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November 6, 2015

Doug Slape, Chair, Capital Adequacy (E) Task Force
c/o Jane Barr (jbarr@naic.org), Company Licensing/RBC Manager
1100 Walnut Street, Suite 1500
Kansas City, MO 64106-2197

RE: Bond Risk Factors for Property/Casualty Risk-Based Capital Formula

Dear Mr. Slape:

On behalf of the American Academy of Actuaries'[1] Property and Casualty Risk-Based Capital (P/C RBC) Committee, I would like to provide the Capital Adequacy (E) Task Force of the National Association of Insurance Commissioners (NAIC) with an update of our work on the bond risk factors in the risk-based capital (RBC) calculation. This is in response to the August 19, 2015 request from Mr. Doug Slape, Chair of the NAIC Capital Adequacy (E) Task Force (Attachment 1).

The P/C RBC Committee has identified three possible approaches to review the bond factors:

1. Maintain the current bond factors and provide the rationale for the status quo;

2. Follow the recommendation of the Academy's Life C1 Work Group regarding bond factors without modification; or

3. Leverage the modeling work completed by the Academy's C1 Life Work Group adjusting the modeling for known differences between property/casualty and life RBC formulas.

Although the P/C RBC Committee believes that Option 1 is appropriate based on the relative immateriality of bond risks in the P/C RBC calculation (discussed below in the section entitled "Materiality"), we recognize that it may be deemed preferable to periodically update the factor calibration.

The P/C RBC Committee recommends that the second option not be pursued. We believe that bond risk should be charged consistently across insurers. However, structural differences in the

[1] The American Academy of Actuaries is an 18,500+ member professional association whose mission is to serve the public and the U.S. actuarial profession. The Academy assists public policymakers on all levels by providing leadership, objective expertise, and actuarial advice on risk and financial security issues. The Academy also sets qualification, practice, and professionalism standards for actuaries in the United States.

P/C and Life RBC formulas would result in different charges for the same bond if the same factors are used in both formulas.

We are therefore investigating use of the Life C1 Work Group analysis, subject to certain adjustments to develop appropriate P/C RBC factors. The adjustments will result in factors that, when used in the P&C formula, will produce comparable risk charges for the same credit risks as in the Life formula.

The adjustments that we are investigating are outlined below:

- P/C investment portfolios typically have much shorter average maturities than life insurance portfolios. Our initial research supports an adjustment of the 10-year horizon used for the Life factors to approximately a 5-year horizon for P/C. This adjustment in isolation will decrease the P/C factors.
- Life insurance statutory policy reserves include a provision for expected credit losses and therefore the Life RBC calculation includes an offset for this provision. P/C reserves have no such provision and no such offset in the RBC formula. Removing this adjustment from the Life credit risk model will produce factors appropriate for P/C insurers. This adjustment in isolation will increase the P/C factors.
- Life insurance RBC factors are calibrated on an after-tax basis. P/C RBC factors are calibrated on a pre-tax basis. A tax adjustment in the Life credit risk model will produce the pre-tax treatment appropriate for the P/C factors. This adjustment in isolation will increase the P/C factors.

The net effect of the adjustments outlined above should result in consistent treatment of credit risk across the P/C and Life industries.

Materiality

In our work, we have noted that the portion of total RBC for property/casualty insurers has historically been very small. The NAIC report on RBC results for 2010 (Attachment 2) shows Government Agency Bonds at 0.07% of Total RBC, and Unaffiliated Bonds at 1.34%. The Bond Size Factor is 0.49% and the Asset Concentration (Fixed) component is 0.21%. The total of all four components is 2.11%. The covariance adjustment reduces this contribution to the total RBC to less than 0.5%.

Similarly, the results for 2011 show an R1 RBC charge that is 1.5% of total RBC before the covariance adjustment, and 0.3% after covariance (Attachment 3, excerpted from *Financial Reporting Through the Lens of a Property/Casualty Actuary*[2]).

The NAIC's Investment Risk Based Capital Working Group received a memo from Richard Marcks of the Connecticut Insurance Department in February 2014 that reported on an analysis of changes in the R1 component (Attachment 4). The Academy's P/C Risk-Based Capital Committee undertook to update that analysis with more recent data and reached similar results

[2] http://www.casact.org/library/studynotes/Odomirok-etal_Financial-Reportingv4.pdf

(Attachment 5). It shows that eliminating the R1 component (i.e., setting it to zero), or doubling it, does not have a significant impact on total RBC for the overwhelming majority of companies.

The fact that the impact of R1 on total RBC is very small, and that it has been so over several years, leads the committee to observe that the first option, of maintaining the current factors, should continue to be considered.

The Life C1 analysis is recommending an increase in the number of bond classes from the current six to 14 or more. At the same time, we understand that the suggestion has been made that property/casualty RBC retain the current six classes. If the task force would like, we are prepared to map the new factors back onto the current six classes and analyze the impact of utilizing the new factors.

We look forward to a discussion of this report and to further guidance on our analysis. If you have any questions about our comments, please contact Lauren Pachman, the Academy's casualty policy analyst, at pachman@actuary.org or 202-223-8196.

Sincerely,

Thomas S. McIntyre, MAAA, FCAS, CERA
Chairperson, P/C Risk-Based Capital Committee
American Academy of Actuaries

Enclosures

National Association of Insurance Commissioners
The Center for Insurance Policy and Research

TO: Tim Deno, chair of the Health Solvency Subcommittee of the American Academy of Actuaries and
Tom McIntyre, chair of the Property and Casualty RBC Committee of the American Academy of Actuaries

FROM: Doug Slape, Chair of the Capital Adequacy (E) Task Force

Date: August 19, 2015

RE: Status Update on the Analysis of the Risk-Based Capital Formula for Health and Property/ Casualty

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On July 24, 2014 the Investment Risk-Based Capital (E) Working Group requested assistance from the Health Solvency Subcommittee and the Property and Casualty Risk-Based Capital Committee of the American Academy of Actuaries (Academy) to analyze the differences between investment practices and the risk-based capital formulas. During the 2014 Summer National Meeting the Capital Adequacy (E) Task Force acknowledged this request and asked the Academy to provide a well-documented report as to the reasoning for the differences in the formulas and why they should remain that way or if they should be more in line with the Life RBC formula when their analysis was concluded.

The Capital Adequacy (E) Task Force requests the Health Solvency Subcommittee and the Property and Casualty Risk-Based Capital Committee provide an update on their analysis of the Health and Property and Casualty Risk-Based Capital formulas during the Fall National Meeting in Maryland.

Please forward a copy of your status update by Nov. 9 to Jane Barr via email jbarr@naic.org to be included with the materials for the Fall National Meeting of the Capital Adequacy Task Force.

cc: David Linn, Staff support- Health Solvency Subcommittee of the American Academy of Actuaries
Lauren Pachman, Staff support -Property and Casualty RBC Committee of the American Academy of Actuaries
David Altmaier, Chair -Property/Casualty Risk-Based Capital (E) Working Group
Patrick McNaughton, Chair -Health Risk-Based Capital (E) Working Group
Jane Barr, Eva Yeung and Crystal Brown (NAIC)

Property & Casualty Industry RBC Results for 2010

by NAIC Staff

As of August 16, 2011, approximately 2,606 Property & Casualty Risk-Based Capital (RBC) filings have been received and uploaded to the NAIC database for calendar year 2010. This article summarizes the industry results and discusses some of the trends noted in the 2010 filings.

The NAIC RBC formula generates the regulatory minimum amount of capital that a company is required to maintain to avoid regulatory action. There are five levels of action that a company can trigger under the formula. The base action level is the Authorized Control Level. If a company's actual capital dips below its Authorized Control Level Risk-Based Capital, the state insurance regulator has the authority to place the company under regulatory control. Therefore, the Authorized Control Level (ACL) is used as the base level, and the other regulatory intervention levels are defined relative to the ACL. The five action levels are:

1) No Action, which means that a company's total adjusted capital (TAC) is at least twice its ACL;
2) Company Action Level, which means that a company's TAC is at least 1.5 times its ACL but less than twice its ACL;
3) Regulatory Action Level, which means that the company's TAC is at least equal to its ACL but less than 1.5 times its ACL;
4) Authorized Control Level, which means that a company's TAC is at least 0.70 times its ACL but less than its ACL; and
5) Mandatory Control Level, which means that the company's TAC is less than 0.70 times its Authorized Control Level RBC.

Most companies fall into the "No Action" level. This level does not necessarily mean that the company is in strong financial condition. It simply means that the company has not triggered one of the regulatory intervention levels. A company can be in weak condition and still pass the RBC test.

Distribution of Companies by Action Level

As can be seen in Table 1, the number of companies triggering one of the regulatory intervention levels is relatively small. Typically, around 97 percent of all P&C insurers filing with the NAIC fall into the "No Action" level. That number has been fairly constant throughout the sixteen years that the NAIC's Property & Casualty RBC system has been in place.

Table 2 shows the disposition of insurers filing in data years 2009 and/or 2010. There is an increase of 45 new filers in 2010, which is offset by a decrease of 78 companies that filed in 2009 but did not file in 2010. Some of these companies have not filed because they have merged or otherwise gone out of business, and some have not filed because they were exempted by state regulators.

Of the 2,561 companies that filed in both 2009 and in 2010, 58 companies triggered one of the action levels in 2009. Twenty-six percent of those companies that triggered an action level in 2009 were able to move to the "No Action" level in 2010, while 74 percent (43 out of 58 companies) remain in one of the action levels.

Aggregate Industry Results

The RBC ratio is the ratio of a company's TAC to its ACL RBC. Table 3 shows the median RBC ratio by asset size for data years 2006 through 2010. The "average" RBC ratio is a function of size. Larger insurers tend to operate with lower capital margins (the ratio of capital to assets). The RBC ratios reflect this difference and emphasize the inappropriateness of comparing RBC ratios between insurers. Although larger insurers tend to have lower RBC ratios, on average, the larger insurers also tend to have more stability in their operating results.

Another word of caution is in order with respect to time series analysis of RBC ratios. The ratios for years prior to 1998 are not exactly comparable to the ratios for later years because of phase-out aspects of the RBC formula. Companies were allowed to count 80 percent of reserve discounts as part of TAC in 1994, 60 percent in 1995, 40 percent in 1996, and 20 percent in 1997. In 1998, all reserve discounts were phased out of the calculation of TAC. Though relatively few companies employ reserve discounting, this phase-out must still be considered.

Table 4 shows the relative risk factors by year for the two major underwriting risk components: reserve risk and premium risk. The total amount of RBC attributable to premiums and reserves has typically grown over time, as would be expected due to inflation. The totals did fall in 2009 but they increased again in 2010. The effective rate for premiums and reserves both fell in 2010 after increasing in 2009.

Table 5 shows the aggregate RBC by major covariance elements for 2006 through 2010. The RBC after covariance for each year is calculated using that year's respective covariance formula.

Overall, aggregate TAC rose 7.6% from 2009 to 2010, resulting in a net TAC increase of 16 percent over the past five years. Total RBC rose 4% over the past year.

Table 1
Industry Results By Action Level, 2006-2010

	2006	2007	2008	2009	2010
No Action	2,523	2,567	2,566	2,571	2,545
Company Action Level	23	22	29	19	13
Regulatory Action Level	15	16	16	10	17
Authorized Control Level	5	8	10	10	5
Mandatory Control Level	33	27	29	29	26
Total	2599	2640	2650	2639	2606
Percent At 'No Action' Level	97.1%	97.2%	96.8%	97.4%	97.7%

Table 2
2010 Disposition of 2009 RBC Filers By Action Level

		2010 Action					
		NO ACTION	COMPANY ACTION LEVEL	REGUL. ACTION LEVEL	AUTHOR. CONTROL LEVEL	MANDATORY CONTROL LEVEL	NOT ON DATABASE
2009 Action	NO ACTION	2,489	5	5	1	3	68
	COMPANY ACTION LEVEL	11	4	4	0	0	0
	REGULATORY ACTION LEVEL	4	1	3	0	0	2
	AUTHORIZED CONTROL LEVEL	0	2	2	3	2	1
	MANDATORY CONTROL LEVEL	0	1	1	1	19	7
	NOT ON DATABASE	41	0	2	0	2	0

Table 3
Median RBC Ratios By Asset Size, 2006-2010

Asset Size	2010 Surplus to Asset Ratio	2006	2007	2008	2009	2010
Less than $10 million	0.742	1536%	1924%	1605%	1866%	1729%
$10 million to $25 million	0.598	1389%	1559%	1595%	1610%	1587%
$25 million to $100 million	0.463	983%	985%	1039%	1145%	1108%
$100 million to $250 million	0.418	803%	896%	870%	920%	889%
$250 million to $500 million	0.401	796%	862%	861%	907%	908%
$500 million to $1 billion	0.382	722%	744%	773%	832%	784%
$1 billion to $10 billion	0.367	690%	681%	667%	720%	725%
More than $10 billion	0.375	480%	539%	474%	528%	556%
All Companies	0.468	935%	977%	992%	1047%	1037%

Table 4
Average Underwriting Risk Factors, 2006-2010

Year	Aggregate Reserve Base (000)	Aggregate Reserve Base RBC (000)	Average Effective Factor	Aggregate Premium Base (000)	Aggregate Premium Base RBC (000)	Average Effective Factor
2006	498,386,189	90,883,219	0.182	441,514,956	53,926,560	0.122
2007	553,508,233	92,254,735	0.167	437,408,945	57,208,353	0.131
2008	543,265,335	91,358,674	0.168	428,270,742	55,376,189	0.129
2009	534,185,972	92,046,039	0.172	413,241,089	54,614,304	0.132
2010	546,238,801	92,847,848	0.170	416,620,138	53,422,759	0.128

Table 5

P&C RBC By Components, 2006-2010

	Aggregates for 2,599 Companies (000) 2006	Aggregates for 2,640 Companies (000) 2007	Aggregates for 2,650 Companies (000) 2008	Aggregates for 2,568 Companies (000) 2009	Aggregates for 2,606 Companies (000) 2010	Percent of Total RBC 2006	2007	2008	2009	2010
R0 - Asset Risk - Affiliates										
Direct P&C Insurers	21,797,178	22,487,331	22,390,774	22,728,641	24,263,446	7.81%	7.75%	8.18%	8.11%	8.31%
Indirect P&C Insurers	5,282,083	5,735,135	6,354,630	6,682,900	6,090,293	1.89%	1.98%	2.32%	2.38%	2.09%
Direct Life Insurers	3,587,291	3,939,839	3,505,148	4,241,619	4,351,220	1.29%	1.36%	1.28%	1.51%	1.49%
Indirect Life Insurers	2,585,617	2,242,002	2,049,912	2,369,769	2,295,040	0.93%	0.77%	0.75%	0.85%	0.79%
Direct Health Insurers	0	0	0	0	0	0.00%	0.00%	0.00%	0.00%	0.00%
Indirect Health Insurers	3,920	0	0	0	0	0.00%	0.00%	0.00%	0.00%	0.00%
Direct Affiliated Alien Insurers	2,436,857	4,830,605	5,113,652	5,623,934	5,949,782	0.87%	1.67%	1.87%	2.01%	2.04%
Indirect Affiliated Alien Insurers	1,967,633	1,576,387	1,387,450	1,150,616	1,030,765	0.71%	0.54%	0.51%	0.41%	0.35%
Non-controlled Assets	395,899	904,715	718,078	928,790	981,845	0.14%	0.31%	0.26%	0.33%	0.34%
Guarantees for Affiliates	28,139	21,646	206,595	245,333	216,712	0.01%	0.01%	0.08%	0.09%	0.07%
Contingent Liabilities	203,093	202,745	240,790	257,706	229,622	0.07%	0.07%	0.09%	0.09%	0.08%
Total R0	38,287,711	41,940,406	41,956,539	44,229,308	45,408,726	13.72%	14.46%	15.33%	15.78%	15.55%
R1 - Asset Risk - Fixed Income										
Government Agency Bonds	205,734	247,537	200,722	199,228	199,065	0.07%	0.09%	0.07%	0.07%	0.07%
Unaffiliated Bonds	2,932,593	3,173,638	3,519,179	3,789,018	3,926,520	1.05%	1.09%	1.29%	1.35%	1.34%
Bond Size Factor	954,418	1,005,879	1,267,490	1,352,645	1,437,284	0.34%	0.35%	0.46%	0.48%	0.49%
Bonds - Affiliated Investment Subs.	19	34	34	34	0	0.00%	0.00%	0.00%	0.00%	0.00%
Bonds - Holding Company	0	0	84	83	2,129	0.00%	0.00%	0.00%	0.00%	0.00%
Bonds - Parents	18,102	9,199	8,140	59,489	41,314	0.01%	0.00%	0.00%	0.02%	0.01%
Bonds - PC Not Subject	0	5,696	0	0	0	0.00%	0.00%	0.00%	0.00%	0.00%
Bonds - Life Not Subject	0	0	0	0	0	0.00%	0.00%	0.00%	0.00%	0.00%
Bonds - Health Not Subject	0	0	0	0	0	0.00%	0.00%	0.00%	0.00%	0.00%
Bonds - Non-Insurer	58,129	42,182	79,968	346,761	37,244	0.02%	0.01%	0.03%	0.12%	0.01%
Mortgage Loans	198,349	251,696	264,006	237,650	221,159	0.07%	0.09%	0.10%	0.08%	0.08%
Collateral Loans	3,933	4,364	59,391	60,895	101,474	0.00%	0.00%	0.02%	0.02%	0.03%
Cash, Cash Equiv & Short-Term Invest.	98,275	101,319	90,368	76,725	85,006	0.04%	0.03%	0.03%	0.03%	0.03%

Replication - Synthetic Assets: One Half	8,534	14,438	4,620	3,382	-1,023	0.00%	0.00%	0.00%	0.00%	0.00%
Asset Concentration (Fixed)	279,368	296,393	525,787	619,371	615,967	0.10%	0.10%	0.19%	0.22%	0.21%
Total R1	4,757,455	5,152,372	6,019,789	6,745,280	6,666,137	1.70%	1.78%	2.20%	2.41%	2.28%
R2 - Asset Risk - Equity										
Common - Affiliated Investment Subs.	43,749	191,617	106,809	127,295	190,847	0.02%	0.07%	0.04%	0.05%	0.07%
Common - Holding Company	1,427,009	1,964,159	2,132,444	1,990,959	2,112,637	0.51%	0.68%	0.78%	0.71%	0.72%
Common - Parents	109,060	98,226	69,171	66,457	74,190	0.04%	0.03%	0.03%	0.02%	0.03%
Common - PC Not Subject	18,733	62,103	94,050	88,562	98,264	0.01%	0.02%	0.03%	0.03%	0.03%
Common - Life Not Subject	1,107	1,128	1,475	1,717	1,553	0.00%	0.00%	0.00%	0.00%	0.00%
Common - Health Not Subject	4,444	0	0	0	0	0.00%	0.00%	0.00%	0.00%	0.00%
Common - Non-Insurer	2,557,389	2,360,484	4,148,937	3,866,513	2,310,248	0.92%	0.81%	1.52%	1.38%	0.79%
Preferred - Affiliated Investment Subs.	0	0	0	0	6,450	0.00%	0.00%	0.00%	0.00%	0.00%
Preferred - Holding Company	0	3,596	147,015	147,515	1,820	0.00%	0.00%	0.05%	0.05%	0.00%
Preferred - Parents	0	0	374	3,161	3,633	0.00%	0.00%	0.00%	0.00%	0.00%
Preferred - PC Not Subject	0	0	5,059	5,483	0	0.00%	0.00%	0.00%	0.00%	0.00%
Preferred - Life Not Subject	0	0	0	0	0	0.00%	0.00%	0.00%	0.00%	0.00%
Preferred - Health Not Subject	0	0	0	0	0	0.00%	0.00%	0.00%	0.00%	0.00%
Preferred - Non-Insurer	562,026	547,793	681,041	137,829	127,608	0.20%	0.19%	0.25%	0.05%	0.04%
Unaffiliated Preferred	107,151	148,225	139,334	165,784	206,358	0.04%	0.05%	0.05%	0.06%	0.07%
Unaffiliated Common	26,856,613	27,127,325	18,660,310	22,825,449	23,515,744	9.62%	9.35%	6.82%	8.14%	8.05%
Real Estate	999,341	1,052,561	1,096,874	1,072,664	1,033,676	0.36%	0.36%	0.40%	0.38%	0.35%
Schedule BA Assets	10,579,772	15,357,049	11,923,225	11,752,528	20,510,715	3.79%	5.29%	4.36%	4.19%	7.02%
Receivables for Securities	108,841	89,686	128,562	51,910	223,113	0.04%	0.03%	0.05%	0.02%	0.08%
Aggregate Write-ins for Invested Assets	112,953	203,872	145,623	107,980	72,161	0.04%	0.07%	0.05%	0.04%	0.02%
Derivatives (new line 2010)					31,981					0.01%
Replication - Synthetic Asset: One Half	8,534	14,438	4,620	3,382	-1,023	0.00%	0.00%	0.00%	0.00%	0.00%
Asset Concentration (Equity)	16,361,398	18,305,541	12,971,776	14,794,440	18,968,359	5.86%	6.31%	4.74%	5.28%	6.49%
Total R2	59,858,120	67,527,803	52,456,701	57,209,628	69,488,335	21.45%	23.28%	19.16%	20.41%	23.79%
R3 - Asset Risk - Credit										
Other Credit RBC	6,179,719	2,713,236	3,310,690	3,333,020	3,138,588	2.21%	0.94%	1.21%	1.19%	1.07%
One Half of Rein Recoverables	11,464,017	10,703,079	10,870,321	10,462,354	9,964,021	4.11%	3.69%	3.97%	3.73%	3.41%
Other Half of Rein Recoverables	3,289,586	2,553,875	3,066,407	2,389,458	1,801,276	1.18%	0.88%	1.12%	0.85%	0.62%
Health Credit Risk	0	0	0	0	0	0.00%	0.00%	0.00%	0.00%	0.00%
Total R3	20,933,322	15,970,190	17,247,418	16,184,833	14,903,885	7.50%	5.51%	6.30%	5.77%	5.10%

R4 - Underwriting Risk – Reserves										
One Half of Reinsurance RBC	8,174,432	8,149,204	7,803,914	8,072,896	8,162,745	2.93%	2.81%	2.85%	2.88%	2.79%
Unpaid Loss/Expense Reserve	90,883,104	92,254,735	91,358,674	92,046,039	92,847,848	32.56%	31.80%	33.37%	32.84%	31.79%
Excess Growth – Loss/Expense Reserve	1,346,463	898,700	668,114	373,103	426,323	0.48%	0.31%	0.24%	0.13%	0.15%
A&H Claims Reserves	113,738	108,820	106,873	162,932	194,982	0.04%	0.04%	0.04%	0.06%	0.07%
Total R4	100,517,737	101,411,459	99,937,576	100,654,969	101,631,899	36.02%	34.96%	36.50%	35.91%	34.79%
R5 - Underwriting Risk - Written Premiums										
NWP RBC	53,926,575	57,208,353	55,376,189	54,614,304	53,422,032	19.32%	19.72%	20.23%	19.49%	18.29%
Excess Growth - Premiums	654,028	540,365	483,979	261,959	227,547	0.23%	0.19%	0.18%	0.09%	0.08%
Net Health Premium RBC	195,326	318,625	295,513	338,165	317,428	0.07%	0.11%	0.11%	0.12%	0.11%
Health Stabilization Reserves	-2,002	-1,433	-1,342	20,489	30,068	0.00%	0.00%	0.00%	0.01%	0.01%
Total R5	54,733,927	58,065,911	56,154,339	55,234,918	53,997,075	19.61%	20.02%	20.51%	19.71%	18.49%
Total RBC	279,088,272	290,068,141	273,772,362	280,258,936	292,096,057	100.00%	100.00%	100.00%	100.00%	100.00%
RBC After Covariance	197,427,592	205,803,118	193,386,033	199,654,405	211,980,682	70.74%	70.95%	70.64%	71.24%	72.57%
Total Adjusted Capital	598,836,593	640,380,204	578,401,613	643,578,743	692,557,389	214.57%	220.77%	211.27%	229.64%	237.10%

As shown in Table 75, the sum of the RBC charges is $48,016,000 (total RBC before covariance). After covariance, total RBC is $25,913,505. RBC after covariance is considerably less, reflecting independence of the risks associated with R_1 through R_5.

Components of the Charges

Within subsequent sections of this chapter, we will walk through the components of each charge that goes into the RBC formula, deliberately leaving out certain information that would be necessary to prepare and issue the RBC report for a company. The NAIC issues instructions on how to compute RBC, including an instructional CD-ROM providing a spreadsheet with the necessary formulas. Additionally, RBC software is available from Annual Statement software vendors and is used by insurance companies for filing with state regulatory authorities. This publication is only intended to provide an overview of the RBC formula and is not intended to supplant the NAIC instructions or electronic filing requirements.

Before we delve into the details, let us provide some perspective on the relevance of each risk category to the overall formula. Table 76 provides a summarization of a table provided by the NAIC in its presentation of 2011 RBC results for the property/casualty insurance industry:[127]

TABLE 76

Aggregate for 2,600 Property/Casualty Companies
RBC by Category
USD in 000s

2011 Risk Category	Totals
R_0 – Asset Risk – Affiliates	45,083,423
R_1 – Asset Risk – Fixed Income	7,941,632
R_2 – Asset Risk – Equity	74,325,097
R_3 – Asset Risk – Credit	15,514,367
R_4 – Underwriting Risk – Reserves	102,176,645
R_5 – Underwriting Risk – Written Premiums	55,754,469
Total RBC before Covariance	300,795,633

Underwriting risk associated with loss and LAE reserves (R_4) represented the largest risk charge within the RBC formula for the property/casualty insurance industry in 2011 ($102 billion).

Recall that the covariance adjustment increases the dependency of the larger risks and decreases the significance of the smaller risk categories in the overall aggregate RBC requirement. As displayed in the Table 77, squaring each of charges R_1 through R_5 and

[127] NAIC, *Property & Casualty Industry RBC Results*, 2012, http://www.naic.org/documents/research_stats_rbc_results_pc.pdf, Table 5, pages 5 through 7.

summing the results shows that the underwriting risk charges contributed 70% of the total charge associated with R_1 through R_5 in 2011. The asset risk charge associated with equity investments essentially comprised the remainder (29%).[128]

TABLE 77

Aggregate for 2,600 Property/Casualty Companies
RBC by Category
USD in 000s

2011 Risk Charges for R_1 through R_5	Totals	Squared Totals	Distribution
R_1 – Asset Risk – Fixed Income	7,941,632	63,069,518,823,424	0%
R_2 – Asset Risk – Equity	74,325,097	5,524,220,044,059,410	29%
R_3 – Asset Risk – Credit	15,514,367	240,695,583,410,689	1%
R_4 – Underwriting Risk – Reserves	102,176,645	10,440,066,783,456,000	54%
R_5 – Underwriting Risk – Written Premiums	55,754,469	3,108,560,813,471,960	16%
Total RBC before Covariance	255,712,210	19,376,612,743,221,500	100%

Despite representing more than half of the invested assets of the property/casualty insurance industry in 2011 (see Table 2), the asset risk charge for fixed income investments had almost no impact (0%) on the overall RBC charge for the industry. This is because property/casualty insurers tend to invest in relatively safe, high-credit quality bonds.

The asset risk charge for equity is relatively high (29%), reflecting the increased risk associated with these investments over fixed income. As shown in Table 2, common stocks represented 14% of total assets held by property/casualty insurers in 2011.

The charge for credit risk is relatively low. As we shall see, this is probably due to the fact that this charge is applied to reinsurance recoverables after consideration of the provision for reinsurance to avoid double counting.

Note that the NAIC's report on 2011 results also shows that the relative significance of each risk charge to the overall formula has remained relatively consistent over the past five years.

THE RBC CHARGE FOR ASSET RISK ASSOCIATED WITH INSURANCE COMPANY SUBSIDIARIES (R_0)

The RBC required for investments in insurance company subsidiaries depends on the asset class and type of subsidiary and whether the subsidiary is subject to RBC. Recall that certain insurance companies are not subject to RBC, such as title insurers, monoline mortgage guaranty insurers and monoline financial guaranty insurers. R_0 considers only those investments in insurance company subsidiaries for which the subsidiary itself files RBC. For

[128] Ibid.

STATE OF CONNECTICUT

INSURANCE DEPARTMENT

TO: Matti Peltonen, Chair
Investment Risk Based Capital Working Group

FROM: Richard Marcks
Chief Actuary
Connecticut Insurance Department

DATE: February 20, 2014

RE: Implications for Changes to the Bond Risk Charge in the PC RBC Formula

Over the past several months I have participated in the conference calls of the Investment RBC WG and listened with interest to the work being done to reassess Bond charges in the RBC formulae.

I recognize there is a value in seeking a system of uniformity, unless there is a good reason to be different. We have heard comments from some Interested Parties that led me to pursue the reasons for maintaining differences for Property Casualty (non AVR) companies. I believe there is merit to an argument for the status quo for PC. I am not leading a crusade for that position. What I hope for is that this Working Group will consider what I am about to present and make a more informed decision on the benefits of making a change to the PC formula (both structure and charges for Bond Risk) relative to the costs of such a change.

Risk-based capital standards will be used by regulators to set in motion appropriate regulatory actions relating to insurers that show indications of weak or deteriorating conditions.

According to the Forecasting & Instructions document RBC provides a standard for minimum capital requirements. We often refer to it as the mechanism for identifying weakly capitalized companies. If we are to make a change in the formula, the change should be one that serves a meaningful purpose to enhance that objective. The Academyôs efforts have directed us toward various ways to segregate or group bonds into risk categories. I do not pretend to be informed enough to comment on the academic merits of those efforts.

I do, however, pose this question to the WG: ñWould this change help to better discriminate weakly capitalized PC companies?ò To help me answer that question I asked Eva Yeung for an extract of RBC filing detail (TAC, ACL, R0, R1, R2, R3, R4, and R5) for all PC companies that submitted RBC reports on ISITE ← 2,599 companies.

- With that detail I recalculated ACL to be sure I had the formula correct.
- I then ran a few alternate scenarios to assess the sensitivity of ACL to large changes in R1. The Bond charge is indeed only a subset of the R1 component. For the small sample of companies I looked at I felt that was a reasonable simplifying assumption. If you disagree, I would only point out that any inferences of my testing would overstate the impact of the alternate scenarios I used.
    - Scenario 1: Eliminate R1. This would be comparable to assuming that all companies would have a portfolio of zero risk charge bonds. That would be an extreme assumption ï right!
    - Scenario 2: Double the R1 charge. This would be comparable to assuming that all companies would have a portfolio of bonds that, on average, would be in new categories with charges at least twice as high as the current charges. I cannot say if this is an extreme assumption. Those of you who are more informed that I might argue that the new categories could produce a much higher average charge.

Here are the basic results.

1. 2,023 (or 78%) have less than a 1% reduction in ACL if R1 is eliminated (Scenario 1).
2. Those same 2,023 companies have less than a 3.1% increase in ACL if R1 is doubled (Scenario 2).

One might suggest that ACL changes of this magnitude are or are not meaningful. That is a question for the WG as a whole to consider. I can run additional scenarios if there is interest. If one assumes that ACL changes of this magnitude do not help to better identify weakly capitalized companies within those 2,023, the next question is ñWhat do the other 576 companies look like?ò

3. 370 of those 576 companies have year-end 2012 RBC ratios greater than 10,000%. 562 have year-end 2012 RBC ratios greater than 1,000%.

One might suggest that high RBC ratios are not a measure of relative strength since RBC is intended to be a minimum standard. That is another question for the WG as a whole to consider. So I continue with the remaining 15 companies (less than 0.6% of all filing companies).

4. The year-end RBC ratios for those 15 range from 330% to 930%.
5. Eleven of the 15 are members of larger groups. Some are in pools with pool shares ranging from 2% to 30%.

Now for the other side of the discussion. What is the cost of such an enhancement?

A change of this nature will make the formula more complex. There will be a learning curve for regulators to understand any new element.

A change will require reprogramming for companies and for the NAIC. We often hear arguments that regulatory changes add burdensome costs that are passed on to consumers . . . making insurance more costly ï less affordable.

I donôt see much purpose in creating a longer list of costs. So I get back to my objective of making an informed decision on the value of such a change in the PC formula.

What I have found makes me doubt the benefit of such a change relative to the costs. The simple scenarios I used do not convince me that this would be helpful in enhanced discrimination of weakly capitalized companies. And even I have done some eye rolls when I listen to some of these arguments about the burdensome costs of regulation. But in this case I have more sympathy for the argument.

Others may disagree. Thatôs why we do this as a group. My interest is in helping us make an informed decision. I can run additional scenarios if there is interest. I can make my work available to other members of the WG so that you can look at it for yourself.

This is only a look at PC companies. On a previous call Nancy Bennett made the point that bond portfolios in the PC line contribute less to ACL that for Life companies. That is my general expectation. I have received a comparable file from Eva for the 763 Life companies that submitted RBC information at year-end 2012. The Life formula is definitely more complex than the PC formula, so I have more work to do. First indications support Nancy's comment.

In conclusion, I ask the WG if there is merit to asking more questions about the cost and benefits of this effort in serving a regulatory purpose.

Date: September 29, 2015

To: Thomas S. McIntyre

From: Ramona C. Lee

Re: Testing Impact of Investment Risk Based Capital (RBC) Changes for P&C Companies

In a memo dated February 20, 2014, Richard Marcks detailed his findings from testing the Property and Casualty (P&C) companies' RBC formulas for sensitivity to the investment factors. Being a regulator, I have access to company specific RBC data and was able to perform similar tests using current data.

Alan Harder of the Iowa Insurance Division provided the following year end 2014 data from NAIC's I-Site database for all individual P&C filers, separately by company:

- Total Adjusted Capital,
- R0 through R5 used to calculate Risk Based Capital,
- Total RBC After Covariance excluding Catastrophe Risk,
- Authorized Control Level RBC (ACL RBC) excluding Catastrophe Risk,
- RBC Ratio,
- R1A through R7 used to calculate Risk Based Capital with the Catastrophe adjustment,
- Total RBC After Covariance including Catastrophe Risk,
- Authorized Control Level RBC (ACL RBC) including Catastrophe Risk.

I set up the following formulas to calculate the Total RBC amounts, ACL RBC, and RBC Ratios and compared the calculated amounts to the amounts from I-Site. For nearly every company, the calculated amounts balanced to the amounts from I-Site.

Total RBC after Covariance excluding Catastrophe Risk
= R0+SQRT(R1^2+R2^2+R3^2+R4^2+R5^2);
Total RBC after Covariance including Catastrophe Risk
= R0A+SQRT(R1A^2+R2A^2+R3^2+R4^2+R5A^2+R6^2+R7^2);
ACL RBC = 0.5 x Total RBC after Covariance; and
RBC Ratios = ACL RBC with or without Catastrophe Adjustment / Total Adjusted Capital.

To test the sensitivity of the ACL RBC to changes in the investment factors, I replaced the R1 and R1A factors in the above formulas for each company with zero, two, and ten times the database amount.

ACL RBC after Covariance excluding Catastrophe Risk

= 0.5 x [R0+SQRT((<u>0, 2, or 10</u> x R1)^2+R2^2+R3^2+R4^2+R5^2)]

ACL RBC after Covariance including Catastrophe Risk

= 0.5 x [R0A+SQRT((<u>0, 2, or 10</u> x R1A)^2+R2A^2+R3^2+R4^2+R5A^2+R6^2+R7^2)]

The following tables detail the percentage of companies experiencing various changes in the ACL RBC for the three levels of R1 and R1A factor changes (0, 2x, and 10x the amounts).

Effect of Changing R1 Factors on ACL RBC
Excluding Catastrophe Risk

% Change in ACL RBC	Percentage of Companies		
up to & including	*R1=0*	*R1=2xR1*	*R1=10xR1*
-100%	0%	0%	0%
-50%	8%	0%	0%
-10%	7%	0%	0%
-1%	9%	0%	0%
0%	76%	1%	1%
1%	0%	64%	11%
10%	0%	17%	33%
50%	0%	8%	28%
100%	0%	10%	6%
More	0%	0%	21%
Total	100%	100%	100%

Effect of Changing R1A Factors on ACL RBC
Including Catastrophe Risk

% Change in ACL RBC	Percentage of Companies		
up to & including	*R1A=0*	*R1A=2xR1A*	*R1A=10xR1A*
-100%	0%	0%	0%
-50%	8%	0%	0%
-10%	6%	0%	0%
-1%	9%	0%	0%
0%	77%	1%	1%
1%	0%	65%	12%
10%	0%	16%	34%
50%	0%	7%	27%
100%	0%	10%	6%
More	0%	0%	20%
Total	100%	100%	100%

Similar to the results reported by Richard Marcks in his memo:

- Of the 2,534 companies, 1,927 (or 76%) had less than a 1% reduction in ACL RBC when R1 was eliminated;
- For those companies, the maximum increase in ACL RBC when R1 was doubled was less than 3%;
- Of the other 607 companies, 416 had year-end 2014 RBC ratios greater than 10,000%;
- Of the 607 companies, 587 had year-end 2014 RBC ratios greater than 1,000%;

I also considered the results after the catastrophe adjustment:

- Of the 2,534 companies, 1,947 (or 77%) had less than a 1% reduction in ACL RBC when R1 was eliminated;
- For those companies, the maximum increase in ACL RBC when R1 was doubled was also less than 3%;
- Of the other 587 companies, 332 had year-end 2014 RBC ratios greater than 10,000%;
- Of the 587 companies, 513 had year-end 2014 RBC ratios greater than 1,000%;

I would be happy to run additional tests with the data I have available to me.