Pension Obligation Bond Proposal

Data compiled by Professor Runhuan Feng (University of Illinois) in conjunction with State Universities Annuitants Association

Updated on Jan 27, 2018

Solution D: Serial bonds with partial funding earmarked for debt services

- Issue 27-year fixed rate serial bonds in 2018 to the fund the UAAL of 2018.
- All bond proceeds are to be allocated to retirement systems in order to reach 90% funded ratio immediately in 2018.
- 35.82% of allocation in each system is to be designated as a special investment fund (for debt services) until 2045.
- State's pension funding cost for each of the FY 2018 through 2045 consists of two parts:
 - Normal costs for all retirement systems;
 - Annual payments to special investment funds.

Updated on Jan 27, 2018

2

Statutory Funding Plan

- Pension Funding Act was enacted in 1994 to create a 50-year schedule of State contributions designed to achieve a 90% funded ratio by the end of FY 2045.
- Part I: A ramp-up period of increasing State contributions as a percentage of payroll in each of FY 1996 to 2010.
- Part II: A period of contributions equal to the constant percent of payroll necessary to allow retirement systems to reach 90% funded ratio.

THE EDGAR RAMP

Set artificially low in the '90s, required payments to the state pension funds accelerated dramatically in 2012 and will stay high for the next three decades.

PENSION COSTS AS A PERCENTAGE OF TOTAL GENERAL FUNDS



Problems with SFP: #1

- For the plan's first 15 years, the contributions were set artificially low, less than actuarially required annual contributions.
- Instead of addressing the inadequate pension funding right away, the SFP effectively ignored the problem and made it worse by design for the first 15 years.

Problems with SFP: #2

Static assumption: during the ramp-up period, the SFP required that the percentage of payroll contributed by the State increase by an equal amount in each year such that by FY 2010 the contribution percentage of payroll was equal to to the same percentage of payroll required to be contributed for FY 2011 through 2045.



Problems with SFP: #2

Reality check: the constant percent of payroll is revised and adjusted each year due to modifications to the actuarial assumptions and changes in asset values.



Projected State contribution as a percentage of payroll

	2011 projection	2013 projection	2015 projection	2016 projection
2015	29.7%	36.2%	35.9%	-
2025	29.5%	35.9%	35.2%	41.6%
2035	31.5%	36.3%	37.0%	44.5%
2045	31.5%	36.6%	37.1%	44.5%



Lessons from 2003 Pension Obligation Bond

- 10 billions funded:
 - approximately 25% of FY 2003 required annual statutory contribution;
 - all of its FY 2004 required annual statutory contribution;
 - o a portion of the UAAL in FY 2004.
- Were the bonds a good deal for the pension systems?

From an investment point of view

- It was a good deal!
- Take the SURS allocations of bond proceeds and debt services for example.
 - The interest cost on the bonds was 5.05%.
 - If SURS allocations from 2004 and 2033 are viewed as a stand-alone bond, the effective annual rate of return is 7.51%.
 - Consider SURS actual investment returns on POB proceeds from 2004 and 2015, its realized rate of return is 9.31%.

From a liability point of view

- It was a terrible deal!
- 2003 Pension Bond Act also provided that the State's required annual statutory contributions be reduced each year by the State's debt service payments allocated among the retirement systems. (Who pays debt service?)
- the State effectively evaded its liabilities for the required annual statutory contributions.
 - 2003 & 2004 contributions as well as reductions in subsequent years' contributions were supposed to be State's obligations according to the SFP.
 - 2003 & 2004 contributions as well as the 2004 reduction in UAAL were effectively paid by the retirement systems' own debts.
 - The net outcomes were that the State missed or reduced its contributions and the retirement systems only got to earn some interests.

2010 & 2011 POBs

- 2010 Pension Bond Act and 2011 Pension Bond Act did not provide that the required annual statutory contributions be reduced by the debt service payments on the 2010 and 2011 POBs.
- They were still terrible because again the bond proceeds were used to fund portions of the State's 2010 and 2011 contributions.

Solution D: Assumptions

- Target funded ratio:
 90% for all retirement systems by 2018
- Total bond sale: 107.42 billions
- The same assumptions on serials bonds and investment fund investment return
- Optimization objective: minimal initial investment of the designated fund to cap annual state appropriation at 8.5 billions
- Stress tests under two scenarios:
 - Historic rate of return
 Average rate of return on 2003 POB: 7.62%
 - Adverse scenario

SURS rates of return from 2008 to 2012: -4.5%,-19.7%,15.0%, 23.8% and 0.5%. The rest of return rates are assumed to be 7%.

Comparison with 2003 POB

	2003 POB	Proposed 2018 POB
Principle	10 billions	107 billions
Funded ratio	48.6%->60.9%	39.9% -> ~90%
UAAL	42.1 -> 35.1 b	128.9 -> ~ 21.4 b
Reduced state contributions?	Yes, 2003 & 2004 (followed by pension holidays in 2005-2007)	Not permitted under the proposal.
Budgetary uncertainty?	Yes. All subsequent state contributions were determined by a constant percentage of payroll through 2045.	No. Projections of annual state contributions are no longer needed.

Data compiled by Professor Runhuan Feng (University of Illinois) in conjunction with State Universities Annuitants Association

Solution D: Assumptions

Maturity EOY	Coupon rate	Nominal Yield
2019	5.50%	2.74%
2020	5.50%	2.99%
2021	5.50%	3.18%
2022	5.50%	3.38%
2023	5.50%	3.55%
2024	5.50%	3.79%
2025	5.50%	3.95%
2026	5.50%	4.10%
2027	5.50%	4.20%
2028	5.50%	4.30%
2029	5.50%	4.40%
2030	5.50%	4.49%
2031	5.50%	4.55%
2032	5.50%	4.75%
2033	5.50%	4.69%
2034	5.50%	4.80%
2035	5.50%	4.84%
2036	5.50%	4.87%
2037	5.50%	4.98%
2038	5.50%	4.90%
2039	5.50%	4.93%
2040	5.50%	5.11%
2041	5.50%	4.97%
2042	5.50%	4.98%
2043	5.50%	5.50%
2044	5.50%	5.50%
2045	5.50%	5.50%

Make-up of serial bonds



Data compiled by Professor Runhuan Feng (University of Illinois) in conjunction with State Universities Annuitants Association

Comparison

The state is expected to make annual appropriation of 8.5 billions.



Data compiled by Professor Runhuan Feng (University of Illinois) in conjunction with State Universities Annuitants Association

CoGFA Mar 2016 Projected Costs under the SFP versus Pension Funding Costs under Solution D

Fiscal	Tier 1	Tier 2	Total	CoGFA Mar-16	Annual Contribution	
Year	Normal Cost	Normal Cost	Normal Cost	Projected Contribution	Under Solution D	
2018	3,228.1	392.4	3,620.5	8,013.8	8,500.0	
2019	3,175.6	474.0	3,649.6	8,155.0	8,500.0	
2020	3,119.7	557.6	3,677.3	8,326.0	8,500.0	
2021	3,059.6	645.0	3,704.6	8,592.3	8,500.0	
2022	2,996.6	735.8	3,732.4	8,831.8	8,500.0	
2023	2,930.5	830.7	3,761.2	9,084.1	8,500.0	
2024	2,857.8	929.5	3,787.3	9,329.6	8,500.0	
2025	2,779.2	1,033.0	3,812.2	9,585.3	8,500.0	
2026	2,694.5	1,140.0	3,834.5	9,875.3	8,500.0	
2027	2,604.5	1,252.6	3,857.1	10,178.3	8,500.0	
2028	2,508.7	1,368.7	3,877.4	10,471.7	8,500.0	
2029	2,406.1	1,488.5	3,894.6	10,779.7	8,500.0	
2030	2,298.1	1,612.8	3,910.9	11,077.1	8,500.0	
2031	2,181.7	1,741.3	3,923.0	11,391.5	8,500.0	
2032	2,058.1	1,874.0	3,932.1	11,744.7	8,500.0	
2033	1,927.0	2,010.8	3,937.8	12,133.7	8,500.0	
2034	1,786.3	2,151.1	3,937.4	13,232.1	8,500.0	
2035	1,635.9	2,295.6	3,931.5	13,612.3	8,500.0	
2036	1,480.2	2,442.7	3,922.9	13,993.7	8,500.0	
2037	1,324.0	2,591.3	3,915.3	14,373.9	8,500.0	
2038	1,165.6	2,742.3	3,907.9	14,751.6	8,500.0	
2039	1,003.9	2,895.3	3,899.2	15,124.7	8,500.0	
2040	843.1	3,050.5	3,893.6	15,493.9	8,500.0	
2041	688.9	3,206.0	3,894.9	15,860.2	8,500.0	
2042	544.8	3,360.5	3,905.3	16,226.1	8,500.0	
2043	415.1	3,513.8	3,928.9	16,593.6	8,500.0	
2044			*3,926.4	16,962.2	8,500.0	
2045			*3,952.4	17,333.7	8,500.0	
Total				341,127.9	238,000.0	

All monetary amounts are represented in millions.

CoGFA's current projection of total state contributions up to 2045 is 341 billions under the SFP, whereas the total cost under solution D is 238 billions. The total saving for the state is 103 billions.

Annual Contribution under Solution D

			Total Debt	Deposit to		
Fiscal Year	Principal	Interest	Service	Fund	Normal Cost	Total Contribution
2018	0	0	0	4,880	3,621	8,500
2019	0	5,501	5,501	4,850	3,650	8,500
2020	0	5,501	5,501	4,823	3,677	8,500
2021	0	5,501	5,501	4,795	3,705	8,500
2022	0	5,501	5,501	4,768	3,732	8,500
2023	0	5,501	5,501	4,739	3,761	8,500
2024	0	5,501	5,501	4,713	3,787	8,500
2025	0	5,501	5,501	4,688	3,812	8,500
2026	0	5,501	5,501	4,666	3,835	8,500
2027	0	5,501	5,501	4,643	3,857	8,500
2028	0	5,501	5,501	4,623	3,877	8,500
2029	0	5,501	5,501	4,605	3,895	8,500
2030	0	5,501	5,501	4,589	3,911	8,500
2031	0	5,501	5,501	4,577	3,923	8,500
2032	0	5,501	5,501	4,568	3,932	8,500
2033	0	5,501	5,501	4,562	3,938	8,500
2034	0	5,501	5,501	4,563	3,937	8,500
2035	26	5,501	5,528	4,569	3,932	8,500
2036	20,000	5,500	25,500	4,577	3,923	8,500
2037	0	4,400	4,400	4,585	3,915	8,500
2038	20,000	4,400	24,400	4,592	3,908	8,500
2039	20,000	3,300	23,300	4,601	3,899	8,500
2040	0	2,200	2,200	4,606	3,894	8,500
2041	20,000	2,200	22,200	4,605	3,895	8,500
2042	20,000	1,100	21,100	4,595	3,905	8,500
2043	0	0	0	4,571	3,929	8,500
2044	0	0	0	4,574	3,926	8,500
2045	0	0	0	4,548	3,952	8,500

Comparison of total balance under historic return and adverse scenario



Data compiled by Professor Runhuan Feng (University of Illinois) in conjunction with State Universities Annuitants Association

Scenario test

Historic return scenario v.s. adverse scenario

	Historic rate of return on			
Fiscal Year	POB	Total balance	Adverse Scenario	Total balance
2018		43,358,507,541		43,358,507,541
2019	7.62%	46,011,371,815	-4.50%	40,756,320,701
2020	7.62%	48,838,684,348	-19.70%	32,048,571,523
2021	7.62%	51,854,138,095	15.00%	36,149,803,252
2022	7.62%	55,071,569,418	23.80%	44,019,602,426
2023	7.62%	58,505,369,008	0.50%	43,477,046,438
2024	7.62%	62,174,724,126	7.00%	45,731,685,689
2025	7.62%	66,098,784,105	7.00%	48,119,249,687
2026	7.62%	70,299,557,453	7.00%	50,651,643,165
2027	7.62%	74,797,829,731	7.00%	53,338,704,187
2028	7.62%	79,618,570,357	7.00%	56,193,559,480
2029	7.62%	84,789,451,418	7.00%	59,231,054,643
2030	7.62%	90,338,053,616	7.00%	62,464,874,468
2031	7.62%	96,297,359,301	7.00%	65,912,961,680
2032	7.62%	102,701,664,079	7.00%	69,593,314,998
2033	7.62%	109,588,276,879	7.00%	73,525,593,044
2034	7.62%	117,000,049,576	7.00%	77,733,530,557
2035	7.62%	124,956,066,615	7.00%	82,215,490,957
2036	7.62%	113,554,818,696	7.00%	67,047,675,129
2037	7.62%	122,392,395,678	7.00%	71,925,712,185
2038	7.62%	111,910,796,037	7.00%	57,152,611,847
2039	7.62%	101,739,198,497	7.00%	42,454,094,478
2040	7.62%	111,898,121,603	7.00%	47,832,277,272
2041	7.62%	102,829,858,470	7.00%	33,585,636,681
2042	7.62%	94,160,193,685	7.00%	19,431,331,249
2043	7.62%	105,906,300,444	7.00%	25,362,624,436
2044	7.62%	118,549,973,738	7.00%	31,711,621,347
2045	7.62%	132,131,054,436	7.00%	38,479,007,541

Data compiled by Professor Runhuan Feng (University of Illinois) in conjunction with State Universities Annuitants Association