IOWA PUBLIC EMPLOYEES RETIREMENT SYSTEM

20 Year Projection Study
July 1, 1989 - July 1, 2009

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September 27, 1990

Iowa Public Employees Retirement System
600 E. Court Avenue
Des Moines, Iowa 50306

In re: 20 Year Projection Study

We are pleased to present this report which provides various 20 year actuarial projections for IPERS. Projection results are shown for 12 scenarios, starting with the system as in effect on July 1, 1989, the actuarial assumptions used in the regular valuation for that date, and the actuarial funding method used for that valuation. All scenarios include the year by year benefit improvements enacted in 1990, and the first three scenarios also include ongoing covered wage increases of $3,000 a year instead of capping the covered wages at $55,000. This was done in order to show the expectations as to affordability of those changes. Some scenarios reflect assumed fund growth which is in excess of the actuarial interest assumption of 6.50%, and some scenarios reflect an increase in the actuarial interest assumption.

We will be happy to answer any questions you might have regarding this report.

Respectfully submitted,

MILLIMAN & ROBERTSON, INC.

Denis J. Sullivan

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Consulting Actuary

DJS:dw

IOWA PUBLIC EMPLOYEE'S RETIREMENT SYSTEM

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IOWA PUBLIC EMPLOYEE'S RETIREMENT SYSTEM

20 Year Projection Study

Purpose and General Comments

A. Purpose

This report was prepared to project the relationship of the System's liabilities, contributions at the current rates set out in the law, benefit payouts, and assets, all over a 20 year period under the System (with benefit improvements enacted in 1990) with all actuarial assumptions being exactly met, and then with some fund growth and assumption changes. In addition, there are projections of what the required contribution rates would be at any of the future valuation dates, assuming the present total of 9.45% contributions had been made to that time.

B. General Comments

For any given set of benefit provisions and actuarial assumptions, there are no unusual circumstances leading to unexpected divergences during the 20 year period.

The fund growth, compared to the actuarial assumption, is a net growth. In other words, the expenses of the fund are paid from fund earnings and the remaining earnings net out to the growth rate as specified.

By the same token, payouts relate to benefit payments only, since it is assumed that fund expenses are paid from fund earnings.

On any given projected valuation date, the only future benefit enhancements recognized are those in effect on that date. The benefit formula and wage base increases enacted in (or as intended by, if affordable) the 1990 law, and any ongoing covered wage increases, are incorporated only on a year by year basis. The November dividends to be paid to retired participants were assumed to be renewed every two years but with only two year's of payments guaranteed at each renewal.

PROJECTION TECHNIQUES AND ACTUARIAL ASSUMPTIONS

In regular actuarial valuations of the Retirement System, a snapshot approach is used to determine liabilities and contribution requirements as of the valuation date. Benefits for all members, whether active, retired or terminated vested, are valued as a lump sum equivalent amount required to provide the expected benefits. For the actives, this includes benefits to be earned in the future. Actuarial contributions differing from the amounts required under that particular valuation are not expected.

The projection valuation technique used for the results presented in the report has the following elements:

1. The System's population was projected forward to each of the next 19 years, including the effect of new entrants entering the work force.

2. The benefits payable were determined for each of the projected populations.

3. The actuarial liabilities at each projection date were computed using the snapshot approach.

4. The actuarial value of assets was developed at each of the projection dates, including the effect of the net growth of the assets and contributions and benefits paid during the intervening years.

This process is followed for each scenario reported on herein. Thus, there are 20 valuations for each of the 12 scenarios, resulting in 240 snapshot valuations.

Actuarial Assumptions

Actuarial assumptions are used in two phases of this projection study. One phase involves the actuarial assumptions used in each snapshot valuation. The second involves the actuarial assumptions used in projecting the membership population and the assumed actual fund growth.

Except as noted in Scenarios 7 through 12, the actuarial assumptions used for the snapshot valuations were the actuarial assumptions used in the regular valuation as of June 30, 1989. For reference, those assumptions are summarized in the Appendix of this report.

The other phase involves assumptions related to experience during the time between snapshot valuations. It was assumed that the demographic assumptions used in the snapshot valuation would be met. In other words, in the intervening years the actual deaths, terminations and disabilities among the membership would be at the rates used in the valuations, salary increases would be as predicted in the valuation assumptions, and the mortality among retirees and terminated vested employees would be as predicted for the valuations.

An additional assumption needed for this second phase of the projection study relates to size of the membership population. It was assumed that the membership population would remain stable. Therefore, the projection makes allowance for sufficient new entrants into the System to replace those

retiring, dying, terminating or becoming disabled. Those new entrants were entered at various ages corresponding to the average ages at employment of the group during the two years preceding June 30, 1989. The salaries of the new entrants were based on average salaries of new entrants during the preceding two years, but for each year after June 30, 1989 the salaries of new entrants were assumed to increase according to salary scale rate at the age of the new entrants.

Another second phase assumption relates to projected fund growth compared to the actuarial assumption for snapshot valuations. Scenarios 1, 4, 7 and 10 assume net fund growth to be equal to the actuarial valuation assumption. Scenarios 2, 5, 8 and 11 assumed net fund growth to be 8.0%, and Scenarios 3, 6, 9 and 12 assumed net fund growth to be 10%.

The final second phase assumption pertains to the benefit structure. In all cases, increases in the formula and covered wage were assumed to take place on schedule, in accordance with the intentions stated in the 1990 legislation. In addition, for scenarios 1, 2 and 3 it was assumed the covered wages would continue to increase by $3,000 a year (rather than capping covered wages at $55,000), since history indicates there will be covered wage increases as long as there continue to be increases in comparative salary levels.

SCENARIO 1

SYSTEM AS OF JUNE 30, 1989; ACTUARIAL ASSUMPTIONS SAME AS JUNE 30, 1989; BENEFIT CHANGES AS ENACTED IN 1990, WITH ONGOING COVERED WAGE INCREASES OF $3,000 A YEAR; ASSUMPTIONS MET

In Scenario 1 everything is the same as in the June 30, 1989 valuation report. The changes to the System passed by the legislature in 1990 are recognized in later years' valuations but only as they would become effective, along with continued covered wage increases of $3,000 a year. Actuarial assumptions are unchanged. Thus, projections in this Scenario show what is likely to happen to the System liabilities, contributions, payouts, and assets over the next 20 years if the valuation assumptions are exactly met, the membership remains stable, and the stated benefit improvements take place.

Given these circumstances, over the 20 year period from 1989 to 2009, it is projected that:

a) Total liabilities will increase from $5,664,567,476 to $15,871,622,796, an increase of $10,207,055,320.

b) Total annual contributions, at 9.45% of covered pay, will increase from $202,861,620 to $401,184,489, an increase of $198,322,869.

c) Total annual payouts will increase from $171,373,783 to $643,241,001, an increase of $471,867,218.

d) Total actuarial assets will increase from $4,380,355,689 to $12,125,401,313, an increase of $7,745,045,624.

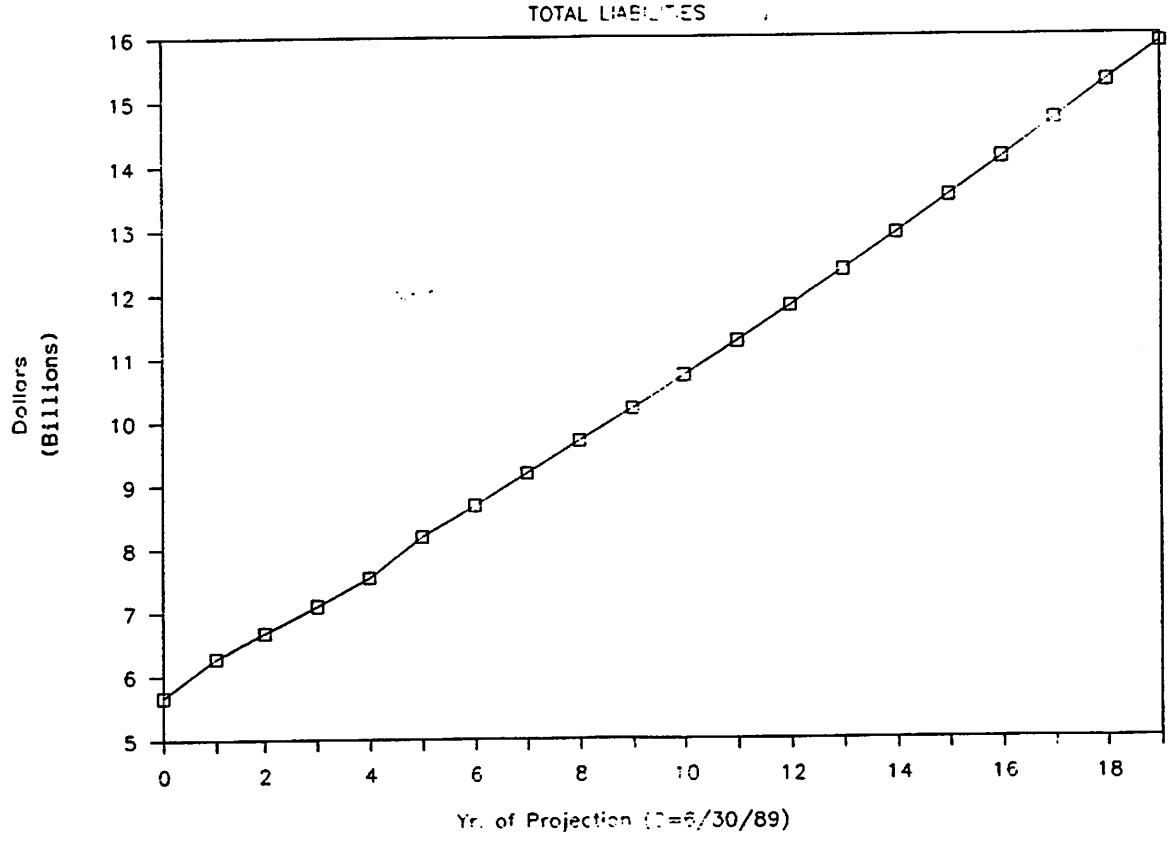
e) The total required contribution rate, as a percentage of salary, increases from 7.864% to 13.721%, an increase of 5.857%.

Comparing a) to d), the difference between total liabilities and actuarial assets increases from $1,284,211,787 to $3,746,221,483. Thus, with the benefit improvements according to the intent of the 1990 legislation and with ongoing increases in covered wages, and with assumptions being met, the System will experience a widening of the gap between liabilities and actuarial assets.

This course of events is due primarily to the fact that the 9.45% total contribution rate is less than needed during most of the 20 year projection period.

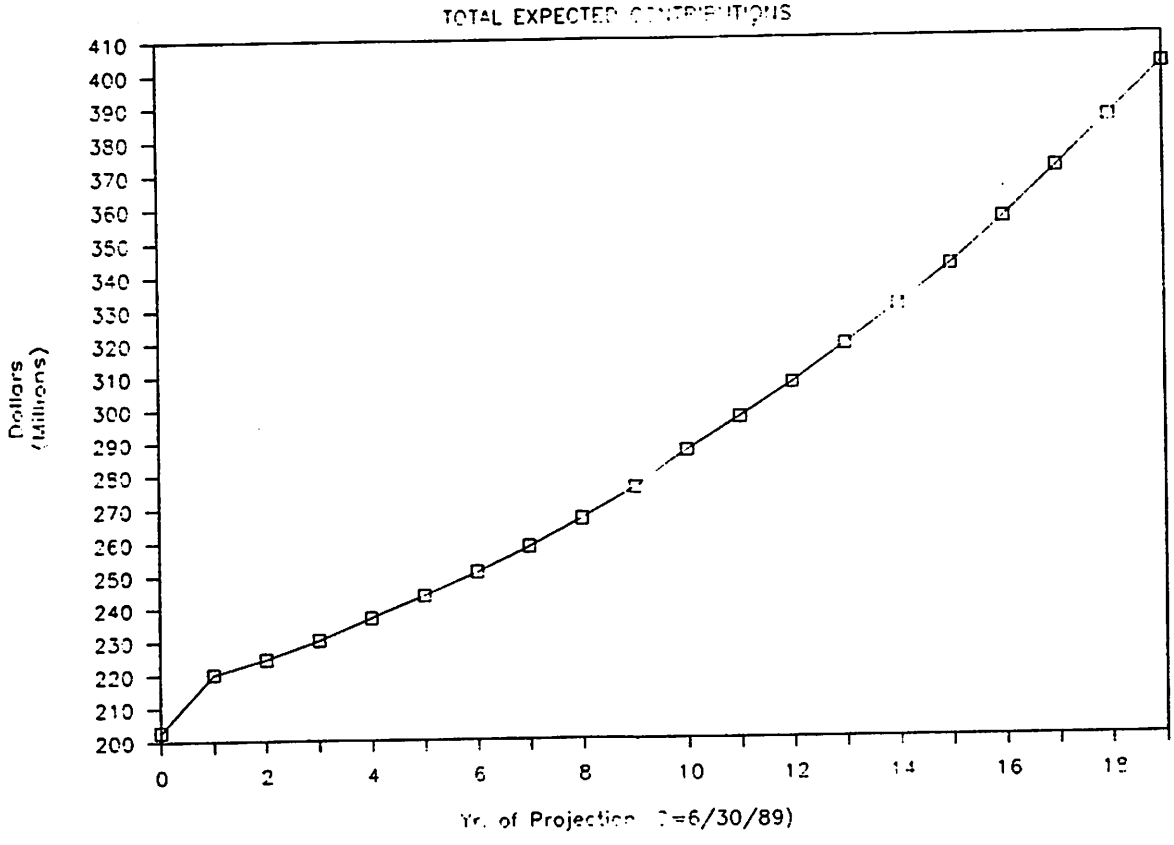
IPERS 20 YEAR PROJECTION
SCENARIO 1
LIABILITIES

As of June 30	Total Liabilities	As of June 30	Total Liabilities
1989	$ 5,664,567,476	1999	$10,717,139,463
1990	6,278,910,140	2000	11,253,296,965
1991	6,672,625,576	2001	11,802,852,373
1992	7,094,967,542	2002	12,362,457,725
1993	7,538,916,039	2003	12,933,648,446
1994	8,186,448,594	2004	13,518,743,792
1995	8,677,237,586	2005	14,105,501,113
1996	9,174,747,112	2006	14,687,143,414
1997	9,681,398,203	2007	15,273,750,418
1998	10,191,822,419	2008	15,871,622,796



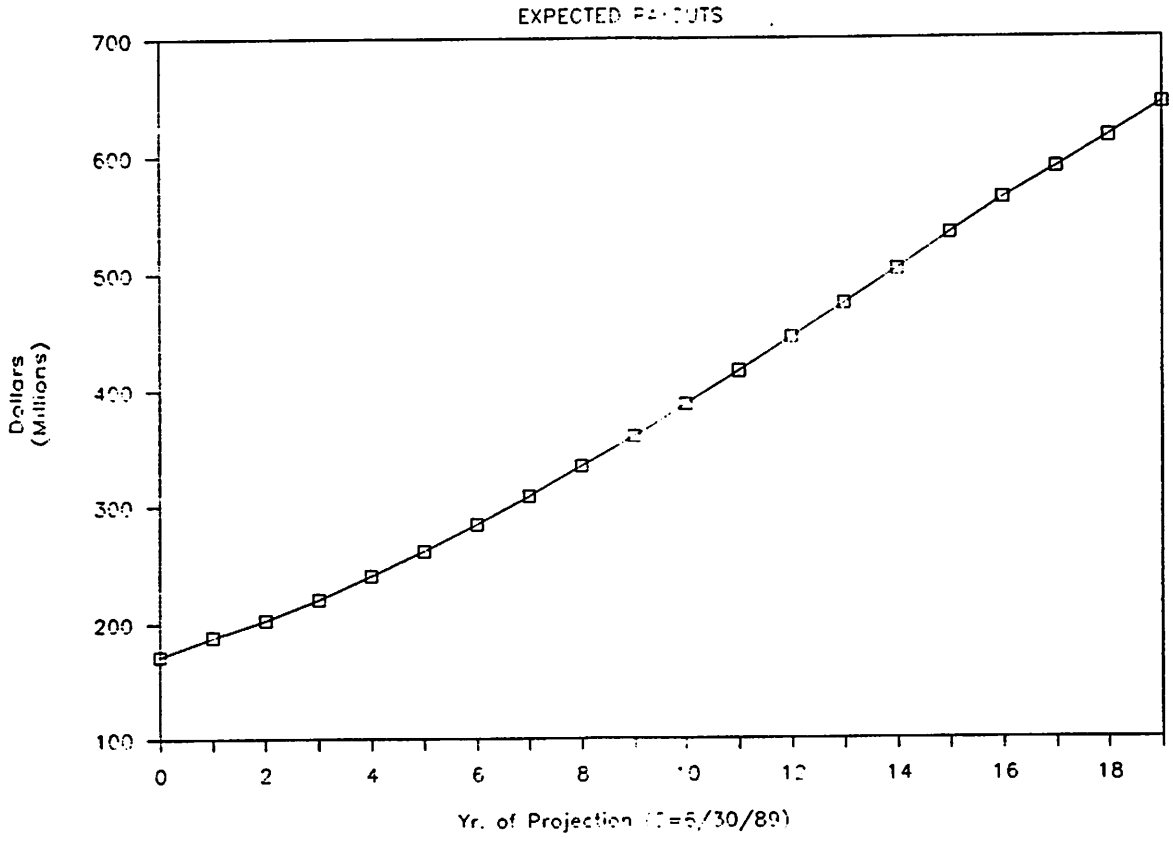
IPERS 20 YEAR PROJECTION
SCENARIO 1
CONTRIBUTIONS

Year Ending June 30	Total Contributions	Year Ending June 30	Total Contributions
1990	$202,861,620	2000	$286,757,219
1991	220,137,993	2001	296,714,904
1992	224,538,551	2002	307,170,302
1993	230,378,416	2003	318,569,906
1994	236,940,031	2004	330,322,056
1995	243,730,526	2005	342,199,784
1996	250,819,378	2006	355,891,943
1997	258,390,866	2007	370,463,360
1998	266,514,976	2008	385,381,130
1999	275,734,500	2009	401,184,489



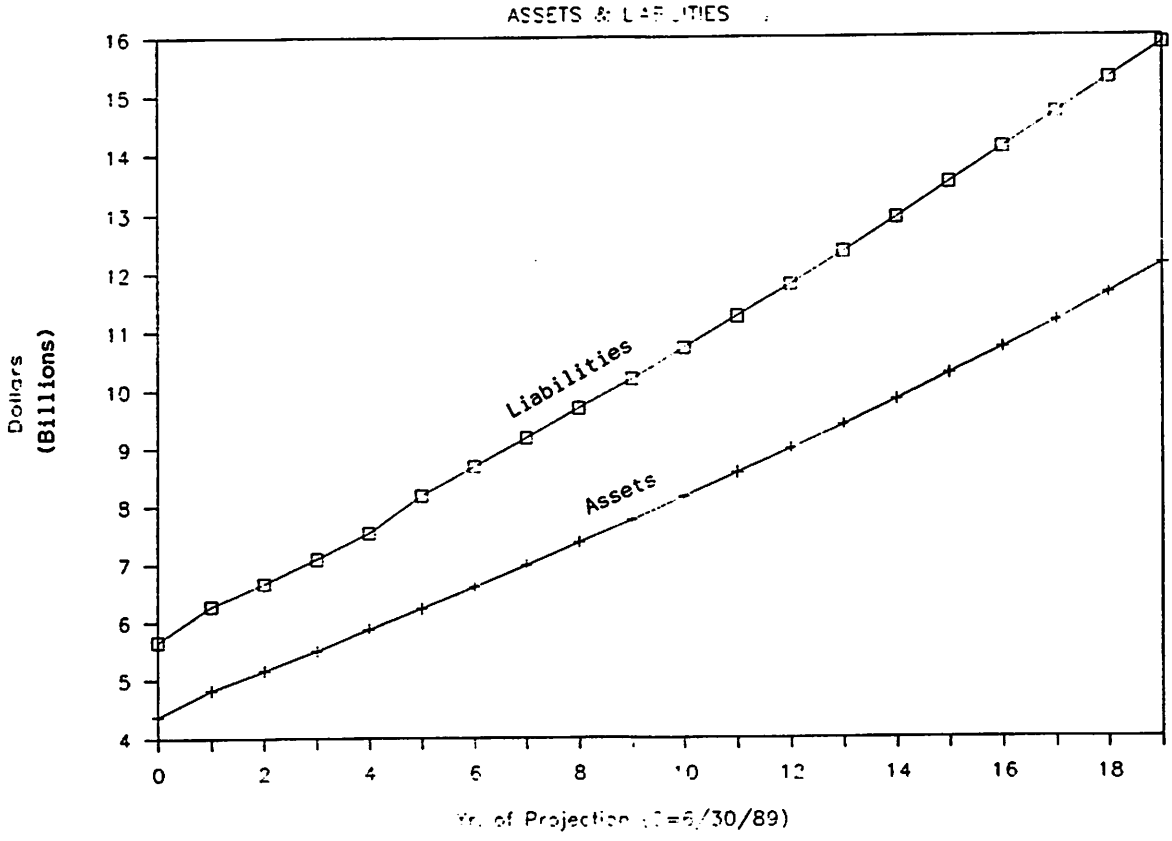
IPERS 20 YEAR PROJECTION
SCENARIO 1
PAYOUTS

Year Ending June 30	Total Payouts	Year Ending June 30	Total Payouts
1990	$171,373,783	2000	$387,734,617
1991	188,384,010	2001	416,171,451
1992	202,843,342	2002	445,304,443
1993	220,588,481	2003	474,271,690
1994	240,628,204	2004	503,314,000
1995	261,724,870	2005	533,823,108
1996	284,483,117	2006	563,347,524
1997	308,049,298	2007	589,880,457
1998	334,305,953	2008	615,423,170
1999	361,342,096	2009	643,241,001



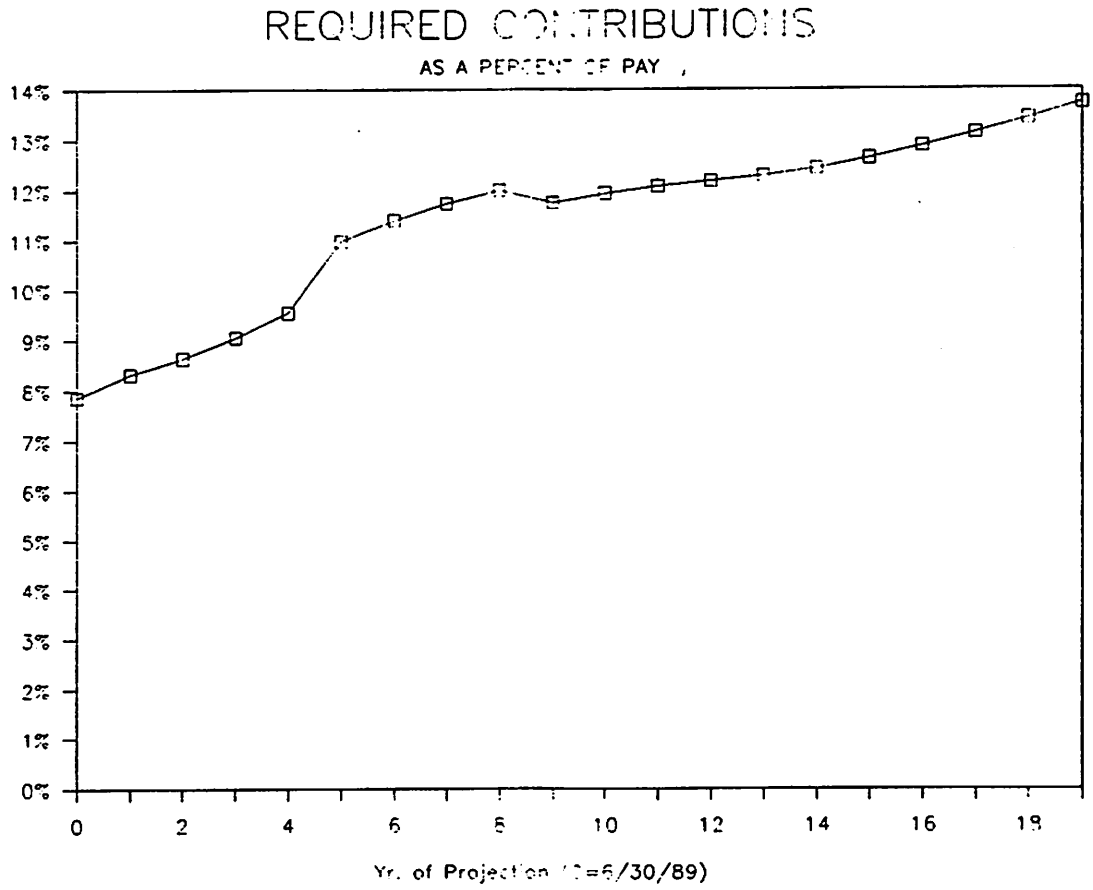
IPERS 20 YEAR PROJECTION
SCENARIO 1
ACTUARIAL ASSETS

As of June 30	Total Actuarial Assets	As of June 30	Total Actuarial Assets
1989	$ 4,380,355,689	1999	$ 8,153,775,425
1990	4,829,933,406	2000	8,560,435,645
1991	5,164,883,398	2001	8,973,552,684
1992	5,510,485,901	2002	9,393,325,935
1993	5,865,503,603	2003	9,821,318,197
1994	6,228,903,743	2004	10,258,331,127
1995	6,600,357,414	2005	10,703,545,493
1996	6,978,962,372	2006	11,160,365,277
1997	7,364,831,130	2007	11,633,515,270
1998	7,756,211,761	2008	12,125,401,313



IPERS 20 YEAR PROJECTION
SCENARIO 1
TOTAL CONTRIBUTION RATE

Year Ending June 30	Required Contribution As a % of Covered Pay	Year Ending June 30	Required Contribution As a % of Covered Pay
1990	7.864%	2000	11.953%
1991	8.325%	2001	12.088%
1992	8.647%	2002	12.195%
1993	9.062%	2003	12.300%
1994	9.546%	2004	12.443%
1995	10.977%	2005	12.641%
1996	11.408%	2006	12.870%
1997	11.748%	2007	13.131%
1998	12.011%	2008	13.423%
1999	11.760%	2009	13.721%



SCENARIO 2

SYSTEM AS OF JUNE 30, 1989; ACTUARIAL ASSUMPTIONS SAME AS JUNE 30, 1989; BENEFIT CHANGES AS ENACTED IN 1990, WITH ONGOING COVERED WAGE INCREASES OF $3,000 A YEAR; ASSUMPTIONS MET, EXCEPT ACTUAL NET FUND GROWTH IS 8.0% ANNUALLY

In Scenario 2 everything is the same as in Scenario 1 except it has been assumed the fund will earn a net rate of 8.0% instead of just meeting the actuarial assumption rate of 6.50%. Thus, in Scenario 2 the System liabilities, contributions, and payouts are the same as in Scenario 1. However, the fund assets increase significantly more than under Scenario 1 because of the excess earnings.

With these substantial excess earnings over the 20 year period from 1989 to 2009, it is projected that:

a) Total liabilities will increase the same as in Scenario 1.

b) Total annual contributions, at 9.45% of covered pay, will increase the same as Scenario 1.

c) Total annual payouts will increase the same as Scenario 1.

d) Total actuarial assets will increase from $4,380,355,689 to $16,115,687,576, an increase of $11,735,331,887.

e) The total required contribution rate, as a percentage of salary, decreases from 7.864% to 0% (first occurring in 2008).

If liabilities are compared to assets under this Scenario 2, it will be seen that the actuarial assets exceed total projected liabilities by June 30, 2008.

Actuarial gains from investments hold the total required contribution rate below the levels of Scenario 1 and, in fact, keep it below the actual rate of 9.45%. The investment gains, and the fact that the actual contribution rate remains above the required rate, are the reasons why assets eventually exceed liabilities and why the required total contribution rate goes down to zero.

IPERS 20 YEAR PROJECTION

SCENARIO 2

SYSTEM AS OF JUNE 30, 1989; ACTUARIAL ASSUMPTIONS SAME AS JUNE 30, 1989; BENEFIT CHANGES AS ENACTED IN 1990, WITH ONGOING COVERED WAGE INCREASES OF $3,000 A YEAR; ASSUMPTIONS MET, EXCEPT ACTUAL NET FUND GROWTH IS 8.0% ANNUALLY

LIABILITIES

Same As Scenario 1 (See Page 5)

CONTRIBUTIONS

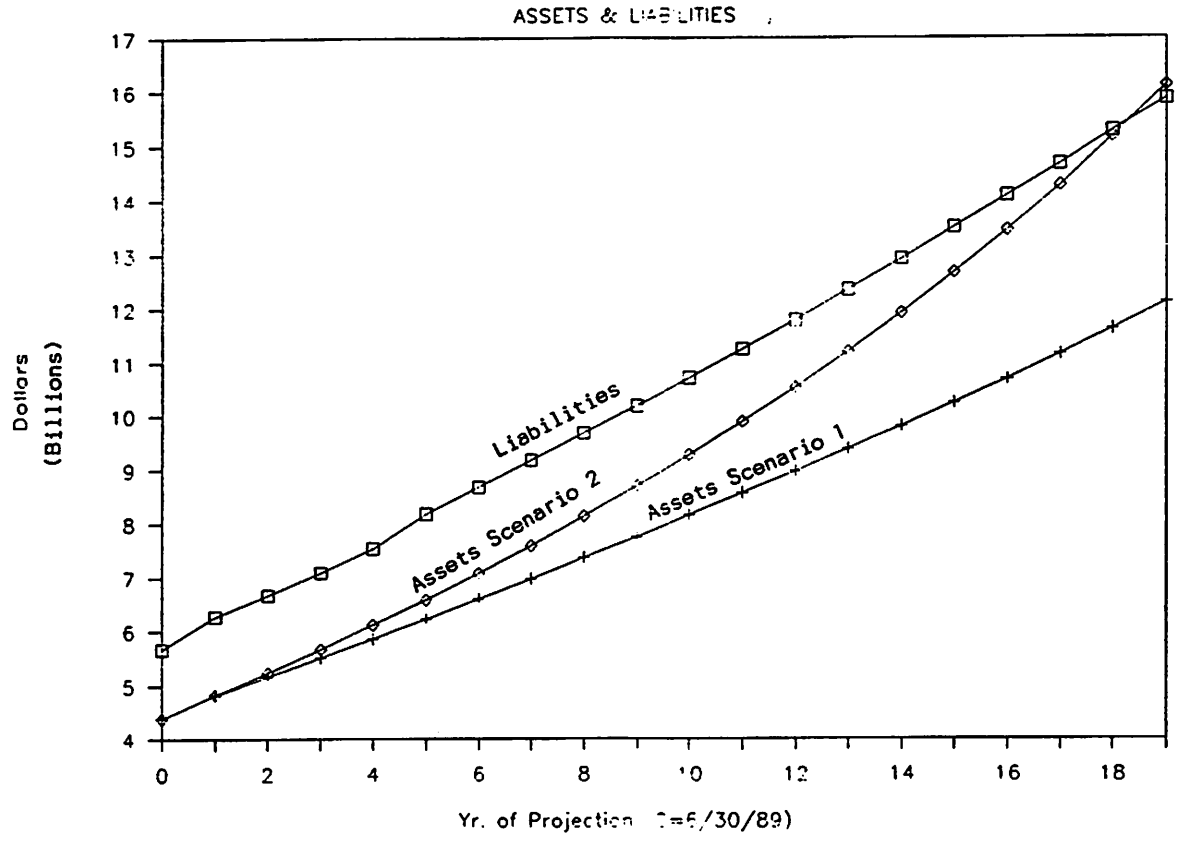
Same as Scenario 1 (See Page 6)

PAYOUTS

Same As Scenario 1 (See Page 7)

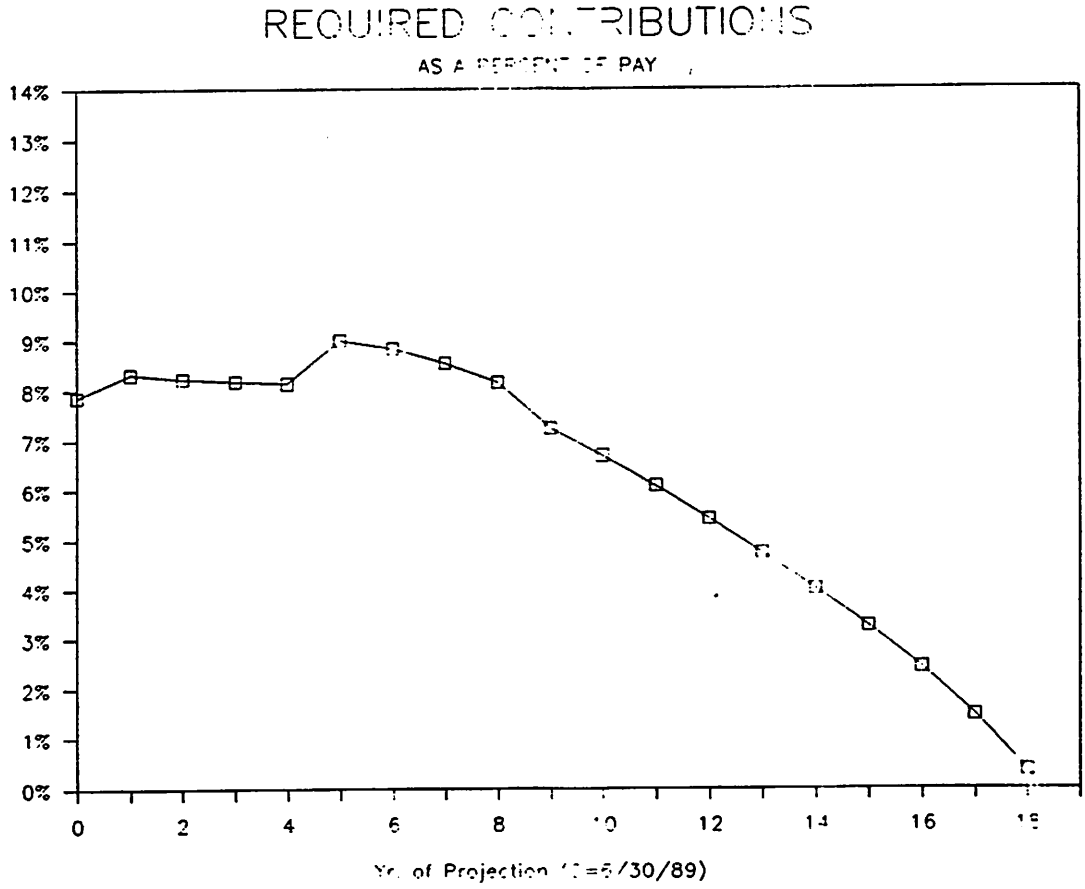
IPERS 20 YEAR PROJECTION
SCENARIO 2
ACTUARIAL ASSETS

As of June 30	Total Actuarial Assets	As of June 30	Total Actuarial Assets
1989	$ 4,380,355,689	1999	$ 9,280,712,931
1990	4,829,933,406	2000	9,896,823,577
1991	5,237,570,554	2001	10,541,689,486
1992	5,666,478,620	2002	11,217,344,692
1993	6,116,394,467	2003	11,927,342,542
1994	6,587,318,987	2004	12,674,647,704
1995	7,080,027,646	2005	13,460,772,555
1996	7,594,799,766	2006	14,291,653,316
1997	8,133,015,838	2007	15,174,803,627
1998	8,694,278,910	2008	16,115,687,576



IPERS 20 YEAR PROJECTION
SCENARIO 2
TOTAL CONTRIBUTION RATE

Year Ending June 30	Required Contribution As a % of Covered Pay	Year Ending June 30	Required Contribution As a % of Covered Pay
1990	7.864%	2000	6.698%
1991	8.325%	2001	6.089%
1992	8.236%	2002	5.436%
1993	8.185%	2003	4.744%
1994	8.143%	2004	4.023%
1995	9.011%	2005	3.273%
1996	8.839%	2006	2.439%
1997	8.547%	2007	1.472%
1998	8.155%	2008	.365%
1999	7.231%	2009	.000%



SCENARIO 3

SYSTEM AS OF JUNE 30, 1989; ACTUARIAL ASSUMPTIONS SAME AS JUNE 30, 1989; BENEFIT CHANGES AS ENACTED IN 1990, WITH ONGOING COVERED WAGE INCREASES OF $3,000 A YEAR; ASSUMPTIONS MET, EXCEPT ACTUAL NET FUND GROWTH IS 10.0% ANNUALLY

In Scenario 3 everything is the same as in Scenario 1 except it has been assumed the fund will earn a net rate of 10.0% instead of just meeting the actuarial assumption rate of 6.50%. Thus, in Scenario 3 the System liabilities, contributions, and payouts are the same as in Scenario 1. However, the fund assets increase dramatically more than under Scenario 1 because of the excess earnings.

With these substantial excess earnings over the 20 year period from 1989 to 2009, it is projected that:

a) Total liabilities will increase the same as in Scenario 1.

b) Total annual contributions, at 9.45% of covered pay, will increase the same as Scenario 1.

c) Total annual payouts will increase the same as Scenario 1.

d) Total actuarial assets will increase from $4,380,355,689 to $23,190,619,452, an increase of $18,810,263,763.

e) The total required contribution rate, as a percentage of salary, decreases from 7.864% to 0% (first occurring in 1999).

If liabilities are compared to assets under this Scenario 3, it will be seen that the actuarial assets exceed total projected liabilities by June 30, 2004, and the required contribution rate is down to zero by June 30, 1999. The reasons for this are the same as Scenario 2, namely that excess fund earnings, plus contributions in excess of those required, further depress future required contribution rates.

IPERS 20 YEAR PROJECTION

SCENARIO 3

SYSTEM AS OF JUNE 30, 1989; ACTUARIAL ASSUMPTIONS SAME AS JUNE 30, 1989; BENEFIT CHANGES AS ENACTED IN 1990, WITH ONGOING COVERED WAGE INCREASES OF $3,000 A YEAR; ASSUMPTIONS MET, EXCEPT ACTUAL NET FUND GROWTH IS 10.0% ANNUALLY

LIABILITIES

Same As Scenario 1 (See Page 5)

CONTRIBUTIONS

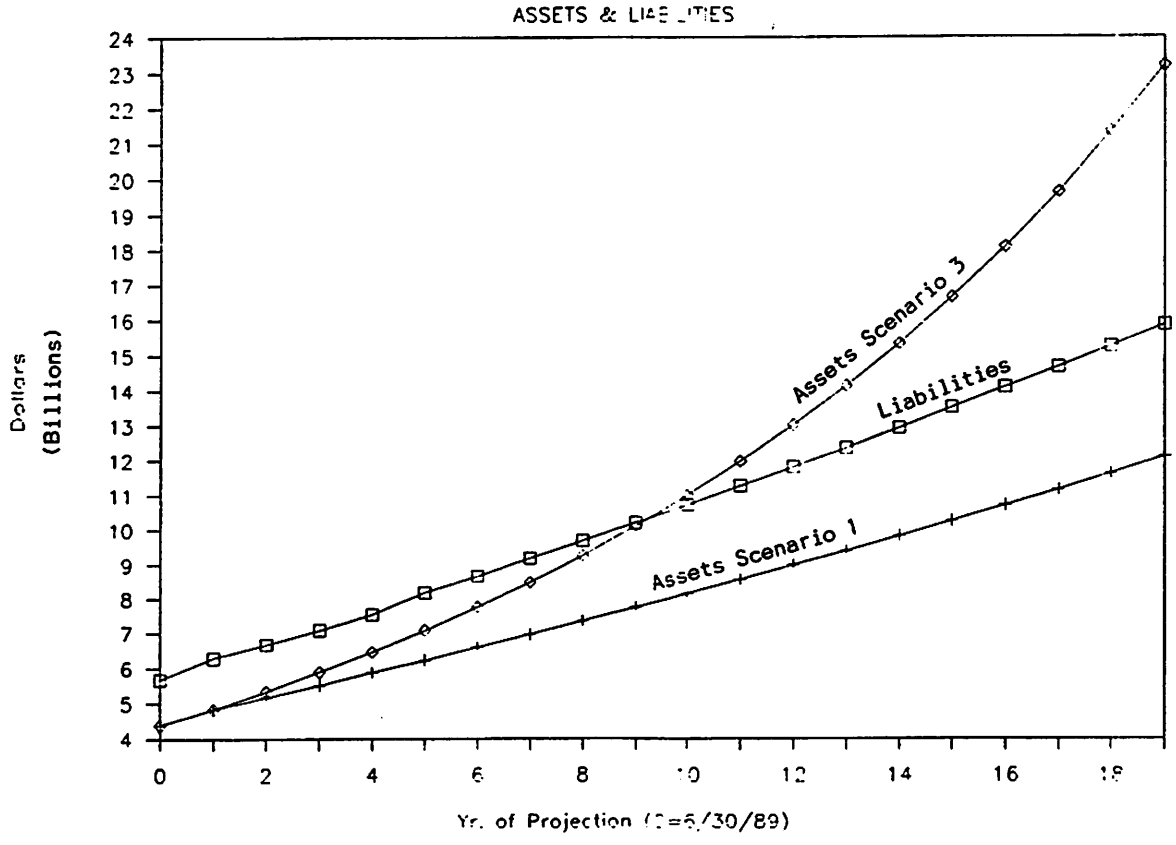
Same as Scenario 1 (See Page 6)

PAYOUTS

Same As Scenario 1 (See Page 7)

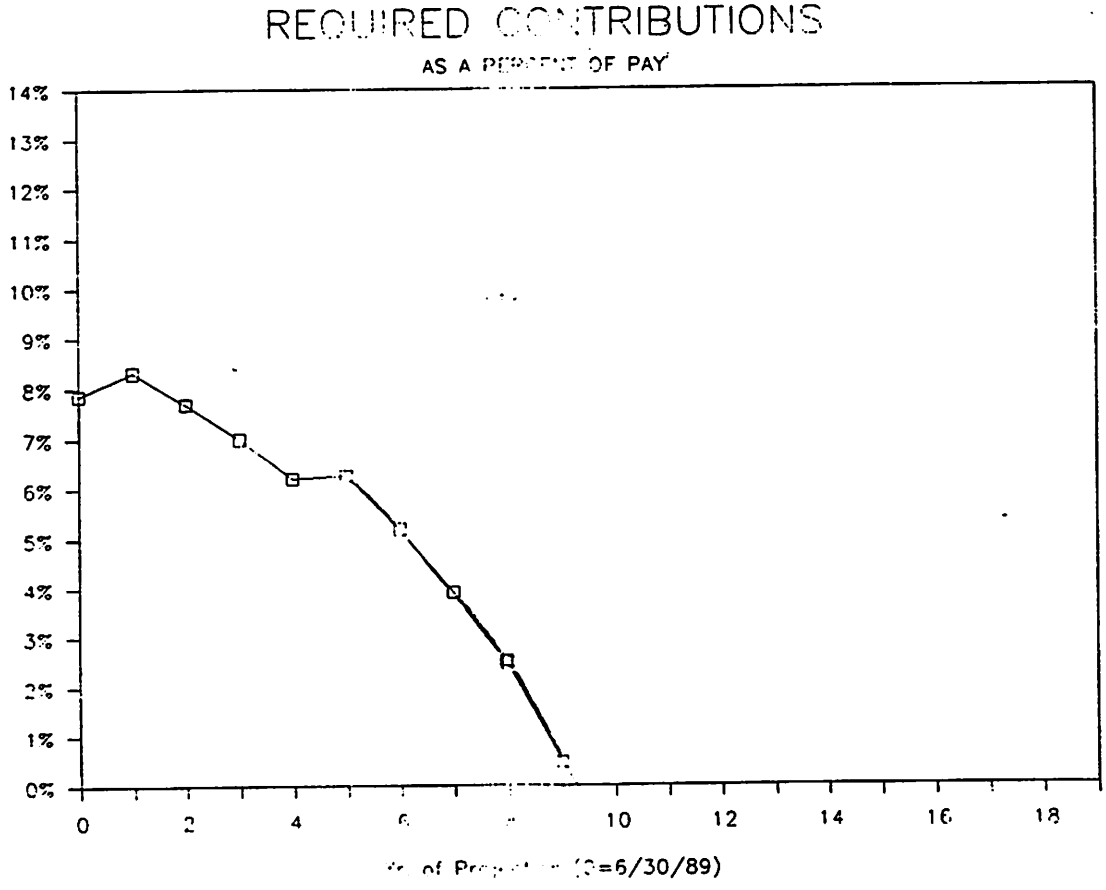
IPERS 20 YEAR PROJECTION
SCENARIO 3
ACTUARIAL ASSETS

As of June 30	Total Actuarial Assets	As of June 30	Total Actuarial Assets
1989	$ 4,380,355,689	1999	$10,992,993,420
1990	4,829,933,406	2000	11,961,512,039
1991	5,334,486,762	2001	13,005,459,323
1992	5,877,860,980	2002	14,132,016,421
1993	6,461,919,770	2003	15,350,441,977
1994	7,088,996,777	2004	16,670,027,815
1995	7,762,436,295	2005	18,099,276,638
1996	8,485,348,378	2006	19,651,871,694
1997	9,262,237,625	2007	21,343,962,301
1998	10,096,146,839	2008	23,190,619,452



IPERS 20 YEAR PROJECTION
SCENARIO 3
TOTAL CONTRIBUTION RATE

Year Ending June 30	Required Contribution As a % of Covered Pay	Year Ending June 30	Required Contribution As a % of Covered Pay
1990	7.864%	2000	.000%
1991	8.325%	2001	.000%
1992	7.688%	2002	.000%
1993	6.997%	2003	.000%
1994	6.212%	2004	.000%
1995	6.259%	2005	.000%
1996	5.184%	2006	.000%
1997	3.918%	2007	.000%
1998	2.488%	2008	.000%
1999	.462%	2009	.000%



SCENARIO 4

SYSTEM AS OF JUNE 30, 1989; ACTUARIAL ASSUMPTIONS SAME AS JUNE 30, 1989; BENEFIT CHANGES AS ENACTED IN 1990; ASSUMPTIONS MET

In Scenario 4 everything is the same as in the June 30, 1989 valuation report. The changes to the System passed by the legislature in 1990 are recognized in later years' valuations but only as they would become effective, along with a $55,000 cap on covered wages. Actuarial assumptions are unchanged. Thus, projections in this Scenario show what is likely to happen to the System liabilities, contributions, payouts, and assets over the next 20 years if the valuation assumptions are exactly met, the membership remains stable, and the stated benefit improvements take place.

Given these circumstances, over the 20 year period from 1989 to 2009, it is projected that:

a) Total liabilities will increase from $5,664,567,476 to $13,445,998,758, an increase of $7,781,431,282.

b) Total annual contributions, at 9.45% of covered pay, will increase from $202,861,620 to $386,123,664, an increase of $183,262,044.

c) Total annual payouts will increase from $171,373,783 to $631,761,356, an increase of $460,387,573.

d) Total actuarial assets will increase from $4,380,355,689 to $12,076,179,421, an increase of $7,695,823,732.

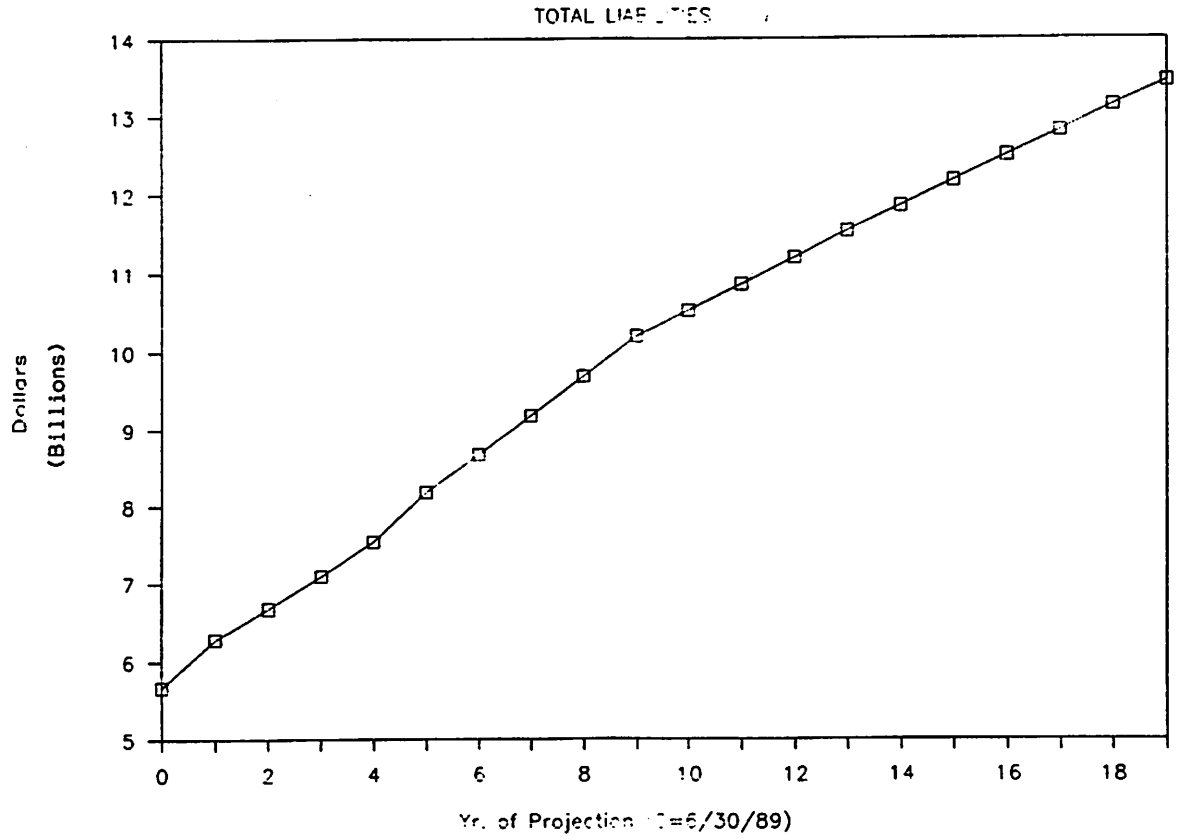
e) The total required contribution rate, as a percentage of salary, decreases from 7.864% to 5.249% but hits a peak of 12.011% in 1998 as benefit formula improvements become effective. In 1998 the prior service funding is completed, and the covered wage cap is reached in 1999, at which time the required contribution rate starts to decrease.

Comparing a) to d), the difference between total liabilities and actuarial assets increases from $1,284,211,787 to $1,369,819,337. Thus, with the benefit improvements according to the intent of the 1990 legislation, and with assumptions being met, the System will experience a slight widening of the gap between liabilities and actuarial assets.

When covered wages hit the limit of $55,000 in 1999, the projected benefits thereafter increase proportionately more slowly than does the present value of future pay, so the required contribution rate declines from that time on.

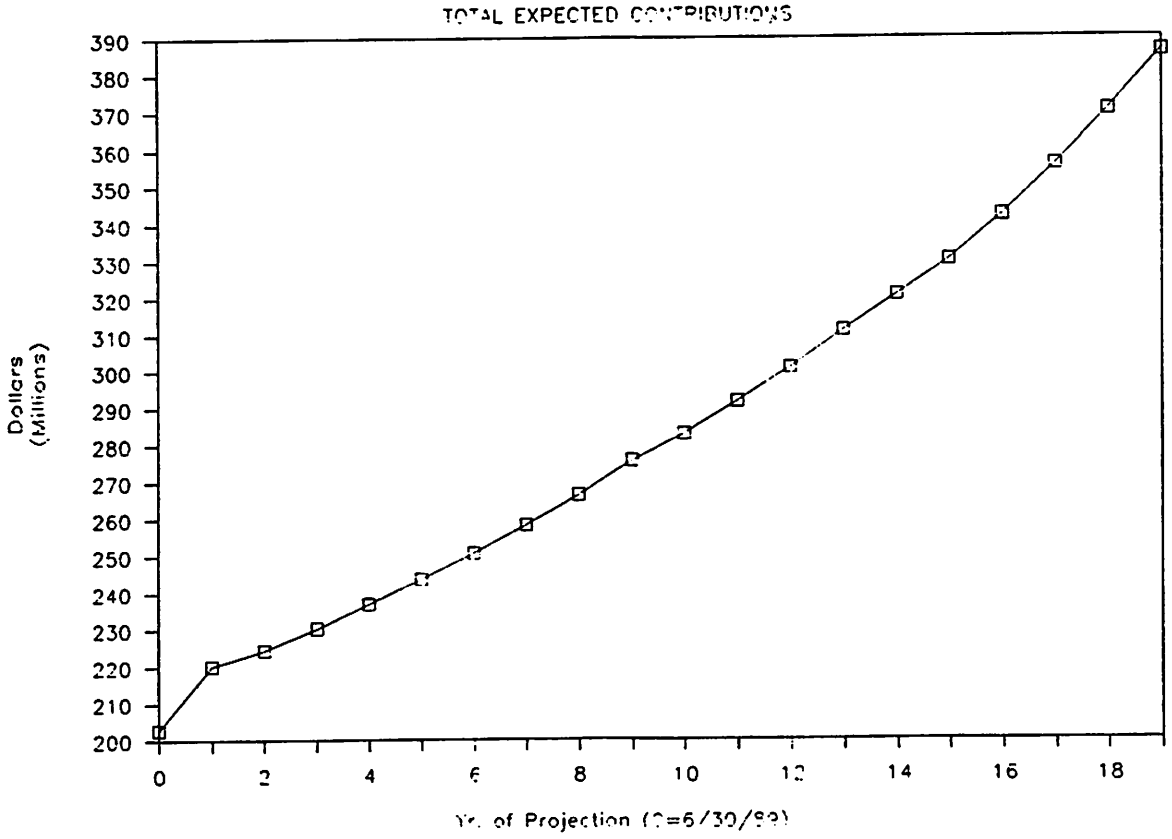
IPERS 20 YEAR PROJECTION
SCENARIO 4
LIABILITIES

As of June 30	Total Liabilities	As of June 30	Total Liabilities
1989	$ 5,664,567,476	1999	$10,523,617,089
1990	6,278,910,140	2000	10,857,483,698
1991	6,672,625,576	2001	11,193,490,134
1992	7,094,967,542	2002	11,525,388,019
1993	7,538,916,039	2003	11,852,356,553
1994	8,186,448,594	2004	12,176,167,613
1995	8,677,237,586	2005	12,497,176,082
1996	9,174,747,112	2006	12,813,956,687
1997	9,681,398,203	2007	13,128,427,591
1998	10,191,822,419	2008	13,445,998,758



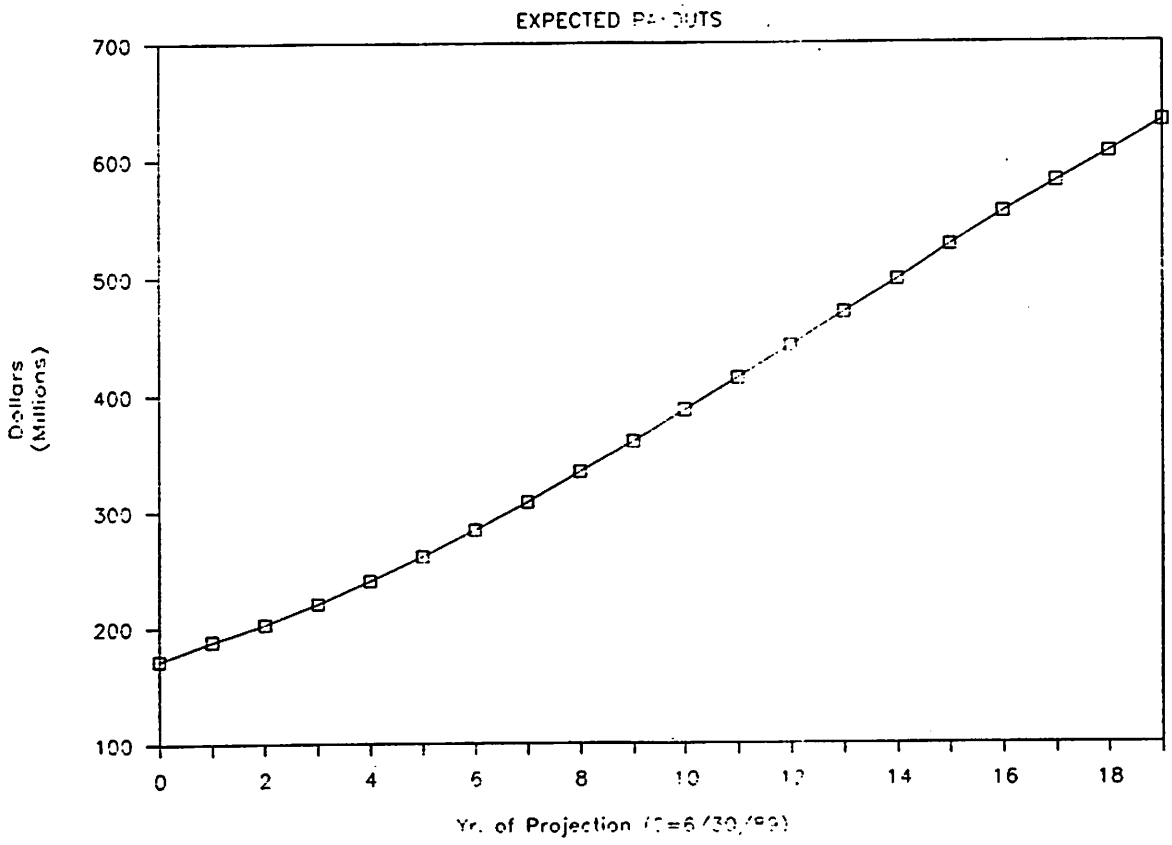
IPERS 20 YEAR PROJECTION
SCENARIO 4
CONTRIBUTIONS

Year Ending June 30	Total Contributions	Year Ending June 30	Total Contributions
1990	$202,861,620	2000	$283,007,543
1991	220,137,993	2001	291,575,516
1992	224,538,551	2002	301,028,535
1993	230,378,416	2003	311,124,205
1994	236,940,031	2004	320,682,337
1995	243,730,526	2005	330,218,975
1996	250,819,378	2006	342,222,546
1997	258,390,866	2007	355,717,913
1998	266,514,976	2008	370,229,220
1999	275,734,500	2009	386,123,664



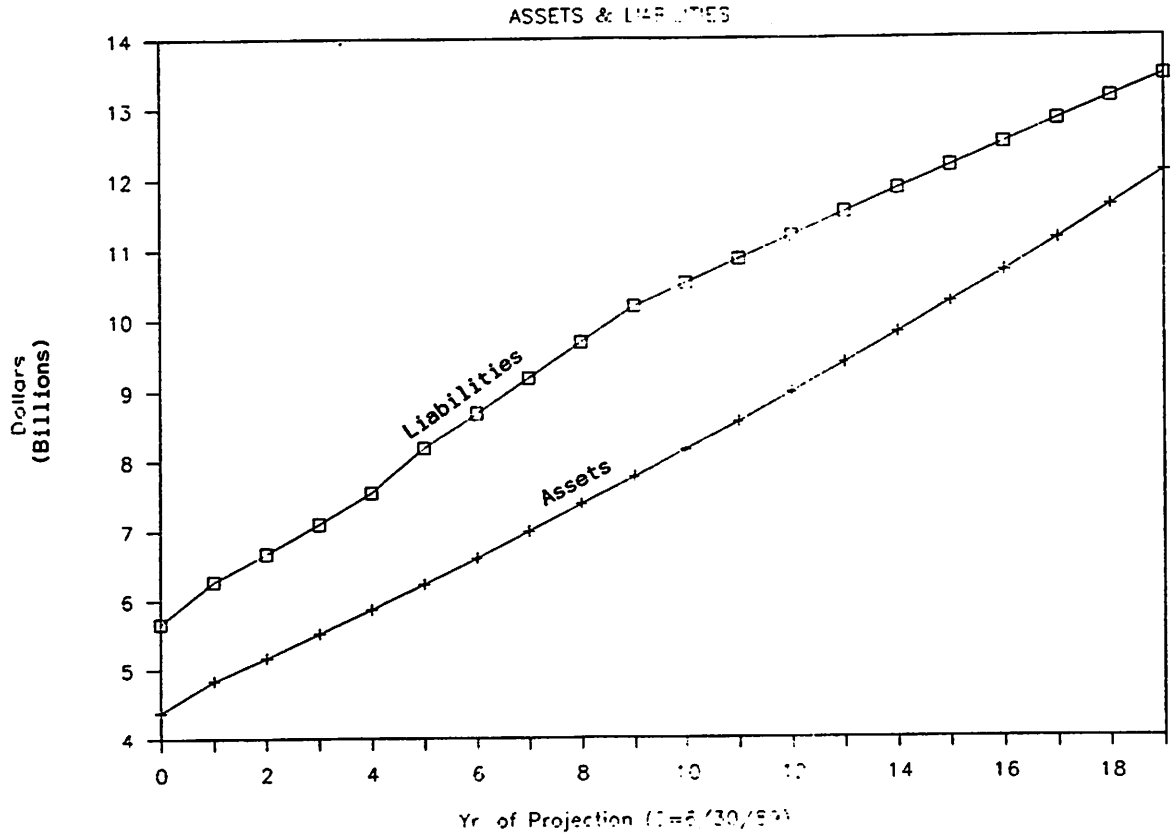
IPERS 20 YEAR PROJECTION
SCENARIO 4
PAYOUTS

Year Ending June 30	Total Payouts	Year Ending June 30	Total Payouts
1990	$171,373,783	2000	$386,793,800
1991	188,384,010	2001	414,154,738
1992	202,843,342	2002	442,139,652
1993	220,588,481	2003	470,013,364
1994	240,628,204	2004	497,911,195
1995	261,724,870	2005	526,945,297
1996	284,483,117	2006	555,343,322
1997	308,049,298	2007	581,175,089
1998	334,305,953	2008	605,592,701
1999	361,342,096	2009	631,761,356



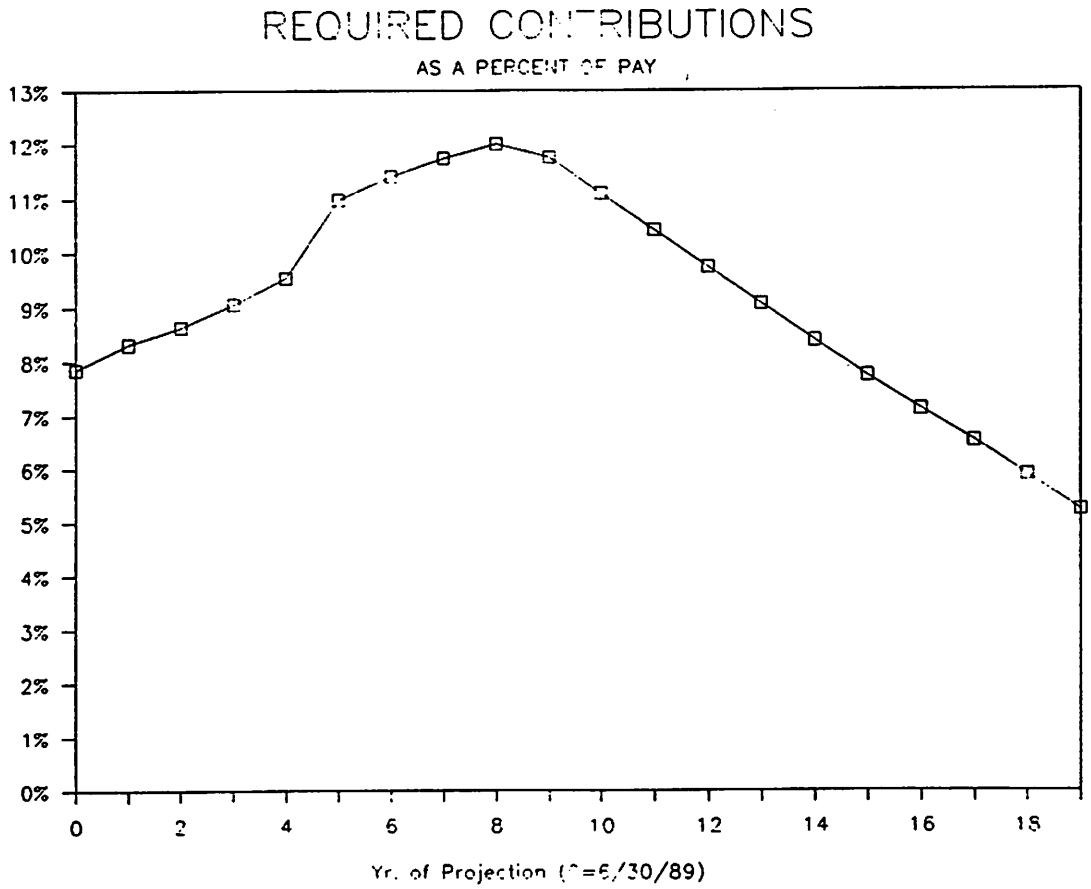
IPERS 20 YEAR PROJECTION
SCENARIO 4
ACTUARIAL ASSETS

As of June 30	Total Actuarial Assets	As of June 30	Total Actuarial Assets
1989	$ 4,380,355,689	1999	$ 8,153,775,425
1990	4,829,933,406	2000	8,557,535,498
1991	5,164,883,398	2001	8,967,245,667
1992	5,510,485,901	2002	9,383,547,848
1993	5,865,503,603	2003	9,807,633,126
1994	6,228,903,743	2004	10,239,409,282
1995	6,600,357,414	2005	10,678,162,727
1996	6,978,962,372	2006	11,127,534,082
1997	7,364,831,130	2007	11,592,379,330
1998	7,756,211,761	2008	12,076,179,421



IPERS 20 YEAR PROJECTION
SCENARIO 4
TOTAL CONTRIBUTION RATE

Year Ending June 30	Required Contribution As a % of Covered Pay	Year Ending June 30	Required Contribution As a % of Covered Pay
1990	7.864%	2000	11.105%
1991	8.325%	2001	10.433%
1992	8.647%	2002	9.753%
1993	9.062%	2003	9.074%
1994	9.546%	2004	8.407%
1995	10.977%	2005	7.758%
1996	11.408%	2006	7.136%
1997	11.748%	2007	6.533%
1998	12.011%	2008	5.910%
1999	11.760%	2009	5.249%



SCENARIO 5

SYSTEM AS OF JUNE 30, 1989; ACTUARIAL ASSUMPTIONS SAME AS JUNE 30, 1989; BENEFIT CHANGES AS ENACTED IN 1990; ASSUMPTIONS MET, EXCEPT ACTUAL NET FUND GROWTH IS 8.0% ANNUALLY

In Scenario 5 everything is the same as in Scenario 4 except it has been assumed the fund will earn a net rate of 8.0% instead of just meeting the actuarial assumption rate of 6.50%. Thus, in Scenario 5 the System liabilities, contributions, and payouts are the same as in Scenario 4. However, the fund assets increase significantly more than under Scenario 4 because of the excess earnings.

With these substantial excess earnings over the 20 year period from 1989 to 2009, it is projected that:

a) Total liabilities will increase the same as in Scenario 4.

b) Total annual contributions, at 9.45% of covered pay, will increase the same as Scenario 4.

c) Total annual payouts will increase the same as Scenario 4.

d) Total actuarial assets will increase from $4,380,355,689 to $16,063,430,102, an increase of $11,683,074,413.

e) The total required contribution rate, as a percentage of salary, decreases from 7.864% to 0% (first occurring in 2003).

If liabilities are compared to assets under this Scenario 5, it will be seen that the actuarial assets exceed total projected liabilities by June 30, 2003.

Actuarial gains from investments hold the total required contribution rate below the levels of Scenario 4 and, in fact, keep it below the actual rate of 9.45%. The required rate eventually goes to zero. The investment gains, and the fact that the actual contribution rate remains above the required rate, are the reasons why assets eventually exceed liabilities and why the required total contribution rate goes down to zero.

IPERS 20 YEAR PROJECTION

SCENARIO 5

SYSTEM AS OF JUNE 30, 1989; ACTUARIAL ASSUMPTIONS SAME AS JUNE 30, 1989; BENEFIT CHANGES AS ENACTED IN 1990; ASSUMPTIONS MET, EXCEPT ACTUAL NET FUND GROWTH IS 8.0% ANNUALLY

LIABILITIES

Same As Scenario 4 (See Page 19)

CONTRIBUTIONS

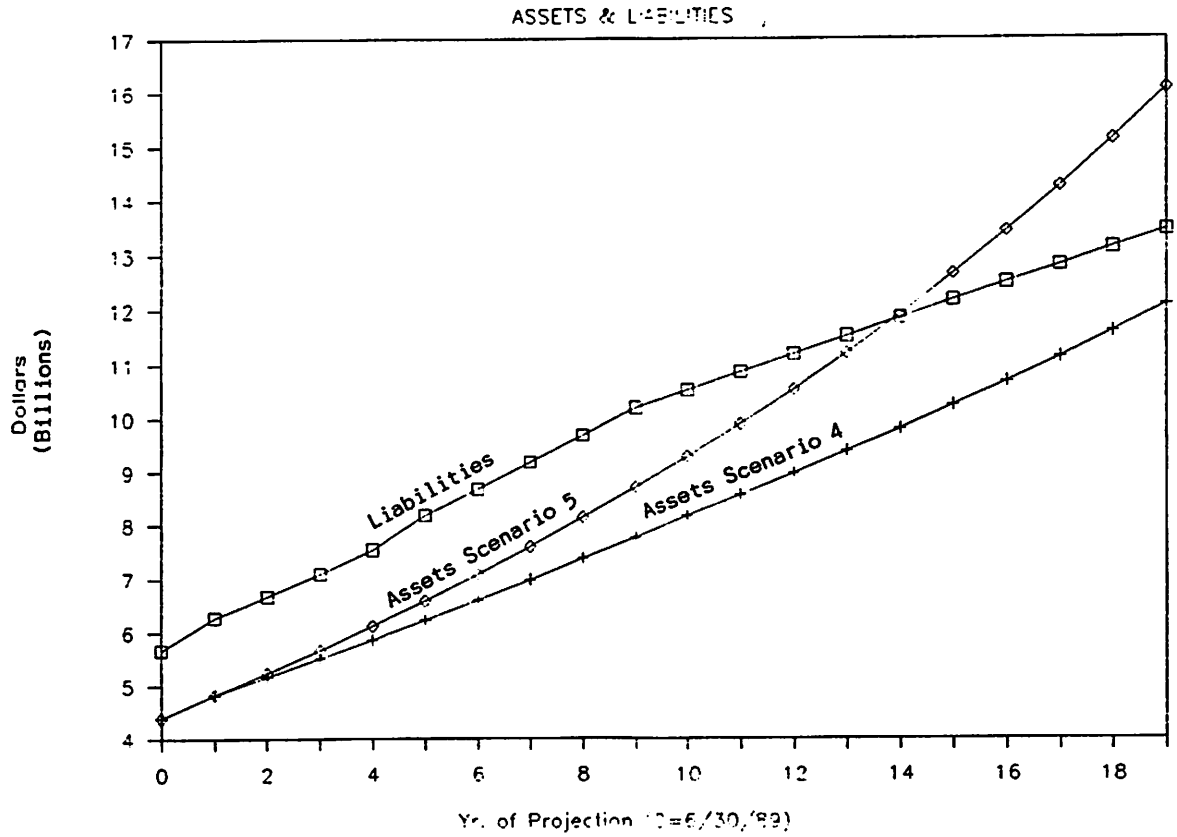
Same as Scenario 4 (See Page 20)

PAYOUTS

Same As Scenario 4 (See Page 21)

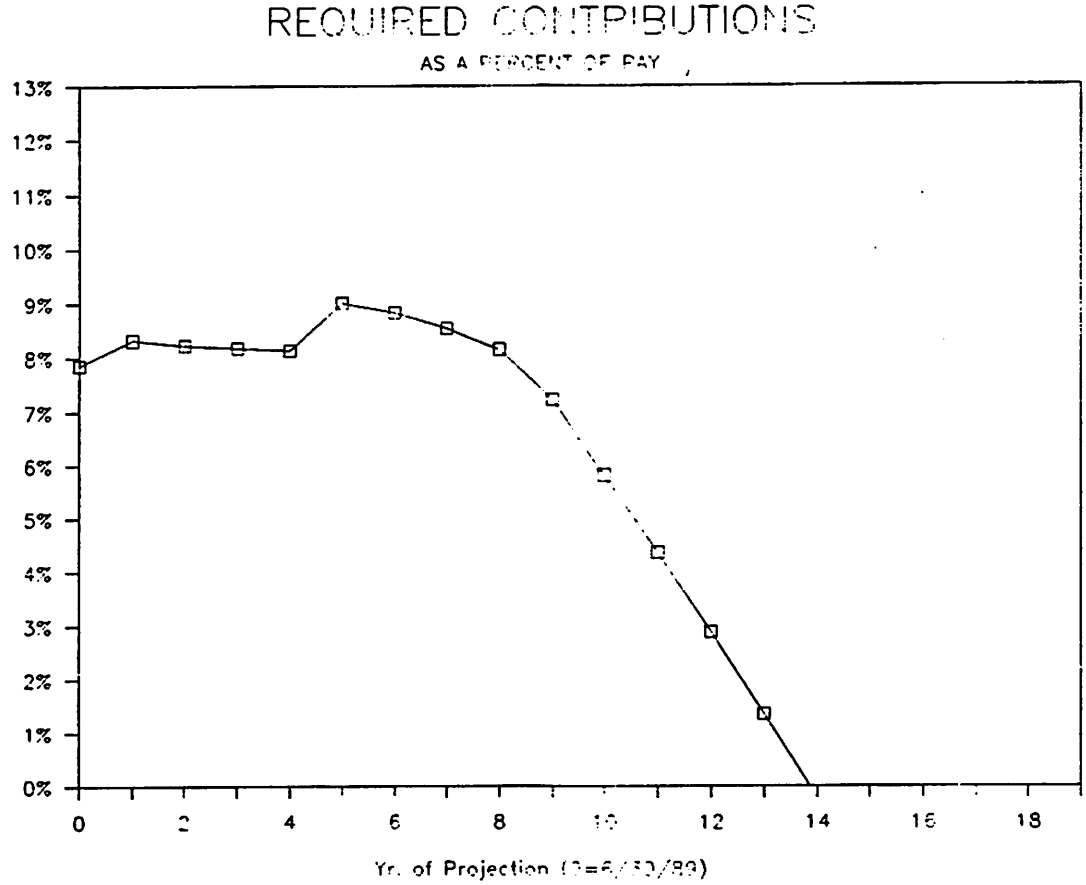
IPERS 20 YEAR PROJECTION
SCENARIO 5
ACTUARIAL ASSETS

As of June 30	Total Actuarial Assets	As of June 30	Total Actuarial Assets
1989	$ 4,380,355,689	1999	$ 9,280,712,931
1990	4,829,933,406	2000	9,893,902,364
1991	5,237,570,554	2001	10,535,292,837
1992	5,666,478,620	2002	11,207,353,049
1993	6,116,394,467	2003	11,913,256,682
1994	6,587,318,987	2004	12,655,056,756
1995	7,080,027,646	2005	13,434,346,395
1996	7,594,799,766	2006	14,257,274,112
1997	8,133,015,838	2007	15,131,461,164
1998	8,694,278,910	2008	16,063,430,102



IPERS 20 YEAR PROJECTION
SCENARIO 5
TOTAL CONTRIBUTION RATE

Year Ending June 30	Required Contribution As a % of Covered Pay	Year Ending June 30	Required Contribution As a % of Covered Pay
1990	7.864%	2000	5.824%
1991	8.325%	2001	4.371%
1992	8.236%	2002	2.884%
1993	8.185%	2003	1.347%
1994	8.143%	2004	.000%
1995	9.011%	2005	.000%
1996	8.839%	2006	.000%
1997	8.547%	2007	.000%
1998	8.155%	2008	.000%
1999	7.231%	2009	.000%



SCENARIO 6

SYSTEM AS OF JUNE 30, 1989; ACTUARIAL ASSUMPTIONS SAME AS JUNE 30, 1989; BENEFIT CHANGES AS ENACTED IN 1990; ASSUMPTIONS MET, EXCEPT ACTUAL NET FUND GROWTH IS 10.0% ANNUALLY

In Scenario 6 everything is the same as in Scenario 4 except it has been assumed the fund will earn a net rate of 10.0% instead of just meeting the actuarial assumption rate of 6.50%. Thus, in Scenario 5 the System liabilities, contributions, and payouts are the same as in Scenario 4. However, the fund assets increase dramatically more than under Scenario 4 because of the excess earnings.

With these substantial excess earnings over the 20 year period from 1989 to 2009, it is projected that:

a) Total liabilities will increase the same as in Scenario 4.

b) Total annual contributions, at 9.45% of covered pay, will increase the same as Scenario 4.

c) Total annual payouts will increase the same as Scenario 4.

d) Total actuarial assets will increase from $4,380,355,689 to $23,133,979,897, an increase of $18,753,624,208.

e) The total required contribution rate, as a percentage of salary, decreases from 7.864% to 0% (first occurring in 1999).

If liabilities are compared to assets under this Scenario 6, it will be seen that the actuarial assets exceed total projected liabilities by June 30, 1999, and the required contribution rate goes to zero by June 30, 1999. The reasons for this are the same as Scenario 5.

IPERS 20 YEAR PROJECTION

SCENARIO 6

SYSTEM AS OF JUNE 30, 1989; ACTUARIAL ASSUMPTIONS SAME AS JUNE 30, 1989; BENEFIT CHANGES AS ENACTED IN 1990; ASSUMPTIONS MET, EXCEPT ACTUAL NET FUND GROWTH IS 10.0% ANNUALLY

LIABILITIES

Same As Scenario 4 (See Page 19)

CONTRIBUTIONS

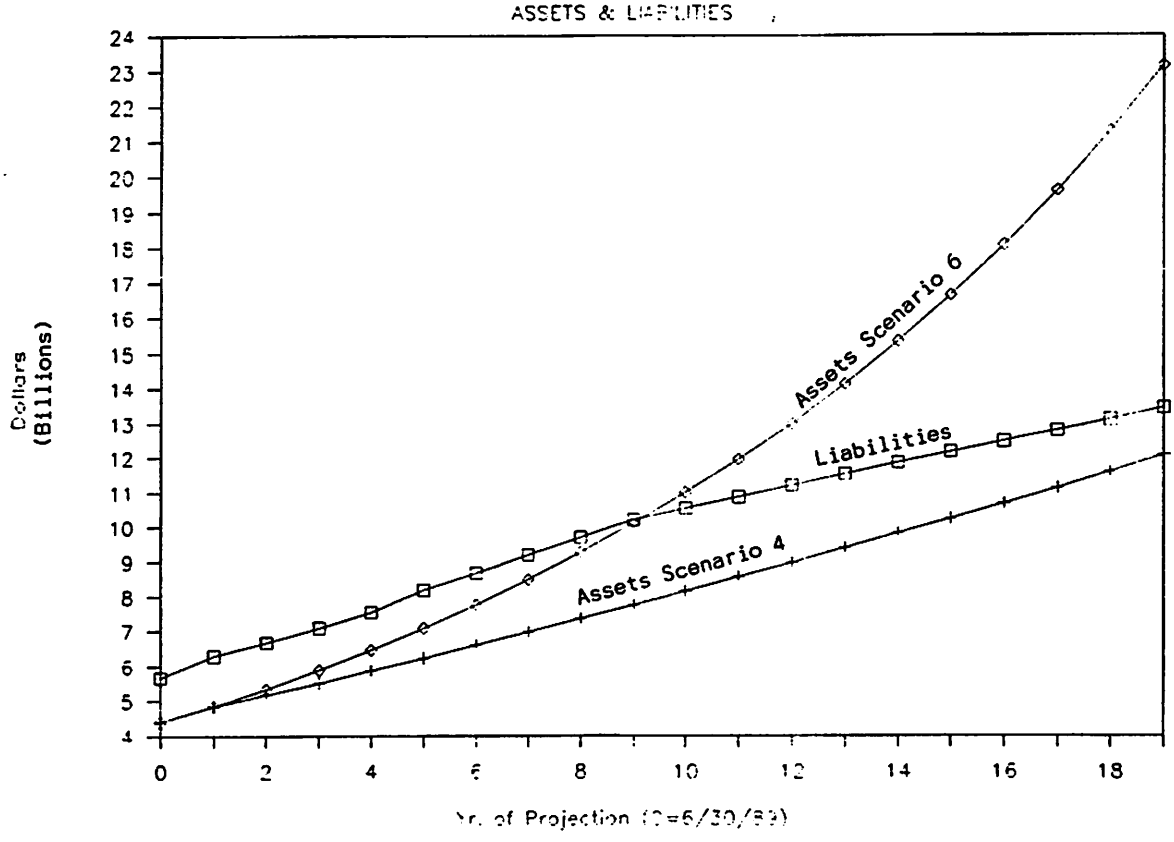
Same as Scenario 4 (See Page 20)

PAYOUTS

Same As Scenario 4 (See Page 21)

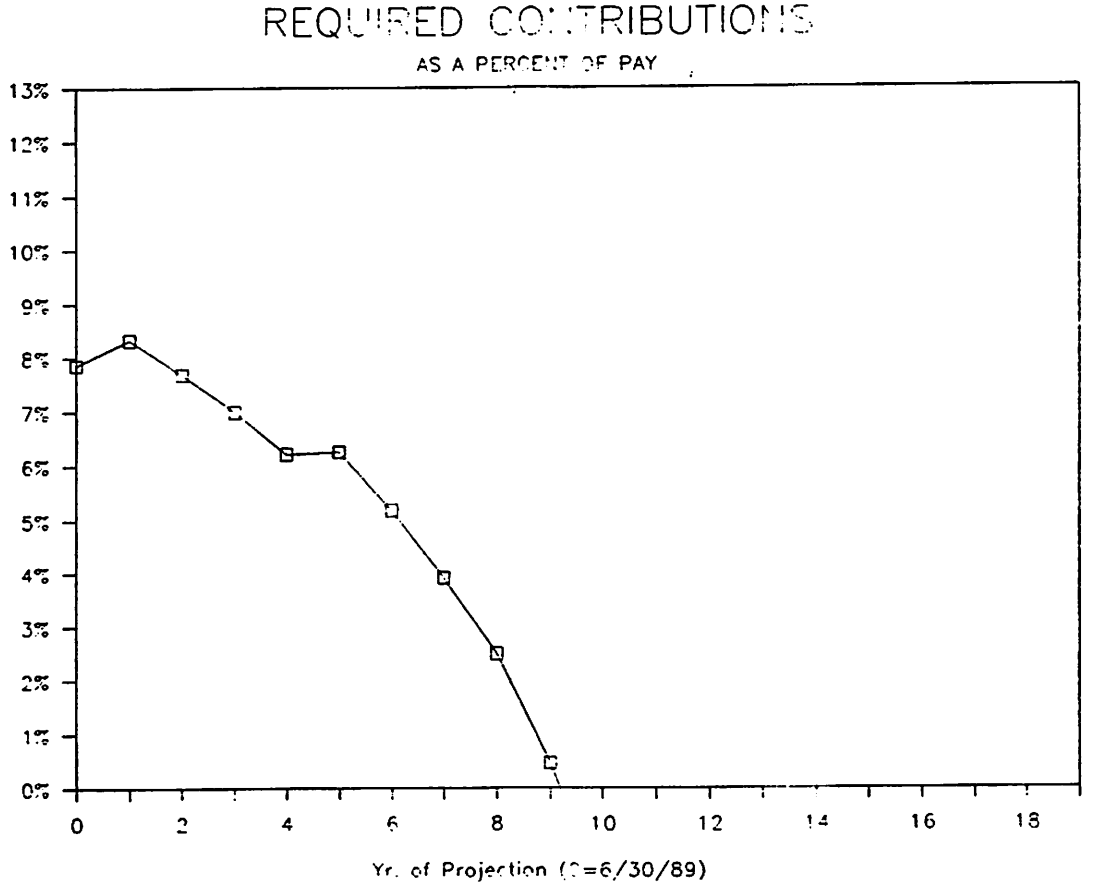
IPERS 20 YEAR PROJECTION
SCENARIO 6
ACTUARIAL ASSETS

As of June 30	Total Actuarial Assets	As of June 30	Total Actuarial Assets
1989	$ 4,380,355,689	1999	$10,992,993,420
1990	4,829,933,406	2000	11,958,562,738
1991	5,334,486,762	2001	12,998,942,182
1992	5,877,860,980	2002	14,121,734,775
1993	6,461,919,770	2003	15,335,805,986
1994	7,088,996,777	2004	16,649,508,737
1995	7,762,436,295	2005	18,071,388,542
1996	8,485,348,378	2006	19,615,302,110
1997	9,262,237,625	2007	21,297,466,816
1998	10,096,146,839	2008	23,133,979,897



IPERS 20 YEAR PROJECTION
SCENARIO 6
TOTAL CONTRIBUTION RATE

Year Ending June 30	Required Contribution As a % of Covered Pay	Year Ending June 30	Required Contribution As a % of Covered Pay
1990	7.864%	2000	.000%
1991	8.325%	2001	.000%
1992	7.688%	2002	.000%
1993	6.997%	2003	.000%
1994	6.212%	2004	.000%
1995	6.259%	2005	.000%
1996	5.184%	2006	.000%
1997	3.918%	2007	.000%
1998	2.488%	2008	.000%
1999	.462%	2009	.000%



SCENARIO 7

SYSTEM AS OF JUNE 30, 1989; ACTUARIAL ASSUMPTIONS SAME AS JUNE 30, 1989, EXCEPT THE INTEREST RATE IS INCREASED TO 7% BEGINNING 7/1/91; BENEFIT CHANGES AS ENACTED IN 1990; ASSUMPTIONS MET

In Scenario 7 everything is the same as in Scenario 4 except beginning July 1, 1991, both the interest rate used to discount future benefits and the rate of investment growth will raise to 7.0% from the current 6.5%.

Given this assumption change over the 20 year period from 1989 to 2009, it is projected that:

a) Total liabilities will increase from $5,664,567,476 to $12,649,266,192, an increase of $6,984,698,716.

b) Total annual contributions, at 9.45% of covered pay, will increase the same as Scenario 4.

c) Total annual payouts will increase the same as Scenario 4.

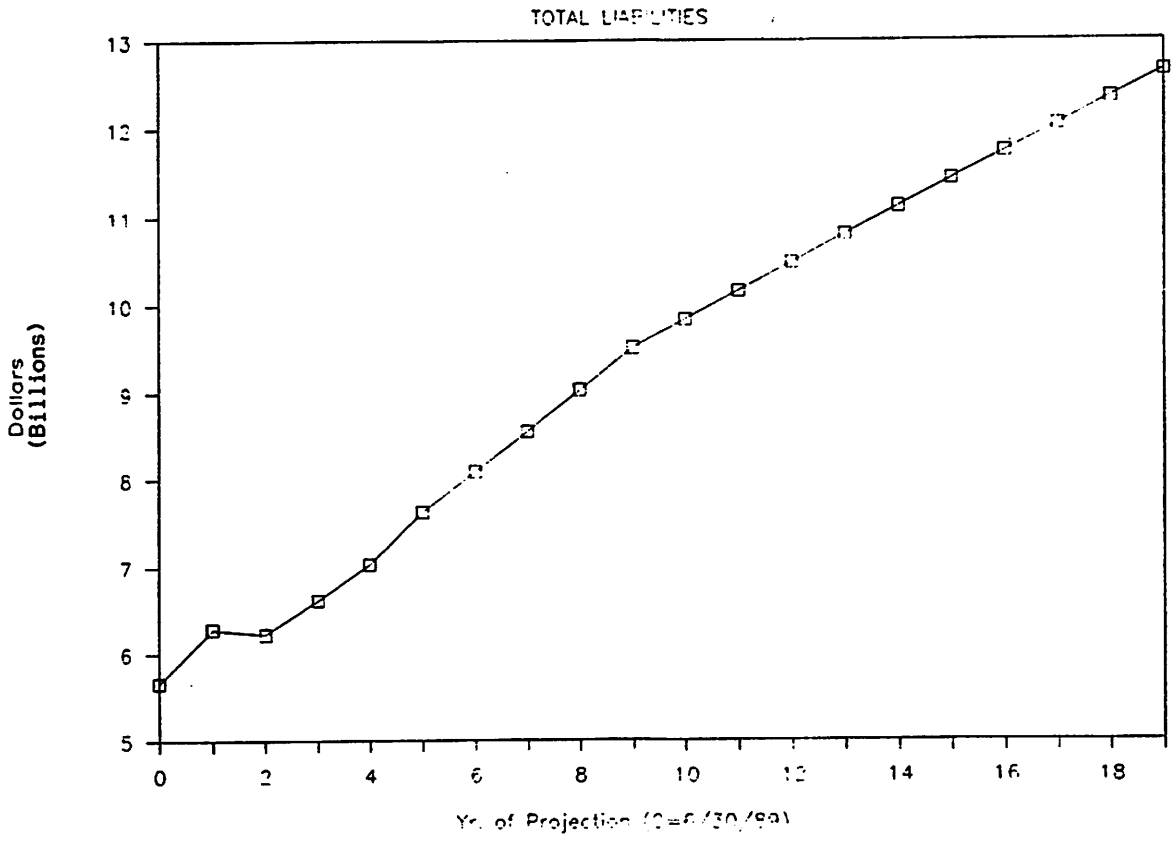
d) Total actuarial assets will increase from $4,380,355,689 to $13,223,793,067, an increase of $8,843,437,378.

e) The total required contribution rate, as a percentage of salary, decreases from 7.864% to 0% (first occurring in 2008).

Comparing liabilities to assets under this Scenario 7, it will be seen that projected actuarial assets will exceed projected liabilities by June 30, 2007. The required contribution rate increases until the assumption change in 1991 when the rate drops. The rate then increases steadily again until 1997 (7.898%) when all benefit enhancements proposed in the current law are in place. However, the rates never reach the actual rate of 9.45%, and excess contributions help the assets eventually exceed the liabilities, which in turn lowers the required contribution rate to zero.

IPERS 20 YEAR PROJECTION
SCENARIO 7
LIABILITIES

As of June 30	Total Liabilities	As of June 30	Total Liabilities
1989	$ 5,664,567,476	1999	$ 9,832,161,234
1990	6,278,910,140	2000	10,154,076,619
1991	6,222,347,203	2001	10,477,826,863
1992	6,616,236,457	2002	10,797,680,132
1993	7,031,450,625	2003	11,112,945,556
1994	7,629,785,271	2004	11,424,828,224
1995	8,089,348,373	2005	11,733,937,817
1996	8,556,086,194	2006	12,039,350,143
1997	9,032,072,344	2007	12,342,888,257
1998	9,512,217,337	2008	12,649,266,192



IPERS 20 YEAR PROJECTION

SCENARIO 7

SYSTEM AS OF JUNE 30, 1989; ACTUARIAL ASSUMPTIONS SAME AS JUNE 30, 1989, EXCEPT THE INTEREST RATE IS INCREASED TO 7% BEGINNING 7/1/91; BENEFIT CHANGES AS ENACTED IN 1990; ASSUMPTIONS MET

CONTRIBUTIONS

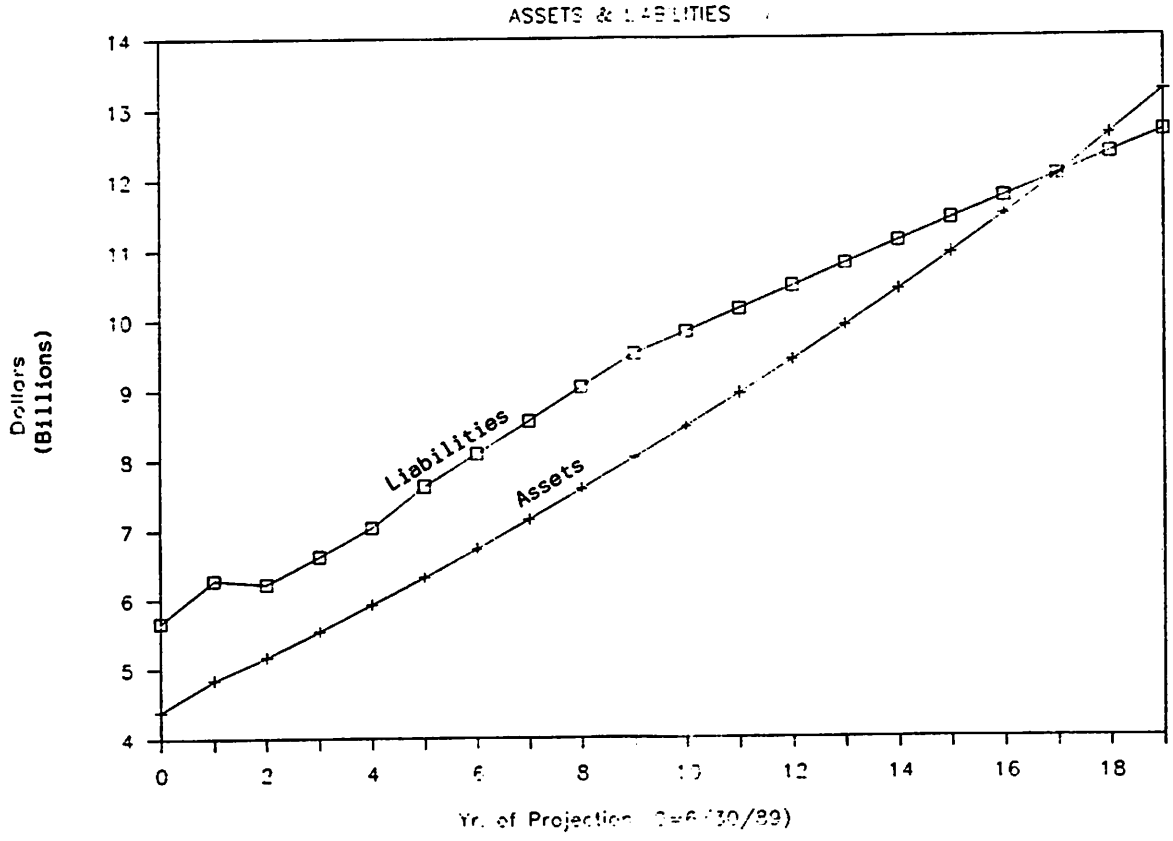
Same as Scenario 4 (See Page 20)

PAYOUTS

Same As Scenario 4 (See Page 21)

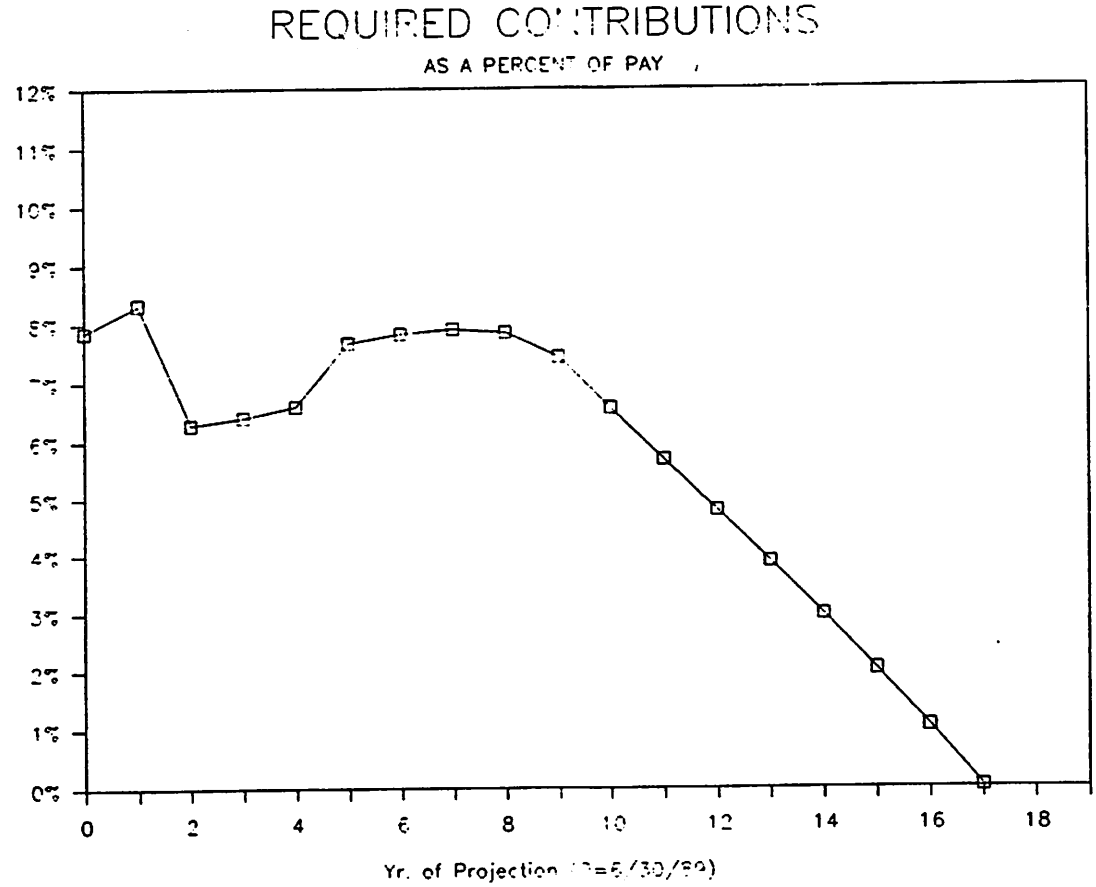
IPERS 20 YEAR PROJECTION
SCENARIO 7
ACTUARIAL ASSETS

As of June 30	Total Actuarial Assets	As of June 30	Total Actuarial Assets
1989	$ 4,380,355,689	1999	$ 8,474,386,807
1990	4,829,933,406	2000	8,940,457,866
1991	5,164,883,398	2001	9,418,687,985
1992	5,536,364,556	2002	9,910,171,695
1993	5,920,718,911	2003	10,416,587,911
1994	6,317,191,989	2004	10,938,368,086
1995	6,725,748,794	2005	11,475,355,959
1996	7,145,797,994	2006	12,031,794,467
1997	7,577,782,240	2007	12,613,203,448
1998	8,020,298,224	2008	13,223,793,067



IPERS 20 YEAR PROJECTION
SCENARIO 7
TOTAL CONTRIBUTION RATE

Year Ending June 30	Required Contribution As a % of Covered Pay	Year Ending June 30	Required Contribution As a % of Covered Pay
1990	7.864%	2000	6.560%
1991	8.325%	2001	5.675%
1992	6.283%	2002	4.783%
1993	6.412%	2003	3.875%
1994	6.594%	2004	2.950%
1995	7.664%	2005	2.007%
1996	7.818%	2006	1.045%
1997	7.898%	2007	.030%
1998	7.846%	2008	.000%
1999	7.429%	2009	.000%



SCENARIO 8

SYSTEM AS OF JUNE 30, 1989; ACTUARIAL ASSUMPTIONS SAME AS JUNE 30, 1989, EXCEPT THE INTEREST RATE IS INCREASED TO 7% BEGINNING 7/1/91; BENEFIT CHANGES AS ENACTED IN 1990; ASSUMPTIONS MET, EXCEPT ACTUAL NET FUND GROWTH IS 8.0% ANNUALLY

In Scenario 8 everything is the same as in Scenario 7 except it has been assumed the fund will earn a net rate of 8.0% instead of just meeting the actuarial assumption rate of 6.50% for 1989 and 1990 and 7.0% thereafter. Thus, in Scenario 8 the System liabilities, contributions, and payouts are the same as in Scenario 7. However, the fund assets increase more than under Scenario 7 because of the excess earnings.

With these excess earnings over the 20 year period from 1989 to 2009, it is projected that:

a) Total liabilities will increase the same as in Scenario 7.

b) Total annual contributions, at 9.45% of covered pay, will increase the same as Scenarios 4 and 7.

c) Total annual payouts will increase the same as Scenarios 4 and 7.

d) Total actuarial assets will increase the same as Scenario 5.

e) The total required contribution rate, as a percentage of salary, decreases from 7.864% to 0% (first occurring in 2001).

If liabilities are compared to assets under this Scenario 8, it will be seen that the actuarial assets exceed total projected liabilities by June 30, 2001. This is because the actuarial gains from investments have now been added to the ongoing contributions at 9.45%, which we saw in Scenario 7 were more than were needed. This combination also reduces the time it takes for the required contribution rate to go to zero.

IPERS 20 YEAR PROJECTION

SCENARIO 8

SYSTEM AS OF JUNE 30, 1989; ACTUARIAL ASSUMPTIONS SAME AS JUNE 30, 1989, EXCEPT THE INTEREST RATE IS INCREASED TO 7% BEGINNING 7/1/91; BENEFIT CHANGES AS ENACTED IN 1990; ASSUMPTIONS MET, EXCEPT ACTUAL NET FUND GROWTH IS 8.0% ANNUALLY

LIABILITIES

Same As Scenario 7 (See Page 33)

CONTRIBUTIONS

Same as Scenario 4 and 7 (See Page 20)

PAYOUTS

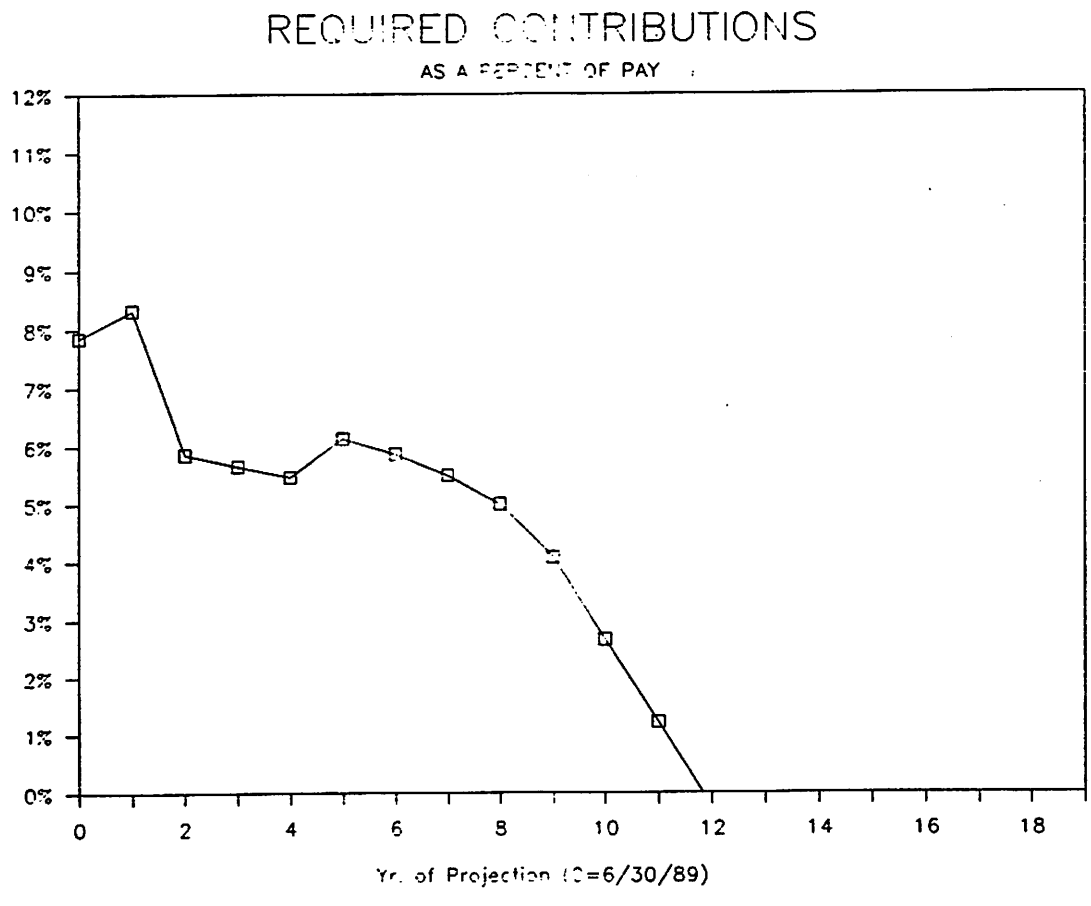
Same As Scenario 4 and 7 (See Page 21)

ACTUARIAL ASSETS

Same As Scenario 5 (See Page 26)

IPERS 20 YEAR PROJECTION
SCENARIO 8
TOTAL CONTRIBUTION RATE

Year Ending June 30	Required Contribution As a % of Covered Pay	Year Ending June 30	Required Contribution As a % of Covered Pay
1990	7.864%	2000	2.664%
1991	8.325%	2001	1.217%
1992	5.859%	2002	.000%
1993	5.658%	2003	.000%
1994	5.466%	2004	.000%
1995	6.136%	2005	.000%
1996	5.861%	2006	.000%
1997	5.491%	2007	.000%
1998	4.999%	2008	.000%
1999	4.073%	2009	.000%



SCENARIO 9

SYSTEM AS OF JUNE 30, 1989; ACTUARIAL ASSUMPTIONS SAME AS JUNE 30, 1989, EXCEPT THE INTEREST ASSUMPTION IS INCREASED TO 7.0% BEGINNING 7/1/91; BENEFIT CHANGES AS ENACTED IN 1990; ASSUMPTIONS MET, EXCEPT ACTUAL NET FUND GROWTH IS 10.0% ANNUALLY

In Scenario 9 everything is the same as in Scenario 7 except it has been assumed the fund will earn a net rate of 10.0% instead of just meeting the actuarial assumption rate of 6.50% for 1989 and 1990 and 7.0% thereafter. Thus, in Scenario 9 the System liabilities, contributions, and payouts are the same as in Scenario 7. However, the fund assets increase dramatically more than under Scenario 7 because of the excess earnings.

With these substantial excess earnings over the 20 year period from 1989 to 2009, it is projected that:

a) Total liabilities will increase the same as in Scenario 7.

b) Total annual contributions, at 9.45% of covered pay, will increase the same as Scenarios 4 and 7.

c) Total annual payouts will increase the same as Scenarios 4 and 7.

d) Total actuarial assets will increase the same as Scenario 6.

e) The total required contribution rate, as a percentage of salary, decreases from 7.864% to 0% (first occurring in 1997).

If liabilities are compared to assets under this Scenario 9, it will be seen that the actuarial assets exceed total projected liabilities by June 30, 1997. This is because the very substantial actuarial gains from investments have now been added to the ongoing contributions at 9.45%, which we saw in Scenario 7 were more than were needed. The greater excess earnings also accelerate the time by which the required contribution rate reaches zero.

IPERS 20 YEAR PROJECTION

SCENARIO 9

SYSTEM AS OF JUNE 30, 1989; ACTUARIAL ASSUMPTIONS SAME AS JUNE 30, 1989, EXCEPT THE INTEREST ASSUMPTION IS INCREASED TO 7.0% BEGINNING 7/1/91; BENEFIT CHANGES AS ENACTED IN 1990; ASSUMPTIONS MET, EXCEPT ACTUAL NET FUND GROWTH IS 10.0% ANNUALLY

LIABILITIES

Same As Scenario 7 (See Page 33)

CONTRIBUTIONS

Same as Scenario 4 and 7 (See Page 20)

PAYOUTS

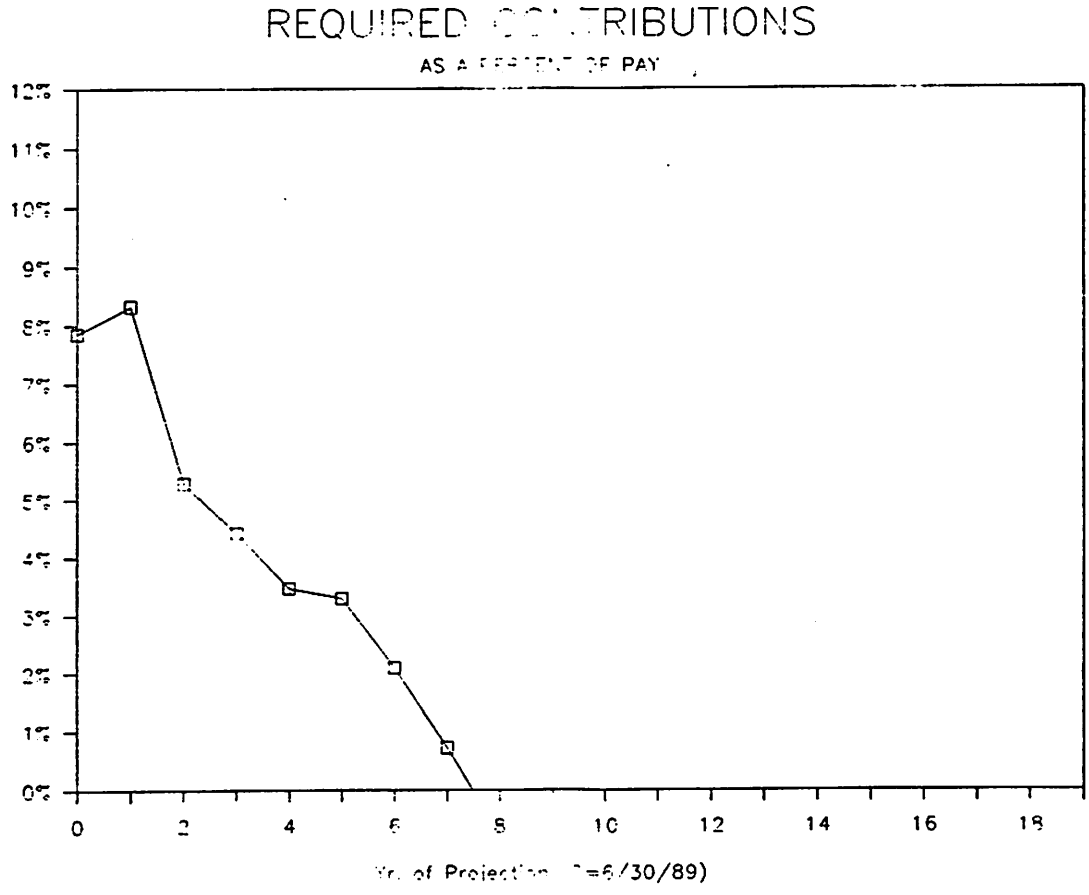
Same As Scenario 4 and 7 (See Page 21)

ACTUARIAL ASSETS

Same As Scenario 6 (See Page 30)

IPERS 20 YEAR PROJECTION
SCENARIO 9
TOTAL CONTRIBUTION RATE

Year Ending June 30	Required Contribution As a % of Covered Pay	Year Ending June 30	Required Contribution As a % of Covered Pay
1990	7.864%	2000	.000%
1991	8.325%	2001	.000%
1992	5.294%	2002	.000%
1993	4.432%	2003	.000%
1994	3.474%	2004	.000%
1995	3.297%	2005	.000%
1996	2.092%	2006	.000%
1997	.716%	2007	.000%
1998	.000%	2008	.000%
1999	.000%	2009	.000%



SCENARIO 10

SYSTEM AS OF JUNE 30, 1989; ACTUARIAL ASSUMPTIONS SAME AS JUNE 30, 1989, EXCEPT THE INTEREST ASSUMPTION IS INCREASED TO 7.5% BEGINNING 7/1/91; BENEFIT CHANGES AS ENACTED IN 1990; ASSUMPTIONS MET

In Scenario 10 everything is the same as in Scenario 4 except, beginning July 1, 1991, both the interest rate used to discount future benefits and the rate of investment growth will raise to 7.5% from the current 6.5%.

Given this assumption change over the 20 year period from 1989 to 2009, it is projected that:

a) Total liabilities will increase from $5,664,567,476 to $11,939,396,674, an increase of $6,274,829,198.

b) Total annual contributions, at 9.45% of covered pay, will increase the same as Scenarios 4 and 7.

c) Total annual payouts will increase the same as Scenarios 4 and 7.

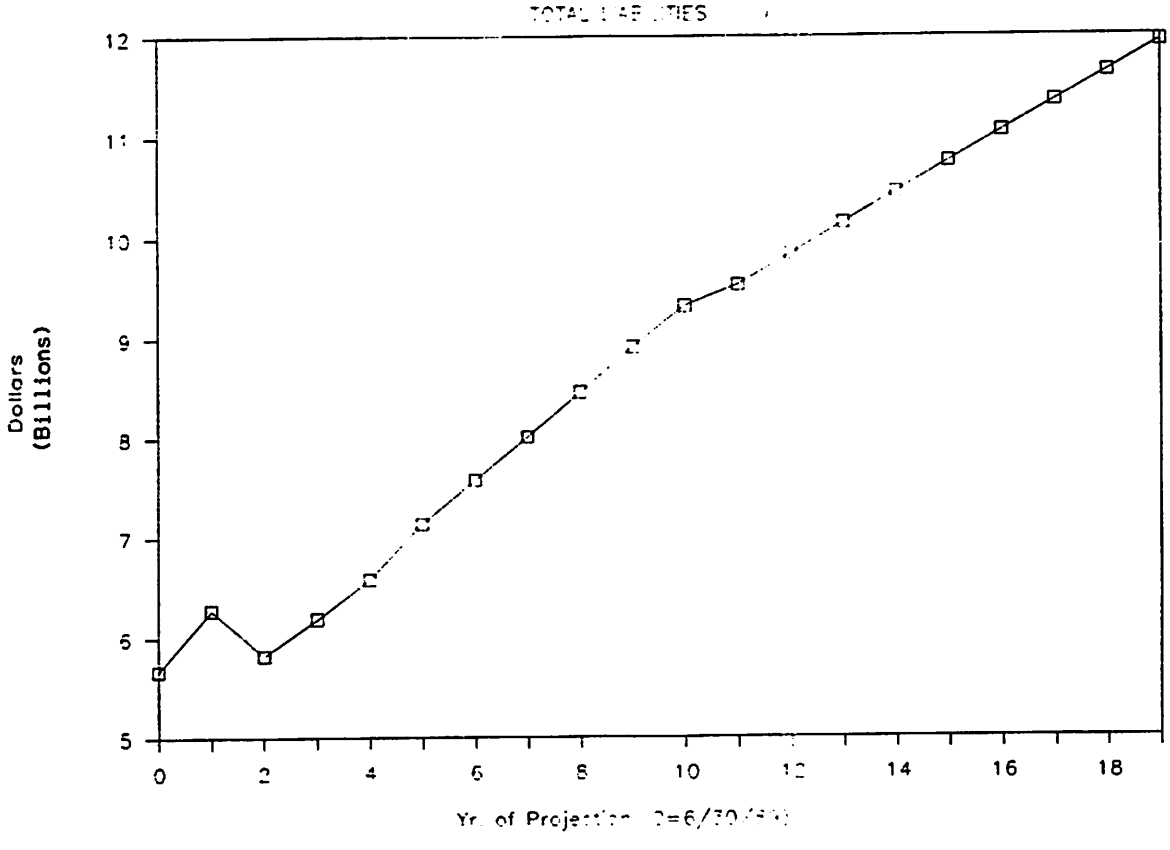
d) Total actuarial assets will increase from $4,380,355,689 to $14,463,747,702, an increase of $10,083,392,013.

e) The total required contribution rate, as a percentage of salary, decreases from 7.864% to 0% (first occurring in 2001).

Comparing liabilities and assets under this Scenario 10, it will be seen that projected actuarial assets will exceed projected liabilities by June 30, 2001. The required contribution rate has a large drop when the interest rate assumption is changed in 1991, and then decreases to zero (except for a surge in 1995 due to an impact related to covered wage increases).

IPERS 20 YEAR PROJECTION
SCENARIO 10
LIABILITIES

As of June 30	Total Liabilities	As of June 30	Total Liabilities
1989	$ 5,664,567,476	1999	$ 9,322,258,426
1990	6,278,910,140	2000	9,529,153,388
1991	5,823,323,553	2001	9,841,640,165
1992	6,192,515,650	2002	10,150,631,969
1993	6,582,236,479	2003	10,455,537,187
1994	7,137,199,936	2004	10,757,065,592
1995	7,568,939,184	2005	11,055,551,470
1996	8,008,144,208	2006	11,350,462,156
1997	8,456,626,405	2007	11,643,610,146
1998	8,909,465,889	2008	11,939,396,674



IPERS 20 YEAR PROJECTION

SCENARIO 10

SYSTEM AS OF JUNE 30, 1989; ACTUARIAL ASSUMPTIONS SAME AS JUNE 30, 1989, EXCEPT THE INTEREST ASSUMPTION IS INCREASED TO 7.5% BEGINNING 7/1/91; BENEFIT CHANGES AS ENACTED IN 1990; ASSUMPTIONS MET

CONTRIBUTIONS

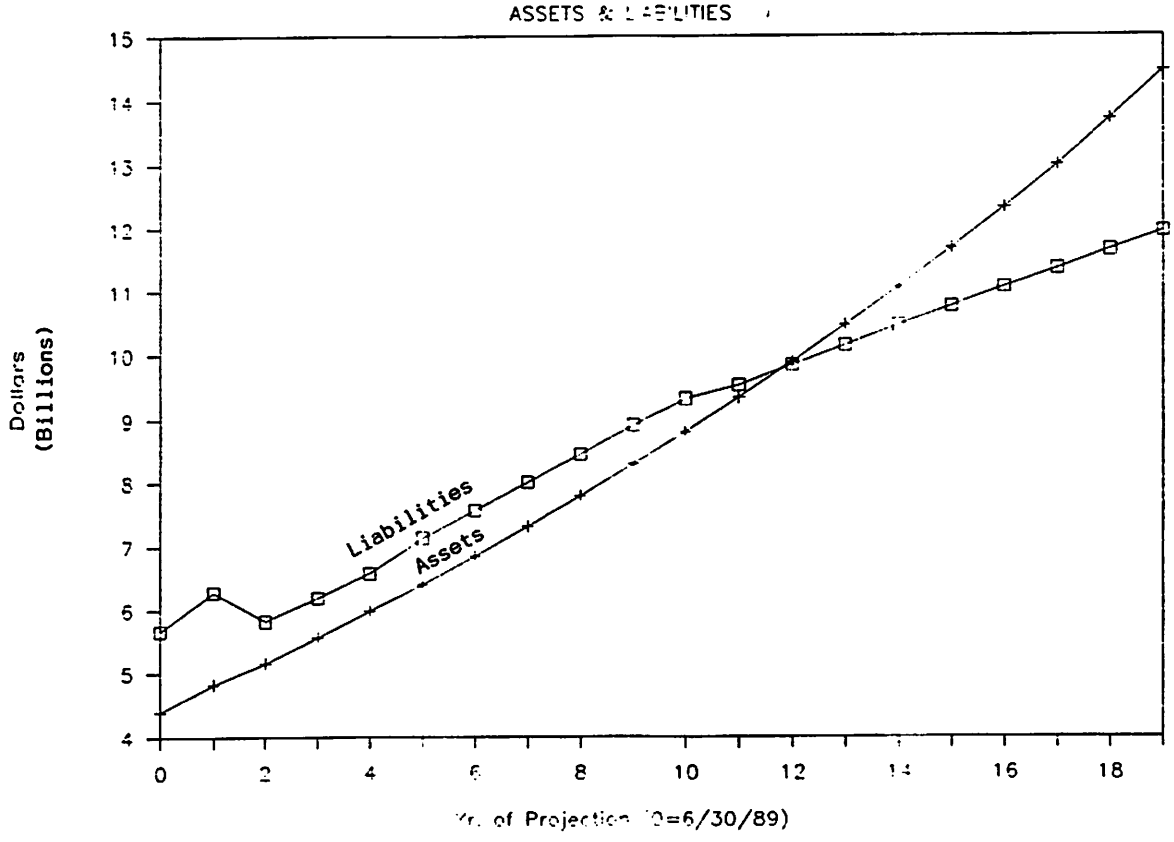
Same as Scenario 4 and 7 (See Page 20)

PAYOUTS

Same As Scenario 4 and 7 (See Page 21)

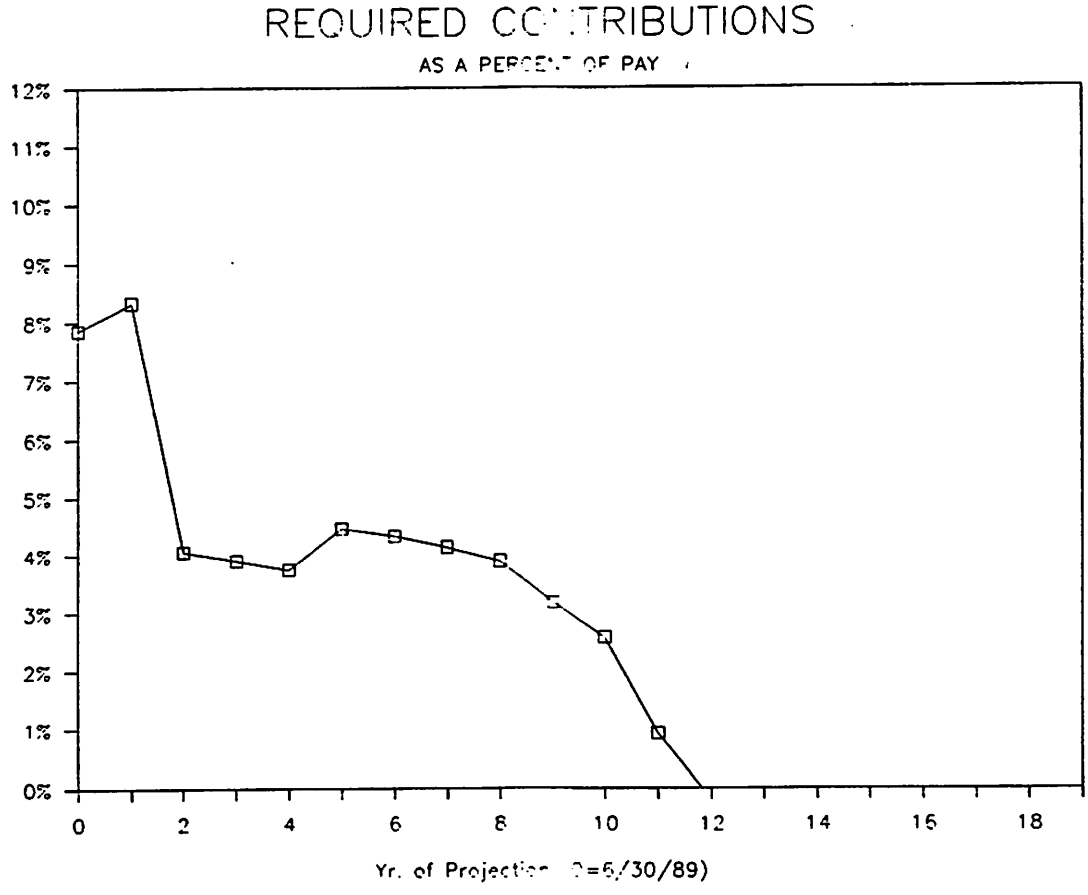
IPERS 20 YEAR PROJECTION
SCENARIO 10
ACTUARIAL ASSETS

As of June 30	Total Actuarial Assets	As of June 30	Total Actuarial Assets
1989	$ 4,380,355,689	1999	$ 8,805,744,503
1990	4,829,933,406	2000	9,338,117,142
1991	5,164,883,398	2001	9,889,772,230
1992	5,562,243,211	2002	10,462,385,751
1993	5,976,193,005	2003	11,058,267,229
1994	6,406,310,066	2004	11,678,529,861
1995	6,852,913,465	2005	12,323,749,569
1996	7,315,790,271	2006	12,998,964,788
1997	7,795,788,797	2007	13,710,572,532
1998	8,291,938,693	2008	14,463,747,702



IPERS 20 YEAR PROJECTION
SCENARIO 10
TOTAL CONTRIBUTION RATE

Year Ending June 30	Required Contribution As a % of Covered Pay	Year Ending June 30	Required Contribution As a % of Covered Pay
1990	7.864%	2000	2.571%
1991	8.325%	2001	.920%
1992	4.068%	2002	.000%
1993	3.913%	2003	.000%
1994	3.755%	2004	.000%
1995	4.460%	2005	.000%
1996	4.326%	2006	.000%
1997	4.130%	2007	.000%
1998	3.887%	2008	.000%
1999	3.168%	2009	.000%



SCENARIO 11

SYSTEM AS OF JUNE 30, 1989; ACTUARIAL ASSUMPTIONS SAME AS JUNE 30, 1989, EXCEPT THE INTEREST ASSUMPTION IS INCREASED TO 7.5% BEGINNING 7/1/91; BENEFIT CHANGES AS ENACTED IN 1990; ASSUMPTIONS MET, EXCEPT ACTUAL NET FUND GROWTH IS 8.0% ANNUALLY

In Scenario 11 everything is the same as in Scenario 10 except it has been assumed the fund will earn a net rate of 8.0% instead of just meeting the actuarial assumption rate of 6.50% for 1989 and 1990 and 7.5% thereafter. Thus, in Scenario 11 the System liabilities, contributions, and payouts are the same as in Scenario 10. However, the fund assets increase more than under Scenario 10 because of the excess earnings.

With these excess earnings over the 20 year period from 1989 to 2009, it is projected that:

a) Total liabilities will increase the same as in Scenario 10.

b) Total annual contributions, at 9.45% of covered pay, will increase the same as Scenarios 4, 7 and 10.

c) Total annual payouts will increase the same as Scenarios 4, 7 and 10.

d) Total actuarial assets will increase the same as Scenarios 5 and 8.

e) The total required contribution rate, as a percentage of salary, decreases from 7.864% to 0% (first occurring in 2000).

If liabilities are compared to assets under this Scenario 11, it will be seen that the actuarial assets exceed total projected liabilities by June 30, 2000. This is because the actuarial gains from investments have now been added to the ongoing contributions at 9.45%, which we saw in Scenario 10 were more than were needed. This combination also puts the required contribution rate at zero one year earlier.

IPERS 20 YEAR PROJECTION

SCENARIO 11

SYSTEM AS OF JUNE 30, 1989; ACTUARIAL ASSUMPTIONS SAME AS JUNE 30, 1989, EXCEPT THE INTEREST ASSUMPTION IS INCREASED TO 7.5% BEGINNING 7/1/91; BENEFIT CHANGES AS ENACTED IN 1990; ASSUMPTIONS MET, EXCEPT ACTUAL NET FUND GROWTH IS 8.0% ANNUALLY

LIABILITIES

Same As Scenario 10 (See Page 44)

CONTRIBUTIONS

Same as Scenario 4, 7 and 10 (See Page 20)

PAYOUTS

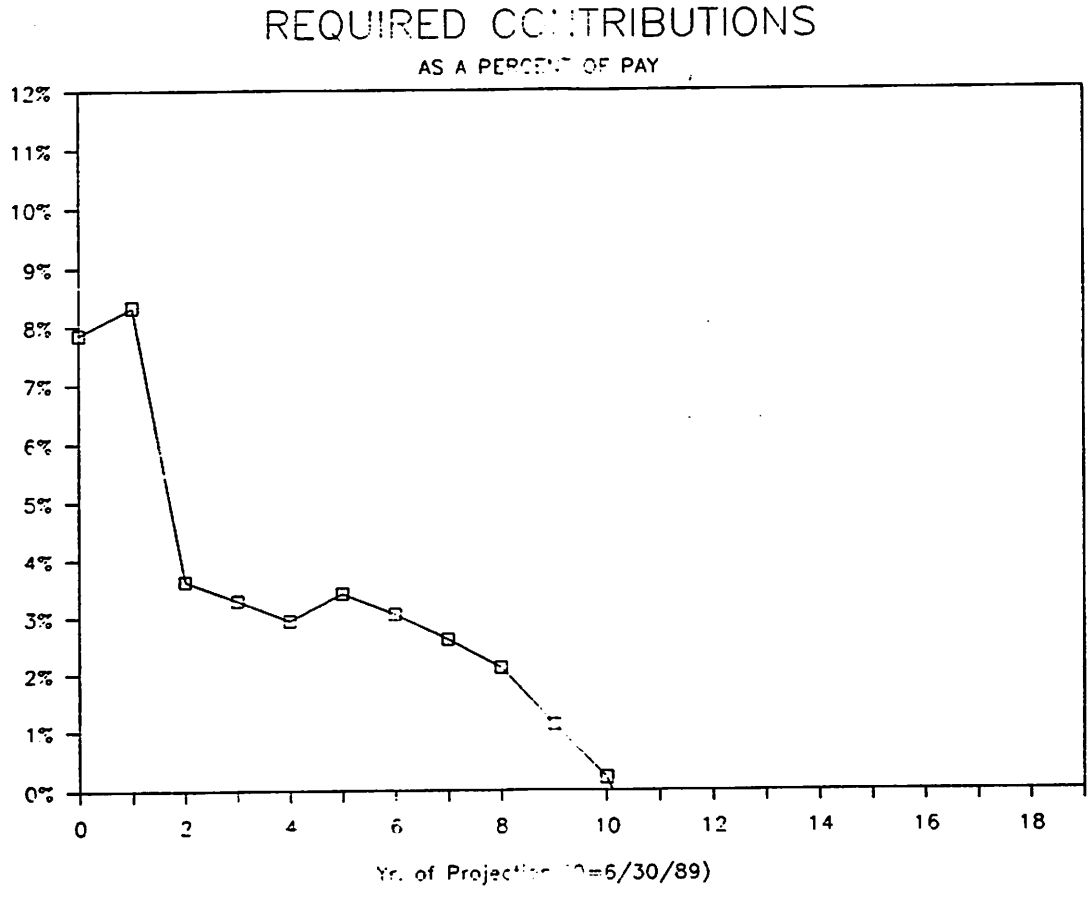
Same As Scenario 4, 7 and 10 (See Page 21)

ACTUARIAL ASSETS

Same As Scenario 5 and 8 (See Page 26)

IPERS 20 YEAR PROJECTION
SCENARIO 11
TOTAL CONTRIBUTION RATE

Year Ending June 30	Required Contribution As a % of Covered Pay	Year Ending June 30	Required Contribution As a % of Covered Pay
1990	7.864%	2000	.207%
1991	8.325%	2001	.000%
1992	3.631%	2002	.000%
1993	3.290%	2003	.000%
1994	2.931%	2004	.000%
1995	3.414%	2005	.000%
1996	3.045%	2006	.000%
1997	2.603%	2007	.000%
1998	2.105%	2008	.000%
1999	1.104%	2009	.000%



SCENARIO 12

SYSTEM AS OF JUNE 30, 1989; ACTUARIAL ASSUMPTIONS SAME AS JUNE 30, 1989, EXCEPT THE INTEREST ASSUMPTION IS INCREASED TO 7.5% BEGINNING 7/1/91; BENEFIT CHANGES AS ENACTED IN 1990; ASSUMPTIONS MET, EXCEPT ACTUAL NET FUND GROWTH IS 10.0% ANNUALLY

In Scenario 12 everything is the same as in Scenario 10 except it has been assumed the fund will earn a net rate of 10.0% instead of just meeting the actuarial assumption rate of 6.50% for 1989 and 1990 and 7.5% thereafter. Thus, in Scenario 12 the System liabilities, contributions, and payouts are the same as in Scenario 10. However, the fund assets increase dramatically more than under Scenario 10 because of the excess earnings.

With these substantial excess earnings over the 20 year period from 1989 to 2009, it is projected that:

a) Total liabilities will increase the same as in Scenario 10.

b) Total annual contributions, at 9.45% of covered pay, will increase the same as Scenarios 4, 7 and 10.

c) Total annual payouts will increase the same as Scenarios 4, 7 and 10.

d) Total actuarial assets will increase the same as Scenarios 6 and 9.

e) The total required contribution rate, as a percentage of salary, decreases from 7.864% to 0% (first occurring in 1995).

If liabilities are compared to assets under this Scenario 12, it will be seen that the actuarial assets exceed total projected liabilities by June 30, 1995. This is because the very substantial actuarial gains from investments have now been added to the ongoing contributions at 9.45%, which we saw in Scenario 10 were more than were needed. The greater excess earnings also accelerate the time by which the required contribution rate reaches zero.

IPERS 20 YEAR PROJECTION

SCENARIO 12

SYSTEM AS OF JUNE 30, 1989; ACTUARIAL ASSUMPTIONS SAME AS JUNE 30, 1989, EXCEPT THE INTEREST ASSUMPTION IS INCREASED TO 7.5% BEGINNING 7/1/91; BENEFIT CHANGES AS ENACTED IN 1990; ASSUMPTIONS MET, EXCEPT ACTUAL NET FUND GROWTH IS 10.0% ANNUALLY

LIABILITIES

Same As Scenario 10 (See Page 44)

CONTRIBUTIONS

Same as Scenario 4, 7 and 10 (See Page 20)

PAYOUTS

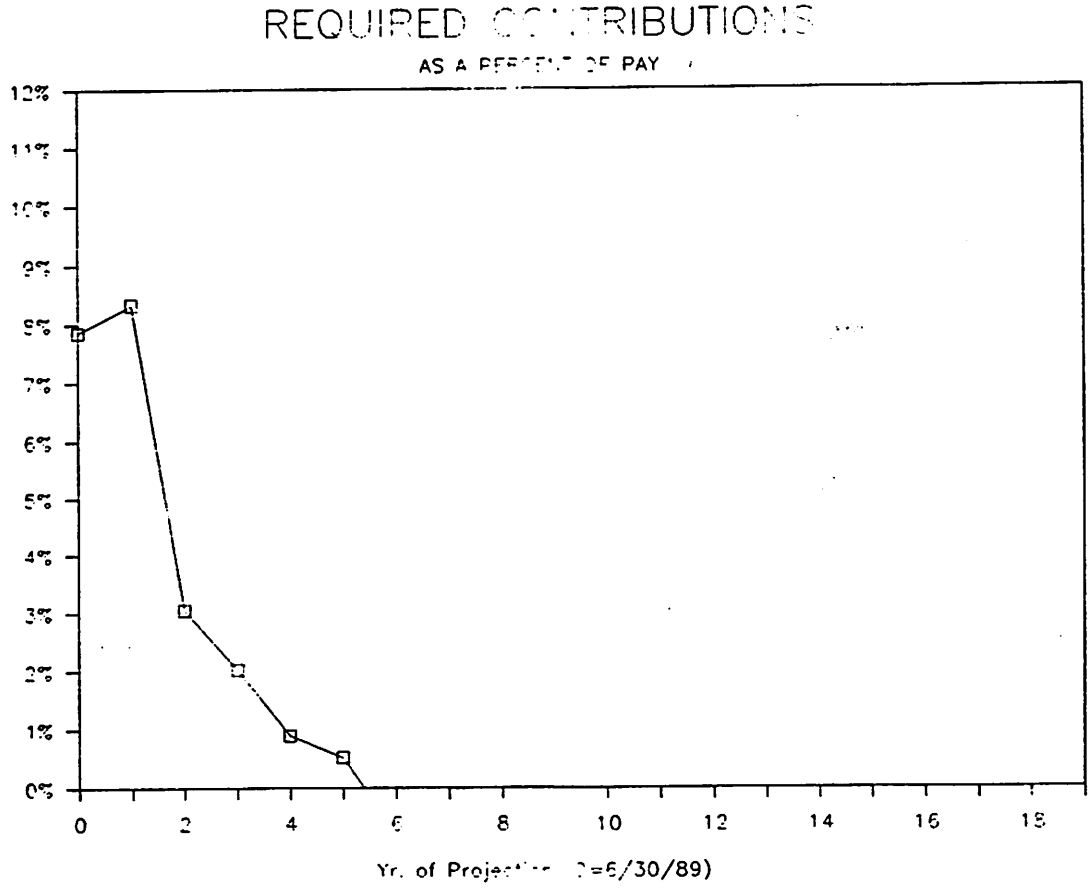
Same As Scenario 4, 7 and 10 (See Page 21)

ACTUARIAL ASSETS

Same As Scenario 6 and 9 (See Page 30)

IPERS 20 YEAR PROJECTION
SCENARIO 12
TOTAL CONTRIBUTION RATE

Year Ending June 30	Required Contribution As a % of Covered Pay	Year Ending June 30	Required Contribution As a % of Covered Pay
1990	7.864%	2000	.000%
1991	8.325%	2001	.000%
1992	3.048%	2002	.000%
1993	2.027%	2003	.000%
1994	.898%	2004	.000%
1995	.517%	2005	.000%
1996	.000%	2006	.000%
1997	.000%	2007	.000%
1998	.000%	2008	.000%
1999	.000%	2009	.000%



SUMMARY
DESCRIPTION OF SCENARIOS

SCENARIO	DESCRIPTION
1	System as of June 30, 1989; Actuarial Assumptions Same as June 30, 1989; Benefit Changes as Enacted in 1990, With Ongoing Covered Wage Increases of $3,000 a Year; Assumptions Met
2	System as of June 30, 1989; Actuarial Assumptions Same as June 30, 1989; Benefit Changes as Enacted in 1990, With Ongoing Covered Wage Increases of $3,000 a Year; Assumptions Met, Except Actual Net Fund Growth is 8.0% Annually
3	System as of June 30, 1989; Actuarial Assumptions Same as June 30, 1989; Benefit Changes as Enacted in 1990, With Ongoing Covered Wage Increases of $3,000 a Year; Assumptions Met, Except Actual Net Fund Growth is 10.0% Annually
4	System as of June 30, 1989; Actuarial Assumptions Same as June 30, 1989; Benefit Changes as Enacted in 1990; Assumptions Met
5	System as of June 30, 1989; Actuarial Assumptions Same as June 30, 1989; Benefit Changes as Enacted in 1990; Assumptions Met, Except Actual Net Fund Growth is 8.0% Annually
6	System as of June 30, 1989; Actuarial Assumptions Same as June 30, 1989; Benefit Changes as Enacted in 1990; Assumptions Met, Except Actual Net Fund Growth is 10.0% Annually
7	System as of June 30, 1989; Actuarial Assumptions Same as June 30, 1989, Except Interest Rate Assumption Increased to 7.0% Beginning with the 7/1/91 Valuation; Benefit Changes as Enacted in 1990; Assumptions Met
8	System as of June 30, 1989; Actuarial Assumptions Same as June 30, 1989, Except Interest Rate Assumption Increased to 7.0% Beginning with the 7/1/91 Valuation; Benefit Changes as Enacted in 1990; Assumptions Met, Except Actual Net Fund Growth is 8.0% Annually
9	System as of June 30, 1989; Actuarial Assumptions Same as June 30, 1989, Except Interest Rate Assumption Increased to 7.0% Beginning with the 7/1/91 Valuation; Benefit Changes as Enacted in 1990; Assumptions Met, Except Actual Net Fund Growth is 10.0% Annually

(continued)

SCENARIO	DESCRIPTION
10	System as of June 30, 1989; Actuarial Assumptions Same as June 30, 1989, Except Interest Rate Assumption Increased to 7.5% Beginning with the 7/1/91 Valuation; Benefit Changes as Enacted in 1990; Assumptions Met
11	System as of June 30, 1989; Actuarial Assumptions Same as June 30, 1989, Except Interest Rate Assumption Increased to 7.5% Beginning with the 7/1/91 Valuation; Benefit Changes as Enacted in 1990; Assumptions Met, Except Actual Net Fund Growth is 8.0% Annually
12	System as of June 30, 1989; Actuarial Assumptions Same as June 30, 1989, Except Interest Rate Assumption Increased to 7.5% Beginning with the 7/1/91 Valuation; Benefit Changes as Enacted in 1990; Assumptions Met, Except Actual Net Fund Growth is 10.0% Annually

(concluded)

SUMMARY
NUMERICAL RESULTS

LIABILITIES

Year of Project (0 = June 30, 1989)

Scenario	0	1	2	3	4	5	6	7	8	9
1	5,664,567,476	6,278,910,140	6,672,625,576	7,094,967,542	7,538,916,039	8,186,448,594	8,677,237,586	9,174,747,112	9,681,398,203	10,191,822,419
2		(Same as Scenario 1)								
3		(Same as Scenario 1)								
4	5,664,567,476	6,278,910,140	6,672,625,576	7,094,967,542	7,538,916,039	8,186,448,594	8,677,237,586	9,174,747,112	9,681,398,203	10,191,822,419
5		(Same as Scenario 4)								
6		(Same as Scenario 4)								
7	5,664,567,476	6,278,910,140	6,222,347,203	6,616,236,457	7,031,450,625	7,629,785,271	8,089,348,373	8,556,086,194	9,032,072,344	9,512,217,337
8		(Same as Scenario 7)								
9		(Same as Scenario 7)								
10	5,664,567,476	6,278,910,140	5,823,323,553	6,192,515,650	6,582,236,479	7,137,199,936	7,568,939,184	8,008,144,208	8,456,626,405	8,909,465,889
11		(Same as Scenario 10)								
12		(Same as Scenario 10)								

Scenario	10	11	12	13	14	15	16	17	18	19
1	10,717,139,463	11,253,296,965	11,802,852,373	12,362,457,725	12,933,648,446	13,518,743,792	14,105,501,113	14,687,143,414	15,273,750,418	15,871,622,796
2		(Same as Scenario 1)								
3		(Same as Scenario 1)								
4	10,523,617,089	10,857,483,698	11,193,490,134	11,525,388,019	11,852,356,553	12,176,167,613	12,497,176,082	12,813,956,687	13,128,427,591	13,445,998,758
5		(Same as Scenario 4)								
6		(Same as Scenario 4)								
7	9,832,161,234	10,154,076,619	10,477,826,863	10,797,680,132	11,112,945,556	11,424,828,224	11,733,937,817	12,039,350,143	12,342,888,257	12,649,266,192
8		(Same as Scenario 7)								
9		(Same as Scenario 7)								
10	9,322,258,426	9,529,153,388	9,841,640,165	10,150,631,969	10,455,537,187	10,757,065,592	11,055,551,470	11,350,462,156	11,643,610,146	11,939,396,674
11		(Same as Scenario 10)								
12		(Same as Scenario 10)								

SUMMARY
NUMERICAL RESULTS

CONTRIBUTIONS

Year of Project (0 = June 30, 1990)

Scenario	0	1	2	3	4	5	6	7	8	9
1	202,861,620	220,137,993	224,538,551	230,378,416	236,940,031	243,730,526	250,819,378	258,390,866	266,514,976	275,734,500
2		(Same as Scenario 1)								
3		(Same as Scenario 1)								
4	202,861,620	220,137,993	224,538,551	230,378,416	236,940,031	243,730,526	250,819,378	258,390,866	266,514,976	275,734,500
5		(Same as Scenario 4)								
6		(Same as Scenario 4)								
7		(Same as Scenario 4)								
8		(Same as Scenario 4 and 7)								
9		(Same as Scenario 4 and 7)								
10		(Same as Scenario 4 and 7)								
11		(Same as Scenario 4, 7 and 10)								
12		(Same as Scenario 4, 7 and 10)								

Scenario	10	11	12	13	14	15	16	17	18	19
1	286,757,219	296,714,904	307,170,302	318,569,906	330,322,056	342,199,784	355,891,943	370,463,360	385,381,130	401,184,489
2		(Same as Scenario 1)								
3		(Same as Scenario 1)								
4	283,007,543	291,575,516	301,028,535	311,124,205	320,682,337	330,218,975	342,222,546	355,717,913	370,229,220	386,123,664
5		(Same as Scenario 4)								
6		(Same as Scenario 4)								
7		(Same as Scenario 4)								
8		(Same as Scenario 4 and 7)								
9		(Same as Scenario 4 and 7)								
10		(Same as Scenario 4 and 7)								
11		(Same as Scenario 4, 7 and 10)								
12		(Same as Scenario 4, 7 and 10)								

SUMMARY

NUMERICAL RESULTS

PAYOUTS

Year of Project (0 = June 30, 1990)

Scenario	0	1	2	3	4	5	6	7	8	9
1	171,373,783	188,384,010	202,843,342	220,588,481	240,628,204	261,724,870	284,483,117	308,049,298	334,305,953	361,342,096
2		(Same as Scenario 1)								
3		(Same as Scenario 1)								
4	171,373,783	188,384,010	202,843,342	220,588,481	240,628,204	261,724,870	284,483,117	308,049,298	334,305,953	361,342,096
5		(Same as Scenario 4)								
6		(Same as Scenario 4)								
7		(Same as Scenario 4)								
8		(Same as Scenario 4 and 7)								
9		(Same as Scenario 4 and 7)								
10		(Same as Scenario 4 and 7)								
11		(Same as Scenario 4, 7 and 10)								
12		(Same as Scenario 4, 7 and 10)								

Scenario	10	11	12	13	14	15	16	17	18	19
1	387,734,617	416,171,451	445,304,443	474,271,690	503,314,000	533,823,108	563,347,524	589,880,457	615,423,170	643,241,001
2		(Same as Scenario 1)								
3		(Same as Scenario 1)								
4	386,793,800	414,154,738	442,139,652	470,013,364	497,911,195	526,945,297	555,343,322	581,175,089	605,592,701	631,761,356
5		(Same as Scenario 4)								
6		(Same as Scenario 4)								
7		(Same as Scenario 4)								
8		(Same as Scenario 4 and 7)								
9		(Same as Scenario 4 and 7)								
10		(Same as Scenario 4 and 7)								
11		(Same as Scenario 4, 7 and 10)								
12		(Same as Scenario 4, 7 and 10)								

SUMMARY
NUMERICAL RESULTS

ACTUARIAL ASSETS

Year of Project (0 = June 30, 1989)

Scenario	0	1	2	3	4	5	6	7	8	9
1	4,380,355,689	4,829,933,406	5,164,883,398	5,510,485,901	5,865,503,603	6,228,903,743	6,600,357,414	6,978,962,372	7,364,831,130	7,756,211,761
2	4,380,355,689	4,829,933,406	5,237,570,554	5,666,478,620	6,116,394,467	6,587,318,987	7,080,027,646	7,594,799,766	8,133,015,838	8,694,278,910
3	4,380,355,689	4,829,933,406	5,334,486,762	5,877,860,980	6,461,919,770	7,088,996,777	7,762,436,295	8,485,348,378	9,262,237,625	10,096,146,839
4	4,380,355,689	4,829,933,406	5,164,883,398	5,510,485,901	5,865,503,603	6,228,903,743	6,600,357,414	6,978,962,372	7,364,831,130	7,756,211,761
5	4,380,355,689	4,829,933,406	5,237,570,554	5,666,478,620	6,116,394,467	6,587,318,987	7,080,027,646	7,594,799,766	8,133,015,838	8,694,278,910
6	4,380,355,689	4,829,933,406	5,334,486,762	5,877,860,980	6,461,919,770	7,088,996,777	7,762,436,295	8,485,348,378	9,262,237,625	10,096,146,839
7	4,380,355,689	4,829,933,406	5,164,883,398	5,536,364,556	5,920,718,911	6,317,191,989	6,725,748,794	7,145,797,994	7,577,782,240	8,020,298,224
8		(Same as Scenario 5)								
9		(Same as Scenario 6)								
10	4,380,355,689	4,829,933,406	5,164,883,398	5,562,243,211	5,976,193,005	6,406,310,066	6,852,913,465	7,315,790,271	7,795,788,797	8,291,938,693
11		(Same as Scenario 5 and 8)								
12		(Same as Scenario 6 and 9)								

Scenario	10	11	12	13	14	15	16	17	18	19
1	8,153,775,425	8,560,435,645	8,973,552,684	9,393,325,935	9,821,318,197	10,258,331,127	10,703,545,493	11,160,365,277	11,633,515,270	12,125,401,313
2	9,280,712,931	9,896,823,577	10,541,689,486	11,217,344,692	11,927,342,542	12,674,647,704	13,460,772,555	14,291,653,316	15,174,803,627	16,115,687,576
3	10,992,993,420	11,961,512,039	13,005,459,323	14,132,016,421	15,350,441,977	16,670,027,815	18,099,276,638	19,651,871,694	21,343,962,301	23,190,619,452
4	8,153,775,425	8,557,535,498	8,967,245,667	9,383,547,848	9,807,633,126	10,239,409,282	10,678,162,727	11,127,534,082	11,592,379,330	12,076,179,421
5	9,280,712,931	9,893,902,364	10,535,292,837	11,207,353,049	11,913,256,682	12,655,056,756	13,434,346,395	14,257,274,112	15,131,461,164	16,063,430,102
6	10,992,993,420	11,958,562,738	12,998,942,182	14,121,734,775	15,335,805,986	16,649,508,737	18,071,388,542	19,615,302,110	21,297,466,816	23,133,979,897
7	8,474,386,807	8,940,457,866	9,418,687,985	9,910,171,695	10,416,587,911	10,938,368,086	11,475,355,959	12,031,794,467	12,613,203,448	13,223,793,067
8		(Same as Scenario 5)								
9		(Same as Scenario 6)								
10	8,805,744,503	9,338,117,142	9,889,772,230	10,462,385,751	11,058,267,229	11,678,529,861	12,323,749,569	12,998,964,788	13,710,572,532	14,463,747,702
11		(Same as Scenario 5 and 8)								
12		(Same as Scenario 6 and 9)								

SUMMARY
NUMERICAL RESULTS

REQUIRED CONTRIBUTION RATES

Year of Project (0 = June 30, 1990)

Scenario	0	1	2	3	4	5	6	7	8	9
1	7.864%	8.325%	8.647%	9.062%	9.546%	10.977%	11.408%	11.748%	12.011%	11.760%
2	7.864%	8.325%	8.236%	8.185%	8.143%	9.011%	8.839%	8.547%	8.155%	7.231%
3	7.864%	8.325%	7.688%	6.997%	6.212%	6.259%	5.184%	3.918%	2.488%	.462%
4	7.864%	8.325%	8.647%	9.062%	9.546%	10.977%	11.408%	11.748%	12.011%	11.760%
5	7.864%	8.325%	8.236%	8.185%	8.143%	9.011%	8.839%	8.547%	8.155%	7.231%
6	7.864%	8.325%	7.688%	6.997%	6.212%	6.259%	5.184%	3.918%	2.488%	.462%
7	7.864%	8.325%	6.283%	6.412%	6.594%	7.664%	7.818%	7.898%	7.846%	7.429%
8	7.864%	8.325%	5.859%	5.658%	5.466%	6.136%	5.861%	5.491%	4.999%	4.073%
9	7.864%	8.325%	5.294%	4.432%	3.474%	3.297%	2.092%	.716%	.000%	.000%
10	7.864%	8.325%	4.068%	3.913%	3.755%	4.460%	4.326%	4.130%	3.887%	3.168%
11	7.864%	8.325%	3.631%	3.290%	2.931%	3.414%	3.045%	2.603%	2.105%	1.104%
12	7.864%	8.325%	3.048%	2.027%	.898%	.517%	.000%	.000%	.000%	.000%

Scenario	10	11	12	13	14	15	16	17	18	19
1	11.953%	12.088%	12.195%	12.300%	12.443%	12.641%	12.870%	13.131%	13.423%	13.721%
2	6.698%	6.089%	5.436%	4.744%	4.023%	3.273%	2.439%	1.472%	.365%	.000%
3	.000%	.000%	.000%	.000%	.000%	.000%	.000%	.000%	.000%	.000%
4	11.105%	10.433%	9.753%	9.074%	8.407%	7.758%	7.136%	6.533%	5.910%	5.249%
5	5.824%	4.371%	2.884%	1.347%	.000%	.000%	.000%	.000%	.000%	.000%
6	.000%	.000%	.000%	.000%	.000%	.000%	.000%	.000%	.000%	.000%
7	6.560%	5.675%	4.783%	3.875%	2.950%	2.007%	1.045%	.030%	.000%	.000%
8	2.664%	1.217%	.000%	.000%	.000%	.000%	.000%	.000%	.000%	.000%
9	.000%	.000%	.000%	.000%	.000%	.000%	.000%	.000%	.000%	.000%
10	2.571%	.920%	.000%	.000%	.000%	.000%	.000%	.000%	.000%	.000%
11	.207%	.000%	.000%	.000%	.000%	.000%	.000%	.000%	.000%	.000%
12	.000%	.000%	.000%	.000%	.000%	.000%	.000%	.000%	.000%	.000%

NOTE: At any point in time, the required contribution rate is determined as if prior contributions had always been made at the current total of 9.45%.

APPENDIX

SECTION II

THE ACTUARIAL VALUATION

Sound financing of any retirement system requires that benefits accruing to its members shall be paid for during their active working lifetime so that when a member (or his beneficiary) becomes entitled to a benefit, the monies necessary to provide such benefit shall be on hand. In this way, the cost of benefits for present active members will not become a liability to future taxpayers.

The principal purpose of an actuarial valuation is to calculate, on the basis of certain assumptions, the present value of benefits that are payable in the future from the system to present members (and their dependents) and the present value of future contributions to be made by the members and their employers. Having calculated such present values, the level of annual contribution to the system required to fund (or pay for) the benefits, in accordance with the above stated principle of sound financing, may be determined.

The assumptions and methods used in the actuarial valuation and the resulting liabilities are presented in this Section II.

PART A - VALUATION ASSUMPTIONS

The determination of the present value of future benefits and contributions requires that certain rates of future interest earnings, salary changes, mortality, termination of employment and retirement be assumed. The assumptions made as to these rates are as follows, based on a five year experience study conducted by Milliman & Robertson, Inc. in 1984:

1. Rate of Interest - 6.5% per annum, compounded annually.

2. Rates of Mortality - 1977 IPERS Unisex Mortality Table is used for active, vested and retired members.

Age	Annual Rate of Death per 1,000 Members	Age	Annual Rate of Death per 1,000 Members
20	.325	55	4.634
25	.412	60	7.138
30	.539	65	11.813
35	.738	70	19.947
40	1.054	75	33.635
45	1.684	80	56.338
50	2.888	85	89.208

3. Rate of Withdrawal - For determining the present value of retirement allowances and termination benefits payable in the future to current active members and for determining the present value of future covered payroll for current active members, the withdrawal rates are as follows:

Age	Annual Rate of Withdrawals Per 1,000 Members
22	388.0
27	196.6
32	146.1
37	114.2
42	95.7
47	84.5
52	64.5
55 & Over	0.0

4. Rate of Salary Increase - For determining the present value of retirement allowances and termination benefits payable in the future to current active members and for determining the present value of future covered payroll for current active members, the rates of salary increases are as follows:

Age	Increase to Adjust Current Earnings to the Final Three Year Average Earnings
22	19.912934
27	12.591826
32	8.335803
37	5.779544
42	4.120738
47	2.938030
52	2.094774
57	1.514667

5. Retirement Rates -

(a) Upon meeting the requirements for early retirement (but not for unreduced benefits), the following rates apply:

Age	Annual Rate of Retirement Per 100 Members
55-60	5
61	10
62	25
63	15
64	20
65	50
66 & Over	100

5. Retirement Rates - (continued)

(b) Upon reaching the requirements for unreduced retirement benefits, the following rates apply in the first year of eligibility:

Age	Annual Rate of Retirement Per 100 Members
59 and below	10
60-61	15
62	25
63-64	20
65	50
66	100

After the initial year of eligibility, the probability of retiring at each age is 50%, except for age 66 for which it is 100%.

6. Age of Spouses For Joint and Survivor Retirees - The male of the couple is assumed to be three years older than the female.

7. Rate of Crediting Interest on Contribution Balances - 9.0% per annum, compounded annually.

8. Valuation of Assets - For actuarial purposes, assets are valued at book value plus the average difference (averaged over the last 120 months) of market value of equities less book value of equities.

PART B - VALUATION FACTORS AND METHODS

1. Valuation Factors - On the basis of the foregoing valuation assumptions, the following factors were prepared for each age, separately for males and females.

(a) The present value of $1 of immediate monthly annuity payable according to the appropriate form of benefit payment.

(b) The present value of $1 of deferred monthly life annuity, with the first monthly annuity payment at age 66.

(c) The present value of future covered salary payable each year from the present age to age 66.

(d) The present value of a refund of past and expected future contributions payable in the event of death, with interest on such contributions to the date of death.

(e) The present value of a refund of past and expected future contributions payable in the event of withdrawal, with interest on such contributions to the date of withdrawal.

(f) The present value of an immediate payment of $1 payable in the event of death.

2. Application of Factors to Date - The total present value of future benefits and contributions was determined by multiplying

(a) the appropriate factor or combination of factors from (1)(a) through (f) above, for each age separately for males and females, times

(b) the data derived from IPERS master file (see summarized schedules in the Appendix)

and summing the products so obtained. The resulting present value of future benefits and contributions is summarized in the valuation balance sheet on page 5.

SECTION III

SUMMARY OF SYSTEM PROVISIONS

Chapter 97B of the Iowa code sets out the IPERS provisions, which are briefly summarized as follows (the special provisions applicable to certain peace officer groups are not reflected in this summary):

Participation:	In general, the System covers people in non-federal public employment within the State of Iowa. Exceptions to this are set out in the law. A notable exception are those covered by another public system in Iowa (such as judges, state patrol, and policemen and firemen in cities having civil service). Membership is mandatory if a person is in covered employment.
Final Average Salary:	The average of covered salaries for the highest paid three years of the member's service.
Covered Salary:	$26,000 a year starting January 1, 1989, $28,000 starting January 1, 1990, then increasing $3,000 each January 1 thereafter.
Age and Service Requirements for Benefits:	
Normal Retirement	First day of the month of the member's 65th birthday.
Early Retirement	First day of any month starting with the month of the member's 55th birthday but preceding the normal retirement date.
Late Retirement	After the normal retirement date.
Deferred Vested Benefit	Before age 55 with at least four years of service.
Death Benefit	Upon death of a member before benefits have started.
Retirement Benefits:	
Normal Retirement	An annual annuity equal to 50% of Final Average Salary if the member has 30 or more years of service (either prior or membership service). Beginning July 1, 1990, the percentage will increase 2% per year until a rate of 60% is reached. With less than 30 years of service, the benefit is multiplied by a fraction equal to the actual years of service divided by 30.

Retirement Benefits: (continued)

Early Retirement	An annuity, payable at the normal retirement date, determined in the same manner as for normal retirement. Benefits can be started at age 55 or over with no reduction when the sum of attained age and service equals or exceeds 92. Otherwise, a reduction of .25% per month for each month preceding age 65 is applied to the benefit.
Late Retirement	An annuity, payable after covered employment ends, determined as for normal retirement.
Form of Annuity:	The base form, or normal form, is a life annuity with a guaranteed return of employee contributions. Optional forms include a straight life annuity, a ten year certain and life thereafter annuity, and joint and survivor annuities (with 25%, 50% or 100% to the surviving joint annuitant).
Termination Benefits:	
Before Age 55, with less than four years of service	A refund of the members contributions under the plan with interest.
Before Age 55 with four or more years of service	At the member's election either
	(1) a refund of the employee's contributions under the plan with interest, or
Before Age 55 with four or more years of service	(2) a deferred retirement income determined as for normal retirement. Payments can be started in accordance with normal or early retirement.
Death Benefits:	A lump sum equal to the member's contributions with interest, plus 1/30 of the member's salary times years of service up to 30 years. Alternatively, the beneficiary can elect an annuity which is the actuarial equivalent of the lump sum.
Source of Funds:	
Member Contributions	3.7% of covered pay.
Employer Contributions	5.75% of covered pay.