

1981-82 REPORT:  
SPECIAL JOINT COMMITTEE  
OF THE GENERAL ASSEMBLY  
TO REVIEW  
RETIREMENT COST-OF-LIVING SUPPLEMENTS  
AND FUNDING SOURCES

General Assembly of the Commonwealth of Pennsylvania  
September 1982

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SPECIAL JOINT COMMITTEE TO REVIEW RETIREMENT  
COST-OF-LIVING SUPPLEMENTS AND FUNDING SOURCES

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September 1982

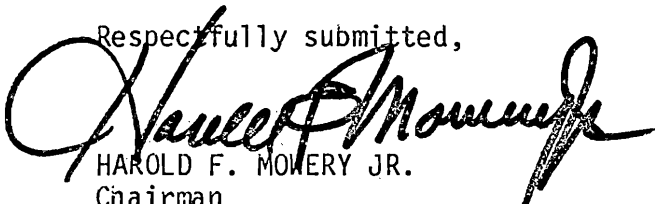
TO THE MEMBERS OF THE GENERAL ASSEMBLY:

The Special Joint Committee to Review Retirement Cost-of-Living Supplements and Funding Sources is pleased to present its first biennial report under the provisions of Act No. 130 of 1979. Written in nontechnical language, this comprehensive review of the costs and options associated with cost-of-living adjustments for annuitants of the State and school retirement systems should aid the informed consideration of retirement legislation and provide a sound factual basis for policy decisions in this complex area.

The members of the Special Committee express appreciation to the staffs and actuaries of the State Employees' Retirement System and the Public School Employees' Retirement System for their interest and input in the committee's work. The committee is particularly grateful to the General Assembly's Joint State Government Commission, chaired by Representative Roger A. Madigan, for making available independent actuarial study as well as technical and editorial staff assistance under Donald C. Steele, research director.

Additional copies of this report are available at the offices of the Joint State Government Commission, Room 108 Finance Building, Harrisburg, Pennsylvania 17120.

Respectfully submitted,



HAROLD F. MOWERY JR.  
Chairman  
Special Joint Committee to Review  
Retirement Cost-of-Living Supplements  
and Funding Sources

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## SUMMARY OF FINDINGS AND CONCLUSIONS

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### Findings

1. Annuitants of the State Employees' Retirement System (SERS) and the Public School Employees' Retirement System (PSERS) received their most recent cost-of-living adjustment in 1979. Previous increases were effective in 1974 and 1975 and in 1967 and 1968. For most retirees these increases restored from about one-half to two-thirds of their annuities' loss in purchasing power due to inflation as measured by the Consumer Price Index (CPI).
2. In 1981-82, the total employer cost of SERS was \$308 million or 14.41 percent of payroll and the total employer cost of PSERS--shared equally by the Commonwealth and the school districts--was \$530 million or 15 percent of payroll. Of these totals, the employer cost of all past cost-of-living adjustments (COLAs) amounted to \$31 million or 1.43 percent of payroll for SERS and \$114 million or 3.24 percent of payroll for PSERS.
3. From July 1, 1979--the effective date of the most recent COLA--through June 1982, the CPI has risen by 34.2 percent.

4. An ad hoc COLA of one-half the rate of increase in the CPI from mid-1979 to mid-1982 would have a first-year funding cost of .82 percent of payroll or \$17.5 million for SERS and 1.6 percent of payroll or \$56.5 million for PSERS. The first-year funding cost of an automatic annual COLA of 3 percent would be 4.3 percent of payroll or \$92.9 million for SERS and 8.6 percent of payroll or \$303.9 million for PSERS.
  
5. A flat limit on the amount of an annuity to which a cost-of-living adjustment applies--ignoring length of service--favors highly paid, short-service employees, discriminates against career public servants and saves only a very small proportion of the total costs. By applying the 1979 COLA only to the first \$12,000 of an eligible member's annuity, employer costs were reduced by 4.6 percent for SERS and 1.4 percent for PSERS. SERS annuitants with 30 or more years of service, while comprising only 16 percent of total annuitants, accounted for 70.8 percent of the persons receiving annuities over the \$12,000 limit and 71.5 percent of the cost reduction due to the limit. For PSERS, 99 percent of the reduction was attributable to the annuitants with 30 or more years of service, who represent 48 percent of all school system retirees and 98.4 percent of the persons receiving annuities over the \$12,000 limit.
  
6. Actuarial investigations of experience during the five-year period 1976 through 1980 produced revised actuarial assumptions

which increased the Commonwealth's employer costs substantially beginning with fiscal 1982-83. For SERS, the employer cost from 1981-82 to 1982-83 increased by 3.44 percent of payroll to 17.85 percent of payroll, requiring an additional \$78 million employer contribution. The PSERS employer cost increased by 4 percent of payroll, which the board will phase in over a four-year period. For 1982-83, the Commonwealth and the school districts will share a 1 percent cost increase amounting to \$35 million.

7. The most recent expansion of retirement benefits is contained in Act No. 152 of 1982, which provides a one-time early retirement option for members of PSERS based on age and length of service. If this policy were to be repeated annually or otherwise made permanent, the cost would represent 1.9 percent of the 1982-83 estimated payroll for PSERS, or \$67.1 million.
8. Actuaries who have studied SERS and PSERS generally agree that the 5.5 percent interest assumption set by statute for valuing retirement fund earnings is unrealistically low. There is no general agreement, however, as to the appropriate rate under current economic conditions. The study of the two systems by Winklevoss & Associates recommends increasing the interest assumption to 10 percent and adopting an 8 percent salary increase assumption. The actuaries for PSERS and SERS--Buck



Consultants and Huggins & Company, respectively--recommend economic assumptions of 7 to 8 percent interest and 6 to 7 percent annual salary increase.

### Conclusions

In reviewing the need for a COLA for annuitants and the substantial costs associated with the various COLA alternatives, the members of the Special Committee were also well aware of the increase in annual costs for both systems resulting from the revised actuarial assumptions and from any liberalization of benefits, such as a permanent early retirement option for school employees. For PSERS, the combined additional cost of the revised assumptions, an automatic COLA capped at 3 percent and the temporary early retirement option if made permanent would about double the existing employer cost.

It is obvious that the Legislature cannot consider COLAs or any other costly change in the retirement systems in isolation but must carefully weigh a range of alternatives. While a revision of the out-of-date economic assumptions of the two systems may reduce the current actuarial costs to some extent, the Legislature must determine if and in what manner such a revision should be accomplished and how the cost reductions should be reflected.

Because of these considerations, the Special Committee decided not to recommend a specific cost-of-living adjustment but to

provide a report to the Legislature containing facts with which to evaluate the need for and costs of COLAs, the alternative methods of providing and funding COLAs and the alternatives associated with revision of the economic assumptions. However, it is the firm opinion of the members of the Special Committee that for both the Commonwealth and for retired State and school employees one of the following alternatives is preferable to unplanned and politically timed ad hoc adjustments:

- An automatic cost-of-living adjustment capped at a level consistent with affordable funding arrangements.
- Annual legislative consideration of the need for and method of funding a COLA incorporated directly in the budget-making process.

## I. INTRODUCTION

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### Authorization of the Special Committee

Under Act No. 130 of 1979, the Legislature granted the most recent cost-of-living supplement to annuitants of the State Employees' Retirement System (SERS) and the Public School Employees' Retirement System (PSERS) and established a special committee of House and Senate members, appointed biennially, to evaluate benefit levels in light of economic conditions and costs to the retirement funds.

The act of December 18, 1979, No. 130, provides in section 3:

Within 30 days after the convening of the General Assembly in an odd-numbered year, the General Assembly shall organize a joint committee, composed of members of the General Assembly to be selected as follows: the President pro tempore shall select three Senators, two from the Majority Party and one from the Minority Party and the Speaker of the House of Representatives shall select three members of the House of Representatives, two from the Majority Party and one from the Minority Party. The joint committee shall select a

chairman and shall conduct a review of the cost-of-living supplements accruing pursuant to 24 Pa.C.S. § 8348 and 71 Pa.C.S. § 5708 during the previous two years, the changes in the Consumer Price Index and the earnings of the funds, for the purpose of determining the equitability of the increases in light of the then prevailing economic conditions. The joint committee shall have the power to call on any State department or agency for assistance and shall report its recommendations to the General Assembly prior to the end of the session.

#### Committee Deliberations

Upon organizing in June 1981, the membership of the committee appointed to serve during the 1981-82 session, chaired by Representative Harold F. Mowery Jr., reviewed data on the membership and funding of the two systems, on the history of cost-of-living supplements and on changes in consumer prices, salaries and interest rates. This material was prepared by the staff of the Joint State Government Commission, which provided technical assistance to the Special Committee throughout its study.

The Special Committee extensively reviewed an independent actuarial audit of the two systems conducted by Winklevoss & Associates, Inc., of Philadelphia. Dr. Howard Winklevoss, a professor of actuarial science at the Wharton School of the University of Pennsylvania, is one of the nation's leading authorities in the public retirement field. The Joint State Government Commission authorized the Winklevoss study in 1980 to assist in the consideration of supplemental annuities upon

the recommendation of a select Commission task force on State and school retirement system cost-of-living adjustments and benefit funding. Established under 1979 Senate Resolution Serial No. 6, the task force was chaired by Senator Henry C. Messinger.

Exploring actuarial methodology and assumptions, current and projected financial status of the retirement funds and funding policy alternatives,<sup>1</sup> the Winklevoss report--"Actuarial Study of the Public School Employees' Retirement System and State Employees' Retirement System of Pennsylvania" (May 1981)--is based upon the actuarial assumptions in effect during the 1976 to 1980 period.

Subsequently the systems' actuarial firms--Huggins & Company, Inc., for SERS and George B. Buck Consulting Actuaries, Inc., for PSERS--completed comprehensive reviews of experience for that period. These investigations, required every five years by the retirement laws,<sup>2</sup> serve as the basis for revised actuarial assumptions and recommended employer contribution rates.

As a result of the recent actuarial investigations, the respective actuaries proposed and the retirement boards adopted major increases in the employer contribution rates for both systems. The Commonwealth's contribution rate for SERS increased

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<sup>1</sup>The summary of findings and recommendations of the Winklevoss report is reproduced in the appendix.

<sup>2</sup>24 Pa.C.S. § 8502(j); 71 Pa.C.S. § 5902(j).

from 14.4 for 1981-82 to nearly 18 percent of payroll for 1982-83. The PSERS employer contribution rate--shared equally by the Commonwealth and the school districts--will increase from 15 percent in 1981-82 to approximately 19 percent of payroll after a four-year phase-in period. The new rate for 1982-83 is 16 percent of payroll.

The Special Committee reviewed retirement legislation either pending or enacted during 1981-82. The committee members indicated particular interest in the potential to enhance investment earnings offered by Act No. 45 of March 4, 1982 (Senate Bill 725) and Act No. 183 of June 25, 1982 (Senate Bill 1384). These amendments to the retirement codes of SERS and PSERS, respectively, expand and increase the flexibility of the boards' investment powers and modify certain investment restraints, most importantly by increasing to 50 percent from 25 percent the percentage of the funds' total assets which may be invested in common stocks. While all of the actuaries questioned agreed that these amendments would probably increase investment earnings, none were able to provide any specific estimates of the expected increase.

The committee also reviewed legislation expanding benefits. Under Act No. 152 of June 17, 1982 (Senate Bill 1385), certain members of the school retirement system can retire during a limited period of time with no reduction in the members' "single-life annuities because of age." Because this amendment applies only

to PSERS and is of a limited nature, it is not estimated to be costly (approximately .1 percent of payroll). Any expansion of early retirement options in either SERS or PSERS, however, could create significant additional costs. In addition, the committee studied various bills proposing cost-of-living adjustments for State and school employees. Subsequent sections of this report review cost estimates and the structure of the specific proposals.

## II. HISTORY OF COST-OF-LIVING ADJUSTMENTS

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The first ad hoc cost-of-living adjustments (COLAs) for annuitants of PSERS and SERS were enacted in 1967 and 1968 to provide increases ranging from 150 percent for those who retired prior to 1934 to 1 percent for those who retired in 1966.

In 1974 and 1975, the adjustments for State annuitants ranged from 30 percent for annuitants who retired prior to July 1967 to 5 percent for those who retired between July 1972 and the effective date of Act No. 31 (March 1, 1974). Comparable increases were granted to retired school employees by Act No. 96 of 1975. These cost-of-living increases on the average restored about 63 percent of the loss in purchasing power as measured by changes in the Consumer Price Index (CPI) between 1967 and 1974.

Act No. 130 of 1979 provided ad hoc COLAs for SERS and PSERS annuitants ranging from 31 percent for those who retired prior to July 1, 1973 in the school system and March 1, 1974 in the State system to 5 percent for those who retired between July 1977 and



July 1978. Initially, the House bill which later became Act No. 130 was designed to restore two-thirds of the decline in purchasing power as measured by the CPI from June 1974 to June 1978. Since the effective date of the increase was delayed to 1979 and the percentages in the original bill were unchanged, the actual restoration of purchasing power averaged 55 percent overall. For the earlier retirees (prior to 1974), the restoration was about 60 percent.

Table 1 details the COLA history of SERS and table 2 the history of PSERS, including the pertinent statutory provisions as well as the actuarially determined employer costs and funding methods adopted by the retirement boards.

#### Policy and Cost Changes

Several policy changes are apparent in tables 1 and 2. While the first COLA applied only to superannuation (i.e., normal retirement age) and disability annuitants, the later adjustments also applied to the benefits of withdrawal annuitants (early retirees) upon their attainment of superannuation ages. Under PSERS, the funding period was changed from 20 to 30 years in 1970 and back to 20 years in 1975. While previous COLAs applied to total annuities, the 1979 COLA was limited to the first \$12,000 of each eligible member's annuity.<sup>3</sup>

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<sup>3</sup>See pp. 20-22 for an analysis of the impact of this policy.

Table I

 HISTORY OF COST-OF-LIVING ADJUSTMENTS  
 STATE EMPLOYEES' RETIREMENT SYSTEM

Statute	Annuitant recipients	Scale of Increase		Statutory funding provision	Actuarial cost and funding method adopted by the board
		Date of retirement	Percentage Increase		
1979, December 18 Act No. 130 Effective 12/18/79 with cost-of-living provision retroactive to 7/1/79	Superannuation, withdrawal* and disability annuitants	7/1/77 - 6/30/78	5%	Level percentage of payroll over a period of 20 years beginning 7/1/80	Level annual payments over a period of 20 years from 7/1/79 Total cost \$225,692,242
		7/1/76 - 6/30/77	10		
		7/1/75 - 6/30/76	13		
		7/1/74 - 6/30/75	20		
		3/1/74 - 6/30/74	27		
		Prior to 3/1/74	31		
		All increases limited to first \$12,000 of the annuity received per year			
1975, October 7 Act No. 101 Effective 10/7/75 with cost-of-living provision retroactive to 1/1/75	Superannuation, withdrawal* and disability annuitants	7/1/72 - 2/28/74	5		Included in 1974 cost
1974, March 1 Act No. 31 Effective 3/1/74 with cost-of-living provision beginning 7/1/74	Superannuation, withdrawal* and disability annuitants	7/1/71 to 6/30/72	5	Level percentage of payroll over a period of 20 years beginning 7/1/74	Level annual payments over a period of 20 years from 7/1/74 Total cost \$110,000,000
		7/1/70 to 6/30/71	10		
		7/1/69 to 6/30/70	15		
		7/1/68 to 6/30/69	20		
		Prior to 7/1/67	30		
1968, July 31 Act No. 230 Effective 7/31/68 with cost-of-living provision retroactive to 7/1/68	Superannuation and disability annuitants	Year 1933 and earlier adjusted downward each year until 1966 at The increase includes any applicable minimums	150  1	Computed as an accrued liability and funded as a level percentage of payroll over a period of 20 years beginning 7/1/69	Level annual payments over a period of 20 years from 7/1/69 Total cost \$15,066,766

\*A withdrawal or early retiree does not receive the cost-of-living adjustment until the first of July coincident with or following his attainment of superannuation age.

NOTE: The cost-of-living adjustments provided in 1974, 1975 and 1979 are payable under the same terms and conditions as provided under the option plan in effect the day before the effective date of the adjustment. Prior to 1974, the COLA factor was applied to the allowance as determined at the time of retirement and prior to optional modification.

SOURCE: Retirement board data.

Table 2

HISTORY OF COST-OF-LIVING ADJUSTMENTS  
PUBLIC SCHOOL EMPLOYEES' RETIREMENT SYSTEM

Statute	Annuitant recipients	Scale of Increase		Statutory funding provision	Actuarial cost and funding method adopted by the board
		Date of retirement	Percentage Increase		
1979, December 18 Act No. 130 Effective 12/18/79 with cost-of-living provision retroactive to 7/1/79	Superannuation, withdrawal* and disability annuitants	After 7/1/77 - 7/1/78	5%	Level annual payments over a period of 20 years beginning 7/1/80	1.69 percent of payroll over a period of 20 years from 7/1/80 Total cost \$633,297,000
		After 7/1/76 - 7/1/77	10		
		After 7/1/75 - 7/1/76	13		
		After 7/1/74 - 7/1/75	20		
		After 7/1/73 - 7/1/74	27		
		On or prior to 7/1/73	31		
		All Increases limited to first \$12,000 of the annuity received per year			
1975, October 2 Act No. 96 Effective 10/2/75 with cost-of-living provision retroactive to 7/1/74	Superannuation, withdrawal* and disability annuitants	After 7/1/71 - 7/1/73	5	Level percentage of payroll over a period of 20 years beginning 7/1/76	.85 percent of payroll over a period of 20 years Total cost \$326,600,000
		After 7/1/70 - 7/1/71	10		
		After 7/1/69 - 7/1/70	15		
		After 7/1/68 - 7/1/69	20		
		After 7/1/67 - 7/1/68	25		
		On or prior to 7/1/67	30		
1970, June 23 Act No. 143 Effective 6/23/70 with cost-of-living provision retroactive to 1/1/69	Superannuation and disability annuitants	Year of 1966	1	Funding period changed from 20 to 30 years as level percentage of payroll beginning 7/1/67	Not available
		Year of 1965	4		
		The Increase includes any applicable minimums			
1967, June 28 Act No. 34 Effective 7/1/67	Superannuation and disability annuitants	Year 1933 and earlier adjusted downward each year thereafter until year 1964 at	150	Computed as an accrued liability contribution and funded as a level percentage of payroll over 20 years beginning 7/1/67	.37 percent of payroll over a period of 20 years Total cost \$64,562,806
		The Increase includes any applicable minimums	6		

\*A withdrawal or early retiree does not receive the cost-of-living adjustment until the first of July coincident with or following his attainment of superannuation age.

NOTE: The cost-of-living adjustments provided in 1975 and 1979 are payable under the same terms and conditions as provided under the option plan in effect the day before the effective date of the adjustment. Prior to 1975, the COLA factor was applied to the allowance as determined at the time of retirement and prior to optional modification.

SOURCE: Retirement board data.

In 1979, Act No. 130 specified that the liability for the school system COLA be funded with level annual payments rather than as a level percentage of payroll as had been previously required for supplemental benefits under both systems. Despite the applicable provisions of the retirement statutes, the PSERS actuaries continued the level percentage method and the SERS actuaries continued the practice of funding with level dollar payments.

Noteworthy is the sizable increase in the actuarially calculated cost of each successive COLA. The dollar value of the employer cost of the 1979 SERS COLA is nearly 15 times and the 1979 PSERS COLA nearly 10 times the cost of the 1967 COLA. As the size of annuities--based on final average salaries and previous benefits which have been adjusted for inflation--becomes greater over the years, the dollar costs of COLAs will continue to rise.

#### Relationship of COLA Cost to Total Cost

Table 3 presents a breakdown of the annual employer costs calculated by the actuaries and adopted by the retirement boards for selected years from 1970-71 to 1981-82. Employer cost is composed of three parts:

1. Normal contribution--the amount determined by the actuaries as sufficient to provide benefits for current service payable to members throughout their lifetimes in excess of the amount funded by the members' expected contributions.

Table 3

RETIREMENT SYSTEM ANNUAL EMPLOYER COSTS  
 SELECTED YEARS, 1970-71 THROUGH 1981-82  
 (in millions of dollars)

Fiscal year	Payroll	Normal contribution		Accrued liability		Supplemental annuity		Total	
		Amount	Percentage of payroll	Amount	Percentage of payroll	Amount	Percentage of payroll	Amount	Percentage of payroll
State Employees' Retirement System									
1970-71	\$919*	na	na	na	na	na	na	\$55	6.00
1975-76	1,595*	\$94	5.90	\$94	5.90	\$13	.80	201	12.60
1978-79	1,833*	141	7.70	86	4.70	11	.60	238	13.00
1980-81	2,080*	164	7.90	111	5.35	30	1.42	305	14.67
1981-82	2,134*	139	6.50	138	6.48	31	1.43	308	14.41
Public School Employees' Retirement System									
1970-71	1,420	100	7.02	36	2.51	5	.37	141	9.90
1975-76	2,294	157	6.83	94	4.10	17	.77	268	11.70
1978-79	2,755	191	6.93	133	4.83	43	1.55	367	13.31
1980-81	3,264	226	6.93	158	4.83	106	3.24	490	15.00
1981-82	3,534	245	6.93	171	4.83	114	3.24	530	15.00

\*Estimated payroll.  
 na. Not available.

NOTE: Payment of the employer's contribution is made from Commonwealth funds for about 90 percent of the State system. PSERS employer cost is divided equally between the Commonwealth and school districts.

SOURCE: Rates provided by the staffs of SERS and PSERS and costs based on information provided by these sources.

2. Accrued (unfunded) liability--the amount calculated as necessary to fund the financial liability arising from service rendered in past years, and which aside from supplemental contributions, generally equals the difference between the retirement system's total assets and actuarial liabilities.
3. Supplemental annuity contribution--the amount determined necessary to fund supplemental benefits, such as past ad hoc cost-of-living adjustments.

These costs, the totals of which are actuarially amortized over a period of years as specified by the retirement laws, are recalculated annually. The Commonwealth is required by the retirement statutes to annually appropriate an amount sufficient to meet its obligations as certified by the retirement boards.

A comparison of the supplemental annuity (COLA) costs with total annual employer costs in both retirement systems shows that the proportions attributable to ad hoc COLAs have increased substantially. For SERS in 1975-76, the supplemental cost is over 6 percent of the total cost of \$201 million; in 1981-82, it is over 10 percent of the total cost of \$308 million. For PSERS in 1970-71, the supplemental annuity cost is about 3.5 percent of the total cost of \$141 million; in 1981-82 the employer cost of supplemental annuities represents nearly 22 percent of the total cost of \$530 million.

### Discriminatory Impact of COLA Limit

The cost-of-living supplement enacted in 1979 was applied only to the first \$12,000 of each member's annuity. It is not clear that the members of the General Assembly were aware that such a flat dollar limit--ignoring length of service--tends to favor highly paid, short-service employees and discriminates against career public servants. An unusually large proportion of State annuitants consists of persons with relatively few years of service, many of whom would have had an opportunity to accumulate retirement benefits from other employers. For example, 47 percent of State annuitants had less than 15 years of service while only 16 percent had more than 30 years of State service.

Table 4 strikingly illustrates for SERS and PSERS the extent of the discrimination against long-service employees in capping the amount of the annuity to which the COLA applies. The table shows by years of annuitants' service the number and percentage of retirees involved and the amount saved by imposing the \$12,000 limit. The total reduction in each system is amazingly small. For SERS, the reduction attributable to the \$12,000 limit totals \$1.31 million or about 4.6 percent of the total unreduced first-year adjustment of \$28 million. For PSERS, savings of \$1.06 million represent only 1.4 percent of the \$74 million unreduced first-year payout. Career employees bore the brunt of these reductions. Those SERS annuitants with 30 or more years of

Table 4

IMPACT OF LIMITING 1979 COLA TO FIRST \$12,000 OF BENEFITS  
BY LENGTH OF ANNUITANTS' SERVICE

Years of service	Total annuitants	Estimated annuitants with annuities over \$12,000		Total reduction in 1979-80 COLA due to \$12,000 limit
		Number	Percentage	
State Employees' Retirement System (December 31, 1978)				
0 - 9.9	8,494	45	.5%	\$26,492
10 - 14.9	9,371	88	.9	67,822
15 - 19.9	6,007	69	1.1	40,512
20 - 24.9	4,328	96	2.2	119,320
25 - 29.9	3,806	135	3.5	118,548
30 - 34.9	2,909	316	10.9	249,522
35 - 39.9	2,295	516	22.5	437,062
40 - 44.9	670	187	27.9	208,382
45 and over	114	34	29.8	39,272
Total	37,994	1,486	3.9	1,306,932
Public School Employees' Retirement System (July 1, 1978)				
0 - 9.9	4,984	0	0	0
10 - 14.9	6,880	1	--a	88
15 - 19.9	5,803	3	--a	725
20 - 24.9	5,076	5	.1	3,065
25 - 29.9	6,631	25	.4	5,075
30 - 34.9	6,273	192	3.1	48,135
35 - 39.9	9,763	782	8.0	319,545
40 - 44.9	8,510	871	10.2	479,115
45 and over	2,417	286	11.8	203,988
Total	56,337	2,165	3.8	1,059,736

a. Less than .1 percent.

SOURCE: Data furnished by staffs of the retirement systems.



service accounted for 71.5 percent of the total savings while PSERS retirees with 30 or more years of service accounted for 99 percent of the total savings.

It appears that the notion of setting a flat dollar limit to the amount of an annuity to which the COLA is applied arises from confusion between a person's annuity and his or her income from all sources. A long-service employee, whether in the State or school system, has little opportunity to acquire retirement income from sources other than his annuity and Social Security. On the other hand, it is not unusual for a person with a high benefit rate or a high salary to earn a State annuity of \$10,000 or \$12,000 for a relatively short service interlude of 10 to 15 years from a career otherwise spent in the private sector or another level of government.

The solution for the obvious discrimination involved in the 1979 enactment is either to forego limits completely, since the savings (unless the limit is significantly reduced) are apt to be rather small, or to specify a limit which is a function of the annuitants years of service.

### III. AD HOC AND AUTOMATIC COST-OF-LIVING ADJUSTMENTS

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The Consumer Price Index has risen by 34.2 percent from July 1, 1979--the date of the most recent ad hoc COLA under SERS and PSERS--to June 1982. While most State and school retirees receive Social Security benefits, which are tied to increases in the CPI, their fixed SERS and PSERS benefits have no protection against inflation. Consequently, various groups of active members and annuitants have called for the enactment of an automatic annual cost-of-living provision in the plan of each system.

In October 1979, a select task force of the Joint State Government Commission recommended an automatic increase for annuitants of each system determined as the lesser of 2 percent or one-half the increase in the CPI over the preceding year.<sup>4</sup> The cost in each system of the automatic COLA was to be partially

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<sup>4</sup>See Interim Report of the Select Task Force to Study Cost-of-Living Adjustments and Benefit Funding for the State and School Retirement Systems (October 1979).

offset by a one-half percent increase in the member contribution rate. Several bills proposing automatic increases for public school employees are currently before the General Assembly.

While the Special Committee does not make recommendations in this report because of funding considerations, the membership did express preference for either a capped automatic COLA or annual consideration of supplemental benefits as part of the budget process rather than the ad hoc approach. In assessing methods for adjusting benefits, the committee recognized the imperfections of the CPI in measuring the impact of inflation on retired persons but found no other widely accepted alternative currently in use.

#### Plans of Other Jurisdictions

By 1980, retired State employees in 48 states had received COLAs, with the annuities of those in 28 states supplemented under automatic provisions added in 1968 or thereafter.<sup>5</sup> All of the statewide systems have limits or caps on the percentage of increase, with the highest 6 percent and the modal cap 3 percent. Maryland's plan, which was previously fully indexed to the CPI, was capped at 3 percent in 1980 for new members.

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<sup>5</sup>Survey of State Retirement Systems (Montgomery, Alabama: National Association of State Retirement Administrators, June 1980). Of the 28 systems with automatic COLAs, 15 include the state teachers.

According to a report issued by the Urban Institute, a stratified sample of 100 state and local public pension plans drawn from the universe of plans with 1,000 or more members in 1980 shows the following methods of compensating for inflation through automatic cost-of-living pension adjustments:<sup>6</sup>

<u>Method</u>	<u>Number of plans<sup>1</sup></u>
Full indexing to CPI	2
Partial, uncapped indexing to CPI <sup>2</sup>	3
Full indexing to wages of rank last held	1
Indexed with a cap of:	
2% or less <sup>3</sup>	12
2 - 3% <sup>3</sup>	26
4 - 5%	8
Over 5%	1
No provision for inflation <sup>4</sup>	<u>59</u>
TOTAL	112

1. Includes 100 basic plans and 12 separate tiers.

2. Increase equals 60 percent of the CPI increase.

3. Includes six plans with automatic COLA tied to original benefit.

4. Includes one state-administered plan with an option for localities to provide an automatic COLA provision. Few have exercised this option.

Of the 59 plans without any provision for meeting inflation, only 9 did not provide at least one ad hoc increase from

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<sup>6</sup>The Future of State and Local Pensions: Final Report (Washington: D.C.: Urban Institute, April 1981), p. 2-8. The sample is composed of two parts: a "certainty stratum" containing the 35 largest state and local plans, in terms of plan membership, and a "random stratum" containing 65 plans drawn from the remaining universe with a probability of selection proportional to plan membership. The sample covers slightly less than three-fourths of all state and local workers enrolled in pension plans.

1974 to 1980; almost half of the plans with automatic capped COLAs provided at least one ad hoc increase in addition to the automatic annual increases.<sup>7</sup> Fifty-two of the plans in the sample provided 3 or more ad hoc increases from 1974 to 1980.

Table 5 provides recent data on the automatic and ad hoc adjustments of the largest statewide and teachers' retirement plans in the U.S. and gives two measures of benefit levels. Thirty of the 48 plans in the table provide automatic capped COLAs. The normal monthly benefit for an annuitant with a final salary of \$20,000 and 30 years of service ranges from \$359 for Omaha, Nebraska teachers to \$1,195 for Louisiana teachers. A number of plans in the sample have the same \$936 normal benefit as SERS and PSERS: the statewide plans include California, Ohio and West Virginia and the teachers' plans include California, Connecticut, Ohio and Texas. Higher benefits are paid by the Massachusetts, New York and Washington statewide systems and by the Alabama, Louisiana, Minnesota and New York City teachers' systems.

#### COLA Funding

The funding implications of ad hoc and automatic cost-of-living adjustments differ distinctly. The actuaries for retirement systems with automatic COLA provisions include in their valuations the expected costs of COLA benefits applying to all active members throughout their lifetimes. Thus, estimated costs

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<sup>7</sup>Ibid., p. 2-13.

Table 5

BENEFIT LEVELS AND COST-OF-LIVING ADJUSTMENTS  
OF LARGE STATEWIDE AND SCHOOL RETIREMENT SYSTEMS<sup>1</sup>

System	Approximate average monthly benefit paid service retirees 1980	Normal retirement monthly benefit with final year salary of \$20,000 30 years of service	Amount of automatic COLAs	Number of ad hoc COLAs 1976-81
Statewide				
Arizona	\$270	\$768	None	4
California	371	936	2% cap - CPI related	6
*Colorado	528	877	3% cap - CPI related	4
Florida	na	702/age 62	3% cap - CPI related	None
Illinois	289	856	3% cap - CPI related	None
Iowa	228	687	None	3
Kansas	193	can be calculated only from individual history	None	4
Maryland - General	313	851	3% cap - CPI related unlimited prior to 1980	None
Massachusetts	na	1,170	3% cap - CPI related	None
*Mississippi	352	731	2.5% cap - CPI related	2
New York	375/tiers I & II	1,123	None	na
	375/tier III	798	3% cap	na
*North Carolina	398	711	4% cap - CPI related contingent on actuarial gains	6
Ohio	372	936	3% cap - CPI related	2
Oklahoma	260	877	None	6
*Oregon	208	468 & annuity**	2% cap - CPI related	1
Pennsylvania	340	936	None	1
*South Carolina	550	724	4% cap - CPI related	3
*Tennessee	317	708	3% cap - CPI related	4
Texas	460	858	None	3
*Utah	na	581	4% cap - CPI related	None
*Virginia - Option A	na	702	5% cap - CPI related	None
Option B	na	723	5% cap - CPI related	None
*Washington	397	967	None	5
West Virginia	350	936	None	2
Wisconsin	na	608	(Dividends declared (if actual earnings exceed assumed earnings)	None
	na	842/protectives		None
School				
Alabama	587	942	None	2
Arkansas	317	614	3% cap - CPI related	1
California	745	936	2%	3
Chicago	698	856	3%	None
Connecticut	765	936	5% cap - CPI related	None
Georgia	535	846 (1.75%)	3% cap - CPI related	6
Illinois - Teachers	631	856	3%	1
Universities	na	856	3%	1
Indiana	375	483	None	6
Kentucky	479	877	1%	5
Louisiana	732	1,195 (2.5% factor)	3% cap - CPI related	None
Michigan	400	658	None	2
Minnesota	350/basic	1,024	(Based on investment (yield in excess of assumption)	6
	350/coordinated w/SS	585	4% cap - CPI related	None
Missouri	402	877	None	1
Montana	684	780	66.7% of actual CPI	None
New Jersey	na	782	2% cap - CPI related	3
New Mexico	580	834	None	None
New York (city)	667	1,117	None	4
New York (state)	936/tiers I & II	911	3% - CPI related	4
	936/tier III	611	3% cap - CPI related	None
Ohio	809	936	10%	None
Oklahoma	525	660	None	None
Omaha	595	359	None	1
Pennsylvania	599	936	None	3
Texas	554	936	None	2
West Virginia	440	877	None	

\*Statewide systems including teachers.

\*\*Annuity paid from employee contributions and interest or lump-sum payment of the annuity.

<sup>1</sup>. Sample includes 24 of the largest statewide systems and 24 of the largest school systems of a universe of 68 school systems.

SOURCE: W. Jack Tennant, Benefits Survey: Public Employee Retirement Systems: A Study of Benefits and Related Provisions in Selected Large PSERS (Washington, D.C.: The Wyatt Company, Actuaries and Consultants, September 1981).

are advance funded and active members can share in the cost of the expected COLAs applying to their future annuities if the higher employer costs preclude other benefit extensions.

Actuaries usually do not consider the costs of possible ad hoc adjustments until after each is determined and funding is deferred to future taxpayers and perhaps active members. Once an ad hoc COLA has been instituted, pressure for further adjustments is inevitable if living costs continue to rise. While the COLA costs under an automatic plan are higher initially, they can be funded with fairly uniform payments over time. An ad hoc COLA of a comparable annual percentage may have a less significant impact initially, but a series of ad hoc adjustments creates a steeply increasing cost pattern which in time reaches that of the automatic plan.<sup>8</sup>

The cost impact over time of COLAs also varies according to the funding methodology and time period adopted. The most conservative and initially the most expensive way to fund an ad hoc COLA is through prefunding the total expected cost in the year the decision is made to grant the COLA. Another conservative method is to fund on a pay-as-you-go basis, i.e., each year fund the supplemental benefits that are paid out in that year. Under this method, costs for any one COLA are high initially and diminish over time as death reduces the number of annuitants entitled to the COLA.

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<sup>8</sup>Ibid., pp. 10-6 through 10-11.

As noted earlier, in SERS and PSERS the costs of ad hoc benefits have been amortized by the actuaries over a period of years either on a level annual dollar or on a level percentage of payroll basis (see tables 1 and 2). When funding periods are uniform, the initial costs are lower under the level percentage of payroll method assuming the payroll of the active membership increases over time.

The annual actuarial cost of an ad hoc COLA is reduced by extending the period for funding. Plans that amortize supplemental costs over 20 to 30 years, however, extend the funding far beyond the average life expectancy of the benefit recipients, with the level percentage of payroll method usually making the most pronounced cost deferral.

### Actuarial Opinions

Many actuaries favor the planning and advance funding possibilities of automatic COLAs in preference to periodic ad hoc adjustments. Consulting Actuary Vincent M. Tobin, vice president and board member of George B. Buck Consulting Actuaries, states in an article directed at the private sector, which unlike the public sector, has traditionally shied away from automatic plans:

The obvious advantage of the ad hoc adjustment from the employer's perspective is complete control of costs. However, there are also advantages in formalizing future increases by making them part of the pension plan. For example:



\*Employees have the opportunity to plan their retirement finances more effectively.

\*Lower prior service costs are deferred to future generations of stockholders in public companies than might otherwise develop.

\*The employer has the opportunity to share some of the cost of the increases with the retiring employee. . . .

. . . it is clear that the funding "cost" is reduced if we can anticipate that the effects of inflation will generate additional income on plan assets. Over the long haul, if inflation produces a need for benefit increases, the same inflationary climate should also be reflected in prevailing interest rates. . . .

One wonders if we will look back with surprise a generation from now on the hesitancy of employers to confront the issue of inflation protection-- much as we recall today the similar situation of 25 or 30 years ago when companies were frightened by the prospect of average-final-pay plans.<sup>9</sup>

Another actuary, Paul Halliwell, who has examined both the State and school retirement systems, has made recommendations concerning COLAs. In an April 25, 1980 audit report on the school retirement system, he advises:

It is our opinion that a properly designed COLA feature added to PSERS would be preferable to the

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<sup>9</sup>"Protecting Retirement Income Against Inflation," Buck: Review and Outlook 1982 (New York City: March 1982), pp. 22, 23 and 25.

ad hoc adjustments now used. By their very nature, ad hoc adjustments are subject to the political process and often tend to magnify existing inequities rather than correct them.

Halliwell lists a number of methods of partial indexation rather than an automatic escalator in the full amount of the increase of the CPI which "can lead to excessive costs":

- indexing but only after a delayed starting date
- indexing with a capped maximum
- indexing with a deductible (for example only after inflation has increased by 4% or 5%)
- indexing to a maximum annual rate
- partial indexing up to a stated percentage of the inflation index.

Winklevoss & Associates, in the study of PSERS and SERS for the Joint State Government Commission, recommends that a formal COLA with a capped percentage of increase be incorporated in the plans.<sup>10</sup> With respect to the funding of an automatic COLA, the report recommends "that the normal contribution rate and the unfunded accrued liability contribution rate should be set so as to advance fund the COLA, obviating the need for a supplemental annuity contribution rate."<sup>11</sup>

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<sup>10</sup>"Actuarial Study of the Public School Employees' Retirement System and State Employees' Retirement System of Pennsylvania," p. 63.

<sup>11</sup>Ibid., p. 65.

Consulting Actuary Hugh Gillespie, senior vice president and board chairman of Buck Consultants in charge of PSERS since 1965, and William A. Reimert, consulting actuary of Huggins & Company assigned to SERS, recommended to the Special Committee that the practice of granting periodic ad hoc COLAs be continued. With respect to the funding of supplemental annuities, Mr. Gillespie suggests that ad hoc COLAs be funded over a 10-to-15 year period rather than over 20 years, which he considers "too long a period of funding in view of the shorter average period over which the payments to pensioners will be made."

Cost Implications for SERS and PSERS

Automatic COLA--The first-year costs (1982-83) of an automatic COLA provision under the current economic assumptions and the 20-year funding period required in the retirement statutes are estimated by the systems' actuaries at varying capped rates of automatic annual inflation adjustments (3, 2 or 1 percent) as follows:

Cap	SERS		PSERS	
	Percentage of payroll	Amount (millions)	Percentage of payroll	Amount (millions)
3%	4.3%	\$92.9	8.6%	\$303.9
2	2.6	56.2	5.2	183.8
1	1.2	25.9	2.5	88.4

These estimates are based on the assumption that annuities would be increased by the full cap percentage. If the COLA is tied to some

portion of the percentage increase in the CPI for the preceding year and such portion of the inflation rate falls below the caps, costs, of course, would be lower.

Ad Hoc COLA--If an ad hoc COLA were to be patterned after the 1979 adjustments, the following schedule would apply for increases of one-half of the change in the CPI between mid-1979 and mid-1982:

Retired prior to July 1979	- 17.1%
Retired July 1979 - June 1980	- 8.7
Retired July 1980 - June 1981	- 3.6

For a SERS COLA of this magnitude effective July 1, 1982, the present value cost is estimated at approximately \$300 million with a first-year cost of \$17.5 million or .82 percent of payroll on the basis of the statutory requirement of 20-year funding. For PSERS, the funding cost would be approximately 1.6 percent of payroll, or \$56.5 million.

The approximate number of annuitants who would be eligible for either an ad hoc or automatic COLA beginning in 1982 and the average annuity are as follows:

<u>System</u>	<u>Number of annuitants</u>	<u>Average annuity</u>
SERS	48,000	\$4,300
PSERS	67,000	6,100

#### IV. IMPACT OF REVISED ACTUARIAL ASSUMPTIONS ON COSTS

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Under the retirement statutes, the actuaries for each system conduct annual valuations of the retirement fund and five-year investigations of experience. The consulting actuary for SERS, William A. Reimert, in the most recent experience investigation explains the purposes of the annual and five-year reviews:

If a retirement system is to operate on a sound actuarial basis, the funds on hand together with the value of expected future contributions must be adequate to cover the value of future promised benefit payments. As implied in Section 5902(j) of the State Employees' Retirement Code . . . this involves a two fold responsibility: (1) to determine the annual contributions to be made to the fund and (2) to perform a periodic evaluation of the actuarial assumptions. This means that the actuary performs an annual valuation comparing the assets and liabilities under the retirement system in order to determine the required contribution. The assets consist of investments on hand and the value of expected future contributions while the liabilities include the value of future promised benefit payments.

The determination of the value of expected future contributions and the value of future promised benefit payments involves projections by means of actuarial tables and functions related

to the rates of mortality, withdrawal, disability, and retirement as well as rates of investment income and salary increase. . . .

. . . At five-year intervals an analysis is made to evaluate the experience under the retirement system in order to revise, where necessary, those assumptions that are no longer in line with current experience.

In many cases of statistical analysis the greater the volume of data analyzed the more reliable the results. This is not necessarily true in evaluating the experience of the members of a retirement system if this involves extending the study over long periods of time. That this is so may be seen from considering the mortality experience of such a group. Twenty years ago the mortality rates at each age, but particularly at ages under 65, were considerably heavier than the corresponding rates of mortality in more recent years. Thus, to include the experience of twenty years ago in a mortality study of the nature of the current analysis would produce rates of mortality heavier than are currently being experienced and can be expected to be experienced in the future. Somewhat the same comments might be made about the experience in the area of turnover, disability, salary progression, retirement rates and investment income. Only the experience since the last evaluation was studied in the current analysis.<sup>12</sup>

In their studies of experience under SERS and PSERS for the five-year period 1976 to 1980 the actuaries found sizable discrepancies between the assumed and actual rates of retirement, withdrawal, vesting and mortality. As a result, the actuaries

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<sup>12</sup>"State Employees' Retirement System of Pennsylvania: Eleventh Actuarial Investigation: January 1, 1976 to December 31, 1980" (Philadelphia: Huggins & Company, Inc., 1981), pp. 2-3.

revised their assumptions to the extent that the employer costs for 1982-83 and thereafter calculated under the new assumptions will increase about 25 percent over the costs which would have accrued under the prior set of assumptions.

SERS Costs

The annual employer costs for SERS as certified by the retirement board increased from \$308 million or 14.41 percent of payroll in 1981-82 to \$386 million or 17.85 percent of payroll in 1982-83. Following are the components of the SERS costs for 1981-82 and as revised for 1982-83:

	1981-82		1982-83	
	Amount (millions)	Percentage of payroll*	Amount (millions)	Percentage of payroll**
Normal contribution	\$139	6.50%	\$169	7.83%
Accrued liability	138	6.48	189	8.74
Supplemental annuity	<u>31</u>	<u>1.43</u>	<u>28</u>	<u>1.28</u>
Total	308	14.41	386	17.85

\*Payroll estimate: \$2,134 million.

\*\*Payroll estimate: \$2,160 million.

In a letter dated July 27, 1981 to the State Employees' Retirement Board, Mr. Reimert summarizes the reasons for the increase:

The impact of the specific assumption changes on plan costs and liabilities can be seen readily from a review of the Total Normal Cost by type of benefit as shown below.

	<u>Old</u> <u>Assumptions</u>	<u>New</u> <u>Assumptions</u>
Retirement Benefits . . . . .	8.22%	9.30%
Disability Benefits . . . . .	0.22	1.02
Death Benefits . . . . .	0.52	1.06
Refunds . . . . .	1.84	1.04
	<u>10.80%</u>	<u>12.42%</u> <sup>13</sup>

Since rates of termination were reduced sharply, the cost of refunding employee contributions upon termination prior to eligibility for retirement decreased. Because more employees are expected to become eligible for a pension, retirement, disability and death benefits can be expected to cost more. Compounding this increase in costs was the increase in the rate of disability (which was more than doubled on average). Hence disability costs quadrupled.

As a result, the cost of disability and death benefits which had represented 0.74% of payroll have jumped to 2.08% of payroll; an increase of 181%! These benefits, which were previously viewed as ancilliary and minor are now a major cost component. The 1.62% increase in the Total Normal Cost is largely attributable to these two benefits.

PSERS Costs

The increased costs of PSERS, which the retirement board adopted and will phase in over a period of four years, will increase to 18.98 percent of payroll in 1985-86 from 15 percent in 1981-82. The total 1982-83 cost is 16 percent of an estimated payroll of \$3,534 million, or \$565 million, which is a \$35 million increase over

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<sup>13</sup>The total normal cost of 12.42 percent of payroll for 1982-83 is funded by an employer normal contribution of 7.42 percent and a member contribution of 5 percent. The 7.42 percent annual rate translates to the 7.83 percent quarterly rate, as shown on p. 37.



1981-82. The board has not provided a breakdown of the total cost into the normal contribution, accrued liability and supplemental annuity components.

Consulting Actuary John W. Thompson of Buck Consultants in a recent memorandum notes that two factors--improved mortality and earlier ages of retirement--"caused an increase in the full cost of the System of 3.5% to 4% of payroll."<sup>14</sup> In the report of the 1980-81 valuation and the five-year experience investigation, Buck Consulting Actuary Hugh Gillespie recommends to the retirement board:

On the basis of the investigation it is recommended that higher rates of service and disability retirement and lower rates of withdrawal, vesting and mortality be adopted. It is also recommended that the early service retirement rates be adjusted to reflect the actual experience. No change in the rates of salary increase is recommended at this time but it is suggested that any change in the valuation interest rate be accompanied by strengthening of the salary scale.

It is also recommended that more conservative mortality tables for service annuitants and beneficiaries be adopted.<sup>15</sup>

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<sup>14</sup>"Memorandum Commenting on the Actuarial Study Conducted by Winklevoss & Associates" (December 3, 1981), p. 9.

<sup>15</sup>"Report on an Actuarial Valuation of the Assets and Liabilities of the Public School Employees' Retirement System of Pennsylvania as of June 30, 1980 and on the Investigation of the Mortality, Service and Compensation Experience of Members and Annuitants of the System for the Five Year Period ended June 30, 1980" (New York: Buck Consultants, October 1981), p. 39.

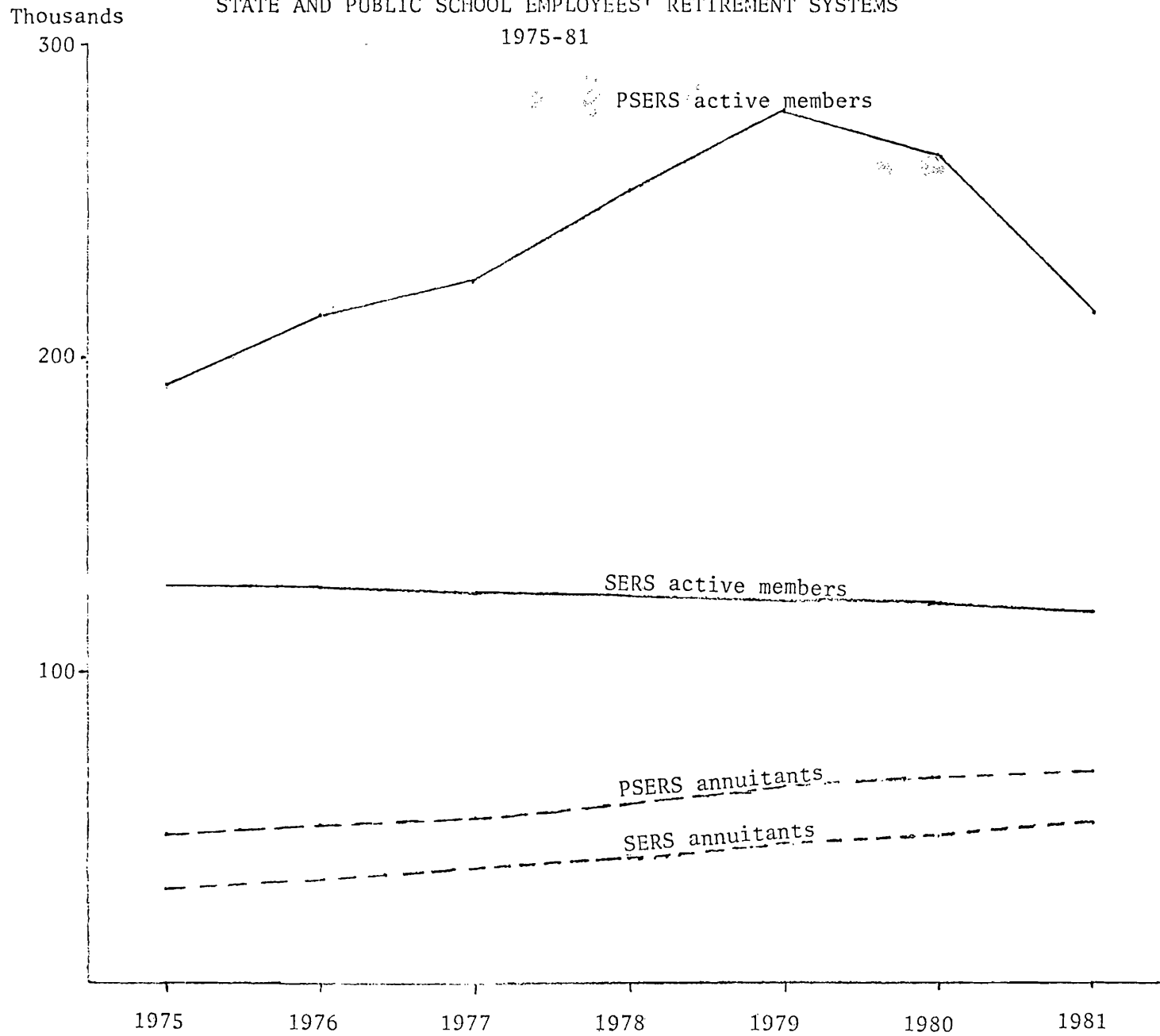
That the retirement and termination trends in PSERS have changed in recent years is evident in figure 1. While the number of annuitants continues to increase steadily, the active membership has taken a sharp drop since 1979. John Thompson points out in his memorandum that "That this declining trend [in active membership] . . . will place additional financing burdens on the employers, since certain fixed costs, i.e., unfunded accrued liabilities, will be spread over a declining population base."

#### Monitoring Assumptions

Revisions in experience assumptions ordinarily do not have significant cost impacts. In cases when revisions do affect costs considerably, a more frequent review of assumptions is suggested. This is brought out in a discussion of financing state and local retirement systems by Bernard Jump Jr.:

Simply adopting actuarial funding as the method of making provision for accruing pension liabilities is not enough. Even the best actuaries cannot predict future events with certainty. Thus, actuarial assumptions have to be monitored against unfolding experience and modified from time to time when they no longer produce realistic current cost estimates. When a new assumption about a relevant event replaces an old assumption, the cost estimate for a particular pension plan and set of participants is likely to change. Such changes are the inevitable product of uncertainty about the future and not a weakness of the general procedure.

Figure 1  
 ACTIVE MEMBERS AND ANNUITANTS IN THE  
 STATE AND PUBLIC SCHOOL EMPLOYEES' RETIREMENT SYSTEMS  
 1975-81



SOURCE: Data provided by staffs of PSERS and SERS.

Barring major and frequent improvements in the pension plan, cost adjustments that result from changed actuarial assumptions should not be large enough to have a major impact on a jurisdiction's annual budget--if the unfolding experience is monitored closely. But if there are major benefit improvements or if actuarial assumptions are too liberal (financially more favorable than actual experience), the actuary's periodic valuation of pension plan liabilities will reveal an increase in accrued liabilities for which no provision has been made. When this occurs, the employer will have to increase the amount of payments to the pension fund.<sup>16</sup>

#### Disclosure of Costs

In his discussions with the Special Committee, Dr. Winklevoss stressed the importance of full disclosure of the actuarially calculated costs. The Winklevoss report expressed concern that the PSERS actuaries, in an effort to compensate for assumptions that were proving to be deficient, had in the past somewhat overstated total costs:

The normal contribution rate as actually calculated by the PSERS actuary is lower than the 6.93% shown above [as of June 30, 1978] and recommended in the most recent actuarial report. In fact, the calculated rate in 1978 was 5.82%. Nonetheless, the system's actuary continues to recommend the normal contribution rate of 6.93%, which was the actual rate calculated several years earlier. Although contrary to State statutes, this procedure is followed by the

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<sup>16</sup>"State and Local Government Employee Compensation: The Fringe Benefit Dimension," Public Employment and State and Local Government Finance, ed. Roy Bahl, Jesse Burkhead and Bernard Jump Jr. (Cambridge, Mass.: Ballinger Publishing Company, 1980), pp. 182-183.

actuary because it develops somewhat higher costs--a result that the actuary believes is desirable because of the unfavorable actuarial experience of PSERS during the past several years.

If the PSERS actuary had followed the State statutes precisely, the normal contribution rate would have been 5.82% in 1978 and the accrued liability contribution rate would have been 5.30% [rather than 4.83%]. Thus, the split between these two contribution rates is more like that for SERS when the same methodology is employed. The total contribution to PSERS under the methodology described in the statute would be 12.67% instead of 13.31%, or a decrease in contributions of \$16.8 million dollars [sic].

Winklevoss & Associates does not believe that the procedure adopted by the PSERS actuary is appropriate. If the actuary believes that the actuarial assumptions are deficient, then an effort should be made to change them so as to correct the cost calculation. At the very minimum, the actuary should calculate and report the total contribution rates based on the statutes and then proceed to recommend a higher contribution rate if, in the opinion of the actuary, a higher rate is warranted for maintaining the actuarial soundness of the pension system.<sup>17</sup>

In discussing the general lack of understanding of the status and costs of public pension plans, Dr. Jump also emphasizes the need for complete and comprehensible information:

Despite the widespread concern about the financial condition of state and local government retirement systems and what this implies for the budgets of sponsoring governments, the information that would be required to determine whether such concern is well founded is a scarce

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<sup>17</sup>"Actuarial Study," p. 9.

commodity. Too few retirement system administrators and other principal government officers have seen fit to acquire for themselves and to convey to others information that reveals clearly the current status of and future prospects for system finances.

The usual financial report issued by a retirement system contains an abundance of information that lends itself to misinterpretation by nonspecialists. Information about the level of unfunded accrued liabilities, while meaningful to actuaries and others skilled in actuarial technicalities, often does more harm than good when used by those who do not recognize its ambiguous character. Far better measures of a pension plan's current obligations, the plan termination liability and the plan continuation liability, are not customarily publicized by most state and local pension plans if they are available at all.

The intricacies of actuarial cost computations and funding require a host of assumptions about which equally-informed persons may disagree. Judging a retirement system's financial condition requires, among other things, that one know what assumptions are being used by the actuary and how well they match the system's prior experience or fit one's estimate of future developments. Thus, when this information is not reported, independent analysts face an unreasonable handicap.

Finally, there is no good reason that we are so much in the dark about the future costs of providing public employee retirement benefits and about what options are available to governments in meeting these costs. Techniques already exist that would enable governments to know within a reasonable degree of accuracy the size of their future pension costs. By and large, few governments have this information because few have made any effort to develop it.<sup>18</sup>

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<sup>18</sup>Public Employment, pp. 189-190.

## V. ECONOMIC ASSUMPTIONS AND COST-OF-LIVING ADJUSTMENTS

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### Decrement and Economic Assumptions

The importance of actuarial assumptions in determining the level at which the systems are funded and the costs of benefits was underscored by all witnesses throughout the deliberations of the Special Committee. It is useful to distinguish between decrement assumptions--including rates of mortality, termination, disability and retirement--and economic assumptions--rates of salary increase and interest (yield), which are strongly affected by inflation.

In general, decrement assumptions are the product of the actuaries' expertise while economic assumptions are ultimately the responsibility of policymakers--the executive or legislative branch in the case of public retirement systems. Unlike decrement assumptions, the choice of "best" economic assumptions does not depend upon special actuarial training or competence. For both SERS and PSERS the interest rate assumption for funding purposes, termed "valuation interest," is specified by statute at 5.5 percent. This rate was increased from 4 percent in 1974.

## Relationship of Interest and Salary Assumptions

The actuaries choose salary increase rates which they believe to be consistent with the valuation interest rates. This practice is explained in the recent five-year experience study for SERS prepared by Huggins & Company:

Because of the interplay of the various elements of actuarial assumptions it is not adequate to review only one of the assumptions but rather the overall effect must be evaluated. This interplay is well illustrated by recent trends in investment income and salary progression. Probably many plans have lagged behind current developments in revising interest assumptions to reflect current yields (thus, leading to higher than normal contributions because the interest assumption is too low) and have lagged behind in reflecting more recent trends in salary progression (thus, leading to lower than normal contributions because benefits receivable at retirement are understated). As a consequence, the overstatement of the contribution due to low interest rates is offset by the understatement of the contribution due to the low assumed salary progression.

The overall reasonableness of the actuarial assumptions is therefore the primary consideration and not that each assumption be realistic in itself. This is an especially important point with respect to the State Employees' Retirement System since the interest rate to be used is established by statute at 5-1/2%.<sup>19</sup>

Generally a salary increase rate about two percentage points below the interest rate assumption is selected. For example, the

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<sup>19</sup>"Eleventh Actuarial Investigation," p. 4.



actuaries for PSERS actually employ different salary increase assumptions for each age-sex group<sup>20</sup> but the overall average is about 3.5 percent.

### Selection Theory

Winklevoss & Associates advocates the adoption of long-term "best-estimate" assumptions for salary increase and interest with the same core of inflation reflected in each rate. The Winklevoss report briefly explains the underlying theory of the choice of interest and salary increase rates in order that the overseers of the retirement systems can make informed judgments as to the desirability of changing the assumptions:

The interest rate may be thought of as consisting of the following three components:

- ° A real rate of return on a riskless asset in the absence of inflation
- ° A long-term inflation rate
- ° A risk premium to compensate for certain types of risks in the marketplace, notably liquidity and price fluctuations

Although it is not a simple matter to estimate the relative values of each of the above components of the interest rate, this approach does provide a sound conceptual framework for arriving at an interest rate assumption. It should be noted that, in today's economic environment, inflation is by far the largest of the three components making up the total long-run interest rate assumption.

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<sup>20</sup>See Annual Report of the Public School Employees' Retirement System for the Fiscal Year Ended June 30, 1981, p. 40.

The current salary rate used to calculate employer contributions is significantly different for each system and, in the case of SERS, differs for each employment group. More specifically, the PSERS salary rate assumption reflects an implicit inflation rate of about 2%, while that for SERS is about 4.5% for general class A employees and 3.5% for the police, judges, and legislators categories. In addition to these inflation-related increases, the salary rates used by each actuary reflect merit or promotional increases which average about 1% to 1.5% per year over the course of a long service career. Moreover, the salary increase assumption for purposes of amortizing the unfunded accrued liabilities, which presumably reflects inflation only, is set by statute at 4%--an assumption which is not consistent with the salary rates otherwise assumed for each plan. Thus, there is no internal consistency with respect to the salary inflation assumption used by each system; nor is there comparability between the two systems even though the impact of inflation on the salaries of the members of each system will undoubtedly be similar.

As with the interest rate, the salary rate should be selected with an eye toward past experience and with considerable emphasis placed on judgment and internal consistency with the interest rate assumption. In the case of salary increases, it is generally argued that such increases stem from the following three sources:

- ° Labor's share of productivity increases in the economy
- ° A long-term inflation rate
- ° Merit or promotional increases

Note that the inflation component, which is again by far the largest of the three components, is present in the salary increase rate as it was in the interest rate. Thus, the most important aspect in selecting economic actuarial assumptions is to decide on a long-term, imbedded

inflation rate. The crucial point is not to have less inflation in one assumption than another--a situation that currently exists with PSERS and SERS when the 5.5% interest rate is compared to the various salary rates used.

In order to illustrate the impact of assuming different valuation interest rates and salary rates on the calculated employer contribution rate under PSERS and SERS, Table II-4 [p. 50] has been constructed. The results in this table illustrate the following rules of thumb:

- ° A one percentage point change in the interest rate will affect contributions by about 20% in the opposite direction
- ° A one percentage point change in the salary rate will affect contributions by about 10% in the same direction.

In other words, the interest rate is approximately twice as powerful in affecting costs as the salary rate. Thus, a one percentage point change in the interest rate will support a two percentage point change in the salary rate without affecting contributions significantly.

The basic reason that the salary rate is only half as powerful as the interest rate assumption is because the salary rate extends from each member's current age up to retirement in estimating retirement benefits, while the interest rate extends additionally throughout each member's retirement years to discount future benefit payments. Thus, roughly speaking, the interest rate operates over twice as long a time period as the salary rate; hence, it has twice as powerful an effect on costs<sup>21</sup>

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<sup>21</sup> "Actuarial Study," pp. 18-21.

RELATIVE EMPLOYER CONTRIBUTIONS UNDER ALTERNATIVE  
INTEREST AND SALARY VALUATION ASSUMPTIONS

PSERS

Salary Increase		Interest Rate		
Individual Member	Aggregate for Amortization Purposes	5 1/2%	6 1/2%	7 1/2%
Merit + 4%	4%	100%	80%	64%
Merit + 5%	5%	111	90	72
Merit + 6%	6%	124	101	81

SERS

Salary Increase		Interest Rate		
Individual Member	Aggregate for Amortization Purposes	5 1/2%	6 1/2%	7 1/2%
Merit + 4%	4%	100%	80%	63%
Merit + 5%	5%	108	87	69
Merit + 6%	6%	118	95	76

SOURCE: Reproduced from Winklevoss & Associates, Inc., "Actuarial Study of the Public School Employees' Retirement System and State Employees' Retirement System of Pennsylvania" (May 1981), Table II-4, p. 20.

COLA Implications of Recommended Assumptions

Winklevoss & Associates recommends a 10 percent "best-estimate" interest rate assumption and an 8 percent annual salary increase assumption based on the following components:

Interest Rate

Real Risk Free Rate	2%
Long-Term Inflation Rate	6%
Risk Premium	2%
Total	<u>10%</u>

Salary Rate

Productivity Increases	1%
Long-Term Inflation Rate	6%
Merit Increases (Approx.)	1%
Total	<u>8%</u>

The Winklevoss report asserts that were these interest and salary assumptions adopted:

. . . the current level of employer contributions [at the time of the study] . . . is not only high enough to maintain long-term actuarial soundness but is of sufficient magnitude to "implicitly" fund an automatic annual cost-of-living adjustment (COLA) of 3 to 4 percent. The primary reason for this excessive contribution level is the relatively low valuation interest rate of 5.5% coupled with the salary inflation assumptions used by each actuary. This finding led to an interesting conclusion; namely, that an alternative funding and plan design policy of using realistic actuarial assumptions and instituting an automatic 4% COLA would have minimal cost consequences.<sup>22</sup>

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<sup>22</sup>Ibid., p. 61.

In his memorandum of December 3, 1981, addressed to the board of PSERS, John Thompson of Buck Consultants comments in detail on the economic assumptions and cost-of-living adjustments proposed in the report of Winklevoss & Associates:

Perhaps the most striking finding of the Winklevoss report is that the combined employers' contribution rate of 15% of payroll for fiscal 1981/82 would be sufficient to support not only the current statutory PSERS benefits, but would in addition support an annual automatic cost-of-living adjustment (COLA) of approximately 4%. . . .

Economic Assumptions

Returning now to the original finding, we should point out that the ability to pay a 4% COLA without an increase in employer costs flows entirely from the effects of the economic assumptions used by Winklevoss.

In making their projections, Winklevoss has adopted as best-estimate economic assumptions an annual yield on the fund of 10% and an average annual salary increase of 8%.

If these assumptions were to be realised in the emerging experience of the System, we would agree with the Winklevoss finding that the contribution rate of 15%, ignoring the effects of the revised actuarial tables, would, along with the current assets of the System at book value, generate sufficient investment income so as to finance approximately a 4% annual COLA.

Of course, an interest rate assumption of 12% per annum would finance, without any increase in employer costs, an even larger annual COLA. The crux of the matter is what are reasonable best-estimates of the long term economic experience of the System.

We believe that an interest rate assumption of 10% per annum is not a prudent enough rate to use for the valuation of PSERS assets and liabilities.

It represents in our view a yield which is unlikely to be achieved on a consistent basis over the long term. Furthermore, we would not recommend at this time the adoption of a statutory 4% COLA for retirees on the strength of the additional investment income flowing from an interest rate assumption of 10%.

A comparison of the actual investment income of PSERS with that required under the Winklevoss 10% assumption for the 3 fiscal years ended June 30, 1981 shows that the fund would already be \$540 million short of the target. This point is illustrated below where the investment earnings under the Winklevoss projection are taken from Table II-5 of their report.

COMPARISON OF ACTUAL AND  
ANTICIPATED INVESTMENT EARNINGS  
(In Millions)

YEAR ENDED JUNE 30	WINKLEVOSS PROJECTED EARNINGS	ACTUAL EARNINGS (NET OF EXPENSES)	SHORTFALL
	(A)	(B)	(A) - (B)
1979	\$ 428	\$ 252	\$ 176
1980	\$ 479	\$ 304	\$ 175
1981	\$ 535	\$ 346	\$ 189
		Total Shortfall	\$ 540

We would recommend that, if the legislated valuation interest rate is to be changed, a more prudent current rate would be in the range of 7% to 8%. This range is also more typical of the rates currently being used by other public retirement systems which have moved to realistic economic assumptions.

When combined with a recommended annual salary increase assumption of 6% to 7%, an interest rate of 7% to 8% would not produce sufficient

investment earnings to finance any significant annual COLA for retirees. This point is confirmed in our memorandum to the Board dated November 24, 1980 on the financing of the System.

Should the fund experience gains using the economic assumptions we recommend above, then these could be put into a reserve fund and used to help pay for any ad hoc COLA the legislature thinks appropriate for PSERS retirees.<sup>23</sup>

At a meeting of the Special Committee in December 1981, the SERS and PSERS actuaries jointly responded to the Winklevoss proposals relating to economic assumptions and cost-of-living increases. Their reactions were presented in a one-page summary prepared by Hugh Gillespie of Buck Consultants (p. 55). Mr. Gillespie agreed with the suggestion of increasing the economic assumptions to a more realistic level but disagreed with the Winklevoss contention that the Legislature could adopt an automatic annual cost-of-living increase of 3 or 4 percent with essentially no increase in employer contribution rates. He noted that in the past 5 to 10 years the annual salary increases have been somewhat higher than 8 percent and that a declining government workforce is forecast.

As shown in their comments, the actuaries recommended relaxing investment restrictions,<sup>24</sup> adopting a 7 to 8 percent interest rate assumption and a 6 to 7 percent salary increase

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<sup>23</sup>"Memorandum," pp. 1-4.

<sup>24</sup>Accomplished by act of March 4, 1982, No. 45, for SERS and act of June 25, 1982, No. 183, for PSERS.



COMMENTS OF ACTUARIES OF PSERS AND SERS  
ON THE MAJOR RECOMMENDATION  
PRESENTED IN THE WINKLEVOSS ACTUARIAL STUDY

MAJOR ISSUE

- . Feasibility of legislature adopting automatic annual 4% COLA for pensioners and beneficiaries of PSERS and SERS

WINKLEVOSS RECOMMENDATION

- . Legislature can adopt automatic annual 3-4% COLA with no increase in employer contribution rates (PSERS - 16%; SERS - 18%)

BASIS FOR WINKLEVOSS RECOMMENDATION

- . 10% interest rate, 8% annual salary increase
- . Constant workforce
- . No change in accrued liability funding periods

QUESTIONABLE BASIS

- . Current and past investment yield less than 10%
- . Annual salary increases in past higher than 8%
- . Declining workforce forecast for future by State agencies
- . Economic assumptions in general use are more conservative than those proposed by Winklevoss
- . Seek views of investment advisors about future investment prospects
- . PSERS employer contribution rate revised to reflect new demographic assumptions

CONCLUSION

- . Imprudent to introduce statutory 4% COLA on strength of 10% interest rate, 8% annual salary increase

ACTUARIES' PREFERRED APPROACH

- . Liberalize current investment restrictions
- . Move to realistic economic assumptions of 7-8% interest rates, 6-7% annual salary increase
- . Periodic ad hoc COLA financed by gains of pension fund, or by additional employer contribution

December 17, 1981

assumption and granting periodic ad hoc COLAs financed by either gains of the pension funds or additional employer contributions.

William Reimert of Huggins & Company used the word "havoc" to describe the impact on the SERS fund of an automatic COLA during another decade similar to the period 1971-80, during which time the return on most retirement funds was greatly exceeded by inflation and Pennsylvania State employees' salaries increased on the average by 8.75 percent annually. In response, Dr. Winklevoss cautioned

against becoming overly myopic as to recent experience. You have to keep an eye on that for sure and you also have to keep one eye on the sensible economic model. . . . If you were to look at the statistics in the last 10 years and say those will be sensible guides for the future . . . you will come to the anomalous conclusion that inflation will be several points ahead of investment returns over the long haul. Then, you have just hypothesized an economy that would absolutely collapse".<sup>25</sup>

#### Valuation Interest, Market Interest Rates and Inflation

From the establishment of PSERS in 1919 and SERS in 1923 to 1974, the valuation interest rate in both systems remained at 4 percent. Through the entire period into the late 1960s, long-term interest rates rarely exceeded 4 percent for any extended period, although during much of the late 1930s, 1940s and 1950s high quality

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<sup>25</sup>Transcript of meeting of December 17, 1981 of Special Joint Committee to Review Retirement Cost-of-Living Supplements and Funding Sources held in offices of the Joint State Government Commission.

bond rates were markedly below 4 percent.<sup>26</sup> In 1974, after a half decade of increasing interest rates reflecting rapidly rising inflation rates, the General Assembly amended the retirement statutes to change the valuation interest rate to the current 5.5 percent.

A summary view of annual inflation rates and high quality bond interest rates over the last 30 years is presented in table 6. Throughout the period 1952 to 1973 the data in table 6 show that the historical "normal" relationship between inflation rates and long-term interest rates prevailed--interest rates exceeded the rate of inflation by 2 to 3 percentage points.<sup>27</sup> During the second half of the 1970s, investors failed to perceive the strength and persistence of inflation with the result that on the average the interest rate and inflation rate were approximately equal, leaving a zero or negative "real" return to investors. Since late 1980 to date, investors in long-term securities have insisted upon extraordinary high risk premiums (perhaps as a reaction to their losses in the late 1970s) with the results that long-term interest rates now exceed inflation rates by extraordinary margins. How long this

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<sup>26</sup>See U.S. Department of Commerce, Bureau of the Census, Historical Statistics of the U.S.: Colonial Times to 1957, series X, pp. 330-342.

<sup>27</sup>The concept of the market interest rate as the sum of a reasonably constant "real" rate and the expected rate of inflation is generally credited to Irving Fisher (see The Theory of Interest, New York, 1930).

Table 6

ANNUAL INFLATION RATES AND ANNUAL AVERAGE INTEREST RATES  
OF CORPORATE (Aaa) BONDS  
VARIOUS TIME PERIODS, 1952 to 1982

Time period	Annual inflation rates (change in U.S. Consumer Price Index)		Annual average interest rates Corporate (Aaa) bonds	
	Range	Average	Range	Average
1952 to 1960	-0.3% to 3.5%	1.5%	2.9% to 4.4%	3.6%
1961 to 1967	1.0 to 2.9	1.7	4.3 to 5.5	4.6
1968 to 1973	3.3 to 6.2	4.9	6.2 to 8.0	7.2
1974 to 1980	5.8 to 13.5	9.3	8.0 to 11.9	9.2
1981	--	8.9	--	14.2
1982*	--	6.6	--	14.8

\*First six months.

SOURCE: U.S. Department of Commerce, Bureau of the Census, Statistical Abstract of the United States: 1981 and Joint Economic Committee, Economic Indicators, July 1982.

situation may last is uncertain. It is a common current view that the underlying inflation rate in the country is now in the range of 5 to 6 percent. A continuation of this rate, and a reestablishment of historical relationships, would imply long-term, high-quality bond yields in the 8 to 10 percent range.

This review of the past 30 years clearly demonstrates that the most realistic anticipated future interest rates bear no relationship to past interest rates. However, while unusually large variations between the direction of change of inflation and of interest rates have occurred over the past decade and still persist, there is no reason to believe that normal historical relationships between inflation and interest rates will not prevail over the long run. If inflation continues at a high level, justifying significant cost-of-living increases for annuitants, higher market interest rates will likely lead to improved investment performance of the assets of the retirement systems.

A review of the problem of protecting retirement income against inflation by Tobin of Buck Consultants concludes as follows:

The concern that inflation could have a disastrous effect on the cost of pensions may be overstated. True, the amounts that must be set aside in periods of high inflation grow at staggering rates--but so do investment returns and the prices of all goods and services.

When expressed as a percentage of pay, however, costs do not increase. Forecasting and planning studies we have prepared for our clients reveal that inflation almost invariably will result in reduced contribution rates. Even if the increase

in inflation is exactly matched by projected increases in pensioner benefits, these studies have shown that costs will remain relatively unchanged or even decrease as a percentage of pay.<sup>28</sup>

### Rates of Return

Over the past decade the actual investment performance of both SERS and PSERS has been a gradual, if uneven, improvement in rates of return as older fixed-income securities carrying low coupon yields (in the range of 3 to 5 percent) have matured and new funds have been invested at higher and higher current rates of return. This process may well continue for many years since both funds, particularly that of PSERS, still contain substantial amounts of low coupon fixed-income securities.

The most comprehensive but in some ways least useful measure of investment performance is the "total rate of return" which incorporates all gains and losses, whether realized or unrealized, into investment income and expresses the net investment income as a percentage of market value of the investment portfolio. This measure is reported by SERS for the past three years as follows:

	<u>1979</u>	<u>1980</u>	<u>1981</u>
Equities portfolio	+15.7%	+27.6%	-3.1%
Bond portfolio	-4.7	-3.9	+5.6
Total investments (including mortgages and short-term investment)	+2.5	+5.3	+.9

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<sup>28</sup>Review and Outlook 1982, p. 25.

These total rates of return by nature of their extreme instability during periods of financial turbulence are useful principally as a means of measuring investment performance in relation to market-wide standards and are not very helpful, and may even be misleading, in making year-to-year or fund-to-fund comparisons. The PSERS does not report total rates of return for its portfolio.

Another measure of investment performance reported by SERS is a computation which ignores all realized or unrealized appreciation or depreciation in investments and simply divides total income from interest and dividends by the average market value of the portfolio. This calculation produced a rate of return for the State system which rose from 9.2 percent for 1980 to 10.4 percent for 1981. Calculations for PSERS on an estimated basis following the same procedure produce a 9.7 percent return for the year ending June 1981.

It should be emphasized that differences in fiscal year timing as well as differences in investment portfolio and strategy impact greatly on any measure of investment performance. The particular treatment of discounts, premiums, realized and unrealized losses on both fixed income and equity securities varies greatly from one audit or actuarial report to another. Unless the data are reported in precisely the same detailed manner, comparability between years or between funds is impossible.

The extent of the difficulty can be observed by studying the data in table 7. This table presents the net return on book

Table 7

INVESTMENT RETURN OF THE SCHOOL AND STATE RETIREMENT SYSTEMS  
FISCAL YEARS 1980 AND 1981

	PSERS		SERS	
	year ending June 30		year ending December 31	
	1980	1981	1980	1981
Investments				
Market value	\$3,800,307,499	\$3,902,496,836	\$2,556,015,084	\$2,684,442,000
Book value	4,575,765,158	5,042,044,372	2,995,870,000	3,315,790,000
Investment income	316,255,970	375,772,938	222,684,586	273,299,294
Plus: discounts, gains, etc. <sup>1</sup>	27,808,764	41,652,970	19,351,104	30,162,017
Less: deductions <sup>2</sup>	(36,625,779)	(66,205,785)	(63,944,220)	(151,300,533)
Net investment income	<u>307,438,955</u>	<u>351,220,123</u>	<u>178,091,470</u>	<u>152,160,778</u>
Net return on average market value	8.2%	9.1%	7.3%	5.8%
Net return on average book value	7.0	7.3	6.1	4.8
1. Accretion of discount	16,440,867	21,527,360	2,838,938	3,284,702
Accretion of capital gains	742,516	680,540	--	--
Gain on sale	10,302,040	17,902,049	16,512,166	26,877,315
Miscellaneous revenue	323,341	1,543,021	--	--
Total	<u>27,808,764</u>	<u>41,652,970</u>	<u>19,351,104</u>	<u>30,162,017</u>
2. Amortization premium	71,575	595,528	4,553,723	15,363,643
Amortization capitalized losses	20,623,332	29,371,567	--	--
Loss on sale	13,746,853	24,083,017	59,390,497	135,936,890
Service fees, investment and miscellaneous expense	2,184,019	2,155,673	--	--
Anticipated bond loss	--	10,000,000	--	--
Total	<u>36,625,779</u>	<u>66,205,785</u>	<u>63,944,220</u>	<u>151,300,533</u>

SOURCE: "Annual Report of the Public School Employees' Retirement System for the Fiscal Year Ended June 30, 1981"; "Commonwealth of Pennsylvania, State Employees' Retirement System: Second Annual Report to the Governor and the General Assembly, February 1982"; and "Pennsylvania State Employees' Retirement System: 1981 Annual Report."



value and on market value for PSERS and SERS on the basis of the available data from their annual reports. While the calculated net returns of the two funds differ widely, this difference is attributable primarily to different methods of treating losses on the sale or "swap" of securities. The auditors for SERS "write-off" losses on the trade or sale of investments in the year in which the sale was made while auditors for PSERS amortize losses in bond "swaps" over a future period. Consequently, no direct comparability between the net returns on either book or market value is possible. Furthermore, the year-to-year net returns are distorted by the relative size of certain portfolio changes. For example, the decline in net return for SERS in 1981 is due solely to the large increase in the loss from sale of investments. If the loss transaction leads to an increase in future income (which is usually the purpose of the sale) the temporary decline in the calculated rate of return is of little significance.

#### Legislative Choices

Two basic conclusions may be drawn from the data and actuarial views presented in this section. First, the economic assumptions of SERS and PSERS are not in line with reality and are in need of revision. Investment yields, however imprecisely reported, are well above the current 5.5 percent valuation rate specified by law and recent changes in investment policies should enhance the yield of the two funds. Second, the adoption of "best

estimate" interest and salary increase assumptions would tend to reduce the employer costs as a percentage of payroll with the extent of the reduction determined by the specific assumptions selected.

The Legislature traditionally has specified the valuation interest rate in the law but has left the setting of the salary assumption to the respective retirement boards, which have passed on the responsibility to their actuaries. The actuaries set salary assumptions which they believe to be consistent with the valuation rate, although the salary assumptions have not been consistent between or within the systems (see p. 48). In deciding whether to take responsibility for the salary increase assumption as well as the interest assumption or conversely to delegate the establishment of both assumptions to the retirement boards, the Legislature should keep in mind that the two rates should be set in relationship to each other and that the extent of the increase in each has a powerful impact on retirement costs. In the absence of other changes, increasing the interest assumption reduces these costs while increasing the salary assumption increases the costs. The Winklevoss table on p. 50 clearly shows the significant impact on costs of alternative salary and interest rate assumptions.

A change in economic assumptions would produce a reduction in current funding that could be used to absorb the increase in costs under the new experience assumptions, to finance a

cost-of-living adjustment or to make permanent early retirement options for school and State employees. Pressure to continue or expand the temporary provisions of Act No. 152 of 1982 will undoubtedly increase.<sup>29</sup>

No realistic change in economic assumptions, however, would cover the funding requirement for all of these changes; the combined estimated employer costs as a percentage of payroll are nearly equal to the total PSERS employer contribution rate in effect in 1981-82 (15 percent of payroll):

	<u>Percentage of payroll</u>	<u>Amount* (millions)</u>
Increase due to revision of experience assumptions	3.98%	\$140.7
Automatic annual COLA with 3 percent cap <sup>30</sup>	8.6	303.9
Permanent early retirement option	1.9	67.1
	<u>14.48</u>	<u>\$511.7</u>

\*Based on estimated 1982-83 payroll of \$3,534 million.

<sup>29</sup>Act No. 152 of 1982 provides early retirement with an unreduced annuity for certain members retiring during the period June 1, 1982 to August 31, 1982. These retirees must have attained age 55 and have at least 25 eligibility points (generally corresponding to years of service). Members who are 50 through 54 years of age and have at least 25 eligibility points and who elect to retire during the same time period would have their annuities reduced only .25 percent for each month they are under age 55 rather than have an actuarial reduction.

<sup>30</sup>Costs under a 1 or 2 percent cap or an ad hoc increase would be lower. See pp. 32-33.

The time period and methodology used for funding benefits is also an important consideration (chapter III). Twenty-to-thirty year actuarial funding of liabilities such as cost-of-living adjustments defers costs beyond the expected average life spans of the recipients, placing the burden on future generations of taxpayers and perhaps members. The 20-year funding period for COLAs is currently specified in the retirement statutes. Decreasing the funding period without changing economic assumptions would increase annual employer costs.

APPENDIX

Summary and Recommendations of "Actuarial Study of the  
Public School Employees' Retirement System and  
State Employees' Retirement System of Pennsylvania,"  
by Winklevoss & Associates, Inc. (May 1981)

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## IV. SUMMARY AND RECOMMENDATIONS

### A. Summary of Results

One of the major findings of this research is that the funded status of PSERS and SERS is fairly good. For example, the funded ratio of both plans fell in the median range of a distribution of funded ratios of 100 large public pension plans. In other words, there are as many public pension plans with lower funded ratios than PSERS and SERS as there are plans with higher funded ratios. In all likelihood, the relative funded status of the Pennsylvania plans is better than these data suggest because of the extremely conservative assumptions used with the plans. The funded ratio of each plan (i.e., assets to plan liabilities) is about 70% to 75%, whether based on a plan termination or plan continuation scenario. Moreover, the forecasted funded ratio of each system under the current funding policies is quite strong. In both cases, full funding is expected to occur in about ten years.

Another major finding is that the current level of employer contributions to the two systems is not only high enough to maintain long-term actuarial soundness but is of sufficient magnitude to "implicitly" fund an automatic annual cost-of-living adjustment (COLA) of 3 to 4 percent. The primary reason for this excessive contribution level is the relatively low valuation interest rate of 5.5% coupled with the salary inflation assumptions used by each actuary. This finding led to an interesting conclusion; namely, that an alternative funding and plan design policy of using realistic actuarial assumptions and instituting an automatic 4% COLA would have minimal cost consequences. Other alternatives in this area were also considered.

The research discovered that employer contributions for PSERS are expected to escalate during the next ten years under the current funding policy, whereas those for SERS are expected to be relatively level as a percentage of payroll. The latter pattern is the preferred one for public pension plans, since it avoids placing a greater pension cost

burden on future taxpayers as compared to current taxpayers.

Although the State statutes were obviously intended to have the actuarial aspects of both systems reasonably uniform, this goal is not being achieved for the following three reasons:

- o The State statutes are not strictly followed by the actuaries in some instances.
- o The State statutes are not internally consistent (e.g., legislated economic assumptions that obviously have different implicit inflation assumptions—such as the 5.5% interest rate and the 4% payroll increase rate).
- o The State statutes are not comprehensive and each actuary has developed a different procedure in some of the areas not covered by the statutes.

Another area researched was the financial effects of using an alternative funding method from the one that is currently in use with the plans. While one of the funding methods analyzed appeared to offer somewhat better costs and asset accumulation patterns than the current method, the differences were not significant enough to warrant a formal recommendation to switch methods.

Finally, this research studied the implications of changing the 4% statutory interest rate used in the determination of "actuarially equivalent" benefits to a rate more closely matching market interest rates, both in terms of the impact on members and on the plans' overall cost structure. Under the current procedure, depending on the option selected, there may be substantial subsidies going from the plan to the member, and overall employer contributions would decrease by over 20% if such subsidies were eliminated.

## B. Recommendations

A summary of the recommendations made throughout this report is given in this section.

- o Coordination of Funding and Benefit Policy: At the present time, the funding policies of both PSERS and SERS are not coordinated with the benefit policy of each system since the current employer contributions to each system are at a level sufficient to advance fund a 3% to 4% automatic cost-of-living provision although the plan provides no such benefits. Moreover, when ad hoc COLAs are granted, additional employer contributions are made. Winklevoss & Associates recommends that a formal COLA in the range of 3% to 4% be adopted and that the funding policies be coordinated by simultaneously adopting best-estimate interest and salary rate assumptions (see recommendation below). If non-best-estimate economic actuarial assumptions are to be continued, then supplemental annuities in this range need not be funded (a risky and not recommended policy). Similarly, if best-estimate assumptions are adopted without the adoption of a COLA, then the funding of supplemental annuities should be quite rapid, as recommended below.
  
- o Scope of Statutory Funding Policy: The statutory funding procedures should be made more comprehensive and set forth, for example, the procedure for dealing with actuarial gains and losses, the method for valuing plan assets, and a number of other items (see below). Moreover, the legislated funding policy should be identical for both PSERS and SERS.
  
- o Components of Statutory Funding Policy: The various components of the statutory funding policy as recommended by Winklevoss & Associates are outlined below:
  - . Actuarial Assumptions—Economic. The economic actuarial assumptions should be best-estimates; and the same inflation component should be consistently used in the interest rate, salary rate, benefit increase rate after retirement (if an automatic COLA is adopted), and payment increase rate for the unfunded accrued liability schedule. Winklevoss & Associates believes that a 6%



long-term annual inflation rate is reasonable for the foreseeable future. The valuation interest rate should exceed the inflation rate to reflect a real rate of return and a risk premium. A 4% excess return, or an annual interest rate of 10%, is reasonable. Similarly, the salary rate should exceed the inflation rate by expected productivity gains and individual merit increases. A 1% productivity factor is reasonable; and the merit component should be derived from the salary structure of active members, producing an average merit component of approximately 1% per year.

- Actuarial Assumptions--Decrements: Experience studies should continue to be performed every 5 years, and adjustments should be made in the various decrement rates (i.e., mortality, disability, termination, and retirement) as suggested by these studies. Consideration should be given to developing termination rates and retirement rates as a function of length of service as well as age, since this dimension is usually important.
  
- Normal Contribution Rate: Consideration should be given to the adoption of the Level Dollar Benefit Method of calculating the normal contribution rate. Since this will provide only minor improvements in employer cost patterns over time, the currently used Entry Age Normal Method is acceptable. However, the procedure of calculating this rate based on the new entrant group rather than the entire active membership should be discontinued.
  
- Accrued Liability Contribution Rate: This rate should continue to be based on a schedule of increasing

payments, with the increase equal to the inflation component used in selecting the valuation interest and salary rates. Although it may be desirable to have the rate of increase in the accrued liability payments be somewhat lower than the inflation rate, it should not be significantly lower. The period over which the unfunded accrued liability is to be funded should not exceed 30 years, and this funding period should be fixed (i.e., it should not be reset each year to 30 years, nor should actuarial gains and losses or other factors affect the length of the payment period once it is established). If the benefits under the plans are changed, then the resulting increase (or decrease) in the unfunded accrued liability should be funded over a new 30 year period—the only exception being the granting of ad hoc supplemental annuities as discussed below.

- Supplemental Annuity Contribution Rate: If ad hoc supplemental annuities are given and if the actuarial economic assumptions are best-estimates (or their equivalent), then a supplemental annuity contribution rate should be set to liquidate the corresponding liability over a period no longer than 5 years (or a period approximately equal to the time interval between successive increases if shorter than 5 years). If the actuarial economic assumptions are not best-estimates (as is currently the case), ad hoc benefit increases in the range of 3% to 4% need not be funded (a risky and not recommended policy). If the plan adopts an automatic cost-of-living benefit increase provision, then the normal contribution rate and the unfunded accrued liability contribution rate should be set so as to advance fund the COLA, obviating the need for a supplemental annuity contribution rate.

- Actuarial Gain and Loss Rate: This rate should be established in order to fund actuarial gains and losses as they arise. Winklevoss & Associates recommends that they be funded over a period of 5 to 10 years, with payments that increase in the same fashion as those for the accrued liability contribution rate. Although only the net gain or loss need be determined each year to comply with this funding requirement, Winklevoss & Associates recommends that an analysis be performed annually to show the gain or loss on account of each actuarial assumption.
  
- Asset Valuation Method: The value placed on assets for determining annual employer contributions should be based on a 3 to 5 year adjusted moving average of market values.
  
- o Review of Statutory Funding Policy: The statutory funding policy should be evaluated at least every five years. This procedure will avoid the current situation of having the valuation interest rate, for example, being set at a value that is significantly out of date.
  
- o Funded Status Analyses: The annual actuarial reports for both systems should include a comparison of (1) the market value of assets to the plan termination liability and (2) the actuarial value of assets to the plan continuation liability. Both liability values should be based on best-estimate actuarial assumptions.
  
- o Forecast of Future Contributions and Funded Status: Periodically, future contributions and funded statuses should be projected for both systems under realistic experience assumptions. This will provide the overseers of PSERS and SERS with a "road map" of where each system is headed and indicate long in advance any potential problems associated with the

funding and plan design policies in effect.

- o Statutory Interest Rate: Winklevoss & Associates recommends that the statutory interest rate be changed to reflect market conditions. Moreover, in order to avoid the problems that currently exist with a statutory interest rate that is significantly out of date, a procedure should be established whereby the statutory interest rate is adjusted to changing market conditions. We recommend that a 3 to 5 year average of the portfolio returns be used as the statutory interest rate. In order to avoid administrative problems, we recommend that the statutory interest rate be set initially at an appropriate value and then not be changed until the average portfolio return is 1 or 2 percentage points different from the prior year's statutory rate.
  
- o Unisex Mortality Tables: Winklevoss & Associates recommends that the same unisex mortality tables be adopted for both systems in calculating the various actuarial equivalence factors that are needed in determining benefits.