THE RETIREMENT SYSTEM OF THE GOVERNMENT OF PUERTO RICO AND ITS INSTRUMENTALITIES

REPORT ON THE ACTUARIAL VALUATION PREPARED AS OF JUNE 30, 1979

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THE RETIREMENT SYSTEM OF THE GOVERNMENT OF PUERTO RICO AND ITS INSTRUMENTALITIES

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MPPR

THE RETIREMENT SYSTEM OF THE COMMONWEALTH OF PUERTO RICO
AND ITS INSTRUMENTALITIES

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INTRODUCTION

At the request of the Administrator of the System, we have prepared an actuarial valuation of the Retirement System of the Commonwealth of Puerto Rico and its instrumentalities as of June 30, 1979. The purpose of this report is to provide a summary of the financial position of the System and to recommend actions to strengthen the future financial security for benefits to be provided under the System.

The previous valuation report for the Retirement System was prepared as of June 30, 1975 by A. Estrella and C.J. Nesbitt. In their report, the major recommendations were as follows:

- Increments of at least 2% per year be made in the employer contribution rates until a future actuarial valuation indicates that an adequate level of income has been reached by the System.

- Employers be charged interest of at least 5% per year of any outstanding employer contributions. Studies be undertaken of ways to increase the rate of investment of funds of the System, and of measures to insure that the combination of benefits from Social Security and from the System are adequate but not redundant.

- An actuarial data base be developed and maintained on a continous basis. Bids have been taken from a number of firms for purpose of selecting one which is to carry out the task of implementing mechanization of the System's data base. Selection of the successful bidder is imminent.

From these recommendations, steps have been taken to improve the rates of return earned on the assets held, and the impact of this improvement is discussed in later sections of the report.

EMPLOYEE DATA

Data for active employees was developed from several sources including a June 30, 1976 census, supplied by the System. This census was matched to records of the Association of Government Employees, and salaries as of June 30, 1978 were entered in all cases where a match was obtained. Using this approach, we were able to proceed with a total census of 55,018 active records, with 1978 annual earnings of $372,010,816.

Based on information provided on the total employees contributions made in the year July 1, 1979 to June 30, 1980, we have been able to generate a valuation payroll of $796 million.

Data for retired employees was based on a census as of June 30, 1980. In total we were provided with information covering 22,237 retired employees entitled to annual pensions of $64,279,634.

According to the latest report of the Trustees, total pensions paid for the year July 1, 1979 to June 30, 1980 amounted to $113 million.

Using the actuarial methods described in a later section of this report, we were able to use the data provided to compute financial results as of June 30, 1979.

The data for active participants as of 1979 was not employed directly but extrapolated from data for active participants available and useable for plan years 1978 and 1980.

While it would have been preferable to have based our calculations on an accurate and complete census prepared as of June 30, 1979, the results presented in this report are sufficiently reliable to act as a basis for the major funding decisions which need be made with respect to the System.

ASSET DATA

The total of assets reported as of June 30, 1979 amounted to $473,720,426. The asset balances at the last three year-ends have been as follows:

Date June 30	Asset Balance $ Millions
1977	$431
1978	452
1979	474

From an examination of these figures, it appears that contributions made plus investment earnings on the fund are running at a level which is barely sufficient to cover benefits currently payable and expenses incurred.

We observe that the actual net interest earned by the System upon its investment portfolio during the 1979 plan year amounted to 6.4%. Additionally, recent legislative changes have allowed the System to make personal loans to participants at or near current market rates for 1980 and 1981.

The result of this, plus other more aggressive investment activity, which demonstrate a 7.3% Net return for the 1980 plan year and an estimated net return of 9.4% for 1981 on the basis of performance for the first half of 1981 encouraged us to introduce an increased valuation interest assumption of 6.5% in place of the existing 5% valuation interest rate.

ACTUARIAL ASSUMPTIONS AND METHODS

In the previous report prepared by Estrella and Nesbitt, two actuarial bases were utilized. In one case only non-inflationary salary increases were recognized. In the second case, a moderate advance allowance for inflationary increases in salaries was made by projecting general salary increases at the rate of 3% per year, in addition to the basic non-inflationary salary scale. The actuarial basis without allowance for inflationary salary increases is summarized as Appendix B to this report.

In preparing the financial exhibits for this report, we have developed results on both of the actuarial bases previously adopted. In recognition of the anticipated higher earnings on the fund in the future, we have also calculated results on a 6.5% interest assumption coupled with the 3% allowance for inflationary salary increases.

In order to obtain valuation results for the active employees as of June 30, 1979, we took the following steps:

1. All employees who had been matched from the 1976 data were valued using the valuation programs developed for the System.

2. The results of this valuation were prorated by the total payroll of the System for the year July 1, 1978 to June 30, 1979.

3. Adjustments were then made to allow for the fact that the valuation census did not include any employees with less than two years of service.

4. Further adjustments were made in respect of the special provisions applying to police and fire employees.

5. The results obtained were then projected to June 1979 using standard actuarial techniques.

The financial results for retired employees were obtained by the following approach:

1. All retired lives for which we received data as of June 30, 1980 were valued using the valuation programs developed for the System.

2. The results of this valuation were prorated in order to provide consistency with the records of pensions paid included in the Trustees' report.

3. The results obtained were then adjusted to June 30, 1979 using standard actuarial techniques.

FINANCIAL RESULTS

Based on the employee data, asset data, and actuarial assumptions and methods described, the financial position of the Plan as of June 30, 1979 is set out in Exhibits I and II on the following two pages.

Exhibit I

Retirement System of the Commonwealth of Puerto Rico

SUMMARY OF EMPLOYER ANNUAL NORMAL COST AND PAST SERVICE LIABILITY

	Basis A No Allowance For Inflationary Increases In Salaries and 5% Valuation Interest Rate	Basis B With Allowance For Inflationary Increases In Salaries and 5% Valuation Interest Rate	Basis C With Allowance For Inflationary Increases In Salaries and 6.5% Valuation Interest Rate	Basis D No Allowance For Inflationary Increases In Salaries and 6.5% Valuation Interest Rate
Employer Annual Normal Cost as a percentage of payroll	4.79%	9.52%	4.97%	1.64%
Past Service Liability:				
- Pensioners	$ 980,000,000	$ 980,000,000	$ 866,000,000	$ 866,000,000
- Active Employees	$1,098,000,000	$1,450,000,000	$1,031,000,000	$ 781,000,000
- Total	$2,078,000,000	$2,430,000,000	$1,897,000,000	$1,647,000,000
Assets	$ 474,000,000	$ 474,000,000	$ 474,000,000	$ 474,000,000
Unfunded Past Service Liability	$1,604,000,000	$1,956,000,000	$1,423,000,000	$1,173,000,000

Exhibit I.

Retirement System of the Commonwealth of Puerto Rico

SUMMARY OF EMPLOYER ANNUAL NORMAL COST AND PAST SERVICE LIABILITY

Proposed amendment: Benefits are to be based on five year average earnings instead of three year average.

	Basis A No Allowance For Inflationary Increases In Salaries and 5% Valuation Interest Rate	Basis B With Allowance For Inflationary Increases In Salaries and 5% Valuation Interest Rate	Basis C With Allowance For Inflationary Increases In Salaries and 6.5% Valuation Interest Rate	Basis D No Allowance For Inflationary Increases In Salaries and 6.5% Valuation Interest Rate
Employer Annual Normal Cost as a percentage of payroll	4.64%	8.88%	4.51%	1.53%
Past Service Liability:				
- Pensioners	$ 980,000,000	$ 980,000,000	$ 866,000,000	$ 866,000,000
- Active Employees	$1,083,000,000	$1,389,000,000	$ 988,000,000	$ 770,000,000
- Total	$2,063,000,000	$2,369,000,000	$1,854,000,000	$1,636,000,000
Assets	$ 474,000,000	$ 474,000,000	$ 474,000,000	$ 474,000,000
Unfunded Past Service Liability	$1,589,000,000	$1,895,000,000	$1,380,000,000	$1,162,000,000

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Exhibit Ib

Retirement System of the Commonwealth of Puerto Rico

SUMMARY OF EMPLOYER ANNUAL NORMAL COST AND PAST SERVICE LIABILITY

Proposed amendment: Change retirement eligibility from age 58 to age 60.

	Basis A No Allowance For Inflationary Increases In Salaries and 5% Valuation Interest Rate	Basis B With Allowance For Inflationary Increases In Salaries and 5% Valuation Interest Rate	Basis C With Allowance For Inflationary Increases In Salaries and 6.5% Valuation Interest Rate	Basis D No Allowance For Inflationary Increases In Salaries and 6.5% Valuation Interest Rate
Employer Annual Normal Cost as a percentage of payroll	4.58%	9.22%	4.75%	1.49%
Past Service Liability:				
- Pensioners	$ 980,000,000	$ 980,000,000	$ 866,000,000	$ 866,000,000
- Active Employees	$1,078,000,000	$1,423,000,000	$1,012,000,000	$ 767,000,000
- Total	$2,058,000,000	$2,403,000,000	$1,878,000,000	$1,633,000,000
Assets	$ 474,000,000	$ 474,000,000	$ 474,000,000	$ 474,000,000
Unfunded Past Service Liability	$1,584,000,000	$1,929.000,000	$1,404,000,000	$1,159.000,000

Exhibit Ic

Retirement System of the Commonwealth of Puerto Rico

SUMMARY OF EMPLOYER ANNUAL NORMAL COST
AND PAST SERVICE LIABILITY

Proposed amendment: Reduce benefits of future retired employees by 5%.

	Basis A No Allowance For Inflationary Increases In Salaries and 5% Valuation Interest Rate	Basis B With Allowance For Inflationary Increases In Salaries and 5% Valuation Interest Rate	Basis C With Allowance For Inflationary Increases In Salaries and 6.5% Valuation Interest Rate	Basis D No Allowance For Inflationary Increases In Salaries and 6.5% Valuation Interest Rate
Employer Annual Normal Cost as a percentage of payroll	4.26%	8.76%	4.43%	1.27%
Past Service Liability:				
- Pensioners	$ 980,000,000	$ 980,000,000	$ 866,000,000	$ 866,000,000
- Active Employees	$1,043,000,000	$1,378,000,000	$ 979,000,000	$ 742,000,000
- Total	$2,023,000,000	$2,358,000,000	$1,845,000,000	$1,608,000,000
Assets	$ 474,000,000	$ 474,000,000	$ 474,000,000	$ 474,000,000
Unfunded Past Service Liability	$1,549,000,000	$1,884 000,000	$1,371,000,000	$1,134,000,000

Exhibit Id

Retirement System of the Commonwealth of Puerto Rico

SUMMARY OF EMPLOYER ANNUAL NORMAL COST AND PAST SERVICE LIABILITY

Proposed amendment: Reduce benefits of future retired employees by 10%.

	Basis A No Allowance For Inflationary Increases In Salaries and 5% Valuation Interest Rate	Basis B With Allowance For Inflationary Increases In Salaries and 5% Valuation Interest Rate	Basis C With Allowance For Inflationary Increases In Salaries and 6.5% Valuation Interest Rate	Basis D No Allowance For Inflationary Increases In Salaries and 6.5% Valuation Interest Rate
Employer Annual Normal Cost as a percentage of payroll	3.73%	7.99%	3.89%	0.89%
Past Service Liability:				
- Pensioners	$ 980,000,000	$ 980,000,000	$ 866,000,000	$ 866,000,000
- Active Employees	$ 988,000,000	$1,305,000,000	$ 928,000,000	$ 703,000,000
- Total	$1,968,000,000	$2,285,000,000	$1,794,000,000	$1,569,000,000
Assets	$ 474,000,000	$ 474,000,000	$ 474,000,000	$ 474,000,000
Unfunded Past Service Liability	$1,494,000,000	$1,811,000,000	$1,320,000,000	$1,095,000,000

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Retirement System of the Commonwealth of Puerto Rico

SUMMARY OF TOTAL EMPLOYER ANNUAL COST

A. NO ALLOWANCE FOR INFLATIONARY INCREASES IN SALARIES AND 5% VALUATION INTEREST RATE

Unfunded Past Service Liability Funded as a Level Percentage of Payroll over:

	20 Years	30 Years	40 Years	50 Years	60 Years
Annual Normal Cost	4.79%	4.79%	4.79%	4.79%	4.79%
Past Service Cost	16.16%	13.11%	11.74%	11.04%	10.64%
Total Annual Cost	20.95%	17.90%	16.53%	15.83%	15.43%

B. WITH 3% PER YEAR ALLOWANCE FOR INFLATIONARY INCREASES IN SALARIES AND 5% VALUATION INTEREST RATE

Unfunded Past Service Liability Funded as a Level Percentage of Payroll over:

	20 Years	30 Years	40 Years	50 Years	60 Years
Annual Normal Cost	9.52%	9.52%	9.52%	9.52%	9.52%
Past Service Cost	14.50%	10.56%	8.62%	7.50%	6.76%
Total Annual Cost	24.02%	20.08%	18.14%	17.02%	16.28%

C. WITH 3% PER YEAR ALLOWANCE FOR INFLATIONARY INCREASES IN SALARIES AND 6.5% VALUATION INTEREST RATE

Unfunded Past Service Liability Funded as a Level Percentage of Payroll over:

	20 Years	30 Years	40 Years	50 Years	60 Years
Annual Normal Cost	4.97%	4.97%	4.97%	4.97%	4.97%
Past Service Cost	12.10%	9.32%	8.01%	7.26%	6.81%
Total Annual Cost	17.07%	14.29%	12.98%	12.23%	11.78%

D. NO ALLOWANCE FOR INFLATIONARY INCREASES IN SALARIES AND 6.5% VALUATION INTEREST RATE

Unfunded Past Service Liability Funded as a Level Percentage of Payroll over:

	20 Years	30 Years	40 Years	50 Years	60 Years
Annual Normal Cost	1.64%	1.64%	1.64%	1.64%	1.64%
Past Service Cost	13.38%	11.29%	10.42%	10.01%	9.81%
Total Annual Cost	15.02%	12.93%	12.06%	11.65%	11.45%

Exhibit IIa

Retirement System of the Commonwealth of Puerto Rico

SUMMARY OF TOTAL EMPLOYER ANNUAL COST

PPPR

Proposed amendment: Benefits are to be based on five year average earnings instead of three year average.

A. NO ALLOWANCE FOR INFLATIONARY INCREASES IN SALARIES AND 5% VALUATION INTEREST RATE

Unfunded Past Service Liability Funded as a Level Percentage of Payroll over:

	20 Years	30 Years	40 Years	50 Years	60 Years
Annual Normal Cost	4.64%	4.64%	4.64%	4.64%	4.64%
Past Service Cost	16.01%	12.99%	11.63%	10.93%	10.54%
Total Annual Cost	20.65%	17.63%	16.27%	15.57%	15.18%

B. WITH 3% PER YEAR ALLOWANCE FOR INFLATIONARY INCREASES IN SALARIES AND 5% VALUATION INTEREST RATE

Unfunded Past Service Liability Funded as a Level Percentage of Payroll over:

	20 Years	30 Years	40 Years	50 Years	60 Years
Annual Normal Cost	8.88%	8.88%	8.88%	8.88%	8.88%
Past Service Cost	14.05%	10.23%	8.35%	7.27%	6.55%
Total Annual Cost	22.93%	19.11%	17.23%	16.15%	15.43%

C. WITH 3% PER YEAR ALLOWANCE FOR INFLATIONARY INCREASES IN SALARIES AND 6.5% VALUATION INTEREST RATE

Unfunded Past Service Liability Funded as a Level Percentage of Payroll over:

	20 Years	30 Years	40 Years	50 Years	60 Years
Annual Normal Cost	4.51%	4.51%	4.51%	4.51%	4.51%
Past Service Cost	11.73%	9.04%	7.77%	7.04%	6.60%
Total Annual Cost	16.24%	13.55%	12.28%	11.55%	11.11%

D. NO ALLOWANCE FOR INFLATIONARY INCREASES IN SALARIES AND 6.5% VALUATION INTEREST RATE

Unfunded Past Service Liability Funded as a Level Percentage of Payroll over:

	20 Years	30 Years	40 Years	50 Years	60 Years
Annual Normal Cost	1.53%	1.53%	1.53%	1.53%	1.53%
Past Service Cost	12.95%	10.93%	10.09%	9.70%	9.50%
Total Annual Cost	14.78%	12.71%	11.85%	11.45%	11.25%

Exhibit

Retirement System of the Commonwealth of Puerto Rico

SUMMARY OF TOTAL EMPLOYER ANNUAL COST

PPPR

Proposed amendment: Change retirement eligibility from age 58 to age 60.

A. NO ALLOWANCE FOR INFLATIONARY INCREASES IN SALARIES AND 5% VALUATION INTEREST RA

Unfunded Past Service Liability Funded as a Level Percentage of Payroll over:

	20 Years	30 Years	40 Years	50 Years	60 Years
Annual Normal Cost	4.58%	4.58%	4.58%	4.58%	4.58%
Past Service Cost	15.96%	12.95%	11.59%	10.90%	10.51%
Total Annual Cost	20.54%	17.53%	16.17%	15.48%	15.09%

B. WITH 3% PER YEAR ALLOWANCE FOR INFLATIONARY INCREASES IN SALARIES AND 5% VALUATI INTEREST RATE

Unfunded Past Service Liability Funded as a Level Percentage of Payroll over:

	20 Years	30 Years	40 Years	50 Years	60 Years
Annual Normal Cost	9.22%	9.22%	9.22%	9.22%	9.22%
Past Service Cost	14.30%	10.41%	8.50%	7.40%	6.67%
Total Annual Cost	23.52%	19.63%	17.72%	16.62%	15.89%

C. WITH 3% PER YEAR ALLOWANCE FOR INFLATIONARY INCREASES IN SALARIES AND 6.5% VALUA INTEREST RATE

Unfunded Past Service Liability Funded as a Level Percentage of Payroll over:

	20 Years	30 Years	40 Years	50 Years	60 Years
Annual Normal Cost	4.75%	4.75%	4.75%	4.75%	4.75%
Past Service Cost	11.94%	9.20%	7.90%	7.16%	6.72%
Total Annual Cost	16.69%	13.95%	12.65%	11.91%	11.47%

D. NO ALLOWANCE FOR INFLATIONARY INCREASES IN SALARIES AND 6.5% VALUATION INTEREST

Unfunded Past Service Liability Funded as a Level Percentage of Payroll over:

	20 Years	30 Years	40 Years	50 Years	60 Years
Annual Normal Cost	1.49%	1.49%	1.49%	1.49%	1.49%
Past Service Cost	13.22%	11.16%	10.30%	9.90%	9.69%
Total Annual Cost	14.71%	12.65%	11.79%	11.39%	11.18%

Exhibit IIc

Retirement System of the Commonwealth of Puerto Rico

SUMMARY OF TOTAL EMPLOYER ANNUAL COST

Proposed amendment: Reduce benefits of future retired employees by 5%.

A. NO ALLOWANCE FOR INFLATIONARY INCREASES IN SALARIES AND 5% VALUATION INTEREST RATE

Unfunded Past Service Liability Funded as a Level Percentage of Payroll over:

	20 Years	30 Years	40 Years	50 Years	60 Years
Annual Normal Cost	4.26%	4.26%	4.26%	4.26%	4.26%
Past Service Cost	15.61%	12.66%	11.34%	10.66%	16.28%
Total Annual Cost	19.87%	16.92%	15.60%	14.92%	14.54%

B. WITH 3% PER YEAR ALLOWANCE FOR INFLATIONARY INCREASES IN SALARIES AND 5% VALUATION INTEREST RATE

Unfunded Past Service Liability Funded as a Level Percentage of Payroll over:

	20 Years	30 Years	40 Years	50 Years	60 Years
Annual Normal Cost	8.76%	8.76%	8.76%	8.76%	8.76%
Past Service Cost	13.97%	10.17%	8.30%	7.22%	6.51%
Total Annual Cost	22.73%	18.93%	17.06%	15.98%	15.27%

C. WITH 3% PER YEAR ALLOWANCE FOR INFLATIONARY INCREASES IN SALARIES AND 6.5% VALUATIO INTEREST RATE

Unfunded Past Service Liability Funded as a Level Percentage of Payroll over:

	20 Years	30 Years	40 Years	50 Years	60 Years
Annual Normal Cost	4.43%	4.43%	4.43%	4.43%	4.43%
Past Service Cost	11.66%	8.98%	7.72%	6.99%	6.56%
Total Annual Cost	16.09%	13.41%	12.15%	11.42%	10.99%

D. NO ALLOWANCE FOR INFLATIONARY INCREASES IN SALARIES AND 6.5% VALUATION INTEREST RAT

Unfunded Past Service Liability Funded as a Level Percentage of Payroll over:

	20 Years	30 Years	40 Years	50 Years	60 Years
Annual Normal Cost	1.27%	1.27%	1.27%	1.27%	1.27%
Past Service Cost	12.94%	10.91%	10.07%	9.68%	9.48%
Total Annual Cost	14.21%	12.18%	11.34%	10.95%	10.75%

Exhibit IId

Retirement System of the Commonwealth of Puerto Rico

SUMMARY OF TOTAL EMPLOYER ANNUAL COST

Proposed amendment: Reduce benefits of future retired employees by 10%.

A. NO ALLOWANCE FOR INFLATIONARY INCREASES IN SALARIES AND 5% VALUATION INTEREST RATE

Unfunded Past Service Liability Funded as a Level Percentage of Payroll over:

	20 Years	30 Years	40 Years	50 Years	60 Years
Annual Normal Cost	3.73%	3.73%	3.73%	3.73%	3.73%
Past Service Cost	15.05%	12.21%	10.93%	10.28%	9.91%
Total Annual Cost	18.78%	15.94%	14.66%	14.01%	13.64%

B. WITH 3% PER YEAR ALLOWANCE FOR INFLATIONARY INCREASES IN SALARIES AND 5% VALUATION INTEREST RATE

Unfunded Past Service Liability Funded as a Level Percentage of Payroll over:

	20 Years	30 Years	40 Years	50 Years	60 Years
Annual Normal Cost	7.99%	7.99%	7.99%	7.99%	7.99%
Past Service Cost	13.43%	9.78%	7.98%	6.94%	6.26%
Total Annual Cost	21.42%	17.77%	15.97%	14.93%	14.25%

C. WITH 3% PER YEAR ALLOWANCE FOR INFLATIONARY INCREASES IN SALARIES AND 6.5% VALUATION INTEREST RATE

Unfunded Past Service Liability Funded as a Level Percentage of Payroll over:

	20 Years	30 Years	40 Years	50 Years	60 Years
Annual Normal Cost	3.89%	3.89%	3.89%	3.89%	3.89%
Past Service Cost	11.22%	8.65%	7.43%	6.73%	6.32%
Total Annual Cost	15.11%	12.54%	11.32%	10.62%	10.21%

D. NO ALLOWANCE FOR INFLATIONARY INCREASES IN SALARIES AND 6.5% VALUATION INTEREST RATE

Unfunded Past Service Liability Funded as a Level Percentage of Payroll over:

	20 Years	30 Years	40 Years	50 Years	60 Years
Annual Normal Cost	0.89%	0.89%	0.89%	0.89%	0.89%
Past Service Cost	12.49%	10.54%	9.73%	9.34%	9.16%
Total Annual Cost	13.38%	11.43%	10.62%	10.23%	10.05%

A number of conclusions may be drawn from these results:

- The value of benefits to be paid to retired employees far exceeds the assets currently accumulated to provide for them.

- The results presented in Exhibit II based on the two actuarial bases used by Estrella and Nesbitt are very similar to those presented in their valuation report as of June 30, 1975.

- The use of a 6.5% interest assumption gives a significant reduction in the level of required contribution and reduces the unfunded liability from $1,956 million to $1,423 million.

- The unfunded liabilities calculated on the two prior valuation bases have increased substantially from their 1975 levels. This is primarily because employer contributions over the intervening period have been at a lower rate than that indicated in the previous valuation report.

RECOMMENDATIONS:

While it is clear that the actions taken to improve the long-term rate of return on the assets have had a positive effect on the financial status of the System, it is evident that additional steps still need to be taken.

The following targets are indicative of the actions necessary in order to stabilize the funding of the System and ensure that sufficient assets will be available to meet future benefit payments.

- Pensioners liabilities are not fully funded; on the 5% valuation basis, the asset deficiency is $506 million; on the 6.5% valuation basis, the asset deficiency is $392 million.

- Employer contributions rates are less than the rates necessary to pay normal annual costs and amortize unfunded past service liabilities over 60 years; these rates are 16.28% and 11.78% respectively on the 5% and 6.5% valuation bases.

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We recommend that the employer contribution be increased. In our opinion, unless timely action is taken, the size of the fund accumulated could soon start to decrease and this ultimately leads to an inability to pay benefits as they fall due.

Imp.

Respectfully Submitted,

HANSEN-PPPR, INC.

Kenneth G. Buffin, FIA, FCA, ASA
President

By Samuel Robbins
Executive Vicepresident
And Actuary

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Appendix A

Employees Retirement System of the Government of Puerto Rico and its Instrumentalities

SUMMARY OF PRINCIPAL PLAN PROVISIONS

Effective Date and Fiscal Year

Law approved May 15, 1951. Effective date of law is July 1, 1951. Effective date law was first applied is January 1, 1952. Fiscal year is the period from July 1 to June 30 of the following year.

Employers Included

Government of the Commonwealth of Puerto Rico; any governmental instrumentality of The People of Puerto Rico ("Public Enterprise"); municipalities.

Employees Included

Officers or employees of the Government of Puerto Rico or its instrumentalities or municipalities, including: members of the Police of Puerto Rico; Justices of the Peace of Puerto Rico; elective officers of the People of Puerto Rico and employees of the Legislature; employees of public enterprises; employees of municipalities.

Service Considered

Service is credited according to months of service during the fiscal year as follows: Nine or more months constitutes one year of service; six to nine months, 3/4 of a year; three to six months, 1/2 year; less than three months not considered.

Service Considered (Cont.)

No service is credited for any period of absence without compensation, other than military service or absence due to job related illness and authorized by the State Insurance Fund. Less than fifteen days of service in a month does not constitute a month of service.

Compensation Considered

Compensation excludes bonuses and overtime pay. Average compensation during the highest thirty six months of creditable service, which do not have to be consecutive.

Employee Contributions

Members of the police or mayors contribute 7% of compensation. Other members contribute 4-1/2% of the first $6,600 of annual compensation, plus 7% of the excess compensation. Other members may elect to contribute necessary sums plus interest to complete the contributions at a rate of 7%.

Normal Retirement Benefit

Normal retirement is at age 58 after completion of 10 years of credited service, or, for members of the police and fire services, at age 50 after completion of 25 years of credited service.

The benefit is 1-1/2% of average compensation times credited service up to 20 years, plus 2% of average compensation times credited service in excess of 20 years. The maximum benefit is 75% of average compensation.

For mayors, the benefit is 5% of average compensation times credited service as a mayor, up to 10 years, plus 1-1/2% of average compensation times other credited service in excess of 10 years. The maximum benefit for a mayor is 90% of the highest salary received.

Following attainment of age 65, the benefit is recomputed for members other than members of the police and mayors, or other than members who have elected to contribute 7% of compensation.

The recomputed benefit is 1% of average compensation up to $6,600 times credited service up to 10 years, plus 1-1/2% of average compensation up to $6,600 times credited service in excess of 20 years, plus 1-1/2% of average compensation in excess of $6,600 times credited service up to 20 years, plus 2% of average compensation in excess of $6,600 times credited service in excess of 20 years.

Early Retirement Benefit

For members other than members of the police and fire forces, early retirement is at age 55 after completion of 25 years of credited service. The benefit is computed as for normal retirement, and where applicable, it is re-computed at age 65. The benefit is actuarially reduced for payment before age 58.

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Thirty-Year Retirement

Members may retire after 30 years of credited service. The benefit is 65% of average compensation if age at retirement was less than age 55, or 75% of average compensation if age at retirement was 55 or older.

following attainment of age 65, other than for members of the police force, the benefit is recomputed, where such adjustment is applicable.

The recomputed benefit is 1-1/2% of average compensation up to $6,600 times credited service, plus 65% of average compensation in excess of $6,600 if age at retirement was less than age 55, or plus 75% of average compensation in excess of $6,600 if age at retirement was 55 or older.

Deferred Vested Retirement Benefit

Following termination of employment after completion of 10 years of credited service, a member is entitled to an annuity computed as for normal retirement, payable at age 58.

Members of the police and fire services who had completed 25 years of credited service at termination of employment are entitled to an annuity computed as for normal retirement, payable at age 50.

Disability Retirement Benefit

Occupational Disability

Following disability arising in the course of employment, the amount of the annuity is 50% of base rate of compensation at the time of occurrence of disability. Where applicable, such pension will be recomputed at age 65.

Non-Occupational Disability

Following non-occupational disability after 10 years of credited service, the annuity is 30% of average compensation plus 1% of average compensation times credited service in excess of 10 years. The maximum annuity is 50% of average compensation.

Upon attainment of age 65, the benefit is recomputed as for normal retirement benefits after age 65 for members who are not members of the police service.

Death Benefit

Occupational Death

Following death arising in the course of employment, the widow shall receive an annuity of 50% of the member's rate of compensation at date of death, payable during her widowhood. An additional $10 per month shall be paid for each of the member's children under age 18. If there is no surviving widow, children of the member under age 18 shall each receive $20 per month. But in no case shall payments exceed 75% of the decedents applicable base salary.

Non-Occupational Death

Active:

Following non-occupational death, the benefit is a refund of accumulated contributions plus the yearly rate of compensation of the member at the date of death.

Pensioner:

$200 payment to decedents heirs.

Respecting Participants Not Eligible For A Retirement Annuity

Upon separation from service, a member who is not eligible for a retirement annuity shall receive a refund of his contributions to the System plus interest.

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Employees Retirement System Of The Government Of Puerto Rico and Its Instrumentalities

SUMMARY OF ACTUARIAL ASSUMPTIONS

1. Investment Return - 5% per annum, compounded annually.

2. Retirement Age - Graduated rates. See attached table.

3. Mortality, Disability, and Separation

   a. Mortality

      Active employees and nondisabled pensioners
      - Males: 1971 Individual Annuity Mortality Table, set forward two years.
      - Females: 1971 Individual Annuity Mortality Table.

      Disabled Pensioners
      - Mortality is based on nondisabled mortality, adjusted below age 75 in accordance with the attached formulas.* See table below for sample rates.

   b. Disability - Graduated rates. See table below for sample values.

   c. Separation - Graduated rates. See table below for sample values.

*Mortality for disabled pensioners below age 75 is the mortality of non-disabled pensioners, adjusted by the following formulas:

$$\text{Male Adjusted } q_x = 1971 \text{ IAM } q_{x+2}(1 + .04(75 - x)),\ x < 75, \text{ and}$$

$$\text{Female Adjusted } q_x = 1971 \text{ IAM } q_x(1 + .10(75 - x)), 55 \leq x < 75, \text{ and}$$

$$1971 \text{ IAM } q_x(1 + .10(75 - x))\ (1 + .16(55 - x)),\ x < 55.$$

4. Earnings Progression Sample Rates

Percentage Increase at the Indicated Age**

Age	All
20	2.78%
30	2.17
40	1.79
50	1.52
60	1.32

**For calculations making advance allowance for inflationary increases in salaries, the rate of such increase was taken as 3% per year.

Employees Retirement System of the Government of Puerto Rico and its Instrumentalities

Annual Rate of Retirement Per 100 Employees

Age	Male	Female
47	.216	.132
48	.530	.270
49	.844	.408
50	1.158	.546
51	1.472	.684
52	1.787	.822
53	3.288	1.629
54	4.788	2.436
55	6.289	3.242
56	7.789	4.049
57	9.290	4.856
58	12.441	9.476
59	15.592	14.096
60	18.743	18.716
61	21.894	23.336
62	25.045	27.956
63	37.104	39.771
64	49.163	51.586
65	61.221	63.401
66	73.281	75.216
67	85.340	87.031
68	100.000	100.000

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CASH FLOW ANALYSIS
(All Figures In Thousands)

Assets 6/30/80 (Trustee Report) $478,289,552 — 6 1/2% Interest

YEAR ENDING JUNE 30	1982	1983	1984	1985	1986	1987
Benefit Payments:	$139,637	$142,407	$145,318	$149,010	$153,467	$158,859
Expenses:	5,800	6,200	6,600	7,000	7,400	7,800
Investment Income:	29,298	28,709	28,083	27,393	26,594	24,245
Contributions: Present Basis						
Employer:	$57,841	$59,576	$61,363	$63,204	$65,100	$67,053
Employee:	49,218	50,695	52,216	53,782	55,396	57,058
Total:	107,059	110,271	113,579	116,986	120,496	124,111
Assets:						
Beginning:	$469,921	$460,840	$451,213	$440,957	$429,326	$415,549
End Of Year:	460,840	451,213	440,957	429,326	415,549	397,246
Contributions: Add 2% Employer, 1% Employee						
Additional:	$25,332	$26,092	$26,875	$27,681	$28,512	$29,367
Investment Income:	31,771	32,365	33,698	35,147	36,677	39,602
Assets:						
Beginning:	$495,315	$514,040	$524,161	$546,395	$570,199	$595,017
End Of Year:	514,040	524,161	546,395	570,199	595,017	621,438
Contributions: Add 2 1/2% Employer, 1% Employee						
Additional:	$29,555	$30,441	$31,354	$32,295	$33,264	$34,262
Investment Income:	32,184	33,733	35,442	37,300	39,729	42,739
Assets:						
Beginning:	$499,547	$522,908	$548,746	$577,203	$607,774	$640,396
End Of Year:	522,908	548,746	577,203	607,774	640,396	674,849

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CASH FLOW ANALYSIS
(All Figures In Thousands)

Assets 6/30/80 (Trustee Report) $478,289,552 — 6 1/2% Interest

YEAR ENDING JUNE 30	1982	1983	1984	1985	1986	1987
Contributions: Add 3% Employer, 1% Employee						
Additional:	$33,777	$34,790	$35,834	$36,909	$38,016	$39,157
Investment Income:	32,596	34,450	36,493	38,715	41,085	44,952
Assets:						
Beginning:	$503,780	$531,775	$562,679	$596,667	$633,267	$671,997
End Of Year:	531,775	562,679	596,667	633,267	671,997	713,558

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CASH FLOW ANALYSIS
(All Figures In Thousands)

Assets 6/30/80 (Trustee Report) $478,283,552 — 7 1/2% Interest

YEAR ENDING JUNE 30	1982	1983	1984	1985	1986	1987
Benefit Payments:	$139,637	$142,407	$145,318	$149,010	$153,467	$158,859
Expenses:	5,800	6,200	6,600	7,000	7,400	7,800
Interest Income:	34,150	33,835	33,497	33,108	32,614	30,355
Contributions: Present Basis						
Employer:	$57,841	$59,576	$61,363	$63,204	$65,100	$67,053
Employee:	49,218	50,695	52,216	53,782	55,396	57,058
Total:	$107,059	$110,271	$113,579	$116,986	$120,496	$124,111
Assets:						
Beginning:	$474,523	$470,295	$465,794	$460,952	$455,036	$447,279
End Of Year:	470,295	465,794	460,952	455,036	447,279	435,086
Contributions: Add 2% Employer, 1% Employee						
Additional:	$25,332	$26,092	$26,875	$27,681	$28,512	$29,367
Investment Income:	37,014	38,841	40,684	43,061	45,421	47,888
Assets:						
Beginning:	$500,030	$523,998	$550,595	$579,815	$611,533	$645,095
End Of Year:	523,998	550,595	579,815	611,533	645,095	679,802
Contributions: Add 2 1/2% Employer, 1% Employee						
Additional:	$29,555	$30,441	$31,354	$32,295	$33,264	$34,262
Investment Income:	37,172	39,004	41,031	43,248	45,613	48,554
Assets:						
Beginning:	$504,281	$532,630	$563,739	$597,785	$634,304	$672,810
End Of Year:	532,630	563,739	597,785	634,304	672,810	713,078

PPPR

CASH FLOW ANALYSIS
(All Figures In Thousands)

Assets 6/30/80 (Trustee Report) $478,289,552 — 7 1/2% Interest

YEAR ENDING JUNE 30	1982	1983	1984	1985	1986	1987
Contributions: Add 3% Employer, 1% Employee						
Additional:	$33,777	$34,790	$35,834	$36,909	$38,016	$39,156
Investment Income:	37,330	39,167	41,199	43,421	45,791	50,801
Assets:						
Beginning:	$508,534	$541,263	$576,884	$615,578	$656,884	$700,320
End Of Year:	541,263	576,884	615,578	656,884	700,320	747,729

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CASH FLOW ANALYSIS
(All Figures In Thousands)

Assets 6/30/80 (Trustee Report) $478,289,552

Interest 9 1/2% First Year
7 1/2% Thereafter

YEAR ENDING JUNE 30	1981	1982	1983	1984	1985	1986
Benefit Payments:	$136,757	$139,637	$142,407	$145,318	$149,010	$153,467
Expenses:	5,400	5,800	6,200	6,600	7,000	7,400
Investment Income:	43,623	34,838	34,574	34,292	33,963	33,533
Contributions: Present Basis						
Employer:	$56,156	$57,841	$59,576	$61,363	$63,204	$65,100
Employee:	47,785	49,218	50,695	52,216	53,782	55,396
Total:	$103,941	$107,059	$110,271	$113,579	$116,986	$120,496
Assets:						
Beginning:	$478,290	$483,697	$480,157	$476,395	$472,348	$467,287
End Of Year:	483,697	480,157	476,395	472,348	467,287	460,449
Contributions: Add 2% Employer, 1% Employee						
Additional:	$24,595	$25,332	$26,092	$26,875	$27,681	$28,512
Investment Income:	44,791	37,720	39,601	41,682	43,953	46,380
Assets:						
Beginning:	$478,290	$509,460	$534,134	$561,491	$591,709	$624,319
End Of Year:	509,460	534,134	561,491	591,709	624,319	658,840
Contributions: Add 2 1/2% Employer, 1% Employee						
Additional:	$28,693	$29,555	$30,441	$31,354	$32,295	$33,264
Investment Income:	44,985	37,878	39,764	41,850	41,116	46,407
Assets:						
Beginning:	$478,290	$513,752	$542,807	$574,676	$609,541	$644,928
End Of Year:	513,752	542,807	574,676	609,541	644,928	684,228

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CASH FLOW ANALYSIS
(All Figures In Thousands)

Interest 9 1/2% First Year
7 1/2% Thereafter

Assets 6/30/80 (Trustee Report) $478,289,552

YEAR ENDING JUNE 30	1981	1982	1983	1984	1985	1986
Contributions: Add 3% Employer, 1% Employee						
Additional:	$32,793	$33,777	$34,790	$35,834	$36,909	$38,016
Investment Income:	45,179	38,036	39,927	42,018	44,299	43,187
Assets:						
Beginning:	$478,290	$518,046	$551,481	$587,862	$627,375	$669,559
End Of Year:	518,046	551,481	587,862	627,375	669,559	710,391

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Addendum To The June 1979 Actuarial Valuation
Of The Sistema De Retiro Del
Estado Libre Asociado De Puerto Rico

A number of actions should be taken to improve the financial condition of the system and to prevent further deterioration. We recommend:

06/79 Imp

I. A significant increase in contributions to this sytem. A minimum of 3% of payroll would be required to reverse the present trend of deficits, and to begin to reduce the accumulated past service liability. Any increase in contributions will be indirectly recovered to some substantial degree by the impact of the more responsible funding policy on the bond ratings and interest which Puerto Rico must pay for its debt issues.

II. A change in the mandated investment policy of the fund. At present a very sizeable part of the fund is invested in mortgages given to participants, at 4 1/2% interest. Such low cost mortgages favor a select group of participants at the expense of other participants and the general public.

With a portfolio rate of return on other investments of 9.4%+, these mortgages in effect result in a refund of contributions made by the employee to the system, but the system continues to accrue retirement benefits for that participant.

A brief example will illustrate the unfavorable impact of those mortgages.

Assume a participant with an annual salary of $10,000 and a $40,000 mortgage. If the employee is contributing the full 7% his annual contribution is $700. The system could earn $3,760 at 9.4% on the $40,000. Instead, it receives $1,800, which amounts to a subsidy of $1,960 (280% of the employee's retirement contribution). If the 4 1/2% mortgage rate is compared to current market rates, the subsidy is in excess of 11%, or $4,400.

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III. Since the system became effective a great number of legislated increases in benefits, and liberalization of eligibility provisions have been made. The cost impact on the system has been very severe. At this writing (April 1981) fourteen bills were introduced in the last four (4) weeks, proposing increases in benefits whose impact can be measured in the tens of millions of dollars.

We recommend that it become a part of the law governing the system that all proposed amendments to the law must be accompanied by an actuarial study giving the cost of the amendment, and that funds to pay for the increased cost must be included in the proposed legislation.

We recommend that if the annual cost of the system would be increased by 1% or more, the proposed amendment should be subject to a public referendum.

IV. A computarized data base system should be implemented at the earliest possible moment. Without such a system it is not possible to accurately identify and quantify the actual liabilities of the system. Liabilities of large amounts are known to exist, but cannot be measured due to lack of data about the participants who are entitled to the benefits related to those liabilities.