



STATE OF WISCONSIN  
Department of Employee Trust Funds  
Robert J. Conlin  
SECRETARY

801 W Badger Road  
PO Box 7931  
Madison WI 53707-7931  
  
1-877-533-5020 (toll free)  
Fax 608-267-4549  
etf.wi.gov

**CORRESPONDENCE MEMORANDUM**

**DATE:** March 17, 2015  
**TO:** Employee Trust Funds Board  
**FROM:** Robert C. Willett, Chief Trust Finance Officer  
**SUBJECT:** December 31, 2014 Actuarial Valuation of Retired Lives

**Staff requests the Employee Trust Funds Board (Board) approve the report, 32<sup>st</sup> Annual Actuarial Valuation of Retired Lives as of December 31, 2014.**

Gabriel Roeder Smith & Company (GRS) has completed the actuarial valuation of Wisconsin Retirement System retired lives as of December 31, 2014. This valuation determines the amounts to be transferred from member and employer accounts to fund 2014 new annuities, and the amount available to provide increases for existing Core and Variable annuities.

GRS is recommending that Core annuities be increased by 2.9% and Variable annuities by 2%. Core annuity increases will be applied equally to all annuities, other than those that will receive a prorated increase beginning in 2014, based on the effective date. Variable annuity increases will be applied equally to all annuities, regardless of the effective date. All increases will be paid beginning on May 1, 2015.

Actuaries from GRS will be at the April Board meeting to present the report and answer questions.

Attachment: 32<sup>st</sup> Annual Actuarial Valuation of Retired Lives

Reviewed and approved by A. John Voelker, Deputy Secretary

Electronically Signed 3/19/15

Board	Mtg Date	Item #
ETF	4.2.15	5A

**WISCONSIN RETIREMENT SYSTEM**  
**32<sup>ND</sup> ANNUAL ACTUARIAL VALUATION OF RETIRED LIVES**  
**DECEMBER 31, 2014**

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March 12, 2015

Employee Trust Funds Board  
Madison, Wisconsin

Ladies and Gentlemen:

The results of the **32nd annual actuarial valuation of core and variable annuities** being paid from the Wisconsin Retirement System are presented in this report. This report should not be relied on for any other purpose.

The date of this valuation was **December 31, 2014**. Actuarial assumptions used in the valuation are summarized in the Appendix.

The results of the valuation may be briefly summarized as follows (\$ millions).

	<b>Core</b>	<b>Variable</b>
Number of Annuitants	185,605	39,420
Annual Amount	\$ 4,102.3	\$ 386.5
Fund Balance	47,135.7	3,995.4
Actuarial Reserve	45,790.7	3,917.1
<b>Ratio</b>	<b>1.029</b>	<b>1.020</b>

**Based upon these results, the increase in the core annuities is 2.9% and variable annuities will be increased by 2%.**

This report was prepared at the request of the Wisconsin Retirement System and those designated or approved by the Wisconsin Retirement System. This report may be provided to parties other than the Wisconsin Retirement System only in its entirety and only with the permission of the Wisconsin Retirement System. The valuation was based upon data furnished by the WRS staff, concerning Fund assets and individual annuitants and beneficiaries. Data was checked for internal consistency, but was not otherwise audited. We are not responsible for the accuracy or completeness of the information provided by the Wisconsin Retirement System.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements; and changes in plan provisions or applicable law.

To the best of our knowledge this report is complete and accurate. All calculations have been made in conformity with generally accepted actuarial principles and practices and with the Actuarial Standards of Practice issued by the Actuarial Standards Board. Brian Murphy, Mark Buis and James Anderson are all Members of the American Academy of Actuaries (MAAA) and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein. The signing actuaries are independent of the plan sponsor.

The cooperation of the Secretary and his staff in gathering materials for this valuation is acknowledged with appreciation.

Respectfully submitted,

Handwritten signatures of Brian B. Murphy, Mark Buis, and James D. Anderson.

Brian B. Murphy, FSA, MAAA   Mark Buis, FSA, MAAA   James D. Anderson, FSA, MAAA

BBM/MB/JDA:sc

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## **SECTION A**

### **EXECUTIVE SUMMARY**

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## EXECUTIVE SUMMARY

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### 1. Retiree Dividend in Core Annuities

This valuation determined the amount of available surplus in the core fund is \$1.3 billion as of December 31, 2014. The surplus of \$1.3 billion would result in a 2.9% increase in all annuities in force. The Core annuity fund return (after applying the five year smoothing method under the Market Recognition Account) of 8.7% exceeds the 5.0% assumed investment return threshold that triggers an annuity adjustment. After adjusting for expected improvements in longevity and various other items (described in detail on page 7), **the result is a 2.9% increase in benefits.**

### 2. Retiree Dividend in Variable Annuities

This valuation determined the amount of available surplus in the variable fund is \$78.3 million as of December 31, 2014. The surplus of \$78.3 million will result in a 2.0% increase in all annuities in force. The actual return on assets in the variable fund of 7.3% exceeds the 5.0% assumed investment return threshold return that triggers an annuity adjustment. After adjusting for mortality improvement and various other items (described in detail on page 17), **the result is a 2.0% increase in benefits.**

## EXECUTIVE SUMMARY

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### 3. General Comments

Due to the asset smoothing method used in the core annuity fund, there are approximately \$3 billion in unrecognized asset gains as of December 31, 2014 which will be recognized over the next four years. Absent offsetting asset losses, this should result in positive dividends being granted over the next few years.

The value of previously granted dividends is approximately \$4.6 billion (prior to the 2015 adjustment). It is important that the value of dividend payments continue to build up in order to avoid the possibility of negative adjustments in the future. This will happen naturally so long as investments in the core fund attain the long term investment goal of 7.2%.

**Conclusion.** In accordance with the Administrative Code, ETF 20.25, Section 40.27(2) and Section 40.28(2) of the Wisconsin Statutes:

Core annuities will be increased by 2.9%, and

Variable annuities will be increased by 2.0%.



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**SECTION B**  
**OPERATION OF THE SYSTEM**

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## **OPERATION OF THE RETIREMENT SYSTEM**

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Each year, as of December 31, an actuarial valuation of the liability for retired persons receiving benefits from the Wisconsin Retirement System is conducted. The purpose of the valuation is to determine the actuarial present value of future benefit payments on behalf of current retired lives. This present value is the “actuarial reserve”. Theoretically, if an amount of money equal to the actuarial present value were invested at a yield equal to the valuation interest rate, the initial amount plus the continuing investment income would provide exactly the right amount of money to pay the annuities of all current retired persons and their beneficiaries for the rest of their lives. The fund would decrease each year, and would become zero many decades in the future when the last annuitant dies.

The above is a “closed group” description of the operation of the annuity reserve fund. But the fund is really an “open group”. The size of the fund does not actually decrease because each year more benefits are added to the rolls than are removed, and fresh money is transferred into the annuity reserve fund to finance the benefits of the new annuitants. (The actuary calculates the reserve transfers for new annuitants each year as a by-product of the actuarial valuation.)

According to theory, the fund will eventually reach a state when the number of people entering (retiring) each year is approximately equal to the number of people exiting (dying) each year. When this mature state is reached, the amount of money in the fund will remain approximately level in constant dollars from year to year. Each year, the reserve transfers for the new annuitants plus real investment earnings on the whole fund (total money in) will be approximately equal to the benefit payments (total money out). The only source of growth in assets would be the result of the effects of inflation. The dollars in the fund would increase, but the “real” value of the fund would not change.

There are at least two factors that cause the actual operation to be different from the theoretical operation described above. The first is that annuitants may have longer or shorter lifetimes than expected. In recognition of this, the actuary monitors mortality experience of the retirement system and recommends a new mortality table when appropriate. The second factor is that actual investment earnings are rarely equal to the assumed rate. When investment earnings differ from the assumed rate, the difference, positive or negative, is recorded in a supplemental reserve.

## OPERATION OF THE RETIREMENT SYSTEM

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The Wisconsin Retirement System (WRS) maintains separate reserves for core and variable annuities. Each year, the actuary determines the actuarial reserve for core and variable annuities separately. WRS' practice with respect to the use of supplemental reserves is described below.

***Core Annuity Division:*** If the supplemental reserve is positive and is at least 0.5% of core annuity liabilities, core annuity increases (dividends) may be granted. If the supplemental reserve is negative and is equal to or greater than 0.5% of core annuity liabilities in absolute value, prior core annuity dividends are reduced by an aggregate amount equal to the shortfall. Increases or decreases become effective in April following the December 31 valuation.

***Variable Annuity Division:*** If the supplemental reserve is at least 2% of variable annuity liabilities, substantially all of the reserve (dropping fractions of a percent) is used to increase or decrease variable annuities for the ensuing year. Increases or decreases become effective in April following the December 31 valuation.

**In calculating both the dividend for the Core annuities and the adjustment for Variable annuities, a 5.0% assumed investment return is used to fund the original benefit. Only returns in excess of 5.0% can produce an increase in a member's annuity. Returns below 5% result in a decrease. Please see page 30 for a full description of these benefits.**

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**SECTION C**  
**CORE ANNUITIES**

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**CORE ANNUITY DIVISION**  
**DEVELOPMENT OF ASSETS AND LIABILITIES**

	\$ Millions		Ratio
	Assets	Liabilities	
<b>Ending Balance December 31, 2013</b>	\$44,273.1	\$42,300.5	1.047
Closing Adjustments	(3.0)	0.0	
Variable Terminations	247.4	247.4	
2014 Core Annuity Average Adjustment: 4.7%	0.0	1,880.6	
<b>Beginning Balance January 1, 2014</b>	44,517.5	44,428.5	1.002
<b>Increases</b>			
Reserve Transfers	3,004.1	3,004.1	
Regular Interest	2,195.8	2,195.8	
Additional Earnings	1,457.2	0.0	
Addition for Mortality Improvement/Data Reserve	0.0	176.6	
Experience Study	0.0	0.0	
Other	0.0	24.6	
<b>Total Increases</b>	6,657.1	5,401.1	
<b>Decreases</b>			
Annuities & Lump Sums	4,038.4	4,038.4	
Credit Re-establishments	0.5	0.5	
Releases for Mortality Improvement/Data Reserve	0.0	0.0	
Experience Study	0.0	0.0	
Other	0.0	0.0	
<b>Total Decreases</b>	4,038.9	4,038.9	
<b>Ending Balance December 31, 2014</b>	<b>\$47,135.7</b>	<b>\$45,790.7</b>	<b>1.029</b>

The ending liability balance includes a data reserve of \$45.7 million and a liability for previously granted dividends of \$4,576 million (prior to the 2015 adjustment).

**RESERVE TRANSFER RECOMMENDATION**  
**DECEMBER 31, 2014**

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Amounts to be transferred from the Employer Reserve and the Employee Reserve to the Annuity Reserve to cover liabilities for new annuities are computed as the first step in the annual actuarial valuation. The actuarial present value at time of retirement of core annuities reported as new since the last actuarial valuation is \$2,987,449,499. Adjustments to prior transfers, related to estimated annuities for which final computations have now been made, totaled \$16,630,823. Reserve transfers are distributed as follows:

<b>Group</b>	<b>Regular Transfer</b>	<b>Adjustment to Prior Transfer</b>	<b>Total Transfer</b>
General	\$2,618,184,691	\$12,929,438	\$2,631,114,129
Protective with Social Security	269,336,607	2,500,110	271,836,717
Protective without Social Security	79,874,007	230,537	80,104,544
Executive & Elected	20,054,194	970,738	21,024,932
<b>Totals</b>	<b>\$2,987,449,499</b>	<b>\$16,630,823</b>	<b>\$3,004,080,322</b>

Accordingly, we recommend that \$3,004,080,322 be transferred to the Core Annuity Reserve. The results in this report assume that this transfer has been made.

## DISCUSSION OF DIVIDEND DECEMBER 31, 2014

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The Core Annuity Fund balance, \$47,135.7 million, was greater than the actuarial present value of core annuities and reserves, \$45,790.7 million, by \$1,345.0 million which resulted in an annuity adjustment of 2.9%. The primary sources of the 2.9% adjustment are:

	<u>% of APV</u>
1. SWIB published investment return	5.70%
2. MRA adjustment	3.00%
3. Published effective earnings rate	8.70%
4. Adjustment to relate earnings to average core annuity fund balance	(0.40)%
5. Earnings rate based on average balance	8.30%
6. Expected dividend before adjustments: 1.083/1.05-1	3.14%
7. Adjustment to relate average asset to ending liability	0.04%
8. Carryover from last year due to timing of dividend accounting adjustments and rounding	0.19%
9. Adjustments for mortality improvement and data reserve	(0.39)%
10. Experience study	0.00%
11. Experience and other effects	(0.04)%
12. Statutory adjustment to round to nearest one-tenth percent	(0.04)%
<b>13. Computed average dividend rate: (6)+(7)+(8)+(9)+(10)+(11)+(12)</b>	<b>2.9%</b>
14. Adjustment for members at or near the statutory floor	0.0%
<b>15. Final maximum computed dividend rate: (13)+(14)</b>	<b>2.9%</b>

**See pages 31 and 32 for a description of items on this page.**

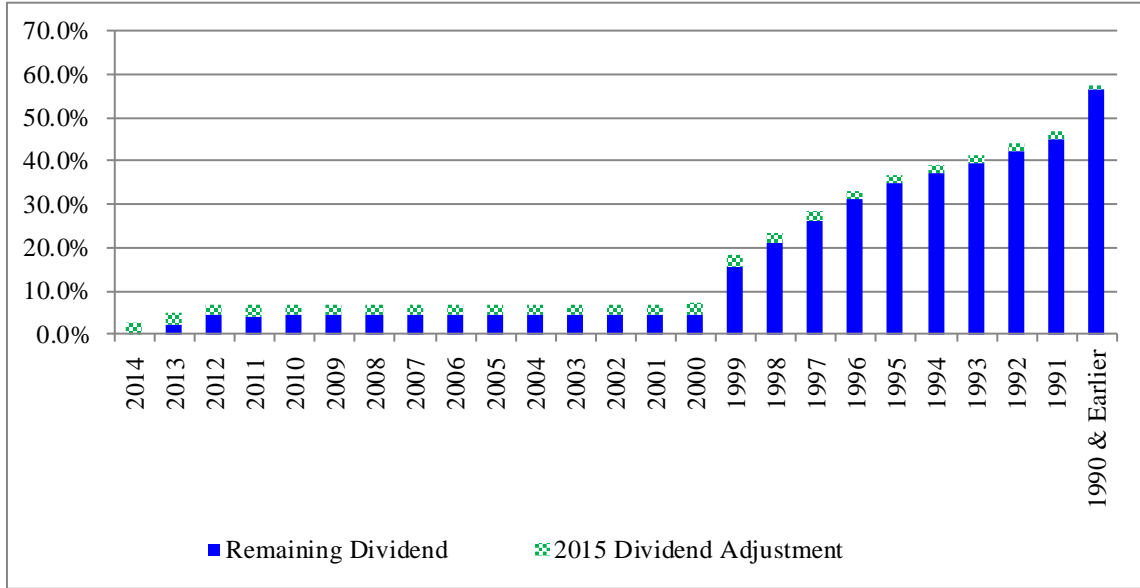
In accordance with the Administrative Code, ETF 20.25 and Section 40.27(2) Wisconsin Statutes (see page 30), the dividend adjustment is 2.9% effective April 1, 2015.

# DISCUSSION OF DIVIDEND

## DECEMBER 31, 2014

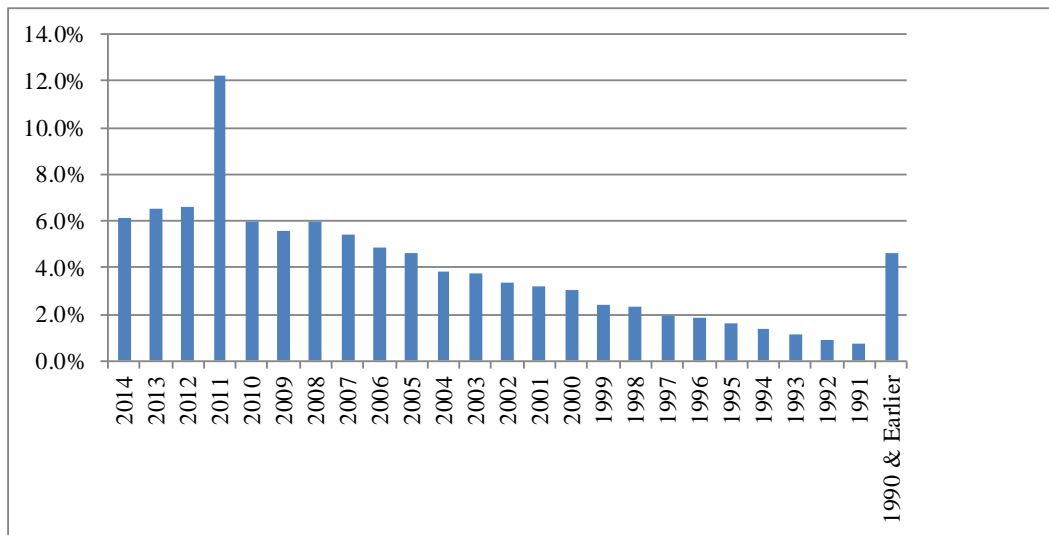
As shown on the prior page, the adjustment for all core fund members is 2.9%. This is the second positive adjustment since 2008, and will be spread equally over all annuitants as shown in the chart below.

### Dividend Remaining (as a Percentage of Total Benefit) by Year of Retirement



After the 2015 dividend adjustment, members retired prior to 2000 continue to have the highest dividend remaining as a percentage of total benefit and also represent a shrinking portion of the liabilities. The chart below shows liabilities by year of retirement.

### Liabilities (as a Percentage of Total) by Year of Retirement



Looking ahead, a few years of spreading positive dividends over all annuitants is needed to decrease the probability of leveraged negative dividends that occurred between 2008 and 2012. Over this period, the liability for dividends decreased from about \$9.2 billion to \$3.0 billion. In 2015 the dividend liability will increase to about \$6 billion. Another positive dividend for 2016 is likely provided there is a positive return on assets in 2015.



**TRANSFERS TO ANNUITY RESERVE  
TO FINANCE CORE ANNUITIES APPROVED IN 2014  
TABULATED BY TYPE OF ANNUITY AND OPTION**

Alpha Code	Type of Benefit	Number	Annual Amount	Present Value
<b>REGULAR RETIREMENT</b>				
SL	Straight Life	1,447	\$ 29,089,358	\$ 390,075,197
SL	Straight Life (accelerated)	0	4,296,386	14,751,983
A60	Life Annuity with 60 payments guaranteed	841	16,115,589	219,134,178
A60	Life Annuity with 60 payments guaranteed (accelerated)	0	2,851,034	9,557,477
A180	Life Annuity with 180 payments guaranteed	1,805	32,849,071	468,617,636
A180	Life Annuity with 180 payments guaranteed (accelerated)	0	7,480,596	27,248,894
JOINT	Joint and 75% Survivor	826	19,793,498	299,124,712
JOINT	Joint and 75% Survivor (accelerated)	0	3,527,857	12,827,672
R25	Reduced 25% on First Death	436	10,819,319	157,791,449
R25	Reduced 25% on First Death (accelerated)	0	1,705,453	6,054,052
C100	100% Continued to Named Survivor	963	18,975,899	290,139,095
C100	100% Continued to Named Survivor (accelerated)	0	3,417,870	12,834,697
C180	100% Continued to Named Survivor with 180 payments guaranteed	2,681	60,288,661	944,958,767
C180	100% Continued to Named Survivor with 180 payments guaranteed (accelerated)	0	13,226,441	52,878,757
AC24	Annuity Certain with 24 Payments	4	59,176	141,092
AC60	Annuity Certain with 60 Payments	1	187,640	843,565
AC120	Annuity Certain with 120 Payments	0	69,727	557,167
AC180	Annuity Certain between 24 and 180 Payments	1	81,214	751,081
SLNSD	Straight Life - Named Survivor Deceased	5	282,015	2,917,742
	Total Regular	9,080	\$ 225,574,614	\$ 2,916,679,730
	Average Age at Retirement	61.1 Years		
<b>DISABILITY RETIREMENT</b>				
SL	Straight Life	9	\$ 356,510	\$ 4,904,089
A60	Life Annuity with 60 payments guaranteed	6	190,815	2,545,284
A180	Life Annuity with 180 payments guaranteed	34	1,050,714	14,997,801
JOINT	Joint and 75% Survivor	14	436,395	6,789,159
R25	Reduced 25% on First Death	0	0	0
C100	100% Continued to Named Survivor	14	374,079	6,097,578
C180	100% Continued to Named Survivor with 180 payments guaranteed	48	1,358,078	21,329,380
	Total Disability	125	\$ 3,766,591	\$ 56,663,291
	Average Age at Retirement	55.3 Years		
<b>DEATH-IN-SERVICE BENEFITS</b>				
SL	Straight Life	13	\$ 100,008	\$ 1,560,563
SL	Straight Life (accelerated)	0	0	0
A60	Life Annuity with 60 payments guaranteed	9	147,817	1,972,194
A60	Life Annuity with 60 payments guaranteed (accelerated)	0	8,939	18,810
A180	Life Annuity with 180 payments guaranteed	47	673,527	10,093,530
A180	Life Annuity with 180 payments guaranteed (accelerated)	0	121,920	461,381
	Total Death-in-Service	69	\$ 1,052,211	\$ 14,106,478
	Average Age at Retirement	55.0 Years		
<b>GRAND TOTAL</b>		<b>9,274</b>	<b>\$ 230,393,416</b>	<b>\$ 2,987,449,499</b>

*In cases where an individual is receiving more than one annuity, the person only appears once in the above number counts, but the corresponding annual amounts can show up in several different places, depending on the option elected for the different annuities. This can result in, for example, a number count of zero (or a very low number count) combined with a significant annual dollar amount in the above table.*

## CORE ANNUITIES BEING PAID DECEMBER 31, 2014 TABULATED BY TYPE OF ANNUITY AND OPTION

Alpha Code	Type of Benefit	Number	Annual Amount	Present Value
<b>REGULAR RETIREMENT</b>				
SL	Straight Life	24,243	\$ 461,460,117	\$ 4,980,207,429
SL	Straight Life (accelerated)	0	22,681,045	52,430,310
A60	Life Annuity with 60 payments guaranteed	20,129	379,344,453	3,882,490,193
A60	Life Annuity with 60 payments guaranteed (accelerated)	0	15,866,516	35,166,014
A120	Life Annuity with 120 payments guaranteed	114	1,460,088	4,132,220
A180	Life Annuity with 180 payments guaranteed	36,754	670,140,914	7,230,938,055
A180	Life Annuity with 180 payments guaranteed (accelerated)	0	41,337,877	102,583,514
A180F	Life Annuity with 180 payments guaranteed (forced)	292	2,076,754	19,093,983
JOINT	Joint and 75% Survivor	21,188	508,045,498	6,014,734,946
JOINT	Joint and 75% Survivor (accelerated)	0	23,306,960	52,135,877
R25	Reduced 25% on First Death	13,881	364,267,900	3,717,451,170
R25	Reduced 25% on First Death (accelerated)	0	8,916,067	21,836,284
C100	100% Continued to Named Survivor	16,552	338,399,901	4,157,831,879
C100	100% Continued to Named Survivor (accelerated)	0	17,924,597	44,735,548
C180	100% Continued to Named Survivor with 180 payments guaranteed	43,693	993,747,478	13,370,397,338
C180	100% Continued to Named Survivor with 180 payments guaranteed (accelerated)	0	78,540,498	195,573,788
LOL	Life with Optional Length Guaranteed	54	814,972	3,984,817
LOLF	Life with Optional Length Guaranteed (Forced)	5	128,836	479,725
AC24	Annuity Certain with 24 Payments	5	96,878	151,158
AC60	Annuity Certain with 60 Payments	7	601,029	1,646,371
AC120	Annuity Certain with 120 Payments	8	1,105,724	5,720,308
AC180	Annuity Certain between 24 and 180 Payments	7	2,292,235	10,267,182
C50	50% Continued to One Beneficiary	52	693,160	2,502,589
C50W180	50% Continued to One Beneficiary with 180 Months guaranteed	5	31,690	97,666
C75WSS	75% Continued to One Beneficiary and Social Security Integrated	66	1,318,911	6,704,569
R25W120	Reduced 25% on Death of Annuitant or Named Survivor with 120 Months guaranteed	4	62,558	169,257
A60WSS	Life with 60 Months Guaranteed and Social Security Integrated	96	584,390	1,851,557
A180WSS	Life with 180 Months Guaranteed and Social Security Integrated	89	1,716,331	6,282,749
PF6213	Police and Firemen s.62.13 *	97	2,846,106	11,161,966
SLNSD	Straight Life - Named Survivor Deceased	618	16,153,539	160,658,213
Total Regular		177,959	\$3,955,963,022	\$44,093,416,675

(concluded on next page)

*In cases where an individual is receiving more than one annuity, the person only appears once in the above number counts, but the corresponding annual amounts can show up in several different places, depending on the option elected for the different annuities. This can result in, for example, a number count of zero (or a very low number count) combined with a significant annual dollar amount in the above table.*

## CORE ANNUITIES BEING PAID DECEMBER 31, 2014 TABULATED BY TYPE OF ANNUITY AND OPTION

Alpha Code	Type of Benefit	Number	Annual Amount	Present Value
<b>DISABILITY RETIREMENT</b>				
SL	Straight Life	771	\$ 18,452,801	\$ 182,783,060
A60	Life Annuity with 60 payments guaranteed	429	10,034,424	96,732,219
A180	Life Annuity with 180 payments guaranteed	1,137	25,379,418	268,508,996
JOINT	Joint and 75% Survivor	523	10,559,977	117,012,928
R25	Reduced 25% on First Death	229	4,688,187	50,526,505
C100	100% Continued to Named Survivor	1,264	21,030,169	238,341,917
C180	100% Continued to Named Survivor with 180 payments guaranteed	1,958	37,652,396	495,046,812
DWSMC	Disability with Spouse or Minor/Dependent Child	24	517,760	4,162,801
DWOSMC	Disability without Spouse or Minor/Dependent Child	2	38,460	304,867
PF6213	Police and Firemen s.62.13 *	19	329,453	1,373,112
SLNSD	Straight Life - Named Survivor Deceased	7	179,100	1,848,019
Total Disability		6,363	\$ 128,862,145	\$ 1,456,641,236
<b>DEATH-IN-SERVICE BENEFITS</b>				
SL	Straight Life	241	\$ 3,030,420	\$ 32,133,796
SL	Straight Life (accelerated)	0	76,751	305,833
A60	Life Annuity with 60 payments guaranteed	135	2,156,562	23,282,507
A60	Life Annuity with 60 payments guaranteed (accelerated)	0	69,890	269,050
A180	Life Annuity with 180 payments guaranteed	867	11,105,855	135,070,531
A180	Life Annuity with 180 payments guaranteed (accelerated)	0	832,607	2,863,586
C180	100% Continued to Named Survivor with 180 payments guaranteed	2	10,226	153,966
LOL	Life with Optional Length Guaranteed	4	59,356	363,468
AC180	Annuity Certain between 24 and 180 Payments	2	35,027	44,471
A60WSS	Life with 60 Months Guaranteed and Social Security Integrated	30	31,141	136,494
PF6213	Police and Firemen s.62.13 *	2	57,465	262,602
Total Death-in-Service		1,283	\$ 17,465,300	\$ 194,886,304
<b>GRAND TOTAL</b>		<b>185,605</b>	<b>\$4,102,290,467</b>	<b>\$45,744,944,215</b>

*In cases where an individual is receiving more than one annuity, the person only appears once in the above number counts, but the corresponding annual amounts can show up in several different places, depending on the option elected for the different annuities. This can result in, for example, a number count of zero (or a very low number count) combined with a significant annual dollar amount in the above table.*

### \*Additional Information for Police and Firemen 62.13 Annuities

	Regular Retirement			Disability Retirement			Death-in-Service Retirement		
	Original	Dividends	Total	Original	Dividends	Total	Original	Dividends	Total
<b>Benefit Amount</b>	789,022	2,057,084	2,846,106	79,592	249,861	329,453	14,477	42,988	57,465
<b>Present Value</b>	3,147,281	8,014,685	11,161,966	332,652	1,040,460	1,373,112	66,143	196,459	262,602

**CORE ANNUITIES BEING PAID DECEMBER 31, 2014**  
**TABULATED BY ATTAINED AGES**

Attained Ages	Regular		Disability		Death-in-Service		Totals	
	No.	Annual Amount	No.	Annual Amount	No.	Annual Amount	No.	Annual Amount
Under 20	0	\$ 0	2	\$ 13,343	5	\$ 50,913	7	\$ 64,256
20-24	0	0	3	35,876	11	63,303	14	99,179
25-29	0	0	11	74,513	18	99,105	29	173,618
30-34	0	0	16	120,788	20	135,323	36	256,111
35-39	2	17,415	15	127,844	28	205,053	45	350,312
40-44	13	80,445	25	231,571	28	171,852	66	483,868
45-49	60	666,211	114	2,639,475	36	318,745	210	3,624,431
50-54	1,124	31,466,968	374	9,556,409	79	994,814	1,577	42,018,191
55-59	13,304	390,697,228	834	19,721,566	144	2,452,156	14,282	412,870,950
60-64	33,360	869,136,637	1,280	27,964,919	192	3,395,946	34,832	900,497,502
65-69	43,619	960,418,114	1,203	24,857,316	191	3,193,487	45,013	988,468,917
70-74	31,456	639,193,955	924	17,474,007	144	2,033,618	32,524	658,701,580
75-79	21,964	427,868,970	727	13,047,628	110	1,518,140	22,801	442,434,738
80-84	15,780	315,920,600	459	7,470,508	98	960,829	16,337	324,351,937
85-89	10,213	199,472,243	257	3,847,728	83	1,012,933	10,553	204,332,904
90-94	4,592	83,815,115	101	1,403,082	41	331,153	4,734	85,549,350
95& Up	1,375	18,528,413	18	275,572	21	112,254	1,414	18,916,239
Certain Only*	1,097	18,680,708	0	0	34	415,676	1,131	19,096,384
<b>Totals</b>	<b>177,959</b>	<b>\$3,955,963,022</b>	<b>6,363</b>	<b>\$128,862,145</b>	<b>1,283</b>	<b>\$17,465,300</b>	<b>185,605</b>	<b>\$4,102,290,467</b>

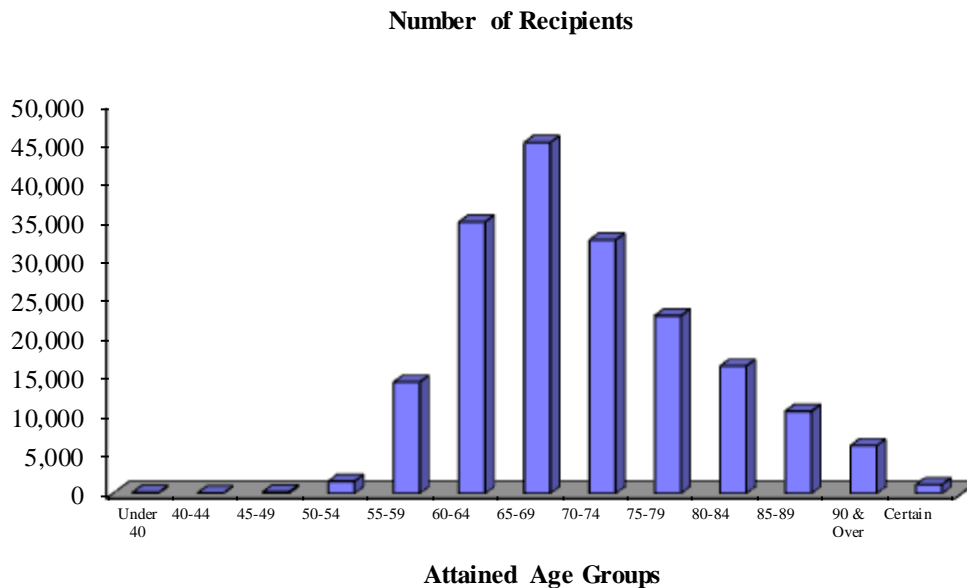
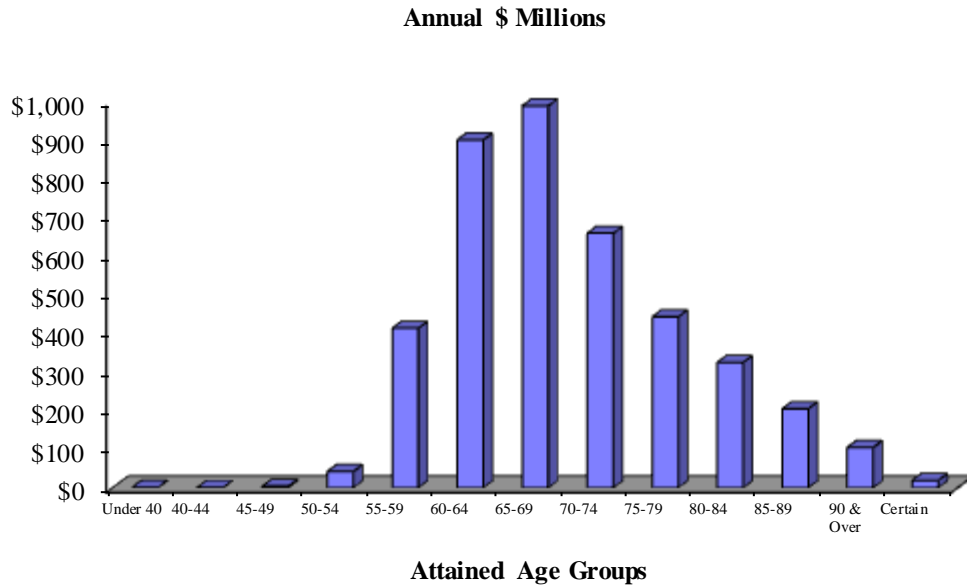
Averages in Years

Age at retirement	59.6	52.0	51.4	59.4
Attained age	69.9	67.0	67.1	69.8

\* Certain Only category consists of continuations of 5, 10 and 15-year certain and life annuities to beneficiaries of deceased annuitants.

# CORE ANNUITIES BEING PAID BY ATTAINED AGE\* DECEMBER 31, 2014

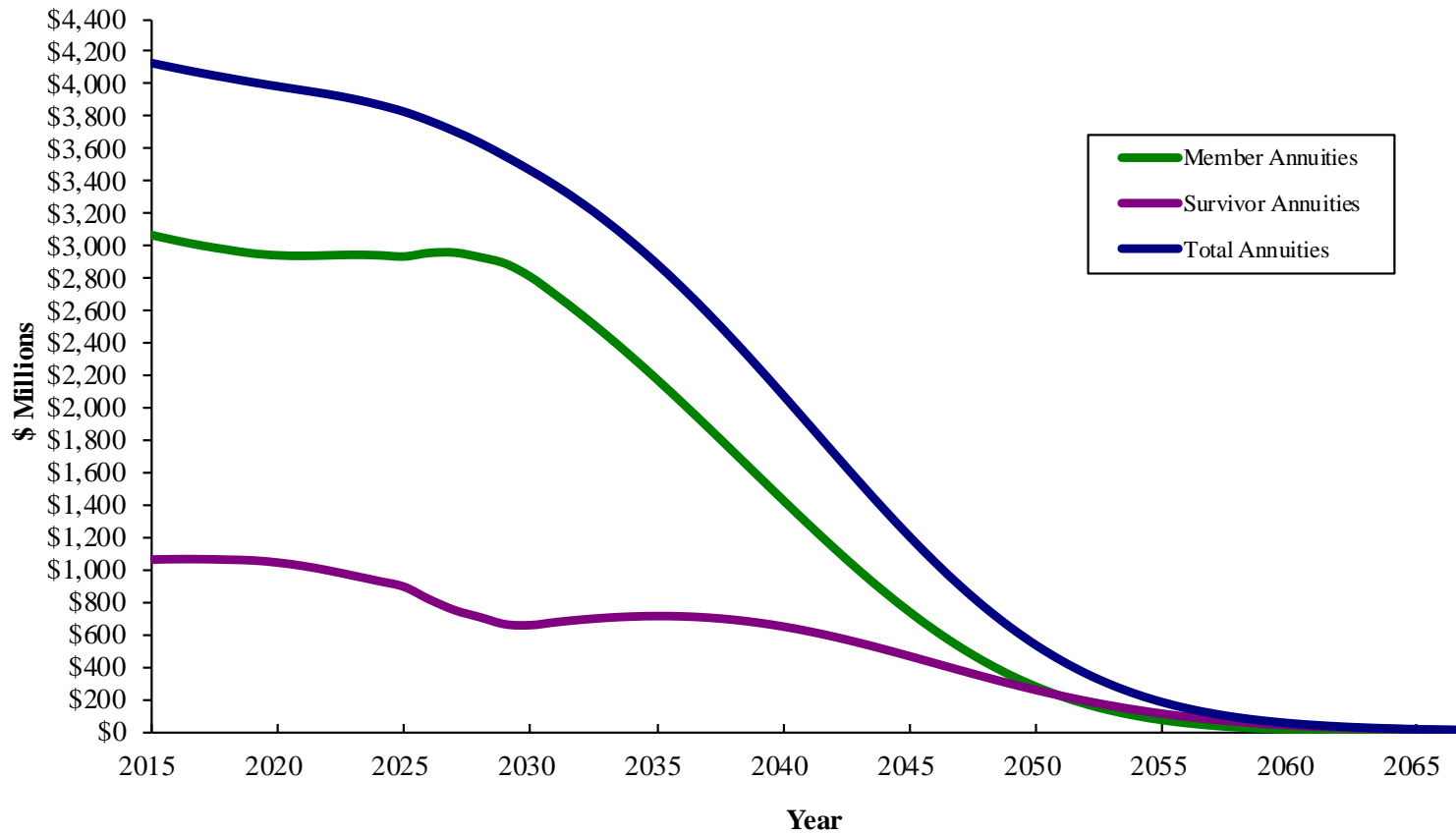
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\* Includes regular and disability retirees and survivor beneficiaries. The “certain” category includes annuities paid for a fixed period which is not dependent upon the age of the recipient.

**PROJECTED FUTURE CORE ANNUITY PAYMENTS  
ON BEHALF OF PRESENT RETIRED LIVES  
INCLUDING PRESENT DIVIDENDS**

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Total Future Payments	\$103.4 billion
From Present Assets	47.1
From Investment Return	56.3

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**SECTION D**  
**VARIABLE ANNUITIES**

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**VARIABLE ANNUITY DIVISION**  
**DEVELOPMENT OF ASSETS AND LIABILITIES**

	\$ Millions		Ratio
	Assets	Liabilities	
<b>Ending Balance December 31, 2013</b>	\$4,187.3	\$3,347.0	1.251
Closing Adjustments	0.8	0.0	
Variable Terminations	(247.4)	(247.4)	
2014 Adjustment: 25%	0.0	818.0	
Beginning Balance January 1, 2014	3,940.7	3,917.6	1.006
<b>Increases</b>			
Reserve Transfers	165.8	165.8	
Regular Interest	190.8	190.8	
Additional Earnings	70.6	0.0	
Addition for Mortality Improvement/Data Reserve	0.0	11.8	
Experience Study	0.0	0.0	
Other	0.0	3.6	
<b>Total Increases</b>	427.2	372.0	
<b>Decreases</b>			
Annuities & Lump Sums	372.2	372.2	
Credit Re-establishments	0.3	0.3	
Release for Mortality Improvement/Data Reserve	0.0	0.0	
Experience Study	0.0	0.0	
Other	0.0	0.0	
<b>Total Decreases</b>	372.5	372.5	
<b>Ending Balance December 31, 2014</b>	<b>\$3,995.4</b>	<b>\$3,917.1</b>	<b>1.020</b>



**RESERVE TRANSFER RECOMMENDATION**  
**DECEMBER 31, 2014**

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Amounts to be transferred from the Employer Reserve and the Employee Reserve to the Annuity Reserve to cover liabilities for new annuities are computed as the first step in the annual actuarial valuation. The actuarial present value at time of retirement of variable annuities reported as new since the last actuarial valuation is \$158,388,548. Adjustments to prior transfers, relating to estimated annuities for which final computations have now been made, totaled \$7,448,099. Reserve transfers were distributed as follows:

Group	Regular Transfer	Adjustment to Prior Transfer	Total Transfer
General	\$144,984,528	\$5,927,923	\$150,912,451
Protective with Social Security	9,959,708	706,955	10,666,663
Protective without Social Security	1,975,474	52,220	2,027,694
Executive & Elected	1,468,838	761,001	2,229,839
<b>Totals</b>	<b>\$158,388,548</b>	<b>\$7,448,099</b>	<b>\$165,836,647</b>

Accordingly, we recommend that \$165,836,647 be transferred to the Variable Annuity Reserve. The results in this report assume that this transfer has been made.

## DISCUSSION OF VARIABLE ANNUITY CHANGE DECEMBER 31, 2014

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Variable Annuity Reserves, \$3,995.4 million, exceeded the actuarial present value of variable annuities, \$3,917.1 million, by \$78.3 million as of December 31, 2014 or 2% of the Actuarial Present Value (APV) of variable annuity payments. In accordance with Section 40.28(2) of the Wisconsin statutes (see page 30), variable annuities will be increased by 2% effective April 1, 2015. The primary sources of the 2% are as follows:

	<u>% of APV</u>
1. SWIB published investment return	7.3%
2. Adjustment to published effective rate	(0.3)%
3. Published effective earnings rate	7.0%
4. Adjustment to relate earnings to average variable annuity fund balance	(0.2)%
5. Earnings rate based on average balance	6.8%
6. Expected change before adjustments: 1.068/1.05-1	1.7%
7. Adjustment to relate average asset to ending liability	0.1%
8. Carryover from last year due to timing of distribution, accounting adjustments and truncation	0.6%
9. Adjustments for mortality improvement	(0.3)%
10. Experience study	0.0%
11. Experience and other effects	(0.1)%
12. Statutory adjustment: (truncate to whole percent)	0.0%
<b>13. Variable annuity change: (6)+(7)+(8)+(9)+(10)+(11)+(12)</b>	<b>2.0%</b>

**Please see pages 31 and 32 for a description of the items on this page.**

**TRANSFERS TO ANNUITY RESERVE  
TO FINANCE VARIABLE ANNUITIES APPROVED IN 2014  
TABULATED BY TYPE OF ANNUITY AND OPTION**

Alpha Code	Type of Benefit	Number	Annual Amount	Present Value
<b>REGULAR RETIREMENT</b>				
SL	Straight Life	285	\$ 1,653,732	\$ 21,871,463
SL	Straight Life (accelerated)	0	179,307	618,765
A60	Life Annuity with 60 payments guaranteed	154	828,221	11,182,147
A60	Life Annuity with 60 payments guaranteed (accelerated)	0	140,120	468,771
A180	Life Annuity with 180 payments guaranteed	378	1,864,441	26,138,914
A180	Life Annuity with 180 payments guaranteed (accelerated)	0	388,289	1,376,629
A180F	Life Annuity with 180 payments guaranteed (forced)	9	34,233	412,853
JOINT	Joint and 75% Survivor	192	1,165,001	16,702,820
JOINT	Joint and 75% Survivor (accelerated)	0	150,582	567,594
R25	Reduced 25% on First Death	92	495,454	7,174,326
R25	Reduced 25% on First Death (accelerated)	0	96,795	301,554
C100	100% Continued to Named Survivor	205	1,186,071	17,779,443
C100	100% Continued to Named Survivor (accelerated)	0	193,230	655,883
C180	100% Continued to Named Survivor with 180 payments guaranteed	628	3,015,256	46,673,193
C180	100% Continued to Named Survivor with 180 payments guaranteed (accelerated)	0	746,119	2,723,213
AC24	Annuity Certain with 24 Payments	1	16,560	31,810
AC60	Annuity Certain with 60 Payments	0	22,299	103,620
AC120	Annuity Certain with 120 Payments	0	16,310	129,726
AC180	Annuity Certain between 24 and 180 Payments	0	3,879	28,270
SLNSD	Straight Life - Named Survivor Deceased	1	4,993	57,368
	Total Regular	1,945	\$ 12,200,892	\$ 154,998,362
	Average Age at Retirement	60.5 Years		
<b>DISABILITY RETIREMENT</b>				
SL	Straight Life	4	\$ 16,446	\$ 217,097
A60	Life Annuity with 60 payments guaranteed	1	4,943	58,469
A180	Life Annuity with 180 payments guaranteed	15	46,633	654,610
JOINT	Joint and 75% Survivor	2	7,145	114,277
C100	100% Continued to Named Survivor	8	26,849	436,514
C180	100% Continued to Named Survivor with 180 payments guaranteed	15	68,079	1,055,269
	Total Disability	45	\$ 170,095	\$ 2,536,236
	Average Age at Retirement	54.7 Years		
<b>DEATH-IN-SERVICE BENEFITS</b>				
SL	Straight Life	2	\$ 5,354	\$ 77,154
A60	Life Annuity with 60 payments guaranteed	1	2,448	35,519
A60	Life Annuity with 60 payments guaranteed (accelerated)	0	6,553	13,790
A180	Life Annuity with 180 payments guaranteed	9	46,817	720,385
A180	Life Annuity with 180 payments guaranteed (accelerated)	0	5,604	7,102
	Total Death-in-Service	12	\$ 66,776	\$ 853,950
	Average Age at Retirement	52.5 Years		
<b>GRAND TOTAL</b>		<b>2,002</b>	<b>\$ 12,437,763</b>	<b>\$ 158,388,548</b>

*In cases where an individual is receiving more than one annuity, the person only appears once in the above number counts, but the corresponding annual amounts can show up in several different places, depending on the option elected for the different annuities. This can result in, for example, a number count of zero (or a very low number count) combined with a significant annual dollar amount in the above table.*

## VARIABLE ANNUITIES BEING PAID DECEMBER 31, 2014 TABULATED BY TYPE OF ANNUITY AND OPTION

Alpha Code	Type of Benefit	Number	Annual Amount	Present Value
<b>REGULAR RETIREMENT</b>				
SL	Straight Life	4,669	\$ 41,448,192	\$ 389,678,158
SL	Straight Life (accelerated)	0	901,184	1,945,126
A60	Life Annuity with 60 payments guaranteed	3,797	33,567,438	304,904,081
A60	Life Annuity with 60 payments guaranteed (accelerated)	0	593,498	1,270,273
A120	Life Annuity with 120 payments guaranteed	23	129,662	402,011
A180	Life Annuity with 180 payments guaranteed	7,398	62,135,586	606,576,338
A180	Life Annuity with 180 payments guaranteed (accelerated)	0	1,749,409	4,351,414
A180F	Life Annuity with 180 payments guaranteed (forced)	34	259,712	2,112,229
JOINT	Joint and 75% Survivor	4,854	53,276,044	573,149,774
JOINT	Joint and 75% Survivor (accelerated)	0	1,012,167	2,123,687
R25	Reduced 25% on First Death	3,679	53,372,710	478,460,443
R25	Reduced 25% on First Death (accelerated)	0	435,623	894,542
C100	100% Continued to Named Survivor	3,555	34,684,594	369,031,513
C100	100% Continued to Named Survivor (accelerated)	0	803,464	1,910,256
C180	100% Continued to Named Survivor with 180 payments guaranteed	9,541	87,206,352	1,065,661,191
C180	100% Continued to Named Survivor with 180 payments guaranteed (accelerated)	0	2,974,493	7,060,497
LOL	Life with Optional Length Guaranteed	7	129,644	497,265
AC24	Annuity Certain with 24 Payments	1	20,892	23,350
AC60	Annuity Certain with 60 Payments	2	66,939	174,714
AC120	Annuity Certain with 120 Payments	1	72,898	412,088
AC180	Annuity Certain between 24 and 180 Payments	2	574,810	3,208,377
C50	50% Continued to One Beneficiary	31	303,651	1,016,637
C50W180	50% Continued to One Beneficiary with 180 Months guaranteed	5	38,315	123,219
C75WSS	75% Continued to One Beneficiary and Social Security Integrated	24	174,294	931,128
R25W120	Reduced 25% on Death of Annuitant or Named Survivor with 120 Months guaranteed	2	26,075	74,019
A60WSS	Life with 60 Months Guaranteed and Social Security Integrated	35	109,903	362,011
A180WSS	Life with 180 Months Guaranteed and Social Security Integrated	16	98,559	362,597
SLNSD	Straight Life - Named Survivor Deceased	113	1,512,116	12,924,026
Total Regular		37,789	\$377,678,224	\$3,829,640,965

(concluded on next page)

*In cases where an individual is receiving more than one annuity, the person only appears once in the above number counts, but the corresponding annual amounts can show up in several different places, depending on the option elected for the different annuities. This can result in, for example, a number count of zero (or a very low number count) combined with a significant annual dollar amount in the above table.*

**VARIABLE ANNUITIES BEING PAID DECEMBER 31, 2014**  
**TABULATED BY TYPE OF ANNUITY AND OPTION**

---

Numeric Code	Alpha Code	Type of Benefit	Number	Annual Amount	Present Value
<b>DISABILITY RETIREMENT</b>					
1	SL	Straight Life	142	\$ 648,179	\$ 5,147,011
3	A60	Life Annuity with 60 payments guaranteed	76	487,040	4,171,207
7	A180	Life Annuity with 180 payments guaranteed	250	1,176,714	11,404,855
10	JOINT	Joint and 75% Survivor	109	812,713	8,279,454
12	R25	Reduced 25% on First Death	52	328,015	3,067,165
14	C100	100% Continued to Named Survivor	239	1,299,191	12,652,970
16	C180	100% Continued to Named Survivor with 180 payments guaranteed	409	2,078,673	24,290,821
30	DWSMC	Disability with Spouse or Minor/Dependent Child	4	18,709	64,317
35	SLNSD	Straight Life - Named Survivor Deceased	1	13,184	81,510
Total Disability			1,282	\$ 6,862,418	\$ 69,159,310
<b>DEATH-IN-SERVICE BENEFITS</b>					
1	SL	Straight Life	61	\$ 429,315	\$ 4,184,588
2	SL	Straight Life (accelerated)	0	697	5,277
3	A60	Life Annuity with 60 payments guaranteed	36	270,511	2,265,751
4	A60	Life Annuity with 60 payments guaranteed (accelerated)	0	9,588	27,166
7	A180	Life Annuity with 180 payments guaranteed	237	1,158,835	11,503,993
8	A180	Life Annuity with 180 payments guaranteed (accelerated)	0	58,808	236,573
23	AC180	Annuity Certain between 24 and 180 Payments	2	1,497	1,512
28	A60WSS	Life with 60 Months Guaranteed and Social Security Integrated	13	9,101	41,822
Total Death-in-Service			349	\$ 1,938,352	\$ 18,266,683
<b>GRAND TOTAL</b>			<b>39,420</b>	<b>\$ 386,478,994</b>	<b>\$ 3,917,066,958</b>

*In cases where an individual is receiving more than one annuity, the person only appears once in the above number counts, but the corresponding annual amounts can show up in several different places, depending on the option elected for the different annuities. This can result in, for example, a number count of zero (or a very low number count) combined with a significant annual dollar amount in the above table.*

**VARIABLE ANNUITIES BEING PAID DECEMBER 31, 2014**  
**TABULATED BY ATTAINED AGES**

Attained Ages	Regular		Disability		Death-in-Service		Totals	
	No.	Annual Amount	No.	Annual Amount	No.	Annual Amount	No.	Annual Amount
20-24	0	\$ 0	1	\$ 2,943	2	\$ 1,615	3	\$ 4,558
25-29	0	0	7	3,337	6	3,323	13	6,660
30-34	0	0	6	2,881	4	1,859	10	4,740
35-39	2	774	6	2,248	4	6,907	12	9,929
40-44	4	26,517	6	32,125	12	22,239	22	80,881
45-49	10	21,697	36	73,335	8	20,267	54	115,299
50-54	309	1,038,575	89	191,832	27	86,532	425	1,316,939
55-59	2,988	14,779,913	191	511,780	31	85,575	3,210	15,377,268
60-64	7,328	43,021,220	254	911,117	54	267,661	7,636	44,199,998
65-69	9,355	80,719,477	213	1,322,244	46	231,162	9,614	82,272,883
70-74	6,129	75,126,003	158	1,468,306	36	322,347	6,323	76,916,656
75-79	4,080	60,420,997	137	1,180,064	31	289,265	4,248	61,890,326
80-84	3,361	49,314,579	96	662,836	26	189,113	3,483	50,166,528
85-89	2,467	33,405,138	56	340,858	30	168,660	2,553	33,914,656
90-94	1,202	14,709,336	21	129,436	13	103,665	1,236	14,942,437
95& Up	339	3,318,385	5	27,076	8	56,962	352	3,402,423
Certain Only*	215	1,775,613	0	0	11	81,200	226	1,856,813
<b>Totals</b>	<b>37,789</b>	<b>\$377,678,224</b>	<b>1,282</b>	<b>\$6,862,418</b>	<b>349</b>	<b>\$1,938,352</b>	<b>39,420</b>	<b>\$386,478,994</b>

Averages in Years

Age at retirement	59.1	52.5	51.0	58.9
Attained age	69.7	66.1	67.5	69.6

\* Certain only category consists of continuations of 5, 10 and 15-year certain and life annuities to beneficiaries of deceased annuitants.

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**SECTION E**  
**COMPARATIVE STATEMENTS**

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**CORE ANNUITIES  
COMPARATIVE STATEMENT  
1983 THROUGH 2014**

Valuation Date	Number	\$ Millions				Change in		
		Annual Annuities	Fund Balance	Actuarial Reserve	Ratio	Annuities		CPI*
						Average	Maximum	
1983	57,770	\$ 177.7	\$ 1,830.3	\$ 1,738.3	1.053	5.0 %		3.8 %
1984	60,302	214.3	2,255.5	2,120.3	1.064	6.0 %		4.0 %
1985	62,953	257.6	2,758.2	2,561.0	1.077	7.2 %		3.8 %
1986	65,425	303.5	3,256.9	3,021.2	1.078	7.6 %		1.1 %
1987	67,688	366.9	3,833.7	3,594.6	1.067	6.7 %		4.4 %
1988	70,017	420.6	4,319.6	4,150.9	1.041	4.1 %		4.4 %
1989	73,232	488.7	5,487.4	4,928.1	1.113	11.3 %		4.6 %
1990	77,666	611.3	6,443.8	6,219.1	1.036	3.6 %		6.2 %
1991	79,465	660.4	7,137.8	6,711.3	1.063	6.3 %		3.0 %
1992	81,508	732.3	7,782.4	7,456.6	1.044	4.4 %		3.0 %
1993	83,836	801.7	8,608.2	8,205.3	1.049	4.9 %		2.7 %
1994	86,214	882.2	9,286.2	9,029.6	1.028	2.8 %		2.7 %
1995	88,998	955.8	10,351.7	9,804.1	1.056	5.6 %		2.6 %
1996	92,198	1,065.8	11,699.8	10,977.1	1.066	6.6 %		3.3 %
1997	95,128	1,188.4	13,185.1	12,240.4	1.077	7.7 %		1.7 %
1998	99,112	1,349.5	14,951.8	13,943.0	1.072	7.2 %		1.6 %
1999	102,817	1,513.8	16,857.8	15,687.2	1.075	17.1 %	**	2.7 %
2000	107,425	1,867.0	20,517.8	19,405.3	1.057	5.7 %		3.4 %
2001	112,142	2,048.6	21,979.7	21,283.6	1.033	3.3 %		1.6 %
2002	116,289	2,226.6	23,142.4	23,202.9	0.997	0.0 %		2.4 %
2003	121,582	2,364.7	25,071.9	24,724.0	1.014	1.4 %		1.9 %
2004	126,211	2,500.3	26,920.0	26,232.2	1.026	2.6 %		3.3 %
2005	131,674	2,691.4	28,575.3	28,359.7	1.008	0.8 %		3.4 %
2006	137,117	2,843.6	31,180.5	30,273.9	1.030	3.0 %		2.6 %
2007	142,906	3,075.3	35,050.1	32,877.5	1.066	6.6 %		4.1 %
2008	144,033	3,399.3	35,798.1	36,551.5	0.979	(2.1)%	(2.1)%	0.1 %
2009	150,671	3,449.3	36,655.8	37,072.7	0.989	(1.1)%	(1.3)%	2.7 %
2010	155,775	3,532.4	37,798.4	38,148.5	0.991	(0.9)%	(1.2)%	1.5 %
2011	167,453	3,842.0	40,411.5	42,078.3	0.960	(4.0)%	(7.0)%	3.0 %
2012	173,655	3,806.3	40,591.6	41,852.4	0.970	(3.0)%	(9.6)%	1.7 %
2013	180,056	3,800.7	44,273.2	42,300.5	1.047	4.7 %	4.7 %	1.5 %
2014	185,605	4,102.3	47,135.7	45,790.7	1.029	2.9 %	2.9 %	0.8 %
<b>32-Year Average</b>						<b>4.1 %</b>		<b>2.8 %</b>
<b>10-Year Average</b>						<b>0.6 %</b>		<b>2.1 %</b>

\* CPI percentage increase determined by ratio of current year CPI-U67 December index over prior year December index.

\*\* Including 10.6% Act 11 transfer.

In cases where there is a negative dividend, a maximum decrease is calculated to account for annuitants that are already at the floor and whose dividend cannot be reduced.

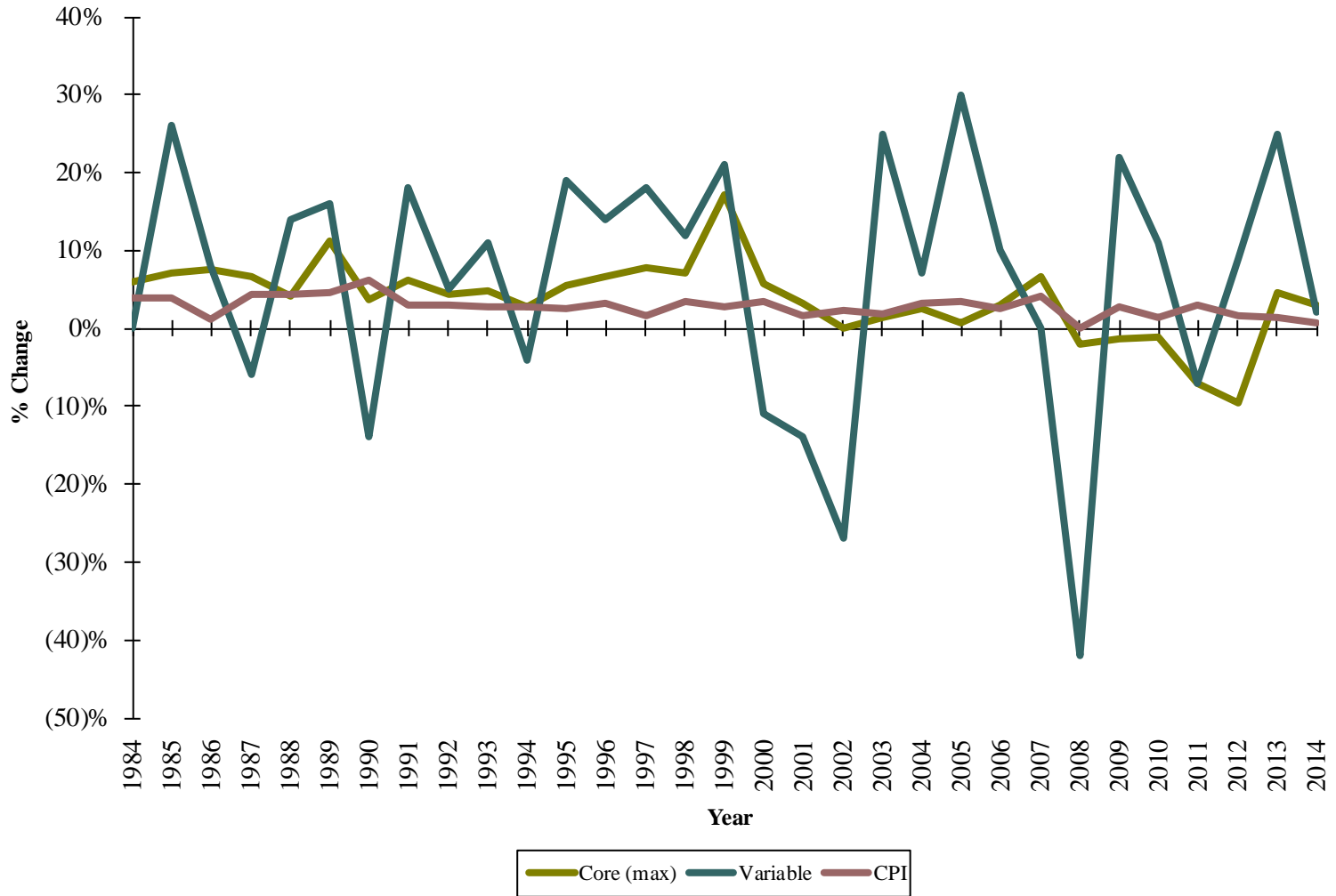


**VARIABLE ANNUITIES  
COMPARATIVE STATEMENT  
1983 THROUGH 2014**

Valuation		\$ Millions				Change in	
		Annual	Fund	Actuarial	Ratio		
Date	Number	Annuitants	Balance	Reserve	Ratio	Annuitants	CPI*
1983	13,598	\$ 25.9	\$ 289.4	\$ 245.0	1.181	18.0 %	3.8 %
1984	14,520	34.2	329.2	327.5	1.005	0.0 %	4.0 %
1985	15,529	38.0	463.1	366.6	1.263	26.0 %	3.8 %
1986	16,276	51.8	538.7	498.6	1.080	8.0 %	1.1 %
1987	17,084	60.4	548.8	584.2	0.939	(6.0)%	4.4 %
1988	17,779	61.4	682.6	594.0	1.149	14.0 %	4.4 %
1989	18,502	75.9	878.1	756.5	1.161	16.0 %	4.6 %
1990	19,922	101.0	868.6	1,013.4	0.857	(14.0)%	6.2 %
1991	20,538	91.5	1,101.3	929.7	1.184	18.0 %	3.0 %
1992	20,968	112.6	1,208.6	1,147.4	1.053	5.0 %	3.0 %
1993	21,623	123.7	1,407.9	1,268.6	1.110	11.0 %	2.7 %
1994	22,248	144.6	1,418.0	1,487.0	0.954	(4.0)%	2.7 %
1995	22,978	150.2	1,854.2	1,556.0	1.192	19.0 %	2.6 %
1996	23,725	189.8	2,264.9	1,976.7	1.146	14.0 %	3.3 %
1997	24,462	228.2	2,800.0	2,371.5	1.181	18.0 %	1.7 %
1998	25,424	289.5	3,400.5	3,035.5	1.120	12.0 %	1.6 %
1999	26,257	345.8	4,432.9	3,659.1	1.212	21.0 %	2.7 %
2000	27,321	445.3	4,211.4	4,749.3	0.887	(11.0)%	3.4 %
2001	28,314	424.4	3,901.8	4,547.4	0.858	(14.0)%	1.6 %
2002	28,662	374.0	2,899.3	3,999.1	0.726	(27.0)%	2.4 %
2003	29,496	273.3	3,635.9	2,892.2	1.257	25.0 %	1.9 %
2004	30,270	346.0	3,909.9	3,654.5	1.070	7.0 %	3.3 %
2005	31,499	376.5	4,092.7	3,970.7	1.031	3.0 %	3.4 %
2006	32,683	391.8	4,594.2	4,145.2	1.108	10.0 %	2.6 %
2007	33,880	432.6	4,625.0	4,563.7	1.013	0.0 %	4.1 %
2008	34,927	427.0	2,574.5	4,491.0	0.573	(42.0)%	0.1 %
2009	34,836	240.3	3,078.4	2,512.7	1.225	22.0 %	2.7 %
2010	35,866	288.4	3,340.6	3,005.4	1.111	11.0 %	1.5 %
2011	38,949	330.3	3,197.9	3,462.9	0.924	(7.0)%	3.0 %
2012	39,873	304.6	3,463.9	3,169.6	1.093	9.0 %	1.7 %
2013	40,317	324.5	4,187.3	3,347.0	1.251	25.0 %	1.5 %
2014	39,420	386.5	3,995.4	3,917.1	1.020	2.0 %	0.8 %
<b>32-Year Average</b>						<b>4.6 %</b>	<b>2.8 %</b>
<b>10-Year Average</b>						<b>1.4 %</b>	<b>2.1 %</b>

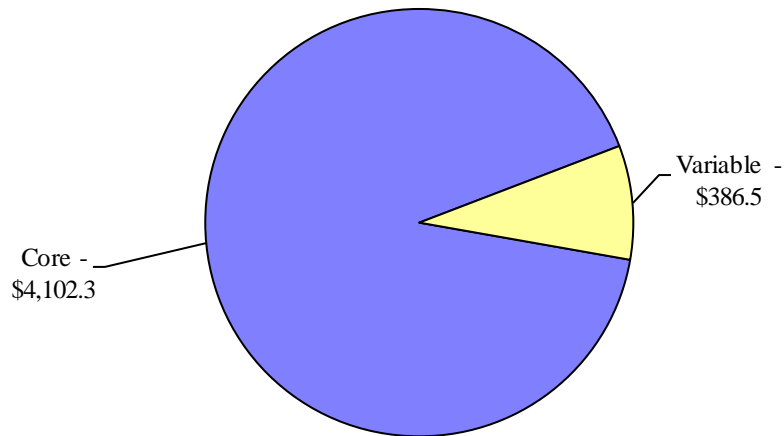
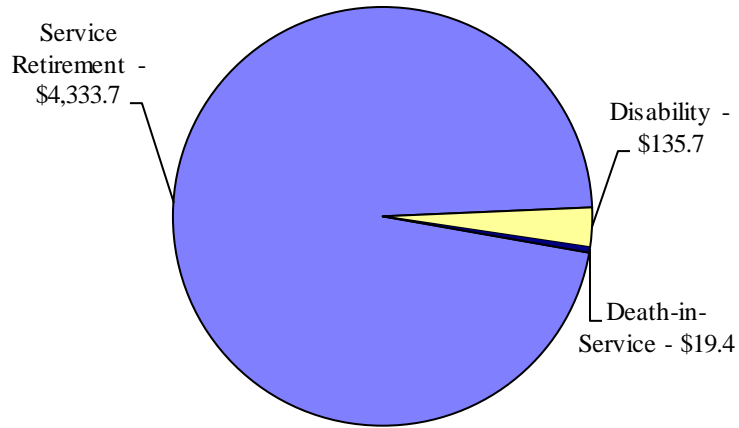
\* CPI percentage increase determined by ratio of current year CPI-U67 December index over prior year December index.

## HISTORY OF % CHANGES IN ANNUITIES AND CPI



**ANNUITIES BEING PAID BY TYPE**  
**DECEMBER 31, 2014**  
**\$ MILLIONS**

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**ANNUITIES BEING PAID DECEMBER 31, 2014**  
**TABULATED BY YEAR OF RETIREMENT**  
**(\$1,000S ANNUALLY)**

Year Ret'd	Core Annuities				Variable Annuities				Avg. Total Annuity
	No.	Initial	Increases	Total	No.	Initial	Increases	Total	
2014	8,824	\$ 217,409	\$ 0	\$ 217,409	1,935	\$ 11,639	\$ 0	\$ 11,639	\$29,479
2013	9,537	229,479	5,671	235,150	1,753	8,611	2,152	10,763	29,116
2012	9,534	229,072	10,693	239,765	1,797	7,489	2,714	10,203	29,908
2011	15,299	426,473	19,758	446,231	3,254	17,176	4,588	21,764	36,158
2010	8,393	207,363	9,648	217,011	1,696	6,849	2,782	9,631	31,073
2009	7,919	193,346	9,026	202,372	1,484	4,678	3,351	8,029	30,604
2008	8,580	206,645	9,639	216,284	1,833	12,458	(52)	12,406	27,358
2007	8,438	182,810	8,550	191,360	1,951	13,393	(59)	13,334	24,351
2006	8,154	167,320	7,827	175,147	1,803	12,762	1,209	13,971	23,245
2005	8,147	163,042	7,637	170,679	1,826	13,473	1,721	15,194	22,882
2004	7,341	138,486	6,497	144,983	1,693	12,518	2,586	15,104	21,846
2003	7,400	139,695	6,554	146,249	1,575	10,445	5,308	15,753	21,951
2002	6,985	126,734	5,940	132,674	1,380	13,927	1,414	15,341	21,245
2001	7,048	127,305	5,965	133,270	1,479	22,256	(1,177)	21,079	21,959
2000	7,087	124,066	5,920	129,986	1,297	25,452	(4,003)	21,449	21,535
1999	5,807	89,369	16,921	106,290	1,069	17,212	337	17,549	21,348
1998	5,688	82,542	22,124	104,666	1,086	15,417	2,189	17,606	21,546
1997	4,773	67,128	24,226	91,354	929	11,063	3,841	14,904	22,323
1996	4,699	64,293	29,336	93,629	945	9,915	5,297	15,212	23,242
1995	4,217	55,947	30,073	86,020	849	7,257	5,995	13,252	23,653
1994	3,787	47,577	28,327	75,904	856	7,182	5,425	12,607	23,503
1993	3,446	41,110	27,036	68,146	768	5,390	5,101	10,491	22,886
1992	2,908	32,606	24,030	56,636	664	4,424	4,624	9,048	22,681
1991	2,605	27,847	23,127	50,974	614	3,363	4,759	8,122	22,941
1990	4,156	47,146	42,709	89,855	1,013	6,307	6,787	13,094	24,933
1989	3,056	34,140	35,898	70,038	693	3,766	5,300	9,066	26,030
1988	2,224	19,568	23,548	43,116	538	2,254	3,932	6,186	22,269
1987	1,859	15,099	20,353	35,452	493	1,992	3,151	5,143	22,135
1986	1,636	12,706	19,730	32,436	456	1,655	2,956	4,611	22,926
1985	1,468	11,566	20,232	31,798	382	1,046	2,623	3,669	24,494
1984	1,057	7,648	14,758	22,406	321	918	2,304	3,222	24,455
1983	859	4,790	9,732	14,522	260	624	1,951	2,575	20,089
1982	625	2,739	6,322	9,061	175	312	1,175	1,487	16,901
1981	532	1,911	4,685	6,596	138	186	691	877	13,994
1980	355	1,143	2,967	4,110	101	114	550	664	13,410
1979	237	726	2,058	2,784	72	67	358	425	13,596
1978	203	543	1,559	2,102	46	29	171	200	11,398
1977	169	437	1,282	1,719	56	39	217	256	11,756
1976	143	347	1,070	1,417	43	26	149	175	11,208
1975	109	234	714	948	33	21	145	166	10,318
Prior	301	426	1,315	1,741	64	32	180	212	3,798
<b>Total</b>	<b>185,605</b>	<b>\$3,548,833</b>	<b>\$553,457</b>	<b>\$4,102,290</b>	<b>39,420</b>	<b>\$293,737</b>	<b>\$92,742</b>	<b>\$386,479</b>	<b>\$24,185</b>

**LIABILITIES AS OF DECEMBER 31, 2014**  
**TABULATED BY YEAR OF RETIREMENT**  
**(\$1,000S ANNUALLY)**

Year Ret'd	Core Liabilities				Variable Liabilities				Total Liabilities
	No.	Initial	Increases	Total	No.	Initial	Increases	Total	
2014	8,824	\$ 2,795,932	\$ 0	\$ 2,795,932	1,935	\$ 147,739	\$ 0	\$ 147,739	\$2,943,671
2013	9,537	2,904,797	71,715	2,976,512	1,753	108,949	27,227	136,176	3,112,689
2012	9,534	2,880,208	134,393	3,014,600	1,797	93,468	33,869	127,338	3,141,938
2011	15,299	5,363,166	248,412	5,611,579	3,254	214,283	57,233	271,516	5,883,095
2010	8,393	2,598,697	120,863	2,719,560	1,696	85,535	34,746	120,281	2,839,841
2009	7,919	2,432,542	113,592	2,546,135	1,484	57,425	41,129	98,554	2,644,688
2008	8,580	2,600,195	121,332	2,721,527	1,833	154,159	(670)	153,489	2,875,016
2007	8,438	2,358,284	110,278	2,468,562	1,951	169,674	(750)	168,924	2,637,486
2006	8,154	2,114,286	98,886	2,213,172	1,803	159,020	15,071	174,091	2,387,263
2005	8,147	2,020,634	94,626	2,115,261	1,826	164,012	20,954	184,966	2,300,227
2004	7,341	1,669,746	78,329	1,748,075	1,693	151,147	31,224	182,371	1,930,446
2003	7,400	1,646,775	77,239	1,724,014	1,575	123,205	62,611	185,816	1,909,830
2002	6,985	1,456,042	68,213	1,524,256	1,380	162,719	16,526	179,245	1,703,501
2001	7,048	1,411,393	66,112	1,477,506	1,479	244,959	(12,998)	231,961	1,709,467
2000	7,087	1,336,757	63,732	1,400,489	1,297	273,543	(43,019)	230,524	1,631,013
1999	5,807	932,908	175,841	1,108,749	1,069	176,675	3,459	180,134	1,288,883
1998	5,688	827,379	221,234	1,048,614	1,086	151,420	21,503	172,923	1,221,537
1997	4,773	643,039	231,325	874,365	929	103,845	36,050	139,895	1,014,260
1996	4,699	590,422	268,433	858,855	945	87,807	46,900	134,708	993,563
1995	4,217	487,939	261,675	749,614	849	60,941	50,335	111,276	860,890
1994	3,787	394,045	234,282	628,328	856	57,429	43,381	100,810	729,138
1993	3,446	324,804	213,159	537,963	768	40,920	38,705	79,625	617,588
1992	2,908	242,269	178,783	421,052	664	31,402	32,825	64,227	485,279
1991	2,605	196,543	163,056	359,599	614	22,440	31,739	54,179	413,778
1990	4,156	327,218	296,305	623,523	1,013	42,671	45,921	88,591	712,115
1989	3,056	217,996	228,786	446,782	693	23,204	32,653	55,858	502,639
1988	2,224	113,185	136,394	249,579	538	12,588	21,959	34,547	284,126
1987	1,859	81,540	109,194	190,734	493	10,159	16,071	26,230	216,964
1986	1,636	63,846	99,522	163,368	456	8,303	14,830	23,132	186,500
1985	1,468	55,655	97,461	153,116	382	4,973	12,461	17,434	170,550
1984	1,057	33,570	65,080	98,651	321	4,036	10,137	14,173	112,824
1983	859	19,368	39,200	58,568	260	2,454	7,652	10,105	68,673
1982	625	11,107	25,597	36,704	175	1,161	4,384	5,544	42,248
1981	532	7,506	18,666	26,172	138	711	2,642	3,354	29,526
1980	355	4,400	11,455	15,855	101	401	1,940	2,341	18,196
1979	237	2,494	7,095	9,590	72	227	1,206	1,433	11,023
1978	203	1,862	5,386	7,248	46	114	662	775	8,023
1977	169	1,461	4,339	5,800	56	137	761	898	6,698
1976	143	1,338	4,163	5,501	43	91	515	606	6,106
1975	109	784	2,388	3,173	33	58	405	463	3,635
Prior	301	1,538	4,725	6,263	64	122	692	813	7,077
<b>Total</b>	<b>185,605</b>	<b>\$41,173,675</b>	<b>\$4,571,269</b>	<b>\$45,744,944</b>	<b>39,420</b>	<b>\$3,154,126</b>	<b>\$762,941</b>	<b>\$3,917,067</b>	<b>\$49,662,011</b>

**COMPARISON OF ACTUAL TO EXPECTED DEATHS AMONG RETIRED LIVES  
(NORMAL RETIREMENT ONLY)  
DURING 2014**

Age	Male Deaths			Female Deaths			Total Deaths		
	Actual	Expected	Exposure	Actual	Expected	Exposure	Actual	Expected	Exposure
30-34									
35-39						3			3
40-44			1			13			14
45-49			12	1		66	1		78
50-54	2	2	751	2	1	531	4	3	1,282
55-59	25	30	5,921	32	23	7,829	57	53	13,750
60-64	73	89	13,176	66	85	19,888	139	174	33,064
65-69	167	193	17,956	139	159	24,354	306	352	42,310
70-74	226	238	13,514	201	195	16,980	427	433	30,494
75-79	324	302	9,695	272	262	12,299	596	564	21,994
80-84	404	404	6,914	394	376	9,192	798	780	16,106
85-89	426	420	4,009	495	523	6,527	921	943	10,536
90-94	282	266	1,531	495	459	3,317	777	725	4,848
95-99	85	90	310	251	253	1,070	336	343	1,380
100 & Up	10	9	25	51	49	160	61	58	185
<b>Totals</b>	<b>2,024</b>	<b>2,043</b>	<b>73,815</b>	<b>2,399</b>	<b>2,385</b>	<b>102,229</b>	<b>4,423</b>	<b>4,428</b>	<b>176,044</b>
Average Ages	80.9	80.5	70.5	83.9	83.7	71.0	82.5	82.2	70.8

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**SECTION F**  
**APPENDIX**

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## ACTUARIAL ASSUMPTIONS USED IN THE RETIRED LIFE ACTUARIAL VALUATION

The interest rate used in the valuation was 5.0% a year, compounded yearly, as provided in Section 40.02 of the Wisconsin Statutes. Please note that we have assumed all current dividends to be payable in the future. To the extent that unfavorable investment performance reduces current dividends, liabilities would be lower than reported in this valuation. The mortality table used in the valuation was the Wisconsin 2012 Mortality Table, as adopted by the Board in connection with the 2009-2011 Experience Study. This table includes margin for future improvements in mortality. Present values are multiplied by 0.993, 0.996 and 1.000 during the 3 respective years of the experience study cycle. Please note that this method replaces an earlier method of adding a gradually increasing reserve to each year's liabilities. This is the third year of the experience study cycle and consequently a factor of 1.000 is used.

### SINGLE LIFE RETIREMENT VALUES Wisconsin Projected Experience Table - 2012 with 5% Interest

Sample Attained Ages	Present Value of \$1 Monthly for Life		Future Life Expectancy (years)		Probability of Death Next Year	
	Males	Females	Males	Females	Males	Females
40	\$209.20	\$214.70	42.9	46.1	0.098%	0.060%
45	200.43	207.06	38.1	41.3	0.130%	0.094%
50	189.60	197.69	33.3	36.5	0.176%	0.139%
55	176.75	186.37	28.7	31.8	0.405%	0.245%
60	162.35	172.92	24.4	27.2	0.572%	0.352%
65	145.13	156.75	20.1	22.7	0.875%	0.541%
70	125.71	137.76	16.1	18.4	1.451%	0.919%
75	104.34	116.43	12.4	14.3	2.468%	1.665%
80	82.05	93.57	9.0	10.7	4.536%	3.110%
85	61.28	70.89	6.3	7.6	8.463%	6.219%

The values shown above are for non-disabled participants. Sample values for disabled participants are as follows:

Sample Attained Ages	Present Value of \$1 Monthly for Life		Future Life Expectancy (years)		Probability of Death Next Year	
	Males	Females	Males	Females	Males	Females
40	\$195.27	\$204.53	35.7	39.9	0.149%	0.103%
45	183.23	194.56	30.9	35.1	0.251%	0.158%
50	169.52	182.61	26.4	30.4	0.498%	0.275%
55	153.66	168.39	22.1	25.8	0.665%	0.402%
60	135.14	151.44	18.0	21.4	1.162%	0.629%
65	114.76	131.73	14.1	17.2	1.908%	1.097%
70	92.83	109.91	10.6	13.2	3.324%	1.995%
75	71.03	86.92	7.6	9.7	6.330%	3.754%
80	52.06	64.92	5.2	6.8	11.650%	7.641%
85	36.73	47.23	3.5	4.7	18.779%	13.173%



## **STATUTORY PROVISIONS - POST-RETIREMENT ADJUSTMENTS**

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### **CORE ANNUITIES - 40.27(2)**

“CORE ANNUITY RESERVE SURPLUS DISTRIBUTIONS. Surpluses in the core annuity reserve established under s. 40.04 (6) and (7) shall be distributed by the board if the distribution will result in at least a 0.5% increase in the amount of annuities in force, except as otherwise provided by the department by rule, on recommendation of the actuary, as follows:

(a) The distributions shall be expressed as percentage increases in the amount of the monthly annuity in force, including prior distributions of surpluses but not including any amount paid from funds other than the core annuity reserve fund, preceding the effective date of the distribution. For purposes of this subsection, annuities in force include any disability annuity suspended because the earnings limitation had been exceeded by that annuitant in that year.

(b) Prorated percentages based on the annuity effective date may be applied to annuities with effective dates during the calendar year preceding the effective date of the distribution, as provided by rule, but no other distinction may be made among the various types of annuities payable from the core annuity reserve.

(c) The distributions shall not be offset against any other benefit being received but shall be paid in full, nor shall any other benefit being received be reduced by the distributions. The annuity reserve surplus distributions authorized under this subsection may be revoked by the board in part or in total as to future payments upon recommendation of the actuary if a deficit occurs in the core annuity reserves and such deficit would result in a 0.5 percent or greater decrease in the amount of annuities in force, except as otherwise provided by the department by rule.

(d) Notwithstanding s 40.03 (2) (i), (7) (d), and (8) (d), the department may promulgate rules under this subsection without the approval of the teachers retirement board and the Wisconsin retirement board.”

### **VARIABLE ANNUITIES - 40.28(2)**

“Whenever the balance in the variable annuity reserve, as of December 31 of any year, exceeds or is less than the then present value of all variable annuities in force, determined in accordance with the rate of interest and approved actuarial tables then in effect, by at least 2% of the present value of all variable annuities in force, the amount of each variable annuity payment shall be proportionately increased or decreased, disregarding fractional percentages, and effective on a date determined by rule, so as to reduce the variance between the balance of the variable annuity reserve and the present value of variable annuities to less than one percent.”

## **NARRATIVE REGARDING THE DEVELOPMENT OF DIVIDEND AND VARIABLE ANNUITY CHANGES SHOWN ON PAGES 7 AND 17**

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**1. SWIB Published Investment Return**

The earnings rate published by State of Wisconsin Investment Board on the Core/Variable Fund.

**2. MRA Adjustment (Core)/Adjustment to Published Effective Rate (Variable)**

Item 3 below minus Item 1 above. For core annuities, this is the MRA adjustment which takes into account five-year smoothing of gains and losses. For variable annuities, it converts a figure based on an average balance to a figure based on a beginning year balance.

**3. Published Effective Earnings Rate**

The earnings rate published by DETF is funds' earnings credits expressed as a percentage of the beginning year balance adjusted for benefit payments and reserve transfers.

**4. Adjustment to Relate Earnings to Average Core/Variable Annuity Balance**

Item 5 below minus Item 3 above.

**5. Earnings Rate Based on Average Balance**

This is similar to the published earnings rate except that the rate is determined as a percentage of the average balance during the year instead of the adjusted beginning of year balance.

**6. Expected Dividend (Variable Change) before Adjustments**

The relative difference in fund growth based on actual versus the 5% assumed earnings rates.

**7. Adjustment to Relate Average Asset to Ending Liability**

The final dividend/variable change is calculated based on the end of year assets divided by the end of year liabilities. Since the calculations in Items 5 and 6 are based on average (approximately mid-year) balances, this adjustment is needed so that the final rate will be based on the end of year liabilities.

**8. Carryover from Last Year Due to Timing of Distribution and Accounting Adjustments (and Truncation for Variable Annuity)**

The dividend or variable rate changes are made effective April 1 of each year. This adjustment takes into account the fact that the prior year dividend/variable increase was in effect for less than a full year as well as any accounting adjustments made to the asset value at the beginning of the year. This adjustment also carries over any truncated or rounded amounts from the prior year.

## **NARRATIVE REGARDING THE DEVELOPMENT OF DIVIDEND AND VARIABLE ANNUITY CHANGES SHOWN ON PAGES 7 AND 17**

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### **9. Adjustments to Contingency Reserve and Data Reserve**

Currently there is a reserve for incomplete data for the dividend calculation of 0.1%. Although the mortality table now includes a projection for expected future improvements in mortality, each valuation phases into the full table incrementally over the three year experience study cycle. The current process will create an increase in the contingency reserve of approximately 0.3% each year of the three year cycle. By increasing reserves gradually each year, instead of all at once every three years, the effect on dividends and variable increases will also be more gradual.

### **10. Experience Study**

A study is conducted for WRS every three years to analyze the assumptions that are made in the valuation versus the experience that actually occurred. If the results of the study show material changes in experience, WRS generally adopts a new set of assumptions. When assumptions are changed, this item displays the effect of the change on the dividend/variable rate calculation.

### **11. Experience and Other Effects**

After making all other known adjustments, this is the remainder of all other experience. Changes here are primarily attributable to mortality experience and, generally to a lesser extent, on any data adjustments.

### **12. Statutory Adjustment to Round/Truncate**

By statute, the dividend rate is calculated to the nearest one-tenth of a percent. For the variable annuity change, the rate is truncated to a whole percent. This is the adjustment made from the calculated dividend/variable annuity rate change without rounding/truncation to the statutory rate.

### **13. Computed Average Dividend Rate/Variable Annuity Change**

This is the end of year asset value divided by the end of year liability. It is reconciled to the published earnings rate (Item 3) by making the adjustments in Items 6 through 12.

### **14. Adjustment for Members Not Eligible for Negative Dividend**

This is an adjustment that is sometimes made for Core Fund recipients to reflect that some members may not have any remaining dividends and hence are not subject to a further negative dividend.

### **15. Final Maximum Computed Dividend Rate**

When there is a negative dividend for the Core fund, it will affect people differently based upon year of retirement. In years when there is a negative dividend, this will be the largest negative dividend that will occur in the Core fund. Item 13 plus Item 14.