

**WISCONSIN RETIREMENT SYSTEM
SUPPLEMENTAL ACTUARIAL VALUATIONS OF**

**Enhancements to Hybrid Plan Features of the
Wisconsin Retirement System and a
Separate Optional Retirement System for
University of Wisconsin Employees**

**PREPARED FOR THE
JOINT SURVEY COMMITTEE ON RETIREMENT SYSTEMS
DECEMBER 21, 1998**



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December 21, 1998

Wisconsin Joint Survey Committee
on Retirement Systems
Madison, Wisconsin

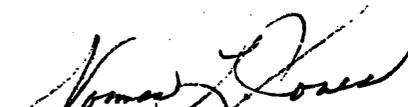
Ladies and Gentlemen:

Presented in this report are the results of supplemental actuarial valuations to measure the potential financial effects of a University of Wisconsin Optional Retirement System (UWORS) on the Wisconsin Retirement System (WRS) as proposed in 1997 Assembly Bill 331, and certain alternative enhancements to WRS benefits which were submitted for analysis by the Joint Survey Committee on Retirement Systems. The objective of the study was to explore ways in which additional defined contribution/hybrid plan features might feasibly be extended to some or all of the covered groups within WRS.

Valuations were based upon active and inactive participant data and financial information used in the last regular annual actuarial valuation of the Wisconsin Retirement System as of December 31, 1997, and supplementary participant information furnished by the University of Wisconsin. Participant data is summarized on the following page.

Actuarial methods and assumptions, except where otherwise noted in the Appendix, were the same as those used in the last regular annual actuarial valuation of the Wisconsin Retirement System as of December 31, 1997. Actuarial valuations were conducted in accordance with standards of practice prescribed by the Actuarial Standards Board and Wisconsin Statutes.

Respectfully submitted,
Gabriel, Roeder, Smith and Company


Norman L. Jones, F.S.A.


Brad L. Armstrong, A.S.A.

NLJBLA:ct

Wisconsin Retirement System
Active Participants Included in Valuations
December 31, 1997

Valuation Group	Number	Annual Earnings (\$ millions)	Group Averages		
			Earnings	Age	Years of Service
General	222,888	\$7,128.0	\$31,980	44.1	11.3
Executive Group & Elected Officials	1,455	71.1	48,881	52.0	11.5
Protective Occupation with Social Security	14,232	535.5	37,625	38.3	11.3
Protective Occupation without Social Security	2,654	120.9	45,568	40.2	13.9
Total Active Participants	241,229	\$7,855.5	\$32,565	43.8	11.3
Prior Year	237,169	7,510.0	31,665	43.6	11.3

Active participants for the University of Wisconsin totaled 15,495 with an annual payroll totalling \$696.0 million. They are included in the General Valuation Group above and separately identified below:

Valuation Group	Number	Annual Earnings (\$ millions)	Group Averages		
			Earnings	Age	Years of Service
Academic Staff hired before age 45	8,189	\$301.3	\$36,795	41.8	10.0
Academic Staff hired after age 44	1,168	35.4	30,307	54.6	4.9
Subtotal	9,357	336.7	35,985	43.4	9.4
Faculty hired before age 45	5,674	332.7	58,639	49.0	16.1
Faculty hired after age 44	464	26.6	57,246	56.2	7.5
Subtotal	6,138	359.3	58,533	49.5	15.4
Total University of Wisconsin	15,495	\$696.0	\$44,917	45.9	11.8

Section I

University of Wisconsin
Optional Retirement System

**UNIVERSITY OF WISCONSIN OPTIONAL RETIREMENT SYSTEM (UWORS)
AS PROVIDED IN 1997 ASSEMBLY BILL 331
SUMMARY OF PROVISIONS**

Effective Date. Upon establishment of a plan by the Regents of the University of Wisconsin after the effective date of the act.

Eligible Employees. University of Wisconsin faculty and academic staff members hired after the establishment of the plan.

Participation. Eligible employees have 60 days after the date of their appointment to elect to transfer from the Wisconsin Retirement System (WRS) and participate in UWORS. Eligible employees who do not elect UWORS remain regular members of the Wisconsin Retirement System.

Benefits. UWORS would be a defined contribution plan to which contributions are made on the behalf of participants. The amount of employer contributions would be the required employer normal cost contributions that would have been made if the participants were in WRS.

Vesting. UWORS participant balances are 100% vested from inception.

WRS UAAL. The University of Wisconsin would make unfunded actuarial accrued liability contributions to WRS in the same manner as if UWORS participants were in WRS.

UNIVERSITY OF WISCONSIN OPTIONAL RETIREMENT SYSTEM (UWORS) ACTUARIAL METHODOLOGY USED TO MEASURE EXPECTED FINANCIAL EFFECT

Cost Method. The best measure of the long term value of benefit costs in a defined benefit pension plan is represented by the entry age normal cost (EANC) benefit accrual rate. The EANC differs slightly from the current WRS normal cost rate due to the operation of the Experience Amortization Reserve. This short term difference was not considered to be germane to the long term measurements of this proposal.

Actuarial Assumptions. In general, assumptions used in this proposal valuation were the same as those used in the last regular actuarial valuation of the Wisconsin Retirement System. At the request of the Research Director, withdrawal rates and probabilities of retirement were modified to more closely reflect actual observed experience for UW personnel during the 1994-96 experience measurement period. Modified assumptions are shown on pages 13-14 of this report.

UWORS Election Pattern. The actual long term financial effect of the proposal will depend on the emerging UWORS election pattern among future academic staff and faculty members. A pure defined contribution plan is generally more advantageous to employees hired at young ages and, conversely, a defined benefit plan is generally more advantageous to those hired at older ages. It is expected that employees will generally select the plan that is in their personal financial best interest. For the purposes of this study it was assumed that employees hired before age 45 would elect UWORS and that those hired at age 45 or later would elect WRS coverage*. It was further assumed that the age characteristics of future UW staff members would mirror the entry age characteristics of present UW staff members.

Not all new hires will select the program that ultimately is the best value to them. However, any resulting savings is assumed to be offset by other anti-selection that will inevitably occur (e.g., added termination benefits for those post-age 45 new hires who elect UWORS and then quit and elect a lump sum termination benefit).

* Results would not be materially different if the break point had been set anywhere between 40 and 45.

**ULTIMATE EXPECTED EFFECT ON CONTRIBUTION RATES
IF ACADEMIC STAFF AND FACULTY APPOINTED BEFORE AGE 45
ELECT TO PARTICIPATE IN UWORS**

WRS Entry Age Normal Costs for	EANC Expressed as a % of Covered Payroll		
	Present	Ultimate After UWORS	Change
University of Wisconsin Participants			
Academic Staff hired before age 45	9.4%	- %	
Academic Staff hired after age 44	12.4	12.4	
Faculty hired before age 45	9.7	-	
Faculty hired after age 44	11.8	11.8	
UW weighted average	9.8	12.1	
Other General Participants	11.7	11.7	
WRS General Valuation Group	11.5%	11.7%	+0.2%*

* 0.2% of payroll translates to \$14.6 million in year 2000 dollars.

- Comments:**
1. The full effect on normal cost rates would emerge over the next 30 years, fairly rapidly in the earlier years and more slowly in the later years. Thirty years is approximately the period needed for nearly complete replacement of the present population of UW employees by new employees who would be offered the Optional Retirement Plan.
 2. The normal cost rates for the various classes of UW participants were based upon historical hiring patterns excluding the last 10 years.

UNIVERSITY OF WISCONSIN OPTIONAL RETIREMENT SYSTEM COMMENTS AND CONCLUSIONS

- Adoption of UWORS is expected to increase the ultimate normal cost rate for remaining WRS participants by approximately 0.2% of covered payroll. The ultimate financial effect would emerge over approximately the next 30 years.
- UWORS participants would collectively enjoy an increase in the value of their benefits of nearly 2% of payroll (the difference between the WRS total normal cost rate and that of UW staff hired before age 45).
- An initial UWORS contribution rate of 9.6% of payroll would be approximately cost-neutral in total (the average of 9.4% for Academic Staff and 9.7% for Faculty). However, in order to avoid cost shifting to other WRS employees, the difference between (i) the WRS 11.5% EANC rate and (ii) the 9.6% UWORS rate would have to be paid to WRS in addition to the ongoing contributions to finance unfunded actuarial accrued liabilities. In addition, periodic reassessment based on emerging election patterns would be needed if a high level of cost neutrality was considered to be essential.
- If the program is not implemented in a cost-neutral manner, increased costs would be divided between remaining WRS members and employers as they emerged.
- An exact measurement of the amount of the employer contribution that would otherwise have been paid under sec. 40.05(2)(a) if UWORS participants were in WRS would require regular annual combined actuarial valuations of WRS and UWORS participants.
- If a similar optional program for a larger segment of the WRS participants were eventually offered, the financial effects would very likely be significantly larger than those measured in this study.

Note: Adoption of the proposal would create a number of administrative requirements, the analysis of which were beyond the scope of this study.

**UNIVERSITY OF WISCONSIN ACADEMIC STAFF AND FACULTY
10 YEAR CLOSED GROUP POPULATION PROJECTION**

Academic Staff

Year	Beginning Number Active	Normal and Early Retirement	Terminated Vested	Disability Retirement	Terminated and Refunded	Deaths	Total Terminations
1998	9,357	139	78	7	653	7	884
1999	8,473	143	79	7	470	7	706
2000	7,767	152	81	8	339	7	587
2001	7,180	166	81	8	242	8	505
2002	6,675	180	80	8	170	8	446
2003	6,229	193	69	9	130	9	410
2004	5,819	198	64	8	100	9	379
2005	5,440	210	59	8	77	9	363
2006	5,077	222	53	8	61	8	352
2007	4,725	227	48	8	48	8	339
2008	4,386						

Faculty Administration

Year	Beginning Number Active	Normal and Early Retirement	Terminated Vested	Disability Retirement	Terminated and Refunded	Deaths	Total Terminations
1998	6,138	275	52	6	189	11	533
1999	5,605	250	49	6	132	11	448
2000	5,157	252	46	6	93	10	407
2001	4,750	245	44	6	64	10	369
2002	4,381	244	41	6	43	10	344
2003	4,037	237	36	6	32	9	320
2004	3,717	226	32	5	25	9	297
2005	3,420	217	29	5	20	9	280
2006	3,140	212	25	5	15	8	265
2007	2,875	206	22	5	12	8	253
2008	2,622						

Total UW

Year	Beginning Number Active	Normal and Early Retirement	Terminated Vested	Disability Retirement	Terminated and Refunded	Deaths	Total Terminations
1998	15,495	414	130	13	842	18	1,417
1999	14,078	393	128	13	602	18	1,154
2000	12,924	404	127	14	432	17	994
2001	11,930	411	125	14	306	18	874
2002	11,056	424	121	14	213	18	790
2003	10,266	430	105	15	162	18	730
2004	9,536	424	96	13	125	18	676
2005	8,860	427	88	13	97	18	643
2006	8,217	434	78	13	76	16	617
2007	7,600	433	70	13	60	16	592
2008	7,008						

**UNIVERSITY OF WISCONSIN ACADEMIC STAFF AND FACULTY
EMERGING NEW ENTRANT PAYROLL AND
ESTIMATED COST SHIFT TO REMAINING WRS PARTICIPANTS AND EMPLOYERS
IN CONSTANT YEAR 2000 \$ MILLIONS**

Year	Academic Staff			Faculty			Total		
	New Entrants		Estimated	New Entrants		Estimated	New Entrants		Estimated
	Number	Payroll	Cost Shift*	Number	Payroll	Cost Shift#	Number	Payroll	Cost Shift
2000	728	\$ 25.2	\$0.5	471	\$ 23.8	\$0.4	1,199	\$ 49.0	\$ 1.0
2001	1,316	46.4	1.0	874	44.9	0.8	2,190	91.3	1.8
2002	1,807	64.8	1.4	1,242	64.6	1.2	3,048	129.4	2.5
2003	2,229	81.1	1.7	1,576	83.1	1.5	3,805	164.2	3.2
2004	2,604	96.1	2.0	1,888	100.8	1.8	4,492	196.9	3.8
2005	2,946	110.2	2.3	2,178	117.6	2.1	5,124	227.8	4.4
2006	3,262	123.6	2.6	2,449	133.9	2.4	5,711	257.4	5.0
2007	3,566	136.7	2.9	2,700	149.4	2.7	6,266	286.0	5.6
2008	3,860	149.7	3.1	2,940	164.4	3.0	6,800	314.1	6.1
2009	4,143	162.4	3.4	3,169	179.2	3.2	7,312	341.6	6.6
Ultimate	8,189	\$374.1	\$7.9	5,674	\$371.9	\$6.7	13,863	\$746.0	\$14.6

* 2.10% of emerging Academic Staff payroll.
1.80% of emerging Faculty payroll.

Section II

Enhancements to Hybrid Features of the Wisconsin Retirement System

WISCONSIN RETIREMENT SYSTEM HYBRID PLAN FEATURES

The Wisconsin Retirement System is a defined benefit (DB) plan which has certain hybrid plan features often associated with a defined contribution plan including:

- Actual interest earned by fund assets is credited to accounts of participants hired before 1982. (Actual interest is a smoothed market rate governed by the operation of the Transaction Amortization Account.)
- A money purchase minimum benefit provision under which a retiring participant is paid a benefit equal to the greater of the DB formula amount or the amount purchasable by 2 times the participant's account balance.
- The sharing of investment gains (and losses) after retirement through the operation of the dividend program.

Consideration is being given to expanding hybrid plan features as an alternate means of enhancing the value and appeal of WRS to a wider range of its constituents. Changes under consideration include (i) increasing interest credits for participants hired after 1981, and (ii) providing a minimum death-in-service benefit equal to 2 times a participant's account balance. Present and alternate features are described in detail on the following page.

INTEREST CREDITED TO ACCOUNTS OF PARTICIPANTS HIRED AFTER 1981

Plan	Type of Credit	Purpose	Bounds on Annual Interest Credits		Assumed Avg. ROR# Based on	
			Min.	Max.	TAA@	MRA@
Present	Fixed	Refunds	3.0%	3.0%	3.0%	3.0%
	Fixed	Money purchase minimum	5.0	5.0	5.0	5.0
Alt. 1a	Actual - 1%	All	none	none	7.0	7.0
Alt. 1b	Actual - 1%	All	0.0	7.0	6.2*	5.9*
Alt. 1c	Actual - 1%	All	5.0	7.0	6.5*	6.4*
Alt. 2a	Actual	All	none	none	8.0	8.0
Alt. 2b	Actual	All	0.0	8.0	6.7*	6.5*
Alt. 2c	Actual	All	5.0	8.0	7.0*	7.0*

* Assumed rate of return (ROR) was determined by Monte Carlo simulations as described on page 20 in the appendix.

ROR means rate of return.

@ TAA and MRA refer to methods of recognizing rates of return for interest crediting purposes. See appendix pages 18 and 19 for detail.

DEATH-IN-SERVICE BENEFITS

Plan	Eligible Group	Amount
Present	Participants age 55 (50 for Protective Occupations) or over with 5 or more years of service with an eligible spouse or dependent children.	Survivor annuity equal to the amount that would have been paid if participant had retired and elected the 100% survivor option.
	All other participants	Refund of accumulated contributions.
Alt. 1 & 2	Participants age 55 (50 for Protective Occupants) or over with 5 or more years of service with an eligible spouse or dependent children.	At the option of the survivor, either (i) a monthly annuity as under present plan, or (ii) a lump sum equal to 2 times participant's accumulated contributions.
	All other participants	A lump sum (or actuarially equivalent annuity) equal to 2 times participant's accumulated contributions.

**ESTIMATED COST OF
HYBRID PLAN ALTERNATIVES
BASED ON TAA ASSET VALUATION METHOD
EXPRESSED AS A % OF COVERED PAYROLL**

Increase in Contributions for	Alternative			Alternative		
	1a	1b	1c	2a	2b	2c
General	.31%	.21%	.25%	.52%	.27%	.31%
Executive and Elected	.21	.14	.17	.43	.19	.21
Protective Occupation With Social Security	.08	.05	.06	.18	.07	.08
Protection Occupation Without Social Security	.01	.01	.01	.07	.01	.01

Notes:

1. Rate increases shown above are on an employer-pay-all basis. If the cost is split between employees and participants, the rate increase for General Participants would be about 15% higher than those shown above.
2. The rate increases shown above include provision for the Death-in-Service benefits described on page 10. The stand alone cost of the Death-in-Service benefit increase based on an 8% rate of interest is as follows:

Group	% of Covered Payroll
General	.03%
Executive and Elected	.03
Protective Occupation	
With Social Security	.01
Without Social Security	.01

**ESTIMATED COST OF
HYBRID PLAN ALTERNATIVES
BASED ON MRA ASSET VALUATION METHOD
EXPRESSED AS A % OF COVERED PAYROLL**

Increase in Contributions for	Alternative			Alternative		
	1a	1b	1c	2a	2b	2c
General	.31%	.17%	.24%	.52%	.25%	.31%
Executive and Elected	.21	.12	.16	.43	.17	.21
Protective Occupation With Social Security	.08	.04	.06	.18	.06	.08
Protection Occupation Without Social Security	.01	.01	.01	.07	.01	.01

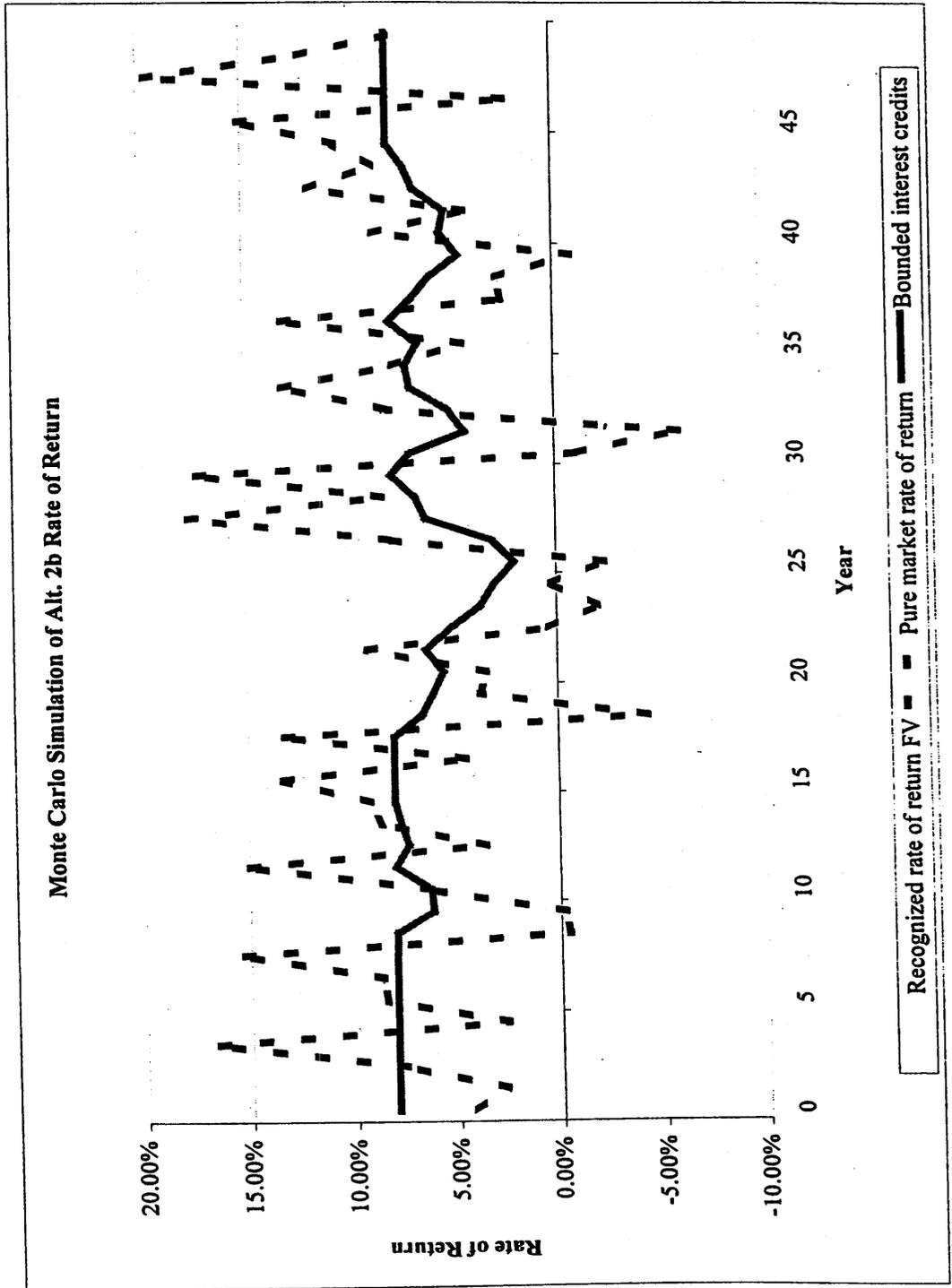
Notes:

1. Rate increases shown above are on an employer-pay-all basis. If the cost is split between employees and participants, the rate increase for General Participants would be about 15% higher than those shown above.
2. The rate increases shown above include provision for the Death-in-Service benefits described on page 10. The stand alone cost of the Death-in-Service benefit increase based on an 8% rate of interest is as follows:

Group	% of Covered Payroll
General	.03%
Executive and Elected	.03
Protective Occupation	
With Social Security	.01
Without Social Security	.01

3. The differences between valuation results based on an MRA vs. the TAA asset valuation method are small. However, the fact that any differences appear is a reminder that all parts of the benefit program and financing provisions are inter-related.

ILLUSTRATION OF BOUNDED INTEREST CREDITS



Appendix I

Age & Service Distributions
For University of Wisconsin Personnel

**UNIVERSITY ACADEMIC STAFF MEMBERS
BY ATTAINED AGE AND YEARS OF SERVICE
AS OF DECEMBER 31, 1997**

Attained Ages	Years of Service to Valuation Date							Totals	
	0-4	5-9	10-14	15-19	20-24	25-29	30 Plus	No.	Valuation Payroll
15-19	1	0	0	0	0	0	0	1	\$ 10,887
20-24	163	0	0	0	0	0	0	163	2,024,304
25-29	656	45	0	0	0	0	0	701	14,282,016
30-34	749	288	24	0	0	0	0	1,061	28,100,842
35-39	739	423	209	22	1	0	0	1,394	43,713,690
40-44	622	444	327	182	35	0	0	1,610	56,972,065
45-49	465	383	305	290	238	60	0	1,741	69,260,620
50-54	271	290	239	220	206	191	27	1,444	63,260,737
55-59	116	118	116	119	110	146	90	815	39,352,833
60	16	12	9	10	7	11	17	82	3,939,467
61	15	9	9	8	12	10	6	69	3,033,654
62	13	14	10	12	5	6	8	68	3,174,597
63	10	4	9	6	6	10	9	54	2,769,654
64	8	4	4	7	2	6	11	42	1,923,254
65	4	2	5	3	6	3	7	30	1,382,162
66	4	1	3	2	3	2	3	18	746,906
67	4	1	3	2	1	1	3	15	675,601
68	3	2	2	3	0	1	2	13	574,745
69	1	1	1	1	1	2	3	10	475,181
70	0	1	1	0	0	2	1	5	339,204
71	4	2	0	0	1	1	0	8	231,961
72	0	2	0	0	0	0	0	2	106,707
73	2	0	0	0	0	0	1	3	85,810
74	1	0	0	1	0	0	2	4	155,038
75	0	0	1	1	0	0	0	2	98,242
78	0	1	0	0	0	0	0	1	7,573
79	0	1	0	0	0	0	0	1	15,735
Totals	3,867	2,048	1,277	889	634	452	190	9,357	\$336,713,485

**UNIVERSITY FACULTY ADMINISTRATION MEMBERS
BY ATTAINED AGE AND YEARS OF SERVICE
AS OF DECEMBER 31, 1997**

Attained Ages	Years of Service to Valuation Date							Totals	
	0-4	5-9	10-14	15-19	20-24	25-29	30 Plus	No.	Valuation Payroll
20-24	1	0	0	0	0	0	0	1	\$ 59,271
25-29	44	1	0	0	0	0	0	45	1,259,349
30-34	236	36	1	0	0	0	0	273	10,012,580
35-39	309	258	52	8	0	0	0	627	29,235,522
40-44	243	410	241	65	10	0	0	969	51,492,564
45-49	147	285	316	221	88	4	0	1,061	60,738,064
50-54	66	190	192	250	269	168	5	1,140	70,122,121
55-59	30	79	85	125	201	405	204	1,129	73,644,518
60	4	8	8	15	16	65	66	182	12,150,086
61	1	7	5	11	16	46	53	139	9,178,604
62	4	6	1	13	14	42	67	147	9,923,612
63	1	6	6	12	8	24	48	105	7,405,327
64	0	1	7	6	6	20	35	75	5,511,584
65	0	2	4	4	3	19	37	69	5,072,013
66	0	1	2	2	1	8	29	43	3,104,056
67	0	0	3	4	5	3	26	41	3,253,163
68	0	0	1	1	2	4	15	23	1,864,917
69	0	0	0	2	2	4	11	19	1,398,866
70	0	0	1	0	1	1	10	13	1,034,605
71	0	0	0	1	1	2	4	8	541,435
72	0	0	0	0	2	2	5	9	741,465
73	0	0	0	0	0	1	9	10	858,001
74	0	1	0	0	1	0	2	4	269,375
75	0	0	0	0	0	2	1	3	167,925
76	0	0	0	0	0	0	2	2	152,939
77	0	0	0	0	0	1	0	1	85,947
Totals	1,086	1,291	925	740	646	821	629	6,138	\$359,277,909

Appendix II

Supplemental Actuarial Methods and Assumptions Used in the Study

WITHDRAWAL RATES FOR UNIVERSITY OF WISCONSIN ACADEMIC STAFF AND FACULTY

Graduation method: Pivotal values found by King's Formula,
then applied Jenkins' 6-point osculatory interpolation formula.

Age X	Ultimate Rates		Select Rates	
	Male	Female	Male	Female
25	0.3850	0.2736	The select rates adopted for the 12/31/97 valuation.	
26	0.3795	0.2697		
27	0.3623	0.2564		
28	0.3293	0.2304		
29	0.2852	0.1956		
30	0.2366	0.1577		
31	0.1895	0.1228		
32	0.1497	0.0968		
33	0.1207	0.0839		
34	0.0999	0.0804		
35	0.0842	0.0815		
36	0.0716	0.0831		
37	0.0614	0.0819		
38	0.0539	0.0760		
39	0.0486	0.0671		
40	0.0452	0.0576		
41	0.0428	0.0491		
42	0.0406	0.0433		
43	0.0376	0.0409		
44	0.0343	0.0409		
45	0.0311	0.0421		
46	0.0281	0.0432		
47	0.0253	0.0431		
48	0.0225	0.0413		
49	0.0198	0.0383		
50	0.0173	0.0350		
51	0.0152	0.0321		
52	0.0139	0.0303		
53	0.0135	0.0300		
54	0.0138	0.0306		
55	0.0145	0.0319		
56	0.0153	0.0333		
57	0.0160	0.0345		
58	0.0164	0.0353		
59	0.0167	0.0360		
60	0.0170	0.0365		
61	0.0172	0.0371		
62	0.0175	0.0378		
63	0.0178	0.0385		
64	0.0182	0.0393		
65	0.0185	0.0400		

Note: Ultimate withdrawal rates were provided by and used in the UWORS valuations at the direction of Scott Dennison, FSA - the Research Director of the WRRC and WJSCRS.

NORMAL RETIREMENT RATES

Male University Participants		Female University Participants	
Age	Retirement Rates	Age	Retirement Rates
57	.06	57	.29
58	.09	58	.06
59	.13	59	.33
60	.13	60	.48
61	.19	61	.18
62	.27	62	.14
63	.31	63	.08
64	.08	64	.08
65	.26	65	.37
66	.30	66	.41
67	.23	67	.32
68	.22	68	.24
69	.16	69	.13
70	.27	70	.37
71	.27	71	.37
72 & Up	1.00	72 & Up	1.00

TRANSACTION AMORTIZATION ACCOUNT (TAA) STATUTORY ASSET VALUATION METHOD

An essential step in the valuation process is comparing valuation assets with computed liabilities. Valuation assets are those assets that are recognized for funding purposes.

Asset valuation methods are distinguished by the timing of the recognition of investment income. Total investment income is the sum of ordinary income and capital value changes. Under a pure market value approach, ordinary investment income and all capital value changes would be recognized immediately. Because of market volatility, use of pure market values in retirement funding can result in volatile contribution rates and unstable financial ratios, contrary to WRS objectives.

Under the statutory WRS asset valuation method, all ordinary income plus 20% of capital value changes are recognized each year. The objective is to give recognition to long term changes in asset values while the minimizing effect of short term fluctuations in the capital markets. Realized and unrealized capital gains and losses are treated in the same manner.

Capital value changes are recorded in the Transaction Amortization Account (TAA), which is maintained by the investment board. A summary of recent TAA activity follows.

	\$ Millions					
	1997	1996	1995	1994	1993	1992
Beginning Balance January 1	\$7,405.1	\$5,892.1	\$2,484.0	\$4,312.9	\$2,978.4	\$2,805.6
Closing Adjustments	0.0	0.0	(39.6)	0.0	0.0	0.0
Net Gains (Losses)	4,871.8	3,392.5	4,982.2	(1,194.4)	2,439.9	927.7
Adjustment for City of Milwaukee	(26.0)	(28.2)	(61.5)	(13.5)	(27.2)	(10.3)
Ending Balance Before Transfer	12,250.9	9,256.4	7,365.1	3,105.0	5,391.1	3,723.0
20% Transfer to Fixed Trust Funds	2,450.2	1,851.3	1,473.0	621.0	1,078.2	744.6
Ending Balance December 31	9,800.7	7,405.1	5,892.1	2,484.0	4,312.9	2,978.4
Statutory Value of Assets	38,584.6	36,540.4	33,962.6	26,954.3	25,436.5	22,943.2
Market Value of Assets	48,385.3	43,945.5	39,854.7	29,438.3	29,749.4	25,921.6
Ratio	80%	83%	85%	92%	86%	89%

MARKET RECOGNITION ACCOUNT (MRA) ALTERNATIVE ASSET VALUATION METHOD

While the TAA has produced reasonable results in the past, it has a number of shortcomings, including:

1. The present structure is not easily understood and may leave the impression that surpluses exist even when actual and assumed experience are the same. This is so because a balance of approximately 20% of fixed annuity reserves is generally required to meet the underlying 8% assumption.
2. The open nature of the recognition of capital value changes (20% annual transfer of year end balances) results in a high TAA growth rate in rising markets. In theory, capital value changes in any given year are never fully recognized. (It takes 10 years to recognize 90% of any given year's activity.) Conversely, in years when the market returns exactly match the assumption, the recognized rate of return falls below the assumed rate because only 20% of the capital value component of total return is immediately recognized.

A method of recognizing market activity that has gained in popularity in recent years is the MRA. It works as follows. Assumed investment return is recognized fully each year. Differences between actual and assumed investment return are phased in over a closed period (4 years in these projections). During periods when investment performance exceeds the assumed rate, the funding value will tend to be less than the market value. Conversely, during periods when investment performance is less than the assumed rate, funding value will tend to be greater than market value. If assumed rates are exactly realized for 3 consecutive years, the funding value will become equal to market value.

If an MRA method is adopted, a transition period would probably be required to avoid the impression that rights to accrued gains are being shifted from one class of participants to another. In this study it was assumed that the existing TAA balance would be frozen and then gradually dispersed at the rate of 20% a year, with future gains and losses recognized as described above.

MONTE CARLO MODELING OF RATES OF INVESTMENT RETURN

In order to determine the cost for changing the interest credited to participant accounts (see pages 10 to 13), a probabilistic method was employed to produce a "random" set of returns from which an average long term interest credit could be calculated. The random returns were generated under a monte carlo simulation method using a normal distribution with an eight percent mean rate of return and an eight percent standard deviation. The method uses a variable seed value as a starting point which was generated by creating a number from the time of execution in hours, minutes, seconds, and hundredths of seconds. The process was executed twenty times, each producing 50 trial results, thereby creating 1,000 possible rates of investment return upon which the proposed benefit provisions were applied.



Pension System Changes

April 28, 1999

Principles for a Pension Bill

- It must have bi-partisan support.
- It will provide some form of benefit increase.
- It must be internally funded.
- It must provide relief for UAAL.
- Passage should be concurrent with the budget.

Possible Benefit Components

- Multiplier increase of .1 or .2 (prior service).
- Multiplier increase of .05 (future service).
- ★ Formula benefit maximum raised from 65% to 75% of final average earnings. *~ leave in*
- Study raising the 5% investment earnings cap on post-1982 employees.
- Study merger of Milwaukee (City) retirement system with WRS

Unfunded Actuarial Accrued Liabilities

- Exceed \$2 billion for WRS employers.
- Carry an 8% interest cost. Employers with slow growing payrolls are seeing their UAAL balances increase over time.
- Different for each WRS employer (some have paid it off).
- Can be reduced across all employers in two ways:
 - a. Directly, by changing actuarial assumptions underlying employer contribution rate calculation;
 - b. Indirectly, by accelerating capital gains recognition from the TAA.
- To get net benefit from TAA the transfer must be in an amount which exceeds the costs of funding any new benefits provided.

WRS Employers UAAL (1998)

	A.	B.	C.	D.	E.	F.
	Annual Payroll	UAAL Balance	Est. Annual Payment on UAAL Balance	Est. Annual Interest on UAAL Balance	Principle & Interest	Savings/Yr From \$200M TAA Flow
WRS Employer						
State Government	\$2,386,000,000	\$643,000,000	\$30,600,000	\$51,440,000	\$82,040,000	\$954,400
Counties	996,000,000	253,000,000	12,948,000	20,240,000	33,188,000	398,400
Dane	74,000,000	18,000,000	996,000	1,440,000	2,436,000	29,600
Brown	45,000,000	11,200,000	595,300	848,000	1,443,300	18,000
Racine	39,000,000	10,300,000	440,000	800,000	1,240,000	15,600
Sheboygan	35,000,000	10,500,000	467,000	790,000	1,257,000	14,000
Kenosha	27,000,000	8,300,000	330,000	638,000	968,000	10,800
Douglas	8,000,000	4,600,000	110,000	360,000	470,000	3,200
School Districts	3,378,000,000	889,000,000	43,914,000	71,120,000	115,034,000	1,351,200
1st ClassCities	791,000,000	234,000,000	10,283,000	18,720,000	29,003,000	316,400
Madison	100,000,000	30,000,000	1,300,000	2,300,000	3,600,000	40,000
Racine	41,000,000	13,300,000	500,000	1,000,000	1,500,000	16,400
Green Bay	40,000,000	13,000,000	520,000	1,040,000	1,560,000	16,000
Kenosha	30,000,000	10,500,000	400,000	840,000	1,240,000	12,000
West Allis	26,000,000	11,580,000	440,000	926,400	1,366,400	10,400
Waukesha	21,000,000	5,000,000	273,000	400,000	673,000	8,400
Other	531,000,000	119,000,000	13,687,700	714,000	14,401,700	212,400
Total WRS	\$8,082,000,000	\$2,138,000,000	\$111,432,700	\$162,234,000	\$273,666,700	\$3,232,800

Note: Savings shown in Column F. are reductions in out-of-pocket costs for current service required contributions. These amounts could be reallocated by employers to fund other costs -- like UAAL in Column B.

Estimated UAAL is approximated at the WRS average of 1.3% of payroll.
Each employer's actual UAAL amount may be different.

TAA = \$11.5 billion

Funding a Multiplier Increase

- Estimated full cost of a .2 multiplier increase: \$3.7 billion (rough estimate).
- Funding of multiplier increase through TAA transfer. Any transfer must be shared:
 - Employer Share: 30%
 - Employee Share: 28%
 - Annuitant Share: 42% of any amount that is transferred from TAA.
- Total TAA transfer needed to fund .2% from Employer Share (only): \$12 billion.
- Assume employer also gets employees' share for those capped at 5%: \$8 billion TAA transfer.
- Estimated cost of a .1 multiplier increase: \$1.85 billion.
- Total TAA transfer needed to fund this: \$4 billion (Assumes employer gets capped employee proceeds.)
- Based on these simulations, a .2 multiplier increase could not reasonably be fully funded by the TAA alone.
- Estimated cost of .05 multiplier increase for future service: \$200 million.

5 - 7.5%

ETF Board Authority to Reduce UAAL

- In December 1997, ETF Board changed a key actuarial assumption (economic "spread"). Effect was to reduce UAAL by 20% or \$450 million.
- AG determined Board lacked authority to reduce existing UAAL.
- ETF now will seek statutory change giving Board explicit authority to change UAAL. If received, Board will likely reduce UAAL by the \$450 M. Effect: Shortens payoff period for UAAL loans. However, this will not reduce current cost levels (principle and interest) being paid by WRS employers.
- This UAAL reduction will be welcomed by some WRS employers, and resisted by others (those who have already paid off their UAAL).
- Including the ETF language sought in pension bill gives a means toward eventual property tax relief.

Employer Flexibility Option

- In lieu of TIAA-CREF, there is another approach offering flexibility: New UWS faculty-academic hires could elect to divert a portion (e.g., 3%) of the required (11.5%) retirement contribution to a private cafeteria style plan administered similar to the deferred compensation program.
- Cafeteria plan would offer five investment options to select from.
- Investments could be portable, go with individual when they leave state service.
- Ultimate effect on WRS would vary, depending on whether the diverted amount came from employee's or employer's share of the required (11.5%) contribution.

↪ have to make up the 3%.

A Better Way to Manage...



→ Bob-prefers
indexes
Benchmarks
→ real estate
investment trusts

May 1999

SWIB at a Crossroads:

Tradition of Active, Internal Management Under Stress

■ **Portfolios have outgrown resources**

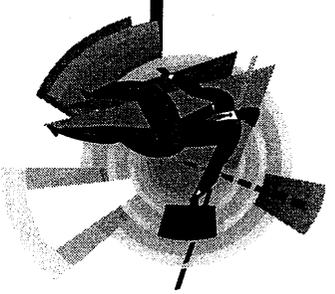
■ **Pressure to use more expensive outside resources:**

- ✓ *Fragmented budget process*
- ✓ *Inefficient resource allocation*

■ **Performance "at risk"—could have adverse impact on:**

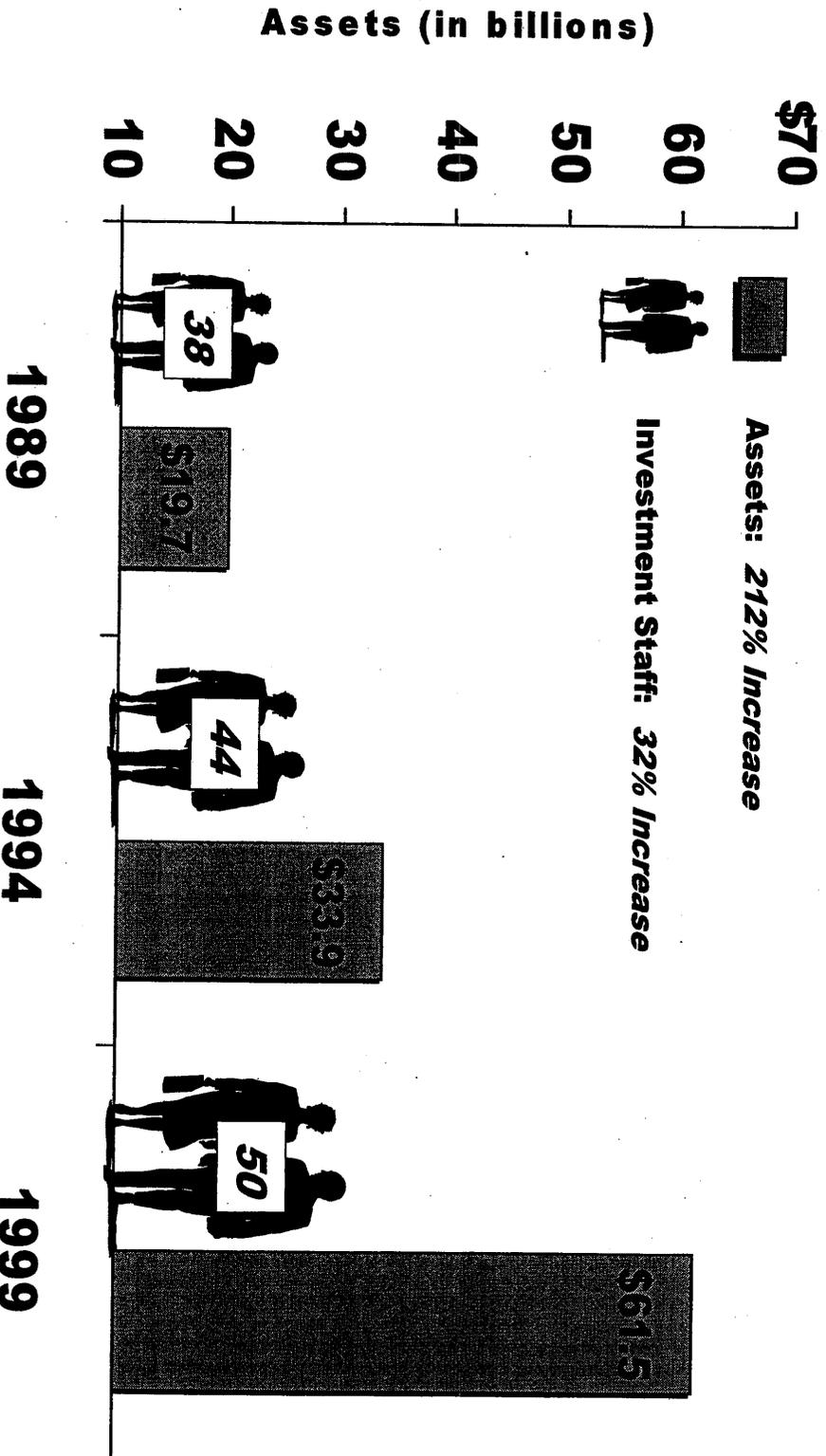
- ✓ *Benefit levels for retirees*
- ✓ *State and local tax costs for retirement benefits*

■ **Compensation not competitive: Losing key staff**



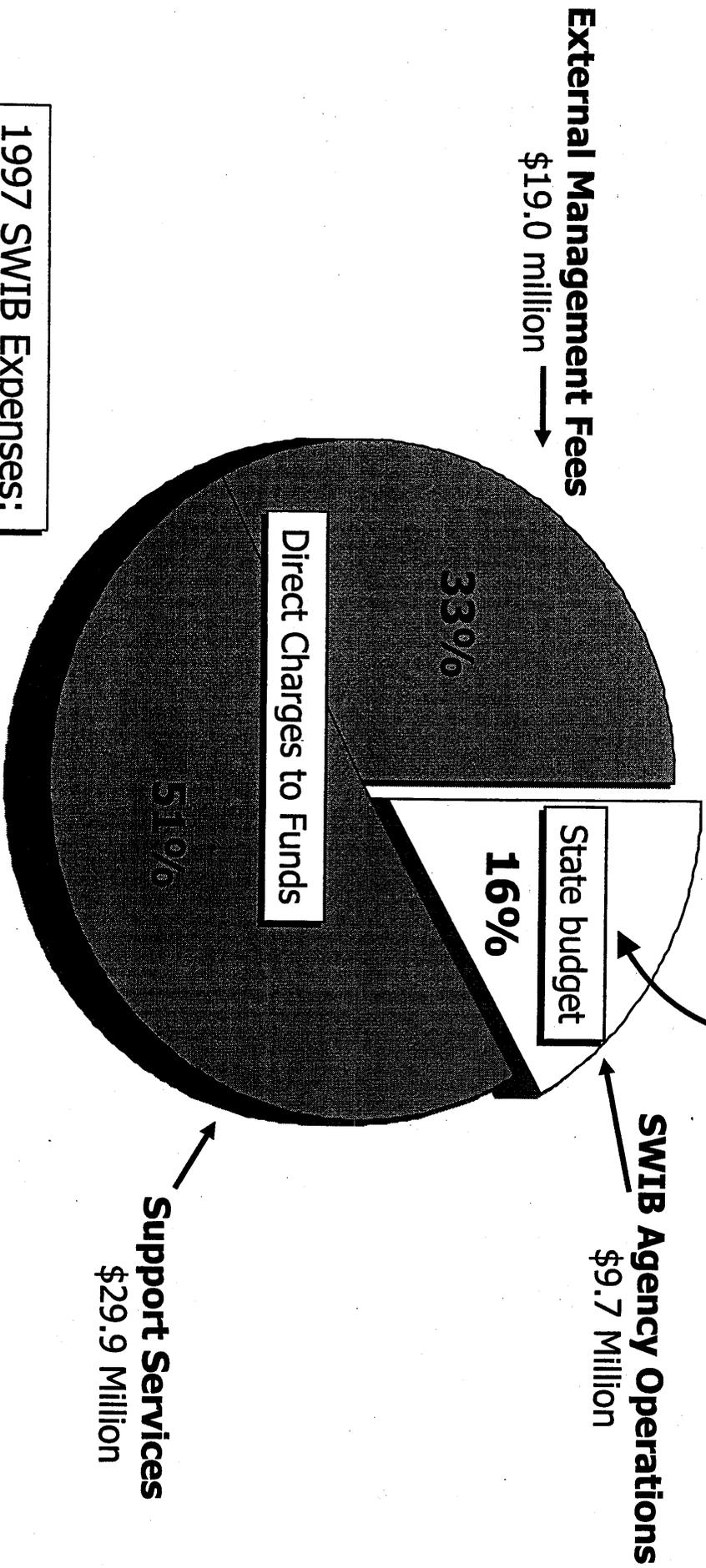
Portfolios Have Outgrown Resources

Last 10 Years: Assets Grew Over Six Times Faster than Investment Staff



SWIB Funded From Earnings (no GPR) :

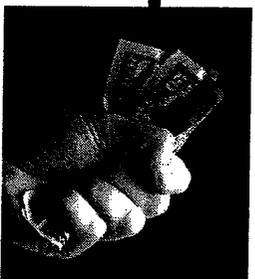
State Oversight Focuses on Agency Operations



1997 SWIB Expenses:
\$58.6 Million

Internal Management Saves Money:

Other Options Cost More



①

Internal Management

- Domestic equities
- International equities
- Public bonds
- Private placements

②

Index Funds

- Domestic equities
- International equities
- Public bonds

③

Internal
with Outside Support

- Real Estate
- Venture Capital/LBO
- Non traditional

④

Outside Management

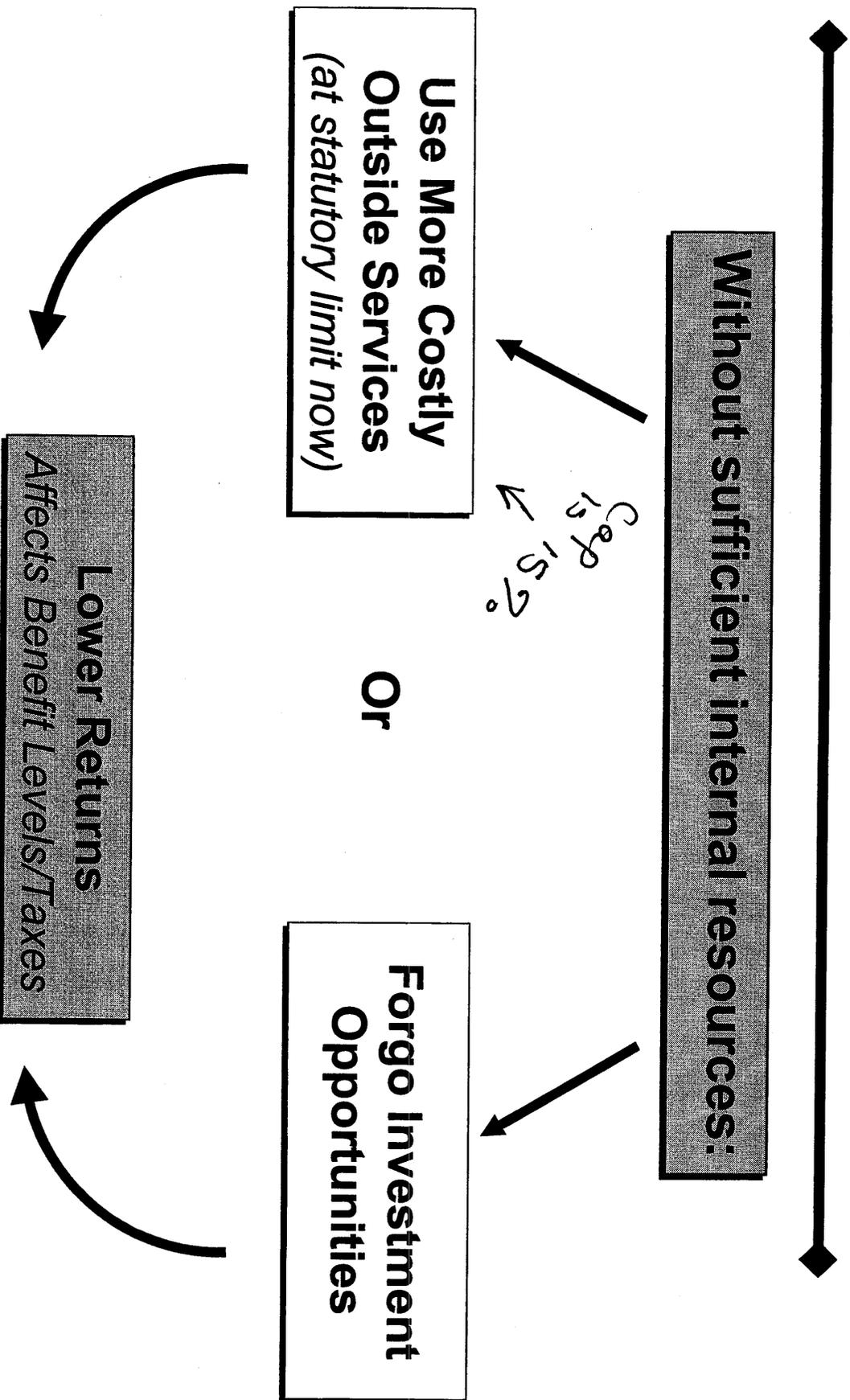
- International equities
- International fixed income
- Emerging markets

Least Expensive



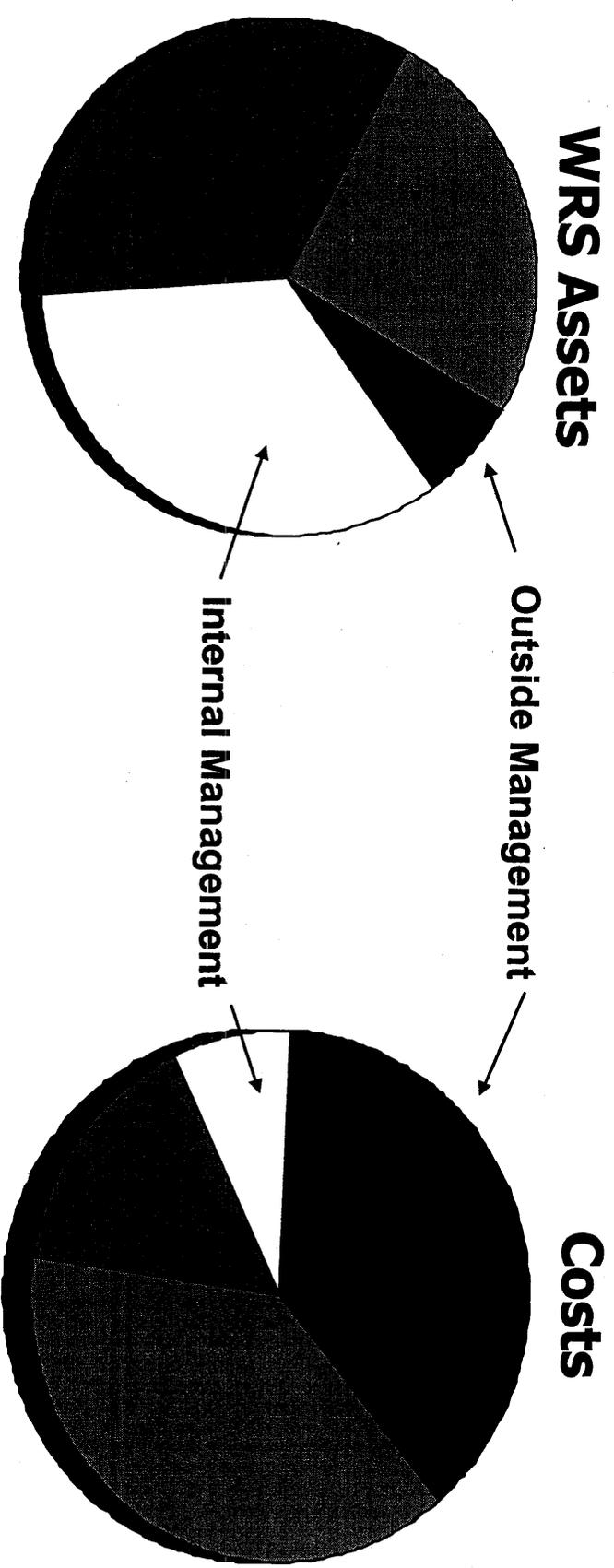
Most Expensive

The Budget Dilemma



Effects of Current Budget Structure:

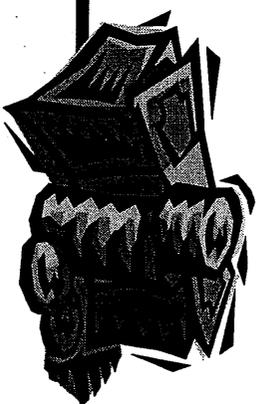
Encourages use of More Expensive Outside Services



SWIB internally manages nearly five times the assets at one-fifth the cost of outside managers

What's at Stake:

If Internal Portfolios had to be Managed Outside



	SWIB Agency Budget <u>Costs</u>	<u>Savings</u> Compared to Outside <u>Management*</u>
Domestic Stocks	\$1,561,300	\$35,551,900
International Stocks	787,500	8,012,900
Fixed Income	<u>1,424,400</u>	<u>11,192,900</u>
TOTAL	\$3,773,200	\$54.7 million <u>savings</u>

Based on 1997 external management costs of peer group, as reported by Cost Effectiveness Measurement, Inc.

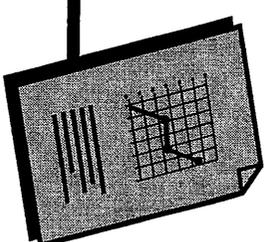
Losing Key People...



- **11 staff left for the private sector in last 2 1/2 years:**
 - ✓ 22% turnover
 - ✓ Compensation packages more than double pay at SWIB
 - ✓ Replaced international stocks manager 3 times in 4 years
- **Experience level of new hires is falling:**
 - ✓ 7 of 9 domestic stock analysts had less than 2 years experience
 - ✓ Both international stocks analysts had no experience

Staff Losses Affect Performance!

Portfolios with Stable Staff Have Done Better

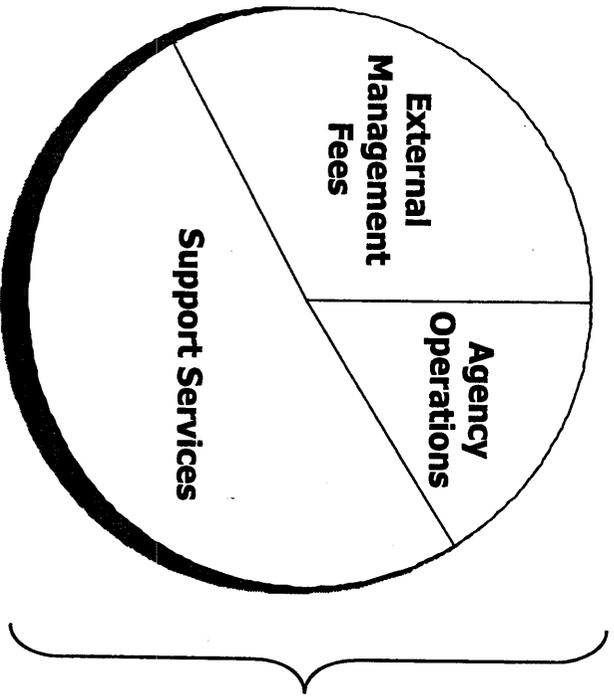


- For the first time, SWIB may not beat five-year performance benchmark
- Domestic stocks (*high turnover/low experience*): Returns have lagged
- Real estate/bonds (*low turnover/high experience*): Outperformed
- Potential staff retirements in next 3-5 years create sense of urgency

A small % change in performance has a large dollar impact:
Each 0.1% in investment returns = \$60 million

A Better Approach:

State Oversight Over Total Costs

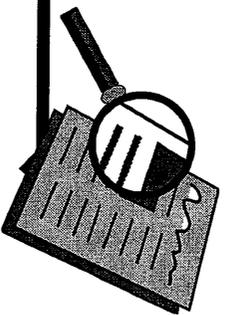


Proposal:

- "Index" SWIB's costs to size of funds managed
- Budget would be a fraction of a percent of assets
- SWIB would have flexibility to choose internal & external resources within the cap, subject to approval by the Board of Trustees

- ✓ Spending growth would be indexed to asset growth
- ✓ Cap would reflect typical pension fund costs

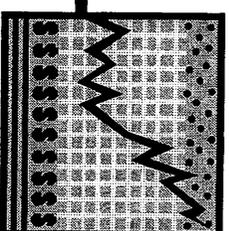
Proposal Specifics: Oversight & Accountability Continues



	Current Law	Proposal
Budget	No GPR State limit on <u>agency operations costs</u>	No GPR % of assets limit on total costs Board of Trustees oversight
Outside Management	Limited to 15% of WRS assets	Limited to 25% of WRS assets
Employee Status	State employees with state benefits All but clericals are unclassified	State employees with state benefits All would be unclassified
Number of Staff	Subject to state control	Board of Trustees oversight
Procurement	Investment services exempt from state procurement requirements	All services exempt from state procurement requirements
Audits	Annual financial audit & biennial performance audit by LAB	No change
Reports to State	Annual strategy & performance reports Investment guidelines reports Quarterly reports on fund charges	No change

Proposal Benefits:

Better Performance, Empowerment with Accountability



- ① **Stronger Investment Returns:** Better resource management should improve performance.
- ② **Cost Savings:** Proposal costs much less than to replace inside management with outside management.
- ③ **Improved Accountability:** Oversight of all SWIB costs would replace the budget limit that currently applies only to agency operations.
- ④ **Full Disclosure:** All costs accounted for.
- ⑤ **Flexibility:** Ability to readily choose the internal & external resources that are more cost effective & will earn the best investment returns