Price Index.
 §The average annual interest rate is the average of the annual interest rates, which, in practice, are compounded semiannually, for special public-debt obligations issuable to the trust funds in each of the 12 months of the year.
 ¶Through 1977, the rates shown are crude civilian unemployment rates. After 1977, the rates are total rates (including military personnel), adjusted by age and sex based on the estimated total labor force on July 1, 1977.
 ¶Preliminary.
 **This value is for 2010. The annual percentage increase in real GNP is assumed to continue to change after 2010 for each alternative to reflect the dependence of labor force growth on the size and age-sex distribution of the population. The increases for 2065 are 2.9, 2.4, 1.4, and 0.6 percent for alternatives I, I-A, I-B, and II, respectively.

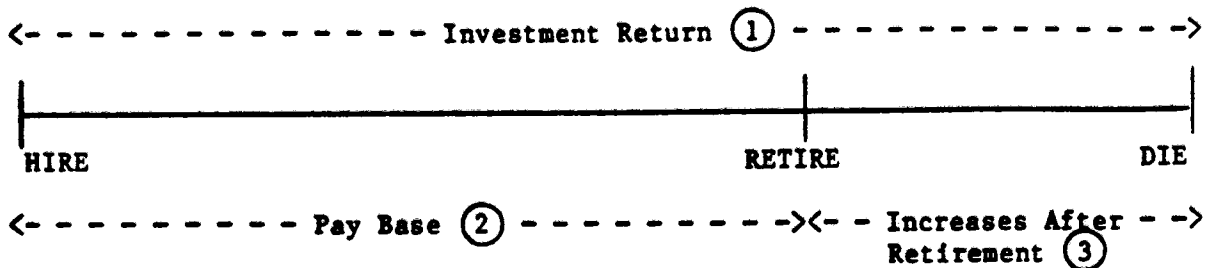




THE 1988 ANNUAL REPORTS
OF
THE SOCIAL SECURITY ADMINISTRATION



RELATIONSHIP OF ECONOMIC ASSUMPTIONS
IN COMPUTING CONTRIBUTIONS TO A RETIREMENT SYSTEM



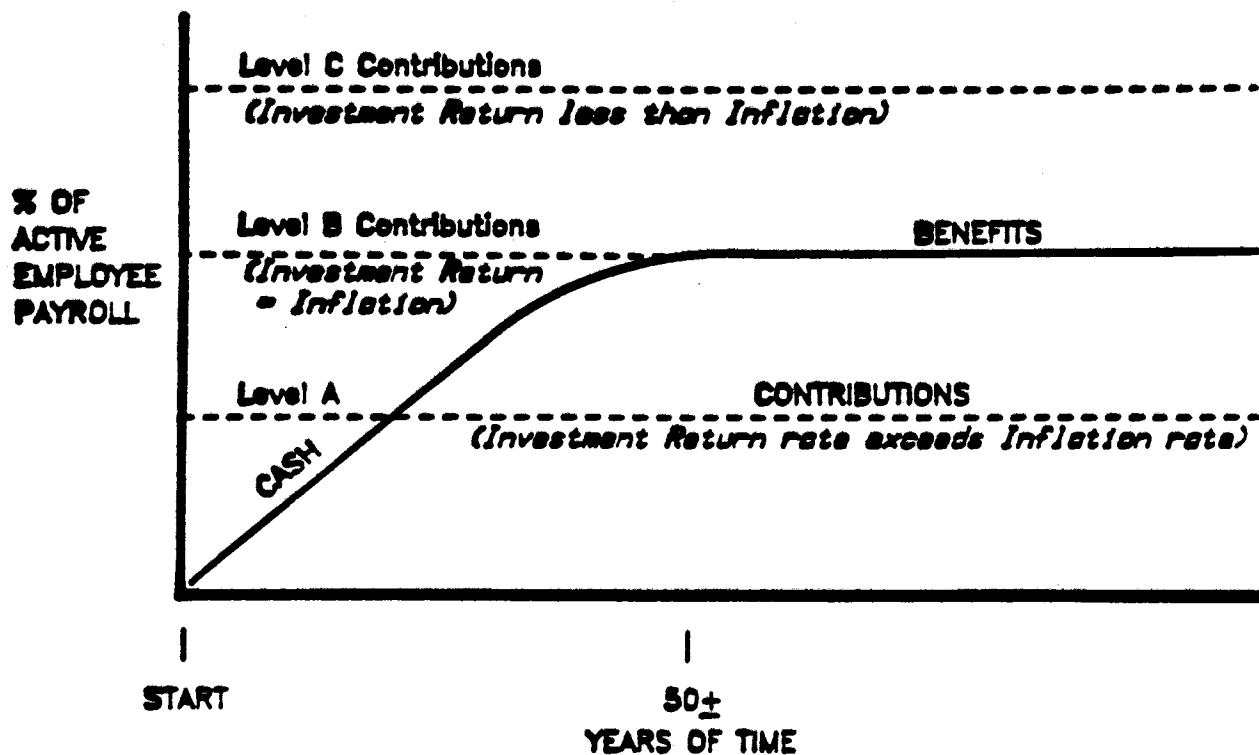
- ① Investment Return. An increase in this assumption reduces computed contributions. The assumption operates over all parts of an employee's lifetime.
- ② Pay Base. An increase in this assumption increases computed contributions. A 1% increase in this assumption, however, does not increase contributions 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.

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.

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



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

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

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

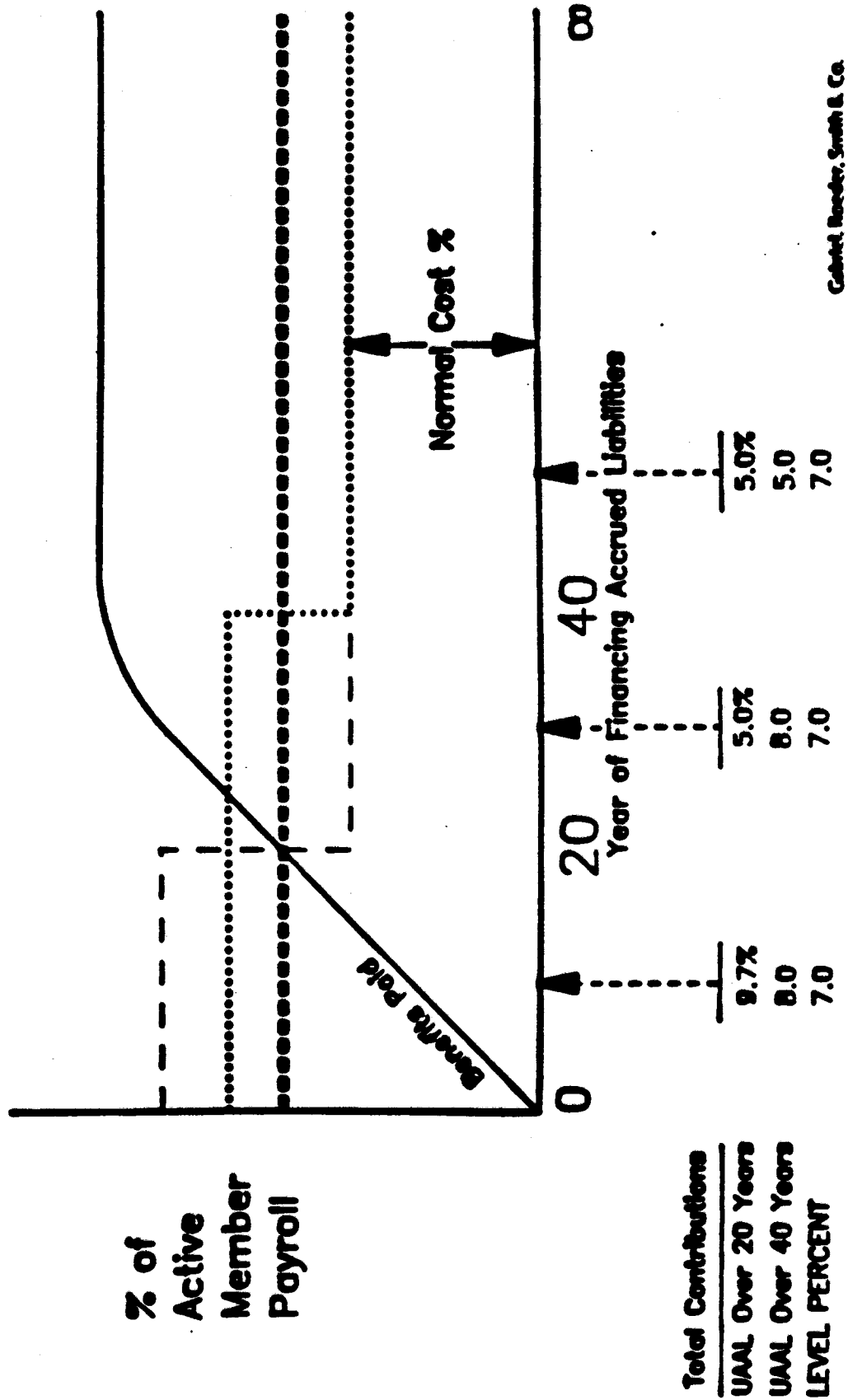
Who would contribute a level rate which is the same as the ultimate contribution rate of "pay-as-you-go" financing?

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

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

**TOTAL CONTRIBUTIONS FOR RETIREMENT BENEFITS
USING ALTERNATE FINANCING FOR ACCRUED LIABILITIES:
..... LEVEL % OF PAYROLL**

- - - FULL AMORTIZATION OF UAAL OVER 20 YEARS
- FULL AMORTIZATION OF UAAL OVER 40 YEARS



(1926 - 1987)

Year	Common Stocks	Small Company Stocks	Long-Term Corporate Bonds	Long-Term Government Bonds	Intermediate-Term Government Bonds	U.S. Treasury Bills	Consumer Price Index
1926	0.1162	0.0888	0.0737	0.0777	0.0538	0.0227	-0.0149
1927	0.3749	0.2718	0.0744	0.0895	0.0432	0.0512	-0.0888
1928	-0.4261	0.3949	0.0284	0.0918	0.0592	0.0234	-0.0897
1929	-0.0842	-0.3134	0.0227	0.0842	0.0691	0.0475	0.0819
1930	-0.0498	-0.3815	0.0798	0.0666	0.0673	0.0241	-0.0883
1931	-0.4334	-0.4975	-0.0188	-0.0831	-0.0232	0.0187	-0.0882
1932	-0.0819	-0.0839	0.1882	0.1684	0.0881	0.0596	-0.1838
1933	0.3399	1.4227	0.1828	-0.0808	0.0182	0.0288	0.0851
1934	-0.0144	0.3422	0.1284	0.1882	0.0788	0.0514	0.0283
1935	0.4757	0.4819	0.0961	0.0498	0.0701	0.0917	0.0299
1936	0.3392	0.4480	0.0674	0.0751	0.0306	0.0918	0.0121
1937	-0.3803	-0.3881	0.0275	0.0823	0.0154	0.0314	0.0310
1938	0.3112	0.3280	0.0613	0.0553	0.0423	-0.0002	-0.0278
1939	-0.0841	0.0235	0.0397	0.0894	0.0432	0.0002	-0.0848
1940	-0.0978	-0.0814	0.0339	0.0609	0.0294	0.0000	0.0894
1941	-0.1139	-0.0900	0.0273	0.0893	0.0049	0.0006	0.0772
1942	0.2834	0.4451	0.0260	0.0322	0.0194	0.0027	0.0729
1943	0.2990	0.0837	0.0283	0.0208	0.0281	0.0035	0.0316
1944	0.1975	0.3372	0.0473	0.0881	0.0188	0.0033	0.0211
1945	0.3644	0.7361	0.0488	0.1873	0.0222	0.0033	0.0225
1946	-0.0807	-0.1143	0.0172	-0.0810	0.0188	0.0035	0.1817
1947	0.0571	0.0892	-0.0234	-0.0263	0.0091	0.0050	0.0901
1948	0.0850	-0.0211	0.0414	0.0348	0.0185	0.0081	0.0271
1949	0.1879	0.1975	0.0331	0.0845	0.0232	0.0118	-0.0188
1950	0.3171	0.3875	0.0212	0.0806	0.0070	0.0128	0.0579
1951	0.2402	0.0780	-0.0269	-0.0394	0.0034	0.0149	0.0587
1952	0.1837	0.0283	0.0232	0.0114	0.0143	0.0146	0.0088
1953	-0.0099	-0.0649	0.0341	0.0343	0.0323	0.0182	0.0043
1954	0.2362	0.0858	0.0339	0.0719	0.0268	0.0086	-0.0050
1955	0.3124	0.2844	0.0048	-0.0138	-0.0045	0.0157	0.0037
1956	0.0654	0.0428	-0.0481	-0.0259	-0.0042	0.0244	0.0286
1957	-0.1878	-0.1457	0.0871	0.0745	0.0784	0.0314	0.0302
1958	0.4334	0.6489	-0.0222	-0.0818	-0.0129	0.0154	0.0176
1959	0.1196	0.1448	-0.0097	-0.0226	-0.0039	0.0295	0.0150
1960	0.0847	-0.0239	0.0907	0.1378	0.1175	0.0044	0.0148
1961	0.2689	0.3289	0.0482	0.0897	0.0185	0.0213	0.0867
1962	-0.0873	-0.1188	0.0795	0.0689	0.0854	0.0275	0.0122
1963	0.2288	0.2257	0.0219	0.0121	0.0144	0.0312	0.0148
1964	0.1448	0.2282	0.0477	0.0351	0.0484	0.0034	0.0119
1965	0.1345	0.4175	-0.0044	0.0871	0.0182	0.0395	0.0192
1966	-0.1884	-0.0781	0.0288	0.0345	0.0448	0.0476	0.0335
1967	0.2398	0.0287	-0.0495	-0.0919	0.0181	0.0421	0.0384
1968	0.1188	0.3997	0.0257	-0.0886	0.0433	0.0321	0.0472
1969	-0.0888	-0.0888	-0.0289	-0.0888	-0.0074	0.0088	0.0611
1970	0.0481	-0.1763	0.1827	0.1218	0.1886	0.0083	0.0849
1971	0.1431	0.1888	0.1181	0.1323	0.0572	0.0439	0.0826
1972	0.1898	0.0443	0.0726	0.0868	0.0816	0.0884	0.0341
1973	-0.1466	-0.0898	0.0114	-0.0111	0.0488	0.0495	0.0888
1974	-0.2847	-0.1998	-0.0886	0.0438	0.0868	0.0088	0.1288
1975	0.3788	0.3282	0.1444	0.0919	0.0783	0.0088	0.0781
1976	0.2284	0.0728	0.1888	0.1675	0.1287	0.0888	0.0481
1977	-0.0718	0.0288	0.0171	-0.0867	0.0148	0.0512	0.0677
1978	0.0888	0.2346	-0.0887	-0.0114	0.0848	0.0718	0.0923
1979	0.0844	0.4346	-0.0418	-0.0122	0.0488	0.1888	0.1331
1980	0.2342	0.3888	-0.0262	-0.0895	0.0891	0.1134	0.1348
1981	-0.0491	0.1288	-0.0894	0.0188	0.0944	0.1471	0.0894
1982	0.2141	0.0881	0.4379	0.4835	0.2918	0.1884	0.0387
1983	0.2251	0.3967	0.0478	0.0868	0.0741	0.0888	0.0288
1984	0.0627	-0.0667	0.1639	0.1543	0.1482	0.0988	0.0395
1985	0.2214	0.2446	0.3898	0.3897	0.2833	0.0772	0.0377
1986	0.1847	0.0685	0.1988	0.2444	0.1514	0.0614	0.0113
1987	0.0823	-0.0938	-0.0827	-0.0269	0.0298	0.0647	0.0441