CAPITAL ADEQUACY (E) TASK FORCE

- Capital Adequacy (E) Task Force March 23, 2021, Virtual Meeting *in lieu of meeting at the Spring National Meeting*
  - Minutes
  - Capital Adequacy (E) Task Force Feb. 1, 2021, Minutes (Attachment One)
    - Catastrophe Events List (Attachment One-A)
  - Health Risk-Based Capital (E) Working Group March 17, 2021, Minutes (Attachment Two)
    - Health Risk-Based Capital (E) Working Group Feb. 10, 2021, Minutes (Attachment Two-A)
      - Proposal 2021-02-CA (Attachment Two-A1)
    - Health Risk-Based Capital (E) Working Group Jan. 22, 2021, Minutes (Attachment Two-B)
      - Academy's Report on Investment Income in Underwriting Risk (Attachment Two-B1)
      - UnitedHealth Group—UHG Comment Letter Regarding the American Academy of Actuaries Letter Regarding an Investment Income Adjustment to Health RBC Underwriting Risk Factors. (Attachment Two-B2)
    - Health Risk-Based Capital (E) Working Group Dec. 18, 2020, Minutes (Attachment Two-C)
      - Health Care Receivable Proposal to the Blanks (E) Working Group (Attachment Two-C1)
      - Academy's Report on Investment Income in Underwriting Risk (Attachment Two-C2)
    - Update from the Academy on Investment Income in the Underwriting Risk Component and Exposed Proposal 2021-04-CA (Attachment Two-D)
    - Summary of (Attachment Two-E)
    - Proposal 2021-04-CA (Attachment Two-F)
  - Life Risk-Based Capital (E) Working Group March 12, 2021, Minutes (Attachment Three)
    - Life Risk-Based Capital (E) Working Group Feb. 26, 2021, Minutes (Attachment Three-A)
      - Update to the Mortgage Reporting Guidance (Attachment Three-A1)
      - Presentation of the ACLI Real Estate Proposal (Attachment Three-A2)
      - ACLI's Real Estate Proposal (Attachment Three-A3)
    - Life Risk-Based Capital (E) Working Group Feb. 11, 2021, Minutes (Attachment Three-B)
      - Moody's Analytics Report on Bonds (Attachment Three-B1)
      - Presentation on Moody's Analytics Report on Bonds (Attachment Three-B2)
      - Alternatives for the Requested Modification to the Mortgage Reporting Guidance (Attachment Three-B3)
    - Life Risk-Based Capital (E) Working Group Jan. 21, 2021, Minutes (Attachment Three-C)
      - ACLI's Presentation Over Real Estate RBC: Structural Changes January 2021 (Attachment Three-C1)
      - Guaranty Fund Memorandum to the Capital Adequacy (E) Task Force (Attachment Three-C2)
    - Life Risk-Based Capital (E) Working Group Dec. 17, 2020, Minutes (Attachment Three-D)
    - Comment Letter from ACLI Regarding the Real Estate Proposal (Attachment Three-E)
    - Memo from ACLI Regarding Review of Proposals from the PFML Federal Strategies Working Group (Attachment Three-F)
  - Property and Casualty Risk-Based Capital (E) Working Group March 15, 2021, Minutes (Attachment Four)
    - Catastrophe Risk (E) Subgroup March 8, 2021, Minutes (Attachment Four-A)
    - Joint Property and Casualty Risk-Based Capital (E) Working Group and Catastrophe Risk (E) Subgroup Jan. 27, 2021, E-Vote Minutes (Attachment Four-B)
    - Update to Property and Casualty Risk-Based Capital Underwriting Factors Experience Through December 31, 2017 (Attachment Four-C)
  - Memorandum from the Life Risk-Based Capital (E) Working Group Regarding Recommendation Regarding Risk-Based Capital Charge for Guaranty Association Assessment Risk (Attachment Five)
  - Proposal 2020-10-CA (Attachment Six)
  - Proposal 2021-02-CA (Attachment Seven)
  - Proposal 2020-08-CR (Attachment Eight)
  - Proposal 2020-11-CR (Attachment Nine)
  - Capital Adequacy (E) Task Force Working Agenda (Attachment Ten)

Draft: 3/30/21

Capital Adequacy (E) Task Force
Virtual Meeting *(in lieu of meeting at the Spring National Meeting)*
March 23, 2021

The Capital Adequacy (E) Task Force met March 23, 2021. The following Task Force members participated: Judith L. French, Chair, represented by Tom Botsko (OH); Doug Slape, Vice Chair, represented by Mike Boerner and Rachel Hemphill (TX); Lori K. Wing-Heier represented by Wally Thomas (AK); Jim L. Ridling represented by Richard Ford (AL); Ricardo Lara represented by Perry Kupferman (CA); Andrew N. Mais represented by Wanchin Chou (CT); Karima M. Woods represented by Philip Barlow (DC); David Altmaier represented by Carolyn Morgan (FL); Doug Ommen represented by Mike Yanacheak (IA); Dana Popish Severinghaus represented by Vincent Tsang (IL); Vicki Schmidt represented by Tish Becker (KS); Grace Arnold represented by John Robinson (MN): Chlora Lindley-Myers represented by John Rehagen (MO); Mike Causey represented by Jackie Obusek (NC); Bruce R. Ramge represented Lindsay Crawford (NE); Marlene Caride represented by Diana Sherman (NJ); Glen Mulready represented by Diane Carter (OK); Raymond G. Farmer represented Michael Shull (SC); Mike Kreidler represented by Steve Drutz (WA); and Mark Afable represented by Amy Malm (WI).

1. Adopted its Feb.1, 2021, and 2020 Fall National Meeting Minutes

The Task Force conducted an e-vote that concluded Feb. 1 to adopt the 2020 catastrophe event list.

Mr. Yanacheak made a motion, seconded by Mr. Chou, to adopt the Task Force's Feb. 1, 2021, minutes (Attachment One) and 2020 Fall National Meeting minutes *(see NAIC Proceedings – Fall 2020, Capital Adequacy (E) Task Force)*. The motion passed unanimously.

2. Adopted its Working Group Reports and Minutes

a. Health Risk-Based Capital (E) Working Group

Mr. Drutz said the Health Risk-Based Capital (E) Working Group's met March 17 and took the following action: 1) adopted its Feb. 10, 2021; Jan. 22, 2021; and Dec. 18, 2020, minutes; 2) adopted its 2021 working agenda; 3) referred proposal 2021-02-CA (Managed Care Credit – Incentives) to the Capital Adequacy (E) Task Force for exposure; 4) continued discussion of the impact analysis on the inclusion of investment income in underwriting risk; 5) exposed proposal 2021-04-CA for a 30-day public comment period; and 6) received an update on the bond factor analysis..

b. Life Risk-Based Capital (E) Working Group

Mr. Barlow said that the Life Risk-Based Capital (E) Working Group met March 12 and took the following action: 1) adopted its interim minutes; 2) discussed the Moody's Analytics report on bonds; and 3) discussed the real estate proposal submitted by the American Council of Life Insurers (ACLI). He said the Working Group's main focus has been on the real estate and bond factors for year-end 2021.

c. Catastrophe Risk (E) Subgroup

Mr. Chou noted that the Catastrophe Risk (E) Subgroup met March 8 and took the following action: 1) adopted its Jan. 27 minutes; 2) adopted proposal 2020-08-CR (Clarification to PR027 Interrogatories); 3) adopted proposal 2020-11-CR (Remove Operational Risk Factor from Contingent Credit Risk); 4) discussed the development progress of wildfire modeling and a risk-based capital (RBC) charge; 5) discussed its 2021 working agenda; 6) discussed the internal catastrophe model evaluation process; and 7) established an ad hoc group to conduct a more in-depth review on different wildfire models.

d. Property and Casualty Risk-Based Capital (E) Working Group

Mr. Botsko said that the Property and Casualty Risk-Based Capital (E) Working Group met March 15 and took the following action: 1) exposed a credit risk instruction modification; and 2) heard an update from its Runoff Ad Hoc Group.

Ms. Hemphill made a motion, seconded by Mr. Drutz, to adopt the reports of the Health Risk-Based Capital (E) Working Group (Attachment Two), the Life Risk-Based Capital (E) Working Group (Attachment Three), and the Property and Casualty Risk-Based Capital (E) Working Group (Attachment Four). The motion passed unanimously.

3. Received a Guaranty Fund Memorandum

Mr. Barlow said that the Life Risk-Based Capital (E) Working Group reviewed the referral regarding adopted amendments to the *Life and Health Insurance Guaranty Association Model Act* (#520) and determined that no action was necessary to change its current risk charge.

The Task Force accepted the memorandum (Attachment Five).

4. Adopted Proposal 2020-10-CA

Mr. Botsko said proposal 2020-10 (revised Bond Structure for Health and Property/Casualty) was exposed on Oct. 27 for a 45-day comment period ending Dec. 16, 2020, and no comments were received (Attachment Six). Mr. Botsko added that the Health, Life and Property and Casualty Risk-Based Capital (E) Working Groups are continuing to work on their factors and will exposed by April 30 for consideration on June 30.

Mr. Chou made a motion, seconded by Mr. Boerner, to adopt proposal 2020-10-CA (Bond Structure-Health and P/C). The motion passed unanimously.

5. Exposed Proposal 2021-02-CA

Mr. Drutz said that the Working Group exposed proposal 2021-02-CA for a 30-day comment period ending March 12, and no comments were received. He said that the purpose of the proposal is to provide clarifying language for the inclusion of incentives in the managed care credit instructions and blank.

Mr. Botsko said the Task Force will expose proposal 2021-02-CA (Managed Care Credit Incentives) (Attachment Seven) for a 30-day comment period ending April 22.

6. Adopted Proposal 2020-08-CR

Mr. Botsko said proposal 2020-08-CR (Clarification to PR027 Interrogatories) is for those insurers that do not report earthquake or hurricane exposure. He said the purpose of this proposal is to clarify the instructions for reporting minimal to no exposure for these catastrophe risks.

Mr. Chou made a motion, seconded by Mr. Boerner, to adopt proposal 2020-08 CR (Clarification to PR027 Interrogatories) (Attachment Eight). The motion passed unanimously.

7. Adopted Proposal 2020-11-CR

Mr. Botsko said the operational risk is now separately addressed in the RBC formula as a stand-alone capital add-on. The purpose of this proposal is to remove the embedded 3% operational risk charge in the Rcat component to avoid double-counting of the charge. He also stated that the Subgroup received comment letters from the American Property Casualty Insurance Association (APCIA) and Reinsurance Association of America (RAA) during the exposure period. They both support this proposal to eliminate the duplicative application of operational risk charges for modeled reinsurance recoverable in the Rcat component.

Mr. Chou made a motion, seconded by Mr. Kupferman, to adopt proposal 2020-11-CR (Remove Operational Risk Factor from Rcat) (Attachment Nine). The motion passed unanimously.

8. Adopted its Working Agenda

Mr. Drutz summarized the changes to the 2021 health RBC working agenda, which included the following substantial changes: 1) the addition to review the managed care credit across the formulas; 2) the deletion of the MAX function as the proposal was adopted for 2021 reporting; and 3) moving the investment income and bond factor items from the New Items section to the Carry Over Items section.

Mr. Botsko summarized the changes to the Working Group's 2021 working agenda: 1) changed "Evaluate other catastrophe risks for possible inclusion in the charge" item expected completion date to year-end 2022 or later; 2) removed "Evaluate the possibility of using the NAIC as a centralized location for reinsurer designations" and "Evaluate the RBC impact on two different retroactive reinsurance exception approaches"; 3) modified "Evaluate the possibility of allowing additional third-party

models to calculate the cat model losses" to "Evaluate the possibility of allowing additional third-party models or adjustments to the vendor models to calculate the cat model losses," and the expected completion date was changed to year-end 2021 or later; and 4) added "Implement Wildfire Peril in the Rcat component (For Informational Purpose Only)" in the new items section.

Mr. Botsko added that the Task Force continues to address the items on its working agenda as they are prioritized and will update the working agenda this summer.

Mr. Drutz made a motion, seconded by Mr. Chou, to adopt the Task Force's working agenda (Attachment Ten). The motion passed unanimously.

Having no further business, the Capital Adequacy (E) Task Force adjourned.

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Draft: 2/23/21

Capital Adequacy (E) Task Force
E-Vote
February 1, 2021

The Capital Adequacy (E) Task Force conducted an e-vote that concluded Feb. 1, 2021. The following Task Force members participated: Tynesia Dorsey, Chair, represented by Tom Botsko (OH); Doug Slape, Vice Chair, represented by Mike Boerner (TX); Lori K. Wing-Heir represented by Wally Thomas (AK); Jim L. Ridling (AL); Ricardo Lara represented by Thomas Reedy (CA); Andrew N. Mais represented by Wanchin Chou (CT); Karima M. Woods represented by Philip Barlow (DC); David Altmaier represented by Virginia Christy (FL); Doug Ommen represented by Mike Yanacheak (IA); Vicki Schmidt represented by Tish Becker (KS); Sharon P. Clark represented by Russell Coy (KY); Chlora Lindley-Myers represented by John Rehagen (MO); Grace Arnold represented by John Robinson (MN); Mike Causey represented by Jackie Obusek (NC); Bruce R. Ramge represented by Lindsay Crawford (NE); Glen Mulready represented by Andrew Schallhorn (OK); and Mike Kreidler represented by Steve Drutz (WA).

1. Adopted the Updated 2020 U.S. and Non-U.S. Catastrophe Risk Event Lists

The Task Force conducted an e-vote to consider adoption of the updated 2020 U.S. and non-U.S. catastrophe risk event lists.

Mr. Chou made a motion, seconded by Mr. Thomas, to adopt the lists (Attachment One-A). The motion passed unanimously.

Having no further business, the Capital Adequacy (E) Task Force adjourned.

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U.S. List of Catastrophes for Use in Reporting catastrophe Data in PR036 and PR100+

Type of Event	Name	Date	Location	Overall losses when occurred
Hurricane	Irene	2011		$ 4,300,000,000
Tropical Storm	Lee	2011		$ 315,000,000
Hurricane	Sandy	2012		$ 50,000,000,000
Hurricane	Isaac	2012		$ 970,000,000
Tropical Storm	Debby	2012		$ 105,000,000
Earthquake		2014	California	25+ million
Hurricane	Patricia	2015		25+ million
Hurricane	Joaquin	2015		25+ million
Hurricane	Matthew	2016	Florida, North Carolina, South Carolina, Georgia and Virginia	$ 2,698,400,000
Hurricane	Hermine	2016	Florida, North Carolina, South Carolina, Georgia and Virginia	$ 245,640,000
Hurricane	Harvey	2017	Texas, Lousiana	25+ million
Hurricane	Jose	2017	East Coast of the United States	25+ million
Hurricane	Irma	2017	Eastern United States	25+ million
Hurricane	Maria	2017	Southeastern United States, Mid-Atlantic States	25+ million
Hurricane	Nate	2017	Louisiana, Mississippi, Alabama, Tennessee and Eastern United States	25+ million
Tropical Storm	Alberto	2018	Southeast, Midwest	25+ million
Hurricane	Lane	2018	Hawaii	25+ million
Tropical Storm	Gordon	2018	Southeast, Gulf coast of the United States, Arkansas and Missouri	25+ million
Hurricane	Florence	2018	Southeast, Mid-Atlantic	25+ million
Hurricane	Michael	2018	Southeastern and East Coasts of United States	25+ million
Hurricane	Dorian	2019	Southeast, Mid-Atlantic	500+ million
Hurricane	Barry	2019	Southeast, Midwest, Northeast	300+ million
Tropical Storm	Imelda	2019	Plains, Southeast	25+ million
Tropical Storm	Nestor	2019	Southeast	25+ million
Hurricane	Lorenzo	2019	Louisiana, Mississippi, Texas and Arkansas	25+ million
Tropical Storm	Cristobal	2020	Southeast, Plains, Midwest	150 million
Tropical Storm	Fay	2020	Southeast, Northeast	400 million
Hurricane	Hanna	2020	Texas	350 million
Hurricane	Isaias	2020	Southeast, Mid-Atlantic, Northeast	> 3 billion
Hurricane	Laura	2020	Plains, Southeast, Mid-Atlantic	> 4 billion
Hurricane	Sally	2020	Southeast (Alabama, Mississippi, Louisiana)	> 1 billion
Tropical Storm	Beta	2020	Plains, Southeast	25+ million
Hurricane	Delta	2020	Gulf Coast of United States, Southeast, Northeast (AL, GA, NC, SC, MS, LA, TX)	> 2 billion
Hurricane	Zeta	2020	Gulf coast of the United States, Southeastern United States, Mid-Atlantic	> 1.5 billion

Non U.S. List of Catastrophes For Use in Reporting Catastrophe Data in PR036 and PR100+

Year	Event Type	Begin	End	Event	Country	Affected Area (Detail)	Munich Re NatCATService Insured losses (in original values, US$m) Criteria: insured losses equal/greater US$ 25m. Tries to reflect non-US losses only	Swiss Re Sigma: Insured Loss Est. US$m (mid point shown if range given) Mostly reflect total US and nonUS losses combined.	
2011	Tropical Cyclone	20/09/2011	22/09/2011	Typhoon Roke (Onyok), floods			1200	1210	
2011	Tropical Cyclone	22/08/2011	02/09/2011	Hurricane Irene		Caribbean Islands and Eastern Canada	300	5300	
2011	Earthquake	13/06/2011	13/06/2011	Earthquake	New Zealand	South Island, Canterbury, Christchurch, Lyttelton	800	2000	
2011	Earthquake	11/03/2011	11/03/2011	Earthquake	Japan	Honshu, Aomori, Tohoku; Miyagi, Sendai; Fukushima, Mito; Ibaraki; Tochigi, Utsunomiya; Iwate, Morioka; Yamagata, Chiba; Tokyo	35000	35000	
2011	Tropical Cyclone	09/02/2011	09/03/2011	Tropical Storm Talas			N/A	470	
2011	Earthquake	22/02/2011	22/02/2011	Earthquake	New Zealand	South Island, Canterbury, Christchurch, Lyttelton	13000	12000	
2011	Tropical Cyclone	02/02/2011	07/02/2011	Cyclone Yasi		Queensland, Tully, Townsville, Mission Beach, Cardwell, Giru, Ingham, Innisfail, Cassowary Coast Shire, Cairns, Bedarra and Dunk islands	1430	1360	
2012	Earthquake	29/05/2012	29/05/2012	Earthquake	Italy	Emilia-Romagna, San Felice del Panaro, Cavezzo, Rovereto di Novi, Carpi, Concordia, Bologna, Mailand, Aosta Valley, Venice, Mirandola	1600	N/A	
2013	Tropical Cyclone	08/11/2013	12/11/2013	Typhoon Haiyan		Phillippines, Vietnam, China	700	N/A	
2014	Earthquake	07/07/2014		Earthquake	Mexico, Guatemala		N/A	N/A	25+milion
2014	Earthquake	04/01/14		Earthquake	Chile		N/A	N/A	100+milion
2014	Earthquake	12/02/2014		Earthquake	China		N/A	N/A	350+milion
2014	Earthquake	05/04/2014		Earthquake	China		N/A	N/A	80+milion
2014	Earthquake	05/05/2014		Earthquake	Thailand		N/A	N/A	62+milion
2014	Earthquake	05/24/14		Earthquake	China		N/A	N/A	60+milion
2014	Tropical Storm	06/14/14	06/16/14	TS Hagibis	China		N/A	N/A	131+milion
2014	Super Typhoon	07/08/14	07/11/14	STY Neoguri	Japan		N/A	N/A	100+milion
2014	Super Typhoon	07/15/14	07/20/14	STY Rammasun		Philippines, China, Vietnam	N/A	N/A	570+milion
2014	Typhoon	07/22/14	07/24/14	TY Matmo		Taiwan, China, Philippines	N/A	N/A	570+milion
2014	Cyclone	01/10/14	01/12/14	CY Ian	Tonga		N/A	N/A	48+milion
2014	Cyclone	04/10/14	04/14/14	CY Ita	Australia		N/A	N/A	1+billion
2015	Hurricane	08/16/92	08/28/92	Hurrican Andrew	Bahamas	Bahamas			> 25 million
2015	Hurricane	10/20/15	10/24/15	Hurricane Patricia		Central America, Mexico	N/A	N/A	> 25 million
2015	Typhoon	06/26/15	07/13/15	Typhoon Chan-hom (Falcon)		Guam, Northern Mariana Islands, Philippines, Japan, Taiwan, Chian, Korea, Russian Far East	N/A	N/A	> 25 million
2015	Severe Tropical Storm	07/01/15	07/10/15	Severe Tropical Storm Linfa (Egay)		Philippines, Taiwan, China	N/A	N/A	> 25 million
2015	Typhoon	07/02/15	07/18/15	Typhoon Nangka		Marshall Islands, Mariana Islands and Japan	N/A	N/A	> 25 million
2015	Typhoon	07/29/15	08/12/15	Typhoon Soudelor (Hanna)		Mariana Islands, Japan, Philippines, Taiwan, Eastern China and South Korea	N/A	N/A	> 25 million
2015	Typhoon	08/13/15	08/30/15	Typhoon Goni (Ineng)		Mariana Islands, Japan, Philippines, Taiwan, China, Russia and Korea	N/A	N/A	> 25 million
2015	Severe Tropical Storm	09/06/15	09/11/15	Severe Tropical Storm Etau		Japan, Russian Far East	N/A	N/A	> 25 million

Non U.S. List of Catastrophes For Use in Reporting Catastrophe Data in PR036 and PR100+

2015	Typhoon	09/19/15	09/30/15	Typhoon Dujuan (Jenny)		Ryukyu Islands, Taiwan, East China	N/A	N/A	> 25 million
2015	Typhoon	09/30/15	10/05/15	Typhoon Mujigae (Kabayan)		Philippines, Vietnam and China	N/A	N/A	> 25 million
2015	Typhoon	10/12/15	10/21/15	Typhoon Koppu (Lando)		Northern Mariana Islands, Philippines, Taiwan, Ryukyu Islands	N/A	N/A	> 25 million
2015	Typhoon	12/03/15	12/08/15	Storm Desmond		Ireland, Isle of Man, United Kingdom, Iceland, Norway and Sweden	N/A	N/A	> 25 million
2015	Hurricane	09/28/15	10/15/15	Hurricane Joaquin		Caribbean Islands, Portugal	N/A	N/A	> 25 million
2015	Earthquake	04/27/15		Earthquake	Nepal		N/A	N/A	> 25 million
2015	Earthquake	09/22/15		Earthquake	Chile		N/A	N/A	> 25 million
2016	Hurricane	08/28/16	09/06/16	Hurricane Hermine		Dominican Republic, Cuba, The Bahamas	N/A	N/A	> 25 million
2016	Tropical Cyclone	02/16/16	02/22/16	TC Winston		South Pacific Islands	N/A	N/A	> 25 million
2016	Earthquake	02/06/16		Earthquake	Taiwan	Asia	N/A	N/A	> 25 million
2016	Earthquake	01/03/16		Kaohsiung EQ	India, Bangladesh, Myanmar	Asia	N/A	N/A	> 25 million
2016	Earthquake	02/14/16		Christchurch EQ	New Zealand	Oceania	N/A	N/A	> 25 million
2016	Earthquake	04/14/16	04/16/16	Kumamoto EQs	Japan	Asia	N/A	N/A	> 25 million
2016	Earthquake	04/16/16		Ecuador EQ	Ecuador	South America	N/A	N/A	> 25 million
2016	Tropical Cyclone	05/14/16	05/23/16	CY Roanu	Sri Lanka, india, Bangladesh, China	Asia	N/A	N/A	> 25 million
2016	Earthquake	08/24/16		Italy EQ	Italy	Europe	N/A	N/A	> 25 million
2016	Tropical Cyclone	09/14/16	09/16/16	STY Meranti	China, Taiwan, Philippines	Asia	N/A	N/A	> 25 million
2016	Tropical Cyclone	07/08/16	07/12/16	STY Nepartak	China, Taiwan	Asia	N/A	N/A	> 25 million
2016	Tropical Cyclone	09/26/16	09/29/16	TY Megi	Taiwan, China	Asia	N/A	N/A	> 25 million
2016	Earthquake	09/10/16		Kagera EQ	Tanzania, Uganda	Africa	N/A	N/A	> 25 million
2016	Tropical Cyclone	08/29/16	09/01/16	TY Lionrock	China, Japan, South Korea	Asia	N/A	N/A	> 25 million
2016	Tropical Cyclone	09/19/16	09/22/16	TY Malakas	Japan, China	Asia	N/A	N/A	> 25 million
2016	Tropical Cyclone	08/18/16	08/20/16	TS Dianmu	China, Vietnam	Asia	N/A	N/A	> 25 million
2016	Tropical Cyclone	07/31/16	08/03/16	TY Nidia	China, Phillippines Vietnam	Asia	N/A	N/A	> 25 million
2016	Tropical Cyclone	08/02/16	08/10/16	HU Earl	Belize, Mexico, Carribbean Islands	Caribbean Islands, Mexico and Central America	N/A	N/A	> 25 million
2016	Tropical Cyclone	08/22/16	08/23/16	TS Mindulle	Japan	Asia	N/A	N/A	> 25 million
2016	Tropical Cyclone	09/06/16	09/08/16	HU Newton	Mexico	North America (non-U.S.)	N/A	N/A	> 25 million
2016	Tropical Cyclone	10/04/16	10/07/16	STY Chaba	Japan, Korea	Asia	N/A	N/A	> 25 million
2016	Tropical Cyclone	10/16/16	10/22/16	STY Haima	Phillipines, China	Asia	N/A	N/A	> 25 million
2016	Tropical Cyclone	10/14/16	10/20/16	TY Sarika	Phillipines, China, Vietanm	Asia	N/A	N/A	> 25 million
2016	Earthquake	10/26/16		Central Italy EQ	Italy	Europe	N/A	N/A	> 25 million
2016	Earthquake	10/27/16		Central Italy EQ	Italy	Europe	N/A	N/A	> 25 million
2016	Earthquake	10/21/16		Tottori	Japan	Asia	N/A	N/A	> 25 million
2016	Hurricane	09/28/16	10/10/16	Hurricane Matthew		Carribbean Islands and Eastern Canada	N/A	N/A	> 25 million
2016	Hurricane	08/28/16	09/06/16	Hurricane Hermine		Dominican Republic, Cuba, The Bahamas	N/A	N/A	> 25 million
2017	Earthquake	01/18/17		Earthquake	Italy	Europe	N/A	N/A	> 25 million
2017	Earthquake	01/28/17		Earthquake	China	Asia	N/A	N/A	> 25 million
2017	Earthquake	02/10/17		Earthquake	Philippines	Asia	N/A	N/A	> 25 million
2017	Earthquake	03/27/17		Earthquake	China	Asia	N/A	N/A	> 25 million
2017	Cyclone	03/28/17	04/05/17	CY Debbie	Australia	Queensland, New South Wales, New Zealand	N/A	N/A	> 25 million

Non U.S. List of Catastrophes For Use in Reporting Catastrophe Data in PR036 and PR100+

2017	Earthquake	05/11/17		Earthquake	China	Asia	N/A	N/A	> 25 million
2017	Typhoon	07/29/17	07/31/17	TY Nesat & TS Haitang	China, Taiwan, Philippines	Asia	N/A	N/A	> 25 million
2017	Typhoon	08/07/17	08/09/17	Typhoon Noru	Japan	Asia	N/A	N/A	> 25 million
2017	Earthquake	08/08/17		Earthquake	China	Asia	N/A	N/A	> 25 million
2017	Typhoon	08/23/17	08/24/17	TY Hato	China	Macau, Hong Kong	N/A	N/A	> 25 million
2017	Typhoon	08/25/17	08/28/17	TY Pakhar	China	Asia	N/A	N/A	> 25 million
2017	Hurricane	08/25/17	09/02/17	Hurricane Harvey		Caribbean Islands and Central America	N/A	N/A	> 25 million
2017	Hurricane	08/30/17	09/16/17	Hurricane Irma		Caribbean Islands and Cape Verde	N/A	N/A	> 25 million
2017	Hurricane	09/05/17	09/26/17	Hurricane Jose		Caribbean Islands and Eastern Canada	N/A	N/A	> 25 million
2017	Hurricane	09/16/17	10/03/17	Hurricane Maria		Caribbean Islands, UK, Francs and Spain	N/A	N/A	> 25 million
2017	Earthquake	09/07/17		Earthquake		Mexico, Guatemala	N/A	N/A	> 25 million
2017	Earthquake	09/19/17		Earthquake	Mexico	Mexico City	>200	N/A	> 25 million
2017	Hurricane	10/04/17		Hurricane Nate		Central America, Cayman Islands, Cuba Yucatan Peninsula	N/A	N/A	> 25 million
2018	Earthquake	02/06/18		Earthquake	Taiwan				> 25 million
2018	Earthquake	02/16/18		Earthquake	Mexico				> 25 million
2018	Cyclone	02/09/18	02/20/18	CY Gita	Tonga, Fiji, Samoa, New Zealand				> 25 million
2018	Earthquake	02/26/18		Earthquake	Papua New Guinea				> 25 million
2018	Earthquake	03/05/18		Earthquake	Papua New Guinea				> 25 million
2018	Cyclone	03/17/18		CY Marcus					> 25 million
2018	Tropical Storm	05/23/18	05/27/18	Tropical Storm Mekunu	Yamen, Oman , Saudi Arabia				> 25 million
2018	Tropical Storm	06/02/18	06/07/18	Tropical Storm Ewiniar	Vietnam, China, Taiwan, Philippines and Ryukyu Islands	Guangdong Province, Jiangxi, Fujian, Zhejiang Provinces, and Hainan Island.			> 25 million
2018	Earthquake	06/18/18		Earthquake	Japan				> 25 million
2018	Super Typhoon	07/10/18	07/12/18	STY Maria	China, Taiwan, Guam and Japan	Fujian province, Yantze River Basin, Japan's Ryukyu Islands			> 25 million
2018	Tropical Storm	07/17/18	07/24/18	TS Sonh-Tinh	Vietnam, China, Loas	Japan, Russian Far East			> 25 million
2018	Tropical Storm	07/22/18	07/25/15	TS Ampil	China	Jiangsu, Zhejiang, Shandong, and Hebei			> 25 million
2018	Typhoon	07/27/18	08/03/18	TY Jongdari	Japan, China				> 25 million
2018	Earthquake	08/05/15	08/09/18	Earthquake	Indonesia				> 25 million
2018	Tropical Storm	08/09/18	08/15/18	TS Yagi	Philippines, China	Zhejiang, Anhui, Jiangsu and Shandong Provinces.			> 25 million
2018	Tropical Storm	08/13/18	08/19/18	TS Bebinca	China	Hong Kong, Guangdong and Hainan			> 25 million
2018	Typhoon	08/16/18	08/18/18	TY Rumbia	China	Shanghai, Jiangsu, Zhehiang, Anhui, Shandong and Henan			> 25 million
2018	Typhoon	08/23/18	08/25/18	TY Soulik	Japan, South Korea, China and Russia	Haenam County, South Jeolla Province			> 25 million
2018	Typhoon	09/04/18	09/05/18	RY Jebi	Japan, Mariana Islands, Taiwan, Japan, Russian Far East and Artic				> 25 million

Non U.S. List of Catastrophes For Use in Reporting Catastrophe Data in PR036 and PR100+

2018	Earthquake	09/06/18		Earthquake	Japan	Hokkaido			> 25 million
2018	Super Typhoon	09/15/18	0918/18	STY Mangkhut	N. Mariana Islands, Philippines, China and Hong Kong				> 25 million
2018	Hurricane	Leslie	09/23/18	Hurricane Leslie	Azores, Bermuda, Europe	Azores, Bermuda, Madeira, Iberian Peninsula, France			> 25 million
2018	Hurricane	10/07/18	10/16/18	Hurricane Michael	Central American, Yucatan Peninsula, Cayman Islands, Cuba, Atlantic, Canad				> 25 million
2019	Cyclone	05/03/19	05/05/19	Cyclone Fani	India, Bangladesh				>500 million
2019	Earthquake	06/17/19		Earthquake	China				> 25 million
2019	Tropical Storm	08/01/19	08/08/19	Tropical Storm Wipha	China, Vietnam				> 25 million
2019	Typhoon	08/09/19	08/11/19	Typhoon Lekima	China				> 855 million
2019	Typhoon	08/15/19	08/16/19	Typhoon Krosa	Japan				>25 million
2019	Hurricane	08/31/19	09/07/19	Hurricane Dorian	Caribbean, Bahamas, Canada				>1 billion
2019	Typhoon	09/05/19	09/08/19	Typhoon Lingling	Japan, China, Korea				>5.78 billion
2019	Typhoon	09/08/19	09/09/19	Typhoon Faxai	Japan				> 7 billion
2019	Hurricane	09/19/19	09/22/19	Hurricane Humberto	Bermuda				>25+ million
2019	Hurricane	09/17/19	09/26/19	Hurricane Lorenzo	Portugal				>25+ million
2019	Earthquake	11/26/19		Earthquake	Albania				>25+ million
2019	Cyclone	11/08/19	11/11/19	Cyclone Matmo (Bulbul)	India, Bangladesh				>25+ million
2019	Typhoon	10/01/19	10/02/19	Typhoon Hagibis	Japan				> 7 billion
2019	Earthquake	12/18/19		Earthquake	Philippines				>25+ million
2020	Earthquake	03/22/20		Earthquake	Croatia				>25+ million
		04/01/20	04/11/20	Cyclone Harold	Solomon Islands, Canuatu, Fiji, Tonga				> 25+ million
2020	Tropical Storm	05/31/20		Tropical Storm Amanda	El Salvador, Guatemala, Honduras				> 25+ million
2020	Tropical Storm	06/01/20	06/05/20	Tropical Storm Cristobal	Mexico, Guatemala, El Salvador				150 million
2020	Hurricane	07/25/20	07/27/20	Hurricane Hanna	Mexico				350 million
2020	Hurricane	07/28/20	08/01/20	Hurricane Isaias	Caribbean, Canada				> 3 billion
2020	Hurricane	08/22/20	08/25/20	Hurricane Laura	Caribbean				> 4 billion
2020	Typhoon	05/15/20	05/22/20	Typhoon Amphan	India, Bangladesh, Sri Lanka				15 billion
2020	Tropical Storm	06/03/20	06/04/20	Tropical Storm Nisarga	India				> 25+ million
2020	Typhoon	08/03/20	08/04/20	Typhoon Hagupit	China, Taiwan				> 100+ million
2020	Hurricane	10/05/20	10/12/20	Hurricane Delta	Jamaica, Nicaragua, Cayman Island, Yucatan Peninsula				> 2 billion
2020	Hurricane	10/24/20	10/30/20	Hurricane Zeta	Cayman Islands, Jamaica, Central America, Yucatan Peninsula, Ireland, United Kingdom				> 1.5 billion
2020	Cyclone	04/01/20	04/11/20	Cyclone Harold	Solomon Islands, Canuatu, Fiji, Tonga				> 25+ million
2020	Hurricane	10/31/20	11/14/20	Hurricane Eta	Colombia, Jamaica, Central America, Cayman Islands, Cuba, The Bahamas				> 7.9 billion

Non U.S. List of Catastrophes For Use in Reporting Catastrophe Data in PR036 and PR100+

2020	Hurricane	11/14/20	11/19/20	Hurricane Iota	ABC Islands, Colombia, Jamaica, Central America				> 1.4 billion
2020	Typhoon	11/22/20	11/23/20	Typhoon Goni	Philippines, Vietnam, Cambodia, Laos				> 400+ million
2020	Typhoon	11/08/20	11/15/20	Typhoon Vamco	Philippines, Vietnam, Laos, Thailand				> 400+ million

Source: Munich Re's NAT CAT Service, Swiss Re Sigma and Aon Benfield

Draft: 3/22/21

Health Risk-Based Capital (E) Working Group
Virtual Meeting (*in lieu of meeting at the 2021 Spring National Meeting*)
March 17, 2021

The Health Risk-Based Capital (E) Working Group of the Capital Adequacy (E) Task Force met Mar. 17, 2021. The following Working Group members participated: Steve Drutz, Chair (WA); Jennifer Li (AL); Wanchin Chou (CT); Carolyn Morgan (FL); Tish Becker (KS); Rhonda Ahrens (NE); Tom Dudek (NY); Kimberly Rankin (PA); and Aaron Hodges (TX).

1. Adopted its Feb. 10, 2021; Jan. 22, 2021; and Dec. 18, 2020 Minutes

The Working Group met Feb. 10, 2021; Jan. 22, 2021; and Dec. 18, 2020. During these meetings, the Working Group took the following action: 1) received, exposed and discussed the American Academy of Actuaries (Academy) report on the inclusion of investment income in the underwriting risk component and impact analysis; 2) discussed its March 5 regulator-to-regulator meeting; 3) referred the health care receivable proposal to the Blanks (E) Working Group for consideration in 2021 reporting; 4) exposed proposal 2021-02-CA (Managed Care Credit – Incentives); 4) received an update on the bond factor analysis; and 5) received a summary of the Blanks (E) Working Group's proposal related to health business reporting and discussed next steps for the Health Test Ad Hoc Group.

Mr. Chou made a motion, seconded by Mr. Dudek, to adopt the Working Group's Feb. 10, 2021 (Attachment Two-A); Jan. 22, 2021 (Attachment Two-B); and Dec. 18, 2020 minutes (Attachment Two-C). The motion passed unanimously.

2. Adopted its 2021 Working Agenda

Mr. Drutz summarized the changes to the 2021 health risk-based capital (RBC) working agenda, which included the following substantial changes: 1) the addition to review the managed care credit across the formulas; 2) the deletion of the MAX function as the proposal was adopted for 2021 reporting; and 3) moving the investment income and bond factor items from the New Items section to the Carry Over Items section.

Mr. Chou made a motion, seconded by Ms. Rankin, to adopt the 2021 health RBC working agenda. The motion passed unanimously.

3. Referred Proposal 2021-02-CA to the Capital Adequacy (E) Task Force for Exposure

Mr. Drutz said that the Working Group exposed proposal 2021-02-CA for a 30-day comment period ending March 12, and no comments were received. He said that the purpose of the proposal is to provide clarifying language for the inclusion of incentives in the managed care credit instructions and blank.

Hearing no objections, the Working Group referred proposal 2021-02-CA to the Capital Adequacy (E) Task Force for exposure on all lines of business.

4. Heard an Update from the Academy on Investment Income in the Underwriting Risk Component and Exposed Proposal 2021-04-CA

Mr. Drutz said the Working Group requested the Academy's assistance in developing adjusted factors to include investment income for Columns 1–4 on the Experience Fluctuation Risk page. The Academy provided the adjusted factors in its letter dated Feb. 22, 2021 (Attachment Two-D). Derek Skoog (Academy) said that the Academy used the same methodology used in its previous letter where the Academy had deconstructed the current factors assuming that they currently have no investment income attributed to them based on its understanding of how they were developed. Then using a combination of the Academy's knowledge of industry completion factors by product as well as industry loss ratios, the Academy developed a range of potential output risk factors that would correspond to do those assumptions. Mr. Skoog said when it comes to determining the investment return rate, there are a number of factors worthy of consideration, and the Academy has included a range of potential results within its letter.

Mr. Drutz said that a summary (Attachment Two-E) of the number of companies whose RBC ratio changed by both the percentage change and point change for the 0.5%, 1%, 1.5% and 2% investment returns was included in the impact analysis.

He said that a majority of companies had a 0% to 1.5% percent change with the 0.5% investment return, while a majority of companies had about a 0% to 2.5% change in the 1% investment return, a 0% to 3% change with the 1.5% investment return, and 0% to 3.5% change with the 2% investment return.

Mr. Drutz said that the Working Group will need to determine the frequency in which the factors will need to be reviewed and if a benchmark should be established in updating the factors, such as Treasury bonds. He said the five-year Treasury Bond yield for 2021 has ranged from 0.36 to 0.84%, and five years would seem to be the longest time frame to consider based on his understanding of the health portfolios with an average maturity around five years. Mr. Drutz said that proposal 2021-04-CA includes the 0.5% and 1% investment return adjustment to the underwriting risk factors as Option 1 and Option 2.

Hearing no objections, the Working Group agreed to expose proposal 2021-04-CA (Attachment Two-F) for a 30-day public comment period ending April 16. The exposure will include both the 0.5% and 1% investment return factors and the Academy's Feb. 22 letter. Following the initial exposure, the proposal will then be referred to the Capital Adequacy (E) Task Force for a subsequent exposure for all lines of business.

5. Received an Update on the Bond Factor Impact Analysis

Mr. Drutz said NAIC staff are working on the impact analysis for the 20 designation bond factors based on year-end 2020 reporting. He said the Working Group expects to meet in early April to discuss the results for both the two- and five-year time horizon factors. He said the Working Group will need to determine which factors to move forward with and expose by no later than April 30.

Having no further business, the Health Risk-Based Capital (E) Working Group adjourned.

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Draft: 3/8/21

Health Risk-Based Capital (E) Working Group
Virtual Meeting
February 10, 2021

The Health Risk-Based Capital (E) Working Group of the Capital Adequacy (E) Task Force met Feb. 10, 2021. The following Working Group members participated: Steve Drutz, Chair (WA); Steve Ostlund and Jennifer Li (AL); Rolf Kaumann and Eric Unger (CO); Wanchin Chou, Kathy Belfi and Andrew Greenhalgh (CT); Kyle Collins (FL); Tish Becker (KS); Rhonda Ahrens and Michael Muldoon (NE); Tom Dudek (NY); Kimberly Rankin (PA); and Matthew Richard, Aaron Hodges, Sean Fulton and Mike Boerner (TX).

1. Discussed Impact Analysis on Investment Income in Underwriting Risk

Mr. Drutz said the Working Group agreed start working on the impact analysis for the investment income adjustment in the underwriting risk factors for Comprehensive Medical, Medicare Supplement, Dental and Vision, and Stand-Alone Medicare Part D lines of business reported on page XR012. He said the Working Group will continue to work with the American Academy of Actuaries (Academy) to review the remaining lines of business once the initial lines of business have been addressed. He said the key assumptions to consider in determining the investment return are asset duration and spread. He noted that the Academy referenced one-month U.S. treasury yields, and these could be used as a reference point; UnitedHealth Group (UHG) suggested that the rate of investment return be consistent with the time horizon used for the bond risk modeling. He asked if the UHG's reference to the rate of investment return was referencing the reference rate to be used, the period over which the return should be calculated, or both. Jim Braue (UHG) said it primarily referenced the reference rate, but it could be both because they are interconnected.

Mr. Drutz said the Working Group will be performing an impact analysis on the bond factors using a two- and five-year time horizon, and one of the key questions that the Working Group will have to address is if the duration between the bonds and investment income in the underwriting risk factors should be linked. Derek Skoog (Academy) said the Academy did not necessarily take a position as far as the duration of the assets, but rather the Academy modeled out a month of premiums and claims for simplicity; however, the investment income would be the same if you were modeling out a full contact year. He said the data point for consideration is the average length of time it took to pay out claims, which was approximately one month. The Academy then referenced the one-month treasury yield, which is fairly low, and that was a consideration for the investment return assumption. Mr. Skoog said the critical assumption is the investment return. How you get to that investment return is going to be the product of the duration of the asset and the risk of the asset that was assumed. Treasury yields would be lower than corporate bonds, which would be somewhat higher. Mr. Skoog said the Academy did not take a position on those two points, but that is what drives the investment return assumption. Mr. Drutz noted that the table in the Academy's letter included the yield assumption and the adjustment that would be based on that yield. He said if the yield were based on a five-year treasury, yielding 0.5% versus a two-year corporate bond that was yielding 0.5%, the adjustments to the risk factors would not change based on the length of the duration of the bonds. Mr. Skoog agreed. Mr. Drutz said that adjustment to the factors is not based on duration.

Mr. Drutz asked the Working Group to consider what rate should be used. He said three-month Treasury yields are at 0.04% and five-year yields are at about 0.46%. He said there appears to be a linear relationship between the yield and the reduction in the risk factor. Mr. Boerner suggested a granular stair step approach using the 0.5%, 1%, 1.5% and 2% returns in the impact analysis. Mr. Dudek agreed with using the four points to show more of the stair step method. Lou Felice (NAIC) said the investment returns appear to be the outer markers, and the 0% is essentially a one-month Treasury yield up to something like a two- to three-year investment grade corporate bond. He asked if the 2–3% investment return is about where a two- to three-year corporate return is today. Edward Toy (Risk & Regulatory Consulting LLC) said corporate "A" rated yields are about 1.66%, and "BBB" corporates are just over 2%.

Mr. Drutz said the Working Group will also need to consider if there is a certain reference rate when making the assumptions on the investment yields. For example, should the Working Group look at "A" rated corporate bond yields over five- or two-year periods or should it be treasuries or a mix of both. Mr. Drutz said the Working Group will also need to consider the frequency of the adjustment, and he suggested setting a benchmark to determine what assumptions to use. He said as an example, if the adjustment was based on a corporate five-year yield, the Working Group could then review that number annually and adjust the risk charge based on whether that return is going up or down. He said if the benchmark linked to a particular rate of return, it would be helpful in making decisions on the adjustment to the factors in the coming years.

The Working Group agreed to run the impact analysis on a half point basis from 0.5% up to 2%.

2. Exposed Proposal 2021-02-CA

Mr. Drutz said NAIC staff drafted proposal 2021-02-CA, which clarifies and includes a reference for "incentives" where "withholds and bonuses" are referenced in the Managed Care Credit instructions. A definition was also included in Appendix 1 for "Incentives, Bonuses and Withholds." Mr. Drutz said the following questions need to be considered: 1) whether there is a consistent use of incentives, where a set amount is paid; and 2) whether there are scenarios in which incentives could be classified or the payment is built into the claim payment. Mr. Felice said NAIC staff received a question related to what gets included in some of the managed care credit lines calculation for category 2. He said the question was focused on the line in that category, which says to report net of withholds; in other words, this means the full amount of the claim before adjustment for the withhold and also net of bonuses, which means that if there is a bonus that was paid out, it would show the amount of the claims that were paid without including the bonus. He asked what to do with incentives. In the past, incentives were normally paid out after the actual claim was paid, it would be included like a bonus or withhold, and the value of the claim would be reported without consideration of those items on that line. However, there are some items, mostly in government programs, that are called incentives where the incentive is built into the value of the claim. The claim is then paid at an increased value to encourage things like getting a doctor to participate in an underserved area or to help a doctor with the International Classification of Diseases (ICD) 10 in a small office to upgrade their abilities to share or report claims data and medical information. In most cases, these would be reported like a bonus and withhold arrangements because they were called incentive pools—pools of money set aside to, not dissimilar to a bonus arrangement and paid after the claim. However, if there are instances where the claim is enhanced and that is considered an incentive arrangement, we want to be sure that we instruct this to be reported properly. Mr. Felice asked industry users who see these arrangements every day whether there are arrangements with no distinction between the claim value and the incentive because it is paid under a contractual arrangement.

Hearing no objections, proposal 2021-02-CA (Attachment Two-A1) was exposed for a 30-day public comment period ending March 12. Following the initial exposure, the proposal will then be referred to the Capital Adequacy (E) Task Force for a subsequent exposure for all lines of business.

3. Discuss Bond Factor Analysis

Mr. Drutz said the Working Group agreed to perform an impact analysis on the two- and five-year time horizon factors for the 20 bond designations for year-end 2020; and while a majority of states have a March 1 annual statement filing deadline, there are a few states that have a March 31 or April 1 filing deadline. He recommended that the companies with a March 1 filing deadline be included in the impact analysis to ensure that the April 30 exposure deadline can be met. Mr. Ostlund asked how many companies do not have the March 1 filing deadline. Crystal Brown (NAIC) said she would identify the states with the March 31 and April 1 filing dates and the number of companies that would not file until that date, and she will bring this information back to the Working Group.

Having no further business, the Health Risk-Based Capital (E) Working Group adjourned.

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Capital Adequacy (E) Task Force

RBC Proposal Form

[x] Capital Adequacy (E) Task Force
[ ] Catastrophe Risk (E) Subgroup
[ ] C3 Phase II/ AG43 (E/A) Subgroup
[ ] Health RBC (E) Working Group
[ ] Investment RBC (E) Working Group
[ ] P/C RBC (E) Working Group
[ ] Life RBC (E) Working Group
[ ] Longevity Risk (A/E) Subgroup

DATE:	**1-28-21**
CONTACT PERSON:	**Crystal Brown**
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EMAIL ADDRESS:	**cbrown@naic.org**
ON BEHALF OF:	**Health RBC (E) Working Group**
NAME:	**Steve Drutz**
TITLE:	**Chief Financial Analyst/Chair**
AFFILIATION:	**WA Office of Insurance Commissioner**
ADDRESS:	**PO Box 40255**
	Olympia, WA 98504-0255

FOR NAIC USE ONLY

Agenda Item # 2021-02-CA

Year 2021

DISPOSITION

[ ] ADOPTED _____
[ ] REJECTED _____
[ ] DEFERRED TO _____
[ ] REFERRED TO OTHER NAIC GROUP
[ ] EXPOSED _____
[ ] OTHER (SPECIFY) _____

IDENTIFICATION OF SOURCE AND FORM(S)/INSTRUCTIONS TO BE CHANGED

[x] Health RBC Blanks
[x] Health RBC Instructions
[x] Property/Casualty RBC Blanks
[x] Property/Casualty RBC Instructions
[x] Life and Fraternal RBC Instructions
[x] Life and Fraternal RBC Blanks
[ ] OTHER _____

DESCRIPTION OF CHANGE(S)

Incorporate references for “Incentives” under the managed care instructions and blank as “Bonuses/Incentives.”

REASON OR JUSTIFICATION FOR CHANGE **

Currently the managed care instructions and blank only reference the bonuses, this change would clarify that both incentives and bonuses are to be included.

Additional Staff Comments:

**** This section must be completed on all forms.** **Revised 2-2019**

Health

UNDERWRITING RISK - Managed Care Credit Calculation

Managed Care Claims Payments	Annual Statement Source	(1) Factor	(2) Paid Claims	(3) Weighted Claims†	(4) Part D Weighted Claims‡
(1) Category 0 - Arrangements not Included in Other Categories	Exhibit 7, Part 1, Column 1, Line 5, in part §	0			
(2) Category 1 - Payments Made According to Contractual Arrangements	Exhibit 7, Part 1, Column 1, Line 6, in part §	0.150			
(3) Category 2a - Subject to Withholds or Bonuses/**Incentives** - Otherwise Categc	Exhibit 7, Part 1, Column 1, Line 7, in part §	*			
(4) Category 2b - Subject to Withholds or Bonuses/**Incentives** - Otherwise Categc	Exhibit 7, Part 1, Column 1, Line 8, in part §	*			
(5) Category 3a - Capitated Payments Directly to Providers		0.600			
(5.1) Capitation Payments - Medical Group - Category 3a	Exhibit 7, Part 1, Column 1, Line 1, in part §				
(5.2) Capitation Payments - All Other Providers - Category 3a	Exhibit 7, Part 1, Column 1, Line 3, in part §				
(6) Category 3b - Capitated Payments to Regulated Intermediaries	Included in Exhibit 7, Part 1, Column 1, Line 2 §	0.600	$0		
(7) Category 3c - Capitated Payments to Non-Regulated Intermediaries	Included in Exhibit 7, Part 1, Column 1, Line 2 §	0.600	$0		
(8) Category 4 - Medical & Hospital Expense Paid as Salary to Providers		0.750			
(8.1) Non-Contingent Salaries - Category 4	Exhibit 7, Part 1, Column 1, Line 9, in part §				
(8.2) Aggregate Cost Arrangements - Category 4	Exhibit 7, Part 1, Column 1, Line 10, in part §				
(8.3) Less Fee For Service Revenue from ASC or ASO	Company Records				
(9) Sub-Total Paid Claims	Exhibit 7, Part 1, Column 1, Lines 13 - 11 - (8.3) - (12) - (13)				
Stand-Alone Medicare Part D Coverage Claim Payments					
(10) Category 0 - No Federal Reinsurance or Risk Corridor Protection	Company Records	XXX	XXX		XXX
(11) Category 1 - Federal Reinsurance but no Risk Corridor Protection	Company Records	XXX	XXX		XXX
(12) Category 2a - No Federal Reinsurance but Risk Corridor Protection	Company Records	0.667			
(13) Category 3a - Federal Reinsurance and Risk Corridor Protection Apply	Company Records	0.767			
(14) Sub-Total Paid Claims	Sum of Lines (10) through (13)				
(15) Total Paid Claims	Sum of Lines (9) and (14)				
(16) Weighted Average Managed Care Discount					
(17) Weighted Average Managed Care Risk Adjustment Factor					

† This column is for a single result for the Comprehensive Medical & Hospital, Medicare Supplement and Dental/Vision Managed Care Discount factor.
‡ This column is for the Medicare Part D Managed Care Discount factor.
§ Stand-Alone Medicare Part D business reported in Lines (12) and (13) would be excluded from these amounts.
* The factor is calculated on page XR018.

Denotes items that must be manually entered on filing software.

Health

		(1) Annual Statement Source	Amount
*** Calculation of Category 2 Managed Care Factor**			
(18)	Withhold & Bonus/**Incentive** Payments, ***Prior Year***	Company Records	
(19)	Withhold & Bonuses/**Incentives** Available, ***Prior Year***	Company Records	
(20)	MCC Multiplier - Average Withhold Returned [Line (18)/(19)]		
(21)	Withholds & Bonuses/**Incentives** Available, ***Prior Year***	Company Records	
(22)	Claims Payments Subject to Withhold, ***Prior Year***	Company Records	
(23)	Average Withhold Rate, Prior Year [Line (21)/(22)]		
(24)	MCC Discount Factor, Category 2 Min{.25,[Lines (20) x (23)]}		

* The factor is pulled into Lines (3) and (4) on page XR017.

Denotes items that must be manually entered on filing software.

Life

UNDERWRITING RISK – MANAGED CARE CREDIT

	Comprehensive Medical, Medicare Supplement and Dental Claim Payments	Annual Statement Source	(2) Paid Claims		Factor		(3) Weighted Claims*	(4) Part D Weighted Claims**
(1)	Category 0 - Arrangements not Included in Other Categories	Company records		X	0.000	=		
(2)	Category 1 - Payments Made According to Contractual Arrangements	Company records		X	0.150	=		
(3)	Category 2a - Subject to Withholds or Bonuses/**Incentives** – Otherwise Category 0	Company records		X	†	=		
(4)	Category 2b - Subject to Withholds or Bonuses/**Incentives** – Otherwise Category 1	Company records		X	‡	=		
(5)	Category 3a - Capitated Payments Directly to Providers	Company records		X	0.600	=		
(6)	Category 3b - Capitated Payments to Regulated Intermediaries	Company records		X	0.600	=		
(7)	Category 3c - Capitated Payments to Non-Regulated Intermediaries	Company records		X	0.600	=		
(8)	Category 4 - Medical & Hospital Expense Paid as Salary to Providers	Company records		X	0.750	=		
(9)	Subtotal Paid Claims	Sum of Lines (1) through (8)						
	Stand-Alone Medicare Part D Coverage Claim Payments							
(10)	Category 0 - No Federal Reinsurance or Risk Corridor Protection	Company records	XXX	X	xxx	=		XXX
(11)	Category 1 - Federal Reinsurance but no Risk Corridor Protection	Company records	XXX	X	xxx	=		XXX
(12)	Category 2a - No Federal Reinsurance but Risk Corridor Protection	Company records		X	0.667	=		
(13)	Category 3a - Federal Reinsurance and Risk Corridor Protection apply	Company records		X	0.767	=		
(14)	Subtotal Stand-Alone Medicare Part D Paid Claims	Sum of Lines (10) through (13)						
(15)	Total Paid Claims	Line (9) + Line (14)						
(16)	Weighted Average Managed Care Discount	Column (3) = Column (3) Line (9) / Column (2) Line (9) Column (4) = Column (4) Line (14) / Column (2) Line (14)						
(17)	Weighted Average Managed Care Risk Adjustment Factor	1.0 - Line (16)						

	Calculation of Category 2 Managed Care Factor (Comprehensive Medical and Dental only)		(1) Amount
(18)	Withhold & bonus/**incentive** payments, prior year	Company Records	
(19)	Withhold & bonuses/**incentives** available, prior year	Company Records	
(20)	Managed Care Credit Multiplier – average withhold returned	Line (18) / Line (19)	
(21)	Withholds & bonuses/**incentives** available, prior year	Line (19)	
(22)	Claims payments subject to withhold, prior year	Company Records	
(23)	Average withhold rate, prior year	Line (21) / Line (22)	
(24)	Managed Care Credit Discount Factor, Category 2	Minimum of 0.25 or Line (20) x Line (23)	

† Category 2 Managed Care Factor calculated on Line (24).

‡ Category 2 Managed Care Factor calculated on Line (24) with a minimum factor of 15 percent.

* This column is for a single result for the Comprehensive Medical & Hospital, Medicare Supplement and Dental managed care discount factor.

** This column is for the Stand-Alone Medicare Part D managed care discount factor.

Denotes items that must be manually entered on the filing software.

Property/Casualty

UNDERWRITING RISK - MANAGED CARE CREDIT PR021

	Comprehensive Medical, Medicare Supplement and Dental & Vision Claim Payments	Annual Statement Source	(2) Paid Claims	Factor	(3) Weighted Claims†	(4) Part D Weighted Claims††
(1)	Category 0 - Arrangements not Included in Other Categories	Company records	0	0.000	0	
(2)	Category 1 - Payments Made According to Contractual Arrangements	Company records	0	0.150	0	
(3)	Category 2a - Subject to Withholds or Bonuses/**Incentives** – Otherwise Category (	Company records	0	*	0	
(4)	Category 2b - Subject to Withholds or Bonuses/**Incentives** – Otherwise Category	Company records	0	**	0	
(5)	Category 3a - Capitated Payments Directly to Providers	Company records	0	0.600	0	
(6)	Category 3b - Capitated Payments to Regulated Intermediaries	Company records	0	0.600	0	
(7)	Category 3c - Capitated Payments to Non-Regulated Intermediaries	Company records	0	0.600	0	
(8)	Category 4 - Medical & Hospital Expense Paid as Salary to Providers	Company records	0	0.750	0	
(9)	Sub-Total Paid Claims	Sum of Lines (1) through (8)	0		0	
	Stand-Alone Medicare Part D Coverage Claim Payments					
(10.1)	Category 0 - No Federal Reinsurance or Risk Corridor Protection	Company records	XXX	XXX		XXX
(10.2)	Category 1 - Federal Reinsurance but no Risk Corridor Protection	Company records	XXX	XXX		XXX
(10.3)	Category 2a - No Federal Reinsurance but Risk Corridor Protection	Company records	0	0.667		0
(10.4)	Category 3a - Federal Reinsurance and Risk Corridor Protection apply	Company records	0	0.767		0
(10.5)	Sub-Total Paid Claims	Sum of Lines (10.1) through (10.4)	0			0
(10.6)	Total Paid Claims	Sum of Lines (9) and (10.5)	0			
(11)	Weighted Average Managed Care Discount	Col (3) = Col (3) Line (9) / Col (2) Line (9) Col (4) = Col (4) Line (10.5) / Col (2) Line (10.5)			0.000	0.000
(12)	Weighted Average Managed Care Risk Adjustment Factor	Col (3) = 1.0 - Col (3) Line (11) Col (4) = 1.0 - Col (4) Line (11)			0.000	0.000

	Calculation of Category 2 Managed Care Factor		(1) Amount
(13)	Withhold & bonus/**incentive** payments, prior year	Company Records	0
(14)	Withhold & bonuses/**incentives** available, prior year	Company Records	0
(15)	Managed Care Credit Multiplier – average withhold returned	Line (13) / Line (14)	0.000
(16)	Withholds & bonuses/**incentives** available, prior year	Line (14)	0
(17)	Claims payments subject to withhold, prior year	Company Records	0
(18)	Average withhold rate, prior year	Line (16) / Line (17)	0.000
(19)	Managed Care Credit Discount Factor, Category 2	Minimum of 0.25 or Line (15) x Line (18)	0.000

* Category 2 Managed Care Factor calculated on Line (19)

**Category 2 Managed Care Factor calculated on Line (19) with a minimum factor of 15 percent.

† This column is for a single result for the Comprehensive Medical & Hospital, Medicare Supplement and Dental managed care discount factor.

†† This column is for the Stand-Alone Medicare Part D managed care discount factor.

Denotes items that must be manually entered on the filing software.

HEALTH

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UNDERWRITING RISK – MANAGED CARE CREDIT
XR017

The effect of managed care arrangements on the variability of underwriting results is the fundamental difference between health entities and pure indemnity carriers. The managed care credit is used to reduce the RBC requirement for experience fluctuations. It is important to understand that the managed care credit is based on the reduction in uncertainty about future claims payments, not on any reduction in the actual level of cost. Those managed care arrangements that have the greatest reduction in the uncertainty of claim payments receive the greatest credit, while those that have less effect on the predictability of claims payments engender less of a discount.

There are currently five levels of managed care that are used in the formula, other than for Medicare Part D Coverage, although in the future as new managed care arrangements evolve, the number of categories may increase, or new arrangements may be added to the existing categories. The managed care categories are:

* Category 0 – Arrangements not Included in Other Categories
* Category 1 – Contractual Fee Payments
* Category 2 – Bonus and/or Incentives / Withhold Arrangements
* Category 3 – Capitation
* Category 4 – Non-Contingent Expenses and Aggregate Cost Arrangements and Certain PSO Capitated Arrangements

For Medicare Part D Coverage, the reduction in uncertainty comes from two federal supports. The reinsurance coverage is optional in that a plan sponsor may elect to participate in the Part D Payment Demonstration. The risk corridor protection is expected to have less impact after the first few years. To allow flexibility within the RBC formula, Lines (10) through (13) will be used to give credit for the programs in which the plan sponsor participates. While all PDPs will have formularies and may utilize other methods to reduce uncertainty, for the near future, no other managed care credits are allowed for this coverage.

The managed care credit is based on the percentage of paid claims that fall into each of these categories. Total claims payments are allocated among these managed care "buckets" to determine the weighted average discount, which is then used to reduce the Underwriting Risk-Experience Fluctuation RBC. Paid claims are used instead of incurred claims due to the variability of reserves (unpaid claims) in incurred claim amounts and the difficulty in allocating reserves (unpaid claims) by managed care category.

In some instances, claim payments may fit into more than one category. If that occurs, enter the claim payments into the highest applicable category. CLAIM PAYMENTS CAN ONLY BE ENTERED INTO ONE OF THESE CATEGORIES! The total of the claim payments reported in the Managed Care Credit Calculation page should equal the total year's paid claims.

Line (1) – Category 0 – Arrangements not Included in Other Categories. There is a zero managed care credit for claim payments in this category, which includes:

- Fee for service (charges).
- Discounted FFS (based upon charges).
- Usual Customary and Reasonable (UCR) Schedules.
- Relative Value Scales (RVS) where neither payment base nor RV factor is fixed by contract or where they are fixed by contract for one year or less.
- Stop-loss payments by a health entity to its providers that are capitated or subject to withhold/incentive programs.
- Retroactive payments to capitated providers or intermediaries whether by capitation or other payment method (excluding retroactive withholds later released to the provider and retroactive payments made solely because of a correction to the number of members within the capitated agreement).
- Capitation paid to providers or intermediaries that have received retroactive payments for previous years (including bonus arrangements on capitation programs).

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This amount should equal Exhibit 7, Part 1, Column 1, Line 5 of the annual statement excluding Stand-Alone Medicare Part D business reported in Lines (12) and (13).

Line (2) – Category 1 – Payments Made According to Contractual Arrangements. There is a 15 percent managed care credit for payments included in this category:

- Hospital per diems, DRGs or other hospital case rates.
- Non-adjustable professional case and global rates.
- Provider fee schedules.
- RVS where the payment base and RV factor are fixed by contract for more than one year.
- Ambulatory payment classifications (APCs).

This amount should equal Exhibit 7, Part 1, Column 1, Line 6 of the annual statement excluding Stand-Alone Medicare Part D business reported in Lines (12) and (13).

Line (3) - Category 2a - Payments Made Subject to Withholds or Bonuses/Incentives With No Other Managed Care Arrangements. This category may include business that would have otherwise fit into Category 0. That is, there may be a bonus/incentives/withhold arrangement with a provider who is reimbursed based on a UCR schedule (Category 0).

The maximum Category 2a managed care credit is 25 percent. The credit is based upon a calculation that determines the ratio of withholds returned and bonuses and/or incentives paid to providers during the prior year to total withholds and bonuses and incentives available to the providers during that year. That ratio is then multiplied by the average provider withhold ratio for the prior year to determine the current year's Category 2a managed care credit factor. Bonus and/or incentive payments that are not related to financial results are not included (e.g., patient satisfaction). Therefore, the credit factor is equal to the result of the following calculation:

EXAMPLE – **2019** Reporting Year

2018 withhold / bonus/incentive payments	750,000
2018 withholds / bonuses/incentives available	1,000,000
A. MCC Factor Multiplier	75% – Eligible for credit
2018 withholds / bonuses/incentives available	1,000,000
2018 claims subject to withhold - gross*	5,000,000
B. Average Withhold Rate	20%
Category 2 Managed Care Credit Factor (A x B)	15%

The resulting factor is multiplied by claim payments subject to withhold - net** in the current year.

*** These are amounts due before deducting withhold or paying bonuses and/or incentives.**
**** These are actual payments made after deducting withhold or paying bonuses and/or incentives.**

Enter the paid claims for the current year where payments to providers were subject to withholds and bonuses/incentives, but otherwise had no managed care arrangements. This amount should equal Exhibit 7, Part 1, Column 1, Line 7 of the annual statement excluding Stand-Alone Medicare Part D business reported in Lines (12) and (13).

Line (4) – Category 2b – Payments Made Subject to Withholds or Bonuses/Incentives That Are Otherwise Managed Care Category 1. Category 2b may include business that would have otherwise fit into Category 1. That is, there may be a bonus/incentives/withhold arrangement with a provider who is reimbursed based on a provider fee schedule (Category 1). The Category 2 discount for claim payments that would otherwise qualify for Category 1 is the greater of the Category 1 factor or the calculated Category 2 factor.

The maximum Category 2b managed care credit is 25 percent. The minimum of Category 2b managed care credit is 15 percent (Category 1 credit factor). The credit calculation is the same as found in the previous example for Category 2a.

Enter the paid claims for the current year where payments to providers were subject to withholds and bonuses/incentives AND where the payments were made according to one of the contractual arrangements listed for Category 1. This amount should equal Exhibit 7, Part 1, Column 1, Line 8 of the annual statement excluding Stand-Alone Medicare Part D business reported in Lines (12) and (13).

Line (5) – Category 3a – Capitated Payments Directly to Providers. There is a managed care credit of 60 percent for claims payments in this category, which includes:

- All capitation or percent of premium payments directly to licensed providers.

Enter the amount of claim payments paid DIRECTLY to licensed providers on a capitated basis. This amount should equal Exhibit 7, Part 1, Column 1, Line 1 + Line 3 of the annual statement excluding Stand-Alone Medicare Part D business reported in Lines (12) and (13).

Line (6) – Category 3b – Capitated Payments to Regulated Intermediaries. There is a managed care credit of 60 percent for claim payments in this category, which includes:

- All capitation or percent of premium payments to intermediaries that in turn pay licensed providers.

Enter the amount of medical expense capitations paid to regulated intermediaries. An *intermediary* is a person, corporation or other business entity (not licensed as a medical provider) that arranges, by contracts with physicians and other licensed medical providers, to deliver health services for a health entity and its enrollees via a separate contract between the intermediary and the health entity. This includes affiliates of a health entity that are not subject to RBC, except in those cases where the health entity qualifies for a higher managed care credit because the capitated affiliate employs providers and pays them non-contingent salaries, and where the affiliated intermediary has a contract only with the affiliated health entity. A *Regulated Intermediary* is an intermediary (affiliated or not) subject to state regulation and files the Health RBC formula with the state.

Line (7) – Category 3c – Capitated Payments to Non-Regulated Intermediaries. There is a managed care credit of 60 percent for claim payments in this category, which includes:

- All capitation or percent of premium payments to intermediaries that in turn pay licensed providers. (Subject to a 5 percent limitation on payments to providers or other corporations that have no contractual relationship with such intermediary. Amounts greater than the 5 percent limitation should be reported in Category 0.)

Enter the amount of medical expense capitations paid to non-regulated intermediaries.

IN ORDER TO QUALIFY FOR ANY OF THE CAPITATION CATEGORIES, SUCH CAPITATION MUST BE FIXED (AS A PERCENTAGE OF PREMIUM OR FIXED DOLLAR AMOUNT PER MEMBER) FOR A PERIOD OF AT LEAST 12 MONTHS. Where an arrangement contains a provision for prospective revision within a 12-month period, the entire arrangement shall be subject to a managed care credit that is calculated under category 1 for a provider, and for an intermediary at the greater of category 1 or a credit calculated using the underlying payment method(s) to the providers of care. Where an arrangement contains a provision for retroactive revisions

either within or beyond a 12-month period, the entire arrangement shall be subject to a managed care credit that is calculated under category 0 for both providers and intermediaries.

Line (8) – Category 4 – Medical & Hospital Expense Paid as Salary to Providers**.** There is a managed care credit of 75 percent for claim payments in this category. Once claim payments under this managed care category are totaled, any fee for service revenue from uninsured plans (i.e., ASO or ASC) that was included on line 7 in the Underwriting Risk section should be deducted before applying the managed care credit factor. This category includes:

- Non-contingent salaries to persons directly providing care.
- The portion of payments to affiliated entities, which is passed on as non-contingent salaries to persons directly providing care where the entity has a contract only with its affiliated health entity.
- All facilities related medical expenses and other non-provider medical costs generated within a health facility that is owned and operated by the health entity.
- Aggregate cost payments.

Salaries paid to doctors and nurses whose sole corporate purpose is utilization review are also included in this category if such payments are classified as "medical expense" payments (paid claims) rather than administrative expenses. The "aggregate cost" method of reimbursement means where a health plan has a reimbursement plan with a corporate entity that directly provides care, where (1) the health plan is contractually required to pay the total operating costs of the corporate entity, less any income to the entity from other users of services, and (2) there are mutual unlimited guarantees of solvency between the entity and the health plan, which put their respective capital and surplus at risk in guaranteeing each other.

This amount should equal Exhibit 7, Part 1, Column 1, Line 9 + Line 10 of the annual statement excluding Stand-Alone Medicare Part D business reported in Lines (12) and (13).

Line (9) – Sub-Total Paid Claims. The total of paid claims for Comprehensive Medical, Medicare Supplement and Dental [should equal the total claims paid for the year as reported in Exhibit 7, Part 1, Column 1, Line 13 less Line 11 of the annual statement and the sum of Lines (8.3), (12) and (13) on page XR017 – Underwriting Risk – Managed Care Credit.

Line (10) – Category 0 – No Federal Reinsurance or Risk Corridor Protection**.** Category 0 for Medicare Part D Coverage would be all claims during a period where neither the reinsurance coverage or risk corridor protection is provided.

Line (11) – Category 1 – Federal Reinsurance but no Risk Corridor Protection**.** Category 1 for Medicare Part D Coverage would be all claims during a period when only the reinsurance coverage is provided. This is designed for some future time period and is not to be interpreted as including employer-based Part D coverage that is not subject to risk corridor protection.

Line (12) – Category 2a – No Federal Reinsurance but Risk Corridor Protection**.** Category 2a for Medicare Part D Coverage would be for all claims during a period when only the risk corridor protection is provided.

Line (13) – Category 3a – Federal Reinsurance and Risk Corridor Protection**.** Category 3a for Medicare Part D Coverage would be for all claims during a period when both reinsurance coverage and risk corridor protection are provided.

Line (14) – Sub-Total Paid Claims**.** The total paid claims for Medicare Part D Coverage, excluding supplemental benefits.

Line (16) – Weighted Average Managed Care Discount. These amounts are calculated by dividing the total weighted claims by the comparable sub-total claim payments. For Column (3), this is Column (3), Line (9) divided by Column (2), Line (9). For Column (4), this is Column (4) Line (14) divided by Column (2), Line (14).

Line (17) – Weighted Average Managed Care Risk Adjustment Factor**.** These are the credit factors that are carried back to the underwriting risk calculation. They are one minus the Weighted Average Managed Care Discount values in Line (16).

Lines (18) through (24) are the calculation of the weighted average factor for the Category 2 claims payments subject to withholds and bonuses/incentives. This table requires data from the PRIOR YEAR to compute the current year's discount factor. These do not apply to Medicare Part D coverage.

Line (18) – Withhold & Bonus/Incentive Payments**, *prior year*.** Enter the prior year's actual withhold and bonus/incentive payments.

Line (19) –Withhold & Bonuses/Incentives Available**, *prior year*.** Enter the prior ~~year's~~years withholds and bonuses/incentives that were available for payment in the prior year.

Line (20) – MCC Multiplier – Average Withhold Returned**.** Divides Line (18) by Line (19) to determine the portion of withholds and bonuses/incentives that were actually returned in the prior year.

Line (21) – Withholds & Bonuses/Incentives Available, ***prior year*.** Equal to Line (19) and is automatically pulled forward.

Line (22) – Claims Payments Subject to Withhold, ***prior year*.** Claim payments that were subject to withholds and bonuses/incentives in the prior year. Equal to L(3) + L(4) of the managed care credit claims payment table FOR THE PRIOR YEAR.

Line (23) – Average Withhold Rate, ***prior year*.** Divides Line (21) by Line (22) to determine the average withhold rate for the prior year.

Line (24) – MCC Discount Factor, Category 2**.** Multiplies Line (20) by Line (23) to determine the discount factor for Category 2 claims payments in the current year, based on the performance of the health ~~entity's~~entities withhold/bonus/incentive program in the prior year.

LIFE

UNDERWRITING RISK - MANAGED CARE CREDIT
LR022

This worksheet LR022 Underwriting Risk – Managed Care Credit is optional. It may be completed for only part of the comprehensive medical dental business, Stand-Alone Medicare Part D Coverage or all of them. Line (1) will be filled in as the balancing item if any of Lines (2) through (8) are entered (and then Line (9) will be required).

The effect of managed care arrangements on the variability of underwriting results is the fundamental difference between coverages subject to the managed care credit and pure indemnity insurance. The managed care credit is used to reduce the RBC requirement for experience fluctuations. It is important to understand that the managed care credit is based on the reduction in uncertainty about future claims payments, not on any reduction in the actual level of cost. Those managed care arrangements that have the greatest reduction in the uncertainty of claims payments receive the greatest credit, while those that have less effect on the predictability of claims payments engender less of a discount.

There are five levels of managed care that are used in the RBC formulas other than for Stand-Alone Medicare Part D Coverage, although in the future as new managed care arrangements evolve, the number of categories may increase or new arrangements may be added to the existing categories. The managed care categories are:

- Category 0 - Arrangements not Included in Other Categories
- Category 1 - Contractual Fee Payments
- Category 2 – Bonus and/or incentives / Withhold Arrangements
- Category 3 - Capitation
- Category 4 - Non-contingent Expenses and Aggregate Cost Arrangements and Certain PSO Capitated Arrangements

For Stand-Alone Medicare Part D Coverage, the reduction in uncertainty comes from two federal supports. The reinsurance coverage is optional in that a plan sponsor may elect to participate in the Part D Payment Demonstration. The risk corridor protection is expected to have less impact after the first few years. To allow flexibility within the RBC formula, Lines (10) through (13) will be used to give credit for the programs in which the plan sponsor participates. While all PDPs will have formularies and may utilize other methods to reduce uncertainty, for the near future no other managed care credits are allowed for this coverage.

The managed care credit is based on the percentage of paid claims that fall into each of these categories. Total claims payments are allocated among these managed care "buckets" to determine the weighted average discount, which is then used to reduce the Underwriting Risk-Experience Fluctuation RBC. Paid claims are used instead of incurred claims due to the variability of reserves (unpaid claims) in incurred claim amounts and the difficulty in allocating reserves (unpaid claims) by managed care category.

In some instances, claims payments may fit into more than one category. If that occurs, enter the claims payments into the highest applicable category. CLAIMS PAYMENTS CAN ONLY BE ENTERED INTO ONE OF THESE CATEGORIES! The total of the claims payments reported in the managed care worksheet should equal the total year's paid claims. Category 2a, Category 2b and Category 3c are not allowed to include non-regulated intermediaries who are affiliated with the reporting company in order to insure that true risk transfer is accomplished.

Line (1)
Category 0 - Arrangements not Included in Other Categories. There is a zero managed care credit for claim payments in this category, which includes:

- Fee for service (charges).
- Discounted fee for service (based upon charges).

- Usual customary and reasonable (UCR) schedules.
- Relative value scale (RVS), where neither payment base nor RV factor is fixed by contract or where they are fixed by contract for one year or less.
- Retroactive payments to capitated providers or intermediaries whether by capitation or other payment method (excluding retroactive withholds later released to the provider and retroactive payments made solely because of a correction to the number of members within the capitated agreement).
- Capitation paid to providers or intermediaries that have received retroactive payments for previous years (including bonus arrangements on capitation programs).
- Claim payments not included in other categories.

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Line (2)

Category 1 - Payments Made According to Contractual Arrangements. There is a 15 percent managed care credit for payments included in this category:

- Hospital per diems, diagnostic related groups (DRGs) or other hospital case rates.
- Non-adjustable professional case and global rates.
- Provider fee schedules.
- Relative value scale (RVS), where the payment base and RV factor are fixed by contract for more than one year.

Line (3)

Category 2a - Payments Made Subject to Withholds or Bonuses/Incentives with No Other Managed Care Arrangements. This category may include business that would have otherwise fit into Category 0. That is, there may be a bonus/incentives/withhold arrangement with a provider who is reimbursed based on a UCR schedule (Category 0).

The maximum Category 2a managed care credit is 25 percent. The credit is based upon a calculation that determines the ratio of withholds returned and bonuses and/or incentives paid to providers during the prior year to total withholds and bonuses and incentives available to the providers during that year. That ratio is then multiplied by the average provider withhold ratio for the prior year to determine the current year's Category 2a managed care credit factor. Bonus and/or incentive payments that are not related to financial results are not included (e.g., patient satisfaction). Therefore, the credit factor is equal to the result of the following calculation:

EXAMPLE - 1998 Reporting Year	
1997 withhold / bonus/incentive payments	750,000
1997 withholds / bonuses/incentives available	1,000,000
A . MCC Factor Multiplier	75% - Eligible for credit
1997 withholds / bonuses/incentives available	1,000,000
1997 claims subject to withhold -gross†	5,000,000
B. Average Withhold Rate	20%
Category 2 Managed Care Credit Factor (A x B)	15%

The resulting factor is multiplied by claims payments subject to withhold - net‡ in the current year.

† These are amounts due before deducting withhold or paying bonuses and/or incentives.
‡ These are actual payments made after deducting withhold or paying bonuses and/or incentives.

Enter the paid claims for the current year where payments to providers were subject to withholds and bonuses/incentives, but otherwise had no managed care arrangements.

Line (4)

Category 2b - Payments Made Subject to Withholds or Bonuses/Incentives That Are Otherwise Managed Care Category 1. Category 2b may include business that would have otherwise fit into Category 1. That is, there may be a bonus/incentive/withhold arrangement with a provider who is reimbursed based on a provider fee schedule (Category 1). The Category 2 discount for claims payments that would otherwise qualify for Category 1 is the greater of the Category 1 factor or the calculated Category 2 factor.

The maximum Category 2b managed care credit is 25 percent. The minimum of Category 2b managed care credit is 15 percent (Category 1 credit factor). The credit calculation is the same as found in the previous example for Category 2a.

Enter the paid claims for the current year where payments to providers were subject to withholds and bonuses/incentives AND where the payments were made according to one of the contractual arrangements listed for Category 1.

Line (5)
Category 3a - Capitated Payments Directly to Providers. There is a managed care credit of 60 percent for claims payments in this category, which includes:

- All capitation or percent of premium payments directly to licensed providers.

Enter the amount of claims payments paid DIRECTLY to licensed providers on a capitated basis.

Line (6)
Category 3b - Capitated Payments to Regulated Intermediaries. There is a managed care credit of 60 percent for claims payments in this category, which includes:

- All capitation or percent of premium payments to regulated intermediaries that, in turn, pay licensed providers.

Enter the amount of medical expense capitations paid to regulated intermediaries (see Appendix 2 for definition). In those cases where the capitated regulated intermediary employs providers and pays them non-contingent salaries or otherwise qualifies for Category 4, the insurer may include that portion of such capitated payments in Category 4.

Line (7)
Category 3c - Capitated Payments to Non-Regulated Intermediaries. There is a managed care credit of 60 percent for claims payments in this category, which includes:

- All capitated or percent of premium payments to non-affiliated intermediaries that, in turn, pay licensed providers (subject to a 5 percent limitation on payments to providers or other corporations that have no contractual relationship with such intermediary. Amounts greater than the 5 percent limitation should be reported in Category 0).

Enter the amount of medical expense capitations paid to non-regulated intermediaries not affiliated with the reporting company. Do not include the amount of medical expense capitations paid to non-regulated intermediaries affiliated with the reporting company. These amounts should be reported in Category 0. Non-regulated intermediaries are those organizations that meet the definition in Appendix 2 for Intermediary but not regulated intermediary. In those cases where the capitated non-regulated intermediary (even if affiliated) employs providers and pays them non-contingent salaries or otherwise qualifies for Category 4, the insurer may include that portion of such capitated payments in Category 4.

IN ORDER TO QUALIFY FOR ANY OF THE CAPITATION CATEGORIES, SUCH CAPITATION MUST BE FIXED (AS A PERCENTAGE OF PREMIUM OR FIXED DOLLAR AMOUNT PER MEMBER) FOR A PERIOD OF AT LEAST 12 MONTHS. Where an arrangement contains a provision for prospective revision within a 12-month period, the entire arrangement shall be subject to a managed care credit that is calculated under Category 1 for a provider, and for an intermediary at the greater

of Category 1 or a credit calculated using the underlying payment method(s) to the providers of care. Where an arrangement contains a provision for retroactive revisions either within or beyond a 12 month period, the entire arrangement shall be subject to a managed care credit that is calculated under Category 0 for both providers and intermediaries.

Line (8)
Category 4 - Medical & Hospital Expense Paid as Salary to Providers. There is a managed care credit of 75 percent for claims payments in this category. Once claims payments under this managed care category are totaled, any fee for service revenue from uninsured plans (i.e., ASO or ASC) that was included on Line (7) in the underwriting risk section should be deducted before applying the managed care credit factor.

- Non-contingent salaries to persons directly providing care.
- The portion of payments to affiliated entities passed on as non-contingent salaries to persons directly providing care where the entity has a contract only with the company.
- All facilities-related medical expenses and other non-provider medical costs generated within health facility that is owned and operated by the insurer.
- Aggregate cost payments.

Salaries paid to doctors and nurses whose sole corporate purpose is utilization review are also included in this category if such payments are classified as "medical expense" payments (paid claims) rather than administrative expenses. The Aggregate Cost method of reimbursement means where a health plan has a reimbursement plan with a corporate entity that directly provides care, where (1) the health plan is contractually required to pay the total operating costs of the corporate entity, less any income to the entity from other users of services; and (2) there are mutual unlimited guarantees of solvency between the entity and the health plan, which put their respective capital and surplus at risk in guaranteeing each other.

Line (9)
Subtotal Paid Claims – The total of Column (2) paid claims should equal the total claims paid for the year as reported in Schedule H, Part 5, Columns 1 and 2, Line A.4 of the annual statement.

Line (10)
Category 0 for Stand-Alone Medicare Part D Coverage would be all claims during a period where neither the reinsurance coverage or risk corridor protection is provided.

Line (11)
Category 1 for Stand-Alone Medicare Part D Coverage would be for all claims during a period when only the reinsurance coverage is provided. This is designed for some future time period and is not to be interpreted as including employer-based Part D coverage that is not subject to risk corridor protection.

Line (12)
Category 2a for Stand-Alone Medicare Part D Coverage would be for all claims during a period when only the risk corridor protection is provided.

Line (13)
Category 3a for Stand-Alone Medicare Part D Coverage would be for all claims during a period when both reinsurance coverage and risk corridor protection are provided.

Line (16)
Weighted Average Managed Care Discount – The amounts in Column (3) and Column (4) are calculated by dividing the total weighted claims in Column (3) by the total claims paid in Column (2) for Lines (9) and (14) respectively.

Line (17)

Weighted Average Managed Care Risk Adjustment Factor – These are the credit factors that are carried back to the underwriting risk calculation. They are one minus the Weighted Average Managed Care Discount (Line (16)).

Lines (18) through (24)
Lines (18) through (24) are the calculation of the weighted average factor for the Category 2 claims payments subject to withholds and bonuses/incentives. This table requires data from the PRIOR YEAR to compute the current year's discount factor.

Line (18)
Enter the prior year's actual withhold and bonus/incentive payments.

Line (19)
Enter the prior year's withholds and bonuses/incentives that were available for payment in the prior year.

Line (20)
Divides Line (18) by Line (19) to determine the portion of withholds and bonuses/incentives that were actually returned in the prior year.

Line (21)
Equal to Line (19) and is automatically pulled forward.

Line (22)
Claims payments that were subject to withholds and bonuses/incentives in the prior year. Equal to Line (3) + Line (4) of LR022 Underwriting Risk – Managed Care Credit FOR THE PRIOR YEAR.

Line (23)
Divides Line (21) by Line (22) to determine the average withhold rate for the prior year.

Line (24)
Multiplies Line (20) by Line (23) to determine the discount factor for Category 2 claims payments in the current year, based on the performance of the insurer's withhold/bonus/incentive program in the prior year.

PR021 - Underwriting Risk – Managed Care Credit

This worksheet PR021 Underwriting Risk – Managed Care Credit is optional. It may be completed for only part of the Comprehensive Medical, Stand-Alone Medicare Part D Coverage, Dental business or all of them. Line (1) will be filled in as the balancing item if any of Lines (2) through (8) are entered (and then Line (9) will be required).

The effect of managed care arrangements on the variability of underwriting results is the fundamental difference between coverages subject to the managed care credit and pure indemnity insurance. The managed care credit is used to reduce the RBC requirement for experience fluctuations. It is important to understand that the managed care credit is based on the reduction in uncertainty about future claims payments, not on any reduction in the actual level of cost. Those managed care arrangements that have the greatest reduction in the uncertainty of claims payments receive the greatest credit, while those that have less effect on the predictability of claims payments engender less of a discount.

There are currently five levels of managed care that are used in the RBC formulas other than for Stand-Alone Medicare Part D Coverage, although in the future as new managed care arrangements evolve, the number of categories may increase or new arrangements may be added to the existing categories. The managed care categories are:

* Category 0 - Arrangements not Included in Other Categories
* Category 1 - Contractual Fee Payments
* Category 2 – Bonus and/or Incentives / Withhold Arrangements
* Category 3 - Capitation
* Category 4 - Non-contingent Expenses and Aggregate Cost Arrangements and Certain PSO Capitated Arrangements

For Stand-Alone Medicare Part D Coverage, the reduction in uncertainty comes from two federal supports. The reinsurance coverage is optional in that a plan sponsor may elect to participate in the Part D Payment Demonstration. The risk corridor protection is expected to have less impact after the first few years. To allow flexibility within the RBC formula, Lines (10.1) through (10.4) will be used to give credit for the programs in which the plan sponsor participates. While all PDPs will have formularies and may utilize other methods to reduce uncertainty, for the near future no other managed care credits are allowed for this coverage.

The managed care credit is based on the percentage of paid claims that fall into each of these categories. Total claims payments are allocated among these managed care "buckets" to determine the weighted average discount, which is then used to reduce the Underwriting Risk – Premium Risk for Comprehensive Medical, Medicare Supplement and Dental RBC. Paid claims are used instead of incurred claims due to the variability of reserves (unpaid claims) in incurred claim amounts and the difficulty in allocating reserves (unpaid claims) by managed care category.

In some instances, claims payments may fit into more than one category. If that occurs, enter the claims payments into the highest applicable category. CLAIMS PAYMENTS CAN ONLY BE ENTERED INTO ONE OF THESE CATEGORIES! The total of the claims payments reported in the managed care worksheet should equal the total year's paid claims. Category 2a, Category 2b and Category 3c are not allowed to include non-regulated intermediaries who are affiliated with the reporting company in order to ensure that true risk transfer is accomplished.

Line (1)

Category 0 - Arrangements not Included in Other Categories. There is a zero managed care credit for claim payments in this category, which includes:

* Fee for service (charges).
* Discounted fee for service (based upon charges).
* Usual customary and reasonable (UCR) schedules.
* Relative value scale (RVS) where neither payment base nor RV factor is fixed by contract or where they are fixed by contract for one year or less.

* Retroactive payments to capitated providers or intermediaries whether by capitation or other payment method (excluding retroactive withholds later released to the provider and retroactive payments made solely because of a correction to the number of members within the capitated agreement).
* Capitation paid to providers or intermediaries that have received retroactive payments for previous years (including bonus arrangements on capitation programs).
* Claim payments not included in other categories.

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Line (2)
Category 1 - Payments Made According to Contractual Arrangements. There is a 15 percent managed care credit for payments included in this category:

* Hospital per diems, diagnostic related groups (DRGs) or other hospital case rates.
* Non-adjustable professional case and global rates.
* Provider fee schedules.
* Relative value scale (RVS) where the payment base and RV factor are fixed by contract for more than one year.

Line (3)
Category 2a - Payments Made Subject to Withholds or Bonuses/Incentives with No Other Managed Care Arrangements. This category may include business that would have otherwise fit into Category 0. That is, there may be a bonus/incentive/withhold arrangement with a provider who is reimbursed based on a UCR schedule (Category 0).

The maximum Category 2a managed care credit is 25 percent. The credit is based upon a calculation that determines the ratio of withholds returned and bonuses and/or incentives paid to providers during the prior year to total withholds and bonuses and incentives available to the providers during that year. That ratio is then multiplied by the average provider withhold ratio for the prior year to determine the current year's Category 2a managed care credit factor. Bonus and/or incentive payments that are not related to financial results are not included (e.g., patient satisfaction). Therefore, the credit factor is equal to the result of the following calculation:

EXAMPLE - 1998 Reporting Year	
1997 withhold / bonus payments	$750,000
1997 withholds / bonuses available	$1,000,000
A. MCC Factor Multiplier	75% - Eligible for credit
1997 withholds / bonuses available	$1,000,000
1997 claims subject to withhold -gross†	$5,000,000
B. Average Withhold Rate	20%
Category 2 Managed Care Credit Factor (A x B)	15%

The resulting factor is multiplied by claims payments subject to withhold - net‡ in the current year.

† These are amounts due before deducting withhold or paying bonuses and/or incentives.
‡ These are actual payments made after deducting withhold or paying bonuses and/or incentives.

Enter the paid claims for the current year where payments to providers were subject to withholds and bonuses/incentives, but otherwise had no managed care arrangements.

Line (4)
Category 2b - Payments Made Subject to Withholds or Bonuses/Incentives That Are Otherwise Managed Care Category 1. Category 2b may include business that would have otherwise fit into Category 1. That is, there may be a bonus/incentive/withhold arrangement with a provider who is reimbursed based on a provider fee schedule

(Category 1). The Category 2 discount for claims payments that would otherwise qualify for Category 1 is the greater of the Category 1 factor or the calculated Category 2 factor.

The maximum Category 2b managed care credit is 25 percent. The minimum Category 2b managed care credit is 15 percent (Category 1 credit factor). The credit calculation is the same as found in the previous example for Category 2a.

Enter the paid claims for the current year where payments to providers were subject to withholds and bonuses/incentives AND where the payments were made according to one of the contractual arrangements listed for Category 1.

Line (5)
Category 3a - Capitated Payments Directly to Providers. There is a managed care credit of 60 percent for claims payments in this category, which includes:

* All capitation or percent of premium payments made directly to licensed providers.

Enter the amount of claims payments paid DIRECTLY to licensed providers on a capitated basis.

Line (6)
Category 3b - Capitated Payments to Regulated Intermediaries. There is a managed care credit of 60 percent for claims payments in this category, which includes:

* All capitation or percent of premium payments to regulated intermediaries that in turn pay licensed providers.

Enter the amount of medical expense capitations paid to regulated intermediaries (see Appendix 1 for definition). In those cases where the capitated regulated intermediary employs providers and pays them non-contingent salaries or otherwise qualifies for Category 4, the insurer may include that portion of such capitated payments in Category 4.

Line (7)
Category 3c - Capitated Payments to Non-Regulated Intermediaries. There is a managed care credit of 60 percent for claims payments in this category, which includes:

* All capitated or percent of premium payments to non-affiliated intermediaries that in turn pay licensed providers. (Subject to a 5 percent limitation on payments to providers or other corporations that have no contractual relationship with such intermediary. Amounts greater than the 5 percent limitation should be reported in Category 0).

Enter the amount of medical expense capitations paid to non-regulated intermediaries not affiliated with the reporting company. Do not include the amount of medical expense capitations paid to non-regulated intermediaries that are affiliated with the reporting company. These amounts should be reported in Category 0. Non-regulated intermediaries are those organizations which meet the definition of Intermediary but not regulated intermediary in Appendix 1. In cases where the capitated non-regulated intermediary (even if affiliated) employs providers and pays them non-contingent salaries or otherwise qualifies for Category 4, the insurer may include that portion of such capitated payments in Category 4.

IN ORDER TO QUALIFY FOR ANY OF THE CAPITATION CATEGORIES, SUCH CAPITATION MUST BE FIXED (AS A PERCENTAGE OF PREMIUM OR FIXED DOLLAR AMOUNT PER MEMBER) FOR A PERIOD OF AT LEAST 12 MONTHS. Where an arrangement contains a provision for prospective revision within a 12-month period, the entire arrangement shall be subject to a managed care credit that is calculated under Category 1 for a provider, and for an intermediary at the greater of Category 1 or a credit calculated using the underlying payment method(s) to the providers of care. Where an arrangement contains a provision for retroactive

revisions either within or beyond a 12-month period, the entire arrangement shall be subject to a managed care credit that is calculated under Category 0 for providers and intermediaries.

Line (8)
Category 4 - Medical & Hospital Expense Paid as Salary to Providers. There is a managed care credit of 75 percent for claims payments in this category. Once claims payments under this managed care category are totaled, any fee for service revenue from uninsured plans (i.e., ASO or ASC) that was included on Line (7) in the underwriting risk section should be deducted before applying the managed care credit factor.

* Non-contingent salaries to persons directly providing care.
* The portion of payments to affiliated entities which is passed on as non-contingent salaries to persons directly providing care where the entity has a contract only with the company.
* All facilities related medical expenses and other non-provider medical costs generated within health facility that is owned and operated by the insurer.
* Aggregate cost payments.

Salaries paid to doctors and nurses whose sole corporate purpose is utilization review are also included in this category if such payments are classified as "medical expense" payments (paid claims) rather than administrative expenses. The Aggregate Cost method of reimbursement means where a health plan has a reimbursement plan with a corporate entity that directly provides care, where (1) the health plan is contractually required to pay the total operating costs of the corporate entity, less any income to the entity from other users of services; and (2) there are mutual unlimited guarantees of solvency between the entity and the health plan, that put their respective capital and surplus at risk in guaranteeing each other.

Line (10.1)
Category 0 for Stand-Alone Medicare Part D Coverage would be all claims during a period where neither the reinsurance coverage or risk corridor protection is provided.

Line (10.2)
Category 1 for Stand-Alone Medicare Part D Coverage would be for all claims during a period when only the reinsurance coverage is provided. This is designed for some future time period and is not to be interpreted as including employer-based Part D coverage that is not subject to risk corridor protection.

Line (10.3)
Category 2a for Stand-Alone Medicare Part D Coverage would be for all claims during a period when only the risk corridor protection is provided.

Line (10.4)
Category 3a for Stand-Alone Medicare Part D Coverage would be for all claims during a period when both reinsurance coverage and risk corridor protection are provided.

Line (10.6)
Total Paid Claims – The total of Column (1) paid claims should equal the total claims paid for the year as reported in Schedule H, Part 5, Columns 1 and 2, Line D16 of the annual statement.

Line (11)
Weighted Average Managed Care Discount – This amount is calculated by dividing the total weighted claims (Line (9) Column (2)) by the total claim payments (Line (9) Column (1).

Line (12)

Weighted Average Managed Care Risk Adjustment Factor - This is the credit factor that is carried back to the underwriting risk calculation. They are one minus the Weighted Average Managed Care Discount (Line (11)).

Lines (13) through (19)
Lines (13) through (19) are the calculation of the weighted average factor for the Category 2 claims payments subject to withholds and bonuses/incentives. This table requires data from the PRIOR YEAR to compute the current year's discount factor.

Line (13)
Enter the prior year's actual withhold and bonus/incentive payments.

Line (14)
Enter the prior year's withholds and bonuses/incentives that were available for payment in the prior year.

Line (15)
Divides Line (13) by Line (14) to determine the portion of withholds and bonuses/incentives that were actually returned in the prior year.

Line (16)
Equal to Line (14) and is automatically pulled forward.

Line (17)
Claims payments that were subject to withholds and bonuses/incentives in the prior year. Equal to Line (3) + Line (4) of Underwriting Risk–Managed Care Credit FOR THE PRIOR YEAR.

Line (18)
Divides Line (16) by Line (17) to determine the average withhold rate for the prior year.

Line (19)
Multiplies Line (15) by Line (18) to determine the discount factor for Category 2 claims payments in the current year, based on the performance of the insurer's withhold/bonus/incentive program in the prior year.

HEALTH, LIFE AND PROPERTY AND CASUALTY

APPENDIX 1 – COMMONLY USED TERMS

The Definitions of Commonly Used Terms are frequently duplicates from the main body of the text. If there are any inconsistencies between the definitions in this section and the definitions in the main body of the instructions, the main body definition should be used.

Incentives, Withhold and Bonus Amounts – Are amounts to be paid to providers by the Health entity as an incentive to achieve goals such as effective management of care. An incentive arrangement may involve paying an agreed-on amount for each claim (e.g. provider agrees practice in an underserved area). While a bonus arrangement may be paid at the end of a contact period after specific goals have been met. Withhold arrangements can involve a set amount to be withheld from each claim, and then paying a portion (which could be none or all) of the withheld amount at the end of the contract period.

Incentive pool, withhold, and bonus amounts are defined as: amounts to be paid to providers by the Health entity as an incentive to achieve goals such as effective management of care. Some arrangements involve paying an agreed-on amount for each claim, and then paying a bonus at the end of the contract period. Other arrangements involve a set amount to be withheld from each claim, and then paying a portion (which could be none or all) of the withheld amount at the end of the contract period.

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Commented [BC1]: This could also be worded as "(e.g. provider is paid on a per claim basis for practicing in an underserved area.)"

Commented [BC2]: This is directly from the A/S instructions. It used as a basis for the definition drafted above.

Draft: 3/8/21

Health Risk-Based Capital (E) Working Group
Virtual Meeting
January 22, 2021

The Health Risk-Based Capital (E) Working Group of the Capital Adequacy (E) Task Force met Jan. 22, 2021. The following Working Group members participated: Steve Drutz, Chair (WA); Steve Ostlund (AL); Eric Unger (CO); Wanchin Chou and Andrew Greenhalgh (CT); Kyle Collins (FL); Tish Becker (KS); Lindsay Crawford and Michael Muldoon (NE); Kelsey Barlow (NV); Tom Dudek (NY); Kimberly Rankin (PA); and Matthew Richard, Aaron Hodges and Mike Boerner (TX).

1. Discussed the Academy's Report on Investment Income in Underwriting Risk

Mr. Drutz said the American Academy of Actuaries (Academy) report that was exposed in December 2020 discussed the incorporation of investment income into the underwriting risk component and that additional information was requested regarding the proposed adjustment for investment income. Derek Skoog (Academy) summarized the Academy's response (Attachment Two-B1) and said that the investment income adjustment to the underwriting factors was similar to how it is contemplated in the property/casualty (P/C) formula. He said that the Academy analyzed the comprehensive medical factors that are currently in the underwriting risk component of the health formula and assumed there was not an investment income adjustment included in the current factors. The Academy developed a set of underlying factors that would correspond to the P/C formula and then developed an investment income adjustment based on investment income that is earned on premium collected less claims paid. This considers the development and payment pattern of claims for a typical major medical policy. Then using that investment income assumption, the Academy applied that to the risk factors to develop an alternative set of experience volatility risk factors within each of the tiered factors. Mr. Skoog said that the follow-up letter laid out more detail for the arithmetic for how the investment income adjustment factor gets applied within the P/C construct and shows how the output or the resulting risk factors would result from that approach.

Mr. Chou asked if the Academy was able to look at the P/C on page PR017 for the adjustment of investment income as a factor by line for consistency between the formulas. Mr. Skoog said that served as a basis for the Academy's analysis and said that exact approach was taken. However, rather than expanding the reporting structure in H2 of the health formula for experience volatility risk, the Academy was able to get a similar result by using industry factors. He said that the Academy opted for a simpler and higher-level approach in which the same logic was used. Mr. Chou asked if the 87.5% confidence level was used. Mr. Skoog said no. He said the original request was to consider investment income without adjusting other components of the formula. He said that if the 9% risk factor within the health risk-based capital (RBC) formula were decomposed into the P/C construct, it would basically imply an administrative expense ratio of about 9%. He said there was no investment income adjustment within the current construct, and that would imply a safety or confidence level of about a 100% loss ratio. Mr. Skoog said this would be the corresponding loss ratio in the P/C formula if the same construct was used. He said the Academy did not change those assumptions as this would have led to a more significant study of loss ratios and safety levels that would require more significant changes to the H2 component. He said that the Academy simply applied an investment income adjustment to the factors as they are currently constructed using the P/C construct.

Mr. Drutz said the letter indicated that a 0.5% return would have about a 0.07 percentage point decrease in the 9% factor for comprehensive medical. He asked if this same percentage decrease could be applied to the other tiers and lines of business on page XR012. Mr. Skoog said a similar approach could be applied to the other lines of business by looking at particular claim's payment patterns for those lines to the extent that they may differ from comprehensive major medical. For example, Medicare Supplement paid claims are substantially slower than comprehensive major medical, so it may merit a different adjustment. However, in terms of magnitude, the adjustments would be very similar to that of the comprehensive major medical.

Jim Braue (UnitedHealth Group—UHG) summarized the UHG's comment letter (Attachment Two-B2). He said that UHG supports making an adjustment for investment income in the formula. He said that the Academy letter noted that the amount of the adjustment is highly sensitive to the rate of investment return that is assumed, and it was also noted that statutory financial results would suggest a rate of 2% to 3%, but an amount lower may be justified by the short-term nature of the liabilities. He said that UHG believes that something consistent with a slightly longer maturity such as two to three years is more appropriate. Mr. Braue said since there is a charge applied for the risk of the bond, there should be some recognition for the income and revenue produced by those bonds. Therefore, it seems appropriate to have the revenue assumption sync up with risk assumption for the bond factors. He said the run-out period of the liabilities are not reflected in the underwriting risk factors. If it were, it would be a reserve risk and not an underwriting risk, and the risk being looked at here is the risk for future incurred claims

being higher than future payments. He asked if current interest rates or longer-term averages should be used, as this ties into the frequency of updating the factors. If current rates are used, it implies that every time the current rate changes appreciably, the factors would need to be adjusted. If the factors were to be updated less frequently, a longer-term average rate would be more appropriate. Mr. Braue said that it is probably not appropriate to apply the adjustment to the factors for long-term disability and long-term care insurance (LTC) due to the nature of those coverages and because there is a risk charge applied to the claim reserves. However, an adjustment could be considered for those shorter-tailed coverages that behave like comprehensive medical and where the risk charges are determined in a similar fashion. He said where there are tiered factors, both tiers should be adjusted.

Mr. Drutz said there are several decision points that the Working Group will need to address prior to implementation of a factor adjustment: 1) whether the issue of bond default risk and investment revenue should be based on the same duration of assumptions; 2) the appropriate duration for applying the underwriting credit; and 3) the appropriate interest rate of return to be used in adjusting the underwriting factor.

Lou Felice (NAIC) said that from a health perspective and based on the Academy's review, the duration of the asset holding is longer, which seems to be an appropriate measure in determining default risk because the length of time that the bond is held is related to whether there is a potential for default over that time. However, the crediting of investment income could use a one-year underwriting cycle due to the short duration of claims. He said that a one-year underwriting cycle could be a little longer as the run out is longer. However, given the short run out, given that premium changes are usually limited to once a year, and given that product design and selection changes once a year, a one-year time period could be used as an under-investment risk duration. He said that for health specifically, bond default risk and investment return risk are not as well connected as they are for P/C, so different durations could be considered for default risk on bonds versus underwriting risk benefit from investment income. Mr. Felice said that the frequency of review is tied to the rate selected, so if a smaller return percentage is used, then the factors would need to be reviewed more frequently and a larger return percentage could be reviewed less frequently. He said if a risk-free or pegged rate were used, the factors would need to be reviewed very frequently. However, if portfolio rates were used, they would need to be reviewed less frequently. There are two items to consider with portfolio rates: 1) whether perverse incentives are created to get more credit by investing in risky assets to raise their portfolio rates of return; and 2) changes to the bond factors or asset risk factors may not have as robust of change as changes to the underwriting risk factors in the formula. Therefore, a small change to the underwriting risk factors may have more of an impact on RBC after covariance than a larger change to a bond factor or asset factor.

Mr. Drutz said that if there is no structural change, the factor updates could be relatively simple. He said there are a couple of methods that could be considered for updating: 1) if a five-year duration were used, the adjustment could be tied to a five-year Treasury bond or some other bond that was published, which could then be used to adjust the factors on an annual basis; or 2) it could be tied to the average investment income of companies. Mr. Drutz suggested that the Working Group run an analysis on the 2019 health RBC data to determine the impact of incorporating the investment income adjustment in the underwriting risk factors and the impact that it would have on RBC ratios. Mr. Muldoon agreed that an impact analysis was a good idea to see what kind of impacts these changes would have.

Mr. Muldoon also asked what lines of business on page XR012 would be considered under the adjusted factors. Crystal Brown (NAIC) asked if the Academy would be able to provide the Working Group with adjusted factors for each line of business in which the investment income would be incorporated into. Mr. Skoog said that the Academy could provide updated factors by line of business, but it would be easier to isolate the lines of business that the adjustment should be applied to because premium collection relative to claims payout patterns would need to be considered.

Mr. Drutz said that the Working Group would like to come to a conclusion on both the bond factors and investment income adjustment projects at the same time and implement for year-end 2021 if possible. Therefore, the Working Group will need to look at the materiality and impact of the investment income adjustment and determine which lines of business the adjustment would apply to. Ms. Brown asked how long it would take the Academy to provide factors for the additional lines of business. Mr. Skoog said that some lines of business will be more challenging than others to get a good view of claim payment patterns. He said that comprehensive medical, Medicare Supplement, dental and vision, and stand-alone Medicare Part D coverage are the most straightforward lines of business, while other health and other non-health may be more challenging because of the number of products that fall under these categories. He said page XR012 would be the most straightforward page and said that the Academy could provide updated factors to the Working Group within a few weeks. Mr. Felice asked if it was necessary to incorporate the investment income adjustment across all the lines of business this year or could the most straightforward lines of business include the adjustment this year and then continue working on the other lines of business. Mr. Felice also asked for clarification on including the adjustment across the tiers and what the Academy thinks about this. Mr. Skoog said that it was

not originally included but that it should apply to all tiers. He said the Academy could provide this. Mr. Braue said that the majority of business is going to be included in Columns 1–4 on page XR012. He suggested that the Academy work on providing adjusted factors for just those four lines of business for year-end 2021 and then over the longer term look at the other lines of business that are more difficult to analyze to determine if any of them are material enough to make any difference. Mr. Skoog said that the Columns 1–4 lines of business are the most straightforward and that the Academy could work on those for this year.

The Working Group agreed and requested that the Academy look at the lines of business in Columns 1–4 on page XR012 and provide an updated analysis like the comprehensive medical and incorporate the tier breakdowns.

Having no further business, the Health Risk-Based Capital (E) Working Group adjourned.

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AMERICAN ACADEMY *of* ACTUARIES

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January 11, 2021

Steve Drutz
Chair, Health Risk-Based Capital (E) Working Group
National Association of Insurance Commissioners (NAIC)

Re: Request for Analysis to Incorporate Investment Income into the Underwriting Risk Component of the Health Risk-Based Capital Formula

Dear Mr. Drutz:

On behalf of the American Academy of Actuaries (Academy)[1] Health Solvency Subcommittee, I am pleased to provide this response letter to the NAIC Health Risk-Based Capital (HRBC) Working Group. This letter is in response to the request from the HRBC Working Group to provide additional detail regarding the potential investment income adjustment factor for Health H2 Experience Fluctuation Risk.

Incorporation of Investment Income into H2 Risk Factors

As described in our letter dated December 15, 2020, the property and casualty (P&C) framework with respect to the Investment Income Adjustment (IIA) within the P&C Net Written Premium Risk (akin to the Health H2 Experience Fluctuation Risk), the base RBC charge amounts to:

*Premium * (IIA * Risk_Factor + Expense_Ratio - 1)*

The IIA*Risk_Factor expression is the discounted loss ratio at the target safety margin (87.5th percentile for P&C). Then, the IIA*Risk_Factor + Expense_Ratio -1 is the discounted operating loss at the target safety margin.

For Comprehensive Major Medical, if a 9% expense ratio (based on high-level industry benchmarking of health plan administrative expenses, excluding loss adjustment expense) is assumed and no IIA (i.e., an IIA of 1.0), then the underlying Risk Factor is 100%. This is essentially the loss plus loss adjustment expense ratio at the target safety margin implied by the Health RBC formula.

[1] The American Academy of Actuaries is a 19,500-member professional association whose mission is to serve the public and the U.S. actuarial profession. For more than 50 years, the Academy has assisted 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.

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The table below summarizes a range of risk factors if an investment income adjustment was applied, assuming a consistent 100% loss and loss adjustment expense ratio and a 9% expense ratio.

Investment Return (a)	Investment Income Adj. (b)	Loss Ratio at safety margin (c)	Expense Ratio (d)	Discounted Risk Factor (b)*(c)+(d)-1
0.0%	1.0000	100%	9%	9.00%
0.1%	0.9999	100%	9%	8.99%
0.5%	0.9993	100%	9%	8.93%
1.0%	0.9987	100%	9%	8.87%
1.5%	0.9980	100%	9%	8.80%
2.0%	0.9974	100%	9%	8.74%
3.0%	0.9960	100%	9%	8.60%

*****

If you have any questions or would like to discuss further, please contact Matthew Williams, the Academy's senior health policy analyst, at williams@actuary.org.

Sincerely,

Derek Skoog, MAAA, FSA
Chairperson
Health Solvency Subcommittee
American Academy of Actuaries

Cc: Crystal Brown, Senior Insurance Reporting Analyst

UNITEDHEALTH GROUP

Corporate Finance – Actuarial Services Division
185 Asylum Street, CityPlace I ● Hartford, CT 06103

January 13, 2021

Mr. Steven Drutz, Chair
Health Risk-Based Capital (E) Working Group
National Association of Insurance Commissioners
1100 Walnut Street, Suite 1500
Kansas City, MO 64106-2197

Via electronic mail to Crystal Brown.

Re: American Academy of Actuaries letters regarding an investment income adjustment to Health RBC underwriting risk factors.

Dear Mr. Drutz:

I am writing on behalf of UnitedHealth Group, to supplement our January 6, 2021 letter to you regarding the incorporation of investment income into the Risk-Based Capital (RBC) charges for health underwriting risk. As we noted in that letter, the American Academy of Actuaries was expected to provide additional details of the calculations shown in their December 15, 2020 letter, and we stated that we might have further comments when those details became available. The Academy submitted that additional information in a letter dated January 11, 2021. Our comments in response to that letter follow.

The Academy has explained that they have calculated "discounted risk factors" using the following formula:

$$\text{Discounted risk factor} = \text{IIA} * (\text{Loss ratio at safety margin}) + (\text{Expense ratio}) - 1$$

where "IIA" is an Investment Income Adjustment. As we understand it, the IIA represents a discount factor at the indicated rate of investment return, discounted over a period of slightly more than 1.5 months. (Although the exact discounting period is not stated in either of the Academy's letters, from the calculated values it appears that the period is approximately 0.1339 years, or 1.607 months.)

The underwriting risk factors were originally based on modeling over a multiyear period, and from that standpoint it seems that the discounting should occur continuously over that period (or, more approximately, back from the midpoint of the modeling period). However, in that case, the premiums would also have to be discounted, which would result in the constant term in the

above equation being less than 1. The IAA, then, can be interpreted as an approximation of the difference between the impact of discounting on the loss ratio and the impact of discounting on the premium, as the 1.6-month period approximates the difference in timing between the receipt of the premium and the payment of the corresponding claims. Considered in that light, the adjustment seems reasonable.

We will note that, potentially, a similar adjustment should be made to the expense ratio. However, because the expense ratio used by the Academy is so much lower than the loss ratio that they used (9% vs. 100%), there would be much less impact on the final result. Therefore, the lack of an adjustment on the expense ratio could be viewed as providing a small degree of conservatism.

Given the interpretation of the IIA that we've presented above, it is important to note that the 1.6-month discounting period has no relevance to the question of what rate of investment return should be assumed. The 1.6-month discounting period really should be thought of as the difference between two amounts discounted over a longer period. As we explained in our January 6 letter, the assumed rate of investment return should be consistent with investments held for a period of two to three years. The information in this latest letter from the Academy does not alter that position in any way.

We would be happy to discuss these comments with you and the Working Group.

James R. Braue

James R. Braue
Director, Actuarial Services
UnitedHealth Group

cc: Crystal Brown, NAIC
Randi Reichel, UnitedHealth Group

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January 6, 2021

Mr. Steven Drutz, Chair
Health Risk-Based Capital (E) Working Group
National Association of Insurance Commissioners
1100 Walnut Street, Suite 1500
Kansas City, MO 64106-2197

Via electronic mail to Crystal Brown.

Re: American Academy of Actuaries letter regarding an investment income adjustment to Health RBC underwriting risk factors.

Dear Mr. Drutz:

I am writing on behalf of UnitedHealth Group in regard to the December 15, 2020 letter to you from the American Academy of Actuaries (the "Academy"), exposed for comment on December 18, 2020. The letter presented the Academy's analysis of incorporating investment income into the Risk-Based Capital (RBC) charges for health underwriting risk.

We greatly appreciate your Working Group's willingness to address this subject. We hope that our comments on the Academy's letter will assist the Working Group in its further consideration of the matter. We have comments on several distinct aspects of the letter, as shown under separate headings below.

During the Working Group's December 18, 2020 conference call, we requested additional details of the calculations shown in the Academy's letter. We understand that the Academy is preparing to provide those details. As of this writing, we have not yet seen that additional material, and our comments below should be considered in that context. When that material becomes available, we may have additional comments regarding it.

Our support for an adjustment.

It is definitely appropriate for an adjustment to be made. We understand the Academy's remark that, "making this change in the RBC formula may be an exercise in false precision because the baseline factors are not well understood." However, that is not a reason to forgo the adjustment. The current underwriting risk factors are what they are, whether they are well understood or not; they are the baseline we all must work from. The adjustment for investment income should

therefore not be thought of as one element of the development of those factors, which might be offset by other elements that are currently unidentified. Instead, the adjustment should be viewed simply as the introduction of an investment income component into the formula, by means of adjusting the existing underwriting risk factors. Conceptually, the adjustment could be a stand-alone negative component of underwriting risk; the fact that it is instead being added to the existing underwriting risk factors does not somehow invalidate its appropriateness.

Accordingly, we strongly recommend that the Working Group adopt an adjustment to the underwriting risk factors as discussed in the Academy's letter. As we noted at the Working Group's July 30, 2020 virtual meeting, and reiterated in our August 31 comment letter, if for some reason the Working Group does not consider it feasible to implement this adjustment as part of the underwriting risk portion of the RBC formula, then it will be necessary to return to the subject of incorporating investment income into the bond risk factors.

Rate of investment return.

The Academy's letter notes that the amount of the adjustment is highly sensitive to the rate of investment return that is assumed in the calculation. The Academy states that statutory financial results would suggest a rate of 2-3%, but also suggests that the short-term nature of the liabilities (about 1.5 months on average, the letter indicates) might justify a much lower rate.

The run-out period of a single incurral date's claims should not be the determinative consideration, for several reasons. First of all, while the Working Group's deliberations on the bond risk factors are not complete, most recently the Working Group has been contemplating using a 3-year average maturity assumption for that purpose. As we have noted previously, if the risk associated with health entities' bond holdings is to be reflected in the RBC formula, it is important that the corresponding returns likewise be reflected. If (as we had originally recommended) the investment return were being incorporated into the bond risk factors themselves, that linkage would be readily apparent. Merely because the investment returns are instead being incorporated into the underwriting risk factors, that linkage is not somehow broken.

Also, we suggest that the run-out period of a single incurral date's claims is not really relevant from an investment standpoint. As a going concern, a health entity does not repeatedly run its assets down to zero as claims are paid; there is a continual inflow of cash from premiums and other revenues, and investments are held for a longer term (approximating the 3-year average maturity referred to above). Even in a run-out situation, it is unlikely that all payments would run out as quickly as the 1.5-month average cited by the Academy would suggest. We will point out that the Academy, in its August 2018 update on bond risk factors, said, "To estimate the liability runoff duration, we review (a) the duration of unpaid claim liabilities and (b) the duration of claim liabilities and related premium from an additional year of policies." As a result of that review, the Academy selected a 2-year horizon for the bond risk modeling.

In summary, the rate of investment return should be consistent with the time horizon used for the bond risk modeling, whatever that is eventually determined to be. In light of the most recent discussions regarding the bond factors, we would expect that to be either 2 or 3 years.

Another consideration is whether the assumed rate of return should be based on current interest rate levels, or on longer-term averages. This consideration is tied in with the question of how frequently the investment income adjustment should be updated, which we address below.

Scope of application.

During the December 18 call, you raised the question of which Health RBC underwriting risk factors should be subject to the investment income adjustment. Because the pricing and reserving characteristics of long-term disability income and long-term care coverages are so different from those of the majority of the business subject to the Health formula, it makes sense to us that those categories would be excluded. For the other, shorter-tailed lines of business subject to the formula, it seems reasonable to apply the investment income adjustment. Also, where a particular product's underwriting risk factor is tiered by premium volume, the adjustment should be applied to all tiers.

Frequency of updates.

Also during the December 18 call, NAIC staff raised the question of how frequently the investment income adjustment should be updated. As we noted above, we believe that this question is closely related to the question of whether the adjustment should be based on current interest rates or on a longer-term average. If the adjustment is based on current rates, it should be updated whenever market interest rates change significantly. If less frequent updates are desired by the Working Group, then it would be appropriate to use a longer-term average of rates to determine the adjustment.

* * * * *

We appreciate your consideration of these comments. We would be happy to discuss this matter further with the Working Group.

James R. Braue

James R. Braue
Director, Actuarial Services
UnitedHealth Group

cc: Crystal Brown, NAIC
Randi Reichel, UnitedHealth Group

Draft: 1/29/21

Health Risk-Based Capital (E) Working Group
Virtual Meeting
December 18, 2020

The Health Risk-Based Capital (E) Working Group of the Capital Adequacy (E) Task Force met Dec. 18, 2020. The following Working Group members participated: Steve Drutz, Chair (WA); Steve Ostlund (AL); Eric Unger (CO); Wanchin Chou and Andrew Greenhalgh (CT); Kyle Collins (FL); Brenda Johnson and Chut Tee (KS); Rhonda Ahrens and Michael Muldoon (NE); Kelsey Barlow (NV); Tom Dudek (NY); Kimberly Rankin (PA); and Aaron Hodges and Mike Boerner (TX).

1. Referred the Health Care Receivable Proposal to the Blanks (E) Working Group

Mr. Drutz said the health care receivable proposal provides additional clarification on the annual statement instructions as a result of feedback in the drafting of the health care receivable guidance. The recommended changes include: 1) adding a reference to "Other Health Care Receivables" in Line 24 of the Assets page; 2) adding "Health Care" to the "Other Receivables" line on Exhibit 3 for consistency across the schedules and risk-based capital (RBC); and 3) modifying the headers of Exhibit 3A to provide additional clarification. No comments were received during the 30-day public comment period.

Mr. Boerner made a motion, seconded by Mr. Dudek, to refer the Health Care Receivable Proposal to the Blanks (E) Working Group for consideration in 2021 reporting (Attachment Two-C1). The motion passed unanimously.

2. Exposed the Academy's Report on Investment Income in Underwriting Risk

Mr. Drutz said the incorporation of investment income into the health RBC formula was brought forward by industry participants through the bond factor discussion. Including investment income within the bond factors would require several considerations; therefore, the Working Group agreed to instead look at incorporating investment income into the Underwriting Risk component. The Working Group asked the American Academy of Actuaries (Academy) to review and analyze incorporating investment income into Underwriting Risk component of the health RBC formula.

Derek Skoog (Academy) said the Academy studied the background of the underwriting risk factors, and given their age, the task was somewhat challenging. The Academy was able to refer to an old Academy report, and it found that the calibration of the factors was different than the property and casualty formula; however, it was still able to decompose the factors into a construct similar to the property and casualty formula for the purposes of the investment income adjustment. Mr. Skoog said the Academy went through that exercise with the major medical base risk charge of 9% in a range of investment income return assumptions. He said depending on the investment return, the underwriting risk factor could go from 9% to 8.6% with an investment return of 3% and then graded between the 8.6% and 9% for lower investment returns.

Mr. Skoog said one of the challenges is determining what the investment return should be due to sensitivity. He said given the low interest rate environment—something between 0–1% range—may make the most sense; but ultimately, that is a decision of the Working Group. He said the other item tested was the speed of which claims are completed, because you are essentially earning investment income under this approach based on whatever residual premium you have after you have paid claims. To the extent that it takes longer to pay claims, you get more of an investment income benefit. Mr. Skoog said the Academy used a normal working claims completion rate so that the results are not overly sensitive to that as they are to the actual investment return. However, there is still some sensitivity; therefore, a range of outcomes was presented. Mr. Skoog said one of the fundamental challenges is in the underlying factors themselves because the base risk charges that are presented within the health RBC formula are a bit dated and do not necessarily tie to quantitative results as they do in the property and casualty formula, which can make any analysis somewhat challenging.

Jim Braue (UnitedHealth Group—UHG) asked if the investment return assumption was the 2–3% return on invested assets. Mr. Skoog said that was correct; it was from the statutory schedules by looking at the return on invested assets relative to invested assets on the balance sheet. Mr. Braue said one month treasury rates may not be relevant to this discussion because for the purposes of the bond factors, the Working Group is looking at a two- to three-year maturity range. He said it would seem appropriate that if the regulated legal entity is being charged for the risk of those longer investments, then it should likewise receive the benefit of those longer investments. Therefore, the return assumption should be consistent with the maturity assumption used for the bond factors to maintain consistency of the risk and return throughout the formula.

Mr. Braue asked for further clarification on how to get from Column 1 to Column 2 and then to Column 3 on the Risk Factor table within the report. He suggested that an example would be helpful to follow the development. He said there was a note in the final paragraph that making a change to the formula could be an exercise in false precision. He said there is a lot of rounding in the existing underwriting risk factors, and had this been incorporated into the original factors, that rounding may have eliminated this effect anyway; but what we have today is a 9% factor, so we should not necessarily be concerned about whether the net of the 9% and this adjustment has a reasonable degree of precision but instead think about whether the adjustments to the 9% factor are appropriate.

Mr. Skoog said the Academy could provide an update on the formulas and description used to move from Columns 1 through 3 on the Risk Factor table. Mr. Chou asked how the 87.5th percentile translated into the adjusted factor. Mr. Skoog said this is how property and casualty developed the risk factor. He said it is essentially the loss ratio at that level of confidence. He said health does not have that same level of construct, but if you were to reconstruct the health risk factor the same as property and casualty risk factors were constructed, it would imply that the risk factor was about a 100% loss ratio. However, because the factor is dated and the Academy does not have the work papers on how it was built, it would be the implied health loss ratio at that same confidence level. Mr. Chou asked if the loss ratio would be at 100% if the confidence level was at the 87.5th percentile. Mr. Skoog agreed and said if you assume that today the health formula does not have an investment income adjustment, and we assume that an expense ratio for a typical health plan is about 9%, excluding claims adjustment expenses, the implied loss ratio at that confidence level is 100%.

Mr. Ostlund said duration is considered in determining the appropriate rate. He said there are times when RBC has looked at long durations for longer duration bonds; however, in this instance, we have a claim payment on major medical claims that have a very short duration, and the Academy appropriately chose the short duration and interest rate to use. He said he agrees with the Academy's recommendation to use a short duration rather than a longer duration.

Mr. Drutz asked if an investment return of 1% was used, would the factors be reduced by 0.13 percentage point across all tiers and lines of business. Mr. Skoog said you could essentially use the 1% as a scaler for other similar lines of business, so it would then be the 0.9854 factor. Mr. Drutz asked if there was a contemplation about applying the adjustment to only the Experience Fluctuation Risk page or whether it would be applied to other lines, such as federal employee health benefits or disability lines. Mr. Skoog said the Academy did think about this; the same logic holds across the lines within your experience fluctuation risk, and a similar scaler makes sense. However, the one thing to be mindful of is that there is some sensitivity to claim payment pattern, so a proposed scaler may not appropriate for something that does not look like comprehensive major medical when looking at the longer tailed items. Mr. Skoog said a higher investment income adjustment may need to be considered, but the Academy would need to look at the claims payments for each of those lines of business. Lou Felice (NAIC) asked if it is more likely that the factors would have to be updated more frequently if a shorter duration is used since you would need to be more conservative and adhere closer to a treasury note, whereas with a longer duration you could maybe be less conservative in anticipation of loosening over time. He also asked if the report discussed how frequently the factors would need to be adjusted. Mr. Skoog said the Academy did not consider the frequency for updating; however, in the prevailing interest rate environment, it is the most impactful reason to adjust going forward, to the extent that the interest rate environment moves past the near zero amount. He agreed that it is something worth looking at.

Hearing no objections, the Working Group agreed to expose the Academy's report to include Investment Income in the Underwriting Risk with the additional follow-up and clarification on Columns 1 through 3 on the Risk Factor table (Attachment Two-C2) for a 30-day public comment period ending Jan. 18, 2021.

3. Received a Summary of Blanks Proposals and Discussed Next Steps for the Health Test Ad Hoc Group

Mary Caswell (NAIC) provided a summary of proposals 2020-32BWG, 2020-33BWG and 2020-38BWG for the Working Group. She said proposal 2020-32BWG adds Exhibits 3 and 3A as supplements to the life blank to allow for the data capture of health care receivable information. She said the Blanks (E) Working Group also approved the posting of the health care receivable guidance that the Working Group previously referred to them, and a link to this guidance was also incorporated into the instructions of this proposal. She said proposal 2020-33BWG is a change to the references used for the health annual statement lines used within the property and casualty annual statement blank to be more consistent with the terms used in the health blank. She said the purpose of proposal 2020-38BWG is to modify the Accident and Health Policy Experience Exhibit to provide state insurance regulators additional health data and greater consistency across the blanks.

Mr. Drutz said the Health Test Ad Hoc Group had taken a pause in meeting during the development of the Blanks proposals, and he suggested that the group resume meeting to determine if they would like to provide comments on the proposals and later discuss the health test language.

4. Discussed Other Matters

Mr. Drutz said the Excessive Growth Ad Hoc Group will meet Jan. 8 and begin reviewing the data for the analysis.

Having no further business, the Health Risk-Based Capital (E) Working Group adjourned.

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NAIC BLANKS (E) WORKING GROUP

Blanks Agenda Item Submission Form

		FOR NAIC USE ONLY
	DATE: 11-11-20	Agenda Item #
CONTACT PERSON:		Year
TELEPHONE:		Changes to Existing Reporting [ ]
EMAIL ADDRESS:		New Reporting Requirement [ ]
ON BEHALF OF:	Health Risk-Based Capital (E) Working Group	**REVIEWED FOR ACCOUNTING PRACTICES AND PROCEDURES IMPACT** No Impact [ ] Modifies Required Disclosure [ ]
NAME:	Steve Drutz, Chiar	**DISPOSITION** [ ] Rejected For Public Comment [ ] Referred To Another NAIC Group [ ] Received For Public Comment [ ] Adopted Date [ ] Rejected Date [ ] Deferred Date [ ] Other (Specify)
TITLE:		
AFFILIATION:		
ADDRESS:		

BLANK(S) TO WHICH PROPOSAL APPLIES

[x] **ANNUAL STATEMENT**	[x] **INSTRUCTIONS**	[ ] **CROSSCHECKS**
[ ] **QUARTERLY STATEMENT**	[x] **BLANK**	
[ ] Life, Accident & Health/Fraternal	[ ] Separate Accounts	[ ] Title
[ ] Property/Casualty	[ ] Protected Cell	[ ] Other
[x] Health	[ ] Health (Life Supplement)	

Anticipated Effective Date:

IDENTIFICATION OF ITEM(S) TO CHANGE

Clarifying language was added to Exhibit 3, Exhibit 3A and Assets page for health care receivables.

REASON, JUSTIFICATION FOR AND/OR BENEFIT OF CHANGE**

NAIC STAFF COMMENTS

Comment on Effective Reporting Date:

Other Comments:

** **This section must be completed on all forms.** **Revised 7/18/2018**

ASSETS

Detail deleted

Line 24 – Health Care and Other Amounts Receivable

Include: Bills Receivable – Report any unsecured amounts due from outside sources or receivables secured by assets that do not qualify as investments.

Amounts due resulting from advances to agents or brokers – Refer to *SSAP No. 6—Uncollected Premium Balances, Bills Receivable for Premiums, and Amounts Due From Agents and Brokers* for accounting guidance.

Health Care Receivables – Include pharmaceutical rebate receivables, claim overpayment receivables, loans and advances to providers, capitation arrangement receivables, ~~and~~ risk sharing receivables and other health care receivables, from affiliated and non-affiliated entities. Refer to *SSAP No. 84—Health Care and Government Insured Plan Receivables* for accounting guidance.

Other amounts receivable that originate from the government under government insured plans, including **undisputed** amounts over 90 days due that qualify as accident and health contracts are admitted assets. Refer to *SSAP No. 84—Health Care and Government Insured Plans Receivables* and *SSAP No. 50—Classifications of Insurance or Managed Care Contracts* for accounting guidance.

Exclude: Pharmaceutical rebates relating to uninsured plans that represent an administrative fee and that are retained by the reporting entity and earned in excess of the amounts to be remitted to the uninsured plan. These amounts should be reported on Line 17.

Premiums receivable for government insured plans reported on Lines 15.1, 15.2 or 15.3.

EXHIBIT 3 – HEALTH CARE RECEIVABLES

Individually list the greater of any account balances greater than $10,000 or those that are 10% of gross health care receivables. Use Lines 010001 through 0699996, as needed. Report gross amounts for insured plans although these amounts may be offset against corresponding liabilities on the balance sheet. Report the aggregate of amounts not individually listed on Lines 0199998 through 0699998. The subtotal and grand total amounts should be reported on the following lines:

Category	Line Number
Pharmaceutical Rebate Receivables	0199999
Claim Overpayment Receivables	0299999
Loans and Advances to Providers	0399999
Capitation Arrangement Receivables	0499999
Risk sharing Receivables	0599999
Other Health Care Receivables	0699999
Gross Health Care Receivables	0799999

Column 7 – Admitted

Total line should equal the inset amount on Line 24 of the Asset Page.

EXHIBIT 3A – ANALYSIS OF HEALTH CARE RECEIVABLES COLLECTED AND ACCRUED

Type of Health Care Receivable	Health Care Receivables Collected or Offset During the Year		Health Care Receivables Accrued as of December 31 of Current Year		5	6
	1 On Amounts Accrued Prior to January 1 of Current Year	2 On Amounts Accrued During the Year	3 On Amounts Accrued December 31 of Prior Year	4 On Amounts Accrued During the Year	Health Care Receivables in from Prior Years (Cols. 1 + 3)	Estimated Health Care Receivables Accrued as of December 31 of Prior Year
1. Pharmaceutical rebate receivables						
2. Claim overpayment receivables						
3. Loans and advances to providers						
4. Capitation arrangement receivables						
5. Risk sharing receivables						
6. Other health care receivables						
7. Totals (Lines 1 through 6)						

Note that the accrued amounts in Columns 3, 4 and 6 are the total health care receivables, not just the admitted portion.

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December 15, 2020

Steve Drutz
Chair, Health Risk-Based Capital (E) Working Group
National Association of Insurance Commissioners (NAIC)

Re: Request for Analysis to Incorporate Investment Income into the Underwriting Risk Component of the Health Risk-Based Capital Formula

Dear Mr. Drutz:

On behalf of the American Academy of Actuaries (Academy)[1] Health Solvency Subcommittee, I am pleased to provide this response letter to the NAIC Health Risk-Based Capital (HRBC) Working Group. This letter is in response to the request from the HRBC Working Group to provide analysis to incorporate investment income into the existing underwriting risk factors within the HRBC formula.

Incorporation of Investment Income into H2 Risk Factors

The H2 risk factors were based on a 5% probability of ruin over a 3- to 5-year period for each line. There is a fair degree of uncertainty with respect to the development of these factors, though it is likely they were developed without consideration of offsetting investment income. To reflect investment income into these factors, we studied the property and casualty (P&C) underwriting risk factor approach, which explicitly includes investment income via an Investment Income Adjustment (IIA).

To summarize the P&C framework with respect to the IIA within the P&C Net Written Premium Risk (akin to the Health H2 Experience Fluctuation Risk), the base RBC charge amounts to:

$$Premium * (IIA * Risk\_Factor + Expense\_Ratio - 1)$$

[1] The American Academy of Actuaries is a 19,500-member professional association whose mission is to serve the public and the U.S. actuarial profession. For more than 50 years, the Academy has assisted 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.

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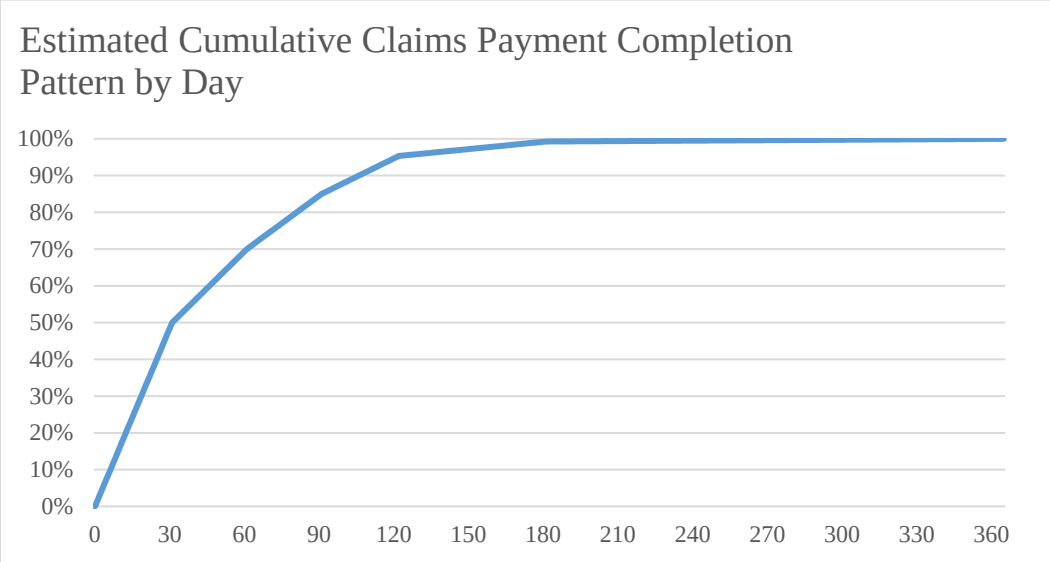
The IIA*Risk_Factor expression is the discounted loss ratio at the target safety margin (87.5th percentile for P&C). Then, the IIA*Risk_Factor + Expense_Ratio -1 is the discounted operating loss at the target safety margin.

This level of clarity around the components of the risk charges does not exist for the Health risk factors, but, using certain assumptions the P&C framework can be translated into the current Health factors. For example, the base Comprehensive Major Medical risk factor is 9%; if a 9% expense ratio (based on high-level industry benchmarking of health plan administrative expenses, excluding claims adjustment expense) is assumed and no IIA (i.e., an IIA of 1.0), then the underlying Risk Factor is 100%. To estimate the IIA for a typical health product, the subcommittee used the following claims payment completion pattern and assumed that premium is collected at policy onset and investment income is earned on any premium collected less claims paid.



The results are sensitive to the assumed claim payment pattern. For example, if all claims are paid at the end of the year, a full year of investment income could be earned; if all claims were paid immediately, then no investment income could be earned. Under this illustration, the average claim is paid approximately 1.5 months after incurral—largely consistent with health product payment patterns. To the extent actual claims take longer to develop, more investment income will be earned and the Investment Income Adjustment will be larger.

The other key assumption is the investment return. Investment yields based on a high-level analysis of health plan statutory financial statements over the past several years might indicate that a 2-3% assumption would be reasonable, though that may be overstating investment income on written premiums, as approximately half of the claims are paid in about one month and the

one-month Treasury rates are near zero today. Additionally, most investment income is likely earned from surplus funds. Given this uncertainty, the subcommittee performed sensitivity testing to understand the impact returns would have on the Risk Factor, as shown below:

Investment Return	Investment Income Adj.	Risk Charge Adj. Factor	Base Risk Factor
0.0%	1.0000	1.0000	9.00%
0.1%	0.9999	0.9985	8.99%
0.5%	0.9993	0.9927	8.93%
1.0%	0.9987	0.9854	8.87%
1.5%	0.9980	0.9780	8.80%
2.0%	0.9974	0.9707	8.74%
3.0%	0.9960	0.9558	8.60%

One concern raised by the Academy's Solvency Subcommittee is that investment income is not generally a consideration with respect to the underwriting of short-term health care policies. While this is true, the related claims payable reserves and corresponding assets do generate investment returns. Because reserving risk is not considered within the HRBC formula, inclusion of investment income in Experience Fluctuation Risk may be reasonable.

There is considerably more uncertainty around the development of the Health Experience Fluctuation Risk factors than P&C Net Written Premium risk factors, as it has been some time since they were materially changed. As a result, making this change in the RBC formula may be an exercise in false precision because the baseline factors are not well understood. Ultimately, the regulatory usefulness of changes to the RBC formula will depend on both a strong understanding of the starting point and the suggested change. Given the importance of Underwriting Risk factors within the HRBC formula, it may be worth revisiting their development more broadly in the future.

*****

If you have any questions or would like to discuss further, please contact Matthew Williams, the Academy's senior health policy analyst, at williams@actuary.org.

Sincerely,

Derek Skoog, MAAA, FSA
Chairperson
Health Solvency Subcommittee
American Academy of Actuaries

Cc: Crystal Brown: Senior Insurance Reporting Analyst

February 22, 2021

Steve Drutz
Chair, Health Risk-Based Capital (E) Working Group
National Association of Insurance Commissioners (NAIC)

Re: Request for Analysis to Incorporate Investment Income into the Underwriting Risk Component of the Health Risk-Based Capital Formula

Dear Mr. Drutz:

On behalf of the American Academy of Actuaries (Academy)[1] Health Solvency Subcommittee, I am pleased to provide this response letter to the Health Risk-Based Capital (HRBC) Working Group. This letter is in response to the request from the HRBC Working Group to provide additional analysis regarding the potential investment income adjustment factor for Health H2 Experience Fluctuation Risk.

Incorporation of Investment Income into H2 Risk Factors

As per the HRBC Working Group's request to further analyze the impact of incorporating investment income into Columns 1-4 from page XR012 – Underwriting Experience Fluctuation Risk, we have analyzed expense ratios and claims payment patterns for each type of health coverage.

The table below summarizes the assumed expense ratio for each product, the current base RBC factors, and the implied Risk Factors (i.e., loss ratios at the desired safety margins). The expense ratio assumptions were generated based on a high-level analysis of General Administrative expenses from Page 7 of the annual statement. Additionally, since stand-alone Medicare Part D coverage has effectively no claims lag, the investment income adjustment would be negligible and the RBC factors would not be impacted.

[1] The American Academy of Actuaries is a 19,500-member professional association whose mission is to serve the public and the U.S. actuarial profession. For more than 50 years, the Academy has assisted 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.

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Expense Ratio Assumption and Current RBC Factor Summary

	Comprehensive Medical	Medicare Supplement	Dental & Vision
Typical Expense Ratio	9.0%	14.0%	13.0%
Tiered RBC Factors			
$0 - $3 Million	0.150	0.105	0.120
$3 - $25 Million	0.150	0.067	0.076
Over $25 Million	0.090	0.067	0.076
Implied Risk Factor (loss ratio)			
$0 - $3 Million	106%	97%	99%
$3 - $25 Million	106%	93%	95%
Over $25 Million	100%	93%	95%

Also, in order to calculate the investment income impact, the following cumulative claims payment patterns were utilized. Since Dental and Vision share a column within the RBC formula, we used a blended completion factor assuming 75% weighting for dental and 25% weighting for vision. The Comprehensive Medical (CM) completion pattern is consistent with our prior analyses.

Claim Payment Pattern Assumption

Months of Run Out	CM	Medicare Supplement	Dental	Vision	*D&V Blended*
0	50%	10%	50%	70%	*55%*
1	70%	75%	85%	92%	*87%*
2	85%	95%	90%	97%	*92%*
3	95%	96%	93%	99%	*95%*
4	97%	97%	95%	100%	*96%*
5	99%	98%	97%	100%	*98%*
6	99%	99%	99%	100%	*99%*
7	100%	100%	100%	100%	*100%*
8	100%	100%	100%	100%	*100%*

Utilizing the same approach described in our previous letters[2] to the HRBC Working Group on this topic, the resulting Tiered RBC factors were calculated using a range of investment return assumptions.

[2] https://www.actuary.org/sites/default/files/2021-01/HEALTHSOLVENCY_Investment_Income_H2_Considerations_to_NAIC_Follow_Up_Letter.pdf; https://www.actuary.org/sites/default/files/2020-12/HEALTHSOLVENCY_Investment_Income_H2_Considerations_Letter_to_NAIC.pdf; https://www.actuary.org/sites/default/files/2020-03/Bond%20Factors%20HRBC%20Horizon%20Results.pdf

Investment Income Adjusted Tiered RBC Factors

Assumed Investment Return	CM	Medicare Supplement	Dental/ Vision
	High Tier (i.e., less than $3M or less than $25M)		
0.0%	15.0%	10.5%	12.0%
0.1%	15.0%	10.5%	12.0%
0.5%	14.9%	10.4%	11.9%
1.0%	14.8%	10.4%	11.9%
1.5%	14.7%	10.3%	11.8%
2.0%	14.7%	10.2%	11.8%
3.0%	14.6%	10.1%	11.7%
	Low Tier		
0.0%	9.00%	6.70%	7.60%
0.1%	8.99%	6.69%	7.59%
0.5%	8.93%	6.63%	7.55%
1.0%	8.87%	6.56%	7.50%
1.5%	8.81%	6.50%	7.45%
2.0%	8.74%	6.43%	7.40%
3.0%	8.61%	6.30%	7.31%

We note that the CM RBC factor changed from 8.60% to 8.61% due to a change in the rounding detail utilized within the calculation. Otherwise, the CM column is unchanged.

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If you have any questions or would like to discuss further, please contact Matthew Williams, the Academy's senior health policy analyst, at williams@actuary.org.

Sincerely,

Derek Skoog, MAAA, FSA
Chairperson
Health Solvency Subcommittee
American Academy of Actuaries

Cc: Crystal Brown: Senior Insurance Reporting Analyst

Number of Companies by Percent Change

.5% Investment Income - Number of Companies by Percentage Change														
0-.5% Change	.5-1% Change	1.1-1.5% Change	1.6%-2% Change	2.1%-2.5% Change	2.6%-3.0% Change	3.1%-3.5% Change	3.6%-4.0% Change	4.1%-4.5% Change	4.6%-5.0% Change	5.1%-5.5% Change	5.6%-6.0% Change	6.1%-6.5% Change	6.6%-7.0% Change	7.1%-7.4% Change
560	309	137	3	2	0	0	0	0	0	0	0	0	0	0

1.0% Investment Income - Number of Companies by Percentage Change														
0-.5% Change	.5-1% Change	1.1-1.5% Change	1.6%-2% Change	2.1%-2.5% Change	2.6%-3.0% Change	3.1%-3.5% Change	3.6%-4.0% Change	4.1%-4.5% Change	4.6%-5.0% Change	5.1%-5.5% Change	5.6%-6.0% Change	6.1%-6.5% Change	6.6%-7.0% Change	7.1%-7.4% Change
369	273	234	63	68	2	0	0	1	1	0	0	0	0	0

1.5% Investment Income - Number of Companies by Percentage Change														
0-.5% Change	.5-1% Change	1.1-1.5% Change	1.6%-2% Change	2.1%-2.5% Change	2.6%-3.0% Change	3.1%-3.5% Change	3.6%-4.0% Change	4.1%-4.5% Change	4.6%-5.0% Change	5.1%-5.5% Change	5.6%-6.0% Change	6.1%-6.5% Change	6.6%-7.0% Change	7.1%-7.4% Change
319	87	131	212	237	17	1	4	1	1	0	1	0	0	0

2.0% Investment Income - Number of Companies by Percentage Change														
0-.5% Change	.5-1% Change	1.1-1.5% Change	1.6%-2% Change	2.1%-2.5% Change	2.6%-3.0% Change	3.1%-3.5% Change	3.6%-4.0% Change	4.1%-4.5% Change	4.6%-5.0% Change	5.1%-5.5% Change	5.6%-6.0% Change	6.1%-6.5% Change	6.6%-7.0% Change	7.1%-7.4% Change
311	44	89	163	177	78	132	8	2	2	0	2	1	1	1

Number of Companies by Point Change

.5% Investment Income - Number of Companies by Point Change													
Less than 0	No Change	0-10 points	11-20 points	21-30 points	31-40 points	41-50 points	51-60 points	61-70 points	71-80 points	81-90 points	91-100 points	More than 100 points	
4	432	506	44	9	5	4	1	3	2	2	0	1	1013

1.0% Investment Income - Number of Companies by Point Change													
Less than 0	No Change	0-10 points	11-20 points	21-30 points	31-40 points	41-50 points	51-60 points	61-70 points	71-80 points	81-90 points	91-100 points	More than 100 points	
4	270	587	108	15	7	8	2	6	2	1	1	2	1013

1.5% Investment Income - Number of Companies by Point Change													
Less than 0	No Change	0-10 points	11-20 points	21-30 points	31-40 points	41-50 points	51-60 points	61-70 points	71-80 points	81-90 points	91-100 points	More than 100 points	
4	270	460	176	48	16	12	4	6	0	4	3	10	1013

2.0% Investment Income - Number of Companies by Point Change													
Less than 0	No Change	0-10 points	11-20 points	21-30 points	31-40 points	41-50 points	51-60 points	61-70 points	71-80 points	81-90 points	91-100 points	More than 100 points	
4	270	339	252	80	21	13	5	7	0	5	3	14	1013

Capital Adequacy (E) Task Force

RBC Proposal Form

[x] Capital Adequacy (E) Task Force [ ] Health RBC (E) Working Group [ ] Life RBC (E) Working Group
[ ] Catastrophe Risk (E) Subgroup [ ] Investment RBC (E) Working Group [ ] Longevity Risk (A/E) Subgroup
[ ] C3 Phase II/ AG43 (E/A) Subgroup [ ] P/C RBC (E) Working Group

	DATE: 3-17-21	**FOR NAIC USE ONLY**
CONTACT PERSON:	Crystal Brown	Agenda Item # 2021-04-CA
TELEPHONE:	816-783-8146	Year 2021
EMAIL ADDRESS:	cbrown@naic.org	**DISPOSITION**
ON BEHALF OF:	Health RBC (E) Working Group	[ ] ADOPTED
NAME:	Steve Drutz	[ ] REJECTED
TITLE:	Chief Financial Analyst/Chair	[ ] DEFERRED TO
AFFILIATION:	WA Office of Insurance Commissioner	[ ] REFERRED TO OTHER NAIC GROUP
ADDRESS:	PO Box 40255	[ ] EXPOSED
	Olympia, WA 98504-0255	[ ] OTHER (SPECIFY)

IDENTIFICATION OF SOURCE AND FORM(S)/INSTRUCTIONS TO BE CHANGED

[x] Health RBC Blanks [x] Property/Casualty RBC Blanks [x] Life and Fraternal RBC Instructions
[x] Health RBC Instructions [x] Property/Casualty RBC Instructions [x] Life and Fraternal RBC Blanks
[ ] OTHER _____

DESCRIPTION OF CHANGE(S)

Incorporate investment income into the Underwriting Risk – Experience Fluctuation Risk factors for columns 1-3. The base underwriting factors would be adjusted for Comprehensive Medical, Medicare Supplement and Dental and Vision.

REASON OR JUSTIFICATION FOR CHANGE **

Incorporated investment income into Columns 1-3 on the Underwriting Risk – Experience Fluctuation Risk page. The American Academy of Actuaries provided recommended factors to the Working Group. The Academy found that due to no claims lag in Stand-Alone Medicare Part D coverage, the investment income adjustment would be negligible and the RBC factors would not be impacted.

The Working Group will continue to work with the Academy to look at the potential to incorporate an investment income adjustment to the factors for the other health lines of business for 2022 or later.

Additional Staff Comments:

These changes will also need to be incorporated into the Life and P/C formula.

**** This section must be completed on all forms.** **Revised 2-2019**

UNDERWRITING RISK - L(1) THROUGH L(21)
XR012

Underwriting Risk is the largest portion of the risk-based capital charge for most reporting entities. The Underwriting Risk page generates the RBC requirement for the risk of fluctuations in underwriting experience. The credit that is allowed for managed care in this page comes from the Managed Care Credit Calculation page.

Underwriting risk is present when the next dollar of unexpected claim payments comes directly out of the reporting entity's capital and surplus. It represents the risk that the portion of premiums intended to cover medical expenses will be insufficient to pay such expense. For example, a reporting entity may charge an individual $100 in premium in exchange for a guaranty that all medical costs will be paid by that reporting entity. If the individual incurs $101 in claims costs, the reporting entity's surplus will decline because it did not charge a sufficient premium to pick up the additional risk for that individual.

There are other arrangements where the reporting entity is not at risk for excessive claims payments, such as when an HMO agrees to serve as a third-party administrator for a self-insured employer. The self-insured employer pays for actual claim costs, so the risk of excessive claims experience is borne by the self-insured employer, not the reporting entity. The underwriting risk section of the formula, therefore, requires some adjustments to remove non-underwriting risk business (both premiums and claims) before the RBC requirement is calculated. Appendix 1 contains commonly used terms for general types of health insurance. Refer to INT 05-05: Accounting for Revenue under Medicare Part D Cover for terms specifically used with respect to Medicare Part D coverage of prescription drugs.

Claims Experience Fluctuation

The RBC requirement for claims experience fluctuation is based on the greater of the following calculations:

A. Underwriting risk revenue, times the underwriting risk claims ratio, times a set of tiered factors. The tiered factors are determined by the underwriting risk revenue volume.

or

B. An alternative risk charge that addresses the risk of catastrophic claims on any single individual. The alternative risk charge is equal to multiple of the maximum retained risk on any single individual in a claims year. The maximum retained risk (level of potential claim exposure) is capped at $750,000 per individual and $1,500,000 total for medical coverage; $25,000 per individual and $50,000 total for all other coverage except Medicare Part D coverage and $25,000 per individual and $150,000 total for Medicare Part D coverage. Additionally, for multi-line organizations (e.g., writing more than one coverage type), the alternative risk charge for each subsequent line of business is reduced by the amount of the highest cap. For example, if an organization is writing both comprehensive medical (with a cap of $1,500,000) and dental (with a cap of $50,000), then only the larger alternative risk charge is considered when calculating the RBC requirement (i.e., the alternative risk charges for each line of business are not cumulative).

For RBC reports to be filed by a health organization commencing operations in this reporting year, the health organization shall estimate the initial RBC levels using operating (revenue and expense) projections (considering managed care arrangements) for its first full year (12 months) of managed care operations. The projections, including the risk-based capital requirement, should be the same as those filed as part of a comprehensive business plan that is submitted as part of the application for licensure. The Underwriting, Credit (capitation risk only), and Business Risk sections of the first RBC report submitted shall be completed using

the health organization's actual operating data for the period from the commencement of operations until year-end, plus projections for the number of months necessary to provide 12 months of data. The affiliate, asset and portions of the credit risk section that are based on balance sheet information shall be reported using actual data. For subsequent years' reports, the RBC results for all of the formula components shall be calculated using actual data.

L(1) through L(21)

There are six lines of business used in the formula for calculating the RBC requirement for this risk: (1) Comprehensive Medical and Hospital; (2) Medicare Supplement; (3) Dental/Vision; (4) Stand-Alone Medicare Part D Coverage; and (5) Other Health; and (6) Other Non-Health. Each of these lines of business has its own column in the Underwriting Risk – Experience Fluctuation Risk table. The categories listed in the columns of this page include all risk revenue and risk revenue that is received from another reporting entity in exchange for medical services provided to its members. The descriptions of the items are described as follows:

Column (1) - Comprehensive Medical & Hospital. Includes policies providing for medical coverages including hospital, surgical, major medical, Medicare risk coverage (but NOT Medicare Supplement), and Medicaid risk coverage. This category DOES NOT include administrative services contracts (ASC), administrative services only (ASO) contracts, or any non-underwritten business. These programs are reported in the Business Risk section of the formula. Neither does it include Federal Employees Health Benefit Plan (FEHBP) or TRICARE, which are handled in Line 24 of this section. Medicaid Pass-Through Payments reported as premiums should also be excluded from this category and should be reported in Line 25.2 of this section. The alternative risk charge, which is twice the maximum retained risk after reinsurance on any single individual, cannot exceed $1,500,000. Prescription drug benefits included in major medical insurance plans (including Medicare Advantage plans with prescription drug coverage) should be reported in this line. These benefits should also be included in the Managed Care Credit calculation.

Column (2) - Medicare Supplement. This is business reported in the Medicare Supplement Insurance Experience Exhibit of the annual statement and includes Medicare Select. Medicare risk business is reported under comprehensive medical and hospital.

Column (3) - Dental & Vision. This is limited to policies providing for dental-only or vision-only coverage issued as a stand-alone policy or as a rider to a medical policy, which is not related to the medical policy through deductibles or out-of-pocket limits.

Column (4) - Stand-Alone Medicare Part D Coverage. This includes both individual coverage and group coverage of Medicare Part D coverage where the plan sponsor has risk corridor protection. See INT 05-05: Accounting for Revenue under Medicare Part D Coverage for definition of these terms. Medicare drug benefits included in major medical plans or benefits that do not meet the above criteria are not to be included in this line. Supplemental benefits within Medicare Part D (benefits in excess of the standard benefit design) are addressed separately on page XR014. Employer-based Part D coverage that is in an uninsured plan as defined in *SSAP No. 47—Uninsured Plans* is not to be included here.

Column (5) – Other Health Coverages. This includes other health coverages such as other stand-alone prescription drug benefit plans, **NOT INCLUDED ABOVE** that have not been specifically addressed in the other columns listed above.

Column (6) - Other Non-Health Coverages. This includes life and property and casualty coverages.

The following paragraphs explain the meaning of each line of the table for computing the experience fluctuation underwriting risk RBC.

Line (1) Premium. This is the amount of money charged by the reporting entity for the specified benefit plan. It is the earned amount of prepayments (usually on a per member per month basis) made by a covered group or individual to the reporting entity in exchange for services to be provided or offered by such organization. However, it does not include receipts under administrative services only (ASO) contracts; or administrative services contracts (ASC); or any non-underwritten business. Nor does it include federal employees health benefit programs (FEHBP) and TRICARE. Report premium net of payments for stop-loss or other reinsurance. The amounts reported in the individual columns should come directly from Analysis of Operations by Lines of Business, Page 7, Lines 1 and 2 of the annual statement. For Stand-Alone Medicare Part D Coverage the premium includes beneficiary premium (standard coverage portion), direct subsidy, low-income subsidy (premium portion), Part D payment demonstration amounts and risk corridor payment adjustments. See INT 05-05: Accounting for Revenue under Medicare Part D Coverage for definition of these terms. It does not include revenue received for reinsurance payments or low-income subsidy (cost-sharing portion), which are considered funds received for uninsured plans in accordance with Emerging Accounting Issues Working Group (EAIWG) INT. No. 05-05. Also exclude the beneficiary premium (supplemental benefit portion) for Stand-Alone Medicare Part D coverage.

> **NOTE**: Where premiums are paid on a monthly basis, they are generally fully earned at the end of the month for which coverage is provided. In cases where the mode of payment is less frequent than monthly, a portion of the premium payment will be unearned at the end of any given reporting period.

Line (2) Title XVIII Medicare. This is the earned amount of money charged by the reporting entity (net of reinsurance) for Medicare risk business where the reporting entity, for a fee, agrees to cover the full medical costs of Medicare subscribers. This includes the beneficiary premium and federal government's direct subsidy for prescription drug coverage under MA-PD plans. The total of this line will tie to the Analysis of Operations by Lines of Business, Page 7, Lines 1 and 2 of the annual statement.

Line (3) Title XIX Medicaid. This is the earned amount of money charged by the reporting entity for Medicaid risk business where the reporting entity, for a fee, agrees to cover the full medical costs of Medicaid subscribers. The total of this line will tie to the Analysis of Operations by Lines of Business, Page 7, Lines 1 and 2 of the annual statement. Stand-Alone Medicare Part D coverage of low-income enrollees is not included in this line.

Line (4) Other Health Risk Revenue. This is earned amounts charged by the reporting entity as a provider or intermediary for specified medical (e.g., full professional, dental, radiology, etc.) services provided to the policyholders, or members of another insurer or health entity. Unlike premiums, which are collected from an employer group or individual member, risk revenue is the prepaid (usually on a capitated basis) payments, made by another insurer or health entity to the reporting entity in exchange for services to be provided or offered by such organization. Payments to providers under risk revenue arrangements are included in the RBC calculation as underwriting risk revenue and are included in the calculation of managed care credits. Exclude fee-for-service revenue received by the reporting entity from another reporting entity. This revenue is reported in the Business Risk section of the formula as non-underwritten and limited risk revenue. The amounts reported in the individual columns will come directly from Page 7, Line 4 of the annual statement.

Line (5) Medicaid Pass-Through Payments Reported as Premiums. Medicaid Pass-Through Payments that are included as premiums in the Analysis of Operations by Lines of Business, Page 7, Lines 1 and 2 should be reported in this line.

Line (6) Underwriting Risk Revenue. The sum of Lines (1) through (4) minus Line (5).

Line (7) Net Incurred Claims. Claims incurred (paid claims + change in unpaid claims) during the reporting year (net of reinsurance) that are arranged for or provided by the reporting entity. Paid claims include capitation and all other payments to providers for services to members of the reporting entity, as well as reimbursement directly to members for covered services. Paid claims also include salaries paid to reporting entity employees that provide medical services to

members and related expenses. Do not include ASC payments or federal employees health benefit program (FEHBP) and TRICARE claims. These amounts are found on Page 7, Line 17 of the annual statement.

For Stand-Alone Medicare Part D Coverage, net incurred claims should reflect claims net of reinsurance coverage (as defined in INT 05-05: Accounting for Revenue under Medicare Part D Coverage). Where there has been prepayment under the reinsurance coverage, paid claims should be offset from the cumulative deposits. Unpaid claims liabilities should reflect expected recoveries from the reinsurance coverage, for claims unpaid by the PDP or for amounts covered under the reinsurance coverage that exceed the cumulative deposits. Where there has not been any prepayment under the reinsurance coverage, unpaid claim liabilities should reflect expected amounts still due from CMS. Exclude the beneficiary incurred claims (supplemental benefit portion) for Stand-Alone Medicare Part D coverage and report the incurred claims amount (supplemental benefit portion) on Line (25.1) of page XR014.

Line (8) Medicaid Pass-Through Payments Reported as Claims. Medicaid Pass-Through Payments that are included as claims in the Analysis of Operations by Lines of Business, Page 7, Line 17 should be reported in this line.

Line (9) Total Net Incurred Claims Less Medicaid Pass-Through Payments Reported as Claims. Line (7) minus Line (8).

Line (10) Fee-for-Service Offset. Report fee for service revenue that is directly related to medical expense payments. The fee for service line does not include revenue where there is no associated claim payment (e.g., fees from non-member patients where the provider receives no additional compensation from the reporting entity) and when such revenue was excluded from the pricing of medical benefits. The amounts reported in the individual columns should come directly from Page 7, Line 3 of the annual statement.

Line (11) Underwriting Risk Incurred Claims. Line (9) minus Line (10).

Line (12) Underwriting Risk Claims Ratio. For Columns (1) through (5), Line (11) / Line (6). If either Line (6) or Line (11) is zero or negative, Line (12) is zero.

Line (13) Underwriting Risk Factor. A weighted average factor based on the amount reported in Line (6), Underwriting Risk Revenue. The factors for Column 1-3 have incorporated investment income for xx% investment return.

	$0 – $3 Million	$3 – $25 Million	Over $25 Million
Comprehensive Medical & Hospital	0.150	0.150	0.090
Medicare Supplement	0.105	0.067	0.067
Dental & Vision	0.120	0.076	0.076
Stand-Alone Medicare Part D Coverage	0.251	0.251	0.151
Other Health	0.130	0.130	0.130
Other Non-Health	0.130	0.130	0.130

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The factors for the highlighted items to the left will be updated based on either Option 1 or Option 2.

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Line (14) Base Underwriting Risk RBC. Line (6) x Line (12) x Line (13).

Line (15) Managed Care Discount. For Comprehensive Medical & Hospital, Medicare Supplement (including Medicare Select) and Dental/Vision, a managed care discount, based on the type of managed care arrangements an organization has with its providers, is included to reflect the reduction in the uncertainty about future

claim payments attributable to the managed care arrangements. The discount factor is from Column (3), Line (17) of the Managed Care Credit Calculation page. An average factor based on the combined results of these three categories is used for all three.

For Stand-Alone Medicare Part D Coverage, a separate managed care discount (or federal program credit) is included to reflect only the reduction in uncertainty about future claims payments attributable to federal risk arrangements. The discount factor is from Column (4), Line (17) of the Managed Care Credit Calculation page.

There is no discount given for the Other Health and Other Non-Health lines of business.

Line (16) RBC After Managed Care Discount. Line (14) x Line (15).

Line (17) Maximum Per-Individual Risk After Reinsurance. This is the maximum after-reinsurance loss for any single individual. Where specific stop-loss reinsurance protection is in place, the maximum per-individual risk after reinsurance is equal to the highest attachment point on such stop-loss reinsurance, subject to the following:

- Where coverage under the stop-loss protection (plus retention) with the highest attachment point is capped at less than $750,000 per member, the maximum retained loss will be equal to such attachment point plus the difference between the coverage (plus retention) and $750,000.

- Where the stop-loss layer is subject to participation by the reporting entity, the maximum retained risk as calculated above will be increased by the reporting entity's participation in the stop-loss layer (up to $750,000 less retention).

If there is no specific stop-loss or reinsurance in place, enter $9,999,999.

Examples of the calculation are presented below:

EXAMPLE 1 (Reporting entity provides Comprehensive Care):

Highest Attachment Point (Retention)	$100,000
Reinsurance Coverage	90% of $500,000 in excess of $100,000
Maximum reinsured coverage	$600,000 ($100,000 + $500,000)

Maximum Ret. Risk =	$100,000	deductible
	+ $150,000	($750,000 – $600,000)
	+ $ 50,000	(10% of ($600,000 – $100,000) coverage layer)
	= $300,000	

EXAMPLE 2 (Reporting entity provides Comprehensive Care):

Highest Attachment Point (Retention)	$75,000
Reinsurance Coverage	90% of $1,000,000 in excess of $75,000

Maximum reinsured coverage	$1,075,000 ($75,000 + $1,000,000)	
Maximum Ret. Risk =	$ 75,000	deductible
	+ 0	($750,000 – $1,075,000)
	+ $ 67,500	(10% of ($750,000 –$75,000)) coverage layer)
	= $142,500	

Line (18) Alternate Risk Charge. This is twice the amount in Line (17) for columns (1), (2), (3) and (5) and Column (4) is six times the amount in Line (17), subject to a maximum of $1,500,000 for Column (1), $50,000 for Columns (2), (3) and (5) and $150,000 for Column (4). Column (6) is excluded from this calculation.

Line (19) Alternate Risk Adjustment. This line shows the largest value in Line (18) for the column and all columns left of the column. Column (6) is excluded from this calculation.

Line (20) Net Alternate Risk Charge. This is the amount in Line (18), less the amount in the previous column of Line (19), but not less than zero. Column (6) is excluded from this calculation.

Line (21) Net Underwriting Risk RBC. This is the maximum of Line (16) and Line (20) for each of columns (1) through (5). This is the amount in Line (14), Column (6). The amount in Column (7) is the sum of the values in Columns (1) through (6).

UNDERWRITING RISK

Option 1 - 0.5% Investment Return

Experience Fluctuation Risk

		Line of Business	(1) Comprehensive Medical	(2) Medicare Supplement	(3) Dental & Vision	(4) Stand-Alone Medicare Part D Coverage	(5) Other Health	(6) Other Non-Health	(7) Total
(1)	†	Premium							
(2)	†	Title XVIII-Medicare		XXX	XXX	XXX	XXX	XXX	
(3)	†	Title XIX-Medicaid		XXX	XXX	XXX	XXX	XXX	
(4)	†	Other Health Risk Revenue		XXX				XXX	
(5)		Medicaid Pass-Through Payments Reported as Premiums		XXX	XXX	XXX	XXX	XXX	
(6)		Underwriting Risk Revenue = Lines (1) + (2) + (3) + (4) - (5)							
(7)	†	Net Incurred Claims						XXX	
(8)		Medicaid Pass-Through Payments Reported as Claims		XXX	XXX	XXX	XXX	XXX	
(9)		Total Net Incurred Claims Less Medicaid Pass-Through Payments Reported as Claims = Lines (7) - (8)						XXX	
(10)	†	Fee-For-Service Offset		XXX				XXX	
(11)		Underwriting Risk Incurred Claims = Lines (9) - (10)						XXX	
(12)		Underwriting Risk Claims Ratio = For Column (1) through (5), Line (11)/(6)						1.000	XXX
(13)		Underwriting Risk Factor*					0.130	0.130	XXX
(14)		Base Underwriting Risk RBC = Lines (6) x (12) x (13)							
(15)		Managed Care Discount Factor						XXX	XXX
(16)		RBC After Managed Care Discount = Lines (14) x (15)						XXX	
(17)	†	Maximum Per-Individual Risk After Reinsurance						XXX	XXX
(18)		Alternate Risk Charge **						XXX	XXX
(19)		Alternate Risk Adjustment						XXX	XXX
(20)		Net Alternate Risk Charge***						XXX	
(21)		Net Underwriting Risk RBC (MAX{Line (16), Line (20)}) for Columns (1) through (5), Column (6), Line (14)							

TIERED RBC FACTORS*						
	Comprehensive Medical	Medicare Supplement	Dental & Vision	Stand-Alone Medicare Part D Coverage	Other Health	Other Non-Health
$0 - $3 Million	**0.1490**	**0.1040**	**0.1190**	0.251	0.130	0.130
$3 - $25 Million	**0.1490**	**0.0663**	**0.0755**	0.251	0.130	0.130
Over $25 Million	**0.0893**	**0.0663**	**0.0755**	0.151	0.130	0.130

ALTERNATE RISK CHARGE**

** The Line (15) Alternate Risk Charge is calculated as follows:						
LESSER OF:	$1,500,000 or 2 x Maximum Individual Risk	$50,000 or 2 x Maximum Individual Risk	$50,000 or 2 x Maximum Individual Risk	$150,000 or 6 x Maximum Individual Risk	$50,000 or 2 x Maximum Individual Risk	N/A

Denotes items that must be manually entered on filing software.

† The Annual Statement Sources are found on page XR013.

* This column is for a single result for the Comprehensive Medical & Hospital, Medicare Supplement and Dental/Vision managed care discount factor.

*** Limited to the largest of the applicable alternate risk adjustments, prorated if necessary.

UNDERWRITING RISK

Option 2 - 1.0% Investment Return

Experience Fluctuation Risk

	Line of Business	(1) Comprehensive Medical	(2) Medicare Supplement	(3) Dental & Vision	(4) Stand-Alone Medicare Part D Coverage	(5) Other Health	(6) Other Non-Health	(7) Total
(1) †	Premium							
(2) †	Title XVIII-Medicare		XXX	XXX	XXX	XXX	XXX	
(3) †	Title XIX-Medicaid		XXX	XXX	XXX	XXX	XXX	
(4) †	Other Health Risk Revenue		XXX				XXX	
(5)	Medicaid Pass-Through Payments Reported as Premiums		XXX	XXX	XXX	XXX	XXX	
(6)	Underwriting Risk Revenue = Lines (1) + (2) + (3) + (4) - (5)							
(7) †	Net Incurred Claims						XXX	
(8)	Medicaid Pass-Through Payments Reported as Claims		XXX	XXX	XXX	XXX	XXX	
(9)	Total Net Incurred Claims Less Medicaid Pass-Through Payments Reported as Claims = Lines (7) - (8)						XXX	
(10) †	Fee-For-Service Offset		XXX				XXX	
(11)	Underwriting Risk Incurred Claims = Lines (9) - (10)						XXX	
(12)	Underwriting Risk Claims Ratio = For Column (1) through (5), Line (11)/(6)						1.000	XXX
(13)	Underwriting Risk Factor*					0.130	0.130	XXX
(14)	Base Underwriting Risk RBC = Lines (6) x (12) x (13)							
(15)	Managed Care Discount Factor						XXX	XXX
(16)	RBC After Managed Care Discount = Lines (14) x (15)						XXX	
(17) †	Maximum Per-Individual Risk After Reinsurance						XXX	XXX
(18)	Alternate Risk Charge **						XXX	XXX
(19)	Alternate Risk Adjustment						XXX	XXX
(20)	Net Alternate Risk Charge***						XXX	
(21)	Net Underwriting Risk RBC (MAX{Line (16), Line (20)}) for Columns (1) through (5), Column (6), Line (14)							

TIERED RBC FACTORS*						
	Comprehensive Medical	Medicare Supplement	Dental & Vision	Stand-Alone Medicare Part D Coverage	Other Health	Other Non-Health
$0 - $3 Million	**0.1480**	**0.1040**	**0.1190**	0.251	0.130	0.130
$3 - $25 Million	**0.1480**	**0.0656**	**0.0750**	0.251	0.130	0.130
Over $25 Million	**0.0887**	**0.0656**	**0.0750**	0.151	0.130	0.130

ALTERNATE RISK CHARGE**

** The Line (15) Alternate Risk Charge is calculated as follows:						
LESSER OF:	$1,500,000 or 2 x Maximum Individual Risk	$50,000 or 2 x Maximum Individual Risk	$50,000 or 2 x Maximum Individual Risk	$150,000 or 6 x Maximum Individual Risk	$50,000 or 2 x Maximum Individual Risk	N/A

Denotes items that must be manually entered on filing software.

† The Annual Statement Sources are found on page XR013.

* This column is for a single result for the Comprehensive Medical & Hospital, Medicare Supplement and Dental/Vision managed care discount factor.

*** Limited to the largest of the applicable alternate risk adjustments, prorated if necessary.

Draft: 4/12/21

Life Risk-Based Capital (E) Working Group
Virtual Meeting
March 12, 2021

The Life Risk-Based Capital (E) Working Group of the Capital Adequacy (E) Task Force met March 12, 2021. The following Working Group members participated: Philip Barlow, Chair (DC); Jennifer Li (AL); Thomas Reedy (CA): Wanchin Chou (CT); Sean Collins (FL); Vincent Tsang (IL); Mike Yanacheak and Carrie Mears (IA); John Robinson (MN); William Leung (MO); Rhonda Ahrens (NE); Seong-min Eom (NJ); Bill Carmello (NY); Mike Boerner and Rachel Hemphill (TX); and Tomasz Serbinowski (UT).

1. Adopted its Feb. 26, 2021; Feb. 11, 2021; Jan. 21, 2021, Dec. 17, 2020, and 2020 Fall National Meeting Minutes

The Working Group met Feb. 26, 2021; Feb. 11, 2021; Jan. 21, 2021; Dec. 17, 2020; and Nov. 10, 2020. During its Feb. 26, 2021, meeting, the Working Group took the following action: 1) adopted an update to the mortgage reporting guidance; and 2) discussed the American Council of Life Insurers (ACLI) real estate proposal. During its Feb. 11, 2021, meeting, the Working Group took the following action: 1) discussed the Moody's Analytics report on bonds; and 2) exposed the alternatives for the requested modification to the mortgage reporting guidance for a 10-day public comment period ending Feb. 22. During its Jan. 21, 2021, meeting, the Working Group took the following action: 1) exposed the ACLI's real estate proposal for a public comment period ending March 8; and 2) agreed to forward the guaranty fund memorandum to the Capital Adequacy (E) Task Force. During its Dec. 17, 2020, meeting, the Working Group took the following action: 1) heard an update on economic scenario generators (ESGs); and 2) discussed the ACLI's real estate proposal.

Mr. Boerner made a motion, seconded by Mr. Chou, to adopt the Working Group's Feb. 26, 2021 (Attachment Three-A); Feb. 11, 2021 (Attachment Three-B); Jan. 11, 2021 (Attachment Three-C); Dec. 17, 2020 (Attachment Three-D); and Nov. 10, 2020 (see NAIC Proceedings – Fall 2020, Capital Adequacy (E) Task Force, Attachment Four) minutes. The motion passed unanimously.

2. Discussed the ACLI's Real Estate Proposal

Mr. Barlow said there was one comment letter received on the ACLI's real estate proposal. Jerry Holman (American Academy of Actuaries—Academy) presented the Academy's comments and, while the Academy generally supports a different approach for calculating capital requirements for real estate as 30 years have passed since the current real estate factors were set, he discussed the Academy's four areas of concern with the ACLI proposal as presented in its comment letter (Attachment Three-E).

Mr. Barlow said in the discussions of this proposal, there were several requests from the Working Group for more information. John Bruins (ACLI) said that as risk-based capital (RBC) is developed, there are two fundamental issues. The first is how much is at risk, which he said is typically the amount being held in the statutory balance sheet. In the case of real estate, he said this is depreciated cost, while for common stock it is market value. However, in both cases, the asset values are defined within the balance sheet, and this is what drives the amount at risk. He said the second issue is the determination of an appropriate factor for that risk, and this is where a lot of the analysis has been done. He presented each of the ACLI's responses as detailed in its March 9 letter (Attachment Three-F). Mr. Barlow suggested it would be helpful for the April 6 discussion for the Working Group to focus, and for the ACLI to provide any possible additional information, on four main areas: 1) whether there should be different factors for different real estate types; 2) whether there should be an adjustment for the fair value given the concerns about the appropriateness and the amounts reported in the annual statement; 3) whether there should be different factors for Schedule A versus Schedule BA real estate; and 4) the proposed underlying base factors.

Having no further business, the Life Risk-Based Capital (E) Working Group adjourned.

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Draft: 3/10/21

Life Risk-Based Capital (E) Working Group
Virtual Meeting
February 26, 2021

The Life Risk-Based Capital (E) Working Group of the Capital Adequacy (E) Task Force met Feb. 26, 2021. The following Working Group members participated: Philip Barlow, Chair (DC); Jennifer Li (AL); Thomas Reedy (CA); Deborah Batista (CO); Wanchin Chou (CT); Sean Collins (FL); Mike Yanacheak and Carrie Mears (IA); Vincent Tsang (IL); John Robinson (MN); William Leung (MO); Rhonda Ahrens (NE); Seong-min Eom (NJ); Bill Carmello (NY); Andrew Schallhorn (OK); Mike Boerner and Rachel Hemphill (TX); and Tomasz Serbinowski (UT).

1. Adopted an Update to the Mortgage Reporting Guidance

Mr. Barlow said the proposed update to the mortgage reporting guidance was exposed for comment with two options: 1) updating the previous guidance; and 2) adding new guidance. One joint comment letter was received from the American Council of Life Insurers (ACLI) and the Mortgage Bankers Association (MBA).

Mike Monahan (ACLI) said the ACLI and the MBA support the alignment of the periods covered by the risk-based capital (RBC) and troubled debt restructuring (TDR) guidance. He said, operationally, either approach would accomplish the objective of aligning accounting and RBC guidance on TDR. He the ACLI and the MBA prefer option one, with the language from the Origination Date, Valuation Date, Property Value and 90 Days Past Due paragraph in option two that includes the accounting interpretations.

Mr. Barlow said incorporating the language from option two into the option one guidance would alleviate the need for potential updates in the future.

Mr. Boerner agreed and made a motion, seconded by Mr. Tsang, to adopt option one, with the modification to replace the language on Origination Date, Valuation Date, Property Value and 90 Days Past Due with the language from option two (Attachment Three-A1). The motion passed unanimously.

2. Discussed the ACLI Real Estate Proposal

John Bruins (ACLI) provided a PowerPoint presentation (Attachment Three-A2) of the ACLI's real estate proposal (Attachment Three-A3). He said the structural changes of the proposal were presented to the Working Group during its Jan. 21 meeting and were exposed for public comment.

Mr. Bruins said that version of the proposal had actually been presented to the Investment Risk-Based Capital (E) Working Group four years ago. He said the proposal has been updated, and what is now included is new material. He noted the proposal is fundamentally the same. However, the data period now includes an additional four years since the proposal was originally drafted in 2015. As a result of a review of the modeling and the larger data period, the recommended factors were changed from 10% to 11%.

Mr. Bruins said, in discussions with both state insurance regulators and other interested parties, concerns were raised about having the same factor on Schedule BA real estate as for Schedule A real estate and the updated proposal increases that factor from 10% to 12%. He presented the recommended changes to Schedule A; the proposed adjustment for unrealized gains; updates to the RBC encumbrance factor; and the recommended approach for Schedule BA, which are detailed on pages 3–11 of the PowerPoint presentation.

With respect to Schedule A real estate, Mr. Bruins said the modeling was based on historical experience of the real estate portfolio, and the ACLI used two databases. The first was the NCREIF database, which begins in 1977. It is the most robust database that exists on real estate and has been in continuous existence from 1977. He said this was supplemented with another study and allowed for the study done in 1997 to be extended back to 1961, which provided essentially 60 years' worth of experience in the commercial real estate marketplace. The modeling largely parallels that done for the July 2013 report on common stock to the Investment Risk-Based Capital (E) Working Group and looks at a portfolio of real estate over time given various historical data starting points.

In looking at that and using a two-year time horizon, Mr. Bruins said the factor comes to about 9.5%. However, if it is extended two years out to time, the worst it would result in is a factor of about 10.2%. He also said that the adjustment for unrealized gains and losses are integrated with the modeling of the base factor, so these items will need to be looked at together.

Considering that the proposal is changing factors that were put in place in the early 1990s, Mr. Robinson asked if it would be part of the ACLI's recommendation to revisit these factors and, if so, what would the recommended time frame be.

Mr. Bruins said it would be up to the Working Group to make that determination, but he noted that one comment made in the bond modeling was that an economic cycle was typically 10 years and suggested that might be guidance on what timeline to consider.

Mr. Barlow said how often factors are updated is something to be considered at the Task Force level—not just for real estate but for all factors—and there is a plan to do it more periodically.

With respect to the 1.5% margin providing for still unknowns due to post-COVID and other impacts, Ms. Hemphill said in the March 2017 proposal, it was an estimated 8% with 2% for unknowns for a final 10% factor, and now it is at 9.5% base with a 1.5% for unknowns. She asked how the Working Group can know that is the right amount and how it evolved from the previous proposal.

Mr. Bruins said this is a decision that the state insurance regulators have made, and the margin was more backed into than derived. He said the ACLI looked at what a reasonable rounded factor would be and that the margin is the difference but is in response to state insurance regulator concerns.

Mr. Tsang said the 9.5% factor is at the 95th percentile and asked what percentile it would be if the 1.5% were added. Ms. Hemphill said it would be 96.8th percentile.

Mr. Tsang asked if the interest rate would have an impact. Mr. Bruins said it would raise it slightly.

Mr. Tsang asked if the 11% is a pre-tax number. Mr. Bruins said it is and that it is the same as the current 15%.

Mr. Schallhorn said the foreclosed real estate changed from 23% to 11% and asked if that was appropriate.

Mr. Bruins said the recommended change on foreclosed real estate is from the perspective that when a company acquires real estate through foreclosure, it is required to mark it down to market value. Because it is starting at market value, that puts it on the same basis of other real estate. He said the ACLI did not understand why there was an additional margin in the first place on foreclosed real estate and thinks the way that it is treated in Schedule A and tracked through is a reasonable recommendation to make them the same.

Mr. Reedy asked if Mr. Bruins knew what proportion of life companies' assets would actually be in these real estate equity investments and if that proportion increased in recent years.

Mr. Bruins said that for the industry in total, it is about 1% to 1.5% of the total general account assets, and it has been increasing but not by a lot. He said part of the reason is that companies look at the 15% RBC charge, and that becomes a detriment to investment. He said he could get the statistics for the Working Group.

Mr. Chou said the real estate and the volatility due to the economic downturn could be different from one region to another and asked if the ACLI has this level of detail in its analysis that it could share with the Working Group. Mr. Bruins said he would see what the ACLI could provide.

With respect to the proposed adjustment for unrealized gains and losses, Mr. Tsang expressed concern with the possibility of double-counting because the RBC factors are applied to book value. Mr. Barlow suggested the ACLI look at this question further. Mr. Bruins said they would.

Birny Birnbaum (Center for Economic Justice—CEJ) said the life insurance industry, among other sectors of the U.S. insurance industry, is opposed to the international capital standard, which is based in large part on market valuations, with the argument being that using these abuses the matching of assets and liabilities, introduces volatility and creates a pro-cyclical situation. He asked how those positions align with this proposal.

Mr. Bruins said the ACLI is not recommending a change to statutory accounting that reflects the value of real estate, but is trying to define a risk profile that reflects varying circumstances of a property for real estate. Unlike bonds, there are not rating agencies, and one of the key factors that can be recognized is the relationship of the market as an indicator of the level of risk. With respect to volatility, he said when bonds get downgraded, the RBC goes up, and there is volatility, which he does not believe is any different. He said RBC is based on the risk profile that exists on the date of the financial statement and, if risks change because of future circumstances, then both the financial statements and the risk profiles will change. He said keeping everything stable at the worst possible point is not necessarily good for either industry or state insurance regulators.

Mr. Barlow said more discussion will take place during the Working Group's March 12 meeting and subsequently as needed.

Having no further business, the Life Risk-Based Capital (E) Working Group adjourned.

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

To: All Insurers
From: Life Risk-Based Capital (E) Working Group
RE: Guidance for Troubled Debt Restructurings for December 31, 2020 and Interim Risk-Based Capital Filings (where required)
Date: October 9, 2020, Revised February 11, 2021

Additional Guidance Adopted by the Life Risk-Based Capital Working Group

The Financial Condition (E) Committee delegated to the Life Risk-Based Capital (E) Working Group certain questions that arose as part of its June 12 memorandum. Under that delegation, the Working Group adopted the following guidance.

Construction Loans

For purposes of Note 4 to the Risk-Based Capital Reporting Instructions, government-mandated construction delays due to COVID-19 that occur at any time during 2020 are not "construction issues." This guidance would apply to all mortgages and not just those mortgages where a COVID-19 modification occurred.

Origination Date, Valuation Date, Property Value, and 90 Days Past Due

For purposes of the Description/explanation of item in the Risk-Based Capital Reporting Instructions for Date of Origination (2), Property Value (20), Year of Valuation (21 and by reference Quarter of Valuation - 22), and 90 Days Past Due? (29), no changes to these values are required for any COVID-19 related modifications that are captured within *INT 20-03: Troubled Debt Restructuring Due to COVID-19* or *INT 20-07: Troubled Debt Restructuring of Certain Debt Instruments Due to COVID-19*.

Contemporaneous Property Values

For purposes of computing the Contemporaneous Property Value (40) for any period ending in 2020, an insurer may use the average of the NCREIF Price Index as of 12/31/2019 and the 2020 NCREIF Price Index for the Price Index current value. This guidance applies to all mortgages and not just those mortgages where a COVID-19 modification occurred, and it applies for the filings for any period ending in 2020 only and not subsequent years.

Net Operating Income

For purposes of the NOI inputs at (14), (15), (16), and the computation of a Rolling Average NOI at (36), an insurer may report 2020 NOI (i.e., NOI for any 12-month fiscal period ending after June 30, 2020 but not later than June 30, 2021) as the greater of: (1) actual NOI as determined under the CREF-C IRP Standards or (2) 85% of NOI determined for the immediate preceding fiscal year's annual report. This guidance with respect to 2020 NOI applies to the application of the 2020 NOI in risk-based capital reporting for 2021, 2022, and 2023. In cases where an insurer reports 85% of 2019 NOI as the 2020 NOI input, the insurer should retain information about actual 2020 NOI in its workpapers so that the information can be readily available to regulators.

Related Accounting Guidance & Updates

Please see the following for both related accounting guidance and updates to this guidance via Q&A.
https://content.naic.org/cmte_e_lrbc.htm
(Please see related documents tab)

Questions

Any questions on this guidance should be directed to Dave Fleming by e-mail at dfleming@naic.org.

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ACLI
Financial Security for Life

Real Estate Equity RBC Proposal
February 26, 2021

ACLI

Focus Areas to Achieve Consensus

- Schedule A: Factor for Real Estate Equity investments
- Proposed Adjustment for Unrealized Capital Gains
- Update factor for RBC Adjustment for Real Estate Encumbrances
- Schedule BA: Proposed treatment consistent with Schedule A

ACLI

Schedule A: Equity investments in real estate

Current status: C-1 factor of 15%

- Rationale: Article from 1991 proposed that real estate volatility is about 60 percent of that for common stock, suggesting a factor in the range of 18 percent. If one assumes full tax credit for losses, this converts to a factor of about 10% after tax.

Proposal: C-1 factor of 11%

- Rationale: Analyses of real estate performance data conducted or sponsored by ACLI/NAIC/Industry specialists suggest that the base C-1 RBC factor applicable to Schedule A real estate (including company occupied, investment, acquired by foreclosure and held for sale) should be set at 9.5%. Proposed factor increased to 11% to add conservatism.

ACLI

Schedule A: Factor for Real Estate Equity investments

- Modeling based on historical experience indicates a factor of 9.5% for wholly owned real estate.
- Model database covers experience from 1961 through 2020
- Concerns raised by regulators and other interested parties indicate some margin for prudence in light of unknown COVID-19 impacts on economy.
- Proposal modified to recommend a base factor of 11%.
  - This will be applied to Real Estate reported on Schedule A, including company occupied, investment real estate, and real estate acquired by foreclosure.
  - This includes a 1.50% margin over modeled values at 95% confidence.

ACLI

Schedule A: Factor for Real Estate Equity investments

Concern	Response
Methodology for factor estimation does not adequately reflect market volatility, and more specifically the downturn surrounding Global Financial Crisis and possible effects of COVID-19	Addressed through additional modeling and margin added to proposed factor
Methodology uses Total Rate of Return in modeling,	This approach is consistent with common stock RBC analysis. As added conservatism, there is no offset for AVR contribution, although AVR is available to offset losses.
Discount interest rate	As added conservatism, losses are cumulative and not discounted.
Impact of Federal Income Tax	As added conservatism, all losses are projected on a cash basis with no impact of Federal Income Tax.

5

ACLI

Adjustment for Unrealized Capital Gains/Losses

RBC measures the risk of loss of statutory capital

Factor Development: While the analysis and proposed factors are based on market value, Statutory Accounting sets value of real estate at depreciated cost.

- When statutory value is less than fair value, risk to statutory capital is much lower. e.g., if fair value is 150 and deprecated cost is 100, the property can lose 1/3 of its value with no impact on statutory capital. Fair value is a key component of the risk profile.
- Fair value of real estate assets held by life companies is reported in Schedule A for each individual property.

Proposal: Adjust the RBC factor to recognize the difference between fair value and statutory value when applying it to the statutory value

- Rationale: The excess of fair value over the statutory value is a cushion against loss of statutory capital that is not currently recognized for risk-based capital purposes. Over time, the difference between depreciated cost and fair value can become substantial. This will reduce the need to sell appreciated properties to raise statutory capital.

ACLI

Adjustment for Unrealized Capital Gains/Losses

- The formula for the adjusted factor would be:

Adj Factor = *RE Factor*(1 – [2/3] * (MV-BVg)/BVg)}*

BV	MV	RBC
100	50	14.7%
100	100	11.0%
100	150	7.3%
100	200	3.7%
100	250	1.3%

ACLI

Adjustment for Unrealized Capital Gains

Why use market value in RBC for Real Estate but not for Bonds?

Bonds	Real Estate
Defined, finite time horizon	Open ended timeframes
Defined maturity value (par)	No defined maturity value
Defined cash flows	No defined cash flows
Default based on failure to make a contractual payment.	Statutory write-down based on assessment of a permanent impairment.
Risk to stat capital not affected by a change to market value	Risk to stat capital is affected by change in market value

ACLI

RBC Adjustment for Real Estate Encumbrances

- **Current status**: RBC is based on the total value of the real estate, with an adjustment for any encumbrance based on the RBC factor for Commercial Mortgage Loans.
- The proposed change is to update this adjustment to reflect the new RBC factors for commercial mortgage loans adopted in 2012:
  - Original average Commercial Mortgage factor: 3.00%
  - Updated average Commercial Mortgage average factor: 1.75%
- Since this is an offset to the RE factor, the lower factor produces an increase to RBC.
- The presentation is changed, but algebraically equal for the same factor.

ACLI

Schedule BA: Indirect equity investments in real estate

- **Current status**: C-1 factor of 23%
  - Rationale: C-1 factor for Schedule BA is 50% more than the C-1 factor for Schedule A real estate assets to account for presumed additional risk associated with potentially lower information transparency and control within the structures as well as unknown leverage.
- **Proposal:** Factor of 12%, factor for Schedule A real estate assets (11%) plus 1% premium (10% of base factor)
  - Rationale: Data availability and industry experience has provided evidence that this premium is overly conservative, if not altogether unnecessary for the assets classified as real estate within Schedule BA. A study showed that, since 1983, real estate held through joint ventures has performed consistently with and perhaps even slightly better than, wholly-owned real estate.
  - An ACLI survey of member companies showed characteristics of Schedule BA real estate to be similar to Schedule A.

ACLI

RBC for Real Estate Decisions

- What base factor should be used for company owned real estate? Proposed to be 11%.
- How much of the impact on the risk profile from the unrealized gains be reflected in the RBC? Propose a ratio of 2/3 of the gain to the BACV.
- Should the recognition of encumbrances be updated from the original CML factor of 3% to an average of the current CML of 1.75%?
- Should real estate held through a joint venture or fund receive the same factor as directly owned? If not, how adjusted? Propose to use a factor of 12%.

ACLI

Questions?

Capital Adequacy (E) Task Force

RBC Proposal Form

[ ] Capital Adequacy (E) Task Force [ ] Health RBC (E) Working Group [ ] Life RBC (E) Working Group
[ ] Catastrophe Risk (E) Subgroup [ ] Investment RBC (E) Working Group [ ] Operational Risk (E) Subgroup
[ ] C3 Phase II/ AG43 (E/A) Subgroup [ ] P/C RBC (E) Working Group [ ] Longevity Risk (A/E) Subgroup

DATE: February 26, 2021	**FOR NAIC USE ONLY**
CONTACT PERSON: Steve Clayburn	Agenda Item #
TELEPHONE: (202) 624-2197	Year
EMAIL ADDRESS: steveclayburn@acli.com	**DISPOSITION**
ON BEHALF OF: American Council of Life Insurers (ACLI)	[ ] ADOPTED
NAME: Steve Clayburn	[ ] REJECTED
TITLE: Senior Actuary, Health Insurance & Reinsurance	[ ] DEFERRED TO
AFFILIATION: ACLI	[ ] REFERRED TO OTHER NAIC GROUP
ADDRESS:	[ ] EXPOSED
	[ ] OTHER (SPECIFY)

IDENTIFICATION OF SOURCE AND FORM(S)/INSTRUCTIONS TO BE CHANGED

[ ] Health RBC Blanks [ ] Property/Casualty RBC Blanks [X] Life and Fraternal RBC Instructions
[ ] Health RBC Instructions [ ] Property/Casualty RBC Instructions [X] Life and Fraternal RBC Blanks
[ ] OTHER _____

DESCRIPTION OF CHANGE(S)

To update the RBC calculation for Real Estate to reflect updated experience and analysis since RBC was first developed.

REASON OR JUSTIFICATION FOR CHANGE **

When RBC was developed, there was limited experience on the default and loss for commercial real estate. Since then data sources have been compiled and tracked in the industry, and can now be accessed to provide more meaningful analysis and information for development of capital standards.

Additional Staff Comments:

**** This section must be completed on all forms.** **Revised 2-2019**

1. REAL ESTATE

LR007

Basis of Factors

~~Companies that have developed their own risk-based capital factors for real estate have used a range of factors from 5 percent to 20 percent. One study indicated real estate volatility is about 60 percent of common stock, suggesting a factor in the range of 18 percent. Assuming a full tax effect for losses, a pre-tax factor of 15 percent was chosen. Foreclosed real estate would carry a somewhat higher risk at 23 percent pre-tax. Schedule BA real estate also has a 23 percent factor pre-tax because of the additional risks inherent in owning real estate through a partnership. The pre-tax factors were developed by dividing the post-tax factor by 0.65 (0.65 is calculated by taking 1.0 less 0.35). The pre-tax factors are not changing for 2018 due to tax reform.~~ The base factor for equity real estate of **[11%]** was developed by adding a margin for conservatism to the results of an analysis of real estate performance over the period of 1978 – 2020. The analysis was conducted by a group of life insurance company real estate investment professionals coordinated by the ACLI. The data used was a national database of real property owned by investment fiduciaries and supplemented by data on real estate backing mortgage securities. The analysis is documented in a report to the NAIC dated February 26, 2021. In addition to modifying the factor for company owned and investment real estate, this updated factor will also be used for real estate acquired in satisfaction of debt (Foreclosed real estate). For assets with the characteristics of real held estate (partnership or other structure) reported on Schedule BA, a higher factor is used to account for the lower transparency involved with these structures. Foreclosed real estate is recognized in the statutory statements as having acquisition cost equal to market value at time of foreclosure. Schedule BA real estate was originally given a higher factor under a presumption that it was more highly levered. Analysis has shown these assets to have experience very similar to directly held and will therefore use a modestly higher factor.

While the experience analysis was done based on analysis of fair value impacts, Real Estate is reported at depreciated cost in the Statutory statements. The difference in values impacts the risk to statutory surplus. Therefore, an adjustment is made to the factor based on the difference between fair value and statutory carrying value on a property by property basis. The adjustment is defined as

Adj Factor = *RE Factor*(1 – [factor] * (MV-BVg)/BVg)}*

factor is [2/3]

The resulting adjusted RBC factor is subject to a minimum of zero. In the RBC calculation, see Figure 7, fair value is taken from Schedule A Column 10 plus encumbrances, or from Schedule BA column 11 plus encumbrances, respectively, while BVg is the net Book Adjusted Carrying Value plus the encumbrance.

Encumbrances have been included in the real estate base since the value of the property is held net of the encumbrance, but the entire value is subject to loss ~~would include encumbrances~~. Encumbrances receive ~~a~~the base real estate factor of [11%] reduced by the average factor for commercial mortgages of 1.75~~2~~ percent pre-tax. In the past this was computed as a base factor applied to the net real estate value plus a separate factor applied to the amount of the encumbrance. Beginning in 2021, the equivalent result will be obtained by applying a base factor to the gross statutory value of the property, and a credit provided for the amount of the encumbrance. ~~for real estate encumbrances not in foreclosure and 20 percent pre-tax for real estate encumbrances in foreclosure and encumbrances on Schedule BA real estate.~~

The final RBC amount is subject to a minimum of the Baa bond factor (1.30%) applied to the BACV, and a maximum of 45% of the BACV.

~~All references to involuntary reserves as it relates to real estate were removed to comply with the codification of statutory accounting principles.~~

Specific Instructions for Application of the Formula

Column (1)
Calculations are done on an individual property or joint venture basis in the worksheets and then the summary amounts are entered in this column for each class of real estate investment. Refer to the real estate calculation worksheet (Figure 7) for how the individual property or joint venture calculations are completed.

Line (1) should equal Page 2, Column 3, Line 4.1.
Line (2) should equal Page 2, inside amount, Line 4.1.
Line (4) should equal AVR Equity Component Column 1 Line 20.
Line (5) should equal AVR Equity Component Column 3 Line 20.
Line (7) should equal AVR Equity Component Column 1 Line 19.
Line (8) should equal AVR Equity Component Column 3 Line 19.
Line (14) should equal Schedule BA, Part 1, Column 12, Line ~~1799999~~ 2199999 plus Line ~~1899999~~2299999, in part.
Line (15) should equal Schedule BA, Part 1, Column 12, Line 1799999 plus Line 1899999, in part.
Line (17) should equal AVR Equity Component Column 1 Line 75.
Line (18) should equal AVR Equity Component Column 1 Line 76.
Line (19) should equal AVR Equity Component Column 1 Line 77.
Line (20) should equal AVR Equity Component Column 1 Line 78.
Line (21) should equal AVR Equity Component Column 1 Line 79.

Low income housing tax credit investments are reported in Column (1) in accordance with *SSAP No. 93—Low Income Housing Tax Credit Property Investments*.

Column (2)
The average factor column is calculated as Column (3) divided by Column (1).

Column (3)
Summary amounts are entered for Column (3) based on calculations done on an individual property or joint venture basis. Refer to Column (8) of the real estate calculation worksheet (Figure 7).

Line (17)
Guaranteed federal low-income housing tax credit (LIHTC) investments are to be included in Line (17). There must be an all-inclusive guarantee from an ARO-rated entity that guarantees the yield on the investment.

Line (18)
Non-guaranteed federal LIHTC investments with the following risk mitigation factors are to be included in Line (18):

a) A level of leverage below 50 percent. For a LIHTC Fund, the level of leverage is measured at the fund level.
b) There is a tax credit guarantee agreement from general partner or managing member. This agreement requires the general partner or managing member to reimburse investors for any shortfalls in tax credits due to errors of compliance, for the life of the partnership. For an LIHTC fund, a tax credit guarantee is required from the developers of the lower-tier LIHTC properties to the upper-tier partnership.

Line (19)
State LIHTC investments that at a minimum meet the federal requirements for guaranteed LIHTC investments.

Line (20)
State LIHTC investments that at a minimum meet the federal requirements for non-guaranteed LIHTC investments.

Line (21)
State and federal LIHTC investments that do not meet the requirements of lines (17) through (20) would be reported on Line (21).

(Figure 7)

Real Estate Worksheet

Fair value adjustment factor [*factor*]

	(1) Description	(2) Book/Adjusted Carrying Value	(3) Encumbrances	(4) Fair Value	(5~~4~~) ~~Book/Adjusted Carrying Value~~Base Factor	(6~~5~~) Encumbrances~~s~~ credit Factor	(7) Adjusted RBC Factor&	(8~~6~~) Gross RBC ~~Book/Adjusted Carrying Value~~ Requirement‡	(9~~7~~) Encumbrances ~~Requirement~~§ Credit	(10~~8~~) RBC Requirement*
	Company Occupied Real Estate									
~~(1)~~	All Properties Without Encumbrances†		XXX		0.1150	XXX			XXX	
(1)										
(2)										
	All Properties With Encumbrances:									
(32)					0.1150	0.0175~~120~~				
(43)					0.1150	0.0175~~0.120~~				
(199)	Total Company Occupied Real Estate									
	Foreclosed Real Estate									
~~(1)~~	All Properties Without Encumbrances†~~All Properties Without Encumbrances‡~~		XXX		0.11230	XXX			XXX	
(1)										
(2)										
	All Properties With Encumbrances:~~All Properties With Encumbrances:~~									
(3)~~(2)~~					0.11230	0.0175~~0.200~~				
(4)~~(3)~~					0.11230	0.0175~~0.200~~				
(299)	Total Foreclosed Real Estate									
	Investment Real Estate									
~~(1)~~	All Properties Without Encumbrances†~~All Properties Without Encumbrances‡~~		XXX		0.11150	XXX			XXX	
(1)										
(2)										
	All Properties With Encumbrances:~~All Properties With Encumbrances:~~									

(3)~~(2)~~				0.11~~15~~0	0.0175~~0.120~~			
(4)~~(3)~~				0.11~~15~~0	0.0175~~0.120~~			
(399)	Total Investment Real Estate							
(499)	Total Real Estate (Line (199) + Line (299) + Line (399))							
	Schedule BA Assets with characteristics of Real Estate							
~~(1)~~	All Assets Without Encumbrances†~~All Joint Ventures w/o Encumbrances~~‡		XXX	0.12~~23~~0	XXX		XXX	
(1)								
(2)								
	All Assets With Encumbrances:~~All Properties With Encumbrances:~~							
(3)~~(2)~~				0.12~~23~~0	0.0175~~0.200~~			
(4)~~(3)~~				0.12~~23~~0	0.0175~~0.200~~			
(899)	Total Schedule BA Real Estate							

Note that column (2) is the book/adjusted carrying value net of any encumbrances, while column (4) is the fair value of the property not reduced for any encumbrances.

† For each category, each property ~~Line (1) should also exclude properties or joint ventures that have a negative book/adjusted carrying value. These~~ should be listed individually, including those for which there is no encumbrance.

& Column (7) is Column (5) times (1-(*factor*) * (Column (4) – (Column (2) + Column (3))) / (Column (2) + Column (3)))

‡ Column (8~~6~~) is calculated as (Column (2) plus Column (3)) multiplied by Column (7~~4~~).

§ Column (9~~7~~) is calculated as Column (3) multiplied by Column (6~~5~~).

* Column (10~~8~~) is calculated as ~~the sum of~~ Column (8~~6~~) minus~~plus~~ Column (9~~7~~), but not less than ~~zero or more than Column (2).~~1.3% nor more than 45% of column (2), and not less than zero.

Proposal
Risk Based Capital for Real Estate Assets
February 26, 2021

Executive Summary

The following recommendations are the product of analyses conducted or sponsored by the ACLI, the NAIC, and industry real estate specialists. These recommendations represent the final product of discussions and deliberations that began in 2012 and are inclusive of changes meant to address questions and recommendations posed by members of the Investments Risk Based Capital (IRBC) and Life Risk Based Capital (LRBC) NAIC working groups, the American Academy of Actuaries (AAA) and other interested parties.

The objective of the recommendations described below is to ensure that the RBC assessment methodology and charges for the real estate sector more accurately reflect the sector's underlying risks and to promote consistency with the methodology used in other asset sectors.

A. Schedule A Real Estate Factor. Update the C-1 factor for real estate assets held on Schedule A to be a base factor of ***11%***. This recommended factor is based on an estimated worst cumulative loss at a 95^{th} – 96^{th} percentile confidence level based on historical experience, which suggested a base factor of 9.5%. As was done with common stock, we used values at 2 years loss horizon. An additional 1.5% charge is recommended to account for potential disparity in individual life company real estate portfolio composition and uncertainty surrounding the longer-term implications of the COVID-19 pandemic on the commercial real estate sector. The proposed factor would be applicable for all categories of real estate reported in Schedule A of the Life and Health Annual Statement. (See Section A)

B. Unrealized Capital Gains/Losses. Adjust the based RBC factor using a ratio of 2/3 of the percentage difference between the reported fair value and statutory book value to the statutory book value. This adjustment would account for the cushion against statutory losses that is often created in real estate assets as they are held through time. The recommended RBC factor for Section A is calibrated based on volatility of market values through time. In contrast, real estate assets are reported for statutory accounting using depreciated cost. Real estate assets depreciate annually, so each year the asset's statutory value will be adjusted downward, even though the actual market value of the asset is more likely to be increasing. This creates an "unrealized gain" that serves as a cushion that must be completely eroded as market values fall before there would be any risk of loss of statutory capital. (See Section B)

C. Encumbrances. Revise the RBC factor for real estate encumbrances following the principles of the current RBC with factors to be consistent with the commercial mortgage RBC framework adopted in 2013. (See Section C)

D. Schedule BA Real Estate Factor. Update the factor for Schedule BA real estate to **12%** *on a look-through basis,* equivalent to the proposed factor for Schedule A (11%) plus a premium of about 10% of the amount, to more accurately reflect the risk of real estate assets reported on Schedule BA. All other mechanics would parallel the proposal for Schedule A Real Estate. (See Section D)

Scope

This proposal is developed for the Life and Fraternal Risk Based Capital formulas. This proposal does not address possible adjustment to the Asset Valuation Reserve (AVR) or tax adjustments for these assets. Finally, this proposal does not directly address the factors for the Health Risk Based Capital or for the Property & Casualty Risk Based Capital.

Background

RBC is used to measure potential future excess losses and their effect on statutory capital. The goal is to help regulators identify weakly capitalized companies, given risks that individual companies are taking. This proposal is consistent in methodology with recent RBC development work for common stock and bonds in areas such as the confidence levels for statistical analyses, while recognizing real estate's unique characteristics.

There is limited historical perspective available on the original construction methodology supporting the currently applied RBC factors for real estate investments. The following general description is taken from a 1991 report covering RBC C-1 (default) factors:

> "There is little data upon which to base requirements for this asset group. Company practice, as shown by the 1990 intercompany survey, indicates factors in the range of 5 percent to 20 percent. An article in the May-June 1991 Financial Analysts Journal (Ennis and Burk) proposes that real estate volatility is about 60 percent of that for common stock, suggesting a factor in the range of 18 percent. If one assumes full tax credit for losses, this converts to a factor of about 10 percent which is the Subcommittee's recommendation for all real estate subcategories, except real estate acquired by foreclosure for which the factor is 15 percent. This is one of several asset groups which deserve continuing study to assure that risk-based capital requirements are adequate and appropriate."

Since the original real estate factor estimation, which was based on the somewhat rudimentary analysis described above, there has been a very significant improvement in the availability of performance data for the sector. While there have been additional analyses conducted for this sector since the initial methodology and factor adoption (i.e., AAA proposals in September and December 2000), to date there have been no significant changes made to the C-1 factor for real estate.

Since 2000, the pre-tax base C-1 factor for real estate applied in the sector has been 15%. The derivation of this factor, as described above, was based on 60% of the common stock factor, adjusted for taxes. The logic at the time was that the volatility of real estate was assumed to be around 60% of common stock volatility[1]. This assumption was reportedly based on inferences made from historical real estate investment trust (REIT) performance, as a robust private market performance history was not available at that time. REITs are companies that use debt in owning and managing properties and have performance characteristics different from that of the underlying commercial real estate.[2] The same 15% C-1 factor currently applies to virtually all directly held real estate, including company occupied properties, investment properties for long-term hold, and properties held for sale, but excludes properties acquired through foreclosure which were perceived to be riskier.

It is also important to note, that while real estate is considered an equity asset, statutory accounting requires it to be valued at depreciated cost. Any capital improvements are added to the statutory book value, and then

[1] Various studies have since shown that equity real estate in general has volatility well less than 60% of that of the S&P 500.

[2] The volatility of REIT performance is higher than the volatility of direct property performance primarily because REITs are leveraged investments, which results in greater volatility of results. Further, privately held property is not marked-to-market daily, trades infrequently, and tends to exhibit price changes rather slowly.

depreciated from that time. If and when there is an other-than-temporary impairment, the book value is revised down to then market value, if lower, and depreciated going forward. Throughout this document this is referred to as depreciated cost.

The real estate sector has matured significantly in the last 30 plus years, as institutional investment has become prevalent and public capital markets have become more developed. Information transparency has increased materially and the market has become much more "efficient". Valuation and accounting policies and standards, and increased regulation, have also increased standardization and invest ability. Ownership of commercial real estate is now much more widespread across institutions, including pension funds, than in the earlier period.

A. Review of Base C-1 RBC Factor – Support for Change to 11%

Analyses conducted or sponsored by the ACLI, the NAIC, and industry specialists suggest that the base C-1 RBC factor applicable to Schedule A real estate (including investment, foreclosed and held for sale real estate) should be set at 9.5%. An additional 1.5% cushion is recommended to account for potential disparities between the composition of the index used and individual life insurance company real estate portfolios and uncertainty surrounding the impact of COVID-19 on the longer term performance of commercial real estate. This recommendation is based primarily upon the NCREIF National Property Index (NPI) Price Variation Analysis presented below.[3]

Note that the support presented in this Section A represents an updated methodology meant to address certain concerns expressed by the American Academy of Actuaries regarding representation of the Global Financial Crisis in the data set. The original supporting methodology and support can be found in Appendix 3, for reference only.

The primary methodology employed to determine the recommended charge is analyses based on actual historical real estate investment performance data from the NCREIF Property Index (NPI), appended by data from FRC/Kelleher to extend the series through earlier years of 1961-1977.[4] This data set is collectively referred to as "NPI" in this analysis.

Results of Price Variation Model of NCREIF Property Index ("NPI")

	1 YR HP Cumulative Loss	2 YR HP Cumulative Loss	3 YR HP Cumulative Loss	4 YR HP Cumulative Loss
95-PCT	4.3	**9.3**	10.1	10.1
96-PCT	5.6	**9.7**	10.6	10.6

The above table presents the results of analyses of historical NPI total return data. The table presents the results of analyses based on both 95th percentile (PCT) and 96th PCT worst results in the historical data set. Further, the table presents cumulative losses at varying periods ranging from 1 to 4 years. Historically, downturns in real estate tend to last no longer than 3 years, so this period also represents the worst cumulative decline that would be observed even if the assumed period was extended further. The "cumulative" observations represent the largest cumulative loss experienced at any point in the period.

The recommendation of 9.5% is based on consideration of the maximum cumulative losses at both the 95th and 96th percentiles ("PCT") during the observed period. This assumed period of loss is consistent with the assumption used for common stock. Importantly, based on historical performance data for the sector, the 11% recommended base factor would cover cumulative losses during a 2-year period at a 96.8% confidence level.

[3] See Appendix 1 for a detailed description of NCREIF and the NPI.

[4] Kaiser, Ronald W., The Long Cycle in Real Estate, Journal of Real Estate Research, Volume 14, Number 3, 1997.

We also note that in using cumulative losses over time, there is no discounting for time value of money, and all analysis are conducted without any consideration of the federal income tax impact of the losses.

The use of actual historic quarterly returns across 60 years of industry experience provides for the incorporation of the impact of several economic cycles on supply and demand for commercial real estate and the impact on market values. This lengthy time period also allows for incorporation of the effects from earlier governmental impact on prices, such as from changes in the tax code in the 1980s.

Considerations

1. Applicability of Index to Individual Life Company Portfolios

The recommended decrease in the RBC factor for Real Estate is based on the performance of a large and well diversified commercial real estate benchmark performance index (i.e., NCREIF-National Property Index, NPI). The index includes quarterly data from all the major property types (office, retail, industrial, multifamily and hotel) across all regions of the US, which makes it broadly applicable to all of these major property types nationwide. Additionally, we compared the distribution of properties by type and by geographical region in the NCREIF database to the distribution of those held by the life insurance companies and found the distributions to be quite similar.

The question of the potential need for increased granularity for the RBC factor was considered thoroughly. In particular, we considered a different factor for company occupied as a class with lower risk than investment properties. However, granularity beyond the single factor representative of all US commercial real estate was deemed inappropriate due to 1) the relatively small size of the asset class, 2) the alignment of composition between the NPI and the life industry portfolio, and 3) regulations separate from RBC factors that address concentration risks and assure diversification of life company real estate portfolios.

Additionally, segmenting the NPI dataset into smaller granularities can be problematic. The NPI as of 2nd Quarter 2013 consisted of just over 7,000 properties but roughly 30,000 properties have been in the index at some point during its 30+ year history. Over that history, the geographic and property type distribution of NPI has been constantly evolving. While the database of properties is large in total, segmenting it into more granular levels can produce sample sizes too small to be statistically sound. Beyond this, segmenting can add only limited additional value. The primary driver of real estate property performance is the national real estate cycle[5] as portrayed in the NPI. The pattern of real estate losses for both the industry and for individual companies is aligned with that cycle. In other words, the overall real estate cycle tends to dominate other effects including geography and property type. The strength of that national real estate cycle has been found in academic research to explain roughly 50% of the variation in property performance across all properties in the index.

2. Impact of Select Key Assumptions

- **Loss Horizon:** The period of time assumed for the accumulation of losses in the analysis (loss horizon) plays an important role in determining the appropriate amount of required capital. In this updated proposal, we suggest an 11% RBC factor, which is based on cumulative losses over 3 years. Real estate assets are typically held longer-term, often five years or greater. As the assets are more illiquid than publicly traded bonds or other securities, they are often used to back surplus, or longer-term liabilities. Liquidity is managed such that the timing of sale of real estate assets can often be strategically determined, thus

[5] Risk and Returns of Commercial Real Estate: A Property Level Analysis, Liang Peng, Leeds School of Business, April, 2010, http://www.reri.org/research/article_pdf/wp173.pdf

avoiding realization of the larger maximum potential losses. The key focus is the length of economic cycles with losses. In past real estate cycles, the duration of losses typically spans a 2 to 3-year period, with the majority of losses during past downturns being materially concentrated within one year. Average holding periods for real estate assets are typically much longer than one year, averaging 10 years or longer, based on analysis periods and investment targets for most institutional investors. As such, and given the statutory accounting for the asset class with declining book value and rigorous impairment requirements, it is normal for the actual recognized impairment rates by insurance companies to be lower in both frequency and severity than market averages. This is primarily related to the existence of unrealized gains that must be exhausted prior to any recognition of losses.

- **Confidence Level:** The confidence level also plays an important role in determining the appropriate amount of required capital. The 9.5% suggested base factor generally corresponds to the losses modeled at between the 95th and 96th percentiles (PCT) over a worst cumulative period. The recommended 11% factor covers losses at a 96.8% confidence level, assuming maximum cumulative losses during a 2-year period.

- **Reserve Offset:** The development of the bond factors includes an offset for expected losses based on the principle that expected losses are covered by reserves. Real estate and common stock are both treated as equity assets which are generally to support surplus and not reserve, and for which expected loss is not considered. The current RBC methodology for real estate equity does not include an offset for the expected loss, as the basic contribution to AVR used as a proxy for expected loss is zero. Similarly, this proposal does not include an offset for expected loss.[6] The rationale for excluding the mitigating effects of the expected loss include:
    - There is no basic contribution to AVR for real estate investments.
    - Real estate is a small asset class, and analyses required to develop appropriate offsets for expected loss are deemed unnecessary.
    - Discussions around the appropriate relationship between expected loss, AVR, and RBC are ongoing. In the future, as precedent is set in the other larger asset classes where the effects are likely even more important, the potential integration of an offset in the real estate equity sector should be reconsidered.

- **Income**: In the development of RBC factors for bonds, income in excess of the expected loss offset discussed above is not included in the modeling and is assumed to be used for policyholder liabilities and not available as a loss offset. For common stock, and for real estate as equity investments, the total return is used. First, since the equity assets are generally presumed to back surplus and not policyholder reserves, the policyholder does not have claim to the income. Consistent with the lack of offset for expected loss, the income is available. When bonds default there is no subsequent income available to the investor. Real estate does not default, and even if subject to impairment, continues to produce income. The real estate values were therefore developed consistent with common stock using a total return view of the assets.

- **Taxes:** All of the modeling discussed in this project was done on a "cash" basis. No consideration has been given to the effect of these losses on the tax liability of the investor. Since losses reduce taxes that otherwise would be paid by the investor, this will result in a lower post-tax RBC factor than the recommended level.

- **Property acquired through foreclosure:** Property acquired through foreclosure should be treated the same as any other real estate. If the insurer forecloses on a mortgage and obtains the property, statutory

[6] There are currently discussions at the NAIC regarding whether RBC assessments should be adjusted to remove the expected losses for sectors. In real estate equity's case, we are uncertain as to the materiality of adjusting for expected losses. The same could be said for common stock, as expected loss is a fixed income concept and would be difficult to apply to equities.

accounting requires the property to be brought onto the company's books at then current market value. As a result, the value is no different than any other property purchased in the course of business. If the property has low income potential, that will be reflected in its market value.

3. Application of Stochastic Approaches

While we considered stochastic approaches, a fully stochastic model was deemed inappropriate by the working group due in large part to the limited amount of quarterly historical observations (limited when compared to the amount of daily transaction data available for public stocks and bonds). It is possible that a stochastic analysis could be performed wherein an algorithm would be built and calibrated to actual history.

However, if the algorithm is calibrated to historical performance, we believe that the results of such an analysis would be consistent with our work, which includes periods of very significant market stress in the sector. Note that the work performed in both common stocks and bonds excluded significant periods of stress in those markets, given changes in the economy from the advent of the creation of the Federal Reserve. Both asset classes have public data going back to early in the 19th century, though of varying quality. We used the full historic track record for Commercial Real Estate (CRE) that is available and includes the downturn in CRE from the S&L crisis in the 1990s, the effects of the dot-com bubble, the global financial crisis and the most recent effects of COVID-19 pandemic in 2020.

B. Adjust RBC to recognize risk impact of unrealized gains and losses

We also recommend implementation of an adjustment to individual property RBC that will account for the cushion against statutory losses that is often created in real estate assets as they are held through time. The RBC factor that is recommended in Section A is calibrated based on volatility of market values through time. However, real estate assets are reported for statutory accounting using depreciated cost. In real estate, the assets depreciate annually, so each year the asset's statutory value will be adjusted downward, even though the actual market value of the asset is more likely to be increasing. Annual depreciation rates in real estate are often 2% or higher. This creates an "unrealized gain" that serves as a cushion that must be completely eroded as market values fall before there would be any risk of loss of statutory capital.

Fair value of real estate assets held by life companies is reported in Schedule A for each individual property. This fair value includes the changing market value of the asset and the impact of any improvements that have been capitalized. This excess of market value over the statutory value is a cushion against loss of statutory capital.

We propose that the applied base RBC factor be adjusted using a ratio of 2/3 of the percentage difference between the reported fair value and statutory book value to the statutory book value. That value applied to the gross book value and after being reduced for any encumbrance would be floored to the RBC using the NAIC bond factor for a Baa equivalent (currently 1.30%)[7] applied to the BACV. Note that in situations where fair value is less than statutory, the RBC factor will be increased.

Examples of the application of the adjustment are presented in the below table and are hypothetical. If a market value were lower than book value, that property would be reviewed for possible impairment. If the value were down temporarily, this adjustment would provide a short-term increase in RBC. If the value is down on a permanent basis, this may provide an early increase in RBC prior to taking an impairment.

[7] See Appendix 2 for sample calculation.

The specific formula including adjustment would be: RBC% = *Max [NAIC2%, 11.0%*(1 - 2/3*(MV-BVg)/BVg)]*

BV	MV	RBC
100	50	14.7%
100	100	11.0%
100	150	7.3%
100	200	3.7%
100	250	1.3%

BVg is the book value gross (prior to netting the encumbrances); NAIC2 is the NAIC2 corporate bond RBC charge.

In an effort to assess the effects of statutory accounting on actual life insurance company experience, a simulation was constructed to analyze hypothetical life company portfolio performance given statutory accounting. The results of this study demonstrate the materially lower statutory losses as compared to market value losses during downturns, and thus provide support for the proposed adjustment.

In 2013 the ACLI, NAIC, and Industry real estate specialists engaged Jeff Fisher (Academic Consultant), who is a special academic consultant to NCREIF, to use the historical property level performance data in the NPI to construct simulated historical performance under statutory accounting rules. The analysis leveraged all available NPI data history at the required level of granularity at that time, which included the period of 1978Q2 through 2013Q1. This analysis was performed to provide additional insight around the impact of statutory accounting (recognition of depreciation, impairment rules, etc.) on the historical performance and risk to capital for insurance companies.

The simulation used the actual historical market experience of the NPI at the individual property level, wherein estimates of statutory accounting were applied. This hypothetical exercise was not intended to serve as the primary basis for determination of an appropriate RBC factor. Rather, the results of this hypothetical exercise illustrate the effect that statutory accounting (i.e., with depreciating book values and impairment rules/requirements) can have on the timing and severity of loss recognition relative to market value changes and provide additional evidence that the primary analysis is reasonable, if not conservative, given the effect of statutory accounting.

The simulation made the following assumptions:

1. Beginning Book Value for statutory accounting when properties enter the data set is set equal to then current market value.
2. For Book Value projections, depreciation is over 20 years (5% per year) for all properties.
3. Properties are tested for impairment quarterly, with impaired properties removed from index after recognizing the loss from the impairment. Any income received to that point is retained in the modeling.
4. As in statutory accounting, there is no accounting for property value increases, only losses are recognized in the analysis.
5. There is no offset related to expected loss (i.e., there is no accounting for AVR).

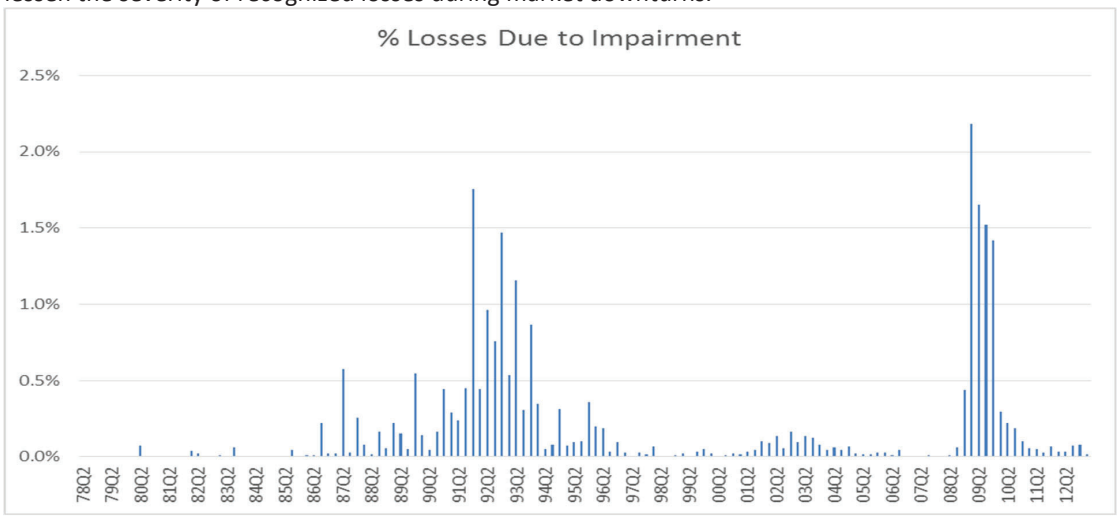
***Example of Simulated Statutory Property Performance**: In the simulation, individual asset market values are recorded in the quarter a property enters the index. At this beginning quarter, book value is set equal to market value, which is assumed to be the cost to acquire and is therefore consistent with statutory accounting. Every*

quarter forward, NCREIF has updated estimates of market value for the asset.[8] Future statutory carrying value of the asset (depreciated book value) is estimated using the generic depreciation assumptions listed above. In every quarter, we estimate whether an impairment would have been recognized using statutory accounting rules, the then current market value, anticipated future property cash flows as implied from that market value, and then current statutory carrying value. Aggregate impairment rates by quarter are tracked through time, which are useful for comparison to actual market value losses reported for the index.

Using the above assumptions in the simulation model and including all properties over the entire history of the NPI, the following chart presents quarterly total losses as a percent of market value. As the chart below illustrates, the largest quarterly loss rate for the simulated index performance was just slightly over 2% during the recent Great Recession. Further, over this entire simulated history there are only a few quarters with significant simulated statutory losses. Losses were concentrated in the real estate market downturns of the early 1990s and in 2009 following the Great Recession.

The largest one-year loss for the full history of the simulated data occurred during the Great Recession, when the simulated one-year cumulative statutory loss was approximately 7% during the year 2009.[9] During 2009, the actual recorded total return for properties in the NPI was a cumulative loss of 17%. This decline occurred amid the most severe downturn in history, based on its intensity. However, the value decline during this period was relatively short-lived, as the negative quarterly total returns persisted for only six quarters.

Given the event was an extreme outlier in the history of real estate performance, the probability of it reoccurring is extremely low within the modeled random sampling. In simple terms, since the 17% decline in one year occurred once in the 36-year exposure, the implied frequency is 2.8% probability (i.e., one year out of 36) while RBC is set to a 5% (or 95% confidence) level. In addition, this temporary reduction in market value would not necessarily have led to equal statutory impairments both since market value is typically in excess of book value, and requirements for statutory impairments do not immediately recognize all changes to market price. Thus, statutory accounting can lessen the severity of recognized losses during market downturns.



[8] The NCREIF database relies on appraisals to establish value where there has not been a transaction. The simulation projected MV could be viewed as projected appraised value. Various studies of CRE appraisals have been performed and show that the appraisals are good estimates of MV, though they may lag actual market changes. This assumption does not affect the validity or applicability of the results.

[9] While the 7% maximum simulated loss should provide a degree of comfort in the reasonableness of the proposed factor, it is not directly comparable in concept to either the proposed factor or the cited actual historic market value based index returns.

As further evidence of the impact of statutory accounting, we examined actual losses incurred during the Global Financial Crisis, which is the most severe real estate market downturn within the 60-year data analysis period. The ACLI conducted an analysis of the life insurance industry's actual performance during 2008 through 2012. The analysis examined all impairments of real estate investments, along with recognized losses on sale of real estate investments, during the period using data from Annual Statement exhibits Schedule A Parts 1 and 2. The industry reported cumulative losses of about 3.5% over that 5-year period, significantly lower than the 9.5% recommended factor. These reported industry losses include Other-Than-Temporary Impairments and losses on sale as reported in the Annual Statement schedule. Note that the analyses did not account for the declines in value of assets that are reported at fair value for statutory purposes.

C. Update RBC charge on real estate encumbrances

Under Statutory Accounting rules, real estate is held at depreciated cost net of encumbrances. Under the current proposal, RBC will be assessed by estimating the risk on the total property, then providing a credit for the value of the encumbrance based on the equivalent risk of the mortgage. The rationale for this is that the total underlying risk of loss on the property is the same whether or not there is an encumbrance, but the holder of the encumbrance bears part of the risk and the holder of the property bears the balance. Therefore, the risk is split effectively by developing the risk for the entire real estate value, then subtracting the amount of risk ascribed to the mortgage. We chose the approach of a reduced factor based on the average factor for mortgages in light of the small size of the real estate asset class, and the even smaller amount of encumbrances. For implementation, we recommend changing the RBC worksheet to show the RBC for the entire real estate, then a credit for the amount of the encumbrance. The final RBC will be subject to a minimum of the NAIC factor for a Baa bond (currently 1.30%) of the net book adjusted carrying value of the real estate, and not more than 45% of the net book adjusted carrying value.

The current encumbrance factors were based on the current RE factor of 15% reduced by the average RBC for commercial mortgages, which was 3.00% under the prior RBC formula. The proposed factor for Real Estate is 11.0%, and the average commercial mortgage factor that was developed as part of the Commercial Mortgage proposal in 2013 was 1.75%. As an example, consider the following:

Property Value	**Amount**	**RBC factor**	**RBC**
No encumbrance	100	11.0%	11.0
With 60% LTV mortgage			
- Property Value	100	11.0%	11.0
- Equity value	40		
- Encumbrance	60	- 1.75%	-1.05
- Real Estate RBC	40	24.9%*	9.95
- Mortgage RBC**	60	1.75%	1.05
- Total	100		11.0

* Equals the RBC value (9.95) divided by the real estate equity value (40).

** This is an estimate of the value of the risk attributable to the mortgage by assuming that the mortgage was held by a life insurance company and estimating the resulting RBC.

This table illustrates our suggestion that the same amount of total capital be held whether a property is held with no encumbrance, or if it has an encumbrance, to reflect the constant level of risk of loss at the property irrespective of the capital stack. The RBC calculated on the encumbrance derives from the price risk of the

property. It is to reflect that there is more risk as a percent of the equity investment, though not in total risk, to the equity investment of an investor in a property when leverage is used compared to when there is no leverage and a property is owned outright. In the case of having an encumbrance, the RBC held by the lender, when added to the RBC held by the owner on its equity and its encumbrance, sum to the same amount as if the property was held with no encumbrance.

In the current RBC, the result of this formula on encumbrances includes a maximum amount equal to 100% of the book adjusted carrying value of the real estate. While recognizing that the loss is generally limited to 100% of the carrying value, we believe that an RBC factor of 100% is excessive, and that the limit should be set at 45% of the carrying value. We note that for common stock, the combined factor at the maximum Beta is 45%.

D. Update Schedule BA Real Estate Factor

Real Estate held in joint ventures (JVs), limited liability companies (LLCs) or similar structures are recorded in Schedule BA, on lines 2199999 and 2299999. Currently, these assets are assessed RBC with a factor (23%) that is 50% higher than the factor for wholly owned real estate reported in Schedule A. The documentation for Schedule BA assets from the original RBC development articulates a premium over the RBC for Schedule A assets to account for additional risk associated with potentially lower transparency and control within the structures. However, since that time, data availability and industry experience has provided evidence that this premium is overly conservative, if not altogether unnecessary for the assets classified as real estate. We propose that the factor for Schedule BA real estate be adjusted to ***12%***, equivalent to the proposed factor for Real Estate recorded on Schedule A (11%) plus a premium of about 10% of that amount for conservatism. All of the other mechanics and components described above for Schedule A real estate would also apply consistently for the real estate recorded on Schedule BA. This proposal is supported by the following:

- Real estate investments today are very often executed through corporate structures such as LLCs simply to mitigate risks. Institutional investors regularly use these structures to reduce the risk of loss from contingent liabilities. Contingent liabilities could be associated with the operations of the property (e.g., slip-and-falls), disputes with vendors or tenants, or debt. LLCs insulate investors from losses above the value of the net equity in an individual investment. Institutional investors also often use LLCs as holding companies for a series of single-asset LLCs, in order to better organize a portfolio in a manner that limits liabilities along each level of the corporate ownership structure.

- The NAIC recently approved the reclassification of certain wholly owned single owner, single asset LLCs to be reported on Schedule A. This was due to the recognition that the LLC structure itself did not produce additional risk. In this approval, the NAIC also agreed that additional reclassification could be proposed and approved when additional supporting materials were submitted. Rather than seeking a change in the accounting, we are proposing to adjust the RBC to reflect the risk.

- Partnership structures are often used to align interests between the life insurance company and local partners who have superior access to the market and property development, asset management and property management skills, while still maintaining control of significant investment decisions, especially around liquidity. This better execution and alignment of interest can result in better investment performance and even lower market risk.

- Partnership structures reduce the capital commitment of the life insurance company to an individual transaction, and thus can add portfolio diversification.

- A study was performed to compare the actual realized risk of institutional real estate investments held through JV's to those of directly-held real estate investments. Jeffrey Fisher, Ph.D. and consultant for NCREIF, broke down all properties in the NCREIF Property Index into joint venture and wholly owned properties to compare the performance since 1983. Mr. Fisher's analysis found as follows:
    - Since 1983, the average quarterly return for JV properties was 2.35% versus wholly owned properties at 1.97%. This performance gap widened over time.
    - The standard deviation of returns for JV properties (2.4%) was only modestly higher than the standard deviation of wholly owned properties (2.2%).
    - Values of the wholly owned properties fell more than the values of JV properties from peak-to-trough during the Global Financial Crisis (GFC).
    - In terms of return dispersion during the GFC's worst quarter, wholly owned properties had the largest negative return and JV properties had the highest positive return.
    - JV properties were found to have shorter average holding periods than wholly owned properties, suggesting potentially higher liquidity in JV structures.

In summary, real estate held through joint ventures has performed consistently with and perhaps even slightly better than, wholly owned real estate. Based on this research, and in recognition of the several legitimate risk/return benefits of ownership through structures, we propose that real estate held on schedule BA use the Schedule A factor (11%) plus a premium of 10% of that amount, totaling approximately 12%.

Appendix 1

The historical National Council of Real Estate Investment Fiduciaries (NCREIF) database goes back to December 31, 1977, and as of 2nd Quarter 2013 consisted of approximately 7,000 properties. NCREIF collects 67 data fields each quarter that consist of financial information such as Market Value, NOI, Debt, and Cap Ex, as well as descriptor data such as Property Type and Subtype, Number of Floors, Square Footage, Number of Units, and Location.

The flagship index of NCREIF is the NCREIF Property Index (NPI), which is a quarterly index tracking the performance of core institutional property markets in the U.S. The objective of the NPI is to provide a historical measurement of property-level returns to increase the understanding of, and lend credibility to, real estate as an institutional investment asset class. The NPI is comprised exclusively of operating properties acquired, at least in part, on behalf of tax-exempt institutions and held in a fiduciary environment. Each property's return is weighted by its market value. The NPI includes properties with leverage, but all returns are reported on an unleveraged basis. The NPI includes Apartment, Hotel, Industrial, Office and Retail properties, and sub-types within each type. The index covers all regions of the US, which makes it broadly applicable to all of these major property types nationwide. Additionally, we have also done a comparison of the distribution of properties by type and by geographical region between those in the NCREIF database and those held by the life insurance companies and found them to be quite similar.

Over the history of the NPI data, there have been two severe downturns, in the 1990s and the recent GFC; as well as a shallow recession corresponding to the 2001 economic recession that did not produce negative total returns for real estate. Given the time series of the data, the index does reflect 'tail events' such as the Great Recession thus appropriately capturing the downturn in the employed primary methodology for estimation of the appropriate RBC charge.

Additional information on NCREIF and the NCREIF Property Index (NPI) can be found here:
https://www.ncreif.org/public_files/NCREIF_Data_and_Products_Guide.pdf

Appendix 2

The difference between market value and statutory value (depreciated cost) is not included in surplus within statutory accounting. As a result, the risk of future impairments of statutory value would be much less for a company where the current market value of its portfolio of properties is well in excess of statutory carrying value, especially compared to one where market value is much closer to statutory carrying value.

Our primary analysis was based on market values, and therefore overstates the risk relative to statutory accounting. We are not proposing that statutory accounting for commercial real estate should change, but rather partially leveling the playing field for properties that have been held for extended periods with market value well in excess of statutory carrying value, versus recent acquisitions with no such unrealized gains. And we are proposing a floor charge equal to that for an NAIC 2 bond (currently 1.30%) so that capital will never be lower.

The following provides a numerical example. Assume a property held at a book value of $100 with a market value of $150. The NCREIF data measures changes in market value, and the ***11%*** proposed factor would make provision for a loss of value to a value down to $133.50. Under the RBC process, factors are applied to the book value and normally do not recognize that unrealized gain. Since real estate is held at book value which in this case is $100, and is below this market value, effectively there an increased margin against the loss of statutory capital in excess of the amount of RBC.

For an asset with a market value well in excess of the carrying value, the reduction in RBC is minimal compared to the large-implied reserve. Similarly, in those relatively few circumstances where an asset will have a market value less than book value, the RBC amount would increase, to reflect the increased likelihood of a loss to carrying value. This increase in RBC would likely be in advance of an actual impairment, which would provide earlier visibility and recognition of weakening market conditions.

Draft: 3/8/21

Life Risk-Based Capital (E) Working Group
Virtual Meeting
February 11, 2021

The Life Risk-Based Capital (E) Working Group of the Capital Adequacy (E) Task Force met Feb. 11, 2021. The following Working Group members participated: Philip Barlow, Chair (DC); Steve Ostlund (AL); Thomas Reedy (CA): Deborah Batista (CO); Wanchin Chou (CT); Sean Collins (FL); Vincent Tsang (IL); Mike Yanacheak (IA); John Robinson (MN); William Leung (MO); Rhonda Ahrens (NE); Seong-min Eom (NJ); Bill Carmello (NY); Andrew Schallhorn (OK); Mike Boerner (TX); and Tomasz Serbinowski (UT).

1. Discussed the Moody's Analytics Report on Bonds

Amnon Levy (Moody's Analytics) presented Moody's Analytics' report on the proposed revisions to the risk-based capital (RBC) C-1 bond factors (Attachment Three-B1) and as summarized in the accompanying PowerPoint presentation (Attachment Three-B2).

Mr. Levy discussed the background of the project and why Moody's Analytics was chosen as detailed on Page 5 of the PowerPoint presentation. He discussed the request for proposal (RFP) requirements, which were to assess the proposed required capital factors for the default risk on bonds, Moody's Analytics' objective opinion and its practical recommendations. He then discussed the factors that the American Academy of Actuaries (Academy) proposed.

Mr. Levy noted the defined scope of the project the Academy was given from the NAIC, which was limited to updating the data given that the bond factors were estimated some time back along with an expansion to 20 designations, recognizing that the six designations were too course and maintaining the modeling structure that was designed 30 years ago. He said the report is not limited to that defined scope but takes a much broader view, recognizing that the markets, techniques and data have evolved with capital markets. He presented Moody's Analytics' key findings, which include areas of concern with regard to best practices with data and modeling choices, as well as model documentation both within the defined scope and outside of the defined scope. These are detailed in Pages 9–11 of the presentation.

Mr. Levy discussed the next steps Moody's Analytics is proposing, which include: 1) the phase 1 delivery of factors for exposure before April 30; and 2) a longer-term phase 2, which addresses modeling and data updates outside the defined scope.

As a reminder, Mr. Barlow said the Working Group was given direction by the Financial Condition (E) Committee to have new bond factors for 2021 and to take into consideration analysis prepared by the consultant for the American Council of Life Insurers (ACLI). He said his plan is to have new factors proposed for 2021 while providing as much support as possible to the consultant on their work to try to provide factors for the Working Group to consider within the necessary time frame. However, he said he believes it is an incredibly aggressive time frame for producing something as significant as new alternative bond factors, exposing them for comment, getting consensus and considering them for adoption.

Given that, Mr. Barlow proposes moving ahead with the work from Moody's Analytics to see what it develops but also move forward with the proposed factors from the Academy so that the Working Group can expose both before the end of April. He said the Investment Risk-Based Capital (E) Working Group discussed the Academy's factors before the tax law change, so they will need to be updated. He said he would also propose a state insurance regulator modification to the portfolio adjustment to address concerns that it could be onerous to small insurers.

2. Exposed the Alternatives for the Requested Modification to the Mortgage Reporting Guidance

Mr. Barlow said a request was received from the ACLI and the Mortgage Bankers Association (MBA) (Attachment Three-B3) to extend the guidance that the Working Group issued in 2020. He said two alternatives have been drafted, one modifying the original guidance document and one presenting the change as a new document.

The Working Group agreed to expose both alternatives for a 10-day public comment period ending Feb. 22.

Having no further business, the Life Risk-Based Capital (E) Working Group adjourned.

Moody's Analytics

February 2021

Assessment of the Proposed Revisions to the RBC C1 Bond Factors

Prepared for NAIC National Association of Insurance Commissioners *and the* ACLI Financial Security for Life

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Throughout this document, "Moody's" rating refers to an MIS rating. And while this report references MIS, it is written by and reflects the views and opinions solely of Moody's Analytics.

Table of Contents

1 Executive Summary

This report follows in response to the awarded request for proposal (RFP) put forth on October 22, 2020 by the American Council of Life Insurers (ACLI) in conjunction with the National Association of Insurance Commissioners (NAIC). We document Moody's Analytics objective assessment of the proposal for updating RBC C1 bond factors (the C1 Factor Proposal), including the modeling process, the development of assumptions from underlying experience, and related adjustments to reflect the diversification of individual company portfolios used in investment risk factors for fixed income assets, as documented in the Model Construction and Development of RBC Factors for Fixed Income Securities for the NAIC's Life Risk-Based Capital (RBC) Formula, by the American Academy of Actuaries (the Academy) C1 Work Group (American Academy of Actuaries, 2015), under the instruction of the NAIC's Life RBC Work Group.[1]

In addition to providing a comprehensive review of the underlying data, assumptions, methodologies, their resulting potential biases, and their materiality, this report provides a set of practical recommendations to better quantify the identified risks intended to be captured by the RBC C1 bond factors (C1 factors). We recognize that the C1 factors, and thus the models that underpin those factors, can impact business decisions, which ultimately impact solvency. Recommendations will be based on data and modeling approaches recognized as best practice, demonstrate past performance, and rest on sound model risk management guidelines, specifically model validation that includes back-testing and performance benchmarking.[2]

Before proceeding with our recommendations, Moody's Analytics recognizes that the scope of the Academy's work was defined by the NAIC RBC Working Group (the Defined Scope). This report does not, generally, consider the "time, budget and complexity constraints" faced by the Academy in their referenced report *(American Academy of Actuaries, 2015)*. We also recognize that this report does not generally consider the direct or indirect costs of adopting any of the recommendations into the RBC framework and related practicalities. These costs include devoting resources to develop and implement models, data collection, model maintenance, and costs encompassing expertise, governance, and control mechanisms, such as policies and procedures, controls and compliance to ensure proper model use, and implications for organizational structure — at life insurance companies or the NAIC.[3] Rather, as specified in the RFP, this report focuses on the considerations, assumptions, and methodologies used by the C1 Factor Proposal and the extent to which the C1 factors capture the risks outlined above.

With these observations in mind, this report identifies two areas of potential concern that make us question the effectiveness of the proposed C1 factors, considering the possible impact on business decisions and solvency that are further discussed in **Table 1**, **Table 2,** and **Table 3**.

1. The use of best practices with data and modeling choices. This includes items within the Defined Scope, as well as items outside of the Defined Scope, that Moody's feels are relevant and material. In particular:
    a. The C1 RBC base factors were estimated using an economic state model that does not lend itself to capturing properties and overcoming limitations associated with the default and recovery rate data.
    b. The lack of differentiation across asset classes (corporate, structured, and municipal credit, for example), maturity, and investment income offsets.
    c. Overly conservative assumption for the risk premium, as well as dated discount rate and tax assumptions.
    d. The use of construction of representative portfolios and the separate analysis of each rating category.
    e. The use of multiple NRSROs given their comparability.
    f. Lack of consideration of climate hazards or emerging risks (e.g., pandemic or cyber) that may not be explicitly incorporated into NRSRO ratings and may not be reflected in the historical data used in estimating C1 factors.
2. Model documentation, including model validation and limitations and general prudent model risk management. This is critical for ongoing model monitoring and model updates. With limited articulation of model limitations, the potential for distorted business use and implications for solvency warrants further investigation into the proposed factors. The lack

[1] In addition, this report relies on supporting documentation of the development of assumptions and modeling processes, updated recommendations (American Academy of Actuaries, 2017), and stakeholder feedback.
[2] While (American Academy of Actuaries, 2015) contains Appendix G – Model Validation, Moody's Analytics is not aware of a report that provides a comprehensive assessments of model performance against historic losses or benchmarks.
[3] For guidance on sound model risk management, please see (Board of Governors of the Federal Reserve System and Office of the Comptroller of the Currency , 2011) and references therein.

of documentation and validation related to the portfolio adjustment function and its material impact on C1 factors stands out in particular.

Moody's Analytics is aware of the significant effort involved in creating a broader redesign of the C1 factors. Thus, we suggest phasing-in model development and implementation, data collection, model maintenance, and governance processes. Given the tight April 2021 deadline, Moody's Analytics suggests a Phase 1 redesign that focuses on the portfolio adjustment function and the "slope" of charges across credit ratings (addressing a number of the inputs and elements of the modeling discussed in this report), adhering to the model risk management practices referenced in this report. In addition, Phase 1 should include an articulation of model limitations related to the other items referenced in this document at a level of detail and adhering to a timeline to be determined jointly with stakeholders. Phase 2 would address items that require a longer timeline and would be determined jointly with stakeholders. While we do not expect completion of Phase 2 in 2021, Moody's suggests starting Phase 2 as soon as practical, prior to completion of Phase 1, recognizing the lead time needed for data collection and research. We discuss further details at the end of this document.

Table 1 and Table 2 present the Summary of Moody's Analytics Significant Areas of Review and Recommendations of key inputs and of the modeling framework that cover Moody's Analytics understanding of the Defined Scope. The recommendations reflect the evolution of new data and techniques that can better describe credit risk since the original C1 factors released in 1992. The recommendations also reflect the increase in size and complexity of life insurance exposure to credit and, therefore, credit risk — in lock-step with credit markets themselves. [4] The recommendations are also influenced by how other regulators, globally, have continued adopting new guidelines to better manage the risks related to growth in credit markets, with an eye toward regulatory arbitrage that is recognized to potentially distort business decisions and solvency.[5] The recommendations recognize constraints that are cited in the C1 Proposal (American Academy of Actuaries, 2015): (1) RBC must be an auditable value, calculated from published financial statements; (2) the C1 component must be based on the credit ratings reported in the NAIC Annual Statement; and (3) the C1 component must represent the statistical safety level prescribed by the NAIC. Essentially, the recommended C1 factors have been developed using a similar methodology to the current factors. Moreover, no single improvement should be made in isolation without consideration of the overall implications of the change, recognizing the overall objectives of C1 factors and potential implications for business decisions that can ultimately impact solvency. Moody's arrived at these conclusions objectively and independently.

Table 1: Summary of Moody's Analytics Significant Areas of Review and Recommendations of Key Inputs

Default Rates	The methodologies used by the C1 Factor Proposal to construct default rates across ratings, as well as methodologies used in differentiating default rates across expansion and contraction states, face data limitation challenges. Moody's recommends updating the methodologies and using additional data referenced in the review that have been demonstrated to better capture credit dynamics.
Recovery Rates	The C1 Factor Proposal's method used to recognize the recovery date does not align with the date of default. This deviation can result in bias with recovery rate levels, as well as their relationships with default rates. Moody's recommends exploring the use of more accurate data and groups when describing recovery distributions and utilizing more current techniques that link recovery with the credit environment.
Discount Rate	Since the modeling work was conducted by Academy in 2015, the discount rate used in the model is calculated using historic data that does not reflect the current low-interest environment, nor the expected continuation of a low interest rate environment. Moody's Analytics recommends updating the discount rate to include December 31, 2013 – December 31, 2020 data to better reflect the current and expected interest rate environment, in conjunction with updated tax assumptions that reflect the 2017 Tax Act.
Construction of the Representative Portfolio	The segmentation and filtering of the sample portfolios used to construct the representative portfolio lack economic justification or sensitivity analysis. For example, for reasons not explained, only NAIC1 and NAIC2 rated issuers are used to determine the number of bonds in the representative portfolio for all rating categories. In addition, each representative portfolio ultimately used in the simulation contains one rating category, which makes the final C1 factors heavily dependent on portfolio adjustment factors. Given the importance of the representative portfolio, we recommend more comprehensive documentation and

[4] In 1992, structured assets were few (outside RMBS), the corporate credit market was on the order of one seventh of what it has been in recent years (Rennison, 2020); life insurers generally hold ~35-50% of corporate issuance (OECD Capital Markets Group, 2020).
[5] For a discussion that explores aligning economic risks and regulatory capital as well as regulatory arbitrage, please see (Basel Committee on Banking Supervision, 2013). For empirical analysis exploring evidence and impact of regulatory arbitrage in European banking and the Financial Crisis, see (Beltrattiab & Paladinocd, 2016). For empirical analysis exploring the evidence of regulatory arbitrage and its impact on overall default risk of banks for the Supplementary Leverage Ratio requirements (the U.S. implementation of the Basel III Tier 1 leverage ratio), see (Federal Reserve Bank of New York, 2019).

	robustness tests that can show whether the segmentation and filtering method has material impact on the C1 factors and explore the option of constructing a representative portfolio that contains all rating categories.
Tax Assumptions	The U.S. corporate tax rate was lowered from 35% to 21% in accordance with the 2017 Tax Reconciliation Act (Deloitte, 2018). Net capital gains included in the taxable income are subject to the 21% rule (CCH Group, 2019). While the model was developed based on historical data before the tax cut, the RBC factors, if adopted, will be applied to insurers, which will pay the updated tax rate. It will be worthy to consider updating the assumed 35% tax rate to 21%. Moody's recommends analysis reflecting the current tax environment.

Table 2: Summary of Moody's Analytics Significant Areas of Review and Recommendations of Modeling Framework

Economic State Model	We have three main concerns regarding the economic state model, which are closely related to the discussion in Section 3.1. First, the two-state model does not accurately capture persistency in default and recovery rates across the credit cycle. Second, the economic state of Loss Given Default (LGD) appears to be mistakenly disconnected from that of default rate for ratings Baa-Caa. Third, the scaling factor used in differentiating default rates across expansions and contractions appears to be overly punitive for the investment-grade segment compared with historical patterns. Moody's recommends a more holistic review of the choice of a framework that can address broader sets of issues, including more precise differentiation across asset classes, as discussed in other sections.
Portfolio Adjustment Factors	The portfolio adjustment factor is one of the most important elements of the model, as it ultimately determines the general RBC level for individual insurers. Unfortunately, documentation is limited, making it difficult to access the materiality of some of the modeling choices. In addition, the limited documentation available suggests a potential material gap between the calculated C1 factor and its target level for individual insurers, especially smaller ones. Moody's recommends: (1) more detailed documentation of the adjustment factor and the underlying economic justification, in conjunction with the doubling of C1 factors for the top-10 largest issuers; (2) further exploring the data and methods used to estimate the portfolio adjustment factors, to ensure they are effective for corporate as well as non-corporate issuers, (3) design the factors to align incentives with the economic risks, and (4) design a structure that brings together the portfolio adjustment factors along with the doubling of C1 of the 10 largest issuers.
Risk Premium	The current assumption of setting the Risk Premium equal to expected loss appears to be overly conservative. While the C1 Factor Proposal recognizes the inconsistency, they point out that the 1992 guidelines defined the Risk Premium in this way and, in conjunction with other parameters, some of which (e.g., AVR) are beyond the scope of this report. While Moody's appreciates the desire to incorporate conservativeness into assumptions, inputs for which accurate proxies are available should be directly used, and rather incorporate the conservative overlay into the final steps to facilitate model transparency. Moody's recommends a broader evaluation of the various interconnected modeling decisions that lead to setting the Risk Premium at the expected loss level, and aligning the models with a general consensus across the actuarial community, including setting the Risk Premium at a one standard deviation loss.

In reviewing the C1 Proposal, Moody's Analytics found several aspects to the underlying modeling and data that were outside of the Defined Scope worth incorporating into this report, included in **Table 3**.

Table 3: Summary of Moody's Analytics Significant Areas of Review and Recommendations of Elements Outside of the Defined Scope

Applicability of Moody's Rated Corporate Data to Other Asset Classes	C1 RBC base factors were developed using Moody's default rate data on Moody's rated public corporate bonds (this report, as well as references herein, uses public corporate and Moody's rated corporate interchangeably) supplemented with S&P's recovery data. After controlling for ratings, we find material differences in observed default, migration, and recovery dynamics across asset classes. These differences question the effectiveness of using public corporate bond data for all asset classes. Moody's Analytics recommends evaluating the possibility of estimating distinct C1 factors using asset-class specific data. For private placements, in particular, Moody's recommends exploring a centralized collection of default, migration, and recovery data that can later be used in further estimating distinct C1 factors and for other purposes.
Simulation and Correlation	The current C1 factor model does not account for variation in cross-industry and cross-asset class concentration risks nor diversification that may be different across life companies' portfolios. These variations can be material, and we recommend additional analysis that assesses the materiality of abstracting from cross-industry and cross-asset class differentiation.

Maturity Effect on Capital Factors	The C1 factors do not differentiate risk across maturity. This can create a material distorted incentive to hold longer-dated bonds whose credit risk is more sensitive to the credit environment. Moody's recommends exploring a maturity adjustment to the C1 factors.
Investment Income Offsets	While investment income can be used to offset loss and support statutory surplus, the C1 factors are modeled with the implicit assumption that all investment profits are fully distributed to policyholders or used to absorb product or operational losses. This introduces a potential bias in differentiating investment income across assets, across rating categories, and across asset classes. Accounting for such heterogeneity in investment income can potentially lead to substantial differences in RBC factors across ratings and asset classes. Moody's recommends more accurately differentiating investment income across assets in the C1 factors.
Comparability Across NRSROs	The model is developed using Moody's rating only. However, NAIC rating designations are often determined by a set of NRSROs ratings. NRSROs have unique differences in credit rating methodologies and do not provide correspondence because they base their credit ratings on a range of qualitative, as well as quantitative, factors. This creates a challenge when mapping ratings across NRSROs to the various NAIC rating designations. It is plausible that the properties (such as default rate, recovery, etc.) of the NAIC rating in practice are substantially different from those of Moody's rating used in the model development. With this in mind, we recommend an assessment of variation across NRSROs rating migration, default, and recovery rates, and across the credit cycle. If this is not possible because of, say, lack of historical data, Moody's Analytics recommends revisiting the use of the second-lowest NRSROs rating in assigning the NAIC designation.
Climate Hazards and Emerging Risks	The C1 factors do not explicitly consider climate hazards or emerging risks (e.g., pandemic or cyber). These risks may not be explicitly incorporated into NRSRO ratings and may not be reflected in the historical data used in estimating the C1 factors. While climate hazards are particularly relevant for the likes of real estate and municipal credit, growing evidence suggests climate hazards and other emerging risks can be material for corporate credit. Moody's Analytics recommends exploring the potential impact of climate hazards and emerging risks on C1 factors across asset classes.

The remainder of this report is organized as follows:

- Section 2 provides Moody's Analytics' general understanding of the C1 factor proposed model.
- Section 3 reviews the key model inputs.
- Section 4 reviews the different model components.
- Section 5 reviews model elements outside the Defined Scope.
- Section 6 concludes and suggests next steps.

It is important to note that Moody's Analytics does not have access to the C1 Factor Proposal's model, data, or final comprehensive technical documentation. Moreover, there have been multiple revisions to the proposed C1 factors. Moody's Analytics has obtained the ACLI model rebuild, which closely replicates the published C1 factors. This rebuild does not include key elements such as the portfolio concentration adjustment or the model that assigns RMBS/CMBS NAIC ratings. While structured asset rating designations are out of scope in this report, we do opine on the effectiveness of corporate factor use. The ACLI's replicated model and the C1 Factor Proposal's methodology papers, along with written communications between the two institutions, were used to review and assess the modeling approach and assumptions. The recommendations and proposals that follow are based on Moody's Analytics' best understanding of the current proposal.

2 General Description of the C1 RBC Proposed Model

The NAIC establishes RBC formulas used to identify potentially weakly capitalized insurance companies. RBC establishes a de facto minimum amount of capital to be held by insurers in order to avoid regulatory intervention. This minimum capital amount protects statutory surplus from the fluctuations that reduce statutory surplus, including credit risk, deferral risk, subordination risk, and event risk.[6]

C1 capital provides protection from statutory insolvency due to losses in statutory asset value resulting from bond defaults, common stock depreciation, and other changes associated with investment activity flowing through statutory surplus.

The prevailing C1 factors were implemented and reported in 1994 with reference to 1970–1990 default experiences. The C1 Factor Proposal was revised multiple times during the 2015–2019 period in response to stakeholder feedback. While the proposed C1 factors were developed based on the loss experience of public U.S. corporate bonds, the same set of factors were recommended for all fixed income securities in NAIC's Schedule D, which is used to report long-term bonds and stocks owned, acquired, sold, redeemed, or otherwise disposed of by insurers during a year. RMBS/CMBS securities are generally filed to NAIC Securities Valuation Office (SVO) and assigned NAIC designations through a financial modeling process conducted by the NAIC Structured Securities Group (SSG), subject to limited filing exemptions (NAIC Securities Valuation Office and NAIC Structured Securities Group, 2019). C1 factors are applied to RMBS/CMBS securities based on the NAIC designations. Based on discussions with the ACLI, other structured securities are treated identically as bonds and are not required to go through the NAIC designation process.

C1 capital charges are intended to cover the 96th percentile portfolio loss in excess of those anticipated in the statutory reserve over a 10-year horizon. Statutory reserve is reflected in the capital fund as Risk Premium, which is currently modeled as the level of annual mean loss from default (after tax and considering recoverable tax on default loss) derived from baseline default and recovery rate assumptions. Risk Premiums are assumed to earn 5% pre-tax interest per annum.
Key inputs to the framework are as follows:

1. Baseline default rates are estimated using 1983–2012 default data, sourced from Moody's (Moody's Investors Service, 2013) as referenced in (American Academy of Actuaries, 2015). For each rating, the marginal default rates in Years 1 through 10 are smoothed using a 4th degree polynomial regression to remove noise. Default rates are differentiated across economic states (e.g., expansion or contraction) using a set of estimated scalars.
2. Baseline recovery rates are estimated using recovery data of senior unsecured bonds provided by Standard & Poor's, covering 1987–2012.
3. Representative portfolios for the seven size categories are constructed based on the corporate bond holdings of life insurers provided by NAIC to the Academy. The final representative portfolio size is set as $10–25 billion USD. Issuers' holding amounts are estimated from a sample of actual life insurers' portfolios (see Section 3.4 for details). Note, only the holding amounts of NAIC-1 and NAIC-2 issuers (824 total) in this portfolio are used to determine the holding amount for each bond in the portfolio, for every rating category in the simulation model. In other words, the representative portfolio for each rating category only differs by issuer rating.

With key inputs in hand, the C1 factor for each rating category is calculated separately through simulation methods. It represents the amount of initial funds needed to cover the 96th percentile greatest default loss over 10 years, offset by statutory reserve, proxied through each rating's Risk Premium. The modeling framework relies on the following calculation steps:

1. Simulate annual economic state for 10 years.
2. The default rate for each rating category in each year is determined by applying a leveled economic state scalar to the baseline default rate, adjusting it up or down according to the simulated economic state.
3. Based on the simulated economic state, simulate a random loss given default (LGD) value for each year, from one of the two distributions (from Step 1) corresponding to the economic state.
4. Simulate representative portfolio loss in each year for each rating category based on the default rate, recovery rate, and the assumptions on Risk Premium and tax, etc. Determine the maximum cumulative portfolio loss with consideration of recoverable tax on default loss in the 10-year period.

[6] American Academy of Actuaries Report of the Invested Assets Work Group regarding the C-1 Framework, to the NAIC's Life RBC Work Group, June 2011. http://actuary.org/files/publications/C1_Framework_Report_061011.pdf (American Academy of Actuaries, 2011).

5. Set the base C1 factor for each rating category as the initial fund required on top of Risk Premium to cover the maximum loss at 96th percentile safety level.[7] The values of these factors in the latest proposal are presented in the last column of **Table 4**.
6. Double the C1 factor of the ten largest issuers held across all debt-related asset classes. The initial filter excludes bonds with C1 RBC equal to zero and NAIC-1 bonds. As applicable after the first filter, if a top-ten issuer has NAIC-1 bonds, they are added back. Up to ten bond issuers of a bond portfolio can be subject to the top-ten doubling rule for concentration risk.
7. Apply the base C1 factors on 677 actual life-insurer portfolios to examine the expected capital coverage for a portfolio with different sizes and to determine the corresponding portfolio adjustment factor that results in enough capital for the portfolio at the 96th percentile safety level. **Table 5** presents the final proposed adjustment factors.

Table 4: Base C1 Factor[8]

	Current	August 2015	June 2017	Sept 2017
Aaa	0.40%	0.28%	0.22%	0.31%
Aa1	0.40%	0.43%	0.32%	0.43%
Aa2	0.40%	0.63%	0.44%	0.57%
Aa3	0.40%	0.79%	0.56%	0.72%
A1	0.40%	0.96%	0.68%	0.86%
A2	0.40%	1.13%	0.82%	1.06%
A3	0.40%	1.30%	0.98%	1.24%
Baa1	1.30%	1.49%	1.13%	1.42%
Baa2	1.30%	1.68%	1.32%	1.69%
Baa3	1.30%	2.01%	1.57%	2.00%
Ba1	4.60%	3.55%	2.88%	3.75%
Ba2	4.60%	4.39%	3.74%	4.76%
Ba3	4.60%	5.62%	4.89%	6.16%
B1	10.00%	5.99%	5.07%	6.35%
B2	10.00%	7.86%	6.89%	8.54%
B3	10.00%	10.31%	9.45%	11.82%
Caa1	23.00%	14.45%	13.87%	17.31%
Caa2	23.00%	19.85%	19.02%	23.22%
Caa3	23.00%	29.82%	29.06%	34.11%*

Source: (American Academy of Actuaries, 2017)

Table 5: Portfolio Adjustment Factor

Current PA Formula			Recommended PA Formula (September 2017)		
	Issuers	Factor		Issuers	Factor
Up to	50	2.50	Up to	10	7.80
Next	50	1.30	Next	90	1.75
Next	300	1.00	Next	100	1.00
Over	400	0.90	Next	300	0.80
			Over	500	0.75

Source: (American Academy of Actuaries, 2017)

[7] Note, the target percentile for base RBC factors for individual exposure before portfolio adjustment factor has been updated from the 92nd to the 96th percentile. See correspondence by American Academy of Actuaries (2017) for details.
[8] The factor for Caa3 should be capped at the 30% factor for unaffiliated common stock. Under the current RBC scheme, the factor for NAIC 6 bonds in or near default is set equal to the base factor for unaffiliated common stock (American Academy of Actuaries, 2017).

The following sections examine the various input and methodology steps, exploring the underlying assumptions, potential biases, and materiality, along with recommendations. Section 3 focuses on key inputs. Section 4 explores the modeling framework.

3 Key Inputs to the Framework

This section reviews the key inputs used in the C1 RBC proposed model. We explore the underlying data, along with the assumptions and methodologies, potential biases, and materiality, along with recommendations. This section is organized as follows: Section 3.1 explores the baseline default rates, Section 3.2 explores LGD, Section 3.3 explores the discount rate, Section 3.4 explores the construction of the representative portfolio, and Section 3.5 explores the tax assumptions.

3.1 Default Rates

This section explores the cohort methodology and data used in estimating baseline default rates, as well as the path-dependent behavior of ratings and associated default rates.[9]

3.1.1 Summary of Moody's Analytics Significant Areas of Review and Recommendations

The methodologies used in the C1 Factor Proposal to construct default rates across ratings, as well as methodologies used in differentiating default rates across expansion and contraction states, face data limitation challenges. Moody's recommends updating the methodologies and using additional data referenced in the review that have been demonstrated to better capture credit dynamics.

3.1.2 Review and Analysis Performed by Moody's Analytics

The C1 Factor Proposal takes a cohort approach, whereby all bonds of a given rating, as of a given start date, are kept track of over time. For example, all A2-rated bonds on January 1, 1995 make up a cohort. Experience for each cohort is measured over the following calendar years without considering any rating change subsequent to the cohort start date.

For each rating, the C1 Factor Proposal smoothed the recommended default rate using a 4th degree polynomial regression to remove noise as presented in **Table 6**. The C1 Factor Proposal noted, "In analyzing the raw Moody's cohort data, issues with data credibility were observed in cells with scarce data. Therefore, a smoothing technique was applied to create smooth probability of default curves across ratings and experience years."

Table 6: Smoothed (Across Ratings) Spot Default Rates-4th Degree, based on 2012 Moody's Study

Rating	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Aaa	0.0006%	0.0035%	0.0003%	0.0429%	0.0353%	0.0331%	0.0276%	0.0276%	0.0276%	0.0276%
Aa1	0.0019%	0.0093%	0.0081%	0.1006%	0.0694%	0.0575%	0.0459%	0.0459%	0.0459%	0.0459%
Aa2	0.0060%	0.0205%	0.0334%	0.1778%	0.1132%	0.0883%	0.0714%	0.0714%	0.0714%	0.0714%
Aa3	0.0152%	0.0401%	0.0853%	0.2503%	0.1628%	0.1277%	0.1085%	0.1149%	0.1147%	0.1302%
A1	0.0321%	0.0714%	0.1617%	0.2958%	0.2166%	0.1798%	0.1621%	0.1909%	0.1930%	0.2192%
A2	0.0587%	0.1186%	0.2475%	0.3102%	0.2759%	0.2485%	0.2364%	0.2788%	0.2810%	0.3160%
A3	0.0963%	0.1866%	0.3237%	0.3065%	0.3444%	0.3374%	0.3348%	0.3761%	0.3744%	0.4137%
Baa1	0.1463%	0.2813%	0.3777%	0.3050%	0.4280%	0.4516%	0.4613%	0.4853%	0.4750%	0.5119%
Baa2	0.2115%	0.4094%	0.4078%	0.3258%	0.5357%	0.5994%	0.6233%	0.6139%	0.5906%	0.6172%
Baa3	0.2980%	0.5802%	0.4224%	0.3876%	0.6810%	0.7939%	0.8316%	0.7749%	0.7352%	0.7424%

Source: (American Academy of Actuaries, 2015)

Two aspects of the approach warrant further exploration. First, the fundamental limitations of the data, as it relates to the framework, i.e., statistical properties of the data (e.g., path-dependent behavior) and the number of observations per rating category. Second, the use of the cohort approach.

We begin with an observation (Moody's Investors Service, 2020 (1)): Moody's credit ratings are opinions of ordinal, horizon-free credit risk and, as such, do not target specific default rates or expected loss rates. Moody's believes the needs of market

[9] The term "path-dependent," recognizes the history of a bond's rating as well as its current rating affects the bond's future rating state and migration. For example, a bond that has experienced a recent rating action may be less likely to experience an additional rating action in the immediate future, when compared to an otherwise identical bond. An equivalent term, non-Markovian, is often also used in references herein.

participants are best served by ratings that are assessments of relative credit risk rather than cardinal risk measures. Indeed, rating transitions are path-dependent. By the same logic, neither are migrations implicit in the cohort default rates term structures. Thus, one should recognize that using ratings data in this way does not consider potentially material time-series dynamics.

While the use of a cohort approach is legitimate in principle, limitations must be understood. Limitations cited by authors of the C1 Factor Proposal with the number of observations per rating category and noted challenges with subsets of data, such as the change in ratings methodology in the financial sector after the financial crisis in 2008–2009, are well recognized (Moody's Investors Service, 2020 (1)). While the C1 Factor Proposal recommends the smoothing method that best fits the original data, it is not clear if this chosen performance criteria makes sense in light of the data limitations (i.e., statistical properties and number of observations). Fitting a smoothing function on noisy data can often lead to a poor description of reality. This issue is exacerbated by poor statistical properties, including the path-dependent nature of default rates.

The C1 Factor Proposal recognizes this point when considering combining transition tables with default rates while incorporating credit migration. However, they also cited the observed and legitimate challenge that the progression of ratings transition for a bond is path-dependent. This challenge is prevalent in the cohort approach as well. We return to path-dependency related issues later in this section.

While challenges abound, we transition to an alternative point of reference. Moody's Idealized Default Rates, presented in **Table 7**, provide a benchmark for default rates across ratings. This was independently suggested by ACLI technical experts based on interviews.[10]

Table 7: Moody's idealized annual spot expected default rates used as benchmark default probability rates in Moody's rating models

Rating	1-Year	2-Year	3-Year	4-Year	5-Year	6-Year	7-Year	8-Year	9-Year	10-Year
Aaa	0.0001%	0.0001%	0.0005%	0.0011%	0.0011%	0.0011%	0.0012%	0.0014%	0.0016%	0.0018%
Aa1	0.0006%	0.0024%	0.0070%	0.0110%	0.0100%	0.0110%	0.0120%	0.0130%	0.0150%	0.0180%
Aa2	0.0014%	0.0066%	0.0180%	0.0210%	0.0210%	0.0210%	0.0220%	0.0240%	0.0290%	0.0361%
Aa3	0.0030%	0.0160%	0.0400%	0.0420%	0.0410%	0.0411%	0.0441%	0.0451%	0.0552%	0.0732%
A1	0.0058%	0.0312%	0.0800%	0.0721%	0.0721%	0.0692%	0.0763%	0.0743%	0.0934%	0.1277%
A2	0.0109%	0.0591%	0.1521%	0.1233%	0.1224%	0.1165%	0.1277%	0.1199%	0.1543%	0.2202%
A3	0.0389%	0.1111%	0.2103%	0.1807%	0.1910%	0.1813%	0.2018%	0.1921%	0.2229%	0.2843%
Baa1	0.0900%	0.1902%	0.2808%	0.2715%	0.2723%	0.2730%	0.3042%	0.3051%	0.3060%	0.3377%
Baa2	0.1700%	0.3005%	0.3617%	0.3731%	0.3846%	0.3963%	0.4488%	0.4509%	0.4014%	0.3721%
Baa3	0.4200%	0.6327%	0.6670%	0.6817%	0.6863%	0.6704%	0.6542%	0.6690%	0.6314%	0.5613%
Ba1	0.8700%	1.1601%	1.1329%	1.1046%	1.1273%	1.0241%	0.8640%	0.8930%	0.8685%	0.7776%
Ba2	1.5600%	1.9403%	1.7715%	1.7085%	1.7275%	1.4849%	1.0307%	1.0750%	1.1207%	0.9731%
Ba3	2.8100%	2.7781%	2.4976%	2.0840%	2.2946%	1.8493%	1.3062%	1.2766%	1.1864%	1.1406%
B1	4.6800%	3.8817%	3.4927%	2.5673%	2.6349%	2.1102%	1.5102%	1.3602%	1.2661%	1.2189%
B2	7.1600%	4.8578%	4.3926%	3.0551%	3.1513%	2.4467%	1.7582%	1.5002%	1.4295%	1.3283%
B3	11.6200%	5.6461%	5.3004%	3.8116%	3.9626%	2.9472%	2.5424%	2.2899%	1.7799%	1.6913%

Source: Moody's Investor Service updated October 25, 2018, represented as Year *n* Annual Spot = (Year *n* Cumulative - Year *n-1* Cumulative)/(1-Year *n-1* Cumulative)

Before proceeding, it is important to understand the purpose and use of Moody's Idealized Default Rates that have remained unchanged since 1989. Per the most recent Rating Symbols and Definition (Moody's Investors Service, 2020 (1)):

> To rate some obligations in some asset classes, however, Moody's uses models and tools that require ratings to be associated with cardinal default rates, expected loss rates, and internal rates of return in order for those models and tools to generate outputs that can be considered in the rating process. For these purposes, Moody's has established a fixed common set of default rates, expected loss rates, and internal rates of return that vary by rating category and/or investment horizon (Moody's Idealized

[10] The question of applicability of the corporate data for other asset classes is discussed in Section 5.1.

Default and Expected Loss Rates;[11] hereafter called "Moody's Idealized Rates"). By using a common fixed set of benchmark parameters, rating models are more likely to provide consistency with respect to the estimation of relative risk across rating levels and investment horizons and can be more easily compared to one another. Moody's Idealized Rates are used with other tools and assumptions that have a combined effect on model outcomes. While cardinal measures are used as inputs to models, the performance of ratings is benchmarked against other metrics.[12] Although Moody's Idealized Rates bore some degree of relationship to corporate default and loss experience at the time they were created, that relationship has varied over time, and Moody's continuing use of the Idealized Rates for modeling purposes does not depend on the strength of that relationship over any particular time horizon. When we perceive changes in risk that necessitate changes in our credit analysis, we make revisions to key assumptions and other aspects of models and tools rather than changing this fixed common set of benchmark parameters. This approach enables us to make adjustments that only affect the particular sectors and asset classes we expect will experience significant changes in risk at a given time.

A casual comparison across the two-term structures highlights important differences. For example, monotonically increasing spot rates for the high-grade universe is commonly recognized as high-quality credit that is more likely to deteriorate than improve; this condition is not met with the recommended baseline term structure. With this, we do recognize that the Idealized Default Rates are not intended to match historical or future ratings performance.

Next, we consider modeling default rates across contraction and expansion economic states, closely related to path-dependency issues with the data. We apply a distinct, single multiplier to each rating baseline default rate. While, in spirit, the approach makes sense, practicalities do not lend themselves in describing the tendencies for the default rate term structure to tilt and become upward (or less downward) sloping during a benign environment and more downward (or less upward sloping) during a deteriorated environment (Beygi, Makarov, Zhao, & Dwyer, 2016). Section 4.1 further discusses the challenges associated with the economic state framework.

With these factors in mind, material improvements in techniques and data availability have been made, allowing more accurate capturing of nuanced time series dynamics for rating migration and default across credit environments that address the observed path-dependent behavior of ratings. These approaches are used in practice by a wide range of institutions, as documented in a number of methodology papers by Moody's (Moody's Analytics, 2020) and others, such as (Lando & Skødeberg, 2002) and (Aguais, Forest, & Wong). Moody's Analytics recommends exploring these approaches. Section 4.1 further discusses the economic state model.

3.2 Recovery Rates

3.2.1 Summary of Moody's Analytics Significant Areas of Review and Recommendations

The method used by the C1 Factor Proposal to recognize the recovery date does not align with the date of default. This deviation can result in bias with recovery rate levels, as well as their relationships with default rates. Moody's Analytics recommends exploring the use of more accurate data and groups when describing LGD distributions and utilizing more current techniques that link recovery with the credit environment.

3.2.2 Review and Analysis Performed by Moody's Analytics

The C1 Factor Proposal estimates two empirical distributions of LGD, for economic contraction and expansion, respectively, using historical data. Each LGD distribution consists of 11 buckets, <0, 0-10%, 10-20%, etc., each with an average LGD and probability of occurrence. Negative LGD corresponds to recovery greater than par value (American Academy of Actuaries, 2015). For example, to construct the LGD distribution for a contraction state, the bond-level LGD data in the contraction period 1983–2012 are grouped into the aforementioned 11 buckets first. Then, the relative frequencies of LGD data points are used as the probability of

[11] These tables are highly stylized and are not intended to match historical or future ratings performance. The tables were constructed in 1989 with reference to corporate default and loss experience over four historical data points. In particular, the 10-year idealized default rates for A2, Baa2, Ba2, and B2 were set equal to the 10-year historical default rates for corporate issuers with single A, Baa, Ba, and single B ratings, as observed between 1970 and 1989. In contrast, the 10-year idealized default rates for Aaa and Aa2 were set lower than their historical default rates. All the other idealized default rates — for different alphanumeric ratings and at different rating horizons — were derived through interpolation, rather than being matched to historical data. The idealized expected loss table was then derived by multiplying each element of the idealized default table by an average loss severity assumption, set equal to the approximate historical recovery rate of senior unsecured debt observed between 1970 and 1989. Moody's has not published a revised version of these tables since the 1989 version and has no plans to revise them at the time of this writing.

[12] Moody's approach to measuring ratings performance is discussed in "Measuring the Performance of Credit Ratings" (Moody's Special Comment, November 2011).

each bucket. For each simulation trial, the proposed model randomly chooses an LGD bucket using the probability of occurrence for each bucket, and then uses the average LGD of the selected bucket to compute loss.

Data used to develop the LGD distribution is based on senior unsecured bond data provided by Standard & Poor's, covering 1987–2012. The average LGD is 53.1% among 1,260 bonds. The detailed LGD data collected from S&P has not been disclosed to either ACLI or Moody's Analytics. ACLI attempted to re-construct the LGD distributions using Moody's recovery data and managed to obtain similar, average LGD (53.1%) and sample size (1,257 bonds). Furthermore, the LGD distributions replicated by ACLI were used in the portfolio loss simulation and resulted in nearly-identical RBC factors for all ratings except Caa3. Therefore, we use ACLI's replication methods for evaluation.

We make three observations regarding the data and the methods by which the data are used to paramterize the economic state model.

First, the C1 Factor Proposal used bond-level recovery data to estimate the empirical LGD distribution. The C1 Factor Proposal recognized that "recovery rates are provided by the issuer, not by issue" but argued that "because the LGD by issuer rating are stable, it is reasonable to assume that the variability in recovery would be observed at the issue level" (American Academy of Actuaries, 2015). Based on empirical observations, this data may be influenced by issuers with a large number of bond defaults. The underlying risk factors are largely the same for bonds linked to the same issuers. For example, 49 senior unsecured bonds from Pacific Gas & Electric (PG&E) defaulted, all with zero LGD in 2001, one of the four contraction years. The estimated LGD distribution for economic contraction will, therefore, be influenced heavily by PG&E bond defaults. We can address this issue using principal-weighted LGD by issuers first and then using the average of issuer LGDs.

Second, Moody's Analytics' recovery data provides up to three alternative methods for deriving LGD, depending on data availability. For each defaulted bond, the LGDs from the three methods can differ. Moody's Ultimate Recovery Database includes a field with Moody's recommended method for each default, based on Moody's extensive experience with recovery data (Moody's Analytics, 2016). While the C1 Factor Proposal used LGD data provided by S&P, it does not clearly define from which method(s) LGD is derived:

- Settlement Method — value of the settlement instruments is taken at or close to default
- Liquidity Method — value of the settlement instruments is taken at the time of a liquidity event
- Trading Price Method — value of the settlement instruments is based on the trading prices of the defaulted instruments at post-emergence

Third, based on the electronic communications between ACLI and the Academy, recovery rate seems to have been categorized by the date of emergence from default rather than the default date (American Council of Life Insurers, 2019). It is not uncommon for the recovery process to take years to complete. The year of emergence is likely to be in a different economic state from the year of default. As a result, the empirical LGD distribution for a contraction economic state may be estimated from defaults that occurred primarily during expansion years. This process is contradictory to the loss simulation model in the C1 Factor Proposal, where loss is realized on the year of default.

With these issues in mind, Moody's Analytics recommends using issuer-level LGD data derived from the more commonly used recovery method and grouped by the year of default to estimate the empirical LGD distributions. More broadly, there have been advances in techniques that allow more accurately linking recovery with the credit environment ((Moody's Analytics, 2011), (Moody's Analytics, 2010 (2)), and that account for correlation between the firm's underlying credit quality and recovery, used in practice that should be considered when modeling LGD dynamics.

3.3 Discount Rate

3.3.1 Summary of Moody's Analytics Significant Areas of Review and Recommendations

Since the modeling work was conducted by Academy in 2015, the discount rate used in the model is calculated using historic data that does not reflect the current low-interest environment, nor the expected continuation of a low interest rate environment. Moody's Analytics recommends updating the discount rate to include December 31, 2013 to December 31, 2020 data to better reflect the current and expected interest rate environment in conjunction with updated tax assumptions that reflect the 2017 Tax Act (see Section 3.5 for details).

3.3.2 Review and Analysis Performed by Moody's Analytics

This section evaluates data and methods used in estimating the discount rate. The discount rate used in the C1 Factor Proposal is assumed to be the average ten-year LIBOR swap rate from December 31, 1993 to December 31, 2013, which is 5.02% pre-tax/3.26% after-tax. The numbers are then rounded to 5% pre-tax/3.25% after-tax (American Academy of Actuaries, 2015). If the discount rate is updated through April 30, 2017, the pre-tax rate drops to 4.2%, as documented in the Academy's letter on February 14, 2018 (American Academy of Actuaries, 2018). It is recognized that this time window for the discount rate is chosen since the modeling work was conducted in 2015.

While Moody's Analytics does not have access to the data used in the C1 Factor Proposal, or information about the exact data source, we use the 10-year USD swap rate from the Federal Reserve H.15 Daily Selected Interest Rates Release and Intercontinental Exchange (ICE) in our analysis. ICE data was used starting August 1, 2014, when the Federal Reserve System data series was discontinued.

Figure 1 shows the downward trend in the 10-year USD swap rate over the most recent two decades. The rate is below 3% for most of the 2011–2021 period. Since the Federal Reserve took extensive measures to support the economy during the global pandemic (Federal Reserve, 2020), the rate decreased further, often to under 1%. The November Minutes of the Federal Open Market Committee quotes, "The Committee decided to keep the target range for the federal funds rate at 0–¼% and expects it will be appropriate to maintain this target range until labor market conditions have reached levels consistent with the Committee's assessments of maximum employment and inflation has risen to 2% and is on track to moderately exceed 2% for some time" (the Federal Open Market Committee, 2020). Therefore, it is reasonable to assume that the current low interest rate environment will likely remain for an extended period, considering the 30-year treasury rate sat under 2% at the time we wrote this report.

With these observations in mind, Moody's Analytics recommends updating the discount rate to include December 31, 2013 to December 31, 2020 data to better reflect the current and expected interest rate environment. Please note, the 2017 Tax Act took effect during this time window. Section 3.5 discusses the update to tax assumptions.

Figure 1: 10-Year USD Swap Rate

Source: Federal Reserve System (data prior to August 1, 2014) and Intercontinental Exchange (data on or after August 1, 2014).

3.4 Construction of the Representative Portfolio

3.4.1 Summary of Moody's Analytics Significant Areas of Review and Recommendations

The segmentation and filtering of the sample portfolios used to construct the representative portfolio are not accompanied by economic justification or sensitivity analysis. For example, for reasons not explained, only NAIC1 and NAIC2 rated issuers are used to determine the number of bonds in the representative portfolio for all rating categories. In addition, each representative portfolio ultimately used in the simulation contains one rating category, which makes the final C1 factors heavily dependent on portfolio adjustment factors. Given the importance of the representative portfolio, we recommend more comprehensive documentation and robustness tests that can show whether the segmentation and filtering method has material impact on the C1 factors and explore the option of constructing a representative portfolio that contains all rating categories.

3.4.2 Review and Analysis Performed by Moody's Analytics

Base C1 factors are intended to cover 96th percentile portfolio loss in excess of those anticipated in the statutory reserve over a 10-year horizon. The C1 factors are estimated using simulation methods described in Section 5.2. This section describes the representative portfolio analyzed in the simulation.

The representative portfolio for each rating category consists of bonds with the same initial rating. The number of bonds, as well as the holding amount of each bond in the portfolio, is determined according to the corporate bond holdings as of December 31, 2011, of the entire universe of 782 life insurers (portfolio size range from under $0.5 billion to $80 billion) provided by NAIC to the authors of the C1 Factor Proposal; Moody's Analytics did not have access to these portfolios.[13, 14]

The C1 Factor Proposal constructs the reference portfolio by placing each credit portfolio into seven size categories, shown in **Table 8**. Under the argument that Category 6 "contains the 50% cumulative Book Adjusted Carrying Value (BACV) point with a range of 33%–56% of industry BACV," the C1 Factor Proposal chose the 24 life companies' portfolios in this category to form the basis of the representative portfolio.

Table 8: Life Company Size Categories

Size	$Billion		$Billion	Count
1	0.0	-	0.5	503
2	0.5	-	1.0	54
3	1.0	-	2.5	70
4	2.5	-	5.0	35
5	5.0	-	10.0	32
6	10.0	-	25.0	24
7	25.0	-	80.0	16

Bonds from these 24 portfolios are then ranked by BACV and segmented into 18 groups. Group 1, 2, 17, and 18 each hold 1/32 of the total BACV, while the remaining 14 groups hold 1/16 of BACV. In the final representative portfolio, the initial holding amount of bonds in each group is set to be the average BACV of the corresponding group from the 24 life insurer's portfolio (last column of **Table 9**). The number of bonds in each group, on the other hand, is set to be the average (across 24 insurer's bond portfolios) number of issuers in each group with rating NAIC-1 or NAIC-2. This results in a final representative portfolio with a total of 824 bonds across 18 groups, with each group's total holding amount determined by the last column of **Table 9**.

[13] Bonds guaranteed by the full faith and credit (FFC) of the U.S. government, affiliate bonds and zero value bonds are removed from the sample.
[14] In total, seven representative portfolios are created from life insurers in different size categories; only the portfolio created based on 24 insurers with portfolio size between $10–$25 billion is used in the end.

Table 9: Representative Portfolio

	NAIC Rating					
Bin	**1**	**2**	**3**	**4**	**5**	**$Million**
1	82	76	47	35	8	2.013
2	37	36	15	10	1	5.062
3	56	53	13	6	2	7.789
4	39	42	7	2	1	11.108
5	30	34	5	1	0	14.229
6	25	30	3	1	0	17.209
7	21	26	2	0	0	20.336
8	19	22	2	0	0	23.561
9	16	20	1	0	0	26.895
10	15	17	1	0	0	30.664
11	13	15	1	0	0	34.746
12	13	12	0	0	0	39.485
13	11	11	0	0	0	46.288
14	8	9	0	0	0	55.684
15	8	7	0	0	0	65.445
16	6	6	0	0	0	81.004
17	3	2	0	0	0	95.349
18	3	1	0	0	0	142.017
Issuer Count	405	419	97	55	12	
Coefficient of Variation	1.13	1.00	1.02	0.83	0.77	
Issuer Count %	41%	42%	10%	6%	1%	
Amount %	47%	47%	4%	1%	0%	

While Moody's Analytics understands the objectives and the need to construct a representative portfolio, given the spirit of the framework justifications for various modeling choices and implications were not included in the documents. A few that stand out:

1. It is not clear how the initial seven size categories used to segment life insurers are determined. Given that the definition of the size categories ultimately determines which life insurers' portfolios are used to construct the representative portfolio, there may be a material impact on base C1 factors. It is unclear whether any robustness test was done to examine to what extent the definition of size categories affects the C1 factor.
2. Ultimately, only 24 out of 782 life companies' portfolios are used to construct the representative portfolio. As recognized in the C1 factor Proposal, these 24 portfolios are much larger in size than the industry average. The implication is that the base C1 factors calculated based on the representative portfolio are only applicable to large life companies' portfolios. For smaller insurers, the effectiveness of the C1 factors is almost entirely dependent on the model of portfolio adjustment factors, which lack model documentation and backtesting. Section 4.2 provides a detailed review of the portfolio adjustment factors.
3. It is not clear why the exercise used to count the number of issuers is limited to NAIC-1 and NAIC-2, given representative portfolios are ultimately assigned the same number of bonds across all rating categories. If we include the count of issuers with NAIC-3 and below ratings from the 24 insurers' portfolios, the number of bonds in the final representative portfolio will increase accordingly, which will add diversification and lower the base C1 factor.
4. Each representative portfolio ultimately used in the simulation contains one rating category, which again makes the final C1 factors heavily dependent on portfolio adjustment factors, which we review in Section 4.2.

With these observations in mind, Moody's Analytics recommends providing economic justification for and conducting robustness tests on the definition of life insurers' size categories. Moody's Analytics also recommends exploring a revision to the representative portfolio's construction to include all ratings and possibly asset classes in a single representative portfolio.

3.5 Tax Assumptions

The U.S. corporate tax rate was lowered from 35% to 21%, in accordance with the 2017 Tax Reconciliation Act (Deloitte, 2018). Net capital gains included in the taxable income are subject to the 21% rule (CCH Group, 2019). While the model was developed based on historical data before the tax cut, the RBC factors, if adopted, will be applied to insurers, which will pay the updated tax rate. It will be worthy to consider updating the assumed 35% tax rate to 21%. Moody's recommends analysis reflecting the current tax environment.[15]

4 Modeling Framework

This section reviews the assumptions and methodologies that underpin the modeling framework. Section 4.1 reviews the economic state model, Section 4.2 explores portfolio adjustment factors, and Section 4.3 explores the Risk Premium.

4.1 Economic State Model

4.1.1 Summary of Moody's Analytics Significant Areas of Review and Recommendations

We have three main concerns regarding the economic state model, which are closely related to the discussion in Section 3.1. First, the two-state model does not accurately capture persistency in default and recovery rates across the credit cycle. Second, the economic state of LGD appears to be mistakenly disconnected from that of the default rate for ratings Baa-Caa. Third, the scaling factor used in differentiating default rates across expansions and contractions appears to be overly punitive for the investment-grade segment compared with historical patterns. Moody's recommends a more holistic review for the choice of a framework that can address broader sets of issues, including more precise differentiation across asset classes, as discussed in other sections.

4.1.2 Review and Analysis Performed by Moody's Analytics

To differentiate default rate and recovery rate during economic booms and downturns, the C1 Factor Proposal defines economic states according to the National Bureau of Economic Research's (NBER) economic state classifications across the 1983–2012 period. Years 1991, 2001, 2008, and 2009 are classified as "contraction" years, while the remaining years are classified as "expansion" years. The baseline default rate is scaled up or down using an economic scalar for the economic state.

There are two models in the simulation process, as summarized in **Table 10**:

- The two-state model is used for recovery rates, and Aaa-A default rates, with the economic state in years one through ten drawn independently according to the probability summarized in **Table 12**.
- The four-state model is used for Baa-Caa default rates. It includes continuing expansion and continuing contraction states in addition to expansion and contraction states. The economic state in the first year is drawn from the probability distribution shown in **Table 13**. The states in subsequent years are dependent on the previous year's state and follow the transition probabilities summarized in **Table 14**.

LGD is drawn from two different distributions corresponding to expansion and contraction state, respectively. Section 3.2.2 describes details.

[15] The 2017 Tax Act repeals the 3-year carryback, 15-year carryforward period for life insurance companies' operations losses. The Act provides that all corporations (including life companies) may carry NOLs forward indefinitely, but limits utilization of NOLs to 80 percent of a given year's taxable income with no loss carryback capacity (Deloitte, 2018).

Table 10: Definition of Two-state and Four-state economic models

Economic model type	Economic state	Description
2-state model	Expansion	Defined by NBER
	Contraction	Defined by NBER. 1991, 2001, 2008, and 2009 are contraction years in the study period of 1983-2012.
4-state model	Continued Expansion	The previous year was an "Expansion" and the present year is also an "Expansion."
	Expansion	The previous year was a "Contraction" and the present year is an "Expansion."
	Contraction	The previous year was an "Expansion" and the present year is a "Contraction."
	Continued Contraction	The previous year was a "Contraction" and the present year is also a "Contraction."

Table 11: Economic models for default rate and recovery rate

Variable	Rating	Economic model
Default rate	Aaa, Aa, A	2-state economic model
	Baa, Ba, B, Caa, C	4-state economic model
Recovery rate	All ratings	2-state economic model

Table 12: Two-state probability distribution

Economic State	Probability
Expansion	86.67%
Contraction	13.33%

Table 13: Four-state probability distribution for the first year

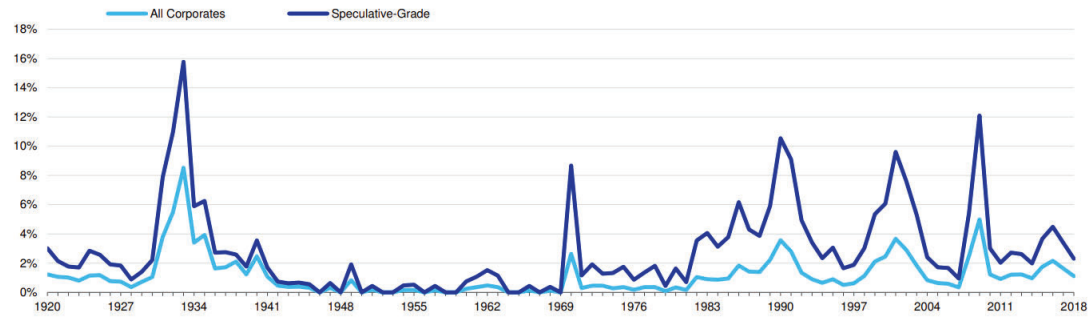
Economic State	Probability in Year 1
Continuing expansion	73.33%
Expansion	13.33%
Contraction	10%
Continuing contraction	3.33%

Table 14: Economic state transition probability for the four-state model

State/Probability	Expansion	Contraction
Expansion	88.00%	12.00%
Contraction	80.00%	20.00%

There are several data treatment and modeling assumptions that may be introducing bias and should be understood. First, the economic state model does not seem to capture serial correlations in defaults. The two-state model assumes the independence of economic states across years. Since default rate is calculated as the baseline default rate multiplied by an economic scalar, default rate is also assumed implicitly to be independent across the years. This assumption does not align with empirical patterns. For example, Figure 2 demonstrates the persistence in global corporate default rates of years before and after a peak.

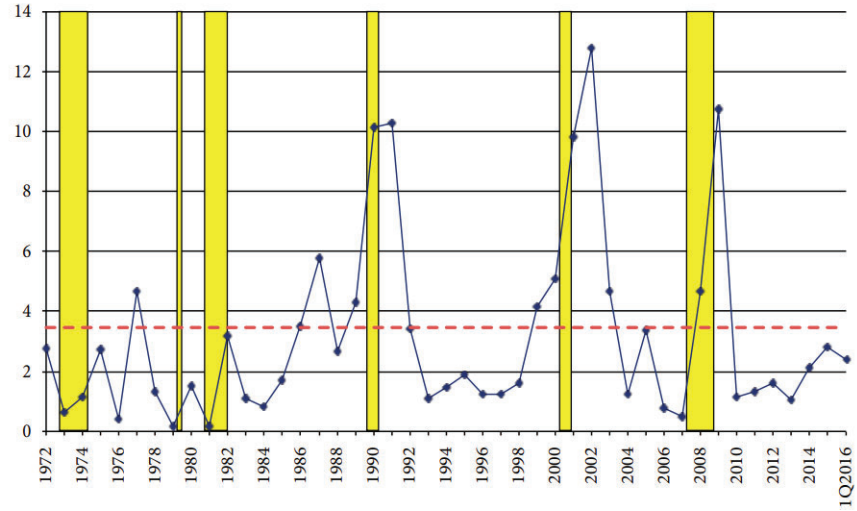
Figure 2: Default rate of global corporate 1920–2018



Source: Moody's Investors Service

While the dependence of economic states across years is established in the four-state model, the model may not be adequately capturing the default rate autocorrelation. The business cycle and the credit cycle do not perfectly overlap. As seen in **Figure 3**, multiple peaks in the U.S. high-yield default rate occurred outside the recession periods (Altman & Kuehne, 2016). It takes time for corporate fundamentals to weaken and reach the default point during a downturn.

Figure 3: Historical default rates of high-yield bonds and recession periods in the United States



Source: (Altman & Kuehne, 2016)

Second, the default rate and recoveries for some ratings are modeled using different economic state scenarios. For Baa1-Caa3, default rate is modeled in the four-state model, while LGD is modeled using a separate two-state model. The ACLI's replicated model is used to simulate the economic scenarios and test this modeling choice. Even if the four-state scenarios are mapped to two-state (for example, map continuing expansion to expansion), 23% of trials have different values from the separate two-state scenarios for LGD modeling. As a result, the default rate may be scaled up by the contraction economic scalar, while LGD is drawn from the distribution for expansion in any simulation trial.

Third, economic scalars used to scale the default rate across states are not adjusted for the remaining time to maturity (Years 1–10), referenced as leveled economic scalars. This approach fails to account for the default rate term structure effect. Specifically, **Table 15** (American Academy of Actuaries, 2015) reports the original economic scalars directly calculated from the empirical data. We can see that the values of these scalar vary significantly across tenors. However, due to data noises, the pattern of these scalars is not always intuitive. Consequently, the C1 Factor Proposal compresses these economic scalars across tenors into a single

scalar for each economic state and rating, shown in **Table 16** (American Academy of Actuaries, 2015). Taking Baa rating, for example, the leveled economic scalar for the contraction state is around 215%. This percentage is lower than the empirical scalar in Years 9–10 and higher than the empirical scalar in Years 1–8.

The use of leveled economic scalars seems to be, in general, overly punitive for investment-grade issues in early years when the default rates tend to be lower, and not sufficiently punitive in later years when default rates tend to be higher. We expect this will dampen concentrated losses overall, but need to assess the dynamics, along with a review of the base default rate term structure.

Table 15: Economic scalar for Baa rating based on empirical data. Source: (American Academy of Actuaries, 2015)

		Duration 1	Duration 2	Duration 3	Duration 4	Duration 5	Duration 6	Duration 7	Duration 8	Duration 9	Duration 10
Baa	Continued Contraction	463%	188%	253%	155%	255%	300%	234%	412%	440%	390%
	Contraction	170%	144%	162%	188%	180%	191%	209%	200%	246%	329%
	Expansion	126%	121%	96%	145%	140%	123%	112%	81%	64%	78%
	Continued Expansion	69%	87%	84%	77%	73%	70%	71%	65%	55%	55%
	Combined	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Table 16: Levelled economic scalars by rating. (American Academy of Actuaries, 2015)

Rating	Continued Contraction	Contraction	Expansion	Continued Expansion
Aaa	274.95%	274.95%	73.65%	73.65%
Aa1	274.09%	274.09%	73.42%	73.42%
Aa2	274.82%	274.82%	73.61%	73.61%
Aa3	273.78%	273.78%	73.34%	73.34%
A1	272.87%	272.87%	73.09%	73.09%
A2	272.14%	272.14%	72.90%	72.90%
A3	272.52%	272.52%	73.00%	73.00%
Baa1	322.31%	214.79%	113.01%	73.81%
Baa2	322.24%	214.75%	112.99%	73.80%
Baa3	322.79%	215.11%	113.18%	73.92%
Ba1	297.28%	194.22%	83.81%	81.89%
Ba2	297.38%	194.29%	83.84%	81.92%
Ba3	297.27%	194.21%	83.81%	81.89%
B1	221.14%	149.58%	119.01%	86.17%
B2	221.22%	149.64%	119.05%	86.20%
B3	221.14%	149.58%	119.01%	86.17%
Caa1	223.88%	180.42%	91.00%	85.49%
Caa2	223.71%	180.28%	90.93%	85.42%
Caa3	223.56%	180.16%	90.87%	85.36%

Given the fundamental nature of the economic state model in generating the factors, as well as potential limitations referenced in prior sections (Section 3.1, Default Rates, in particular, and subsequent sections, Section 5.2, Correlation, in particular), we recommend a more holistic review for a framework choice that can address a broader set of issues and would allow for more precise differentiation across asset classes and also more accurately capture issues related to the time-series dynamics discussed here.

In particular, and, as discussed in Section 3.1 and references therein, there have been material improvements in techniques and data availability to more accurately capture nuanced time series dynamics for rating migration and default across credit environments that address the observed path-dependency behavior of ratings, and more accurately model correlated recovery dynamics. These approaches are used in practice for a wide range of related applications and at a wide range of organization types. Moody's Analytics recommends exploring these approaches.

4.2 Portfolio Adjustment Factors

4.2.1 Summary of Moody's Analytics Significant Areas of Review and Recommendations

The portfolio adjustment factor is one of the most important elements of the model, as it ultimately determines the general RBC level for individual insurers. Unfortunately, documentation is limited, making it difficult to assess the materiality of some of the modeling choices. In addition, the limited documentation available suggests a potential material gap between the calculated C1 factor and its target level for individual insurers, especially smaller ones. Moody's recommends: (1) more detailed documentation of the adjustment factor and the underlying economic justification, in conjunction with the doubling of C1 factors for the top-10 largest issuers; (2) further exploring the data and methods used to estimate the portfolio adjustment factors, to ensure they are effective for corporate as well as non-corporate issuers, (3) design the factors to align incentives with the economic risks, and (4) design a structure that brings together the portfolio adjustment factors along with the doubling of C1 of the 10 largest issuers.

4.2.2 Review and Analysis Performed by Moody's Analytics

The base C1 factors reported in **Table 4** represent the capital required for the representative portfolio described in Section 3.4 for each rating category. As recognized in the C1 Factor Proposal, an individual insurer's portfolio can differ significantly from the representative portfolio in rating composition, number of bonds, and holding amount of each bond. Hence, adjustment to the base C1 factor according to the individual insurer's portfolio characteristics is needed to avoid significant over/under capitalization. There are two proposed adjustments.

First, the C1 factors of the 10 largest issuers held across all debt related asset classes are doubled. The initial filter excludes bonds with C1 RBC equal to 0 and NAIC 1 bonds. As applicable after the first filter, if a top-10 issuer has NAIC 1 bonds, they are added back. Up to 10 bond issuers of a bond portfolio can be subject to the top-10 doubling rule for concentration risk.

Second, the proposed guidelines also include updated base C1 factor adjustment in the form of a scaling factor that is a function of the number of unique issuers in an individual insurer's portfolio (see **Table 5** for details). Regrettably, there is very limited documentation on exactly how these adjustment factors are calculated. To supplement our knowledge, we conducted several interviews with the ACLI and its members. Our best understanding is that the adjustment factors are calibrated roughly according to the following steps:

1. Collect the bond portfolios from 677 actual life insurers.
2. Run the simulation model described in Section 5.2 on these portfolios to determine the capital required to cover 96th percentile statistical safety level for each portfolio.
3. Determine the RBC for each bond in a portfolio using the base C1 factor reported in **Table 4**, multiplied by the scaling factor, which is tiered according to the number of issuers. Solve a set of optimal scaling factors, one for each portfolio size bucket (i.e., unique issuers in the portfolio), so that the scaled portfolio RBC matches the capital required from the simulation in Step 2 as closely as possible across all 677 portfolios.

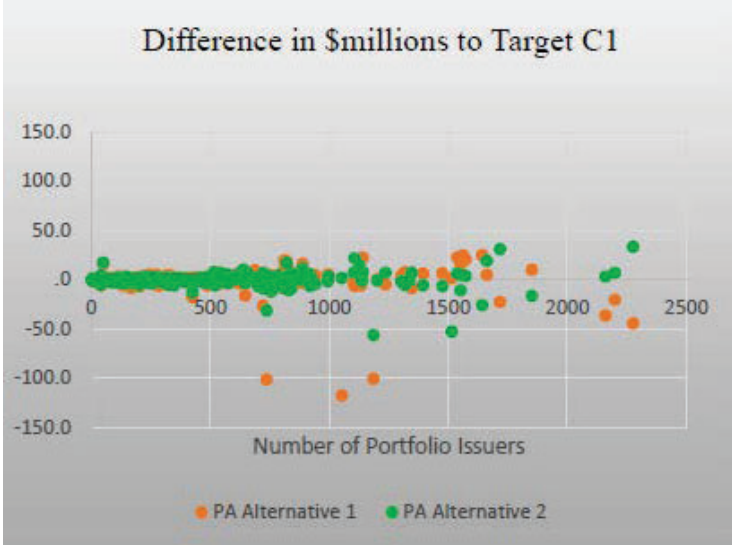
While Moody's Analytics recognizes the importance of these adjustments, we are left questioning the economic justifications of the modeling choices and their materiality:

1. Doubling of capital for the top-10 issuers:
    a. The treatment to double the base C1 factors for top-10 issuers seems arbitrary; why "10", and not, say "20"? why "double", and not, say, "triple". In addition, it is also not clear why this treatment is needed on top of the portfolio adjustment factors.

2. The portfolio adjustment formula:
    a. "Issuer count" is a relatively coarse measure of diversification. While the portfolios used in estimating the relationships between the number of issuers and the cited adjustment factors may have exhibited the cited relationship, there is an incentive to manipulate portfolio composition by holding a small amount in many issuers, which can impact solvency risks. Ideally, the adjustment should align incentives with the economic risks. In this case, concentration is impacted by the total exposure to an issuer, as well as issuer characteristics, including default probability and terms and conditions, including maturity and expected recovery.
    b. The criteria determining the portfolio adjustment factor algorithm are not documented clearly, even though the factors have been updated multiple times: (American Academy of Actuaries, 2016), in June 2017 (American Academy of Actuaries, 2017) and in October 2017 (American Academy of Actuaries, 2017). . The final portfolio RBC using the portfolio adjustment factor may deviate substantially from the actual capital needed for some insurer's portfolio, even though, on average, the gap may be small. We note, that in a presentation deck

prepared by Academy (Bennett & Owens, 2016), analysis is done comparing the C1 factors after the adjustment against the target level for all 677 portfolios based on an early version of the model. **Figure 4** presents analysis results. Due to scaling issues, it is difficult for us to discern from the figure the exact magnitude of the gaps. It appears to be the case though that the gap, on a percentage scale, is larger for smaller sized portfolios, given that the dollar amount of the gap seems relatively flat across different portfolio sizes.

Figure 4: Difference to Portfolio Target C1 Factor



With no access to the underlying portfolios, and limited access to validation and backtesting that examines the appropriateness of doubling capital for the top-10 issuers, or the adjustment factors, especially for smaller portfolios, it is difficult for us to weigh in on the materiality of this issue directly. Rather, we conduct a set of stylized case studies described below.

The stylized case studies assess materiality of issuer diversification on portfolio risk. While the exercise quantifies issuer diversification effects, the simplifying assumptions are broad and provide indicative guidance for additional analysis — worth noting, the exercise abstracts from heterogeneity in notional (holding amount), maturity effects, as well as diversification across industry and asset class discussed elsewhere in this report. If the intent of the portfolio adjustment factors is to capture a more comprehensive set of diversification factors beyond issuer, then this exercise should be redesigned.

Table 17 presents portfolio adjustment formula calibrated to highly stylized Moody's data and based on the standard deviation of losses for hypothetical A2 and Ba1 rated credit portfolios, with the adjustment normalized to the portfolio with 500 issuers. Each portfolio is analyzed separately, and all issuers are homogeneous with equal notional (weight) and with the following characteristics:

- Moody's Idealized Default Probabilities, as specified in **Table 7**
- 0% recovery
- Moody's Analytics GCorr-implied one-step average pairwise default correlations for a sample of Moody's corporate rated issuers, noting that other asset classes can exhibit very different pairwise correlation patterns.[16]
    - A2 One-Year 0.6%
    - A2 Ten-Year 6.2%
    - Ba1 One-Year 3.1%
    - Ba1 Ten-Year 9.9%

We now compare how the factor adjustments relate to the number of issuers. Exploring the doubling the C1 for the 10 largest issuers, we can see the first 10 issuers of the One-Year A1 portfolio exhibits a risk level 3.13 times the level of the normalized 501st

[16] See (Moody's Analytics, 2008) for detailed methodology and validation.

issuer (row labeled "Next 300"). Meanwhile, the One-Year Ba1 portfolio of 10 issuers exhibits a level of risk that is 1.79 times greater.

Moving on to the portfolio adjustment factors, we see that for the aforementioned stylized homogeneous portfolios, most of the diversification is achieved with 200 issuers; increasing the number of issuers from 200 to 500 reduces the A2 One-Year adjustment by 2%, with limited diversification beyond 500.

Given the stylized nature of our exercise, as well as the limited access we had to the model and underlying data, we will not draw hard conclusions from comparing Table 17 against Table 5 that would suggest the proposed portfolio adjustment factors do appear to overly penalize insurers with smaller portfolios, a concern that has been echoed by the insurance industry. Rather, we interpret the stylized portfolio results in Table 17 as providing indicative guidance for needed additional analysis.

Table 17: Portfolio Adjustment Formula Calibrated to Stylized Moody's Data for One- and Ten-Year Horizons

Number of Issuers	A2		Ba1	
	One-Year	Ten-Year	One-Year	Ten-Year
Up to 10	3.13	1.43	1.79	1.30
Next 90	1.17	1.01	1.03	1.00
Next 100	1.02	1.00	1.00	1.00
Next 300	1.00	1.00	1.00	1.00
Over 500	0.99	1.00	1.00	1.00

With these observations in hand, Moody's recommends: (1) more detailed documentation of the portfolio adjustment factors, the underlying economic justification in conjunction with the doubling of C1 factors for the top-10 largest issuers; (2) further exploring the data and methods used to estimate the portfolio adjustment factors, and ensuring they are effective for corporate as well as non-corporate issuers; (3) designing the factors to align incentives with the economic risks; and (4) designing a structure that brings together the portfolio adjustment factors along with the doubling of C1 of the 10 largest issuers.

4.3 Risk Premium

4.3.1 Summary of Moody's Analytics Significant Areas of Review and Recommendations

The current assumption of setting the Risk Premium equal to expected loss appears to be overly conservative. While the C1 Factor Proposal recognizes the inconsistency, it points out that the 1992 guidelines defined the Risk Premium in this way, and in conjunction with other parameters, some of which (e.g., AVR) are beyond the scope of this report. While Moody's appreciates the desire to incorporate conservativeness into assumptions, inputs for which accurate proxies are available should be directly used, and rather incorporate the conservative overlay into the final steps to facilitate model transparency. Moody's recommends a broader evaluation of the various interconnected modeling decisions that lead to setting the Risk Premium at the expected loss level, and aligning the models with a general consensus across the actuarial community, including setting the Risk Premium at a one standard deviation loss.

4.3.2 Review and Analysis Performed by Moody's Analytics

The level of Risk Premium is an important assumption in the calculation of C1 factors. All else equal, the higher the Risk Premium, the lower C1 factors. While the C1 Factor Proposal recognizes the general consensus within the actuarial community that statutory reserves should at least cover moderately adverse loss, which is proxied as a one standard deviation loss (American Academy of Actuaries, 2015), the Risk Premium is set at expected credit loss, calculated as the sum of the product of baseline marginal default rate and average LGD from Years 1–10, with consideration of discounting, tax, and recoverable tax from loss.

While the authors of the C1 Factor Proposal recognize the inconsistency, they point out that the 1992 guidelines defined the Risk Premium in this way and in conjunction with other parameters, some of which (e.g., AVR) are beyond the scope of this report.

Moody's recommends a broader evaluation of the various interconnected modeling decisions that lead to setting the Risk Premium at the expected loss level, and aligning the models with general consensus across the actuarial community, including setting the Risk Premium at a one standard deviation loss. This change should allow for better model transparency and consistency. This issue may be worth considering, along with the pending update to Statutory Accounting Principles that will likely be more aligned with CECL.

5 Key Elements Outside of the Defined Scope

This section reviews the assumptions and methodologies that were out of the Defined Scope. Section 5.1 reviews the applicability of using data based on Moody's rated corporate bonds on all asset classes. Section 5.2 explores the simulation and correlation assumptions. Section 5.3 examines the maturity effect. Section 5.4 reviews the need to more explicitly account for interest income offsets. Section 5.5 discusses the impact of the difference in NRSRO ratings.

5.1 Applicability of Moody's Rated Corporate Data to Other Asset Classes

5.1.1 Summary of Moody's Analytics Significant Areas of Review and Recommendations

C1 RBC base factors were developed using Moody's default rate data on public corporate bond supplemented with S&P's recovery data. After controlling for ratings, we find material differences in observed default, migration, and recovery dynamics across asset classes. These differences question the effectiveness of using Moody's rated public corporate bond data for all asset classes. In the following subsections, we report in more detail our findings related to municipal bonds, structured assets, and private placements.

5.1.2 Municipal Bonds

This section assesses default and recovery dynamics and their comparability to corporate bonds. We first explore differences in default and recovery patterns and later explore data nuances. The authors of the C1 Factor Proposal explained the decision of not developing separate C1 factors for municipal bonds by citing "not able to locate any credible or reliable default or recovery studies (of municipals)". The authors also noted that the rating agencies did not update default studies based on calibrated ratings referencing the recalibration of municipal ratings to the global rating scale by Moody's Investors Service in 2010 (American Academy of Actuaries, 2018). However, there have been material developments in the research of municipal bonds referencing the recalibrated ratings. As a starting point, we cite the observations from a recent study that explores all types of Moody's rated municipal bonds between 1970 and 2019, and bases its findings on re-calibrated historical ratings of municipal bonds to the global rating scale for comparability with corporates (Moody's Investors Service, 2020 (1)). The study finds municipal bonds have: (1) experienced lower default rates, (2) lower rates of rating transitions, and (3) higher recovery rates, than corporate bonds. These observations may not be completely surprising, given municipal and corporate entities are driven by different key rating factors, which are attributed to the different fundamental strengths, weaknesses, and the inherent nature of each sector (Moody's Investors Service, 2010), as demonstrated by their default patterns, which diverge from corporate borrowers, as seen in **Table 18**.

Delving into the differences:

First, after controlling for rating, historically municipal credits experienced significantly lower cumulative default rates (CDRs), on average, than corporates. These CDRs are calculated by grouping credits by their rating on a particular date into cohorts and then tracking their performance over time, similar to the cohort approach used in the C1 Factor Proposal. Cohorts are formed at monthly frequencies and then averaged over a year. For example, if a credit is rated Aaa on January 1, 2014, it would be grouped into a cohort of other credits rated Aaa on that date, regardless of its original rating (Moody's Investors Service, 2020 (2)). Municipal bonds have lower or equal CDRs than global corporate across all horizons and rating categories, as shown in **Table 18**. Using the ten-year CDR, relevant when comparing with the C1 RBC factor model, investment-grade global corporate (2.25%) is significantly higher than that of municipal credits (0.1%). For speculative-grade, the CDR of global corporate (28.68%) is about four times the value of municipal credits (7.29%).

Table 18: Cumulative default rates of municipals and corporate rated by Moody's Investors Service

Municipal default rates lower than global corporates for all broad categories
Cumulative default rates, average over the period 1970-2019, municipal vs. global corporate issuers

Municipals

Rating	Average cohort count	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Aaa	1,003	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Aa	6,980	0.00%	0.00%	0.00%	0.01%	0.01%	0.01%	0.01%	0.02%	0.02%	0.02%
A	4,873	0.00%	0.01%	0.02%	0.02%	0.03%	0.04%	0.06%	0.07%	0.09%	0.10%
Baa	676	0.03%	0.11%	0.21%	0.34%	0.47%	0.61%	0.74%	0.87%	0.99%	1.10%
Ba	111	0.24%	0.67%	1.10%	1.58%	1.98%	2.28%	2.64%	2.99%	3.30%	3.57%
B	23	2.77%	5.48%	8.09%	10.14%	12.20%	13.68%	14.71%	15.46%	16.30%	17.49%
Caa-C	11	8.92%	13.97%	17.22%	19.03%	20.26%	21.51%	22.45%	23.47%	24.45%	25.07%
Investment-grade	13,532	0.00%	0.01%	0.02%	0.03%	0.04%	0.05%	0.06%	0.07%	0.09%	0.10%
Speculative-grade	146	1.29%	2.41%	3.38%	4.20%	4.92%	5.48%	5.98%	6.43%	6.87%	7.29%
All rated	13,678	0.02%	0.03%	0.05%	0.07%	0.08%	0.10%	0.12%	0.13%	0.15%	0.16%

Global Corporates

Rating	Average cohort count	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Aaa	105	0.00%	0.01%	0.01%	0.03%	0.08%	0.13%	0.18%	0.24%	0.30%	0.36%
Aa	411	0.02%	0.06%	0.11%	0.19%	0.29%	0.40%	0.52%	0.62%	0.71%	0.79%
A	879	0.05%	0.16%	0.33%	0.51%	0.73%	0.98%	1.24%	1.52%	1.81%	2.11%
Baa	847	0.16%	0.41%	0.72%	1.10%	1.47%	1.86%	2.24%	2.65%	3.09%	3.58%
Ba	461	0.88%	2.40%	4.14%	6.01%	7.77%	9.44%	10.93%	12.38%	13.86%	15.40%
B	562	3.26%	7.71%	12.32%	16.52%	20.33%	23.69%	26.68%	29.27%	31.66%	33.70%
Caa-C	337	9.68%	17.19%	23.56%	28.95%	33.56%	37.24%	40.41%	43.32%	45.89%	47.89%
Investment-grade	2,241	0.08%	0.23%	0.42%	0.64%	0.89%	1.14%	1.40%	1.67%	1.96%	2.25%
Speculative-grade	1,360	3.99%	8.06%	11.90%	15.33%	18.34%	20.91%	23.14%	25.13%	26.98%	28.68%
All rated	3,601	1.53%	3.04%	4.43%	5.64%	6.67%	7.54%	8.29%	8.96%	9.59%	10.17%

Second, the rating migration of municipal credits differs remarkably from corporate. Municipal ratings are more stable than corporate ratings over the one-year horizon, 1970–2019, as shown in **Table 19**. For example, on average, 94.63% of Aa rated municipal credit, where most reside, remain in the same rating category over one-year intervals, while only 85.3% of corporate credit does so.

Table 19: Average one-year rating transition rates of municipals and corporate rated by Moody's Investors Service

Municipal ratings transition less frequently than global corporates
Average one-year rating transition rates, 1970-2019, municipal vs. global corporate issuers

From/To:	Average cohort count	Aaa	Aa	A	Baa	Ba	B	Caa-C	Withdrawn	Default
Municipals										
Aaa	1,003	94.81%	1.19%	0.11%	0.03%	0.01%	0.00%	0.00%	3.85%	0.00%
Aa	6,980	0.32%	94.63%	1.03%	0.02%	0.01%	0.00%	0.00%	3.97%	0.00%
A	4,873	0.03%	1.81%	92.73%	0.61%	0.13%	0.01%	0.00%	4.67%	0.00%
Baa	676	0.02%	0.07%	3.39%	89.41%	1.72%	0.21%	0.04%	5.10%	0.03%
Ba	111	0.04%	0.22%	2.10%	4.81%	80.42%	2.74%	0.63%	8.82%	0.23%
B	23	0.00%	0.25%	0.90%	1.02%	5.61%	76.13%	5.35%	8.11%	2.64%
Caa-C	11	0.00%	0.00%	0.69%	0.25%	1.50%	2.73%	72.94%	13.64%	8.25%

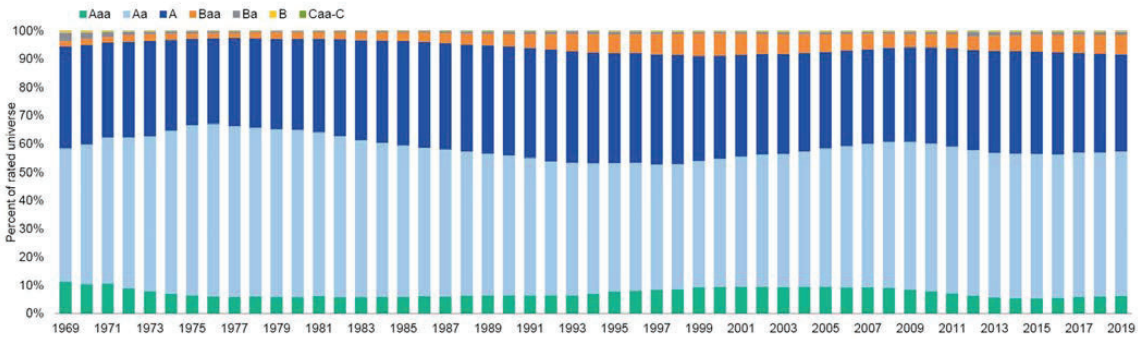
From/To:	Average cohort count	Aaa	Aa	A	Baa	Ba	B	Caa-C	Withdrawn	Default
Global Corporates										
Aaa	105	87.90%	7.78%	0.59%	0.07%	0.02%	0.00%	0.00%	3.63%	0.00%
Aa	411	0.79%	85.30%	8.46%	0.42%	0.06%	0.03%	0.02%	4.90%	0.02%
A	879	0.05%	2.48%	86.99%	5.18%	0.46%	0.10%	0.04%	4.65%	0.05%
Baa	847	0.03%	0.13%	4.02%	86.12%	3.59%	0.65%	0.16%	5.15%	0.16%
Ba	461	0.01%	0.04%	0.40%	6.14%	76.53%	7.00%	0.81%	8.25%	0.84%
B	562	0.01%	0.03%	0.13%	0.44%	4.84%	73.67%	7.05%	10.81%	3.04%
Caa-C	337	0.00%	0.01%	0.02%	0.08%	0.32%	5.94%	69.64%	15.10%	8.89%

Third, Average issuer-weighted recoveries on Moody's-rated municipal bonds since 1970 have been about 68%, significantly higher than the issuer-weighted average 47.7% ultimate recovery rate for senior unsecured bonds of North American corporate issuers since 1987 (Moody's Investors Service, 2020 (2)).

We now discuss nuances with the data (referenced in the Moody's study) that should be recognized if used in estimating distinct municipal C1 factors.

First, municipal credits are concentrated heavily in investment-grade (see **Figure 5**). The average proportion of investment-grade for municipal bonds 1970–2019 is 98.9%, while only 62.2% of corporate bonds are rated investment-grade during the same period. Since there is a limited number of speculative-grade municipal bonds, data from other asset classes may be needed, should a separate model be developed for municipals.

Figure 5: Distribution of Moody's Investors Service Ratings for Municipal Credits (1969–2019)



Source: *(Moody's Investors Service, 2020 (2))*

Second, prior to 2010, municipal bonds were rated using the municipal rating scale, different from the corporate rating scale. Moody's municipal ratings were recalibrated to the global rating scale in May 2010, in order to enhance the comparability of ratings across Moody's rated asset classes. Historical municipal ratings have been adjusted to the global rating scale to ensure comparability of ratings before and after the 2010 rating recalibration exercise. The historical municipal ratings before mid-2010 were first shifted by the average notch of rating shift, by municipal rating scale and sector. If a credit's adjusted rating immediately before the recalibration in mid-2010 differs from its realized recalibrated rating, then the realized recalibrated rating will be extended back to the last rating action date before April 2010. Appendix G of the referenced study (Moody's Investors Service, 2020 (2)) provides a detailed adjustment methodology for historical municipal ratings.

With these observations in mind, Moody's Analytics recommends using municipal default, migration, and recovery data in estimating distinct C1 factors for municipal credit.

5.1.3 Structured Assets

This section assesses the default and recovery dynamics of structured assets and their comparability to corporate bonds. We also evaluate the variations among structured sectors, before and after the Great Recession. As a starting point, we cite the observations from recent studies that explore Moody's rated structured assets between 1993 and 2020 and the underlying data. The studies find marked differences in risk dynamics for structured assets issued on or after January 1, 2009. For the entire study period 1993–2020, structured assets have: (1) experienced higher impairment rates;[17] (2) higher net rating downgrade rates;[18] and (3) lower recovery rates than corporate bonds. For post-2009 issuance,[19] structured assets have (1) close-to-zero impairment rates and (2) high net rating upgrade rates. These observations may not be completely surprising, given that structured assets experienced severe loss during the Great Recession, and regulations and market surveillance have strengthened over the past decade. We note that structured assets and corporate entities are driven by different key rating factors, which are attributed to the different fundamental strengths, weaknesses, and the inherent nature of each sector (Moody's Investors Service, 2020 (3)). Moody's differentiates structured finance ratings from fundamental ratings (i.e., ratings on nonfinancial corporate, financial institution, and public sector entities) on the global long-term scale by adding (sf) to all structured finance ratings. The addition of (sf) to structured finance ratings should eliminate any presumption that such ratings and fundamental ratings at the same letter grade level will behave the same. The (sf) indicator for structured finance security ratings indicates that otherwise similarly rated structured finance and fundamental securities may have different risk characteristics. Through its current methodologies, however, Moody's aspires to achieve broad, expected equivalence in structured finance and fundamental rating performance when measured over a long period of time.

Delving into the differences:

First, structured assets have remarkably higher impairment rates than the global corporate, based on historical experiences 1993–2020 (see **Table 20**). For U.S. RMBS/CMBS/ABS, the impairment rates are at least multiple times higher than the corporate default rate, with U.S. RMBS on average comprising more than half of structured tranches 1993–2020h1. Only Global CLOs have lower impairment rates than corporate.

[17] Due to the unique nature of structured assets, impairment is commonly used to describe the financial loss events. A security is impaired when investors receive — or expect to receive with near certainty — less value than would be expected if the obligor were not experiencing financial distress or otherwise prevented from making payments by a third party, even if the indenture or contractual agreement does not provide the investor with a natural remedy for such events, such as the right to press for bankruptcy (Moody's Investors Service, 2020 (1)).There are two types of impairments — principal impairments and interest impairments. Securities with principal impairments are those that had outstanding principal write-downs or losses greater than 50 basis points (bps) of the tranche original balance or securities currently carrying Ca or C ratings, even if they have not yet experienced an interest shortfall or principal write-down. Securities with interest impairments, or interest-impaired securities, are those that are not principal impaired but have outstanding interest shortfalls greater than 50 bps of the tranche original balance. Because interest shortfalls are cured at fairly high frequency within a short period, we record an interest impairment only if the 50 bps shortfall has been outstanding for 12 months or longer (Moody's Investors Service, 2020 (1)). The vast majority of impairments are principal impairments.

[18] Net rating downgrade rate refers to the difference between 12-month average rating downgrade rate and upgrade rate.

[19] Post-2009 issuance refers to structured asset securities issued on or after January 1, 2009.

Table 20: Average one-year default/impairment rate of securities rated by Moody's Investors Service[20]

Average one-year default/impairment rate

Rating	Global Corporate*	US RMBS**	US CMBS**	US ABS**	Global CLO**	All Structured Finance***
Aaa	0.00%	0.59%	0.02%	0.03%	0.00%	0.46%
Aa	0.02%	4.74%	0.08%	0.20%	0.00%	2.76%
A	0.05%	5.49%	0.27%	0.17%	0.01%	3.00%
Baa	0.16%	9.31%	0.84%	0.50%	0.06%	5.70%
Ba	0.84%	12.37%	3.66%	2.30%	0.14%	7.88%
B	3.04%	14.96%	7.77%	5.91%	0.50%	11.95%
Caa-C	8.89%	20.40%	23.92%	16.43%	2.45%	19.81%

*global corporate default rate 1970-2019

**structured asset impairment rate by sector 1993-2020h1

**impairment rate for all structured assets 1993-2020h1

Source: Moody's Investors Service

In contrast, for post-2009 issuance, impairments become rare. The average one-year impairment is only 0.04% 2009–2019. U.S. RMBS, U.S. ABS, and Global CLOs even have zero impairment (see **Table 21**). There have been notable changes that may contribute to this strong performance (S&P Global, 2019).

- Regulation
  - Increased disclosure requirements, for instance, the simple, transparent, and standardized (STS) designation.
  - New risk retention rules for certain sectors, such as the 5% risk retention requirement for originators, and increased regulatory capital charges for some investors.
  - Limits to the origination of certain products, such as self-certified mortgages in the U.K., and increased focus on loan affordability, such as the ability-to-repay (ATR)/qualified mortgage (QM) rule in the U.S.
- Market structure
  - Shift toward nonbank sponsors and emergence of private portfolio lenders.
  - Less use of leverage by investors and more "buy and hold" investments.
  - Decreased rated issuance compared to pre-crisis levels.
- Securitization structures
  - More sequential pay structures which, all else equal, provide more protection to senior bondholders.
  - Generally, more seasoned and less leveraged structures.
  - Certain structures, such as subprime RMBS and CDOs of ABS,[21] have broadly disappeared.

[20] The default/impairment rates are the fractions of default/impairment from the empirical one-year rating transition matrices for global corporate and structured asset classes provided by Moody's Investors Service.
[21] CDOs of ABS are securities backed by a collateral pool made of other structured tranches. This is different from conventional ABS, such as ABS backed by student loans.

Table 21: 12-month impairment rate for structured tranches issued on or after January 1, 2009 and rated by Moody's Investors Service 2009-2019

12-month impairment rate and cohort size for Global SF by sector

	Impairment rate			Count		
Sector	This year*	5-year avg.**	Hist. avg.***	This year*	5-year avg.**	Hist. avg.***
US ABS	0.00%	0.00%	0.00%	2,332	2,209	1,566
US RMBS	0.00%	0.00%	0.00%	2,876	1,337	586
US CMBS	0.00%	0.12%	0.09%	2,946	2,505	1,477
Global CDOs ex CLOs	0.00%	0.00%	0.00%	282	293	193
Global CLOs	0.00%	0.00%	0.00%	5,834	3,735	1,696
EMEA SF ex CDO & Other	0.00%	0.03%	0.02%	1,611	1,378	1,069
Intl SF ex CDO & Other	0.00%	0.17%	0.20%	1,272	1,012	739
Other SF	0.00%	0.00%	0.00%	2	2	2
Global SF	**0.00%**	**0.04%**	**0.04%**	**17,155**	**12,470**	**7,213**

* This year covers the 12-month period from 1 January 2019 to 31 December 2019.
** 5-yr avg covers the 60-month period from 1 January 2015 to 31 December 2019.
*** Hist. avg. covers the period 1 January 2009 to 31 December 2019.
Source: Moody's Investors Service

Second, the rating transition rates differ between structured assets and corporate, as well as among structured sectors. Given the relatively large number of structured sectors, **Table 22** presents and summarizes the 12-month downgrade and upgrade rates for all structured securities issued in 1993–2020. **Table 23** shows structured securities issued since 2009. We include Global Corporate's Corporate statistics 1984–2020 for comparison.[22] As seen in **Table 22**, Global Structured Finance, overall, have a higher downgrade rate and a lower upgrade rate than Global Corporate (Hist avg. column). This appears to be driven by the performance of U.S. RMBS and Global CDOs. Excluding both sectors, Global Structured Finance has net downgrade rates of approximately 1.02%[23] lower than Global Corporate (4.2%). Understandably, U.S. RMBS and Global CDOs were the most severely impacted sectors during the Great Recession.

In contrast, for structured securities issued since 2009 (see **Table 23**), Global Structured Finance has significantly lower downgrade rates (2.09%) 2009–2020 than Global Corporate (13.63%), while upgrade rates of both sectors are not very different. Remarkably, more Global Structured Finance ratings are upgraded than downgraded. On average, Global Structured Finance ratings have a net upgrade rate of 6.3%, while Global Corporate has a net downgrade rate of 4.2%.

[22] The period for the corporate average differs, as Moody's Investors Service compares with a long-term, corporate benchmark.
[23] Net downgrade rate is the difference between downgrade rate and upgrade rate.

Table 22: Global structured finance 12-month downgrade and upgrade rates by sector (structured asset securities issued in 1993–2020)

	12-month downgrade rate				12-month upgrade rate			
	2020H1*	2019H1*	5-yr avg.**	Hist avg.***	2020H1	2019H1	5-yr avg.	Hist avg.
US ABS, CMBS, & RMBS	4.93%	2.25%	3.52%	17.10%	9.57%	12.84%	15.87%	5.31%
US ABS	3.02%	1.73%	3.90%	5.80%	8.72%	10.69%	11.88%	4.84%
US Auto Loans	0.00%	0.00%	0.10%	1.86%	18.09%	24.22%	22.10%	12.13%
US Credit Cards	0.00%	0.00%	0.65%	1.68%	7.10%	4.22%	2.98%	2.96%
US Student Loans	3.57%	2.19%	6.67%	5.59%	3.65%	4.54%	9.82%	2.41%
US Equipment Lease	0.00%	0.00%	0.00%	2.83%	24.76%	18.32%	19.72%	8.70%
US RMBS	5.85%	2.27%	3.35%	20.49%	12.26%	15.28%	18.92%	4.71%
US CMBS	4.18%	2.70%	3.77%	12.53%	2.61%	5.28%	8.76%	8.85%
excl CRE CDOs	4.44%	2.88%	4.02%	10.87%	2.72%	5.34%	8.39%	9.01%
EMEA ABS, CMBS, & RMBS	2.85%	6.90%	3.92%	8.98%	9.77%	12.98%	16.75%	7.95%
Asia-Pacific ABS, CMBS, & RMBS	0.51%	0.00%	0.20%	5.07%	8.82%	11.13%	8.25%	4.16%
Latin America ABS, CMBS, & RMBS	32.20%	0.00%	11.26%	12.04%	5.65%	2.12%	7.42%	7.81%
Global CDOs ex CLOs	0.00%	0.92%	0.87%	22.32%	14.43%	15.18%	16.40%	7.53%
Global CLOs	1.72%	0.54%	0.93%	7.44%	2.25%	3.08%	5.31%	14.72%
US CLOs	1.77%	0.73%	0.98%	7.17%	2.15%	3.24%	4.29%	14.44%
EMEA CLOs	1.62%	0.00%	0.80%	8.25%	2.48%	2.64%	8.10%	15.57%
Global structured finance	3.84%	2.23%	2.96%	15.72%	7.92%	11.03%	13.78%	6.27%
excl US RMBS and SF CDOs	2.75%	2.17%	2.66%	9.23%	5.58%	7.69%	9.93%	8.21%
Global corporate	16.37%	8.09%	11.82%	13.63%	4.86%	9.37%	9.14%	9.43%

* 2020H1 covers the 12-month period from July 1, 2019 to June 30, 2020; 2019H1 covers the 12-month period from July 1, 2018 to June 30, 2019

** 5-yr avg. covers the 60-month period from July 1, 2015 to June 30, 2020

*** Structured finance hist avg. are rates averaged over time period January 1, 1993 - June 30, 2020; corporate hist avg. are calculated over January 1, 1984 - June 30, 2020

Source: Moody's Investors Service

Table 23: Global structured finance 12-month downgrade and upgrade rates by sector (structured asset securities issued on or after January 1, 2009)

Global structured finance 12-month downgrade and upgrade rates by sector

	12-month downgrade rate				12-month upgrade rate			
	2020H1*	2019H1*	5-yr avg.**	Hist avg.***	2020H1	2019H1	5-yr avg.	Hist avg.
US ABS, CMBS, & RMBS	1.89%	0.75%	1.12%	1.13%	12.08%	11.75%	11.69%	11.08%
US ABS	1.92%	0.35%	0.97%	0.72%	10.70%	12.62%	13.99%	13.76%
US Auto Loans	0.00%	0.00%	0.10%	0.05%	18.09%	24.22%	22.10%	23.15%
US Credit Cards	0.00%	0.00%	0.75%	0.66%	7.43%	4.58%	3.44%	6.36%
US Student Loans	1.09%	0.32%	1.48%	1.00%	4.05%	4.06%	12.63%	8.02%
US Equipment Lease	0.00%	0.00%	0.00%	0.00%	24.76%	18.32%	19.72%	20.31%
US RMBS	0.00%	0.00%	0.00%	0.00%	22.43%	21.51%	21.18%	20.87%
US CMBS	3.95%	1.71%	2.04%	2.14%	1.84%	2.75%	3.17%	3.31%
excl CRE CDOs	4.16%	1.79%	2.18%	1.77%	1.87%	2.71%	2.76%	3.05%
EMEA ABS, CMBS, & RMBS	3.54%	6.08%	4.51%	7.27%	11.32%	13.92%	13.47%	11.43%
Asia-Pacific ABS, CMBS, & RMBS	0.60%	0.00%	0.22%	1.04%	9.49%	11.89%	9.14%	6.78%
Latin America ABS, CMBS, & RMBS	35.77%	0.00%	10.19%	12.52%	5.11%	2.82%	8.45%	11.19%
Global CDOs ex CLOs	0.00%	0.00%	0.20%	2.10%	5.76%	2.70%	4.81%	6.05%
Global CLOs	1.73%	0.55%	0.84%	0.78%	2.23%	2.76%	2.11%	2.10%
US CLOs	1.77%	0.74%	0.88%	0.80%	2.14%	2.92%	2.17%	2.16%
EMEA CLOs	1.63%	0.00%	0.71%	0.72%	2.44%	2.28%	1.92%	1.90%
Global structured finance	2.12%	1.13%	1.39%	2.09%	8.28%	8.74%	8.49%	8.39%
Global corporate	16.37%	8.09%	11.82%	13.63%	4.86%	9.37%	9.14%	9.43%

* 2020H1 covers the 12-month period from July 1, 2019 to June 30, 2020; 2019H1 covers the 12-month period from July 1, 2018 to June 30, 2019

** 5-yr avg. covers the 60-month period from July 1, 2015 to June 30, 2020

*** Structured finance hist avg. are rates averaged over time period January 1, 2009 - June 30, 2020; corporate hist avg. are calculated over January 1, 1984 - June 30, 2020

Source: Moody's Investors Service

Finally, the recovery rates of structured assets are notably different from corporate bonds. Given the scarcity of recovery data for the post-2009 issuance, we present recovery statistics 1993–2019. Moody's Investors Service examined LGDs for the 24,714 global impairments, for which final resolved loss data is available.

During 1993–2019, the average LGD rate for all resolved principal impaired securities was 84% of the original balance. As seen in **Table 24**, realized final LGD rates by sector for resolved principal impairments 1993–2019. U.S. RMBS accounts for the vast majority of impairments among all structured asset classes, with U.S. CMBS a distant second. For investment-grade tranches by rating at issuance, U.S. RMBS and CMBS have significantly higher LGDs than U.S. ABS and Global CLOs, with Global CDOs having the highest LGD. For speculative-grade tranches, U.S. ABS and Global CLOs still have lower LGDs than U.S. CMBS.

In comparison, the issuer-weighted average ultimate recovery rate is 47.7% for North American senior unsecured corporate bonds issued since 1987, implying LGD of 52.3% (Moody's Investors Service, 2020 (2)). U.S. RMBS/CMBS/ABS (both investment-grade and speculative-grade) all have higher LGDs than corporate. The investment-grade Global CLOs have lower LGD than corporate, while the speculative-grade CLOs have higher LGD than corporate.

Table 24: Realized final LGD rates by sector for resolved principal impairments 1993–2019

Realized final LGD rates by sector for resolved principal impairments by asset class, 1993-2019

	Investment-grade at issuance (% Original balance)		Speculative-grade at issuance (% Original balance)	
Asset class	Counts	Mean	Counts	Mean
US ABS	**190**	**59.6%**	**40**	**73.5%**
Small Business Loans	69	81.5%	na	na
Franchise Loans	40	74.4%	17	96.0%
Student Loans	25	12.6%	-	0.0%
Equipment Leases	41	38.2%	15	47.8%
US RMBS/HEL/MH	**18,447**	**83.3%**	**2,258**	**81.5%**
Alt-A/Option ARM	8,617	82.1%	551	80.7%
Jumbo	1,001	39.0%	227	44.4%
HELOC	51	99.6%	20	89.7%
Scratch & Dent	330	90.9%	64	72.7%
Subprime Firsts	7,111	89.2%	1,029	88.2%
Subprime Seconds	983	96.0%	192	94.0%
Manufactured Housing	120	90.0%	35	95.4%
US CMBS	**769**	**90.6%**	**1,291**	**92.2%**
Conduit/Fusion	611	94.5%	1,187	93.4%
CRE CDO	67	88.5%	29	73.1%
Small Balance Commercial	36	81.0%	49	93.2%
Large Loan	51	60.1%	23	54.5%
EMEA ABS,CMBS,RMBS	**42**	**54.9%**	**29**	**40.0%**
INTL ABS,CMBS,RMBS	**52**	**75.2%**	**56**	**95.7%**
Global CLOs	**15**	**34.0%**	**11**	**85.6%**
Global CDOs	**1,416**	**91.6%**	**98**	**96.6%**
HY CBOs				
SF CDOs	1,373	91.8%	87	96.9%
Syn Arbitrage	29	92.8%	na	na

Assets with counts less than 10 are not shown.
Source: Moody's Investors Service

While Moody's Analytics recognizes the data challenges and model complexities of modeling the various structured asset classes across historic periods, the observations above are sufficiently stark enough that we recommend assessing the use of structured data on default/impairment, migration, and recovery when estimating distinct C1 factors for structured assets.

5.1.4 Private Placement Credits

This section assesses default and recovery dynamics of private placement credits and their comparability with Moody's rated corporate bonds. Private placements refer to instruments, issued in reliance on a statutory or rule-based exemption from the registration requirements imposed by the Securities Act of 1933. Broker-dealers that recommend or sell private placements have additional requirements under FINRA and SEC rules, which include filing certain offering documents and ensuring the suitability of

any recommended investments (FINRA, 2021). Private placements are usually unrated by NRSRO but can have equivalent credit designations from NAIC.

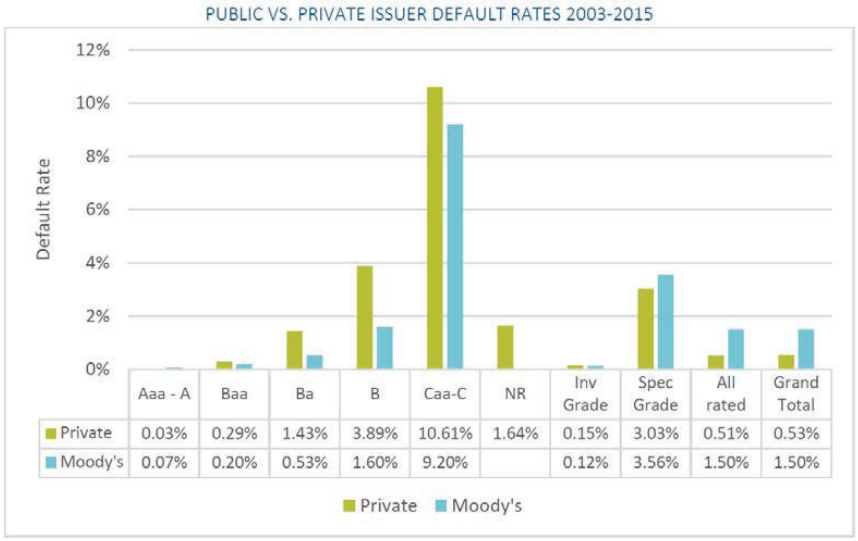
As a starting point, we cite the observations from a recent study that explores the default and recovery experiences of private placement credits in 2003–2015 (Society of Actuaries, 2019). The study is based on data contributed by 20 insurers over the 2003–2015 period that covers 14,142 CUSIPs. The study finds that, when compared with comparable Moody's rated corporates:

- Investment-grade private placement credits have experienced similar default rates
- Speculative-grade private placement credits have experienced higher default rates
- Placement credits have different rates of rating transitions
- Placement credits have higher recovery rates

Delving into the differences:

First, investment-grade default rates are low for both private placements issuers (0.15%) and public corporates (0.12%), respectively (see **Figure 6**, the investment-grade column). [24] Private issuers have higher default rates for all ratings Baa and lower. Since the private placement data from the participating companies are heavily skewed towards investment-grade, the overall default rate for rated bonds is lower for private issuers (0.51%) than Moody's rated issuers (1.50%). The quality mix difference also explains why private issuers have lower, overall speculative-grade default rates. The ratings of speculative-grade private issuers are more concentrated in Ba, while Moody's rated corporates are more concentrated in B and below.

Figure 6: Average one-year issuer default rates of public versus private issuer[25]



	Aaa - A	Baa	Ba	B	Caa-C	NR	Inv Grade	Spec Grade	All rated	Grand Total
Private	0.03%	0.29%	1.43%	3.89%	10.61%	1.64%	0.15%	3.03%	0.51%	0.53%
Moody's	0.07%	0.20%	0.53%	1.60%	9.20%		0.12%	3.56%	1.50%	1.50%

Source for public bonds: (Moody's Investors Service, 2018)
Source for private bonds: (Society of Actuaries, 2019)

Second, the rating transition patterns differ between private placements and Moody's rated corporates. As seen in **Table 25**, constructed using the internal ratings of investors, private placements have a significantly higher probability of Withdrawn Rating

[24] The default rates of private placement issuers are measured by incident rate of Credit Risk Events (CRE). CRE is parallel to default referenced by rating agencies except for two other types of events:

- the sale of a private placement bond at a price less than or equal to 70 cents on the dollar
- any other credit event that a contributor substantiated as a default-like credit deterioration but, due to the nuances of the private placement market, does not fit the definitions above.[15] The purpose of including these types of events as CREs is to avoid understatement of the incidence of CREs for situations that, in similar circumstances with public bonds, would have most likely resulted in a default.

[25] The chart was constructed by the Society of Actuaries, with reference to data from Moody's Investors Service.

(WR)[26] than Moody's rated corporates (see **Table 26**) especially for Aaa and speculative grades. With the exception of Aaa, private placements have similar or lower rating transition rates than Moody's rated corporates for investment-grade. For speculative grades, especially B and below, private placements have a higher rate of rating transition than Moody's rated corporates.

Table 25: One-year rating transition rate of private placement credits (2003–2015)

MOST RECENT INTERNAL RATINGS ONE-YEAR MIGRATION RATES

From \ To	AAA	AA	A	BBB	BB	B	CCC	<CCC	CRE	WR
AAA	**83.65%**	4.57%	1.10%	1.53%	0.05%	0.03%	0.00%	0.00%	0.00%	9.06%
AA	0.73%	**88.75%**	5.29%	0.55%	0.07%	0.01%	0.01%	0.01%	0.01%	4.56%
A	0.03%	1.03%	**87.77%**	5.86%	0.12%	0.03%	0.04%	0.00%	0.03%	5.10%
BBB	0.02%	0.03%	1.68%	**88.97%**	2.05%	0.25%	0.02%	0.03%	0.22%	6.74%
BB	0.03%	0.03%	0.41%	6.50%	**75.23%**	3.15%	0.79%	0.36%	1.63%	11.86%
B	0.00%	0.00%	0.15%	0.80%	6.15%	**66.48%**	2.84%	1.89%	5.13%	16.56%
CCC	0.00%	0.00%	0.00%	0.60%	1.20%	6.08%	**56.97%**	5.98%	10.56%	18.63%
<CCC	0.00%	0.00%	0.00%	0.94%	1.31%	4.50%	0.94%	**65.29%**	7.32%	19.70%

Source: (Society of Actuaries, 2019)

Table 26: One-year rating transition rate of public corporates rated by Moody's Investors Service (1970–2019)

From/To:	Average cohort count	Aaa	Aa	A	Baa	Ba	B	Caa-C	Withdrawn	Default
Global Corporates										
Aaa	105	87.90%	7.78%	0.59%	0.07%	0.02%	0.00%	0.00%	3.63%	0.00%
Aa	411	0.79%	85.30%	8.46%	0.42%	0.06%	0.03%	0.02%	4.90%	0.02%
A	879	0.05%	2.48%	86.99%	5.18%	0.46%	0.10%	0.04%	4.65%	0.05%
Baa	847	0.03%	0.13%	4.02%	86.12%	3.59%	0.65%	0.16%	5.15%	0.16%
Ba	461	0.01%	0.04%	0.40%	6.14%	76.53%	7.00%	0.81%	8.25%	0.84%
B	562	0.01%	0.03%	0.13%	0.44%	4.84%	73.67%	7.05%	10.81%	3.04%
Caa-C	337	0.00%	0.01%	0.02%	0.08%	0.32%	5.94%	69.64%	15.10%	8.89%

Third, the recovery rate of senior unsecured private placements 2003–2015 (62.2%) is higher than the issuer-weighted, average 47.7% ultimate recovery rate for senior unsecured bonds of North American corporate issuers since 1987 (Moody's Investors Service, 2020 (2)). It is recognized that private placement credits have customized covenant protections to investors (Society of Actuaries, 2019). This could contribute to higher recovery rates for private placement credits than public corporate.

It is noted that the private placements data may be subject to challenges, such as change in asset IDs and miscoded ratings. While the Private Placement Experience Committee at the Society of Actuaries has reviewed and detected the data issues, some errors may remain and affect the rating transition matrices. In addition, the experience data was provided by 20 insurers and may not fully reflect the whole universe.

Since private placement credits have higher default rates for Baa and below ratings and higher recovery rate than what is observed for Moody's rated corporates, additional data and analysis may be needed to assess whether C1 factors will be larger or smaller than currently proposed if private placement credits data is used for C1 factors development. While recognizing the data challenges and scarcity of references, Moody's recommends exploring a centralized collection of default, migration, and recovery data that can later be used in further estimating distinct C1 factors and for other purposes.

[26] Withdrawn Rating (WR) includes the events where assets have matured, been sold, or called. This classification also includes a very small proportion of assets that migrated from a letter rating to no rating submitted by the participating companies in the following year.

5.2 Simulation and Correlation

5.2.1 Summary of Moody's Analytics Significant Areas of Review and Recommendations

The current C1 factor model does not account for variation in cross-industry and cross-asset class concentration risks nor diversification that may be different across life companies' portfolios. These variations can be material, and we recommend additional analysis that assesses the materiality of abstracting from cross-industry and cross-asset class differentiation.

5.2.2 Review and Analysis Performed by Moody's Analytics

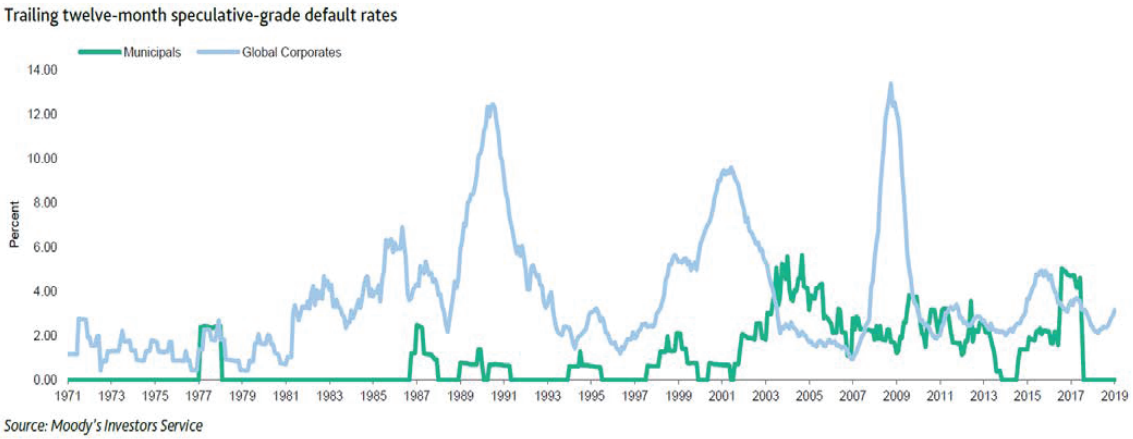
The representative portfolio is simulated for each alphanumeric rating when computing C1 factors. For example, the C1 RBC factor for Aaa rated bonds is computed independently of the C1 factor for A or Baa ratings. The simulated economic state determines the leveled economic scalar that adjusts baseline default rates for each counterparty. If a bond defaults in any year *t* before Year 10, then the full principal is assumed to be reinvested with the same initial rating and maturity (10-*t*) years. For example, if an Aa1 bond defaults at Year 3, then the full principal is assumed to be reinvested in an Aa1 bond with 7 years maturity. The cashflows are discounted to present value by 5% pre-tax/3.25% after-tax per annum, approximately the average 10-year LIBOR swap rates 1994–2013. The tax rate for assets carried at market value is assumed to be 35%. 80% of tax is assumed to be recoverable when default occurs.

The approach of separately simulating each rating makes sense in the context of stylized sub-portfolios that exhibit no diversification benefits when combined. This is generally not the case with credit portfolios, which often have a range of industry, country, and asset-class (e.g., Muni, corporate) exposures. In addition, setting the representative portfolio as having the same level of counterparty concentration and its impact on portfolio risk is worth exploring further.

To better understand the materiality of cross-asset class diversification benefits, we explore their historical default rates and the extent to which they are correlated.

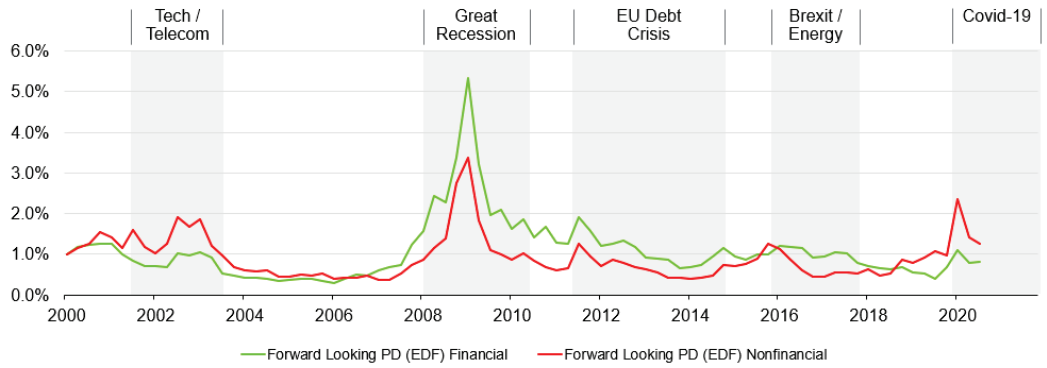
Figure 7 demonstrates historical default rates of speculative-grade municipal bonds and global corporates are not strongly correlated — if they were, the two series would move in lockstep. For example, during the 2001 dot-com bubble, when the speculative-grade corporate default rate skyrocketed, default of similar-rated municipal bonds remained rare. This follows, as municipal and corporate bonds are driven by different underlying risk factors.

Figure 7: Historical default rate of speculative-grade municipal bonds and global corporates



In a similar vein, Figure 8 presents the average annualized default probability, using the Moody's Analytics EDF™ (Expected Default Frequency) credit measure, across all U.S. Financial and Non-financial publicly listed firms. We can see the Tech and Telecom companies deteriorated in credit quality during the early 2000s, with financial institutions weathering reasonably well. Financials' default probabilities increased in a more pronounced manner at the onslaught of the Great Recession, and they have weathered the current COVID-19 crisis reasonably well.

Figure 8: Average One-Year Default Probabilities for Financials and Non-Financial Firms in the United States (normalized so that 2000 probabilities = 1%)



Source: Moody's Analytics

The desire to model these correlations is recognized in (American Academy of Actuaries, 2015); the methodology and data did not lend to segmentation:

> While credit recognized as we considered the use of default rates that varied by industry sector, however, there was limited data available. In addition, there are practical considerations with how to classify bonds by industry. Hypothetically, if sufficient data were available, a model with industry correlation factors could be built. As such data is not available, we assume correlations are implicit in the default data.

We recognize the challenges of using default data for rated corporate borrowers — in particular, the dearth of data limits segmentation. There, however, is a wide range of data and modeling approaches that have been developed to overcome this challenge. Moody's Analytics GCorr™ global correlation model, for example, contains over 1,000 credit factors, with coverage including corporate credit (61 industries across over 100 countries) also relevant for CLOs, retail credit in the U.S. (with 6 retail asset types across 51 states/district) that is relevant for ABS and RMBS, over 100 sovereigns, and commercial real estate (with 5 property types across 73 MSAs) relevant for CMBS. When used in conjunction with Moody's Analytics rating transition model we can obtain a granular representation of portfolio risk that accounts for correlated deterioration in credit and default.[27] When used in assessing diversification, we find corporate industry credit factors within each country are, on average, in the order of 85% correlated, but can exhibit correlations as low as 70%. Meanwhile, cross-asset class diversification can be material, with retail, corporate, and commercial real estate factors often having correlations below 50%. While the impact on portfolio risk measures can be substantial, with reductions of in excess of 30%, when imperfect correlations are accounted for, Moody's recognizes the impact is portfolio-specific and dependent upon the specific nature of the risk measures of interest (e.g., greatest default loss, standard deviation).

We further highlight the unique correlation behavior of structured assets, recognizing the underlying collateral often contains a large diversified pool of issuers. The diversified idiosyncratic risk often results in observed, higher level of correlations for structured assets when compared to, say, corporate credit of similar rating (Yahalom, Levy, & Kaplin, 2010).

Thus, our recommendation for additional analysis to assess the materiality of abstracting from cross-industry and cross-asset class differentiation.

5.3 Maturity Effect on Capital Factors

5.3.1 Summary of Moody's Analytics Significant Areas of Review and Recommendations

The C1 factors do not differentiate risk across maturity. This can create a material distorted incentive to hold longer-dated bonds whose credit risk is more sensitive to the credit environment. Moody's recommends exploring a maturity adjustment to the C1 factors.

[27] For details, see (Moody's Analytics, 2012), (Moody's Analytics, 2020), and references therein.

5.3.2 Review and Analysis Performed by Moody's Analytics

RBC factors are calculated for a ten-year horizon and implicitly assume a maturity of 10 years for all bonds (American Academy of Actuaries, 2015). While the assumption provides simplicity, and the 10-year maturity is recognized as in-line with a modified duration of life insurance portfolios, the sensitivity of risk to maturity is material and can distort the desired composition of asset holdings. There are two aspects to this point:

- Lifetime loss — All else equal, including counterparty and recovery, the lifetime loss of a 10-year bond is greater than that of, a seven-year or a one-year bond. A flat default probability term-structure would have lifetime loss increasing linearly with time to maturity; the 10-year bond faces roughly 10 times the expected lifetime loss as the one-year bond.
- Correlated losses — all else equal, including the expected default probability to maturity, default correlation across two counterparties will be lower if the maturity of one is shorter than the other. Events will impact the longer-dated bond after the maturity of the shorter-dated bond. To further intuit this dynamic, consider the extreme case of a consol bond with no maturity date and a one-year bond to the same counterparty. The events that lead to a default on the consol bond are likely to materialize well after the one-year bond matures.

With these observations, it is clear the proposed RBC factors should consider instrument-level maturity. It is worth exploring the assumptions along with the dynamics that are desired to be captured by the model. If the model is intended to measure capital over a 10-year horizon that includes future investments, assuming matured assets are rolled over, there is some (flawed) justification for treating all bonds as having a 10-year maturity. If, say, the one-year bond is rolled over for 10 years with the same counterparty, its lifetime loss will equate to that of the 10-year bond. Let's explore the two sources of maturity effects listed above:

- Lifetime loss — In general, insurance companies invest in high-quality credit, generally facing upward sloping default probability term structures; the 10-year default probability can often be many multiples larger than the 1-year default probability. After all, high credit quality names can only deteriorate in credit over time. Thus, the lifetime loss of the 10-year bond will be substantially higher than the lifetime loss of a strategy involving one-year bonds rolled over into high credit quality counterparties. **Table 7** presents investment-grade Moody's idealized cumulative expected default rates.[28] For AAA, the one-year spot default rate is 0.0001%, while the 10-year spot rate is 0.0018% ((0.0100%-0.0082%)/(1-0.0082%)), almost 20 times larger.
- Correlated losses — The issue outlined above continues to prevail. Default correlations will be lower across two counterparties if the maturity of one bond is shorter than that of the other.

With these observations in mind, we suggest exploring a maturity adjustment similar in spirit to the one found in regulatory capital guidelines for banks put forth by the Bank of International Settlements and described in (Basel Committee on Banking Supervision, 2005).

5.4 Investment Income Offsets

5.4.1 Summary of Moody's Analytics Significant Areas of Review and Recommendations

While investment income can be used to offset loss and support statutory surplus, the C1 factors are modeled with the implicit assumption that all investment profits are fully distributed to policyholders or used to absorb product or operational losses. This introduces a potential bias in differentiating investment income across assets, across rating categories, and across asset classes. Accounting for such heterogeneity in investment income can potentially lead to substantial differences in RBC factors across ratings and asset classes. Moody's recommends more accurately differentiating investment income across assets in the C1 factors.

5.4.2 Review and Analysis Performed by Moody's Analytics

C1 factors are intended to capture the minimum capital amount that protects statutory surplus from the fluctuations that reduce statutory surplus. While investment income can be used to offset loss and support statutory surplus, it is not explicitly modeled in the current framework under the implicit assumption that all investment profits are fully distributed to policyholders or used to absorb product or operational losses.[29]

[28] For a detailed discussion of Idealized Default Rates and their use, see (Moody's Investors Service, 2020 (1)).
[29] There are two exceptions: the investment income generated by the Risk Premium portion of the fund (assumed to be 5%) and the risk-free income on capital included in the model.

This introduces a potential bias in differentiating investment income across assets, across rating categories, and across asset classes. Accounting for such heterogeneity in investment income can potentially lead to substantial differences in RBC factor across ratings and asset classes.

Per the (American Academy of Actuaries, 2015), the current C1 factors were last analyzed in 2002. While the methodology was changed, no changes were made to the original C1 factors first reported in 1994 as a result of this 2002 analysis. Since 1994, there has been a wide range of developments in the credit securities markets, and the sorts of credit that insurance companies are exposed to. Specifically, with the prevalence of increasingly complex credit securities, the relevance and variation in interest income have increased. In some cases, interest income plays a material role in the risk profile of a credit security that is not well approximated through the Risk Premium method. For example, according to (Wells Fargo Securities, 2020), structured instruments offer higher interest income compared to corporate bonds of the same rating. As of October 2020, the average investment-grade corporate bond OAS was 122bps, while the average CLO OAS for different investment-grade ratings ranged from 138-415bps, and the average non-agency CMBS OAS for different investment-grade ratings ranged from 103-892bps.

Moody's recommends more accurately differentiating investment income across assets in the C1 factors.

5.5 Comparability Across NRSROs Ratings

5.5.1 Summary of Moody's Analytics Significant Areas of Review and Recommendations

The model is developed based on Moody's ratings only. However, NAIC rating designations are typically determined by a set of NRSROs ratings. NRSROs have unique differences in credit rating methodologies and do not provide correspondence because they base their credit ratings on a range of qualitative, as well as quantitative, factors. This creates a challenge when mapping ratings across NRSROs to the various NAIC rating designations. It is plausible that the properties (such as default rate, recovery, etc.) of the NAIC rating in practice are substantially different from those of Moody's rating used in the model development. With this in mind, we recommend an assessment of variation across NRSROs rating migration, default, and recovery rates, and across the credit cycle. If this is not possible because of, say, lack of historical data, Moody's Analytics recommends revisiting the use of the second-lowest NRSROs rating in assigning the NAIC designation.

5.5.2 Review Performed by Moody's Analytics

The Credit Rating Agency Reform Act (CRARA) of 2006 requires that entities that meet defined criteria register with the SEC as a condition of being designated as NRSROs. As a result, as of the beginning of 2019, there were ten rating agencies certified as NRSROs by the SEC. The NAIC adopted the Filing Exempt (FE) rule, granting any NRSRO that has registered with the SEC and has been designated an NRSRO the right to apply and provide credit rating services to the NAIC. Per (National Association of Insurance Commissioners, 2017) the NAIC SVO provides equivalent NAIC designation for nine NRSROs. Per (National Association of Insurance Commissioners, 2007) the FE process will calculate the second-lowest NRSROs rating in assigning the NAIC designation.

The use of multiple NRSROs in the context of model development requires a quantitative correspondence between credit ratings and a range of migration, default probabilities, and loss expectations, that needs to be better understood, recognizing NRSROs assess different aspects of credit risk. For example, Standard & Poor's recognizes that when, "assess[ing] the creditworthiness of an issuer, S&P Global Ratings evaluates the issuer's ability and willingness to repay its obligations in accordance with the terms of those obligations... Credit rating agencies may also assess recovery, which is the likelihood that investors will recoup the unpaid portion of their principal in the event of default. Some agencies incorporate recovery as a rating factor in evaluating the credit quality of an issue, particularly in the case of non-investment-grade debt. Other agencies, such as S&P Global Ratings, issue recovery ratings in addition to rating specific debt issues. S&P Global Ratings may also consider recovery ratings in adjusting the credit rating of a debt issue up or down in relation to the credit rating assigned to the issuer (Standard & Poor's, 2019)." Meanwhile, Moody's Investor Service, the rating agency arm of Moody's, takes the position that its "… ratings reflect both the likelihood of a default and the expected loss suffered in the event of default. Ratings are assigned based on a rating committee's assessment of a security's expected loss rate (default probability multiplied by expected loss severity)" (Moody's Investors Service, 2020 (3)).

The Dodd-Frank Act required the SEC to review the feasibility and desirability of NRSROs credit rating standardization, including quantitative correspondence between credit ratings and a range of default probabilities and loss expectations under standardized conditions of economic stress. In their report to congress, (Securities and Exchange Commision, 2012), the Commission recognized the number and uniqueness of rating scales and differences in credit rating methodologies used by credit rating agencies, and that NRSROs do not provide such a correspondence, because they base their credit ratings on a range of qualitative, as well as

quantitative, factors. With this in mind, we recommend an assessment of variation across NRSROs rating migration, default, and recovery rates, and across the credit cycle. If this is not possible because of, say, lack of historical data, Moody's Analytics recommends revisiting the use of the second-lowest NRSROs rating in assigning the NAIC designation.

5.6 Climate Hazards and Emerging Risks

5.6.1 Summary of Moody's Analytics Significant Areas of Review and Recommendations

The C1 factors do not explicitly consider climate hazards or emerging risks (e.g., pandemic or cyber). These risks may not be explicitly incorporated into NRSRO ratings and may not be reflected in the historical data used in estimating the C1 factors. While climate hazards are particularly relevant for the likes of real estate and municipal credit, growing evidence suggests climate hazards and other emerging risks can be material for corporate credit[30]. Moody's Analytics recommends exploring the potential impact of climate hazards and emerging risks on C1 factors across asset classes.

5.6.2 Review Performed by Moody's Analytics

Climate hazards and emerging risks are drawing growing concerns from credit investors, financial regulators, and rating agencies. COVID-19 has demonstrated the rapid and cascading impacts of a global catastrophic risk that may not be explicitly considered in the NRSRO ratings and that may not be reflected in historical data. Pandemics — as well as climate hazards, debt crises, cyberattacks, and other events — are high-likelihood, high-impact risks (World Economic Forum, 2021).

Climate hazards have been recognized to impact municipal and commercial real estate credit. Climate hazards can be categorized into chronic and acute hazards. The impacts of the acute climate hazards, typically low-frequency and high-damage, may be worth special attention. Hurricane Harvey for example had Moody's downgrade Port Authority (Steinberg, 2018). Climate hazards are increasingly recognized as a risk for longer-dated corporate credit (Levy & Freitas, 2019). One study finds that eighteen sectors with $7.2 trillion issues have high inherent exposure to physical climate risks (Moody's Investors Service, 2020 (4)). The largest sectors in terms of rated debt include emerging market governments, regulated electric and gas utilities with generation, and integrated oil and gas companies. Moody's Investors Service has put efforts to include environment, social, and governance (ESG) risk assessment in the rating issuance and monitoring process. Moody's Investors Service launched a specialized ESG analytical team in March 2017 and published General Principles for Assessing Environment, Social and Governance Risks in January 2019. ESG factors were cited in half of public-sector rating actions taken in the 15 months through the first quarter of 2020 (Moody's Investors Service, 2020 (5)).[31] Likewise, S&P and Fitch have also been incorporating the ESG considerations into their ratings methodologies. For S&P, environmental and climate (E&C) concerns affected corporate ratings in 717 cases, or approximately 10% of corporate ratings assessments and resulted in a rating impact (an upgrade, downgrade, outlook revision, or CreditWatch placement) in 106 cases between July 2015 and August 2017 (S&P Global Ratings, 2017). Fitch Ratings developed an integrated scoring system, ESG Relevance Scores, which clearly displays how ESG factors impact individual rating decisions (Fitch Ratings, 2020).

Many regulators have been increasingly recognizing these risks. The European Central Bank (ECB), for example, speaks to "the number of catastrophes caused by natural hazards... Adjusting for inflation, overall economic losses… of USD 350 billion in 2018" (Lagarde, 2020). Governor Lael Brainard of the Federal Reserve speaks "we are already seeing elevated financial losses associated with… [the] frequency and intensity of extreme weather events" and cites the example of climate-related bankruptcy of Pacific Gas & Electric. She also points out "mortgages in coastal areas are vulnerable to hurricanes …" (Brainard, 2020). "Extreme weather…" is highlighted as one of the highest impact risks of the next decade in the Global Risks Report (World Economic Forum, 2020).

While being increasingly important considerations in NRSRO ratings, climate hazards and emerging risks may not be explicitly incorporated into historical NRSRO ratings nor reflected in the historical data used in estimating C1 factors. Moody's Analytics recommends exploring the potential impact of climate hazards and emerging risks on C1 factors across asset classes.

[30] See Moody's Analytics Research Paper for an empirical assessment of financial impacts of climate-related hazard events (Ozkanoglu, Milonas, Zhao, & Brizhatyuk, 2020)
[31] Other factors such as changes in economic growth, budget deficits or leverage metrics are also considered. When a rating action cites an ESG issue as a material credit consideration, it does not necessarily mean that the issue was a key driver of the rating action.

6 Suggested Next Steps

As discussed in the Executive Summary, this report documents Moody's Analytics objective assessment of the modeling process, the development of assumptions from underlying experience, and the adjustments to reflect diversification of individual company portfolios used in investment risk factors for fixed income assets. The report recognizes that C1 factors have potential implications for business decisions that can ultimately impact solvency. Moreover, Moody's Analytics is aware of the significant effort involved in a broader redesign of C1 factors and understands the original scope was limited to model parameter updates and increased C1 factor granularity in the C1 Factor Proposal. Moody's Analytics appreciates that since the original C1 factors were released in 1992, life insurance exposure to credit has increased in size and complexity, and that new data and techniques are now available that can better describe credit risk.

With these aspects in mind, we suggest a phased-in approach, whereby, targeted aspects of the model development are addressed immediately, recognizing that a broader redesign of C1 factors is also in order. Both the immediate changes, as well as the broader redesign, should have stakeholders prioritize items from **Table 1**, **Table 2**, and **Table 3**, along with potential items outside the scope of this report, recognizing that: (1) changing only one aspect must be done cautiously, given the interconnectedness of portfolio models, and that (2) the objective of allowing C1 factors and their impact on business decisions is to align with prudential management of solvency.

As discussed, the tight April deadline limits the possible items that can be revised during the first phase, focusing on the "slope" of charges across credit ratings and the portfolio adjustment function. The revisions should be approached in conjunction with stakeholders iteratively, as follows:

- Review and prioritize modifications to the proposed rules, along with the current rules as a point of reference.
- Assess and agree on performance criteria, along with possible data sources and methodologies.
- Propose updated model parameters and C1 factors, recognizing benchmarking and validation concerns including model limitations, and adhering to sound model risk management guidelines (Board of Governors of the Federal Reserve System and Office of the Comptroller of the Currency , 2011).
- Assess implications for solvency across the life insurance industry.

In addition, Phase 1 should include an articulation of model limitations related to the other items referenced in this document at a level of detail and adhering to a timeline to be determined jointly with stakeholders.

The Phase 2 broader redesign should start as soon as practical, prior to completion of Phase 1. It would not be completed in 2021, recognizing the lead time needed for data collection and research. It should be approached in conjunction with stakeholders in an iterative manner, as follows:

- Obtain clarity on the desired level of:
    - Model complexity (e.g., issuer concentration)
    - Granularity (e.g., differentiating across asset risks)
- Assess cost implications
    - Resources, including personnel, to develop and implement models within a sound model risk management framework
    - Data collection
    - Model monitoring and model re-development
- Articulate governance — potentially impacting organizational structure at insurance companies and NAIC
    - Control mechanisms through policies and procedures associated with model development, validation, implementation, and use
- Propose redesigned C1 factors
    - Assess and agree on performance criteria, along with possible data sources and methodologies
    - Propose updated model and C1 factors, recognizing benchmarking and validation concerns, including model limitations, and adhering to sound model risk management guidelines (Board of Governors of the Federal Reserve System and Office of the Comptroller of the Currency , 2011)
    - Assess implications for solvency across the life insurance industry

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Assessment of Proposed Revisions to the RBC C1 Bond Factors

FEBRUARY 2021

Moody's (NYSE:MCO) is a global integrated risk assessment firm that empowers organizations to make better decisions. Its data, analytical solutions and insights help decision-makers identify opportunities and manage the risks of doing business with others. We believe that greater transparency, more informed decisions, and fair access to information open the door to shared progress. With over 11,400 employees in more than 40 countries, Moody's combines international presence with local expertise and over a century of experience in financial markets. Learn more at moodys.com/about.

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Moody's Investors Service (MIS) provides investors with a comprehensive view of global debt markets through credit ratings and research. Moody's Analytics provides data, analytics, and insights to equip leaders of financial, non-financial, and government organizations with effective tools to understand a range of risks.

Throughout this document, "Moody's" rating refers to an MIS rating. And while references to MIS are made, the views and opinions in this document are solely of Moody's Analytics.

Agenda

1. Project Overview
2. Key Findings
3. Recommended Next Steps

Appendix I. Detailed Phase 1 Scope

Appendix II. Detailed Significant Areas of Review and Recommendations

1 Project Overview

Background

Timeline

- On October 22, 2020, the ACLI, in conjunction with the NAIC, put forth a public RFP to assess the proposed RBC C1 Bond Factors.
- On December 4, 2020 Moody's Analytics was awarded the RFP.
- Moody's Analytics delivered the final report and recommendations for public comment on February 1, 2021.

Why Moody's Analytics?

- Objective reputation
- Credit portfolio risk thought leader;
  RiskFrontier used by 9 of 12 largest North American life insurers for tail risk
- Comprehensive and granular asset correlations, built using decades of data and default risk experience
- Proprietary default datasets, across multiple asset classes, that can be used to inform our analysis
- Fixed income market data, sourced from multiple authorities, including Moody's Investors Service, with access to underlying data across asset classes, including Corporates, Municipals, Structured, and CRE
- Decades of experience with regulatory initiatives, including IFRS 17, CECL, IFRS 9, Basel, CCAR.
- Experience directly supporting regulators in defining capital guidelines

RFP Requirements

Assess the proposed required capital factors for the default risk on bonds. Review the proposed revisions to the RBC C-1 bond capital factors, including supporting documentation of the development of assumptions and modeling process, and stakeholder feedback on the proposed revisions, focused on concerns with the modeling process, the development of assumptions from underlying experience, and the adjustments to reflect diversification of individual company portfolios.

Moody's Analytics objective opinion based on access to supporting documentation and stakeholder feedback, including the NAIC, ACLI and its members

Practical recommendations

- Quantifying identified risks intended to be captured by C1 factors
- Using data and modeling approaches recognized as best practice and that meet financial industry standards (documentation, model validation, back-testing, performance benchmarking…)
- Acknowledging impact on business decisions through regulatory capital arbitrage incentives, shifting asset holdings, effecting solvency, macroprudential resiliency, and capital markets

Proposed C1 Factors: Context

The Academy's Defined Scope was dictated by the NAIC RBC Working Group and limited to:

- Updated data
- Expansion to 20 designations
- Maintaining the modeling structure designed ~30 years ago (cutting edge for the early 90s)

The report is not limited to the Defined Scope, rather it takes a broader view, recognizing:

- Modeling techniques and data availability have evolved with capital markets (e.g., structured assets)
- Life insurance asset holdings have changed along with capital markets

2 Key Findings

Proposed C1 Factors: Areas of Concern

Not using best practice with data and modeling choices

» This includes items within the Defined Scope, as well as items outside of the Defined Scope, that Moody's feels are relevant and material.

Model documentation, does not generally meet financial industry standards. Critical for ongoing model monitoring and model updates. With limited articulation of model limitations, the potential for distorted business use has implications for solvency.

» Incomplete documentation

» Incomplete model validation, back-testing, and performance benchmarking

» Incomplete articulation of model limitations

Modeling and Data Concerns Within Defined Scope

Methodologies used in estimating default rates and recovery rates do not lend themselves to statistical properties of the data, including:

- Appropriately capturing the risks across ratings when applying the methodology across the granular 20 designations, considering limited data availability and the statistical properties of ratings and default.
- Calibration of the portfolio adjustment function to accurately capture the benefits of diversification. The current proposal may be overly punitive to holdings of smaller life insurance companies. The rational for doubling of C1 factors of the 10 largest issuers is also unclear.

Overly conservative assumption for the risk premium

- Inputs for which accurate proxies are available, as is the case with the risk premium, should be directly used to facilitate transparency and avoid inadvertent risk shifting across categories. Conservatism can be added in the final stage (i.e., when setting percentile loss).

Dated discount rate and tax assumptions

Modeling and Data Concerns Outside the Defined Scope

Lack of differentiation across asset classes (e.g., corporate, structured, municipal credit), maturity, and investment income offsets

- Rating agencies recognize that the fundamental risk drivers differ across asset classes.
- The report finds material differences in observed default, migration, and recovery dynamics across asset classes.

The use of multiple NRSROs given their potential lack of comparability

- NRSROs have unique differences in credit rating methodologies and do not provide correspondence, because they base their credit ratings on a range of qualitative, as well as quantitative, factors.

The economic state modeling framework does not lend itself to statistical properties of default and recovery dynamics

Lack of consideration for climate hazards or emerging risks (e.g., pandemic or cyber)

- These risks may not be explicitly incorporated into NRSRO ratings and may not be reflected in the historical data used in estimating the C1 factors.

3 Recommended Next Steps

A Phased-In Approach is Recommended

Phase 1: Moody's to Propose C1 Factors

Delivered to the LRBCWG and exposed on or before April 30 for comment

Final factors to be approved by both LRBCWG and CADTF by June 30

Model development within Defined Scope and aligning with current Official NAIC Annual Statement Blank. Consensus-driven approach on methodologies and data across the NAIC, ACLI and its members**.** Documentation includes model validation and limitations that meet financial industry standards.

Phase 2: Long-term partnership through 2022+

Modeling and data updates outside the Defined Scope, providing NAIC data and tools to better understand and articulate life insurance companies' credit portfolio risks, recognizing range of holdings have changed materially since C1 factors were introduced.

- **Broader model development,** including cross-asset class differentiation, prioritized with stakeholders, with methodologies and data that meet financial industry standards.
- **Overall model documentation,** that meets financial industry standards, in particular covering elements of the model not modified in Phase 1.
- **Data consortium**, covering private placements and possibly other asset classes.

Phase 1 Timeline

Scope defined jointly with stakeholders while recognizing timeline constraints

By March 31

- V1 proposed factors, iterating with NAIC and ACLI
  - Consensus on methodology, data, and performance criteria
  - Consensus on target probability
- V1 light documentation
- V1 initial industry impact analysis

By April 30

- Delivered to the LRBCWG and exposed for comment
- Initial documentation and validation
- Impact analysis, iterating with NAIC and ACLI
  - Consensus on methodology, data, and limitations
  - Consensus on target probability
- Initial focus group discussions and training

By June 30 (Iterating with NAIC/ACLI as needed

- Final factors to be approved by both LRBCWG and CADTF
- Final documentation and validation of factors that meet financial industry standards
- Final focus group discussions and training

Phase 2 Broader Model Development

Approached in conjunction with stakeholders iteratively

Obtain clarity on the desired level of:

- Model complexity (e.g., issuer concentration)
- Granularity (e.g., differentiating across asset risks)

Assess cost implications

- Resources, including personnel, to develop and implement models
- Data collection
- Articulate governance — potentially impacting organizational structure at insurance companies and NAIC

Propose redesigned C1 factors

- Assess and agree on performance criteria, along with possible data sources and methodologies
- Propose updated model, and C1 factors that meet financial industry standards
- Assess implications for solvency across the life insurance industry

Appendix I

Detailed Phase 1 Scope

Phase 1: Final scope to be agreed on by stakeholders

Base factors

- Risk Premium: Use 1 standard deviation loss (rather than mean)
- Updated discount and tax rate assumptions
- PD and LGDs
  - Use Idealized Default Rates
  - Re-estimate LGD with date errors fixed
  - Fix LGD error in economic state model
  - Limitation - economic state scalar would remain unchanged
- Obtain a representative set of corporate bond holdings and ratings across life insurance companies
- OPTIONAL - Portfolio construction requires an additional [uncertainty has no guarantee of delivery for Phase 1, but will be usable for Phase 2]
  - Explore alternative portfolio construction methods
- Iterate with NAIC on target probability to ensure “average” level, in-line with NAIC risk tolerance
- Iterate with industry on slope and impact

Portfolio adjustment Function

- Integrate the doubling of 10 largest holdings requirement with portfolio adjustment function
- Explore alternative regression approaches such as equal weighted error minimization rather than dollar weighted, to allow for better description for small insurance companies
- Assessment of concentration risk using Moody’s Analytics internal benchmarks, which would be made public
- Iterate with NAIC on target probability to ensure “average” level, in-line with NAIC risk tolerance
- Iterate with industry on impact

Appendix II

Detailed Significant Areas of Review and Recommendations

Review of Key Inputs

Summary of significant areas of review and recommendations

Default Rates	The methodologies used by the C1 Factor Proposal to construct default rates across ratings, as well as methodologies used in differentiating default rates across expansion and contraction states, face data limitation challenges. Moody's Analytics recommends updating the methodologies and using additional data referenced in the review that have been demonstrated to better capture credit dynamics.
Recovery Rates	The C1 Factor Proposal's method used to recognize the recovery date does not align with the date of default. This deviation can result in bias with recovery rate levels, as well as their relationships with default rates. Moody's Analytics recommends exploring the use of more accurate data and groups when describing recovery distributions and utilizing more current techniques that link recovery with the credit environment.
Discount Rate	Since the modeling work was conducted by Academy in 2015, the discount rate used in the model is calculated using historic data that does not reflect the current low-interest environment, nor the expected continuation of a low interest rate environment. Moody's Analytics recommends updating the discount rate to include December 31, 2013 − December 31, 2020 data to better reflect the current and expected interest rate environment, in conjunction with updated tax assumptions that reflect the 2017 Tax Act.
Construction of the Representative Portfolio	The segmentation and filtering of the sample portfolios used to construct the representative portfolio lack economic justification or sensitivity analysis. For example, for reasons not explained, only NAIC1 and NAIC2 rated issuers are used to determine the number of bonds in the representative portfolio for all rating categories. In addition, each representative portfolio ultimately used in the simulation contains one rating category, which makes the final C1 factors heavily dependent on portfolio adjustment factors. Given the importance of the representative portfolio, we recommend more comprehensive documentation and robustness tests that can show whether the segmentation and filtering method has material impact on the C1 factors and explore the option of constructing a representative portfolio that contains all rating categories.
Tax Assumptions	The U.S. corporate tax rate was lowered from 35% to 21% in accordance with the 2017 Tax Reconciliation Act (Deloitte, 2018). Net capital gains included in the taxable income are subject to the 21% rule (CCH Group, 2019). While the model was developed based on historical data before the tax cut, the RBC factors, if adopted, will be applied to insurers, which will pay the updated tax rate. It will be worthy to consider updating the assumed 35% tax rate to 21%. Moody's Analytics recommends analysis reflecting the current tax environment.

Review of Model Framework

Summary of significant areas of review and recommendations

Economic State Model	We have three main concerns regarding the economic state model, which are closely related to the discussion in Section 3.1. First, the two-state model does not accurately capture persistency in default and recovery rates across the credit cycle. Second, the economic state of Loss Given Default (LGD) appears to be mistakenly disconnected from that of default rate for ratings Baa-Caa. Third, the scaling factor used in differentiating default rates across expansions and contractions appears to be overly punitive for the investment-grade segment compared with historical patterns. Moody's Analytics recommends a more holistic review of the choice of a framework that can address broader sets of issues, including more precise differentiation across asset classes, as discussed in other sections.
Portfolio Adjustment Factors	The portfolio adjustment factor is one of the most important elements of the model, as it ultimately determines the general RBC level for individual insurers. Unfortunately, documentation is limited, making it difficult to access the materiality of some of the modeling choices. In addition, the limited documentation available suggests a potential material gap between the calculated C1 factor and its target level for individual insurers, especially smaller ones. Moody's Analytics recommends: (1) more detailed documentation of the adjustment factor and the underlying economic justification, in conjunction with the doubling of C1 factors for the top-10 largest issuers; (2) further exploring the data and methods used to estimate the portfolio adjustment factors, to ensure they are effective for corporate as well as non-corporate issuers, (3) design the factors to align incentives with the economic risks, and (4) design a structure that brings together the portfolio adjustment factors along with the doubling of C1 of the 10 largest issuers.
Risk Premium	The current assumption of setting the Risk Premium equal to expected loss appears to be overly conservative. While the C1 Factor Proposal recognizes the inconsistency, they point out that the 1992 guidelines defined the Risk Premium in this way and, in conjunction with other parameters, some of which (e.g., AVR) are beyond the scope of this report. While Moody's Analytics appreciates the desire to incorporate conservativeness into assumptions, inputs for which accurate proxies are available should be directly used, and rather incorporate the conservative overlay into the final steps to facilitate model transparency. Moody's Analytics recommends a broader evaluation of the various interconnected modeling decisions that lead to setting the Risk Premium at the expected loss level, and aligning the models with a general consensus across the actuarial community, including setting the Risk Premium at a one standard deviation loss.

Review of Elements Outside of the Defined Scope

Summary of significant areas of review and recommendations

Applicability of Moody's Rated Corporate Data to Other Asset Classes	C1 RBC base factors were developed using Moody's default rate data on Moody's rated public corporate bonds (this report, as well as references herein, uses public corporate and Moody's rated corporate interchangeably) supplemented with S&P's recovery data. After controlling for ratings, we find material differences in observed default, migration, and recovery dynamics across asset classes. These differences question the effectiveness of using public corporate bond data for all asset classes. Moody's Analytics recommends evaluating the possibility of estimating distinct C1 factors using asset-class specific data. For private placements, in particular, Moody's Analytics recommends exploring a centralized collection of default, migration, and recovery data that can later be used in further estimating distinct C1 factors and for other purposes.
Simulation and Correlation	The current C1 factor model does not account for variation in cross-industry and cross-asset class concentration risks nor diversification that may be different across life companies' portfolios. These variations can be material, and we recommend additional analysis that assesses the materiality of abstracting from cross-industry and cross-asset class differentiation.
Maturity Effect on Capital Factors	The C1 factors do not differentiate risk across maturity. This can create a material distorted incentive to hold longer-dated bonds whose credit risk is more sensitive to the credit environment. Moody's Analytics recommends exploring a maturity adjustment to the C1 factors.
Investment Income Offsets	While investment income can be used to offset loss and support statutory surplus, the C1 factors are modeled with the implicit assumption that all investment profits are fully distributed to policyholders or used to absorb product or operational losses. This introduces a potential bias in differentiating investment income across assets, across rating categories, and across asset classes. Accounting for such heterogeneity in investment income can potentially lead to substantial differences in RBC factors across ratings and asset classes. Moody's Analytics recommends more accurately differentiating investment income across assets in the C1 factors.
Comparability Across NRSROs	The model is developed using Moody's rating only. However, NAIC rating designations are often determined by a set of NRSROs ratings. NRSROs have unique differences in credit rating methodologies and do not provide correspondence because they base their credit ratings on a range of qualitative, as well as quantitative, factors. This creates a challenge when mapping ratings across NRSROs to the various NAIC rating designations. It is plausible that the properties (such as default rate, recovery, etc.) of the NAIC rating in practice are substantially different from those of Moody's rating used in the model development. With this in mind, we recommend an assessment of variation across NRSROs rating migration, default, and recovery rates, and across the credit cycle. If this is not possible because of, say, lack of historical data, Moody's Analytics recommends revisiting the use of the second-lowest NRSROs rating in assigning the NAIC designation.
Climate Hazards and Emerging Risks	The C1 factors do not explicitly consider climate hazards or emerging risks (e.g., pandemic or cyber). These risks may not be explicitly incorporated into NRSRO ratings and may not be reflected in the historical data used in estimating the C1 factors. While climate hazards are particularly relevant for the likes of real estate and municipal credit, growing evidence suggests climate hazards and other emerging risks can be material for corporate credit. Moody's Analytics recommends exploring the potential impact of climate hazards and emerging risks on C1 factors across asset classes.

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January 29, 2021

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National Association of Insurance Commissioners
1100 Walnut Street, Suite 1500
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RE: Re-alignment of RBC Guidance and INT 20-03 Modification Dates

Dear Mr. Barlow and Working Group Members:

The Mortgage Bankers Association[1] and the American Council of Life Insurers[2] respectfully recommend that the Life Risk-Based Capital Working Group (LRBCWG) modify its *Additional Guidance* on the Financial Condition (E) Committee's *Guidance for Troubled Debt Restructurings* (RBC Guidance) to align the modification period with revised INT 20-03, *Restructuring Due to COVID-19*.

Troubled debt restructurings (TDR) relief under both the RBC Guidance and INT 20-03 was issued in furtherance of the E Committee's statement of support for "the use of prudent loan modifications that can mitigate the impact of COVID-19."[3] Accordingly, the E Committee, Statutory Accounting

[1] The Mortgage Bankers Association (MBA) is the national association representing the real estate finance industry, an industry that employs more than 280,000 people in virtually every community in the country. Its membership of over 2,300 companies includes all elements of real estate finance: mortgage companies, mortgage brokers, commercial banks, credit unions, thrifts, REITs, Wall Street conduits, 70 life insurance companies engaged in real estate finance, and others in the mortgage lending field. For additional information, visit MBA's website: www.mba.org.

[2] The American Council of Life Insurers (ACLI) is the leading trade association driving public policy and advocacy on behalf of the life insurance industry. 90 million American families rely on the life insurance industry for financial protection and retirement security. ACLI's member companies are dedicated to protecting consumers' financial wellbeing through life insurance, annuities, retirement plans, long-term care insurance, disability income insurance, reinsurance, and dental, vision and other supplemental benefits. ACLI's 280 member companies represent 95 percent of industry assets in the United States. Learn more at www.acli.com

[3] See RBC Guidance, p. 1 ("This guidance is being issued by the Financial Condition (E) Committee to all U.S. insurers filing with the NAIC in an effort to encourage insurers to work with borrowers who are unable, or may become unable to meet their contractual payment obligations because of the effects of COVID-19. The Committee, which is the NAIC parent committee of all the solvency policy making task forces and working groups of the NAIC, supports the use of prudent loan modifications that can mitigate the impact of COVID-

Principles Working Group (SAPWG) , and LRBCWG have taken actions necessary to align the RBC Guidance and INT 20-03 modification periods for the reporting periods ending June 30, September 30, and December 31, 2020.

On January 25, 2021, SAPWG revised the modification period under INT 20-03 to conform to the TDR provision of the CARES Act, as amended by the *Consolidated Appropriations Act, 2021*, which was signed into law on December 27, 2020. As a result, INT 20-03 now applies to modifications that occur during "the period ending on the earlier of January 1, 2022 or the date that is 60 days after the date on which the national emergency concerning the novel coronavirus disease (COVID–19), outbreak declared by the President on March 13, 2020 under the National Emergencies Act terminates." In contrast, the modification period under the RBC Guidance ended December 31, 2020.

To re-align modification periods under RBC Guidance with INT 20-03, we recommend that the LRBCWG revise its *Additional Guidance* dated October 9, 2020, as follows:

> **Origination Date, Valuation Date, Property Value, and 90 Days Past Due**
>
> For purposes of the Description/explanation of item in the Risk-Based Capital Reporting Instructions for Date of Origination (2), Property Value (20), Year of Valuation (21 and by reference Quarter of Valuation - 22), and 90 Days Past Due? (29), no changes to these values are required for any COVID-19 related modifications that occur during ~~2020~~ the period ending on the earlier of January 1, 2022 or the date that is 60 days after the date on which the national emergency concerning the novel coronavirus disease (COVID–19), outbreak declared by the President on March 13, 2020 under the National Emergencies Act terminates. This guidance is consistent with the Financial Condition (E) Committee Guidance for Troubled Debt Restructurings for March 31 - September 30 Statutory Financial Statements and Related Interim Risk-Based Capital Filings (where required) (June 12, 2020) and Question and Answer issued by the NAIC but extended for COVID19 modifications that occur through the end of ~~2020~~ the period described above.

To facilitate insurer's planning and reporting activity, we urge LRBCWG to make such a revision as early as possible during the reporting period ending March 31, 2021.

Respectfully,

Mike Flood

Paul S. Graham, III

Attachment: INT 20-03. *Troubled Debt Restructuring Due to COVID-19* (revised January 25, 2021)

cc: Dave Fleming, NAIC Senior Insurance Reporting Analyst

19."); see also INT 20-03, p. 1, INT 20-03 Issue, para. 3 (citing the same language as part of the SAPWG rational for issuing INT 20-03).

Draft: 3/9/21

Life Risk-Based Capital (E) Working Group
Virtual Meeting
January 21, 2021

The Life Risk-Based Capital (E) Working Group of the Capital Adequacy (E) Task Force met Jan. 21, 2021. The following Working Group members participated: Philip Barlow, Chair (DC); Steve Ostlund (AL); Thomas Reedy (CA): Deborah Batista (CO); Wanchin Chou (CT); Sean Collins (FL); Vincent Tsang (IL); Mike Yanacheak (IA); John Robinson (MN); William Leung (MO); Rhonda Ahrens (NE); Seong-min Eom (NJ); Bill Carmello (NY); Andrew Schallhorn (OK); Mike Boerner (TX); and Tomasz Serbinowski (UT).

1. Exposed the ACLI's Real Estate Proposal

Mr. Barlow reminded the Working Group that this proposal was originally presented to the Investment Risk-Based Capital (E) Working Group and is now for this Working Group's consideration. He said work on this was done a few years ago but was delayed while work on the bond proposal was done, and now the goal is to implement this proposal at the same time as the proposal for bonds.

John Bruins (American Council of Life Insurers—ACLI) said he believes the focus of this meeting is to review and, hopefully, expose the structural changes with a more robust discussion of the proposal and the factors during a subsequent meeting. Mr. Barlow concurred.

Mr. Bruins said a brief overview of the proposal was provided during the Dec. 17, 2020, meeting. He said Rich McLemore (MetLife), representing the ACLI, would continue that discussion, but that he would discuss the two parts of the proposal that require structural changes in more detail after that.

Mr. McLemore said the proposed changes are important to industry and that the ACLI's analysis shows that they are warranted. He said the current methodology unduly limits life insurance companies' access to a large and important higher returning asset class during today's low-rate environment when stable and consistent income is already difficult to source. He said the current framework keeps life insurance company capital largely on the sidelines of a market that can provide good portfolio diversification and aid in effective asset-liability management.

The current real estate equity risk-based capital (RBC) framework assesses a 15% base RBC charge on wholly owned directly held real estate investments that are reported on Schedule A, except for foreclosures, and a higher 23% charge on foreclosures and all other real estate investments that are held through fund, joint ventures or other structures and reported on Schedule BA. This framework and charges were implemented years ago at a time when private real estate investment performance history was limited. At that time, the factor was estimated based on an assumed relationship between private real estate and common stocks.

Mr. McLemore said that 30 years ago, the recommendation was for ongoing study, and to date, no subsequent complete study has been done. He said that today, the actual sector performance data depth and history required to assess an appropriate charge more accurately is available, and the appropriate charge is much lower than was originally estimated. He said this is the component of the proposal that recommends lowering the factor applied to real estate.

Mr. McLemore said in the original estimation of RBC charges for real estate, a risk premium was assessed on assets that were held in fund, joint venture or other structures, as the lower levels of investment control by the life company, and the overall lower transparency of the investments, was thought to substantially increase the potential risk. He said a subjective 50% premium was assessed in order to account for this perceived increased risk, which brought the factor for these investments up to 23%. He said that today, in many cases, real estate investments can be held in structures mostly to reduce risk.

In the simplest case, Mr. McLemore said one only has to look at limited liability companies, which is a structure implemented almost solely to protect the insurance company from the risks associated with claims at the properties, like accidents or joint ventures, which are often structures used by insurance companies to align interests with local expert investors and managers of real estate investment assets. In the proposal, he said the ACLI is asking for reconsideration of the assumed higher risk level, and higher RBC charge, associated with these Schedule BA real estate assets.

Mr. McLemore said the final key aspect of the proposal is a proposed adjustment to required individual property RBC that will account for the cushion against RBC losses that is often created in real estate assets as they are held over time. He said the RBC factors that exist today, and even the new lower factors that are proposed, are based on market value volatility in our sector. However, he said the real estate assets are reported for statutory accounting using depreciated cost, and each year the asset's statutory value declines, even though the actual market value of the asset is more likely to be increasing. He said this creates an unrealized gain, and this unrealized gain is, in effect, a cushion that must be completely eroded before there is any risk of loss of statutory capital. He said this is a critically important concept to understand, and the ACLI believes it must be accounted for in an accurate and fair RBC methodology.

With respect to a depreciation cushion, Birny Birnbaum (Center for Economic Justice—CEJ) said that in the aftermath of the savings-and-loan experience, what was seen was some leveraging of loans or buildings that did not add value and that the value of the buildings declined over time with, in some instances, now new commercial building from the 1980s until the early 2000s. He asked if the assessment of the deprecation cushion is based on a particular time frame as opposed to a longer time series. He said there are also questions about the value of commercial real estate going forward, with a number of companies moving to work-from-home situations and the resulting demand for office space, along with the number of shopping malls closing. He asked how this longer-term impact is being considered in the proposal.

In terms of the longer-term, Mr. McLemore said the effects of the savings and loan crisis and the global financial crisis are both incorporated in the estimation of the proposed factors. If the concern is that there is going to be a reduction in RBC for assets where the values are falling dramatically and the capital that should be held on these higher leveraged investments could be understated, he said the opposite would be the effect of the implementation of the proposed change because RBC would be allowed to go up beyond the base factor in the case of a situation where the market value was below the depreciated cost. He said those types of environments would be short-lived because that will typically trigger a real estate impairment based on the impairment testing done on an annual basis.

Mr. McLemore said the question on the larger structural changes in the economy about how real estate is held in the future is a good one but is difficult to answer right now. However, he indicated that MetLife's view is that the impact is going to be more transitory. He said MetLife is seeing an acceleration of pressures that were already in place, as an example in certain segments of the retail market and the long-term sustainability of business models that are going to be more affected by online retailing and e-commerce. For hotels, he said MetLife is less convinced that the impacts are going to be more longer-term but that they will persist over the next couple of years. He said with the introduction of vaccines, the market will return to more of a stabilized demand base to pre-pandemic levels by 2023 or 2024.

Mr. McLemore said the question about office space is probably one of the bigger questions, but MetLife's research does not see the increasing work-from-home environment having as large a long-term structural change as some might suggest because it is not as effective for companies over a longer period of time as they hire new people and experience turnover. He said MetLife has seen companies that have tried to fully outsource through time, and many of those have made the decision to revert back to a more office-based employment. He said the discussion of how these structural changes should influence the calibration of RBC is a larger question and not restricted to real estate.

Mr. Bruins added that RBC is not structured to look at today's particular environment and consider that the results over the next year or two might be worse. He said factors are established looking historically at what the variations have been and take into account the worst of what the modeling shows. He said that is what the analysis for this real estate proposal has done.

Mr. Barlow asked if data can be provided that illustrates the impact of how a decline in the market value of a property, and they are marked down as Mr. McLemore indicated, is reflected in the financial statements. Mr. Bruins said the ACLI would work to provide this.

Mr. Tsang said, in general, he agrees with the proposal updating the factor for real estate by looking at the more emerging statistics but expressed concern with the inclusion of unrealized gains and losses in the RBC calculation. He said real estate does not have a deep secondary market like bonds and mortgages, which probably makes the fair value less transparent. He expressed concern with real estate reported on Schedule BA because of the ability to get out of these commitments. He said bonds and mortgages do not have the unrealized gains and losses being reflected in their RBC requirements and questioned why real estate should have this element introduced.

Mr. Bruins said he may partially address Mr. Tsang's comments while going through the structural changes, but these may need more fuller discussion during future meetings.

Mr. Barlow said that is fine as this proposal is going to require more discussions as these and other questions are addressed. However, he asked Mr. Bruins to address, to the extent possible, flexibility in light of these questions with respect to the final RBC charges based on the structural changes being proposed.

As background, Mr. Bruins said the proposal and all the documents were put together to be a unified proposal even though they are being addressed in pieces, with today's focus being on the structural changes. As such, all the documents and examples use the factors that are in the proposal, and this is not a presumption that these will be the final factors but a matter of consistency in the presentation. Thus, he asked Working Group members to focus on what the formulas and relationships are. He said real estate is an equity asset but is held in statutory accounting at book value, which is a depreciated cost. RBC looks at the risk of loss of statutory capital, which is based on the statutory value. If the market value is greater than the depreciated cost, Mr. Bruins said this has no effect on the statutory values, unless it gets to the point where the market value is less than the statutory value and there is a need to review for impairment. As long as the market value is above the statutory value, he said it will never affect the statutory value.

Mr. Bruins said this is where the margin Mr. McLemore alluded to comes in. He said the proposal is to recognize two-thirds of that margin and to reduce the factor proportionally on a property-by-property basis. With regard to Mr. Barlow's question on flexibility, this would be something that could be changed easily if done as a factor input.

To Mr. Tsang's point, Mr. McLemore said there is some uncertainty because real estate values are not valued on a daily basis, and two-thirds is in the proposal as opposed to a 100% offset to address that concern.

Mr. Bruins discussed the examples as included on Page 5 of the ACLI's presentation (Attachment Three-C1). The other area of structural change is for encumbrances as included on Page 6 of the presentation. Mr. Bruins said this is simply a redesign of the calculation, which does not affect the final result as explained and illustrated on the next two pages of the presentation. Rather, it facilitates for the inclusion of the excess of market value over book value, which would include bringing in the fair value from Schedule A and Schedule BA.

Mr. Barlow asked if these fair value amounts are for informational purposes or whether they are used for something in the investment schedules.

Mr. Bruins said he is not sure. He said the base real estate schedule in life RBC, LR007, will have no changes but is fed from four supporting worksheets in the forecasting file, which are identical but address different categories of real estate. He said the changes are detailed in the following pages of the presentation.

To Mr. Barlow's question and based on his time as NAIC staff support for the Investment Risk-Based Capital (E) Working Group and exam work that he has done, Ed Toy (Risk & Regulatory Consulting—RRC) said he is confident that the fair values are not actually used for anything in the investment schedules for real estate. He said what he has seen in these fields ranges anywhere from being blank to being something that probably is related to the fair value of the property or being a fair value of the mortgage, so even though there are instructions for these fields, how companies are using and populating it ranges all over the place. He expressed a similar concern with the amount of encumbrances companies are reporting.

Mr. Barlow asked Dave Fleming (NAIC) to look into any review or analysis of these fields by the NAIC.

The Working Group agreed to expose the structural changes proposed for real estate by the ACLI, with a modification to make the fair value adjustment a stand-alone factor and not an embedded amount, for a public comment period ending March 8, noting that the proposal includes factors and instructions that are not final.

2. Agreed to Forward the Guaranty Fund Memorandum to the Capital Adequacy (E) Task Force

Mr. Barlow said this item has been discussed during previous meetings, and the consensus was that there was no action by the Working Group required in response to the changes to the *Life and Health Insurance Guaranty Association Model Act* (#520). He said a memorandum to that effect has been drafted and addressed to the Capital Adequacy (E) Task Force.

He asked if there were any concerns before forwarding the recommendation to the Task Force (Attachment Three-C2). The Working Group directed NAIC staff to forward the memorandum to the Task Force.

Having no further business, the Life Risk-Based Capital (E) Working Group adjourned.

ACLI
Financial Security for Life

Real Estate RBC: Structural Changes

January 2021

ACLI

Agenda

- Brief overview of proposal
- Overview of adjustment for unrealized gain/loss
- Overview of encumbrance calculation
- Review of the Real Estate worksheets and specific changes
- Questions

ACLI

Proposal

- Schedule A: Factor for Real Estate Equity investments
- Schedule BA: Proposed treatment consistent with Schedule A
- Adjustment for Unrealized Gain/Loss
- Update factor for RBC Adjustment for Real Estate Encumbrances

ACLI

Unrealized Gain/Loss

- Statutory value for real estate is depreciated cost
- RBC looks at risk of loss of statutory capital
- If market value increases while depreciated cost decreases, there is a typically a growing unrealized gain. That gain provides a margin before any statutory capital is lost.
- The proposal is to modify the base factor proportional to 2/3 of the unrealized gain, on a property by property basis

ACLI

Unrealized Gain/Loss

- The formula for the adjusted factor would be:
- Adj Factor = *RE Factor*(1 – [2/3] * (MV-BVg)/BVg)}*

BV	MV	Adj RBC
100	50	13.4%
100	100	10.0%
100	150	6.7%
100	200	3.3%

ACLI

Encumbrances

- Encumbrances are most commonly a mortgage on the property
- Real Estate is held on balance sheet at net value, i.e., depreciated cost less encumbrance
- Since the mortgage holder has the risk of the mortgage, risk is split between RE owner and the mortgage holder
- Encumbrance factor is RE factor minus commercial mortgage RBC factor

ACLI

Encumbrances

- Currently addressed by having RBC as the sum of:
  - RE factor times **net** value, plus
  - **Encumb. factor** times encumbrance
- Proposal is to rearrange the terms of the algebra to be:
  - RE factor times gross RE value minus avg Comm. Mort factor times encumbrance
- With no change in factors, the RBC is the same. The formula change enables the adjustment for unrealized gain/loss.

ACLI

Encumbrances

Formula Illustration

TODAY'S FORMULA		
	Un-Encumbered	Encumbered
Net BV	150	100
x RE RBC %	10%	10%
= RE RBC	**15**	**10**
Encumbrance	0	50
x (RE RBC % - CM RBC %)	8.25%	8.25%
= Encumbrance RBC	**0**	**4.1**
RE + Encumbrance RBC	**15**	**14.1**

PROPOSED FORMULA		
	Un-Encumbered	Encumbered
Net BV	150	100
+ Encumbrance	0	50
= Gross BV	150	150
x RE RBC %	10%	10%
= RE RBC	**15**	**15**
Encumbrance	0	50
x CM RBC %	1.75%	1.75%
= Encumbrance RBC	**0**	**0.9**
RE - Encumbrance RBC	**15**	**14.1**

8

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Real Estate Worksheets

- LR007 is the Life RBC page for RE, and will have no changes
- All changes are in the worksheets, which are tabs:
  - Real1: Company Occupied Real Estate
  - Real2: Real Estate acquired by Foreclosure
  - Real3: Investment real estate
  - Real4: Schedule BA real estate
- These 4 sheets are identical, separated only by the types of properties that are reported on each.
- The proposed modifications are also identical to each
- For discussion today, we will look at real3 – investment real estate

ACLI

Real Estate Worksheets

- Column 1 –
  - While generally the same, please look down to the line for Properties without encumbrances
  - Currently and in the past, all such properties were aggregated to a single line
  - The proposal will have the properties entered individually, each on a separate line. This is to accommodate the unrealized gain adjustment which is determined property by property.
- Column 2 is unchanged
- Column 3 is unchanged

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Real Estate Worksheets

- Column 4 is a new column showing the fair value from Schedule A column 10 or Schedule BA column 12 as appropriate
- Column 5 is the base real estate RBC factor
- Column 6 is the encumbrance credit rather than the encumbrance factor
- Column 7 is a new column and is the adjusted RBC factor. This is where the adjustment is made for the unrealized capital gains.

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Real Estate Worksheets

- Column 8 is the Gross RBC value, which is the adjusted factor times the gross value of columns 2 plus 3
- Column 9 is the encumbrance adjustment which is column 3 times column 6
- Column 10 is column 8 minus column 9.
  - Floor of BACV times NAIC2 bond factor
  - Cap of BACV times 45%

ACLI

Questions?

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

MEMORANDUM

TO: Tom Bostko (OH), Chair, Capital Adequacy (E) Task Force

FROM: Philip Barlow (DC), Chair, Life Risk-Based Capital (E) Working Group

DATE: January 21, 2021

RE: Recommendation Regarding Risk-Based Capital Charge for Guaranty Association Assessment Risk

The Life Risk-Based Capital (E) Working Group received a request from the Capital Adequacy (E) Task Force to review the referral letter regarding adopted amendments to the *Life and Health Insurance Guaranty Association Model Act*, Model #520. The referral outlined significant amendments to Model #520, including: 1) broadening the assessment base for long-term care insurance (LTCI) insolvencies to include both life and health insurers and splitting the assessment 50%/50% between the life and health insurers; 2) clarifying the guaranty associations' coverage of LTCI; and 3) including health maintenance organizations (HMOs) as members of the guaranty association, similar to other health insurers. The referral letter requested that the Task Force consider if changes were warranted to the life RBC formula in light of the changes made to Model #520. The reason for this item being referred to the Working Group was concern with the fact that the C-4a risk component is based on the amount of guaranty fund assessments. The risk charge is based on the maximum amount of assessments in any one year for a life company, and that is not affected by the changes to Model #520.

Based on the current instructions and reporting, the Working Group does not believe that modifications to the life RBC formula are required for the change to Model #520.

The recommendation above does not preclude the Working Group from potential changes to long-term care or the business risk component charge in the future.

If you have any questions regarding this memorandum, please contact me at philip.barlow@dc.gov or Dave Fleming (NAIC) at dfleming@naic.org.

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Draft: 3/5/21

Life Risk-Based Capital (E) Working Group
Virtual Meeting
December 17, 2020

The Life Risk-Based Capital (E) Working Group of the Capital Adequacy (E) Task Force met Dec. 17, 2020. The following Working Group members participated: Philip Barlow, Chair (DC); Steve Ostlund (AL); Thomas Reedy (CA); Deborah Batista (CO); Wanchin Chou (CT); Sean Collins (FL); Vincent Tsang (IL); John Robinson (MN); William Leung (MO); Seong-min Eom (NJ); Bill Carmello (NY); Andrew Schallhorn (OK); Mike Boerner (TX); and Tomasz Serbinowski (UT).

1. Received an Update on ESGs

Mr. Barlow reminded the Working Group that work is being done on economic scenario generators (ESGs). While this will affect both reserves and capital, he said the work is being done primarily at the Life Actuarial (A) Task Force.

Pat Allison (NAIC) said there will be a meeting of the Task Force later today that will be focused on the new ESG. She said there was a discussion on Dec. 3, 2020, about the interest rate generator, noting that today's discussion will be on the equity and corporate bond models and the potential exposure of a variety of materials for comment. She said these discussions also present goals for the ESG, along with the decisions that state insurance regulators will need to make. The work includes the development of a set of recommendations for each of those decisions for exposure.

Ms. Allison said the NAIC's selected vendor, Conning, has calibrated its model to reflect those recommendations, so a full set of what is being referred to as the basic data set, which is what is intended to be prescribed, will be exposed. She said this is not what is intended for a field test, and it is certainly not final, as numerous comments are expected.

2. Discussed the ACLI's Real Estate Proposal

Mr. Barlow reminded the Working Group that the American Council of Life Insurers (ACLI) developed a real estate proposal as part of the work of the Investment Risk-Based Capital (E) Working Group. He said this has now been moved to the Life Risk-Based Capital (E) Working Group, along with the work on the bond factors, and the intention is to address both at the same time to have them in place for year-end 2021, but it has been some time since this proposal was reviewed.

Steven Clayburn (ACLI) presented an overview of the proposal to assist the Working Group in determining the next steps to be taken. As Mr. Barlow indicated, he said this proposal was presented to the Investment Risk-Based Capital (E) Working Group in 2015, and it was exposed for comment on two occasions. He said there was some, although not universal, consensus at the time that the factors were too high, but what to do to lower those factors remained outstanding. With feedback from state insurance regulators and industry, he said the proposal was revised in 2017, but it was put on hold in 2018 to focus on the proposed revision to bond factors.

Mr. Clayburn provided a recap of the most recent discussions and the concerns expressed, as shown on Page 4 of the presentation. The proposal has four parts, as included on Page 5 of the presentation, and he discussed these in more detail, as provided in the remaining pages of the presentation. He said there are structural changes associated with the proposal, and he thanked the Life Risk-Based Capital (E) Working Group for making time for this presentation.

Dave Fleming (NAIC) said the structural change is actually to underlying worksheets that are included in the forecasting file, and the deadline for exposure of those is the end of January 2021.

Mr. Barlow said the analysis behind the proposal is a few years old, and he asked if the ACLI has any updates to that information. Mr. Clayburn said he believed there had been updates to the modeling in response to previously raised items, but he said he would verify that.

Mr. Barlow asked if there is some analysis or commentary that can be provided to address the current situation. Mr. Clayburn said he would take this back to the ACLI membership.

With respect to additional analysis, Mr. Chou asked about the analysis used in the derivation of the current factors.

Mr. Clayburn said he believes this information is included in the original proposal document, but he said he believes the current factor for Schedule A real estate is based on 60% of the common stock factor and Schedule BA was then 150% of that result. He said this was not based on true analysis, but because there was not much data at the time, it was a conservative approach.

Paul S. Graham (ACLI) said there was data from two companies used back in the 1980s that resulted in the use of a percentage of the stock equity factor for real estate. At the time, he said it was not that material because there was not a lot of industry invested in it, but in the current environment of lower interest rates where companies are trying to back their promises to policyholders with assets that have a little higher return, it is becoming more important.

Mr. Graham said the original study the ACLI did in 2015 showed factors below the 8% that was recommended, and the fact that there may be more current experience that is not as good because of COVID-19, coupled with the factor now being discussed at 10%, it is likely covered.

Mr. Barlow asked if the growth is in real estate or items reported on Schedule BA. Mr. Graham said he believes it is both, but he noted that the proposal is to look not only at the book value but also the market value so investments, other than those done at the beginning of 2020, would have that buffer.

Mr. Tsang asked if the ACLI could include information with respect to the materiality of these investments to its member's portfolios and the impact of the proposed factors on its capital requirements. Mr. Clayburn said the ACLI would work with the members on impact.

Mr. Barlow asked if the exposure would be something captured in the NAIC's database. Mr. Fleming said it is and he would work on providing that information.

Having no further business, the Life Risk-Based Capital (E) Working Group adjourned.

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March 8, 2021

Philip Barlow
Chair
Life Risk-Based Capital (E) Working Group
National Association of Insurance Commissioners (NAIC)

Dear Philip,

On behalf of the American Academy of Actuaries[1] C-1 Work Group (C1WG), we appreciate the opportunity to provide comments on the exposed January 21, 2021, proposal to restate the capital requirements for real estate in the Life Risk-Based Capital (LRBC) formula. The C1WG is generally supportive of a different approach for calculating capital requirements for real estate. As 30 years have passed since the current real estate factors were set, a review of the capital requirements is a prudent exercise. The C1WG has reviewed the proposal and is unable to find agreement with the proposal without additional justification/explanation. In reviewing the proposal, we have the following conceptual concerns:

1. Market Value vs. Statutory Value Issues

   Establishing capital requirements based on market value inputs when real estate is carried at amortized cost in statutory financial statements is a departure from RBC precedents. Clearly, changing statutory accounting to a market value basis and determining capital requirements directly on those market values would be a more direct approach. With a restatement to market value, both total adjusted capital and the required capital calculation would be different (i.e., both the numerator and the denominator of the RBC ratio would change).

   It appears that the proposed structure is an attempt to fix the current LRBC approach that overstates capital requirements by applying a market risk measure to depreciated book value by inserting an adjustment involving unrealized capital gains. Taken together, this approach is intended to reflect the likely lower risk of loss to statutory surplus.

[1] The American Academy of Actuaries is a 19,500-member professional association whose mission is to serve the public and the U.S. actuarial profession. For more than 50 years, the Academy has assisted 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.

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While the work group agrees there should be work to refine the capital charge to recognize the likely lower risk to statutory surplus than the current approach has produced, the use of a market basis risk measure combined with the offset of a portion of unrealized gains to state the risk to capital of an asset valued under statutory rules on a book value basis is unsupported by either fact or theory. Statutory accounting holds real estate at cost less accumulated depreciation unless there is an impairment. At impairment, a restated holding value at market incurs a loss (if less than current book value). Assuming real estate generally increases in value over time, losses measured on a book value basis will be less than those determined on a market value basis.

The use of an arbitrary portion of unrealized gains to convert the market risk measure to the actual book value measure of this asset class is not a supportable approach in the determination of statutory capital requirements. Simply stated, the proposed 2/3 adjustment is not supported by a factual analysis. The capital requirements should be derived based on the likelihood of the occurrence of loss measured as the amounts of future book loss amounts over an appropriate horizon and stated degree of statistical confidence. Developing the adjustment directly from a statutory-based model would provide support for the proposed 2/3 adjustment. A more direct approach could involve a factor for a specific market to book value combination applied directly to depreciated book without further adjustments.

Because of these issues, we have concerns over the reliability of using market measures and unrealized gains to replicate the actual risk of loss on a statutory book basis. As noted above, we suspect the risk is lower than a pure market risk, but do not know how much lower it might be. If this recommended approach were used, is the 2/3 adjustment too high or too low, and could it vary depending on specific conditions? Without more information shared about how the adjustment converts the market measure to a book value, we are unable to come to disposition on the proposed approach. Further, we are concerned that using one scalar applied to the difference between market value and book value would achieve the desired result. If there is a linear relationship between the unrealized loss and the 95th percentile of book value impairments, a scalar might be appropriate, but the C1WG is not convinced of this linear relationship.

We also would question the minimum condition of the NAIC 2 bond factor because there is no clear rationale provided for the relationship between the bond factor used to capture credit risk and real estate capital requirements.

Lastly, we too would raise the question from the February 26, 2021, Life RBC Working Group meeting as to whether it is appropriate to use a market determined risk measure,

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the base factor, in combination with unrealized gains where gains (and losses) are already implicit in the statutory base measure itself.

2. Implementation Issues with the Use of a Market Value Measure

   If the capital requirements are amended to include a market value measure, specific instructions are needed to define how market value is to be calculated. The LRBC formula needs to be calculated using a consistent definition of the market value calculation, as was done in establishing capital requirements for commercial mortgages.

3. Recommended Statistical Safety Level

   The proposal is based on a Statistical Safety Level at the 95th percentile over a 2.5-year time period; what is the basis for the recommended time horizon? The time horizon for bonds was set at 10 years, the typical credit cycle for bonds; what does the 2.5-year period represent? This recommendation moves away from current capital requirements determined relative to those for common stock (i.e., based on a 60% correlation); as such, a time horizon based on the volatility of market returns for an asset carried at amortized cost does not seem consistent with the principles of statutory RBC.

4. Assuming Same Risk Profile for All Types of Real Estate

   a. The proposal is recommending nearly identical treatment for all types of real estate. The C1WG would need to see the data that supports the conclusion that the risk profiles for real estate reported on Schedule A are similar to the risk profiles for real estate reported on Schedule BA; our understanding is that the difference in risk drives different reporting. In particular, we would need to better understand how encumbrances can be determined and reported on a look-through basis on Schedule BA so that the implementation of the proposal will reflect the spirit of accurately identifying risk on a look-through basis.

   b. While real estate is a relatively small asset class for the life insurance industry (approximately 1% of invested assets), using one factor for all types of real estate may not be an appropriate representation of the various risks within the real estate sector. We note that commercial mortgages on hotel properties receive different LRBC treatment, establishing a precedent for different experience for hotel properties. Further, as noted during the February 26, 2021, Life RBC Working Group meeting, using the same factor for distressed properties raises additional concerns.

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c. Properties in development are riskier than properties that are producing income. While there may be materiality and other practical considerations, should different capital requirements be established?

We recognize the importance of this asset class for life insurers and support the review of the capital requirements. However, we continue to have concerns with several aspects of the proposal. We acknowledge that the current LRBC capital requirements may be overstated for certain real estate investments (e.g., where the market value exceeds statutory value by a large amount). Fundamentally, the risk to statutory surplus is less for real estate properties whose statutory value is less than the market value. Consequently, a reduction to the capital requirements has merit, but the proposal's approach to start with market value returns and then adjust statutory values is complex and may not achieve the desired level of required capital that a more direct calculation could produce.

Again, thank you for the opportunity to provide the C1WG comments and should you have any questions or wish to discuss anything in these comments, please contact Khloe Greenwood, the Academy's life policy analyst (greenwood@actuary.org).

Sincerely,

Nancy Bennett, MAAA, FSA, CERA—Co-Chairperson, C1WG
Jerry Holman, MAAA, FSA, CFA—Co-Chairperson, C1WG

Copy: Dave Fleming, NAIC

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ACLI
Financial Security for Life

TO: NAIC Life Risk-Based Capital Working Group

FROM: American Council of Life Insurers

DATE: March 9, 2021

RE: Review of Proposals from the PFML Federal Strategies Working Group

On Life RBC Working Group's conference call of February 26, 2021, several questions were raised during ACLI's presentation and discussion of the proposed changes to the RBC for Real Estate. The questions follow, and responses are provided on the following pages. We can further discuss these on an upcoming call of the Working Group.

1) Please provide additional detail and documentation of the modeling.

2) Please provide documentation of volumes of Real Estate.

3) Given that you apply the RBC charge to the smaller depreciated cost, and not to the full fair value, aren't you somewhat double-counting by then adjusting the RBC rate based on the unrealized gain?

4) What is the confidence that the adjustment to the risk factors based on the relation of market and statutory book value does not result in an appropriately low RBC factor?

5) What happens when the market value declines to be less than the book value?

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1) Please provide additional detail and documentation of the modeling.

This recommendation is based on analyses of actual historical performance of the National Council of Real Estate Investment Fiduciaries (NCREIF) Property Index, appended by data from a couple of other similar studies to extend our historical data back to 1961. The NCREIF Property Index (NPI) is the premier industry benchmark for measurement of institutional commercial real estate investment performance in the US. The NPI data begins in 4Q 1977 and is comprised of quarterly market value-based investment performance of assets acquired and held for investment purposes in a fiduciary environment. There is no minimum property size, and the asset can be held as wholly owned or through a joint venture. It includes a wide array of the primary institutional investment property types, including Office, Retail, Industrial, Apartment and Hotels. As of 4Q 2020, this index included more than 9,000 properties with over $700 billion in real estate market value. It is a robust and directly applicable index for measurement of the market value performance of life insurance company investment real estate, and it is the same data that is currently being used for updating of market values of Commercial Mortgage LTVs in support of the reporting of Commercial Mortgage Loan RBC.

We analyzed the historical sector performance and present the results in Section A of the proposal. We present results across 1, 2, 3 and 4 year analysis periods. In each of these four assumed analysis periods, we examine the historical data and calculate the largest cumulative losses that were observed at any time during the analysis period. The process was to take the index value as of a quarter, e.g., Q1-1961, and track the performance in each subsequent quarter of the respective analysis period. We started with index values at the beginning of the period and found the lowest index value at any quarter during the analysis period and calculated the change from the beginning. For example, for the 2-year analyses, we examined every potential 2-year period within the full data history, which resulted in 232 data points in the full data history. Our analysis found that for a 2-year analysis period, the 95% worst cumulative loss was 9.2% and the 96% worst cumulative loss was 9.7%. We thus recommend adoption of a 9.5% factor.

Lastly, we recommend a 1.5% cushion be added to the 9.5% factor that was estimated using the actual real estate performance history. This cushion is meant to address two primary areas of concern that surfaced in our individual outreach discussions: 1) that individual life insurance company portfolios may not be as diversified as the index used in estimation of the factor; and 2) that future real estate performance may not be similar to the past, especially in light of COVID-19. We believe the 1.5% is a reasonable cushion, and is supported by the following:

- The 1.5% cushion represents an additional 15% conservatism built in on top of the data-supported 9.5% factor. In effect, this means that market downturns can be 15% more severe than in the past, and the factor will still be sufficient to cover losses over two years at a 95% confidence level.
- At 11%, the applied factor would cover historical actual 2-year cumulative losses at an almost 97% confidence level.
- Thus far, the impact of COVID-19 on commercial real estate investments has been significant but have been concentrated in a relatively small segment of the market. The most impacted segments have been hotels and select lower quality regional malls. Overall, the NCREIF Property Index reports around a 1% return on real estate investments in 2020, which is meaningfully below the returns over the last few years, but still positive. Most industry experts do not expect COVID-19 to result in as rapid or severe deterioration as happened in the GFC.

- As we cite in our proposal, we examined the distribution of properties by type and geographic region within life insurance company portfolios and found it to be similar in mix to that of the NCREIF Property Index. This suggests that the distribution of life insurance company investments in real estate are similar in composition to the index. However, given the risk that individual life insurance company portfolios' composition could deviate meaningfully from the diversity of the overall life insurance company space, we believe that the 1.5% cushion is sufficient to cover this risk. Also, we note in our proposal that there are regulations separate from RBC factors that address concentration risks and assure diversification of life company real estate portfolios.

2) Please provide documentation of volumes of Real Estate.

- Real estate investments are a very small component of most life insurance portfolios. The following information is taken from 2019 Annual Statement data.
- Real estate investments represent only 1.29% of Life Company GA assets.
    - Total General Account is $4,812,938 million
    - Total Real Estate $ 61,972 million
        - Schedule A $ 23,358 million
        - Schedule BA $ 38,613 million
- Life company real estate investments are spread across both Schedule A and Schedule BA, with Schedule A accounting for 0.49% and Schedule BA accounting for 0.80%.
- Of 761 life insurance companies, 587 (77%) have less than 0.25% of assets in Schedule A real estate, and 677 (89%) have less than 0.25% of assets in Schedule A real estate.
- Company occupied real estate accounts for a meaningful component of Schedule A real estate exposures in many companies.
    - Of the 174 companies with 0.25% or greater of their assets in Schedule A real estate, 64 (36.8%) of these companies are solely invested in company occupied properties.
    - The remaining 110 companies account for 96.7% of Sch. A real estate, and it constitutes 1.14% of their General Account assets.
        - Approx. 20% of this real estate is company occupied.
    - 59 of these 110 companies have less than $1B in assets. 3.3% of their GA assets are in RE, split 40% company occupied and 60% investment.
- For Schedule BA, ACLI conducted a survey in 2018 in response to similar questions from the Investments RBC Working Group. Appendix A is the memo that summarizes the results of that survey.

3) Given that you apply the RBC charge to the smaller depreciated cost, and not to the full fair value, aren't you somewhat double-counting by then adjusting the RBC rate based on the unrealized gain?

- We do not believe there is "double-counting", as that implies making two adjustments based on the same reason.
- When determining RBC generally, there are two facets to consider: 1) how much is at risk; and 2) what is the level of risk. Statutory Book Value is the amount that is included as the value of the company's assets, and therefore determines the amount of surplus. A factor is applied to this book value, because that is the amount of surplus that is at risk. In statutory accounting, that value is a decreasing value as it is defined to be the depreciated cost.

- The factor that is used should reflect the likelihood of a loss. In the case of real estate, the relation of market and book values is a proxy to determine the amount of risk, where the greater the excess of market value over book value, the lower the risk to statutory surplus.
- Thus, that statutory values use a depreciated value, and that the factor adjustment uses the difference between market and book, are addressing two separate issues even though they appear to be making adjustments that are directionally the same.

4) What is the confidence that the adjustment to the risk factors based on the relation of market and statutory book value does not result in an appropriately low RBC factor?

We start with the premise of RBC - If a company holds assets equal to the existing book assets plus an amount of surplus equal to the RBC, then historically there have not been more than 5% of instances where the value declines by more than the RBC amount, and therefore assets do not fall below the book value. Thus, with an RBC factor of 11%, if market value provides unrecognized gain of more than 11% compared to book value, then 95% of the time the book value will not be reduced. In theory, any gain in excess of that creates a situation of zero risk relative to the 95% standard.

Assumptions:	Credibility	2/3
	RBC factor	11.0%
	RBC max factor	45%
	RBC min factor	1.30%
	95% max loss MV	9.50%

Table - Illustrate 95% certainty level of max BV loss

Book Value (BV)	Market Value (MV)	95% Max Loss MV	Implied BV loss	95% loss as % of BV	RBC%
100	100	9.5	9.5	9.5%	11.00%
100	102.5	9.7	7.2	7.2%	10.82%
100	110	10.5	0.5	0.5%	10.05%
100	120	11.4	-	0.0%	9.53%

As you can see from the table above, the loss to book value in the event of a 95% level of certainty loss of market value is in all cases less than the adjusted RBC percentage, which is applied to book value. So we are more than 95% certain that the adjusted RBC factor is sufficient.

5) What happens when the market value declines to be less than the book value?

- Market value dropping below book is a trigger for review for impairment. However, all circumstances around property performance should be considered, for example loss of a major tenant in a specialized asset.

- There is robust statutory guidance (SSAP 90) around recognizing impairment of wholly-owned real estate. Joint ventures are accounted for under the equity method, and as such are financial assets.
- A write-down is taken if an impairment is present and is not temporary.
- Impairment review is based on modeling of cash flows and not on market values. There is a recoverability test that is based on comparing the expected undiscounted cash flow to the carrying value of the real estate. If cash flows are greater than carrying value, then there may not be an impairment. If the sum of the undiscounted cash flows are less than the carrying value, then the real estate would most likely be impaired. The actual impairment is measured as the difference between the carrying value and fair value of the real estate.
- Rules exist to distinguish temporary vs other than temporary. This a mechanical process so once carrying value is greater than the undiscounted cashflows, life companies are required to recognize a permanent (other than temporary) impairment.
- Thus, capital markets may indicate a lower current market value even when there is not a need to recognize a permanent Impairment.
- In our proposal, the MV/BV adjustment increases the RBC charge in this case, reflecting the possibility of a write down.

APPENDIX A – 2018 Memorandum on Schedule BA Real Estate

FROM: Steve Clayburn

RE: Real estate RBC proposal to the NAIC
Schedule BA Characteristics – summary of survey results

DATE: August 8, 2018

BACKGROUND

Since the inception of RBC, Schedule BA real estate has used a factor that is 150% of Schedule A's factor. This premium was intended to account for the potential of additional risk associated with Schedule BA assets. The ACLI[1] conducted a survey of its member companies on the characteristics of these assets, to provide transparency and support for its recommendation of equivalent factors for both Schedule A and Schedule BA assets.

SCHEDULE BA SURVEY RESULTS

Survey respondents represented approximately 70% of all real estate (Schedule A) reported by life insurance companies and nearly 50% of total general account assets. Of these real estate portfolios, approximately 40% is reported on Schedule A and 60% on Schedule BA.

The following is a summary of the real estate characteristics as reported on Schedule BA based on reported book value as of December 2017:

Ownership

- 80% Affiliated and 20% Unaffiliated
- 50% controlling interest that's either wholly-owned or held in a joint venture with control, and 50% non-controlling interest held in a joint venture

Jeffrey Fisher, Ph.D., a consultant for NCREIF, found that real estate held in joint ventures performed consistently with, and perhaps slightly better than, wholly-owned real estate. For reference, based on assets in the NCREIF index, approximately 60% are wholly-owned and 40% are joint ventures by market value.

Risk Profile

- 71% Core – at least 80% leased and less than 10% under construction
- 16% Value-Add – less than 80% leased with less than 25% under construction

[1] The American Council of Life Insurers (ACLI) advocates on behalf of approximately 290 member companies dedicated to providing products and services that contribute to consumers' financial and retirement security. ACLI members represent 95 percent of industry assets, 93 percent of life insurance premiums, and 98 percent of annuity considerations in the United States. 75 million families depend on our members' life insurance, annuities, retirement plans, long-term care insurance, disability income insurance and reinsurance products. Taking into account additional products including dental, vision and other supplemental benefits, ACLI members provide financial protection to 90 million American families.

- 13% Opportunistic – greater than 25% under construction

Diversification

- Property Type
  - 22% Office
  - 20% Multi-family
  - 11% Retail
  - 5% Industrial
  - 3% Lodging
  - 2% Mixed-Use
  - 37% Diversified – diversified real estate fund investments allocated to various property types, and also land, timber, parking garages and golf courses

- Geography
  - 26% Western U.S. (AS, AK, AZ, CA, CO, GU, HI, ID, MT, NMI, NV, NM, OR, TX, UT, WA, WY)
  - 23% Northeast U.S. (CT, DC, DE, ME, MA, MD, NH, NJ, NY, PA, RI, VT)
  - 11% Southeast U.S. (AL, AR, FL, GA, KY, LA, MS, NC, PR, SC, TN, VA, VI, WV)
  - 5% Midwest U.S. (IL, IN, IA, KS, MI, MN, MO, NE, ND, OH, OK, WI)
  - 12% International (mostly South American agricultural land/timber)
  - 23% Diversified with less than 50% of an asset(s) in a specific zone

CONCLUSION

ACLI believes that these results provide more detail and allow one to assess Schedule BA asset characteristics and therefore risk.

Life insurance companies use local partners to source real estate investments and execute asset business plans, which leads to placement on Schedule BA. Jeffery Fisher's study found use of joint venture partners can be beneficial to performance.

Over 70% of assets on Schedule BA are well-leased, long-term hold investments. Only 13% of assets are undergoing meaningful construction activity.

Similar to the NCREIF National Property Index, Schedule BA assets are diversified by both property type and geography.

The ACLI's proposal to the NAIC adjusts real estate RBC factors for leverage as appropriate for both Schedule A and Schedule BA assets.

In conclusion, our survey demonstrates Schedule BA real estate is similar in ownership, risk and diversification to the properties underlying the NCREIF index which we used in developing our proposed real estate factors for Schedule A. Therefore, these results support our recommendation to equate Schedule A real estate factors to Schedule BA real estate factors.

Draft: 3/17/21

Property and Casualty Risk-Based Capital (E) Working Group
Virtual Meeting *(in lieu of meeting at the 2021 Spring National Meeting)*
March 15, 2021

The Property and Casualty Risk-Based Capital (E) Working Group of the Capital Adequacy (E) Task Force met March 15, 2021. The following Working Group members participated: Tom Botsko, Chair, and Dale Bruggeman (OH); Wanchin Chou (CT); Robert Ridenour (FL); Judy Mottar (IL); Anna Krylova (NM); Sak-man Luk (NY); Miriam Fisk (TX); and Randy Milquet (WI).

1) Adopted the Minutes of the Catastrophe Risk (E) Subgroup and the Property and Casualty Risk-Based Capital (E) Working Group

a) Catastrophe Risk (E) Subgroup

Mr. Chou said the Catastrophe Risk (E) Subgroup met March 8 and took the following action: 1) adopted its Jan. 27 minutes; 2) adopted proposal 2020-08-CR (Clarification to PR027 Interrogatories); 3) adopted proposal 2020-11-CR (Remove Operational Risk Factor from Contingent Credit Risk); 4) discussed the development progress of wildfire modeling and a risk-based capital (RBC) charge; 5) discussed its 2021 working agenda; 6) discussed the internal catastrophe model evaluation process; and 7) established an ad hoc group to conduct a more in-depth review on different wildfire models.

Steve Broadie (American Property Casualty Insurance Association—APCIA) recommended the Subgroup take appropriate time to decide: 1) whether wildfire peril needs to be added to the Rcat component; and 2) how to implement the wildfire in the Rcat component if decision is made.

b) Joint Property and Casualty Risk-Based Capital (E) Working Group and Catastrophe Risk (E) Subgroup

Mr. Chou said the Property and Casualty Risk-Based (E) Working Group met in joint session with the Catastrophe Risk (E) Subgroup to conduct an e-vote that concluded Jan. 27 to adopt the updated 2020 U.S. and non-U.S. catastrophe risk event lists.

Mr. Chou made a motion, seconded by Ms. Krylova, to adopt the Catastrophe Risk (E) Subgroup's March 8 minutes (Attachment Four-A) and the joint Property and Casualty Risk-Based Capital (E) Working Group and Catastrophe Risk (E) Subgroup's Jan. 27 minutes (Attachment Four-B). The motion passed unanimously.

2. Adopted Proposal 2020-08-CR (Clarification to PR027 Interrogatories)

Mr. Chou said some insurers with minimal or no gross earthquake and/or hurricane exposure did not file PR027A or PR027B, and the Interrogatories on PR027 will create some validation issues in the catastrophe risk component. He said the purpose of this proposal is to add instructions to PR027 Interrogatories that clarify how insurers with minimal or no gross exposure to the catastrophe risk should complete the interrogatories. Mr. Chou also stated that the Subgroup received no comments during the exposure period.

Mr. Chou made a motion, seconded by Mr. Luk, to adopt proposal 2020-08-CR. The motion passed unanimously.

3. Adopted Proposal 2020-11-CR (Remove Operational Risk Factor from Rcat)

Mr. Chou said the operational risk is now separately addressed in the RBC formula as a stand-alone capital add-on. The purpose of this proposal is to remove the embedded 3% operational risk charge in the Rcat component to avoid double-counting of the charge. He also stated that the Subgroup received comment letters from the APCIA and Reinsurance Association of America (RAA) during the exposure period. They both support this proposal to eliminate the duplicative application of operational risk charges for modeled reinsurance recoverable in the Rcat component.

Mr. Chou made a motion, seconded by Ms. Krylova, to adopt proposal 2020-08-CR. The motion passed unanimously.

4. Received an Update from its Subgroup on the Development Process of Wildfire Modeling and an RBC Charge

Mr. Chou said understanding the wildfire model and engaging the state insurance regulators and industry to get involved in the development of the RBC charge are the two key elements of implementing the RBC charge properly. He stated that the Subgroup met three times since the 2020 Fall National Meeting in regulator-to-regulator session to discuss wildfire models. He said the Subgroup planned to continue with more in-depth technical reviews of different model assumptions, limitations and impact studies in the upcoming months. Also, Mr. Chou urged the interested parties to provide thoughts regarding the wildfire peril during Subgroup's next meeting on: 1) other key items to be considered during the RBC charge development phases; 2) using the worst year in 100 in the calculation of the RBC charge; and 3) expected actual implementation reporting year.

5. Exposed Proposal 2021-03-P (Credit Risk Instruction Modification)

Mr. Botsko said the purpose of this proposal is to provide examples to clarify how the reporting companies should select the designation in the Annual Statement Schedule F, Part 3, Reinsurer Designation Equivalent Rating column if the reporting entities subscribe to one or multiple rating agencies. He also stated that since the accurate reporting on reinsurer designation equivalent rating in the Schedule F, Part 3 is crucial to calculate the R3 charge appropriately, NAIC staff will conduct a more in-depth review on Schedule F, Part 3 in the near future.

The Working Group agreed to expose proposal 2021-03-P for a 30-day public comment period ending April 14.

6. Heard an Update from its Runoff Ad Hoc Group

Mr. Botsko said an ad hoc group was formed to determine the best course of treatment of run-off companies during the 2020 Fall National Meeting. Mr. Botsko stated that the ad hoc group identified those companies that: 1) stopped renewing policies for at least 12 months; 2) are closed to new business; 3) are large on reserves to premium written ratio; and 4) have zero premium written on the reserves to premium written ratio. He also stated that the ad hoc group is reviewing: 1) the possibility of adding an identifier in the annual statement; and 2) the current RBC calculation, including R5 and the operational risk components. Since different lines of business may have their own definition of runoff, Mr. Botsko said the ad hoc group will share its progress and findings with not only the Working Group and the Restructuring Mechanisms (E) Subgroup, but also the Life Risk-Based Capital (E) Working Group and Health Risk-Based Capital (E) Working Group for their consideration.

7. Adopted its 2021 Working Agenda

Mr. Botsko summarized the changes to the Working Group's 2021 working agenda: 1) changed "Evaluate other catastrophe risks for possible inclusion in the charge" item expected completion date to year-end 2022 or later; 2) removed "Evaluate the possibility of using the NAIC as a centralized location for reinsurer designations" and "Evaluate the RBC impact on two different retroactive reinsurance exception approaches"; 3) modified "Evaluate the possibility of allowing additional third-party models to calculate the cat model losses" to "Evaluate the possibility of allowing additional third-party models or adjustments to the vendor models to calculate the cat model losses," and the expected completion date was changed to year-end 2021 or later; and 4) added "Implement Wildfire Peril in the Rcat component (For Informational Purpose Only)" in the new items section.

Mr. Chou made a motion, seconded by Mr. Luk, to adopt the Working Group's 2021 working agenda. The motion passed unanimously.

8. Heard Updates on Property/Casualty RBC Underwriting Risk Factors from the Academy

David Traugott (American Academy of Actuaries—Academy) said the Academy report *Update to Property and Casualty Risk-Based Capital Underwriting Factors Experience Through December 31, 2017* (Attachment Four-C) was based on data from annual statements reporting between 1989 and 2017 and RBC filings between 1997 and 2017. He stated that the approach in this report is broadly the same as the approach in the 2016 report, with some refinements. Mr. Traugott also said the Academy planned to devote more time to discuss this report in the upcoming Working Group meeting to allow state insurance regulators and interested parties to have chance to review it. In addition, he stated that the investment income adjustment factors and the loss/premium concentration factor reports will be provided to the Working Group later.

Mr. Botsko said he planned to schedule another meeting to discuss this report and other Working Group outstanding items in April.

Having no further business, the Property and Casualty Risk-Based Capital (E) Working Group adjourned.

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Draft: 3/9/21

Catastrophe Risk (E) Subgroup
Virtual Meeting (*in lieu of meeting at the 2021 Spring National Meeting*)
March 8, 2021

The Catastrophe Risk (E) Subgroup of the Property and Casualty Risk-Based Capital (E) Working Group of the Capital Adequacy (E) Task Force met March 8, 2021. The following Subgroup members participated: Wanchin Chou, Chair (CT); Robert Ridenour, Vice Chair (FL); Laura Clements (CA); Gordon Hay (NE); Anna Krylova (NM); Halina Smosna and Sak-man Luk (NY); Tom Botsko (OH); Andrew Schallhorn (OK), Will Davis (SC); and Miriam Fisk (TX).

1. Adopted its Jan. 27 Minutes

Mr. Chou said the Subgroup conducted an e-vote that concluded Jan. 27 to adopt the updated proposal 2020-12-CR (2020 U.S. and Non-U.S. Catastrophe Risk Event Lists).

Mr. Botsko made a motion, seconded by Ms. Clements, to adopt the Subgroup's Jan. 27 minutes (Attachment Four-B). The motion passed unanimously.

2. Adopted Proposal 2020-08-CR (Clarification to PR027 Interrogatories)

Mr. Luk said some insurers with minimal or no gross earthquake and/or hurricane exposure did not file PR027A or PR027B, and the Interrogatories on PR027 will create some validation issues in the catastrophe risk component. He said the purpose of this proposal is to add instructions to PR027 Interrogatories that clarify how insurers with minimal or no gross exposure to the catastrophe risk should complete the interrogatories.

Mr. Chou stated that the Subgroup received no comments during the exposure period.

Mr. Luk made a motion, seconded by Mr. Botsko, to adopt proposal 2020-08-CR. The motion passed unanimously.

3. Adopted Proposal 2020-11-CR (Remove Operational Risk Factor from Rcat)

Mr. Botsko said the operational risk is now separately addressed in the risk-based capital (RBC) formula as a stand-alone capital add-on. The purpose of this proposal is to remove the embedded 3% operational risk charge in the Rcat component to avoid double-counting of the charge. He also stated that the Subgroup received two comment letters during the exposure period.

Stephen W. Broadie (American Property Casualty Insurance Association—APCIA) and Scott Williamson (Reinsurance Association of America—RAA) support this proposal to eliminate the duplicative application of operational risk charges for modeled reinsurance recoverable in Rcat component.

Mr. Botsko made a motion, seconded by Mr. Davis, to adopt proposal 2020-11-CR. The motion passed unanimously.

4. Discussed Wildfire Modeling and RBC Charge Development Progress

Mr. Chou said understanding the wildfire model and engaging the state insurance regulators and industry to get involved in the development of the RBC charge are the two key elements of implementing the RBC charge properly. He stated that the Subgroup met three times since the 2020 Fall National Meeting in regulator-to-regulator session to discuss wildfire models. He said the Subgroup planned to continue with more in-depth technical reviews of different model assumptions, limitations and impact studies in the upcoming months.

Also, Mr. Chou urged the Subgroup to provide thoughts regarding the wildfire peril during its next meeting on: 1) other key items to be considered during the RBC charge development phases; 2) using the worst-year-in-100 in the calculation of the RBC charge; and 3) expected actual implementation reporting year. He stated that a meeting will be scheduled in the near future to continue discussing this issue.

Mr. Broadie said developing an appropriate charge for the wildfire peril is crucial, he recommended that the Subgroup should consider taking time on the development progress. Mr. Chou agreed.

5. Adopted its 2021 Working Agenda

Mr. Chou summarized the changes to the Subgroup's 2021 working agenda: 1) changed "Evaluate other catastrophe risks for possible inclusion in the charge" item expected completion date to year-end 2022 or later; 2) modified "Evaluate the possibility of allowing additional third-party models to calculate the cat model losses" to "Evaluate the possibility of allowing additional third-party models or adjustments to the vendor models to calculate the cat model losses," and the expected completion date was changed to year-end 2021 or later; and 3) added "Implement Wildfire Peril in the Rcat component (For Informational Purpose Only)" in the new items section.

Ralph Blanchard (Travelers) asked the Subgroup to consider changing the expected completion date of implementing wildfire peril in the Rcat component for informational purpose only to after the 2022 Spring National Meeting.

Mr. Botsko made a motion, seconded by Mr. Schallhorn, to adopt the Subgroup's 2021 working agenda, with the change of the expected completion date for "Implement Wildfire Peril in the Rcat component (For Informational Purpose Only)." The motion passed unanimously.

6. Discussed the Internal Catastrophe Model Evaluation Process

Mr. Chou said there are three different kinds of CAT models that deviate from the vendor models: 1) internal CAT models; 2) vendor CAT models with adjustments or different weights; and 3) derivative models based on the vendor models. He stated that detailed instructions in evaluating the internal CAT models have been included in the RBC instructions. However, he said he thinks more in-depth instructions on the derivative model and the vendor models with adjustments may be necessary.

Mr. Botsko recommended that the Subgroup should take wildfire peril into consideration as it continues discussing this issue.

Mr. Blanchard said a different level of evaluation and validation process should be applied to vendor CAT models with adjustments or different weights. He said he believes that a more simplified instructions is worthy of consideration for this type of model.

Mr. Chou asked all the interested parties to share thoughts during the Subgroup's upcoming meeting.

7. Created an Ad Hoc Group to Review Wildfire Models

Mr. Chou said he believes that creating a technical review ad hoc group to conduct a more in-depth review on different wildfire models would speed up the entire wildfire charge development progress. He said encourages interested parties to join the ad hoc group so this project will be completed in time.

Having no further business, the Catastrophe Risk (E) Subgroup adjourned.

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Draft: 1/28/21

Property and Casualty Risk-Based Capital (E) Working Group and Catastrophe Risk (E) Subgroup
E-Vote
January 27, 2021

The Property and Casualty Risk-Based Capital (E) Working Group of the Capital Adequacy (E) Task Force conducted an e-vote with the Catastrophe Risk (E) Subgroup of the Property and Casualty Risk-Based Capital (E) Working Group of the Capital Adequacy (E) Task Force that concluded Jan. 22, 2020. The following Working Group members participated: Tom Botsko, Chair (OH); Richard Ford (AL); Laura Clements (CA); Mitchell Bronson (CO); Wanchin Chou (CT); Robert Ridenour (FL); Judy Mottar (IL); Anna Krylova (NM); Sak-man Luk (NY); Will Davis (SC); Miriam Fisk (TX); and Randy Milquet (WI). The following Subgroup members participated: Wanchin Chou, Chair (CT); Robert Ridenour, Vice Chair (FL); Mitchell Bronson (CO); Judy Mottar (IL); Gordon Hay (NE); Anna Krylova (NM); Sak-man Luk (NY); Tom Botsko (OH); Andrew Schallhorn (OK); Will Davis (SC); and Miriam Fisk (TX).

1. Adopted the Updated 2020 U.S. and Non-U.S. Catastrophe Risk Event Lists

The Working Group and the Subgroup conducted an e-vote to consider adoption of the updated 2020 U.S. and non-U.S. catastrophe risk event lists.

Ms. Krylova made a motion, seconded by Mr. Bronson, to adopt the lists. The motion passed unanimously.

Having no further business, the Property and Casualty Risk-Based Capital (E) Working Group and the Catastrophe Risk (E) Subgroup adjourned.

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Report to the National Association of Insurance Commissioners Property and Casualty Risk-Based Capital (E) Working Group

Update to Property and Casualty Risk-Based Capital Underwriting Factors Experience Through December 31, 2017

Presented by the American Academy of Actuaries[1]
Property and Casualty Risk-Based Capital Committee

March 2021

[1] The American Academy of Actuaries is a 19,500-member professional association whose mission is to serve the public and the U.S. actuarial profession. For more than 50 years, the Academy has assisted public policy makers 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.

American Academy of Actuaries

Property and Casualty Risk-Based Capital Committee

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(2020-current): David Traugott

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NAIC support provided by SakMan Luk, Eva Yeung and Jane Barr

Contents

1. INTRODUCTION

The American Academy of Actuaries Property and Casualty Risk-Based Capital Committee ("Committee" or "We") prepared this Report ("Report") at the request of the National Association of Insurance Commissioners' ("NAIC") Property and Casualty (P&C) Risk-Based Capital (RBC) Working Group ("NAIC Working Group" or "Working Group").

In this Report, we present indicated Line of Business ("LOB") Underwriting ("UW") Risk Factors for the P&C RBC Formula ("RBC Formula" or "Formula"), specifically, RBC Line 4 on pages PR017 and PR018 for the Formula. We refer to these LOB UW Risk Factors as the "Reserve Risk Factor" ("RRF") and the "Premium Risk Factor" ("PRF"), respectively, or "Risk Factors," generically.

This is the first in a series of three reports. The results of this review will be input to subsequent Reports 2 and 3 that will address the following:

- Report 2—Investment Income Adjustment ("IIA")—RBC Line 8 on page PR017 (R4 UW Risk - Reserves) and Line 7 on page PR018 (R5 – UW Risk – Net Written Premium), by LOB.
- Report 3—Loss Concentration Factor ("LCF") and Premium Concentration Factor ("PCF")—RBC Line 14 on PR017 and PR018 respectively.

We describe the full scope of this three-part project in a letter to the NAIC Working Group dated May 9, 2019, that is attached as Appendix 15 in this Report. We plan to issue Reports 2 and 3 later this year.

We provide these indicated Risk Factors for the information of the NAIC Working Group. Report 2—Investment Income Adjustment, to be provided later this year, may also be useful in informing NAIC Working Group action related to the indicated UW Risk Factors in this Report.[2]

This work by the Committee builds on prior American Academy of Actuaries reports on UW Risk Factors, most recently in 2010 and 2016, which we refer to as the 2010 Report and the 2016 Report, respectively. We also use Casualty Actuarial Society (CAS) RBC research prepared by the CAS Dependency and Calibration Working Party (DCWP). We list this American Academy of Actuaries and CAS material in the Reference Section, Appendix 14.

The analysis presented in this Report is based on data evaluated through December 31, 2017. The analysis in the 2016 report was based on data evaluated through December 31, 2014.

[2] The IIA Report will address the fact that the current IIA's are based on a 5% interest rate, even though current interest rates are much lower. It is likely that the effect of reflecting lower interest rates will increase the overall risk charges.

2. FINDINGS

Indicated Risk Factors

Using the data and methodology described in this Report, we calculate the indicated Risk Factors. We compare the indicated factors to (a) indicated Risk Factors from the 2016 Report and (b) the Risk Factors in the 2020 RBC Formula in tables below:

- In Tables 1a and 1b we compare the Risk Factors indicated by the current analysis to the Risk Factors indicated in the 2016 Report. This comparison shows us the effects of changes in methodology and additional data for this Report compared to the 2016 Report.

- In Tables 1c-1e we show the effect on RBC values of moving from the Risk Factors in the 2020 RBC Formula to the Risk Factors indicated by this analysis. Appendix 13 provides further details on the effect of that change, and also the effects of "capping" the changes, using the capping rules the NAIC Working Group considered in evaluating the 2016 Report.[3]

Table 1a shows the following information:

- Columns 2 and 5—The factors in the "2020 RBC Formula" column are those used in the 2020 RBC Formula, except that, for catastrophe exposed LOBs, we increase the 2020 Risk Factors to their values before the NAIC catastrophe risk adjustments.[4,5]
- Columns 3 and 6—The Risk Factors in the "Indicated (2014 Data)" columns are the indicated factors presented in the 2016 Committee Report (2016 report),[6] using data evaluated through December 31, 2014.
- Columns 4 and 7—The Risk Factors in the "Indicated (2017 Data)"[7] columns are the indicated Risk Factors from this study, using data evaluated through December 31, 2017.

The all-lines average indicated Risk Factors in the analysis are relatively close to the all-lines average indicated Risk Factors from the 2016 analysis. Nonetheless, there are some notable changes in Risk Factors by LOB.

[3] While we provide this detailed information, as noted in the Introduction, the results of our IAA Report may provide more context for any changes in Line 4 Risk Factors.

[4] Beginning in 2016, the RBC Formula includes a new risk component, RCat, covering earthquake and hurricane components of the total premium risk. The indicated PRFs in this Report and in the 2016 Report have been calibrated with data that included earthquake and hurricane losses. Therefore, to avoid double counting of catastrophe risk, the NAIC developed a procedure to reduce the otherwise applicable Risk Factors for the affected LOBs. The factors that reduce the indicated PRFs to an ex-cat basis by LOB are as follows: Homeowners (0.971), CMP (0.980), Special Liability (0.983), Special Property (0.982), and Reinsurance: Nonproportional Assumed Property and Reinsurance: Nonproportional Assumed Financial, collectively called ("Reinsurance Property") (0.944).

[5] The indicated Risk Factors do not reflect the transition rules, often referred to as 'capping', that the NAIC requested.

[6] The NAIC has adopted a portion of the indicated Risk Factors from the 2016 Report in several steps from 2016 to 2019. The remaining differences between the 2019 Risk Factors and the indicated Risk Factors contained in the 2016 Report are due to NAIC capping for those LOBs that has not yet been removed.

[7] These indicated Risk Factors do not reflect any transition rules, often referred to as "capping," that the NAIC might request.

If the NAIC Working Group decides to update the current factors based on this research, we can provide "capping" alternatives if so requested.

Table 1a
Comparison of Risk Factors
2020 RBC Formula/ 2014 Data / 2017 data

(1)	(2)	(3)	(4)	(5)	(6)	(7)
	PRFs			RRFs		
Line	2020 RBC Formula	Indicated (2014 Data)	Indicated (2017 Data)	2020 RBC Formula	Indicated (2014 Data)	Indicated (2017 Data)
(1) H/F	0.964	0.964	0.960	0.213	0.213	0.223
(2) PPA	0.969	0.969	0.975	0.179	0.179	0.201
(3) CA	1.010	1.010	1.022	0.276	0.348	0.361
(4) WC	1.044	1.044	1.030	0.344	0.344	0.335
(5) CMP	0.901	0.901	0.897	0.494	0.494	0.499
(6) MPL Occ.	1.668	1.490	1.480	0.383	0.296	0.265
(7) MPL C-M	1.130	1.176	1.149	0.276	0.089	0.094
(8) SL	0.938	0.949	0.952	0.304	0.431	0.415
(9) OL	1.013	1.013	1.014	0.531	0.531	0.527
(11) Spec. Prop.	0.879	0.831	0.831	0.246	0.428	0.278
(12) APD	0.836	0.836	0.837	0.155	0.155	0.132
(10) Fidelity / Surety	0.854	0.680	0.666	0.371	0.917	0.600
(13) Other	0.935	0.935	0.933	0.220	0.375	0.225
(15) International	1.234	1.638	1.712	0.359	0.695	1.044
(16) Reins. Prop. / Fin.	1.239	1.240	1.240	0.415	0.415	0.343
(17) Reins. Liab.	1.323	1.322	1.252	0.656	0.656	0.636
(18) PL	1.263	1.285	1.270	0.802	1.345	1.472
(14) Financial / Mortgage	1.598	2.513	2.588	0.179	0.060	0.001
(19) Warranty	0.854	1.028	0.975	0.371	0.316	0.312
Average Risk Factor- all Lines	0.964	0.968	0.967	0.362	0.383	0.376
Average Risk Factor- 10-Yr Lines	0.996	0.996	0.995	0.375	0.387	0.390
Average Risk Factor- 2-Yr Lines	0.880	0.895	0.897	0.226	0.344	0.218

Note 1: Average Risk Factors are based on 2017 industry total net written premium and net unpaid loss and loss adjustment expense reserves, by LOB, for PRFs and RRFs, respectively.

Note 2: The company risk charge depends on not only the Risk Factors, above, but also depends on adjustments for company experience, investment income, loss sensitive contracts, company expenses (for premium risk) and a concentration adjustment. The change in Risk Factor is not representative of the change in RBC value for any particular company, as the Risk Factor does not include all elements of the RBC Formula and as distribution of premium/reserves by LOB differs widely among companies. Tables 1c-1e provide further details on the effect of the indicted Risk Factors on overall RBC values.

Note 3: Our indications are based on data from 1989[8]–2017 Annual Statements, Schedule P Parts 1, 2 and 3 for "Ten-Year LOBs" and from 1997–2017 confidential RBC Filings for Two-Year LOBs. [9] The NAIC compiled the data from the RBC Filings so that the available experience reflected 10 years for all LOBs.

Note 4: The shaded lines represent factors which are based on a limited amount of data.[10]

As our data sources and methods somewhat different between Two-Year LOBs and Ten-Year LOBs, the table shows the average indicated Risk Factors for all-lines combined and, also, separately for Two-Year LOBs and Ten-Year LOBs. Ten-Year LOBs are the LOBs for which Schedule P shows 10 accident years (AYs) of data. Two-Year LOBs are those for which Schedule P shows only two AYs of data.

Table 1b, below, supplements Table 1a, showing the premium risk charges assuming industry average expenses and showing the percentage change in Premium Risk Charge percentage (PRC%) and Reserve Risk Charge percentage (RRC%).[11] Note that the percentage change in RBC charge is higher than the change in Risk Factor as a percentage of premium or reserves.

[8] Electronic data for Part 1 is available for some earlier years, but, for the earlier annual statement years, the LOB definitions in Schedule P were not the same as the current LOB definitions.
[9] The Two-Year LOBs include Special Property, Automobile Physical Damage, Fidelity/Surety, Other (Including Credit, Accident and Health), Financial/Mortgage Guaranty, and Warranty.
[10] The analysis uses less than $50 billion in 2017 NEP or less than $50 billion in 2017 reserves after filtering, using Annual Statement data for all LOBs.
[11] PRC% = PRF + 2017 industry average expense ratio by LOB -100%. RRC% = RRF. Column (4) = column (3)/column (2). Column (7) = column (6)/column (5).

Table 1b
Comparison of Risk Factors
2020 RBC Formula/ 201 Data / 2017 data

(1)	(2)	(3)	(4)	(5)	(6)	(7)
	PRC%s			RRC%s		
Line	Indicated (2014 Data)	Indicated (2017 Data)	% Change	Indicated (2014 Data)	Indicated (2017 Data)	% Change
(1) H/F	25.4%	24.9%	-1.7%	21.3%	22.3%	4.5%
(2) PPA	19.7%	20.4%	3.2%	17.9%	20.1%	12.3%
(3) CA	29.6%	30.8%	4.1%	34.8%	36.1%	3.9%
(4) WC	30.6%	29.1%	-4.8%	34.4%	33.5%	-2.5%
(5) CMP	25.7%	25.3%	-1.5%	49.4%	49.9%	1.0%
(6) MPL Occ.	74.4%	73.5%	-1.3%	29.6%	26.5%	-10.3%
(7) MPL C-M	43.1%	40.4%	-6.3%	8.9%	9.4%	5.5%
(8) SL	28.7%	29.1%	1.2%	43.1%	41.5%	-3.8%
(9) OL	31.6%	31.8%	0.4%	53.1%	52.7%	-0.8%
(11) Spec. Prop.	13.2%	13.2%	0.1%	42.8%	27.8%	-35.2%
(12) APD	6.8%	6.9%	2.1%	15.5%	13.2%	-14.7%
(10) Fidelity / Surety	18.0%	16.6%	-8.0%	91.7%	60.0%	-34.5%
(13) Other	19.1%	18.9%	-0.9%	37.5%	22.5%	-40.0%
(15) International	107.7%	115.1%	6.9%	69.5%	104.4%	50.2%
(16) Reins. Prop. / Fin.	50.7%	50.7%	0.0%	41.5%	34.3%	-17.3%
(17) Reins. Liab.	59.0%	52.0%	-11.9%	65.6%	63.6%	-2.9%
(18) PL	61.4%	60.0%	-2.4%	134.5%	147.2%	9.5%
(14) Financial / Mortgage	185.4%	192.9%	4.0%	6.0%	0.1%	-98.2%
(19) Warranty	28.6%	23.3%	-18.6%	31.6%	31.2%	-1.3%
Average Risk Factor- all Lines	23.8%	23.8%	-0.1%	38.3%	37.6%	-1.9%
Average Risk Factor- 10-Yr Lines	26.9%	26.7%	-0.5%	38.7%	39.0%	0.9%
Average Risk Factor- 2-Yr Lines	16.0%	16.3%	1.6%	34.4%	21.8%	-36.6%

See Notes 1-4 on Table 1a

Effect of Indicated Risk Factors on RBC by Company

The NAIC has provided the information in Appendix 13, which summarizes the company-by-company changes in RBC values implied by the indicated RBC factors, for all companies with RBC Filings in 2019. These calculations include the effect of all elements of the RBC Formula.

Tables 1c – 1e, below, compare the RBC values based on the indicated Risk Factors with the 2017 data, in this Report, to the RBC values based on the indicated Risk Factors with the 2014 data, in the 2016 Report.

Table 1c shows that, overall, the 2017 indicated Risk Factors produce very little change in UW RBC Values for reserve risk, premium risk, or total Authorized Control Level (ACL) RBC. The average effect is a change of -0.6% for ACL.

Table 1c
Change in RBC Values
Indicated Risk Factors with 2017 Data Compared to Indications with 2014 Data

Risk Element	Indicated 2017 vs. Indicated 2014
Change in Reserve Risk RBC	-1.5%
Change in Premium Risk RBC	-0.4%
Change in ACL	-0.6%

Table 1d shows that the changes, by company, are largely confined to the ±5% range.

Table 1d
Distribution of Change in ACL Values

% Change in ACL RBC	From 2014 to 2017 Data
Less Than -50%	0
-50% to -25%	20
-25% to -15%	29
-15% to -5%	167
-5% to 5%	1,534
5% to 15%	85
15% to 25%	2
25% to 50%	0
Over 50%	0
Total	1,837

Table 1e shows the effect on RBC value by Type of Company.[12]

The largest change is for the Type of Company "NOC". The LOBs that predominate for that Type of Company are Fidelity/Surety, Special Liability,[13] and Other Liability. The variation in changes by Type of Company are larger for reserve risk than for premium risk. Appendix 13 contains more details on Type of Company and the distribution of LOBs within each Type of Company.

In the next section, we discuss the changes in data and methodology that influence those observations.

[12] Each LOB is categorized as being typical of a particular Type of Company, e.g., Private Passenger Automobile Liability is typical of Personal Lines companies. For each company, the category with the largest amount of premium determines the Type for that company. For example, a company with more of its premium in Private Passenger Automobile Liability, Homeowners, or Automobile Physical Damage than in any of the other groups of LOBs is categorized as Personal. Appendix 13, Part 4 provides the complete definition.
[13] For example, Boiler and Machinery and Ocean Marine LOBs.

Table 1e
Change in ACL Values by Type of Company
Indicated Risk Factors with 2017 Data Compared to Indications with 2014 Data

Type of Company	ACL Value with 2020 Risk Charges ($Billions)	Indicated 2017 vs. Indicated 2014		
		Reserve Risk Charge	Premium Risk Charge	ACL
Commercial	64.9	-2.8%	-0.7%	-1.5%
Med Prof Liab	2.4	-14.9%	-6.9%	-3.0%
NOC	0.9	-23.0%	-1.7%	-10.8%
Personal	84.3	4.9%	0.9%	0.5%
Reinsurance	8.2	-4.9%	-3.4%	-0.5%
Workers Comp	10.1	-3.0%	-4.3%	-2.0%
Total	170.6	-1.5%	-0.4%	-0.6%

NOC = Not otherwise classified.

Elements Driving Differences Between 2017 Indicated Risk Factors and 2014 Indicated Risk Factors

The changes in indicated Risk Factors from the 2016 Report to the current Report result from additional data and from some refinements in methodology. The sections below discuss the factors driving the major changes by Type of Company.

1. Zero Interior Anomaly—RRFs

We find that in the RBC Filings, there are companies that do not complete the interior of loss triangles, perhaps because these values are not required in the RBC calculation. For these companies, in the incurred and paid development triangle of the RBC Filing, all points are zero or blank, other than (a) initial evaluations by AY on the diagonal of the triangle, and (b) current evaluations of each AY, on the last column. We refer to these as "Zero Interior" triangles. Appendix 4, Table A-5b, contains an illustration of a zero interior triangle.

For Two-Year LOBs, in this Report, we remove Zero Interior triangle data from our analysis. That is a change compared to the 2016 Report, and that is the largest source of change in indicated RRFs for Two-Year LOBs. Four of those Two-Year LOBs are typical lines for the Type of Company "NOC" which shows the largest change in reserve risk RBC value as follows: Fidelity/Surety, "Other," Financial/Mortgage Guaranty, and Warranty.

In the 2016 Report we addressed the potential for zero interior data by excluding Reserve Runoff Ratios (RRR) with absolute value greater than 5. In this report we applied the zero interior filter in addition to excluding RRRs with absolute value greater than 5. Appendix 11, Table A-8a shows the effect of zero interior filter, by LOB.

2. Refined Minor Lines Definition—RRFs

We exclude risk data points where the premium for the LOB represents a small portion of a company's all lines premium as defined below. We call these data points "Minor Lines."

For Reserve Risk, the Minor Lines filter compares the NEP for the LOB for a period of years to the corresponding all-lines premium. To the extent the appropriate data are available, we use a rolling Ten-Year period for this calculation. As there are variations in the data available from year-to-year, the "window" varies by LOB. Appendix 5 provides further details on this approach.

The use of Ten-Year "windows" differs from the approach in 2016 Report, where the reserve risk Minor Lines definition was based on all-years premium. With the increase in the number of years of premium in our data set, we determined that a change in procedure should be considered, and we adopted this approach.

This change in methodology reduces RRFs by about 1% overall, but by larger amounts for the reinsurance LOBs, for Financial/Mortgage Guaranty, for Other, and for Special Property LOBs. The change drives much of the change for the reserve risk RBC values for the Reinsurance Type of Company. Appendix 11, Table A-8a shows the effect of the revised minor lines definition, by LOB.

3. Absolute (RRR)>5—RRFs—Two-Year LOBs Based on RBC Data

In the 2016 Report, we excluded RRR values greater than 5 for both Ten-Year LOBs and Two-Year LOBs from Annual Statement and RBC data, respectively, because we were concerned that the ratios reflected data quality issues.

We have reviewed this issue, and for the Two-Year LOBs from confidential RBC data, we continue to exclude data if the absolute value of RRR is greater than 5, as many such values appear to be due to data anomalies. For the Ten-Year LOBs, however, in this review, we use RRR values, regardless of size.

If large RRR values were data errors, then we might expect an impact across all LOBs. However, for Ten-Year LOBs, to the contrary, we find a wide range of impacts, as a percentage of reserves, from a low 0.000 to a high of 0.195. There are nine of thirteen Ten-Year LOBs affected by less than 1% of reserves and only two affected by more than 5% of reserves. As such, we see no need for an all-lines exclusion.

Table A-5a, in Appendix 4, below, shows the effect of removing this filter by LOB. It shows that the weighted average effect on the RRFs for Ten-Year LOBs is an increase of 0.9% of reserves. It shows the Ten-Year LOBs most affected by removing the exclusion are as follows: Products Liability (19% of reserves) and International (20% of reserves). The LOB effects are not apparent in the Type of Company summary because Products Liability is usually a small part of business for a Commercial Type of Company and International is a relatively small LOB.

The change tends to increase the indicated RRF for reinsurance liability, which mitigates the effect of other changes in RRF for that LOB, e.g., the change in the Minor Lines procedure.

4. Other Changes

We describe the nature of the changes in more detail in the remainder of the Report, and we show all the components of change in the following Appendices:

- PRFs (Ten-Year LOBs): Appendix 10, Table A-7

- RRFs (all LOBs): Appendix 11, Table A-8

Issues Related to Certain LOBs

Various considerations that might affect the selection of Risk Factors for certain LOBs are as follows:

- Low Credibility LOBs—The International, Financial/Mortgage Guaranty, and Warranty LOBs have relatively few data points for our analysis—900, 200, and 100 respectively—after filtering for reserve risk and similar amounts for premium risk. That compares to over 10,000 data points for the Private Passenger Liability, Homeowners, and Workers' Compensation LOBs. As such, indicated Risk Factors are more subject to variation from year-to-year because of even small changes in methodology and because of random variations in emerging data, than is the case for other LOBs.
- Financial/Mortgage Guaranty—There are many single state/monoline companies that provide data in the Annual Statements, but that are exempt from RBC requirement. The data for the single state/monoline mortgage/financial guaranty companies are not included in the data used to develop the indicated Risk Factors in Table 1.[14]
- Warranty—This LOB was separated from the Fidelity/Surety LOB in 2008. Some companies provided a complete history for Accident Year ("AY") including prior AYs. Other companies provided the separate data only for AYs 2008 and subsequent. As such, RBC data for the Warranty LOB in Annual Statements prior to 2017 is very limited.
- International—As noted in the first bullet, the volume of data in this LOB is relatively low. Moreover, proportionally more of the historical experience for this LOB arises from earlier Annual Statements than from more recent Annual Statements. As such, the relevance of indicated Risks Factors for current LOB M business is less certain than for other LOBs.
- Products—Asbestos and Environmental claim emergence affects reserve development from each of the over 30 years of Annual Statements in our analysis. It is possible that this ongoing emergence results in over-stated indicated RRFs.[15,16]
- Minimum Risk Charges—For some LOBs, the indicated risk charges will be negative, after the investment income adjustment, for a company with industry average expenses and with average loss ratio/reserve development experience (Medical Professional Claims Made and Financial/Mortgage Guaranty RRFs). Also, for one LOB, the indicated risk charge will be zero or above, but below 5%, (Automobile Physical Damage-PRF). The NAIC Working Group may want to consider the use minimum risk factors.

[14] This RBC Risk Factor analysis does not consider the solvency risk aspects of Statutory Contingency Reserves that might be provided for Financial/Mortgage Guaranty LOBs or the implications of large unearned premium reserves (viewed as a percentage of written premium) for longer duration policies in Warranty, Financial/Mortgage, and health (included in "Other") LOBs.

[15] It is less obvious in the PRF indicated Risk Factors, but asbestos and environmental claim emergence might also affect Reinsurance Liability, Other Liability, and (to a lesser degree) Commercial Multiperil LOBs.

[16] To the extent that the NAIC Working Group implements changes in risk factors with caps, as it has done in the past, this risk of over-stated Product Liability RRFs is mitigated.

Effect of 2017 Risk Factors Compared to Risk Factors in 2020 RBC Formula

If the NAIC Working Group were to implement Risk Factor changes based on the indicated Risk Factors, Table 1f, below, shows the percentage change in reserve Risk Charge, premium Risk Charge and ACL that would result, using capped and uncapped scenarios shown.

Table 1f
Change in RBC Values
2020 RBC Formula Risk Factors vs. Alternative Capped and Uncapped Indicated risk Factors

Row	Risk Factors/Cappping	% Change From 2020 Formula		
		Reserve Risk Charge	Premium Risk Charge	ACL
1	**2020 RBC Fomula**	Base	Base	Base
2	**2014 Indicated -Uncapped**	9.3%	-1.9%	2.8%
3	**2017 Indicated -Uncapped**	7.6%	-2.3%	2.2%
4	**2017 Indicated - 5% Min. - Uncapped**	9.0%	-1.1%	2.5%
5	**2017 Indicated - 5% Min. - ±10% Max**	0.5%	-0.6%	0.0%
6	**2017 Indicated - 5% Min. - ±20% Max**	2.2%	-1.3%	0.4%
7	**2017 Indicated - 5% Min. - ±35% Max**	3.9%	-1.4%	0.9%

Table 1f shows the following:

- Row 2—The change in risk charges that would result from implementing the 2014 indicated Risk Factors in the 2016 Report is not zero, because those factors have been partially, but not fully implemented.
- Row 3—The change in Risk Factors that would result from implementing the 2017 indicated Risk Factors are lower than from implementing the 2014 indicted Risk Factors, because, as shown in Table 1c, the 2017 indicated Risk Factors are lower than the 2014 indicted Risk Factors.
- Row 4—If we apply a minimum risk charge, after investment income adjustments, of 5%, the change in risk charges is slightly higher than if that were not applied, i.e., 2.5% of ACL rather than 2.2% of ACL.
- Rows 5-7—If we apply the 2017 indicted Risk Factors, but capped to produce a maximum change in risk charge by LOB, after investment income adjustment, the changes in ACL are 0.0%, 0.4%, and 0.9% for caps of 10%, 20%, and 35% respectively. The caps are applied to the absolute value of the risk charge change, i.e., no more than 10% upward or 10% downward. The 5% minimum is applied in each of the examples.

3. METHODOLOGY

We determine the indicated Risk Factors as outlined below in Appendices 1-9. In Appendices 10 and 11, we analyze the movement in indicated Risk Factors from the values in the 2016 Report to the values in in this Report.

Risk Factor Overview

We describe the basis for the PRF and RRF indications below.

PRF Indications

The PRF for a LOB is a component of the premium risk charge, which reflects the risk that a subsequent year of company premium, net of reinsurance, will produce an adverse UW result.

The indicated PRF for each LOB is derived from loss and loss adjustment expense ("LAE") ratios, for each LOB/company/year in the selected experience period. We refer to the net earned premium ("NEP") and the loss ratio ("LR") for an AY/company/LOB as a premium risk data point.

The indicated PRF is the 87.5th percentile of the LRs after the filtering described in the Data Selection section below.

RRF Indications

The RRF for a LOB is a component of the reserve risk charge, which reflects the risk that currently reported reserves for loss and all loss adjustment expense, net of reinsurance, will develop adversely from the initial reserve date to ultimate.[17, 18]

The indicated RRF for each LOB is derived from RRRs by company/year in the selected experience period. The denominator of that ratio is the company carried loss reserve, for all AYs combined, at the initial reserve date.[19] The numerator of the ratio is the increase/decrease in the company estimated incurred losses for all AYs combined from that initial reserve date to the latest available evaluation date. Appendix 12—Examples 1, 2, and 3 illustrate the RRR calculation. We refer to the initial reserve amount and the RRR for an initial reserve date/company/LOB as a reserve risk data point. We refer to premium and reserve risk data points, generically, as risk data points.

The indicated RRF is the 87.5th percentile of the RRRs after the filtering described below.

Data

We obtain our data from:

- Annual Statements, Schedule P, Parts 1, 2, and 3, for all LOBs, for years 1989[20]–2017, and
- Confidential RBC Filings,[21] for Two-Year LOBs, for years 1994–2017.[22]

[17] The development to ultimate is often referred to as a "runoff" time horizon, in contrast to a "one year" time horizon that considers adverse development over a one-year period. This is intended to be the development to ultimate, but implementation of that intention is limited by the available data.

[18] The RRF does not measure the adequacy of a company's carried reserves. The company experience adjustment, not part of this analysis, partially reflects company historical reserve adequacy, relative to the industry.

[19] The amounts in this calculation are gross of nontabular discount.

[20] Electronic data for Part 1 is available for some earlier years, but, for the earlier annual statement years, the LOB definitions in Schedule P were not the same as the current LOB definitions.

[21] RBC Forms PC111-114 and 121-122 for premium and RBC Forms 211-214, 221-222, and 301-304, for reserves.

[22] RBC Filing data compiled by regulators who provide summary results to this Committee.

Compared to the 2016 Report, the data available for this Report include three "new" Annual Statement and RBC Filings (2015–2017), and eight "older" Annual Statements (1989–1996). These additional data are desirable because they include more data points, contain more developed data for recent years, reflect a wider range of UW and economic conditions, include more recent data, and provide some data for AY 1988 and subsequent that were not available in the data used for the 2016 Report.[23]

Data Filtering

Consistent with the 2016 Report methodology, our indicated Risk Factors use the data described above and filtering rules itemized below. The filtering rules address the following features of the data:

1. Experience period
2. Pooling
3. Anomalous data, including Zero Interior filter
4. Minor lines
5. Age
6. Size
7. Maturity

In this analysis we refine the use of filters compared to the 2016 Report, as follows:

For both Premium and Reserve Risk:

- Enhanced the size threshold calculation (Appendix 7)
- Age based on "pool" age rather than "oldest company" age (Appendix 6)
- In the 2016 Report we selected the most mature LR and RRR after we consolidated company data into pools, as appropriate, ("Pooling First"). In this Report, we select the most mature LRs and RRRs by company, before consolidation into pools, as appropriate ("Maturity First"). (Appendix 3).

For Reserve Risk Factors:

- Revise the treatment of RRRs with absolute value greater than 5 for Ten-Year LOBs (Appendix 4)
- Revised definition of "Minor Lines" (Appendix 5)
- Zero Interior filter for reserve risk data for confidential RBC Filings, used for Two-Year LOBs, and from Annual Statement, for all LOBs (Appendix 4)
- Minor lines categorization and LOB-age for RBC RRRs based on Annual Statement data (Appendix 5—Minor Lines and Appendix 6—LOB-age)

[23] For example, there are companies with 1996 Annual Statements that include data on AY 1988, or reserve year ending December 31, 1988, that did not file Annual Statements after 1996. In this case, the 1988 experience of these companies are not part of the 2016 Report analysis, because data from 1996 and prior Annual Statements were not available.

We identify the changes with the largest effects, by Type of Company, in the Findings section above.

We outline the nature of these filters, and the impact of the changes, in the sections immediately below, and we further describe them in Appendices 1-9. Except as noted, we applied the same methods in our analysis of Annual Statement data and confidential RBC data.

1. Experience Period (Appendix 2)

In this Report, we use LRs for AYs 1988–2017 and RRRs for initial reserve years ending 1988–2016.[24] For Ten-Year LOBs, we obtain this data from Annual Statements. For Two-Year LOBs, we obtain the data from confidential RBC Filings. For the 2016 Report, the data covered LRs and RRRs from AY 1988–2014 and initial reserve years ending December 31, 1988–2013.

Exclude AYs and Initial Reserve Years Prior to 1988

For this Report, we have experience for AYs/Reserve Years 1980 to 1987 that was not available for the 2016 Report. Looking at indicated Risk Factors by decade, we find that for nearly all the liability LOBs, this oldest block of years shows the highest indicated PRFs and RRFs.

This pattern may be due to factors that might not be applicable to current conditions. For example, the 1993 Report on Reserve and Underwriting Risk Factors by the American Academy of Actuaries Property/Casualty Risk-Based Capital Task Force (page 4)[25] identified four reasons why the experience of the 1980's might not be suitable for projection of the future. These are:

- *The tort liability explosion, particularly in respect to asbestos and environmental liabilities.*
- *A great deal of naïve capacity, focused especially on general liability and reinsurance lines.*
- *High interest rates, creating intense pressures to engage in cash flow underwriting*
- *High inflation rates*

Other considerations include:

- Company loss reserving practices may have improved because of required actuarial opinions and increased regulatory, rating agency and management attention to reserving.
- The adverse experience in these years triggered expansion in the use of claims-made policies, pollution exclusions, asbestos exclusions, and other policy changes.
- Company pricing discipline and pricing methodology may have improved since the 1980's.

Therefore, in this Report, we do not use the experience prior to 1988, because these early years may not be sufficiently relevant to the present conditions.

[24] Note that the most recent AY is 2017, but the most recent initial reserve date is December 2016. The most recent initial reserve year is always one year older than the most recent AY, as for the latest year, the reserve development is zero and not useful for our analysis.

[25] American Academy of Actuaries Property/Casualty Risk-Based Capital Task Force, Report on Reserve and Underwriting Risk Factors, May 1993, https://www.casact.org/pubs/forum/93sforum/93sf105.pdf.

2. Pooling (Appendix 3)

We combine risk data points from intercompany pool participants into a single pool-wide risk data point. Two features of the pooling process are new in this Report.

- First, in the 2016 Report we selected the most mature LR and RRR after we consolidated company data into pools, as appropriate, ("Pooling First"). In this Report, we select the most mature LRs and RRRs by company, before consolidation into pools, as appropriate ("Maturity First"). We example the reasons for this change in Appendix 3.
- Second, while we generally apply the filter to the pooled data points, we apply the new zero interior filter before pooling.

3. Anomalous values (Appendix 4)

Premium Risk

For PRFs, we exclude risk data points with anomalous values, i.e., negative values for premiums, incurred losses. We exclude zero incurred losses, as these can represent unusual financial transactions or other data anomalies.

Reserve Risk

For RRFs, we exclude the entire company/LOB/statement year data triangle, before pooling, if:

- Any calendar year[26] has negative cumulative incurred losses, all AYs combined
- Any calendar year has negative total cumulative paid losses, all AYs combined
- Any calendar year has a negative total reserve, all AYs combined
- The interior of the development triangle is entirely zero values

Also, for both Annual Statement and RBC data, we exclude risk data points where the initial reserve is zero. In the Pooling First approach, this can have has the effect of excluding the entire company/LOB/statement year. In the Maturity First approach, even if there is a zero initial reserve at one valuation date, we might construct RRR values from data points in the statement year for other maturities that have non-zero initial reserves.

Absolute (RRR)>5

As discussed in the Findings section, we exclude RBC risk data with absolute values of RRR>5 for Two-Year LOBs. In the 2016 Report, we excluded RRR values greater than 5 for both Ten-Year LOBs and Two-Year LOBs because we were concerned that the ratios reflected data quality issues.

[26] A calendar year in the Annual Statement or RBC development triangle is the sum of values for all AYs within a column of the data triangle. The test means examining the sum of the incurred losses over all AYs plus the prior year row, for a development column in Schedule P, Part 2, or the corresponding amounts for RBC incurred loss schedules, and similarly for paid losses in Schedule P Part 3.

4. Minor Lines (Appendix 5)

We exclude risk data points where the premium for the LOB represents a small portion of a company's all lines premium as defined below. ("Minor Lines")

For premium risk, the Minor Lines filter compares the LOB premium to the all-lines NEP for each AY separately. This is the same method that was used in the 2016 Report. As described in the Findings section above, for Reserve Risk, the Minor Lines filter compares the NEP for the LOB for a period of years—10 years where practical—to the corresponding all-lines premium.

For both reserve risk and premium risk, the threshold boundary for Minor Lines is as follows:

Table 2
Minor Lines Thresholds -PRFs and RRFs

LOBs (NAIC Code)	Minor Lines Threshold
All lines other than those listed below	5.0%
Other Liability and Products Liability combined	5.0%
Special Liability, Fidelity/Surety, Warranty	2.5%
International, Financial/Mortgage Guaranty	No Filter

These thresholds in Table 2 are the same as in the 2016 Report.

We determine the Minor Line status of each reserve risk data point using Annual Statement data. We apply that status to the corresponding RBC reserve risk data point.[27]

5. Age—Years of LOB NEP > 0 (Appendix 6)

We exclude premium and reserve risk data points where, for a particular company/LOB, there are less than five years[28] of NEP greater than zero.

This is the same filter that we used in the 2016 Report, although (1) with additional years of experience, there are some "young" LOBs excluded by this age filter in the 2016 Report that are not excluded in this Report, and (2) in this Report we determined age by pool while in the 2016 Report pool age equaled the age of the oldest company within the pool. This change may have excluded some data points that had been included in the 2016 Report.

6. LOB Size (Appendix 7)

We exclude risk data points where, for a LOB, NEP (or initial reserve) is less than the 15th percentile for the AY or initial reserve year. We smooth the 15th percentile size threshold in one of several ways that we discuss in Appendix 7.

[27] This simplifies the calculation effort required of the regulatory working with the confidential RBC data.
[28] Consecutive or non-consecutive years.

7. Maturity (Appendix 8)

We exclude the least mature risk data points, as we did in the 2016 Report. We exclude risk data points with maturity less than the number of years shown in Table 3 below.

Table 3—Maturity Filtering

"na" means there is no filter, i.e., use all years regardless of maturity

Line	PRF	RRF
(1) H/F	na	**3**
(2) PPA	na	**3**
(3) CA	na	**3**
(4) WC	na	**4**
(5) CMP	na	**5**
(6) MPL Occ.	**5**	**4**
(7) MPL C-M	na	**5**
(8) SL	na	**3**
(9) OL	na	**4**
(11) Spec. Prop.	na	na
(12) APD	na	na
(10) Fidelity / Surety	na	na
(13) Other	na	na
(15) International	**4**	na
(16) Reins. Prop. / Fin.	na	**3**
(17) Reins. Liab.	**4**	**4**
(18) PL	**5**	**4**
(14) Financial / Mortgage	**4**	na
(19) Warranty	**5**	na

8. Overall Effect of Filtering

Table 4 below shows the volume of NEP/reserve used in the filtered data set compared to the total volume. This table shows that the proposed filtered data set uses most of the NEP and reserve volume available in the data, after removing anomalous data.

Table 4—Data Used in Filtered Data Set[29]
1988–2017 AYs and Initial Reserve Years

Item	PRF			RRF		
	All Lines	10 Yr Lines	2-Yr Lines	All Lines	10 Yr Lines	2-Yr Lines
% Premium/Reserves	92%	93%	90%	82%	82%	72%
% Risk Data Points	52%	52%	52%	46%	45%	47%

[29] Data from 1988–2017, reflecting the effect of all filtering (items 1-7).
In the 2016 Report, these ratios had similar values. For premium and reserve amounts, the all-lines ratios were 93% and 80% for premium and reserves, respectively. For number of data points, the ratios were 53% and 43% for premium and reserves, respectively.

9. Safety Level

Consistent with prior Committee reports and NAIC Working Group, decisions, the indicated Risk Factors are based on an 87.5th percentile of reserve risk data points and premium risk data points for Reserve Risk and Premium Risk, respectively, subject to the filtering discussed previously.[30]

4. OTHER CONSIDERATIONS AND FUTURE RESEARCH

This Report does not address the following issues:

1. Catastrophe Loss Adjustment—The indicated PRFs shown in this Report reflect the inclusion of earthquake and hurricane catastrophe losses. We have not separated the Risk Factors into the non-catastrophe and catastrophe components used in the RBC Formula.
2. Workers' Compensation Discount—Our scope does not include estimating the effect that unwinding Workers' Compensation tabular reserves might have on the indicated Risk Factors.
3. Line 3 Company Experience Adjustment—The RBC formula includes an adjustment for the company loss ratio for premium risk (or runoff ratio for reserve risk) in relation to the corresponding industry ratios in pages PR0017 and PR0018, lines 1, 2, and 3.

   Consistent with the proposed calibration of PRFs and RRFs, the NAIC P&C RBC Working Group should consider changes to the calculation of the industry loss ratio and/or reserve ratio (Line 1 on PR0017 and PR0018) to reflect the filtering of the Risk Factor calibration discussed above. This could include:[31]

   - Excluding risk data points when premiums (reserves) are below the 15th percentile for that AY/LOB ("Size").
   - Combining risk data points from intercompany pool participants into a single pool-wide risk data point ("Pooling").
   - Excluding risk data points where the NEP for the LOB represents a small portion of a company's total NEP ("Minor Lines").
   - Excluding LOB/company risk data points if there are less than five years of NEP for that LOB ("Age").
   - Assess the need for change to reflect that calibration data exclude certain immature risk data points.[32]
4. The current RBC formula structure—Our indicated Risk Factors assume the current structure of the RBC Formula. For example,[33] while indicated UW Risk Factors vary by line of business volume, the Committee provides a single factor for each LOB.

[30] In the next report, we plan to further discuss the safety level reflecting both Line 4 safety level and the effect of the investment income offset.

[31] We believe the NAIC method of developing the factors excludes anomalous data, i.e., unexpected zero or negative values.

[32] Adjustment possibilities include (a) revising own-company calculation to use only the more mature risk data points, or (b) making no adjustment because the company data and industry data are at the same maturity.

[33] This is one example. There are other variations in the RBC Formula.

5. As discussed earlier in the report, in the Findings section, for several LOBs, there are particular issues that might affect selected Risk Factors and/or might be the subject of future analysis.
6. The zero interior aspect of the RBC Filing data[34] that we use for our calibration indicates that additional data quality assessment for past data, and/or clarification of RBC Filing requirements, might be useful. Assessment of data quality is problematic because the RBC data is confidential, and not available in detail to this Committee.
7. As we were completing this analysis, we realized that it is possible to obtain two data points from the loss triangles provided for two-year lines of business in the Annual Statement. Because it contains a reserve valued one year prior to two individual accident years provided in the triangle, it is possible to calculate a reserve risk ratio from solely the prior year row and this would provide one additional year of development.

5. APPENDIX 1—DATA

We obtain our data from 1989[35]–2017 Annual Statements, Parts 1, 2, and 3 for all LOBs, and from 1994–2017 confidential RBC Filings for Two-Year LOBs.

Compared to the 2016 Report, the following additional data is available for this Report:

- The 2015–2017 Annual Statements and RBC Filings add three additional AYs and three initial reserve dates: AYs 2015, 2016, and 2017, and initial reserve dates December 31, 2014, 2015, and 2016. These Filings also increase the maturity of data for AYs and reserve runoff on initial reserves for 2007–2014.[36]
- The eight older Annual Statements (1989–1996) provide data for additional older AYs, and initial reserve dates, i.e.:
    - AYs 1980-1987 and December 31, 1980–1987 initial reserve dates for Ten-Year LOBs, and
    - AY 1988 and December 31, 1987, initial reserve dates for Two-Year LOBs, from Annual Statements.

These additional data are desirable, because they include more data points, contain more developed data for recent years, and reflect the effects of a wider range of UW and economic conditions. Moreover, the Annual Statement Filings for years prior to 1997 provide additional data for initial

[34] This issue does not relate to the quality of RBC Filing data used for RBC calculations. Rather, because our calibrations use RBC Filing data that is not used for RBC Filing calculations, some data submission
[35] Electronic data for Part 1 is available for some earlier years, but, for the earlier annual statement years, the LOB definitions in Schedule P were not the same as the current LOB definitions.
[36] LRs for AYs 2006–2014 in the 2016 Report were valued at ages 9, 8, …, 1, respectively. In the current report, LRs for AYs 2006–2008 are valued as of 10 years, and LRs for AYs 2009–2014 are valued at ages 9, 8, …, 4, respectively. Reserve development data are similarly more mature.

reserve years ending 1988 and subsequent, for those companies with 1988 and subsequent experience that did not file Annual Statements after 1996.[37]

Lines of Business

Schedule P currently contains information on 22 LOBs.

For the RBC Formula, and in our analysis, those 22 LOBs are combined into 19 LOBs.[38] Other Liability Claims-Made is combined with Other Liability: Occurrence, (collectively "Other Liability") Products Liability: Claims Made is combined with Products Liability: Occurrence, (collectively "Products Liability") and Reinsurance: Nonproportional Assumed Property is combined with Reinsurance Nonproportional Assumed Financial (collectively "Reinsurance Property").

Two-Year and Ten-Year LOBs

For six of the 19 LOB combinations, Schedule P contains premium and claim information on the most recent two AYs and reserve development information on prior years combined. We refer to these as "Two-Year LOBs." These six lines are Special Property, Automobile Physical Damage, Fidelity/Surety, Other (Including Credit, Accident and Health), Financial/Mortgage Guaranty, and Warranty.

For the remaining LOBs, Schedule P contains information on the most recent 10 AYs and reserve development on prior years. We refer to these as "Ten-Year LOBs."

Thus, in our Annual Statement data, for Ten-Year LOBs, we have AY LRs and RRRs evaluated at maturities up to 10 years, and for Two-Year LOBs, we have AY LRs and RRRs evaluated at maturities up to two years. The RRRs from Two-Year LOBs cover the development of only the most recent two calendar years, for all accident years, including those prior to the most recent two accident years.

Premium and Reserve Risk Data

For the analysis of premium risk, for each LOB, we obtain (a) earned premium net of reinsurance, (b) incurred loss and loss adjustment expenses net of reinsurance, and (c) the related LR, for each LOB, AY, company, and annual statement year.

For the analysis of reserve risk, we obtain (a) loss and defense and cost containment expense ("DCCE") reserves at each year end, for all AYs combined, net of reinsurance (b) the increase/decrease in reserve estimate to the latest available maturity, for all AYs combined, net of reinsurance, and (c) the ratio of (a) and (b) that we call the RRR.[39]

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[37] For example, there are companies with 1996 Annual Statements that include data on AY 1988, or reserve year ending December 31, 1988, that did not file Annual Statements after 1996. In this case, the 1988 experience of these companies are not part of the 2016 Report analysis, because data from 1996 and prior Annual Statements were not available.

[38] The LOB definitions had a major revision in the 1989 Annual Statement. There have been some changes in LOB definitions in the years from 1989 to present. As needed, in the section below, we note those that affect analysis.

[39] All values gross of non-tabular discount. Reserves and payments are net of salvage and subrogation, as reported in the Annual Statement.

Note that the calibration is based on runoff of loss + DCCE, but the resulting Risk Factor is applied to loss + all LAE. This assumes that development for adjusting and other expenses follows the same pattern as loss + DCCE.

Appendix 12, Examples 1, 2, and 3 below illustrate how we calculate RRRs for Ten-Year LOBs and Two-Year LOBs, from Annual Statement data and RRRs for Two-Year LOBs from RBC Filings.

Confidential Information in RBC Filings

The RBC Filings[40] provide incurred loss and DCCE development draw from Schedule P Part 2, for all LOBs, and paid loss and DCCE development drawn from Schedule P Part 3, for Two-Year LOBs.

The differences between Annual Statement data and confidential RBC Filing data for reserve risk, for Two-Year LOBs, include the following:

- Annual Statement Schedule P Parts 2 and 3 contains the latest two calendar years of development data. For example, the 2017 Annual Statement shows the incurred and paid values for the following:
  - AY 2017 evaluated at December 31, 2017,
  - AY 2016 evaluated at December 31, 2016, and December 31, 2016, and
  - The reserve at December 31, 2015, for accident years 2015 and prior and the change in incurred and paid values for AYs 2015 and prior (combined) in calendar year 2016 and in calendar year 2017.
- RBC data includes up to 10 individual AYs of development, over 10 calendar years, but it does not include any development information on AYs prior to those 10.

  Because RBC data does not include development information on AYs prior to year 10, the most mature runoff ratio from RBC data includes only one AY, i.e., the most mature AY, which provides maturities from one to 10.

Thus, for the most mature RRRs from Annual Statement data we have two calendar years of development for all AYs, while for RBC data we have up to 10 calendar years of development, but for only one AY. Neither type of data is as complete as the development history available for Ten-Year LOBs from the Annual Statement, which provides ten calendar years of development for all AYs.

AY Indicated Risk Factors—Annual Statement Data Compared to RBC Data

For Two-Year LOBs, we have data from Annual Statements and from RBC Filings. We calculate indicated PRFs and RRFs from each source.

[40] RBC Forms PC111-114 and 121-122 for premium and RBC Forms 211-214, 221-222, and 301-304, for reserves.

Table A-1 below shows the differences between PRF indications using Annual Statement data and PRFs indications using RBC Filing data, and the differences between RRF indications using Annual Statement data and RRF indications using RBC Filing data.

Table A-1
Two-Year LOBs—Indicated Risk Factors
Annual Statement Data vs. RBC Data

LOB	Indicated PRFs					
	RBC	A/S	A/S - RBC	RBC No. Pts	A/S No. Pts	% increase in No Pts [(5)-(4)]/(4)
	(1)	(2)	(3)	(4)	(5)	(6)
(11) Spec. Prop.	0.831	0.836	0.005	13,073	14,941	14%
(12) APD	0.837	0.847	0.010	13,847	15,121	9%
(10) Fidelity / Surety	0.666	0.704	0.038	2,830	3,389	20%
(13) Other	0.933	0.953	0.020	2,698	3,083	14%
(14) Financial / Mortgage	2.588	1.929	(0.659)	339	1,042	207%
(19) Warranty	0.975	0.902	(0.073)	134	182	36%

LOB	Indicated RRFs					
	RBC	A/S	A/S - RBC	RBC No. Pts	A/S No. Pts	% increase in No Pts [(5)-(4)]/(4)
	(1)	(2)	(3)	(4)	(5)	(6)
(11) Spec. Prop.	0.278	0.238	(0.040)	8,903	11,767	32%
(12) APD	0.132	0.163	0.030	7,508	11,161	49%
(10) Fidelity / Surety	0.600	0.311	(0.290)	1,941	2,636	36%
(13) Other	0.225	0.175	(0.050)	1,886	2,434	29%
(14) Financial / Mortgage	0.001	0.274	0.273	226	957	323%
(19) Warranty	0.312	0.349	0.037	76	144	89%

In interpreting the differences indicated Risk Factors between the Annual Statement data and RBC data, we note the following, with respect to both PRFs and RRFs:

- Warranty—This LOB was separated from the Fidelity/Surety LOB in 2008. Some companies provided a complete history for all AYs, including AYs prior to 2008. Other companies provided the separate data only for AYs 2008 and subsequent. As such, only Annual Statement 2017 and RBC Filing 2017 contains complete development and reserve runoff data, and, overall, there are too few points, i.e., under 100, to provide reliable indicated Risk Factors. Hence, variations between Annual Statement and RBC indicated Risk Factors are not surprising.
- Financial/Mortgage Guaranty—There are many single state/monoline companies that provide data in the Annual Statements, but who are exempt from RBC requirement. As they do not make RBC Filings, the experience for the single state/monoline

mortgage/financial guaranty companies is not included in the data used to develop the indicated Risk Factors in Table 1. Hence there is substantially more data in the Annual Statement data than the RBC data, and differences between Annual Statement and RBC indicated Risk Factors are not surprising.

With respect to PRFs, for the other four Two-Year LOBs, the RBC data produces lower indicated Risk Factors. We interpret this to be the effect of favorable AY LR development that is reflected in the 10-year development in the RBC Filing data but is not reflected in the two-year development in the Annual Statement data.

With respect to RRFs, the direction of the differences between the RRFs based on Annual Statement data and RRFs based on RBC data vary by LOB, and we note the following:

- The RBC data includes both favorable and unfavorable reserve development that may not reflected in the two-calendar year window reflected in the Annual Statement data.
    - For Automobile Physical Damage, it appears that the balance of favorable and unfavorable produces a lower RRF from the RBC data than from the Annual Statement data.
    - For Fidelity and Surety, it appears that adverse economic environments in the 1999–2002 period and the 2008–2009 period generate adverse development on initial reserves established at year-ends prior to those dates, but not reflected for several years after those periods.
- RBC reserve risk data includes fewer data points for all the Two-Year LOBs, and the differences are proportionally larger for some LOBs than for others. As the company-by-company RBC data is confidential, and not available to us, we have not explored that in detail.

6. APPENDIX 2—EXPERIENCE PERIOD

We have Annual Statements premium risk data for AYs 1980–2017, for most Ten-Year LOBs and 1985–2017 from RBC Filings for most Two-Year LOBs.

We have RRRs for the same starting dates, but ending in 2016.[41] Because Annual Statement LOB definitions change over time, there are fewer years of experience for the Medical Professional Liability, Warranty, and Financial/Mortgage Guaranty LOBs. Table A-2, below, shows the LRs and RRRs available to us by year.

[41] The most recent initial reserve year is always one year older than the most recent AY, as, for the latest year, we only have an initial estimate and no information on subsequent development.

Table A-2
LR and RRR Years From Available Data

Source	Net Earned Premium and Loss Ratio Years:	Initial Reserve and Reserve Runoff Ratios for Years Ending Dec. 31:
Annual Statements (Statement Years 1989-2017)		
Most Ten-Year LOBs	1980-2017	1980-2016
Most Two-Year LOBs	1988-2017	1988-2016
Annual Statements Exceptions		
MPL Claims Made, MPL Occurrence (Note 1)	1984-2017	1984-2016
Financial/Mortgage (Note 2)	1993-2017	1993-2016
Warranty (Note 3)	2007-2017	2007-2016
Confidential RBC Filings (Filing Years 1994-2017)		
Most Two-Year LOBs (Note 4)	1985-2017	1988-2016
Warranty (Note 3)	2007-2017	2007-2017

Note 1: Earliest Annual Statement or RBC Filing for the MPL LOBs – 1993
Note 2: Earliest Annual Statement for the Financial/ Mortgage LOB– 1994
Note 3: Earliest Annual Statement or RBC Filing for Warranty LOB – 2008, when the Warranty LOB was separated from the Fidelity/Surety LOB. RBC Filings for some companies show the new Warranty LOB for AYs 2008 and subsequent only, while some companies show RBC data for prior AYs as well.
Note 4: We did not use data from RBC filing years 1994-1996, as data for those years was collected for information purposes only, and might be subject to learning-curve errors.

Treatment of 1980–1987 AYs/RRRs

The current data set includes 1980–1987 AYs and RRRs that were not available for prior Committee reports, nor for the DCWP for its work.

Table A-3 below shows the indicated Risk Factors by decade, 1980–1989, 1990–1999, 2000–2009, and 2010–2017. We see that, for nearly all the liability LOBs, the oldest block of years, 1980–1989, shows the highest indicated PRFs and RRFs.

Table A-4, below, shows that including the oldest years (1980–1987) in the indicated Risk Factors produces significantly higher indicated RRFs and a somewhat higher PRFs, compared to the indicated Risk Factors excluding the oldest years. RRFs increase by more than 20% for many of the larger volume lines.

Therefore, for the reasons we discuss above, in the "1. Experience Period" subsection in the Methodology section, we believe the experience prior to 1988 may not be applicable to current conditions, and we do not include it in our indicated Risk Factors.

We plan to revisit this assumption when we review Investment Income Adjustments in our next report, where we will consider the effect of interest rate changes on risk charges over the entire period.

Table A-3
Comparison of Risk Factors—
Current Indicated (2017 Data) AY/RRF 10-Year Experience Ranges

	PRF				RRF			
Line	80-89	90-99	00-09	10-17 (2)	80-89	90-99	00-09	10-16 (2)
(1) H/F	0.918	0.999	0.946	0.909	0.398	0.195	0.272	0.200
(2) PPA	1.074	0.969	0.955	0.959	0.396	0.165	0.195	0.246
(3) CA	1.193	1.069	0.958	1.017	0.589	0.349	0.359	0.423
(4) WC	1.198	1.041	1.042	0.928	0.536	0.293	0.382	0.134
(5) CMP	1.020	0.951	0.848	0.857	0.973	0.553	0.456	0.366
(6) MPL Occ.	1.777	1.634	1.379	1.254	0.981	0.246	0.361	0.138
(7) MPL C-M	1.035	1.368	1.084	1.023	0.242	0.133	0.081	0.116
(8) SL	1.145	0.996	0.892	0.882	0.651	0.680	0.277	0.102
(9) OL	1.634	1.076	1.016	0.930	1.612	0.619	0.521	0.261
(11) Spec. Prop.	0.722	0.858	0.797	0.840	0.252	0.305	0.246	0.282
(12) APD	0.773	0.847	0.817	0.857	0.045	0.119	0.164	0.146
(10) Fidelity / Surety	0.673	0.666	0.760	0.543	0.373	0.915	0.560	0.264
(13) Other	0.905	0.947	0.932	0.903	0.132	0.239	0.272	0.119
(15) International	1.708	1.623	1.675	1.630	2.489	2.141	0.460	0.273
(16) Reins. Prop. / Fin.	1.363	1.235	1.268	1.127	0.732	0.416	0.314	0.000
(17) Reins. Liab.	1.785	1.328	1.359	0.903	1.023	0.658	0.729	0.060
(18) PL	1.496	1.378	1.290	1.067	2.490	1.532	1.701	0.701
(14) Financial / Mortgage	2.726	2.530	2.506	2.000		0.059	0.000	0.006
(19) Warranty		0.663	0.937	0.900			0.113	0.508
Average Risk Factor- all Lines	1.056	0.991	0.950	0.925	0.780	0.389	0.392	0.223
Average Risk Factor- 10-Yr Lines	1.143	1.023	0.979	0.941	0.835	0.400	0.409	0.227
Average Risk Factor- 2-Yr Lines	0.834	0.907	0.877	0.884	0.163	0.267	0.212	0.182

Notes:
(1) For Medical Professional Liability LOBs, the 1980–1989 year-band includes only 1984–1989. For Two-Year LOBs, the 1980–1989 year-band includes only 1988–1989. For Financial/Mortgage, the 1990–1999 band includes only 1993–1999. For Warranty, data for AYs prior to 2008 is limited, in that many companies did not report any data for AYs prior to 2008.
(2) For PRFs and RRFs the 2010–2016/2017 have limited credibility because the maturity filter excludes up to five of the latest 10 years, and because the remaining data points are less mature than the data points for any other decade.
(3) Average risk factors weighted with Annual Statement premium for all LOBs, including LOBs calibrated with RBC data.
(4) The treatment of salvage and subrogation in statutory accounting has changed over time. That might contribute to the differences between 1980–1989 indicated Risk Factors and subsequent decade Risk Factors for Special Property and Automobile Physical Damage LOBs.

Table A-4
Comparison of Risk Factors by Experience Period
Including/Excluding 1980–1987

	PRF		RRF	
Line	88-17	80-17	88-16	80-16
(1) H/F	0.960	0.951	0.223	0.273
(2) PPA	0.975	1.001	0.201	0.244
(3) CA	1.022	1.073	0.361	0.417
(4) WC	1.030	1.067	0.335	0.376
(5) CMP	0.897	0.928	0.499	0.627
(6) MPL Occ.	1.480	1.556	0.265	0.350
(7) MPL C-M	1.149	1.150	0.094	0.109
(8) SL	0.952	1.006	0.415	0.477
(9) OL	1.014	1.137	0.527	0.821
(11) Spec. Prop.	0.831	0.822	0.278	0.278
(12) APD	0.837	0.834	0.132	0.132
(10) Fidelity / Surety	0.666	0.676	0.600	0.600
(13) Other	0.933	0.933	0.225	0.225
(15) International	1.712	1.679	1.044	1.479
(16) Reins. Prop. / Fin.	1.240	1.240	0.343	0.348
(17) Reins. Liab.	1.252	1.493	0.636	0.636
(18) PL	1.270	1.360	1.472	1.691
(14) Financial / Mortgage	2.588	2.588	0.001	0.001
(19) Warranty	0.975	0.975	0.312	0.312
Average Risk Factor- all Lines	0.967	0.992	0.376	0.471
Average Risk Factor- 10-Yr Lines	0.995	1.030	0.390	0.494
Average Risk Factor- 2-Yr Lines	0.897	0.894	0.218	0.218

See notes to Table A-3.

7. APPENDIX 3—POOLING METHODOLOGY

Pool Mapping

In determining the indicated UW Risk Factors, we combine the data from intercompany pool participants into a single pool-wide risk data point. Alternatively, if we were to treat these interrelated risk data points as independent, the same loss ratio value (or reserve runoff ratio) would appear multiple times, reducing the apparent variability in the LR (or RRR) across companies, and distorting the indicated 87.5th percentile LR/RRR value.[42]

[42] See DCWP Report 6 pages 10-12, 16, and 77-80 for more details.
https://www.casact.org/pubs/forum/13fforum/01-Report-6-RBC.pdf

We identify intercompany pools by annual statement year using the following information, to the extent available, for each company and annual statement year:[43]

- NAIC group code from 2010, 2014, and 2017 analyses to identify member companies,
- Schedule P Intercompany Pooling Participation Percentage (Schedule P Part 1 Column 34),
- Schedule F Part 9 Note, and
- Notes to Financial Statements, Note 26[44] (on Intercompany Pooling Arrangements).

Our current analysis includes 1984–1996 and 2015–2017 Annual Statements, which were not part of prior Academy or DCWP analysis. For the early years, 1984–1996, as we do not have the NAIC group assignments by company, we identify pool members as companies with identical or similar loss ratios across companies in combination with the oldest known NAIC group code. For the most recent years, 2015–2017, we had the 2017 NAIC group code to guide us. For 1997–2014 we make a few changes to the pool mapping based on an improved perspective on pooling, arising from the longer history of Annual Statements available to us.

Note that due to the limitations of the data and information available, our methodology is approximate, and might not necessarily identify all intercompany pooling arrangements and/or may combine some companies that are not actually pooled.[45] Group identification becomes more approximate for older annual statement years. However, we believe that the elimination of multiple identical records from the data set through this adjustment, even with the approximations, improves the quality of the Risk Factor analysis.

Selection of Most Mature Data Point—Maturity First vis-à-vis Pooling First

We have multiple evaluations of each initial reserve date-RRR and AY-LR for a given LOB/company. We remove data triangles that we classify as anomalous (see Appendix 4). Then, for each LOB, for each AY/Initial reserve year, before pooling, we determine the Annual Statement that had the most mature evaluation of the AY/initial reserve year. We calculate the LR/RRR from that Annual Statement. We pooled the resulting LRs/RRRs, using the pool associated with the annual statement year from which we calculated the LR/RRR. We refer to this approach as "Maturity First."

In prior reviews, after removing company data triangles that we classified as anomalous, we then pooled Annual Statements, where appropriate, based on the annual statement year from which the data was derived.[46] After pooling, for each LOB, we determined the most recent annual statement

[43] The pool is defined separately for each statement year. For example, if two companies are in an intercompany pool for annual statement year 2013, then all data points from that annual statement year will be pooled. If the same two companies are no longer subject to intercompany pooling in 2014, the data points will not be pooled.

[44] Currently Note 26. This information was in different Notes at different years in the past.

[45] The pooling structure can also affect "LOB age" as we measure age based on number of years of NEP>0 for the pooled data.

[46] This change is the latest in a series of refinements to the pooling calculation in the course of studies over the past 10 years, as described below.

year for each company or pool. We obtained up to 10 LRs or RRRs from that Annual Statement. We used earlier Annual Statements to obtained one LR/RRR using the most mature AY for LR and both the most mature AY and prior AYs for RRRs. We refer to this approach as "Pooling First."

In the normal course, the Maturity First and Pooling First methods are the same. However, we find that there are companies where the most mature reading for an LR/RRR for a LOB does not appear in the expected Annual Statement. That might be because of new pool assignments, perhaps because the company was sold, the company ceased filing Annual Statements, reinsurance transactions reduced the LR/RRR data to zero, or for other reasons.

For a company subject to pooling, with the Pooling First approach, changes in pool assignment during the experience period can result in using of the same company data multiple times. Consider two companies, A and B, each with two statements (2016 and 2017) with data for each of the 10 AYs and for the prior years combined. Also suppose that A and B became part of Pool X in 2017. In the Pooling First approach, the 2017 statements for A and B are combined into a single statement for Pool X. We calculate 30 LRs (27 RRRs) for each LOB: 10 LRs (9 RRRs) for each of A, plus 10 LRs (9 RRRs) for B from statement year 2016, plus 10 LRs (9 RRRs) for Pool X from statement year 2017.

In the Maturity First approach, prior to pooling, we calculate 10 LRs (9 RRRs) for each of Companies A and B (for AYs 2008–2017, and for initial reserve years 2008–2016) from the 2017 Annual Statement and one LR/RRR from the 2016 Annual Statement (for LR/RRR 2007). These values are then pooled, resulting in 12AY LRs (11 RRRs). The 20 LRs (18 RRRs) from the 2017 Annual Statement from Company A and Company B are pooled into Pool X and the remaining two LRs/RRRs from the 2016 Annual Statement remain unpooled. Hence, the total number of data points in the final dataset is reduced from 30/27 in the Pooling First Approach to 12/11 in the current Maturity First Approach.

The difference arises because, in the Pooling First approach, Pool X is considered a new company which results in some duplication of LR/RRRs. Hence, as expected, using the Maturity First approach somewhat reduces the number of data points.

8. APPENDIX 4—ANOMALOUS DATA

We describe the anomalous data treatment in the Methodology Section. In this Appendix we show Tables supporting the discussion of Absolute (RRR)>5 and Zero Interior anomalous data filters.

Prior to 2010, the pooling issue was identified, but there was no adjustment. DCWP introduced a pooling adjustment. The pooling adjustment assumed the pooling status was constant over the 1997–2010 Annual Statements available for its work. Based on that assumption, Pooling First or Maturity First were equivalent. The 2016 Report, with a longer Annual Statement history, examined the pooling history in more detail and reflected the changes in pooling from annual statement year to annual statement year. However, that analysis continued to calculate based on Pooling First approach. In this Report, with a still longer history of Annual Statements, we revised the Pooling First approach and modified the calculation as described.

Absolute (RRR)>5

Table A-5a, below, shows the effect, by LOB, of removing the Absolute (RRR)>5 filter. Table A-5a shows that the weighted average effect on the RRFs for Ten-Year LOBs is an increase of 2.4% of reserves, in RRFs, and there are important variations by LOB within the Ten-Year LOBs. The effect on indicated RRRs is most apparent in International (23% of reserves) and Products Liability (15% of reserves).

Table A-5a
Effect of 500% Filter/ Ten-Year LOBs

	RRR - Exclude if over 500%		Difference	
Line	Yes	No	%	value
(1) H/F	0.221	0.223	1%	0.002
(2) PPA	0.200	0.201	1%	0.001
(3) CA	0.361	0.361	0%	0.000
(4) WC	0.334	0.335	0%	0.001
(5) CMP	0.494	0.499	1%	0.005
(6) MPL Occ.	0.259	0.265	2%	0.006
(7) MPL C-M	0.090	0.094	4%	0.004
(8) SL	0.386	0.415	7%	0.029
(9) OL	0.520	0.527	1%	0.007
(15) International	0.850	1.044	23%	0.195
(16) Reins. Prop. / Fin.	0.342	0.343	0%	0.002
(17) Reins. Liab.	0.598	0.636	6%	0.038
(18) PL	1.280	1.472	15%	0.192
Average Risk Factor- 10-Yr Lines	0.381	0.390	2.4%	0.009

"Zero Interior" Reserve Risk Data Anomalies

As noted in the Methodology section, in our current review we exclude a LOB/Statement year if the interior of the development triangle is zero. Table A-5b below is an illustration of such data. We also observe some cases where some of, but not the entire interior of the data triangle has unexpected zero values.

Table A-5b
Zero Interior Example

		1	2	3	4	5	6	7	8	9	10
INCURRED NET LOSSES AND DEFENSE AND COST CONTAINMENT EXPENSES REPORTED AT YEAR END ($000 OMITTED)											
Years in Which Losses Were Incurred		2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
1	Prior	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2	2008	1,875									1,231
3	2009		1,926								1,267
4	2010			3,378							2,943
5	2011				7,774						7,393
6	2012					8,010					9,423
7	2013						9,751				9,927
8	2014							11,581			18,535
9	2015								14,533		18,086
10	2016									23,314	24,070
11	2017										

With data of this type, we can calculate RRRs for individual AYs, for example, the 10-year development, for AY 2008. However, we cannot calculate RRRs for any full initial reserve year.

In the 2016 Report, we addressed this data anomaly in two ways. First, wherever possible we used the RRR based on development of the single most mature AY, row 2 that is not affected by the zero interior values. Second, we limited the impact of zero values by excluding data points where the absolute value of the RRR was greater than 500%.

In this Report, we exclude any data point where the entire interior is blank, which partly address the need for the Absolute (RRR)>500% limitation. However, we continue to exclude any data point with RRR >500%. We believe our current process has improved the identification of valid RBC data. However, there may be further steps we and/or NAIC could take to improve the data further, in future reviews.[47]

The Zero Interior issue predominately relates to RBC data for Two-Year LOBs, which are discussed above. There are also a small number of companies with Ten-Year LOB Annual Statement data that present zero interiors, typically showing non-zero values in the latest diagonal but having zero/blank data for all other values, including zero/blank in the latest evaluation column. We exclude that Ten-Year LOB data.

9. APPENDIX 5—MINOR LINES

We exclude risk data points where the volume for a LOB represents a small portion of a company's volume as defined below ("Minor Lines"). The DWCP research[48] reported, and the 2016 Report

[47] As the detailed data is confidential, there are limits on the extent to which this Committee can address this issue alone.
[48] DCWP Reports 6 and 7.

agreed, that "For certain [specialty] LOBs failure to exclude the Minor Lines risk data points appears to result in PRFs that are not representative of the risks for companies writing the bulk of the industry LOB premium."[49]

For premium risk, similar to the 2016 Report, the Minor Lines filter calculation compares the LOB NEP to the all-lines NEP for each AY separately.

For reserve risk, the Minor Lines filter compares the LOB NEP to the all-lines NEP for a range of years, usually 10 years ending at the initial reserve date.[50] Because the Annual Statement LOB definitions vary over time, a 10-year range is not possible for all LOBs for all initial reserve data. Hence, our approach varies somewhat by LOB. Table A-6 shows our approach for all years.

Table A-6
Reserve Risk Minor Lines Definition: Net Earned Premium Year-Ranges

Line	Initial Reserve Years Ending:	Net Earned Premium from the following AYs
Most Lines	1998-2016	Rolling 10-year window ending at the initial reserve date
	1988-1997	Ten years, 1988-1997
	1980-1987	Fifteen years, 1980-1994 (Notes 1, 2) Data unavailable for Two-Year LOBs.
MPL Occ and CM	1984-1987	Eleven years 1984-1994 (Note 2)
	1988-1997	See Most LOBs
	1998-2016	See Most LOBs
Financial/Mortgage	1993-2002	Ten years, 1993-2002
	2003-2016	Rolling 10-year window ending at the initial reserve date
Warranty	2007-2016	Ten Years, 2007-2016 (Note 3)

Note 1: We use a relatively long period because, in the early part of this time period, the all-lines total does not include Two-Year LOBs and overstates the ratio of LOB premium to all-lines premium.
Note 2: This table shows the methods we would apply to initial reserve years 1980-1987, but for the reasons discussed previously, we do not use those initial reserve dates in our indicated Risk Factors.
Note 3: These are the only years of available data for the Warranty LOB.

This Minor Lines approach differs from the approach in the 2016 Report, where the reserve risk Minor Lines definition was based on all-years premium. With the increase in the number of years of premium in our data set, we adopt the approach described above.

The thresholds for the LOB Minor Lines filters for both PRFs and RRFs are the same as those we used in the 2016 Report, and are as follows:

- Apply 5.0% filter for most lines with exceptions described below.

[49] DCWP Report 6, Page 5.

[50] This is determined after pooling, so changes in pooling can affect Minor Line status.

- Apply no Minor Lines exclusion for the International and Financial/Mortgage Guaranty lines of business due to the low volume in these lines.
- Apply 2.5% filter for the Special Liability, Fidelity/Surety, and Warranty lines of business, because a 5% filter for either PRFs or RRFs would exclude most premiums or initial reserves.[51]
- Exclude risk data points where the combined Other Liability and Products Liability NEP is less than 5.0% of total NEP to avoid exclusion of too much Products Liability volume.[52]

For RRFs, which require multiple years of premium data, we determine Minor Line status using Annual Statement data, and we apply that categorization to the RBC data. To the extent that the LOB/Company/Initial Reserve Date in the RBC data do not have a corresponding data point in the Annual Statement data,[53] the data point is treated as a Minor Line. For PRFs, which require a single year of data, we determine Minor Line by comparing the RBC NEP by LOB/company/year to the all-lines total NEP from the Annual Statement data.

We find that the change in Minor Lines definition, from the all-year basis to the 10-year basis, decreases the indicated RRFs for nearly all LOBs. That result is consistent with (a) Minor Lines tend to have higher RRRs than non-Minor Lines, and (b) the new method better distinguishes between Minor Lines data and non-Minor Lines data.

10. APPENDIX 6—YEARS OF LOB NEP > 0 ("LOB Age" or "Age")

The 2016 Report[54] concluded that for most LOBs, PRFs and RRFs are smallest for companies with the longest experience period for a particular LOB. The 2016 Report presented an analysis of Risk Factors, by LOB by Age. The analysis in the 2016 report shows that the differential in Risk Factors by Age is most pronounced when comparing Risk Factors with a filter of Age equal to 5+ years[55] when compared to companies with age less than 5 years. In addition, few risk data points are removed with a filter that removes Ages less than 5.

In this Report we calculate the age of the pool as the number of years of NEP>0 for the pool. In the 2016 Report, we calculated age as the maximum of the number of years of NEP>0 for any of the companies in the pool. This change somewhat reduces the number of data points after filtering.

[51] In addition to the other considerations, for Warranty, a 2.5% filter was chosen due limited volume of warranty experience.

[52] Correlation between NEP for PL and OL lines, for baseline PRF data with no Minor Lines exclusion, was 0.66.

[53] Such mismatches can occur because, there are pooling changes by Annual Statement year and the data point might derive from one Annual Statement year in the RBC data and a different Annual Statement year in the Two-Year Annual Statement data.

[54] This conclusion is consistent with the conclusion in DCWP, in Report 6, Section 7 and DCWP Report 7, Section 7.

[55] Consecutive or nonconsecutive years.

11. APPENDIX 7—LOB-SIZE THRESHOLDS

Our indicated Risk Factors exclude risk data points with small premium/reserve LOB size, defined as the 15th percentile of size. We exclude the risk data points with small size because the experience of these companies/pools is not representative of the experience derived from the majority of risk data points.[56] We apply the size threshold analysis to the data after filtering for Minor Lines and Age, as described in the earlier Appendices.

We consider four smoothing approaches to calculating the 15th percentile, as follows: (1) 15th percentile by year without adjustment, (2) smoothed 15th percentile by year, (3) detrended 15th percentile by year, and (4) all-year 15th percentile.

Raw and Smoothed 15th Percentile by Year

In method 1, we select the 15th percentile by each LOB and accident/reserve year, for each company/pool as appropriate.

In method 2, to remove large discontinuities by year, we limit each point to be within 10% of the prior and subsequent years. For the first accident/reserve year (1988), we limit each point to be within 10% of the three-year average (1989–1991) and the subsequent year (1989). For the last accident/reserve year (2017/2016), we limit each point to be within 10% of the three-year average (2014–2016/2013–2015) and the prior year (2016/2015).

Detrended 15th Percentile by Year

We developed the third approach listed above in response to a suggestion for future research in the 2016 Report. For some LOBs, the 15th percentile size varies randomly up and down so much that even the smoothed 15th percentile had large variations in size threshold from year to year. To address that feature, we use regression to calculate the annual trend in the 15th percentile company size by year. We use this trend to adjust the LOB premium for each company for each year to a common date, 1999 for premium and 1998 for reserves. We call the result of that calculation the "Adjusted LOB Size."

We then determine the all-year LOB 15th percentile of the Adjusted LOB Size values across all data points. We use the regression trend rate to detrend the all-year LOB 15th percentile to the historical level for each year to determine the smoothed LOB 15th percentile by year.

Selected LOB Size Approaches

For all RRF calculations and for PRF calculations with Annual Statement data, we select the smoothed 15th percentile method for Homeowners, Private Passenger Auto Liability, Workers' Compensation, Special Property, and Auto Physical Damage. For Warranty, we select the all-year overall 15th percentile. For the other 13 LOBs, we select the detrended 15th percentile method.

For PRF calculations with RBC data we select the smoothed 15th percentile method for five of the six Two-Year LOBs, and for Warranty, we select the all-year overall 15th percentile.

[56] DCWP Reports 6 and 7 shows the extent to which indicated Risk Factors vary by LOB-size.

12. APPENDIX 8—MATURITY

The 2016 Report found that Risk Factors based on data grouped by age of development can increase as the age of development increases; the effect varies by LOB but is especially pronounced for LOBs such as WC and MPL-Occurrence.

The 2016 Report considered: (a) ways to adjust risk data points so that they reflected a 10 years maturity; and (b) the alternative of excluding risk data points that are not sufficiently mature. The 2016 Report used method (b). Our indicated Risk Factors are based on the same approach that was used in the 2016 Report.

Table 3, in the Methodology section, shows the maturity filters we use.

13. APPENDIX 9—ORDER OF POOLING, ANOMALIES, AND OTHER FILTERS

In this section we summarize the order in which we apply the filtering rules discussed above.

PRF Analysis from Annual Statement Data

1. Exclude AY/LOB/Company data points with negative premium or with zero or negative incurred loss amounts
2. Calculate LRs for each AY/company/LOB remaining in the data
3. Identify the data point with greatest maturity for each AY/company/LOB
4. Apply Pooling rules to combine AY/company/LOB data points, where appropriate
5. For each AY/company-pool/LOB data point we determine, and apply filters, for the following, on a pool basis:
    a. Minor Line status
    b. LOB Age
6. With the pool data, after the prior filtering, calculate size threshold by LOB/AY and identify whether the company size exceeds that threshold.
7. Apply Maturity filter.

RRF Analysis from Annual Statement or RBC Data

1. Exclude all company Annual Statement triangles with negative calendar year values or zero interior values. Also exclude potential data points with zero calendar reserves prior to the current valuation year of each Annual Statement.
2. Calculate RRRs for each initial reserve year/company/LOB from the remaining data.
3. Identify the RRR with the greatest maturity for each initial reserve year/company/LOB.

4. Apply pooling rules to company initial reserve year/company/LOB data points, where appropriate.
5. For each RRR/company-pool/LOB data point, we determine and apply filters, for the following, on pool basis:
    a. Minor Line status
    b. LOB Age
6. With the pool data, after the prior filtering, calculate size threshold by LOB/ initial reserve year and identify whether the company size exceeds that threshold.
7. Apply Maturity filter.

For Two-Year LOBs, for indicated PRFs from RBC data, we determine age, maturity, and size thresholds from RBC data. We determine Minor Line status using RBC data by LOB combined with Annual Statement for all lines combined.

For Two-Year LOBs, for indicated RRFs from RBC data, we determine size thresholds from RBC data. We determine age and Minor Line status, which require matching premium information, from Annual Statement premium data. There is no maturity filter applicable to RRFs for Two-Year LOBs.

For pooled data risk data points, for both Two-Year and Ten-Year LOBs, we determine age and maturity on a pooled basis, rather than using maximum or average values by company. We also determine Minor Lines status on a pooled basis.

14. APPENDIX 10—ANALYSIS OF CHANGE IN PRFs 2014 TO 2017 FOR TEN-YEAR LOBs

In this section we show our analysis of the change in PRFs, from the results of the 2016 Report to the results in this Report, for Ten-Year LOBs. In this analysis of change, for each LOB, we begin with the results in the 2016 Report. We then calculate a series of indicated PRFs, each step applies additional changes in methodology/data from the 2016 Report to this Report. The change in indicated PRFs between steps constitutes our measure of the effect of the methodology/data change.

We believe this provides useful information on the relative effects of each change. However, the effects interact, so that if we calculate effects in a different order, then we might measure a different effect for each change. Hence, the changes should be interpreted as informative, but not definitive.

For Two-Year LOBs, developed from confidential RBC data, we did not have the detail data from the 2016 Report needed to perform a change analysis.[57]

[57] We note that changes are small for the larger LOBs and that when the number of data points is small—e.g., Financial/Mortgage and Warranty—the movements from year to year are not unexpected.

In the subsections below we identify which of the methodology/data changes, each of which was discussed earlier in the report, is placed in each of the categories.

Data and Maturity First

This category covers the following:

- As we now have older Annual Statements, we have data points for AYs and initial reserve years 1988 and subsequent that were not included in our 2016 Report.
- As we discussed in the Appendix 3—Pooling Methodology, we now select the most mature data points and then combine individual companies into pools, rather than performing the calculation in the reverse order.
- Finally, with respect to data, in the normal course of an analysis update, there are changes in the NAIC database, which contains company reports as of the date that the information was extracted.[58] In our current work, we use data extracted from the NAIC database as of the first quarter of 2019, which updates our entire data set. The 2016 Report used data extracted in 2015–2016.

Filters

This category covers the following:

- We implemented some changes in the way we calculate the Size filtering (Appendix 7).
- While we apply the same five-year age filter, as we have added older and newer AYs to our database, some companies that were "new" (age under five years) in the 2016 Report are not "new" in this Report.
- We based age on the pool age. In the 2016 Report age equaled the maximum age of any company in the pool. As a result, we may have excluded some data points that were included in the 2016 Report.

Development and Recent Years

As in every re-evaluation, there are changes due to increasing maturity of data for AYs and initial reserve years that have not yet reached maximum maturity available in our data and the addition of new AYs and initial reserve years.

Effect of Changes

Table A-7a—PRFs, below, shows the effect of these factors, by LOB. Table A-7b, below, shows the changes in the number of data points after each step of the analysis.

[58] For example, we see more data from Annual Statement years and RBC years 2013 and 2014, in the 2017 data than in the 2014 data. We understand this to be because Annual Statements and RBC Filings for some companies were not included in the NAIC data when the 2014 data was downloaded.

Table A-7a—PRFs—Analysis of Change
Indicated Risk Factors based on 2014 data to indications based on 2017 data

		Change as a Percentage of Premium, Due to:					
Line	2014 Indicated PRF	Data, Maturity First	Filter	Development	Recent Years	Total Change	2017 Indicated PRF
(1) H/F	0.964	0.2%	0.1%	0.0%	-0.7%	-0.4%	0.960
(2) PPA	0.969	0.7%	0.0%	0.2%	-0.2%	0.6%	0.975
(3) CA	1.010	0.6%	0.1%	0.9%	-0.4%	1.2%	1.022
(4) WC	1.044	0.3%	0.1%	-0.4%	-1.4%	-1.5%	1.030
(5) CMP	0.901	0.2%	0.0%	0.2%	-0.8%	-0.4%	0.897
(6) MPL Occ.	1.490	2.6%	-3.2%	-0.3%	0.0%	-0.9%	1.480
(7) MPL C-M	1.176	-0.1%	-0.2%	-0.6%	-1.8%	-2.7%	1.149
(8) SL	0.949	0.3%	-0.1%	0.1%	0.0%	0.4%	0.952
(9) OL	1.013	0.5%	0.1%	0.3%	-0.7%	0.1%	1.014
(11) Spec. Prop.	0.831	N/A	N/A	N/A	N/A	0.0%	0.831
(12) APD	0.836	N/A	N/A	N/A	N/A	0.1%	0.837
(10) Fidelity / Surety	0.680	N/A	N/A	N/A	N/A	-1.4%	0.666
(13) Other	0.935	N/A	N/A	N/A	N/A	-0.2%	0.933
(15) International	1.638	7.4%	0.0%	0.0%	0.0%	7.4%	1.712
(16) Reins. Prop. / Fin.	1.240	-1.2%	1.3%	-0.1%	0.0%	0.0%	1.240
(17) Reins. Liab.	1.322	-3.7%	-3.5%	0.2%	0.0%	-7.0%	1.252
(18) PL	1.285	-0.3%	-2.0%	0.9%	0.0%	-1.5%	1.270
(14) Financial / Mortgage	2.513	N/A	N/A	N/A	N/A	7.5%	2.588
(19) Warranty	1.028	N/A	N/A	N/A	N/A	-5.3%	0.975
Average Risk Factor - All Lines	0.968	N/A	N/A	N/A	N/A	0.0%	0.967
Average Risk Factor - 10-Yr Lines	0.996	0.3%	0.0%	0.1%	-0.6%	-0.1%	0.995
Average Risk Factor - 2-Yr Lines	0.895	N/A	N/A	N/A	N/A	0.3%	0.897

Table A-7b—PRFs—Analysis of Change
Number of Filtered Data Points

		Change in Number of Filtered Data Points Resulting From:					
Line	2014 Indicated PRF	Data, Maturity First	Filter	Development	Recent Years (1)	Total Change	2017 Indicated PRF
(1) H/F	11,256	563	9	-	1,070	1,642	12,898
(2) PPA	10,904	556	(35)	-	835	1,356	12,260
(3) CA	7,589	472	(20)	-	631	1,083	8,672
(4) WC	7,931	416	(45)	-	677	1,048	8,979
(5) CMP	8,791	652	(109)	-	731	1,274	10,065
(6) MPL Occ.	1,112	31	135	-	-	166	1,278
(7) MPL C-M	3,281	121	86	-	446	653	3,934
(8) SL	2,145	138	(34)	-	126	230	2,375
(9) OL	10,951	585	(65)	-	991	1,511	12,462
(11) Spec. Prop.	10,908	N/A	N/A	N/A	N/A	2,165	13,073
(12) APD	12,040	N/A	N/A	N/A	N/A	1,807	13,847
(10) Fidelity / Surety	2,370	N/A	N/A	N/A	N/A	460	2,830
(13) Other	2,268	N/A	N/A	N/A	N/A	430	2,698
(15) International	410	47	61	-	-	108	518
(16) Reins. Prop. / Fin.	1,182	89	(2)	-	88	175	1,357
(17) Reins. Liab.	1,189	137	87	-	-	224	1,413
(18) PL	3,341	165	254	-	-	419	3,760
(14) Financial / Mortgage	245	N/A	N/A	N/A	N/A	94	339
(19) Warranty	83	N/A	N/A	N/A	N/A	51	134
Data Points - All Lines	97,996	N/A	N/A	N/A	N/A	14,896	112,892
Data Points - 10-Yr Lines	70,082	3,972	322	-	5,595	9,889	79,971
Data Points - 2-Yr Lines	27,914	N/A	N/A	N/A	N/A	5,007	32,921

Notes: Recent Years for MPL Occ., International, Reins. Liab., and PL are zero because the maturity filter excludes accident years 2015-2017 in the analysis of change.

For all Ten-Year LOBs combined, the change in indicated PRFs from 2014 to 2017 is relatively small, -0.1% of premium.

However, there some LOBs with larger changes in indicated Risk Factors. The two Ten-Year LOBs with indicated PRF changes greater than ±5% of premium are the following:

- International PRF is increased due to the data changes.
- Reinsurance Liability PRF is reduced due to both data changes and the filter changes.
- Financial/Mortgage and Warranty LOB PRFs change by more than 5% of premium, but these are lines with limited data and the therefore more subject to variation in indicated Risk Factors due to random effects of new information and/or even small changes in methodology.

15. APPENDIX 11—ANALYSIS OF CHANGE IN RRFs 2014 TO 2017

In this section we show our analysis of the change in RRFs, for Ten-Year LOBs and Two-Year[59] LOBs, comparing from the results of the 2016 Report to the results in this Report. We described the approach in Appendix 10, above.

We categorize the changes in indicated RRFs, from those in the 2016 Report to those in this Report, as follows:

1. New Minor Lines approach for reserves described in Appendix 5 ("Minor Line Filter").
2. Other Filters including Age, LOB Size, and Maturity ("Other Filters").
3. Updates in NAIC database[60] ("New data") and increased maturity of initial reserve years 1998-2013 ("New Data (< 2014), Development").
4. New AYs – 2014-2016 ("Recent Years (2014-17)".
5. New quality control test to remove triangles whose entire interior is blank, Zero Interior filter.
6. Calculate RRR values by company, and select the most mature company data point, before pooling ("Maturity First").
7. Allow |RRRs|>500% for Ten-Year LOBs ("Allow |RRR| >500%").

Table A-8a—RRFs shows the effects of each of these factors, by LOB. Table A-8b, below, shows the changes in the number of data points after each step of the analysis.

[59] We were able to analyze the drivers of change in RRFs from RBC data, as the regulator working with our committee recreated, under our direction, the 2016 analysis, which enabled us to analyze the drivers of change for both Ten-Year and Two-Year LOBs.

[60] As expected, we see additional data for Annual Statement Years 2013 and 2014. Also, for LOB "Other," in addition to the expected changes due to updates, we observed a significant reduction in the number of data points in the 2001 Annual Statement Year. That might have been an error in the prior analysis.

Table A-8a—RRFs—Analysis of Change
Indicated Risk Factors based on 2014 data to indications based on 2017 data

		Change as a Percentage of Reserves, Due to:								
Line	2014 Indicated RRF	Minor Line Filter	Other Filters	New Data (< 2014), Development	Recent Years (2014-17)	Zero Interior	Maturity First	Allow |RRR| >500%	Total Change	2017 Indicated RRF
(1) H/F	0.213	-0.4%	-0.9%	1.4%	0.0%	0.6%	0.1%	0.2%	1.0%	0.223
(2) PPA	0.179	0.3%	-0.2%	1.2%	0.3%	0.3%	0.2%	0.1%	2.2%	0.201
(3) CA	0.348	-1.1%	-0.1%	1.7%	0.5%	0.4%	0.0%	0.0%	1.4%	0.361
(4) WC	0.344	-0.5%	0.3%	-0.6%	-0.3%	0.2%	0.0%	0.1%	-0.9%	0.335
(5) CMP	0.494	-1.1%	-0.1%	0.2%	0.0%	0.7%	0.2%	0.5%	0.5%	0.499
(6) MPL Occ.	0.296	-1.0%	0.0%	-3.0%	-0.4%	0.4%	0.3%	0.6%	-3.1%	0.265
(7) MPL C-M	0.089	0.0%	0.0%	0.5%	0.0%	0.3%	-0.6%	0.4%	0.5%	0.094
(8) SL	0.431	-0.5%	0.0%	-3.2%	-1.4%	1.3%	-0.7%	2.9%	-1.6%	0.415
(9) OL	0.531	-1.3%	0.3%	-0.5%	-1.0%	1.0%	0.3%	0.7%	-0.4%	0.527
(11) Spec. Prop.	0.428	-4.1%	1.2%	-1.9%	0.0%	-10.9%	0.7%	0.0%	-15.1%	0.278
(12) APD	0.155	0.9%	0.4%	0.9%	0.3%	-3.0%	-1.9%	0.0%	-2.3%	0.132
(10) Fidelity / Surety	0.917	-1.7%	5.7%	4.4%	7.2%	-46.3%	-1.1%	0.0%	-31.6%	0.600
(13) Other	0.375	-5.7%	5.4%	-0.1%	0.6%	-15.8%	0.6%	0.0%	-15.0%	0.225
(15) International	0.695	-0.6%	26.7%	-2.1%	-6.9%	0.4%	-1.9%	19.5%	34.9%	1.044
(16) Reins. Prop. / Fin.	0.415	-6.6%	0.2%	0.7%	-1.6%	0.9%	-0.9%	0.2%	-7.2%	0.343
(17) Reins. Liab.	0.656	-4.7%	0.6%	-3.1%	-1.0%	0.5%	2.0%	3.8%	-1.9%	0.636
(18) PL	1.345	-3.9%	2.8%	-4.5%	-1.1%	0.5%	-0.3%	19.2%	12.8%	1.472
(14) Financial / Mortgage	0.060	-3.7%	-2.3%	0.7%	5.5%	-4.2%	-2.0%	0.0%	-5.9%	0.001
(19) Warranty	0.316	33.2%	-4.7%	8.1%	17.5%	-47.0%	-7.5%	0.0%	-0.4%	0.312
Average Risk Factor - All Lines	0.383	-1.1%	0.3%	-0.1%	-0.2%	-0.5%	0.1%	0.9%	-0.7%	0.376
Average Risk Factor - 10-Yr Lines	0.387	-1.0%	0.2%	-0.1%	-0.3%	0.5%	0.2%	0.9%	0.4%	0.390
Average Risk Factor - 2-Yr Lines	0.344	-3.2%	1.3%	-0.2%	1.9%	-12.0%	-0.4%	0.0%	-12.6%	0.218

Table A-8b—RRFs—Analysis of Change
Number of Filtered Data Points

Line	2014 Indicated RRF	Change in Number of Filtered Data Points Resulting From: Minor Line Filter	Other Filters	New Data (< 2014), Development	Recent Years (2014-17) (1)	Zero Interior (2)	Maturity First	Allow |RRR| >500%	Total Change	2017 Indicated RRF
(1) H/F	11,258	51	(516)	660	748	21	(380)	20	604	11,862
(2) PPA	11,620	105	(709)	619	637	(3)	(456)	13	206	11,826
(3) CA	8,232	(115)	(548)	503	431	9	(254)	4	30	8,262
(4) WC	8,087	60	(586)	682	224	18	(225)	2	175	8,262
(5) CMP	8,322	(91)	(496)	956	-	12	(212)	16	185	8,507
(6) MPL Occ.	1,271	(94)	(30)	136	60	-	35	4	111	1,382
(7) MPL C-M	2,493	(26)	(39)	525	-	-	11	7	478	2,971
(8) SL	2,215	155	(77)	128	106	(3)	(28)	22	303	2,518
(9) OL	10,568	(295)	(395)	956	336	(2)	(16)	20	604	11,172
(11) Spec. Prop.	8,499	(477)	(250)	469	607	137	(82)	-	404	8,903
(12) APD	6,620	(15)	(366)	403	358	278	230	-	888	7,508
(10) Fidelity / Surety	1,971	172	(362)	31	172	(20)	(23)	-	(30)	1,941
(13) Other	1,756	122	(307)	133	124	1	57	-	130	1,886
(15) International	580	(21)	137	76	43	(1)	77	40	351	931
(16) Reins. Prop. / Fin.	1,222	105	(70)	18	65	-	32	7	157	1,379
(17) Reins. Liab.	1,348	65	(20)	74	35	1	52	11	218	1,566
(18) PL	4,196	(57)	(156)	328	116	(4)	(62)	106	271	4,467
(14) Financial / Mortgage	258	(33)	(37)	(5)	19	2	22	-	(32)	226
(19) Warranty	69	(7)	12	(3)	19	9	(23)	-	7	76
Average Risk Factor - All Lines	90,585	(396)	(4,815)	6,689	4,100	455	(1,245)	272	5,060	95,645
Average Risk Factor - 10-Yr Lines	71,412	(158)	(3,505)	5,661	2,801	48	(1,426)	272	3,693	75,105
Average Risk Factor - 2-Yr Lines	19,173	(238)	(1,310)	1,028	1,299	407	181	-	1,367	20,540

Notes:

(1) Recent Years for CMP and MPL C-M are zero due because the maturity filter excludes initial reserve years 2014–2016 in the analysis of change.

(2) The effect shown in this column is the net result of several filters. First, prior to the impact of other filters, applying the zero interior filter caused data points to reduce in all lines. However, some number of RRRs from RBC triangles with zero interiors, have already been removed due to RRR> 5 filter, so the net decrease in number of RRRs is less than the decrease due to the zero interior filter alone. Moreover, when we remove the RBC triangles with zero interior values, then to the extent that there are RBC triangles from later, less mature, valuations, unaffected by zero interior values, we use those triangles. The combined effect of those factors can produce an increase in RRRs.

For all Ten-Year LOBs combined, the change in indicated RRFs from 2014 to 2017 is 0.4% of reserves. However, there some Ten-Year LOBs with larger changes in indicated Risk Factors. The three LOBs with indicated RRF changes greater than ±5% of reserves are the following:

- The International indicated RRF increased by 34.9% overall due to Other Filters (company age) and allowing RRRs greater than 500%. International is one of the three smallest lines of business both in terms of company data points included in the analysis and reserve volume. Its sensitivity to the changes is not surprising.
- The Reinsurance Prop./Fin. indicated RRF decreased 7.2% of reserves, due primarily to changes in the Minor Line filter and the addition of recent years.
- The Products Liability indicated RRF increased 12.8% of reserves due primarily to the impact of allowing RRRs greater than 500%.

For all Two-Year LOBs combined, the change in indicated RRFs from 2014 to 2017 is more significant than the Ten-Year LOBs, at -12.6%. This was driven by the new zero interior filter. With the exception of automobile physical damage, all of the Two-Year LOBs had changes greater than ±5% of reserves.

16. APPENDIX 12—EXAMPLES

Example 1: Reserve Runoff Ratio—Ten-Year LOBs—Annual Statement Data

In this section, we show how the RRRs are calculated from Annual Statement data for Ten-Year LOBs.

To illustrate the runoff ratio calculation based on Annual Statement data, consider the following simulated example, Company XYZ's Schedule P, Part 2 and 3 for a particular LOB for Annual Statement Year 2017.

Table A-9a
Simulated Company XYZ Schedule P—Part 2

		1	2	3	4	5	6	7	8	9	10	11	12
INCURRED NET LOSSES AND DEFENSE AND COST CONTAINMENT EXPENSES REPORTED AT YEAR END ($000 OMITTED)												DEVELOPMENT	
Years in Which												One	Two
Losses Were Incurred		2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Year	Year
1	Prior	**730**	510	470	450	450	450	440	440	440	**440**	0	0
2	2008	**4,890**	3,750	3,700	3,620	3,620	3,620	3,620	3,620	3,620	**3,620**	0	0
3	2009	XXX	5,010	4,110	3,680	3,730	3,660	3,650	3,650	3,660	3,660	0	10
4	2010	XXX	XXX	3,720	2,850	2,810	2,670	2,640	2,620	2,620	2,620	0	0
5	2011	XXX	XXX	XXX	3,150	2,500	2,490	2,480	2,480	2,480	2,470	-10	-10
6	2012	XXX	XXX	XXX	XXX	2,900	2,230	2,190	2,170	2,170	2,150	-20	-20
7	2013	XXX	XXX	XXX	XXX	XXX	2,700	1,960	1,970	1,960	2,050	90	80
8	2014	XXX	XXX	XXX	XXX	XXX	XXX	3,770	3,580	3,530	3,370	-160	-210
9	2015	XXX	XXX	XXX	XXX	XXX	XXX	XXX	270	310	300	-10	30
10	2016	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	0	0	0	XXX
11	2017	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	0	XXX	XXX
12	Total											-110	-120

Table A-9b
Simulated Company XYZ Schedule P—Part 3

		1	2	3	4	5	6	7	8	9	10	11	12
CUMULATIVE PAID NET LOSSES AND DEFENSE AND COST CONTAINMENT EXPENSES REPORTED AT YEAR END ($000 OMITTED)												Number of Claims Closed With Loss	Number of Claims Closed Without Loss
Years in Which Losses Were Incurred		2008	2009	2010	2011	2012	2013	2014	2015	2016	2017		
1	Prior	0	390	450	440	440	440	440	440	440	430	1,110	170
2	2008	2,100	3,360	3,580	3,620	3,620	3,620	3,620	3,620	3,620	3,620	860	150
3	2009	XXX	1,540	2,770	3,350	3,620	3,640	3,650	3,650	3,660	3,650	610	100
4	2010	XXX	XXX	1,410	2,180	2,380	2,570	2,600	2,600	2,600	2,600	490	90
5	2011	XXX	XXX	XXX	1,280	2,120	2,310	2,430	2,440	2,440	2,470	420	50
6	2012	XXX	XXX	XXX	XXX	980	1,630	1,880	2,010	2,080	2,100	410	40
7	2013	XXX	XXX	XXX	XXX	XXX	1,150	1,780	1,830	1,890	2,000	460	50
8	2014	XXX	XXX	XXX	XXX	XXX	XXX	1,560	2,590	3,200	3,300	530	70
9	2015	XXX	XXX	XXX	XXX	XXX	XXX	XXX	140	150	160	40	0
10	2016	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	0	0	0	0
11	2017	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	0	0	0

We calculate nine RRRs from these data. The most mature is the RRR for the 2008 initial reserve year. The numerator of the Reserve Runoff Ratio is the incurred development for 2008 and prior AYs, combined, from the 2008 evaluation year to the 2017 evaluation year. These data come from Schedule P, Part 2 and we calculate this from the numbers in bold above as follows:

(440 + 3,620) – (730 + 4,890) = -1,560

The denominator of this ratio is the carried loss reserves at the 2008 evaluation date. We calculate this for all AYs combined using Schedule P, Parts 2 and 3, from the cells that are shaded above as follows:

(730 + 4,890) – (0 + 2,100) = 3,520

The value for Prior AYs in calendar year 2008 is zero because the Prior rows in Parts 2 and 3 of Schedule P are the amounts excluding the amounts paid through December 31, 2008, on AYs 2008 and prior.

The reserve runoff ratio is then simply the numerator divided by the denominator:
-1,560 ÷ 3,520 = -44.3%

The reserve runoff ratios for reserve years 2009 through 2016 are calculated in the same manner. For initial reserve year 2009, the numerator of the RRR, Part 2, columns 2 and 12, is (440+3,620+3,660) - (510+3,750+5,010) = -1,550.

The denominator of the RRR, from Parts 2 and 3, column 2, is (510+3,750+5,010) - (390+3,360+1,540) = 3,980. The RRR is -38.9%.

Example 2: Reserve Runoff Ratio—Two-Year LOBs—Annual Statement Data

While our indicated RRFs for Two-Years LOBs is based on data from confidential RBC Filings, for comparison purposes, we also calculate indicated RRFs based on Annual Statement data.

The RRR calculation for Two-Year LOBs from Annual Statement data is similar to the calculation for Ten-Year LOBs, but the calculation includes only two AY and the prior year data. The following example from a 2017 Annual Statement illustrates the runoff ratio calculation based on Annual Statement data for sample Company XYZ Schedule P, Part 2 and 3.

Table A10a
Simulated Company XYZ Schedule P—Part 2—Two-Year LOBs

		1	2	3	4	5	6	7	8	9	10	11	12
INCURRED NET LOSSES AND DEFENSE AND COST CONTAINMENT EXPENSES REPORTED AT YEAR END ($000 OMITTED)												Development	
Years in Which Losses Were Incurred		2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	One Year	Two Year
1	Prior	XXX	XXX	XXX	XXX	XXX	XXX	XXX	15,498	**17,703**	**18,326**	624	2,829
2	2016	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	**23,314**	**24,070**	756	XXX
3	2017	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	25,274	XXX	XXX
4	Total											1,379	2,829

Table A10b
Simulated Company XYZ Schedule P—Part 3—Two-Year LOBs

		1	2	3	4	5	6	7	8	9	10
CUMULATIVE PAID NET LOSSES AND DEFENSE AND COST CONTAINMENT EXPENSES REPORTED AT YEAR END ($000 OMITTED)											
Years in Which Losses Were Incurred		2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
1	Prior	XXX	XXX	XXX	XXX	XXX	XXX	XXX	0	**9,253**	15,544
2	2016	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	**4,060**	12,442
3	2017	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	4,263

We calculate only one runoff ratio from these data, the runoff ratio for the 2016 reserve year. For this ratio, the numerator of the Reserve Runoff Ratio is the incurred development for 2016 and prior AYs, combined, from 2016 evaluation year to the 2017 evaluation year. These data come from Schedule P, Part 2 and we calculate this as follows:

(18,326 + 24,070) – (17,703 + 23,314) = 1,379

The denominator is the carried loss reserves at the 2016 evaluation date. We calculate this for all AYs combined using Schedule P, Parts 2 and 3, as follows:

(17,703+23,314) – (9,253 + 4,060) = 27,704

The reserve runoff ratio is then simply the numerator divided by the denominator:
1,379 ÷ 27,704 = 5.0%.

Example 3: Reserve Runoff Ratio—Two-Year LOBs—RBC Data

The tables below shows an example of RBC data. This data is the RBC data that is consistent with the Two-Year Annual Statement data shown in Example 2, above.

Table A11a
Simulated Company XYZ RBC Equivalent of Schedule P—Part 2—Two-Year LOBs

		1	2	3	4	5	6	7	8	9	10
INCURRED NET LOSSES AND DEFENSE AND COST CONTAINMENT EXPENSES REPORTED AT YEAR END ($000 OMITTED)											
Years in Which Losses Were Incurred		2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
1	Prior	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2	2008	1,875	1,808	1,678	1,496	1,463	1,338	1,179	1,182	1,216	1,231
3	2009		1,926	1,827	1,481	1,388	1,446	1,276	1,290	1,304	1,267
4	2010			3,378	3,567	3,100	3,048	3,042	2,947	2,965	2,943
5	2011				7,774	8,902	8,128	7,351	7,949	7,855	7,393
6	2012					8,010	9,881	9,571	9,435	9,428	9,423
7	2013						9,751	10,222	9,959	9,944	9,927
8	2014							11,581	12,426	18,731	18,535
9	2015								14,533	16,738	18,086
10	2016									23,314	24,070
11	2017										

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Table A11b
Simulated Company XYZ RBC Equivalent of Schedule P—Part 3—Two-Year LOBs

		1	2	3	4	5	6	7	8	9	10
Years in Which Losses Were Incurred		CUMULATIVE PAID NET LOSSES AND DEFENSE AND COST CONTAINMENT EXPENSES REPORTED AT YEAR END ($000 OMITTED)									
		2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
1	Prior	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2	2008	92	573	835	960	997	1,039	1,106	1,158	1,202	1,233
3	2009		111	488	779	997	1,090	1,156	1,197	1,201	1,203
4	2010			99	815	1,937	2,238	2,451	2,614	2,811	2,802
5	2011				557	3,939	5,020	5,447	6,165	6,242	6,316
6	2012					2,332	4,315	5,024	7,900	8,656	8,848
7	2013						3,497	8,841	9,374	9,535	9,660
8	2014							3,112	8,533	12,387	14,464
9	2015								1,888	6,049	9,848
10	2016									4,060	12,442
11	2017										XXX

The RBC data differs from the Annual Statement data in that there is no data in the Prior row.

We calculate RRRs using the most mature runoff data available. Often that was age 10, corresponding to 2008 and prior. One feature of that calculation is that the runoff contains only one AY.

For example, the runoff for initial reserve year 2008 would be calculated as follows:

Incurred Movement = 1,231 – 1,875 = -645, using the "2008 row".
The initial reserve = 1,875 – 92 = 1,783
The runoff ratio equals -645 ÷ 1,783 = -36.1%

Because there is no prior row, this constitutes the development of 2008 only.

17.APPENDIX 13—IMPACT OF ALTERNATVE RISK FACTORS

Part 1: Change in P&C RBC Charges by Type of Company: R4 Alone, R5 Alone, and Total ACL

R4 charge - Reserve Risk							
Total R4 Charge \ Company Category	Commercial	Med Mal	NOC	Personal	Reinsurer	Workers Comp	Total
2020 RBC Formula	78.3	2.3	0.6	26.8	3.1	12.3	123.4
Indicated (2014 Uncapped)	89.0	0.7	1.1	27.6	3.3	13.2	134.9
Percentage change	13.7%	-70.1%	85.3%	3.1%	6.0%	7.7%	9.3%
Indicated (2017 Uncapped)	86.5	0.6	0.8	29.0	3.1	12.8	132.8
Percentage change	10.4%	-74.5%	42.6%	8.1%	0.8%	4.4%	7.6%
Indicated (2017 Min 10%)	86.8	1.7	0.8	29.2	3.1	12.8	134.5
Percentage change	10.9%	-27.5%	43.0%	9.0%	0.7%	4.3%	9.0%
Indicated (2017 Max chg 10%)	78.7	2.1	0.6	27.6	3.0	11.9	124.1
Percentage change	0.6%	-8.9%	5.1%	3.1%	-3.7%	-2.8%	0.5%
Indicated (2017 Max chg 20%)	80.1	1.9	0.6	28.5	3.0	12.1	126.2
Percentage change	2.3%	-17.9%	10.1%	6.2%	-4.4%	-1.7%	2.2%
Indicated (2017 Max chg 35%)	81.8	1.8	0.7	28.7	3.0	12.3	128.2
Percentage change	4.5%	-23.0%	17.8%	7.2%	-4.2%	-0.3%	3.9%

R5 charge - Premium Risk							
Total R5 Charge \ Company Category	Commercial	Med Mal	NOC	Personal	Reinsurer	Workers Comp	Total
2020 RBC Formula	33.9	1.5	0.7	32.1	0.7	5.5	74.4
Indicated (2014 Uncapped)	32.6	1.5	0.6	31.9	0.8	5.5	72.9
Percentage change	-3.7%	2.7%	-16.6%	-0.5%	7.3%	0.1%	-1.9%
Indicated (2017 Uncapped)	32.4	1.4	0.6	32.2	0.8	5.2	72.6
Percentage change	-4.4%	-4.4%	-18.0%	0.5%	3.6%	-4.2%	-2.3%
Indicated (2017 Min 10%)	33.2	1.4	0.6	32.3	0.8	5.3	73.6
Percentage change	-2.0%	-4.4%	-17.9%	0.8%	4.4%	-3.9%	-1.1%
Indicated (2017 Max chg 10%)	33.4	1.5	0.7	32.4	0.7	5.2	73.9
Percentage change	-1.4%	1.0%	-1.9%	0.9%	-2.0%	-4.2%	-0.6%
Indicated (2017 Max chg 20%)	33.0	1.5	0.7	32.3	0.7	5.2	73.4
Percentage change	-2.5%	-2.3%	-5.1%	0.7%	-3.4%	-4.4%	-1.3%
Indicated (2017 Max chg 35%)	33.0	1.4	0.6	32.3	0.7	5.2	73.3
Percentage change	-2.5%	-4.4%	-9.9%	0.6%	-1.4%	-4.3%	-1.4%

Total Authorized Control Level (ACL) - RBC							
ACL RBC \ Company Category	Commercial	Med Mal	NOC	Personal	Reinsurer	Workers Comp	Total
2020 RBC Formula	64.9	2.4	0.9	84.3	8.2	10.1	170.6
Indicated (2014 Uncapped)	69.2	2.0	1.0	84.5	8.2	10.5	175.4
Percentage change	6.6%	-17.1%	20.7%	0.3%	0.6%	3.9%	2.8%
Indicated (2017 Uncapped)	68.2	1.9	0.9	84.9	8.2	10.3	174.4
Percentage change	5.1%	-19.5%	7.7%	0.8%	0.1%	1.8%	2.2%
Indicated (2017 Min 10%)	68.5	2.1	0.9	85.0	8.2	10.3	175.0
Percentage change	5.5%	-9.7%	7.8%	0.8%	0.1%	1.8%	2.5%
Indicated (2017 Max chg 10%)	64.9	2.3	0.9	84.5	8.1	10.0	170.7
Percentage change	0.1%	-2.9%	0.8%	0.3%	-0.4%	-1.8%	0.0%
Indicated (2017 Max chg 20%)	65.4	2.2	0.9	84.7	8.1	10.0	171.4
Percentage change	0.9%	-6.3%	1.2%	0.5%	-0.4%	-1.3%	0.4%
Indicated (2017 Max chg 35%)	66.2	2.2	0.9	84.8	8.1	10.1	172.2
Percentage change	2.0%	-8.2%	2.1%	0.7%	-0.4%	-0.6%	0.9%

Notes
Amounts in Billions
Excluding Zero and Negative Size Companies
"NOC," standing for Not Otherwise Classified, means companies whose major line is one of the following: Special Liability, Fidelity/Surety, "Other," International, Financial/Mortgage Guaranty, Warranty.
Risk factors for "2014 Data" and "2017 Data" for catastrophe exposed LOBs, are reduced to reflect the fact that catastrophe risk is incorporated separately in the RBC Formula. We apply the multiplicative adjustment used by the NAIC. See footnote 4.

Part 2: Change in P&C RBC Charges by % Size in Change in RBC Value: R4 Alone, R5 Alone, and Total ACL

% Change in Risk Charge	2020 to 2017 Uncapped	2020 to 2017 Min 10%	2020 to 2017 Max Chg 10%	2020 to 2017 Max Chg 20%	2020 to 2017 Max Chg 35%
P&C RBC - Distribution of Companies by Change of R4 Charges					
% Changes in R4					
Less Than -50%	168	8	1	1	3
-50% to -25%	19	71	1	10	56
-25% to -15%	3	80	2	137	98
-15% to -5%	135	167	308	180	169
-5% to 5%	493	483	989	756	605
5% to 15%	525	535	533	534	545
15% to 25%	271	272	0	214	263
25% to 50%	150	148	0	0	92
Over 50%	73	73	3	5	6
Total	1837	1837	1837	1837	1837
R5 - P&C RBC - Distribution of Companies by Change of R5 Charges					
% Changes in R5					
Less Than -50%	19	17	2	3	11
-50% to -25%	68	52	7	26	36
-25% to -15%	54	43	21	40	53
-15% to -5%	275	196	183	225	207
-5% to 5%	1273	1377	1481	1405	1390
5% to 15%	117	121	118	113	115
15% to 25%	9	9	6	6	6
25% to 50%	12	12	12	11	11
Over 50%	10	10	7	8	8
Total	1837	1837	1837	1837	1837
ACL - P&C RBC - Distribution of Companies by Change of ACL RBC					
% Changes in ACL RBC					
Less Than -50%	26	0	0	0	0
-50% to -25%	77	33	0	2	14
-25% to -15%	55	49	1	35	48
-15% to -5%	135	159	157	198	182
-5% to 5%	1161	1199	1586	1419	1344
5% to 15%	244	259	93	171	195
15% to 25%	64	60	0	12	43
25% to 50%	64	67	0	0	11
Over 50%	11	11	0	0	0
Total	1837	1837	1837	1837	1837

Part 3: Change in P&C RBC Charges by Size of Company: R4 Alone, R5 Alone, and Total ACL

P&C RBC - Comparison of R4 by Company Size (L&LAE + NWP)												
R4 \ Company Size	zero or less	0%-10%	10%-20%	20%-30%	30%-40%	40%-50%	50%-60%	60%-70%	70%-80%	80%-90%	90%-100%	Total
2020 RBC Formula	156.0	19.3	74.3	189.0	355.5	712.7	1,119.9	2,430.2	4,566.6	12,271.0	101,666.8	123,561.5
Indicated (2014 Uncapped)	174.1	21.1	72.4	184.1	404.3	755.0	1,152.4	2,625.6	4,914.1	13,564.6	111,212.9	135,080.6
Percentage change	11.6%	9.1%	-2.6%	-2.5%	13.7%	5.9%	2.9%	8.0%	7.6%	10.5%	9.4%	9.3%
Indicated (2017 Uncapped)	180.5	19.7	68.0	171.9	377.1	726.1	1,129.3	2,520.3	4,850.3	13,322.5	109,632.5	132,998.2
Percentage change	15.7%	2.1%	-8.5%	-9.0%	6.1%	1.9%	0.8%	3.7%	6.2%	8.6%	7.8%	7.6%
Indicated (2017 Min 10%)	180.3	20.9	76.0	191.7	394.3	773.3	1,170.3	2,619.0	4,975.7	13,559.6	110,762.5	134,723.6
Percentage change	15.5%	8.5%	2.2%	1.5%	10.9%	8.5%	4.5%	7.8%	9.0%	10.5%	8.9%	9.0%
Indicated (2017 Max Chg 10%)	164.1	19.2	73.9	187.1	359.4	713.8	1,124.5	2,440.3	4,596.2	12,312.6	102,239.5	124,230.7
Percentage change	5.2%	-0.5%	-0.6%	-1.0%	1.1%	0.1%	0.4%	0.4%	0.6%	0.3%	0.6%	0.5%
Indicated (2017 Max Chg 20%)	171.8	19.4	73.1	186.2	363.8	720.4	1,134.2	2,467.9	4,660.9	12,517.1	104,022.3	126,337.1
Percentage change	10.1%	0.4%	-1.7%	-1.4%	2.3%	1.1%	1.3%	1.6%	2.1%	2.0%	2.3%	2.2%
Indicated (2017 Max Chg 35%)	176.9	19.8	73.8	187.4	371.1	733.3	1,145.6	2,505.6	4,736.3	12,778.6	105,677.0	128,405.5
Percentage change	13.4%	2.5%	-0.7%	-0.8%	4.4%	2.9%	2.3%	3.1%	3.7%	4.1%	3.9%	3.9%
P&C RBC - Comparison of R5 by Company Size (L&LAE + NWP)												
R5 \ Company Size	zero or less	0%-10%	10%-20%	20%-30%	30%-40%	40%-50%	50%-60%	60%-70%	70%-80%	80%-90%	90%-100%	Total
2020 RBC Formula	368.8	107.0	143.6	246.2	472.2	698.0	1,096.9	1,962.0	3,717.3	8,526.7	57,392.3	74,731.0
Indicated (2014 Uncapped)	367.6	106.5	137.3	235.8	456.7	686.5	1,049.7	1,893.3	3,607.5	8,293.0	56,476.0	73,309.9
Percentage change	-0.3%	-0.5%	-4.4%	-4.2%	-3.3%	-1.6%	-4.3%	-3.5%	-3.0%	-2.7%	-1.6%	-1.9%
Indicated (2017 Uncapped)	371.8	106.3	136.0	232.5	451.9	677.9	1,037.8	1,870.1	3,577.7	8,195.4	56,347.9	73,005.5
Percentage change	0.8%	-0.7%	-5.3%	-5.6%	-4.3%	-2.9%	-5.4%	-4.7%	-3.8%	-3.9%	-1.8%	-2.3%
Indicated (2017 Min 10%)	372.5	106.5	137.7	234.3	455.9	682.7	1,050.2	1,894.4	3,646.3	8,330.1	57,017.6	73,928.1
Percentage change	1.0%	-0.5%	-4.1%	-4.8%	-3.5%	-2.2%	-4.3%	-3.4%	-1.9%	-2.3%	-0.7%	-1.1%
Indicated (2017 Max Chg 10%)	372.7	107.0	142.1	243.6	466.8	693.0	1,080.2	1,940.2	3,678.3	8,414.1	57,165.8	74,303.9
Percentage change	1.1%	0.0%	-1.0%	-1.0%	-1.1%	-0.7%	-1.5%	-1.1%	-1.1%	-1.3%	-0.4%	-0.6%
Indicated (2017 Max Chg 20%)	372.5	106.8	140.5	240.9	462.8	688.9	1,067.3	1,922.0	3,647.0	8,340.8	56,778.5	73,768.1
Percentage change	1.0%	-0.2%	-2.1%	-2.2%	-2.0%	-1.3%	-2.7%	-2.0%	-1.9%	-2.2%	-1.1%	-1.3%
Indicated (2017 Max Chg 35%)	372.5	106.7	139.3	238.1	459.4	685.7	1,058.6	1,910.3	3,640.6	8,325.6	56,756.9	73,693.6
Percentage change	1.0%	-0.3%	-3.0%	-3.3%	-2.7%	-1.8%	-3.5%	-2.6%	-2.1%	-2.4%	-1.1%	-1.4%
P&C RBC - Comparison of ACL RBC by Company Size (L&LAE + NWP)												
ACL RBC \ Company Size	zero or less	0%-10%	10%-20%	20%-30%	30%-40%	40%-50%	50%-60%	60%-70%	70%-80%	80%-90%	90%-100%	Total
2020 RBC Formula	897.2	188.3	204.5	442.4	718.3	1,003.2	1,409.5	2,990.9	4,824.2	12,841.7	146,023.6	171,543.8
Indicated (2014 Uncapped)	901.3	189.0	202.6	439.4	731.6	1,020.6	1,407.4	3,032.7	4,951.8	13,367.4	150,037.4	176,281.3
Percentage change	0.5%	0.4%	-0.9%	-0.7%	1.9%	1.7%	-0.1%	1.4%	2.6%	4.1%	2.7%	2.8%
Indicated (2017 Uncapped)	903.5	188.5	200.8	434.8	720.1	1,008.8	1,396.5	3,006.1	4,922.8	13,243.7	149,267.4	175,292.9
Percentage change	0.7%	0.1%	-1.8%	-1.7%	0.3%	0.6%	-0.9%	0.5%	2.0%	3.1%	2.2%	2.2%
Indicated (2017 Min 10%)	903.7	188.7	202.9	439.2	725.2	1,022.2	1,410.4	3,039.4	4,973.1	13,336.1	149,629.1	175,870.2
Percentage change	0.7%	0.3%	-0.8%	-0.7%	1.0%	1.9%	0.1%	1.6%	3.1%	3.9%	2.5%	2.5%
Indicated (2017 Max Chg 10%)	900.6	188.3	203.5	440.6	716.4	1,000.7	1,403.0	2,985.0	4,816.0	12,821.3	146,144.3	171,619.7
Percentage change	0.4%	0.0%	-0.4%	-0.4%	-0.3%	-0.2%	-0.5%	-0.2%	-0.2%	-0.2%	0.1%	0.0%
Indicated (2017 Max Chg 20%)	902.0	188.3	202.8	439.3	716.5	1,001.4	1,401.5	2,988.2	4,830.4	12,881.4	146,718.4	172,270.1
Percentage change	0.5%	0.0%	-0.8%	-0.7%	-0.3%	-0.2%	-0.6%	-0.1%	0.1%	0.3%	0.5%	0.4%
Indicated (2017 Max Chg 35%)	903.1	188.3	202.6	438.7	718.1	1,005.4	1,402.5	2,998.0	4,860.4	12,986.9	147,413.2	173,117.2
Percentage change	0.6%	0.0%	-0.9%	-0.8%	0.0%	0.2%	-0.5%	0.2%	0.8%	1.1%	1.0%	0.9%

Part 4: Type of Company Definition

For each company, the company is assigned to one of six categories—Personal Lines, Commercial Lines, Medical Professional Liability, Reinsurance, Workers' Compensation, or Other—by determining the amount of premium plus reserves (net written premium, plus net loss and LAE unpaid) for each of the six categories (using the table shown below), and then determining the category with the highest amount of premium plus reserves.

Schedule P Line	Category		Schedule P Line	Category
(1) H/F	Personal Lines		(12) APD	Personal Lines
(2) PPA	Personal Lines		(10) Fidelity / Surety	Other
(3) CA	Commercial Lines		(13) Other	Other
(4) WC	Workers Compensation		(15) International	Other
(5) CMP	Commercial Lines		(16) Reins. Prop. / Fin.	Reinsurance
(6) MPL Occ.	Medical Malpractice		(17) Reins. Liab.	Reinsurance
(7) MPL C-M	Medical Malpractice		(18) Product Liab.	Commercial Lines
(8) SL	Other		(14) Financial / Mortgage	Other
(9) OL	Commercial Lines		(19) Warranty	Other
(11) Spec. Prop.	Commercial Lines			

Part 5: LOB Share With Each Type of Company

The table below shows the proportion of NWP+Loss and LAE reserve by LOB within each of the type of company categories.

LOB\Category	Commercial	Med Mal	NOC	Personal	Reinsurer	Workers Comp	Total
HF	6%	0%	0%	17%	2%	2%	10%
PPA	6%	0%	0%	45%	2%	4%	22%
CA	8%	0%	0%	3%	2%	4%	5%
WC	16%	1%	0%	2%	2%	73%	15%
CMP	10%	0%	0%	3%	1%	6%	6%
MM Occ	0%	24%	0%	1%	0%	0%	1%
MM CM	1%	72%	0%	1%	0%	0%	2%
SL	2%	0%	20%	0%	2%	0%	1%
OL	30%	2%	22%	3%	8%	6%	16%
FID/SUR	1%	0%	38%	0%	0%	1%	1%
SP	9%	0%	2%	2%	6%	1%	5%
APD	4%	0%	0%	18%	1%	2%	9%
Other	1%	0%	13%	0%	0%	0%	1%
Fin/Mortgage	0%	0%	0%	0%	0%	0%	0%
INTL	0%	0%	0%	0%	3%	0%	0%
Rein (Prop and	1%	0%	0%	2%	21%	0%	2%
Rein (LiAI)	3%	1%	0%	2%	49%	1%	3%
PL	2%	0%	0%	0%	0%	1%	1%
WAR	0%	0%	4%	0%	0%	0%	0%
Total %	100%	100%	100%	100%	100%	100%	100%
Total - $	612,343,230	21,289,449	7,851,892	524,169,525	14,841,788	119,683,083	1,300,178,967

We see that the main LOBs within the category NOC are Fidelity/Surety, Other Liability and Special Liability, and we see that the Medical Professional Type of Company is predominantly Medical Professional Liability Claims Made.

18. APPENDIX 14—REFERENCES

[1] American Academy of Actuaries, 2010, 2010 Update to P/C Risk-Based Capital Underwriting Factors Presented to the National Association of Insurance Commissioners' Property Risk-Based Capital Working Group March 2010, American Academy of Actuaries' P/C Risk-Based Capital Committee.
https://www.actuary.org/sites/default/files/pdf/casualty/rbc_update_mar10.pdf

[2] American Academy of Actuaries, 2016, A report dated October 2016 presenting an update to the Risk Factors indicated based on data with evaluation dates through December 2014 and with multiple, significant, refinements to the methodology used in the prior reports.
https://www.actuary.org/sites/default/files/files/publications/PC_RBC_UWFactors_10282016.pdf

[3] Casualty Actuarial Society EForum, 2013-2014,

Premium Risk Charges—Improvements to Current Calibration Method (**Report 6**)
http://www.casact.org/pubs/forum/13fforum/01-Report-6-RBC.pdf
Reserve Risk Charges—Improvements to Current Calibration Method (**Report 7**)
http://www.casact.org/pubs/forum/14wforum/Report-7-RBC.pdf

[4] American Academy of Actuaries Property/Casualty Risk-Based Capital Task Force, Report on Reserve and Underwriting Risk Factors, May 1993, https://www.casact.org/pubs/forum/93sforum/93sf105.pdf

19.APPENDIX 15—May 2019 Letter to NAIC

APPENDIX 15 – May 2019 Letter to the NAIC

May 8, 2019

Tom Botsko, Chair
Property and Casualty Risk-Based Capital Working Group
National Association of Insurance Commissioners
(via email to Eva Yeung)

Dear Tom:

The American Academy of Actuaries[1] Property and Casualty Risk-Based Capital (RBC) Committee plans to support the National Association of Insurance Commissioners' efforts to update the calibration of factors used to calculate underwriting (UW) risk. This letter describes our plans. We appreciate this opportunity to describe those plans and solicit input from the NAIC Property and Casualty RBC Working Group.

1. Overview

We plan to analyze the following:

- Investment Income Adjustment (IIA)—RBC Line 8 on page PR017 (R4 Reserve risk) and Line 7 on page PR018 (R5 Premium risk), by Line of Business (LOB);

- Loss Concentration Factor (LCF) and Premium Concentration Factor (PCF)—RBC Line 14 on PR017 and PR018 respectively, which are used to calculate diversification credit in the RBC Formula; and

- LOB UW risk factors—RBC Line 4 on PR017 and PR018. We will use the results of this review as a starting point for the IIA and LCF/PCF analysis. This review will include the use of data not available to this Academy committee at the time the 2016 Academy Report[2] was provided.

[1] The American Academy of Actuaries is a 19,500-member professional association whose mission is to serve the public and the U.S. actuarial profession. For more than 50 years, the Academy has assisted public policy makers 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.

[2] Report to National Association of Insurance Commissioners Property andCasualty Risk-Based Capital (E) Working Group: 2016 Update to Property and Casualty Risk-Based Capital Underwriting Factors, American Academy of Actuaries Property and Casualty Risk-Based Capital Committee, October 2016.

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The remainder of this letter provides more details regarding our proposed analyses.

2. IIA Analysis (Line 8/7)

The IIA reduces the amount of UW risk charge to recognize that future investment income will be available to offset the cost of adverse UW (premium risk) or reserve development (reserve risk).

Evaluation approach

The IIAs are based on a 5% per annum interest rate assumption, which is not consistent with recent experience.

We will consider two ways to update the IIAs. First, the Line 4 risk factor and the IIA on Lines 8/7 are currently calibrated as independent parameters. We use the term Nominal Value Approach (NVA) to describe an approach that does not consider possible interactions between interest rates underlying the IIA and loss experience underlying the Line 4 risk factors.

Implementing NVA requires changing the IIAs to reflect changing interest rates over time. We will consider how that might be done in a manner that provides reasonable stability but remains responsive to current conditions.

Second, we note that there are reasons to expect that loss ratios (LRs) and reserve runoff ratios (RRRs) are higher when interest rates are higher.[3] An alternative to NVA, which considers a possible interaction between UW risk and interest rates, is to calibrate UW risk factors (Line 4) using data discounted to present value based on historical interest rates. Risk factors and IIAs can be developed from that analysis. We refer to that alternative as the Present Value Approach (PVA).

With PVA, we would establish the combined effect of the underwriting risk factors (Line 4) and the IIA (Line 8/7). We would produce a single indicated risk factor that reflects both UW risk, Line 4, and IIA, Lines 8/7. If desired, for consistency with the current format of the RBC Formula, that combined risk factor can be split into its two components. However, future changes in interest rates will not necessarily require changes in the IIA values.

We plan to prepare indicated risk factors for IIAs based on both NVA and PVA.

Interaction with UW risk safety level

Consistent with prior calibrations, UW risk factor Line 4 calibrations prepared for the NAIC in the 2016 Report are based on an 87.5th percentile safety level. We understand

[3] An observation in the 1993 Report on Reserve and Underwriting Risk Factors by the American Academy of Actuaries Property/Casualty Risk-Based Capital Task Force, and more recently, Casualty Actuarial Society Dependency and Calibration Working Party Report 15. Publication in CAS EForum is pending.

the 87.5th percentile is used because it appeared to be consistent with the UW risk safety level selected when the RBC Formula was first calibrated in the early 1990s.

The 5% interest rate was also selected in the initial RBC calibration in the early 1990s. At that time actual interest rates were higher than 5%. Therefore, the initial IIA calibration can be viewed as including an implicit interest rate safety margin—that being the difference between actual interest rates at the time and the 5% interest rate selected.

In the IIA analysis, we will use interest rates with and without the kind of implicit safety margin that was part of the RBC calibration in the early 1990s. In using interest rates with no implicit safety margin, we will consider the extent to which the UW risk safety level should be increased to a value above 87.5%, to reflect the combination of the current 87.5th percentile on UW risk and any implicit interest rate safety margin. We will provide the NAIC with alternative treatments on this issue.

3. LCF/PCF Analysis (Line 14)

The LCF/PCF uses the ratio of the reserve/premium amount for the company's largest RBC LOB to the company's all-lines total reserve/premium amount. This ratio is used to measure the spread of business by LOB, commonly called diversification. We refer to that ratio as the Company Line of Business Maximum% (CoMaxLine%).

The LCF/PCF equals CoMaxLine% times 0.3 plus 0.7. This produces a discount for diversification, up to a maximum somewhat less than 30%.[4]

Evaluation of 30% Maximum Diversification Credit

The proposed work will review the extent to which the 30% maximum should be revised based on experience.

[4] The maximum credit would be 30% if the number of LOBs were infinite. If premium/reserves were divided equally among the 19 LOBs, CoMaxLine% is 1/19, 5.26%, and the maximum credit is 28.4%.

Evaluation of other approaches

There are alternatives to the CoMaxLine% Approach in the RBC formula. One alternative approach is to use the largest LOB risk amount, rather than the largest reserve/premium amount. We refer to this as the CoMaxLine%-Risk approach. [5,6]

Another alternative approach to evaluating diversification could be based on the Herfendahl-Hirschman Index (HHI). HHI is widely used by economists to measure concentration. The HHI index considers the relative proportions of all LOBs (largest, second-largest, third-largest, etc.) [7], whereas the CoMaxLine% approach only considers the relative proportion of the largest LOB.

We will evaluate these alternatives.

4. Update to UW factors

The UW factors presented in the 2016 Report are based on data for Annual Statement years 1997–2014. For this work, the NAIC has provided data for Annual Statement years 1984[8]–2017. We plan to update UW factors to include the additional new years (2015–2017), and we will potentially use data from Annual Statement years prior to 1997 for specific LOBs.

Our indicated risk factors will include the effect of catastrophe events, net of reinsurance. We expect that the NAIC will continue to apply its current catastrophe adjustment

[5] As an example of the difference between the risk maximum and the premium/reserve (volume) maximum, consider a hypothetical company that had $1 million of private passenger liability premium and $1 million of occurrence medical malpractice premium.

The private passenger automobile risk premium charge is about 15% and malpractice occurrence premium risk charge is about 60%, producing $150,000 of automobile premium risk, $600,000 of medical malpractice premium risk, and $750,000 in total premium risk (before diversification).

Using the CoMaxLine% approach in the RBC Formula, the CoMaxLine% is 0.50, and the credit for spread of business is 15%, half of the 30% maximum credit.

Based on risk, the maximum risk is the $600,000 for occurrence medical malpractice and the CoMaxLine%-Risk is 0.80 (600,000/750,000). The CoMaxLine%-Risk is much higher than CoMaxLine% because from the risk perspective the company is much less diversified. Measured this way, the credit for spread of business is reduced to 6%.

[6] Using risk by LOB suggests the use of expenses by LOB. Expenses by LOB for the current year are in the Insurance Expense Exhibit, which is not filed until a month after the Annual Statement is filed. We will test options that use data that is available when the Annual Statement is filed, e.g., current year total expenses allocated by LOB based on prior year expenses by LOB, prior year expense by LOB with no adjustment to the current year, and current year company-wide expenses that does not vary by LOB.

[7] HHI equals the sum of the squares of the relative proportions of each LOB compared to the total.

For example, if there is only one LOB, HHI is 1.0, as is the case for the CoMaxLine%. With two lines split 50% and 50% HHI and the CoMaxLine% are still the same, both 0.5.

With two lines split 25% and 75% HHI is 0.25^2 plus 0.75^2 or 0.625 compared to the CoMaxLine% of 0.750, i.e., HHI shows more diversification. With three lines split 50%, 25% and 25% HHI is 0.50^2 plus 0.25^2 plus 0.25^2 or 0.375, more diversification than the CoMaxLine% of 0.5.

The HHI is sometimes applied to only the n-th largest segments, e.g., the degree of diversification among the top five or 10 LOBs.

[8] Annual Statements 1989 and subsequent for reserve risk data.

process to any updated UW risk factors it may choose to implement based on the results of our analysis.[9]

5. Timeline

NAIC staff have provided us with much of the necessary data. We greatly appreciate that assistance, without which this project would not be possible.

We are currently reviewing the data and organizing it for our analyses.

We will provide a timeline and milestones at future meetings and calls.

6. Directional Impacts of These Analyses on RBC Formula Values

While we currently have no results, based on the nature of the changes, we expect that:

- The IIA revision will indicate an increase in amount of UW risk charges for all companies; and
- The LCF/PCF analysis will generally indicate a decrease in amount of UW risk charges for diversified companies.

We expect to provide possible transition rules for implementation, consistent with past practice and/or if such rules appear warranted by features in the data.

Also, as we have in the past, we will ask NAIC to do an impact review of indicated changes.

* * * *

We appreciate this opportunity to assist the NAIC.

Regards,

Lauren Cavanaugh
Chairperson
Academy Property & Casualty
Risk-Based Capital Committee

[9] The Academy P&C RBC Committee would be happy to discuss how we might assist the NAIC in calibration of the risk factors on a net-of-catastrophe basis, but we believe that should be a separate project, after we complete the projects we describe in this letter.

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Comparison of Risk Factors
2014 Indicated versus 2017 Indicated

(1)	(2)	(3)	(4)	(5)	(6)	(7)
	PRC%s			RRC%s		
Line	Indicated (2014 Data)	Indicated (2017 Data)	% Change	Indicated (2014 Data)	Indicated (2017 Data)	% Change
(1) H/F	25.4%	24.9%	-1.7%	21.3%	22.3%	4.5%
(2) PPA	19.7%	20.4%	3.2%	17.9%	20.1%	12.3%
(3) CA	29.6%	30.8%	4.1%	34.8%	36.1%	3.9%
(4) WC	30.6%	29.1%	-4.8%	34.4%	33.5%	-2.5%
(5) CMP	25.7%	25.3%	-1.5%	49.4%	49.9%	1.0%
(6) MPL Occ.	74.4%	73.5%	-1.3%	29.6%	26.5%	-10.3%
(7) MPL C-M	43.1%	40.4%	-6.3%	8.9%	9.4%	5.5%
(8) SL	28.7%	29.1%	1.2%	43.1%	41.5%	-3.8%
(9) OL	31.6%	31.8%	0.4%	53.1%	52.7%	-0.8%
(11) Spec. Prop.	13.2%	13.2%	0.1%	42.8%	27.8%	-35.2%
(12) APD	6.8%	6.9%	2.1%	15.5%	13.2%	-14.7%
(10) Fidelity / Surety	18.0%	16.6%	-8.0%	91.7%	60.0%	-34.5%
(13) Other	19.1%	18.9%	-0.9%	37.5%	22.5%	-40.0%
(15) International	107.7%	115.1%	6.9%	69.5%	104.4%	50.2%
(16) Reins. Prop. / Fin.	50.7%	50.7%	0.0%	41.5%	34.3%	-17.3%
(17) Reins. Liab.	59.0%	52.0%	-11.9%	65.6%	63.6%	-2.9%
(18) PL	61.4%	60.0%	-2.4%	134.5%	147.2%	9.5%
(14) Financial / Mortgage	185.4%	192.9%	4.0%	6.0%	0.1%	-98.2%
(19) Warranty	28.6%	23.3%	-18.6%	31.6%	31.2%	-1.3%
Average Risk Factor- all Lines	23.8%	23.8%	-0.1%	38.3%	37.6%	-1.9%
Average Risk Factor- 10-Yr Lines	26.9%	26.7%	-0.5%	38.7%	39.0%	0.9%
Average Risk Factor- 2-Yr Lines	16.0%	16.3%	1.6%	34.4%	21.8%	-36.6%

Comparison of Risk Factors
2020 RBC Formula versus 2017 Indicated

(1)	(2)	(3)	(4)	(5)	(6)	(7)
	PRC%s			RRC%s		
Line	2020 RBC Formula	Indicated (2017 Data)	% Change	2020 RBC Formula	Indicated (2017 Data)	% Change
(1) H/F	25.4%	24.9%	-1.7%	21.3%	22.3%	4.5%
(2) PPA	19.7%	20.4%	3.2%	17.9%	20.1%	12.5%
(3) CA	29.6%	30.8%	4.0%	27.6%	36.1%	30.9%
(4) WC	30.6%	29.1%	-4.7%	34.4%	33.5%	-2.6%
(5) CMP	25.7%	25.3%	-1.6%	49.4%	49.9%	1.0%
(6) MPL Occ.	92.3%	73.5%	-20.3%	38.3%	26.5%	-30.7%
(7) MPL C-M	38.5%	40.4%	5.0%	27.6%	9.4%	-66.0%
(8) SL	27.6%	29.1%	5.2%	30.4%	41.5%	36.5%
(9) OL	31.7%	31.8%	0.3%	53.1%	52.7%	-0.7%
(11) Spec. Prop.	18.0%	13.2%	-26.6%	24.6%	27.8%	12.9%
(12) APD	6.8%	6.9%	1.5%	15.5%	13.2%	-14.6%
(10) Fidelity / Surety	35.4%	16.6%	-53.2%	37.1%	60.0%	61.8%
(13) Other	19.1%	18.9%	-1.0%	22.0%	22.5%	2.3%
(15) International	67.3%	115.1%	71.0%	35.9%	104.4%	190.9%
(16) Reins. Prop. / Fin.	50.7%	50.7%	0.1%	41.5%	34.3%	-17.3%
(17) Reins. Liab.	59.0%	52.0%	-11.9%	65.6%	63.6%	-3.0%
(18) PL	59.3%	60.0%	1.2%	80.2%	147.2%	83.6%
(14) Financial / Mortgage	93.9%	192.9%	105.4%	17.9%	0.1%	-99.4%
(19) Warranty	11.2%	23.3%	108.0%	37.1%	31.2%	-15.8%
Average Risk Factor- all Lines	23.4%	23.8%	1.6%	36.2%	37.6%	3.8%
Average Risk Factor- 10-Yr Lines	26.9%	26.7%	-0.5%	37.5%	39.0%	4.2%
Average Risk Factor- 2-Yr Lines	14.6%	16.3%	11.6%	22.6%	21.8%	-3.2%

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

MEMORANDUM

TO: Tom Bostko (OH), Chair, Capital Adequacy (E) Task Force

FROM: Philip Barlow (DC), Chair, Life Risk-Based Capital (E) Working Group

DATE: January 21, 2021

RE: Recommendation Regarding Risk-Based Capital Charge for Guaranty Association Assessment Risk

The Life Risk-Based Capital (E) Working Group received a request from the Capital Adequacy (E) Task Force to review the referral letter regarding adopted amendments to the *Life and Health Insurance Guaranty Association Model Act*, Model #520. The referral outlined significant amendments to Model #520, including: 1) broadening the assessment base for long-term care insurance (LTCI) insolvencies to include both life and health insurers and splitting the assessment 50%/50% between the life and health insurers; 2) clarifying the guaranty associations' coverage of LTCI; and 3) including health maintenance organizations (HMOs) as members of the guaranty association, similar to other health insurers. The referral letter requested that the Task Force consider if changes were warranted to the life RBC formula in light of the changes made to Model #520. The reason for this item being referred to the Working Group was concern with the fact that the C-4a risk component is based on the amount of guaranty fund assessments. The risk charge is based on the maximum amount of assessments in any one year for a life company, and that is not affected by the changes to Model #520.

Based on the current instructions and reporting, the Working Group does not believe that modifications to the life RBC formula are required for the change to Model #520.

The recommendation above does not preclude the Working Group from potential changes to long-term care or the business risk component charge in the future.

If you have any questions regarding this memorandum, please contact me at philip.barlow@dc.gov or Dave Fleming (NAIC) at dfleming@naic.org.

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Capital Adequacy (E) Task Force

RBC Proposal Form

[X] Capital Adequacy (E) Task Force	[X] Health RBC (E) Working Group	[ ] Life RBC (E) Working Group
[ ] Catastrophe Risk (E) Subgroup	[ ] Investment RBC (E) Working Group	[ ] Operational Risk (E) Subgroup
[ ] C3 Phase II/ AG43 (E/A) Subgroup	[X] P/C RBC (E) Working Group	[ ] Longevity Risk (A/E) Subgroup

	DATE: 10-15-20	**FOR NAIC USE ONLY**
CONTACT PERSON:	Jane Barr	Agenda Item # 2020-10-CA
TELEPHONE:		Year 2021
EMAIL ADDRESS:		**DISPOSITION**
ON BEHALF OF:	Capital Adequacy Task Force	[ ] ADOPTED
NAME:	Tom Botsko	[ ] REJECTED
TITLE:		[ ] DEFERRED TO
AFFILIATION:		[ ] REFERRED TO OTHER NAIC GROUP
ADDRESS:		[X] EXPOSED 12/11/2020
		[ ] OTHER (SPECIFY)

IDENTIFICATION OF SOURCE AND FORM(S)/INSTRUCTIONS TO BE CHANGED

[X] Health RBC Blanks [X] Property/Casualty RBC Blanks [ ] Life and Fraternal RBC Instructions
[X] Health RBC Instructions [X] Property/Casualty RBC Instructions [ ] Life and Fraternal RBC Blanks
[ ] OTHER _____

DESCRIPTION OF CHANGE(S)

Modified the structure for the bonds to pull directly from Schedule D, Schedule DA and Schedule E footnotes for the 20 RBC bond designations. Exempt bonds (Line 1) is pulled direct from Schedule D, Part 1, Col. 11, Line 0599999; Schedule DA, Part 1, Col. 7, Line 0599999; and Schedule E, Part 2, Col. 7, Line 0599999 + 8599999.

Hybrid securities will be incorporated into the bonds.

P/C blanks and instruction pages impacted: PR006, PR007, PR011, PR015, PR030, PR031 and PR032.
Health blanks and instruction pages impacted: XR006, XR007.1, XR007.2, XR009, XR011, XR023 and XR024.

REASON OR JUSTIFICATION FOR CHANGE **

The structure of the bonds reported in the health and P/C RBC formulas will be modified to pull from the footnotes of Schedule D, Part 1; Schedule DA, Part 1; and Schedule E, Part 2 for greater consistency and transparency in the RBC reporting. Hybrid securities reported as in Schedule D, Part 1; Schedule DA, Part 1; and Schedule E, Part 2 will be reported as a bond in on the Bonds pages and removed as a separate section in the health and P/C RBC blanks (XR009 and PR007).

Once the factors have been finalized, they will be incorporated into the proposal.

Additional Staff Comments:

10/27/20 jdb Exposed for a 45-day comment period.
01/12/21 cgb Editorial change made to page XR008 to strike-through the "Schedule E, Part 2" in line description and "in part" reference in the Annual Statement Source column for Line (30).

**** This section must be completed on all forms.** **Revised 2-2019**

OFF-BALANCE SHEET SECURITY LENDING COLLATERAL AND SCHEDULE DL, PART 1 ASSETS
XR006

Security lending programs are required to maintain collateral. Some entities post the collateral supporting security lending programs on their financial statements and incur the related risk charges on those assets. Other entities have collateral that is not recorded on their financial statements. While not recorded on the financial statements of the company, such collateral has risks that are not otherwise captured in the RBC formula.

The collateral in these accounts is maintained by a third party (typically a bank or other agent). The collateral agent maintains on behalf of the company detail asset listings of the collateral assets, and this data is the source for preparation of this schedule. The company should maintain such asset listings, at a minimum CUSIP, market value, book/adjusted carrying value, and maturity date.

The asset risk charges are derived from existing RBC factors for bonds, preferred and common stocks, other invested assets, and invested assets not otherwise classified (aggregate write-ins).

Specific Instructions for Application of the Formula

Column (2) – Schedule DL, Part 1 Book/Adjusted Carrying Value comes from Annual Statement Schedule DL, Part 1, Column (6) Securities Lending Collateral Assets reported On-Balance Sheet (Assets Page, Line 10).

Off-balance sheet collateral included in General Interrogatories Part 1, Lines 24.05 and 24.06 of the annual statement should agree with Line (40), Column (1).

Lines (1) through (27) – Bonds – Bond factors described on page XR007 – Fixed Income Assets.

Line (28) through (34) – Preferred Stock – Preferred stock factors described on page XR010 – Equity Assets.

Line (35) – Common Stock – Common stock factors described on page XR010 – Equity Assets.

Line (36) – Real Estate and Property and Equipment Assets – Real Estate and Property and Equipment Assets factors described on page XR011 – Property & Equipment Assets.

Line (37) – Other Invested Assets – Other invested assets factor described on page XR008 – Fixed Income Assets.

Line (38) – Mortgage Loans on Real Estate – Mortgage Loans on Real Estate factors described on page XR008 – Fixed Income Assets.

Line (39) – Cash, Cash Equivalents and Short-Term Investments – Cash, Cash Equivalents and Short-Term Investments factors described on page XR008 – Fixed Income Assets.

FIXED INCOME ASSETS
XR007 AND XR008

The RBC requirement for fixed income assets is largely driven by the default risk on those assets. There are two major subcategories: Bonds and Miscellaneous. Bonds include item that meet the definition of a bond, regardless if the bond is long-term (reported on Schedule D-1), short-term (reported on schedule DA) or a cash equivalent

(reported on Schedule E-2.) Miscellaneous fixed income assets include non-bond items reported on the cash equivalent and short-term schedules, derivatives, mortgage loans, collateral loans, and other items reported on Schedule BA: Other Long-Term Invested Assets.

Bonds (XR007)

The bond factors for investment grade bonds (NAIC Designation Category (1.A-2.C) are based on cash flow modeling. Each bond of a portfolio was annually tested for default (based on a "roll of the dice") where the default probability varies by NAIC Designation Category and that year's economic environment .The default probabilities were based on historical data intended to reflect a complete business cycle of favorable and unfavorable credit environments.
The risk of default was measured over a ___-year time horizon, based on the duration of assets or liabilities held for health companies.

The factors for NAIC Designation Category 3.A to 6 recognize that these non-investment grade bonds are reported at the lower of amortized cost or fair value. These bond risk factors are based on the market value fluctuation for each of the NAIC designation category compared to the market value fluctuation of stocks during the 2008-2009 financial crisis.

While the life and property/casualty formulas have a separate calculation for the bond size factor (based on the number of issuers in the RBC filer's portfolio), the health formula does not include a separate calculation, instead a bond size component was incorporated into the bond factors. A representative portfolio of 382 issuers was used in calculating the bond risk factors.

There is no RBC requirement for bonds guaranteed by the full faith and credit of the United States, Other U.S. Government Obligations, and securities on the NAIC U.S. Government Money Market Fund List because it is assumed that there is no default risk associated with U.S. Government issued securities.

The book/adjusted carrying value of all bonds should be reported in Columns (1), (2) or (3). The bonds are split into twenty-one different risk classifications. These risk classifications are based on the NAIC Designation Category as defined and permitted in the Purposes and Procedures Manual of the NAIC Investment Analysis Office. The subtotal of Columns (1), (2) and (3) will be calculated in Colum (4). The RBC requirement will be automatically calculated in Column (5).

Miscellaneous Fixed Income Assets (XR008)

The factor for cash is 0.3 percent. It is recognized that there is a small risk related to possible insolvency of the bank where cash deposits are held. This factor was based on the original unaffiliated NAIC 01 bond risk factor prior to the increased granularity of the NAIC Designation Categories in 2021, and reflects the short-term nature of this risk. The required risk-based capital for cash will not be less than zero, even if the company's cash position is negative.

The Short-Term Investments to be included in this section are those short-term investments not reflected elsewhere in the formula. The 0.3 percent factor is equal to the factor for cash. The amount reported in Line (35) reflects the total from Schedule DA: Short-Term Investments (Line 33), less the short-term bonds (Line 34). (The short-term bonds reported in Line (34) should equal Schedule DA, Part 1, Column 7, Line 8399999**.)**

Mortgage loans (reported on Schedule B) and Derivatives (reported on Schedule DB) receive a factor of 5 percent, consistent with other risk-based capital formulas studied by the Working Group.

The following investment types are captured on Schedule BA: Other Long-Term Invested Assets. Specific factors have been established for certain Schedule BA assets ased on the nature of the investment. Those Schedule BA assets not specifically identified below receive a 20 percent factor (Line (43)).

- Collateral Loans reported on Line (40) receive a factor of 5 percent, consistent with other risk-based capital formulas studied by the Working Group.

- Working Capital Finance Investments: The book adjusted carrying value of NAIC 01 and 02 Working Capital Finance Investments, Lines (41) and (42), should equal the Notes to Financial Statement, Lines 5M(01a) and 5M(01b), Column 3 of the annual statement.

- Low income housing tax credit investments are reported in Column (1) in accordance with *SSAP No. 93—Low Income Housing Tax Credit Property Investments*.

    - Federal Guaranteed Low-Income Housing Tax Credit (LIHTC) investments are to be included in Line (44). There must be an all-inclusive guarantee from an ARO-rated entity that guarantees the yield on the investment.

    - Federal Non-Guaranteed LIHTC investments with the following risk mitigation factors are to be included in Line (45):

        a) A level of leverage below 50 percent. For a LIHTC Fund, the level of leverage is measured at the fund level.
        b) There is a tax credit guarantee agreement from general partner or managing member. This agreement requires the general partner or managing member to reimburse investors for any shortfalls in tax credits due to errors of compliance, for the life of the partnership. For an LIHTC fund, a tax credit guarantee is required from the developers of the lower-tier LIHTC properties to the upper-tier partnership.

    - State Guaranteed LIHTC investments that at a minimum meet the federal requirements for guaranteed LIHTC investments are to be included in Line (46).

    - State Non-Guaranteed LIHTC investments that at a minimum meet the federal requirements for non-guaranteed LIHTC investments are to be included on Line (47).

    - All Other LIHTC investments, state and federal LIHTC investments that do not meet the requirements of Lines (44) through (47) would be reported on Line (48).

EQUITY ASSETS
XR010

Unaffiliated Preferred Stocks

Experience data to develop preferred stock factors is not readily available; however, it is believed that preferred stocks are somewhat more likely to default than bonds. The loss on default would be somewhat higher than that experienced on bonds; however, formula factors are equal to bond factors.

The RBC requirements for unaffiliated preferred stocks are based on the NAIC designation. Column (1) amounts are from Schedule D, Part 2, Section 1 not including affiliated preferred stock. The preferred stocks must be broken out by asset designation (NAIC 01 through NAIC 06) and these individual groups are to be entered in the appropriate lines. The total amount of unaffiliated preferred stock reported should equal annual statement Page 2, Column 3, Line 2.1, less any affiliated preferred stock in Schedule D Summary by Country, Column 1, Line 18.

Unaffiliated Common Stock

Federal Home Loan Bank Stock has characteristics more like a fixed income instrument rather than common stock. A 2.3 percent factor was chosen. The factor for other unaffiliated common stock is based on studies which indicate that a 10 percent to 12 percent factor is needed to provide capital to cover approximately 95 percent of the greatest losses in common stock over a one-year future period. The higher factor of 15 percent contained in the formula reflects the increased risk when testing a period in excess of one year. This factor assumes capital losses are unrealized and not subject to favorable tax treatment at the time of loss in market value.

ASSET CONCENTRATION
XR012

The purpose of the asset concentration calculation is to reflect the additional risk of high concentrations of certain types of assets in single exposures, termed "issuers." An issuer is a single entity, such as IBM or the Ford Motor Company. When the reporting entity has a large portion of its asset portfolio concentrated in only a few issuers, there is a heightened risk of insolvency if one of those issuers should default. An issuer may be represented in the reporting entity's investment portfolio by a single security designation, such as a large block of NAIC Designation Category 2.A bonds, or a combination of various securities, such as common stocks, preferred stocks, and bonds. The additional RBC for asset concentration is applied to the ten largest issuers.

Concentrated investments in certain types of assets are not expected to represent an additional risk over and above the general risk of the asset itself. Therefore, prior to determining the ten largest issuers, you should exclude those assets that are exempt from the asset concentration factor. Asset types that are excluded from the calculation include: NAIC 06 bonds and unaffiliated preferred stock; affiliated common stock; affiliated preferred stock; property and equipment; U.S. government full faith and credit, other U.S. government obligations, and NAIC U.S. government money market fund list securities; NAIC 01 bonds and unaffiliated preferred stock; any other asset categories with risk-based capital factors less than 1 percent**,** and investment companies (mutual funds) and common trust funds that are diversified within the meaning of the federal Investment Company Act of 1940 [Section 5(b) (1)]. The pro rata share of individual securities within an investment company (mutual fund) or common trust fund are to be included in the determination of concentrated investments, subject to the exclusions identified.

With respect to investment companies (mutual funds) and common trust funds, the reporting entity is responsible for maintaining the appropriate documentation as evidence that such is diversified within the meaning of the federal Investment Company Act and providing this information upon request of the Commissioner, Director or Superintendent of the Department of Insurance. The reporting entity is also responsible for maintaining a listing of the individual securities and corresponding book/adjusted carrying values making up its investment companies (mutual funds) and common trust funds portfolio, in order to determine whether a concentration charge is necessary. This information should be provided to the Commissioner, Director or Superintendent upon request.

The assets that **ARE INCLUDED** in the calculation when determining the 10 largest issuers are as follows:

NAIC Designation Category 2.A – 2.C Bonds
NAIC Designation Category 3.A – 3.C Bonds
NAIC Designation Category 4.A – 4.C Bonds
NAIC Designation Category 5.A – 5.C Bonds
Collateral Loans
Mortgage Loans
NAIC 02 Unaffiliated Preferred Stock
NAIC 03 Unaffiliated Preferred Stock
NAIC 04 Unaffiliated Preferred Stock
NAIC 05 Unaffiliated Preferred Stock
Other Long-Term Assets
NAIC 02 Working Capital Finance Investments
Federal Guaranteed Low Income Housing Tax Credits
Federal Non-Guaranteed Low Income Housing Tax Credits
State Guaranteed Low Income Housing Tax Credits
State Non-Guaranteed Low Income Housing Tax Credits

All Other Low Income Housing Tax Credits
Unaffiliated Common Stock

The concentration factor basically doubles the risk-based capital factor (up to a maximum of 30 percent) for assets held in the 10 largest issuers. Since the risk-based capital of the assets included in the concentration factor has already been counted once in the basic formula, this factor itself only serves to add an additional risk-based capital requirement on these assets.

The name of each of the largest 10 issuers is entered at the top of the table and the appropriate statement amounts are entered in Column (2), Lines (1) through (26). Aggregate all similar asset types before entering the amount in Column (2). To determine the 10 largest issuers, first pool all of the assets subject to the concentration factor. From this pool, aggregate the various securities by issuer. The aggregate book/adjusted carrying values for the assets are computed, and the 10 largest are subject to the concentration factor. For example, an organization might own $6,000,000 in NAIC Designation Category 2.A bonds of IBM, plus $4,000,000 in NAIC Designation Category 2.C plus $5,000,000 of common stock. The total investment in that issuer is $15,000,000. If that is the largest issuer, then the identifier ("IBM Corporation") would be entered in the space allowed for the first Issuer Name, and the $6,000,000 would be entered under the book/adjusted carrying value column for Line (1) (NAIC Designation Category 2.A Bonds) $4,000,000 would be entered on Line (3) (NAIC Designation Category 2.C Bonds) and the $5,000,000 would be entered on Line (22) (Unaffiliated Common Stock).

Replicated assets other than synthetically created indices should be included in the asset concentration calculation in the same manner as other assets.

OFF-BALANCE SHEET SECURITY LENDING COLLATERAL AND SCHEDULE DL, PART 1 ASSETS

Asset Category	Annual Statement Source	(1) Off-Balance Sheet Collateral Book/Adjusted Carrying Value	(2) Schedule DL, Part 1 Book/Adjusted Carrying Value	(3) Subtotal	Factor	(4) RBC Requirement
Fixed Income Assets						
Bonds						
(1) **NAIC 1.A - U.S. Government Full Faith and Credit, Other U.S. Government Obligations, and NAIC U.S. Government Money Market Fund List (Refer to A/S Instructions)**	Company Records	0	0	0	0.000	0
(2) NAIC Designation Category 1.A Bonds	Company Records	0	0	0	0.000	0
(3) NAIC Designation Category 1.B Bonds	Company Records	0	0	0	0.000	0
(4) NAIC Designation Category 1.C Bonds	Company Records	0	0	0	0.000	0
(5) NAIC Designation Category 1.D Bonds	Company Records	0	0	0	0.000	0
(6) NAIC Designation Category 1.E Bonds	Company Records	0	0	0	0.000	0
(7) NAIC Designation Category 1.F Bonds	Company Records	0	0	0	0.000	0
(8) NAIC Designation Category 1.G Bonds	Company Records	0	0	0	0.000	0
(9) Total NAIC 01 Bonds	Sum of Lines (1) through (8)	0	0	0		0
(10) NAIC Designation Category 2.A Bonds	Company Records	0	0	0	0.000	0
(11) NAIC Designation Category 2.B Bonds	Company Records	0	0	0	0.000	0
(12) NAIC Designation Category 2.C Bonds	Company Records	0	0	0	0.000	0
(13) Total NAIC 02 Bonds	Sum of Lines (10) through (12)	0	0	0		0
(14) NAIC Designation Category 3.A Bonds	Company Records	0	0	0	0.000	0
(15) NAIC Designation Category 3.B Bonds	Company Records	0	0	0	0.000	0
(16) NAIC Designation Category 3.C Bonds	Company Records	0	0	0	0.000	0
(17) Total NAIC 03 Bonds	Sum of Lines (14) through (16)	0	0	0		0
(18) NAIC Designation Category 4.A Bonds	Company Records	0	0	0	0.000	0
(19) NAIC Designation Category 4.B Bonds	Company Records	0	0	0	0.000	0
(20) NAIC Designation Category 4.C Bonds	Company Records	0	0	0	0.000	0
(21) Total NAIC 04 Bonds	Sum of Lines (18) through (20)	0	0	0		0
(22) NAIC Designation Category 5.A Bonds	Company Records	0	0	0	0.000	0
(23) NAIC Designation Category 5.B Bonds	Company Records	0	0	0	0.000	0
(24) NAIC Designation Category 5.C Bonds	Company Records	0	0	0	0.000	0
(25) Total NAIC 05 Bonds	Sum of Lines (22) through (24)	0	0	0		0
(26) Total NAIC 06 Bonds	Company Records	0	0	0	0.000	0
(27) Total Bonds	**Lines (9) + (13) + (17) + (21) + (25) + (26)**	0	0	0		0
Equity Assets						
Preferred Stock - Unaffiliated						
(28) NAIC 01 Unaffiliated Preferred Stock	Company Records			0	0.003	0
(29) NAIC 02 Unaffiliated Preferred Stock	Company Records			0	0.010	0
(30) NAIC 03 Unaffiliated Preferred Stock	Company Records			0	0.020	0
(31) NAIC 04 Unaffiliated Preferred Stock	Company Records			0	0.045	0
(32) NAIC 05 Unaffiliated Preferred Stock	Company Records			0	0.100	0
(33) NAIC 06 Unaffiliated Preferred Stock	Company Records			0	0.300	0
(34) Total Unaffiliated Preferred Stock	Sum of Lines (28) through (33)	0	0	0		0
(35) Unaffiliated Common Stock	Company Records			0	0.150	0
(36) Real Estate and Property & Equipment Assets	Company Records			0	0.100	0
(37) Other Invested Assets	Company Records			0	0.200	0
(38) Mortgage Loans on Real Estate	Company Records			0	0.050	0
(39) Cash, Cash Equivalents and Short-Term Investments (Not reported on Bonds above)	Company Records			0	0.003	0
(40) Total	Lines (27) + (34) + (35) + (36) + (37) + (38) + (39)	0	0	0		0

Denotes items that must be manually entered on the filing software

FIXED INCOME ASSETS
BONDS

		Annual Statement Source	(1) Long-Term Bonds Schedule D, Part 1 Book/Adjusted Carrying Value L2 thru 26 = Sch D Pt1F	(2) Short-Term Investments Schedule DA, Part 1 Book/Adjusted Carrying Value L2 thru 26 = Sch DA Pt1F	(3) Cash Equivalents Schedule E, Part 2 Book/Adjusted Carrying Value L2 thr 26 = Sch E Pt2F	(4) Subtotal C(1) + C(2) + C(3)	Factor	(5) RBC Requirement
(1)	NAIC 1.A - U.S. Government Full Faith and Credit, Other U.S. Government Obligations, and NAIC U.S. Government Money Market Fund List (Refer to A/S Instructions)	C(1)=Sch D, Pt 1, C11 L0599999 C(2)=Sch DA, Pt 1, C7 L0599999 C(3)=Sch E, Pt 2, C7 L0599999 + L8599999	0	0	0	0	0.000	0
(2)	NAIC Designation Category 1.A	Footnote Amt 1 L000001A- L(1)	0	0	0	0	0.000	0
(3)	NAIC Designation Category 1.B	Footnote Amt 2 L000001A	0	0	0	0	0.000	0
(4)	NAIC Designation Category 1.C	Footnote Amt 3 L000001A	0	0	0	0	0.000	0
(5)	NAIC Designation Category 1.D	Footnote Amt 4 L000001A	0	0	0	0	0.000	0
(6)	NAIC Designation Category 1.E	Footnote Amt 5 L000001A	0	0	0	0	0.000	0
(7)	NAIC Designation Category 1.F	Footnote Amt 6 L000001A	0	0	0	0	0.000	0
(8)	NAIC Designation Category 1.G	Footnote Amt 7 L000001A	0	0	0	0	0.000	0
(9)	Total NAIC 01 Bonds	Sum of Ls (1) through (8)	0	0	0	0		0
(10)	NAIC Designation Category 2.A	Footnote Amt 1 L000001B	0	0	0	0	0.000	0
(11)	NAIC Designation Category 2.B	Footnote Amt 2 L000001B	0	0	0	0	0.000	0
(12)	NAIC Designation Category 2.C	Footnote Amt 3 L000001B	0	0	0	0	0.000	0
(13)	Total NAIC 02 Bonds	Sum of Ls (10) through (12)	0	0	0	0		0
(14)	NAIC Designation Category 3.A	Footnote Amt 1 L000001C	0	0	0	0	0.000	0
(15)	NAIC Designation Category 3.B	Footnote Amt 2 L000001C	0	0	0	0	0.000	0
(16)	NAIC Designation Category 3.C	Footnote Amt 3 L000001C	0	0	0	0	0.000	0
(17)	Total NAIC 03 Bonds	Sum of Ls (14) through (16)	0	0	0	0		0
(18)	NAIC Designation Category 4.A	Footnote Amt 1 L000001D	0	0	0	0	0.000	0
(19)	NAIC Designation Category 4.B	Footnote Amt 2 L000001D	0	0	0	0	0.000	0
(20)	NAIC Designation Category 4.C	Footnote Amt 3 L000001D	0	0	0	0	0.000	0
(21)	Total NAIC 04 Bonds	Sum of Ls (18) through (20)	0	0	0	0		0
(22)	NAIC Designation Category 5.A	Footnote Amt 1 L000001E	0	0	0	0	0.000	0
(23)	NAIC Designation Category 5.B	Footnote Amt 2 L000001E	0	0	0	0	0.000	0
(24)	NAIC Designation Category 5.C	Footnote Amt 3 L000001E	0	0	0	0	0.000	0
(25)	Total NAIC 05 Bonds	Sum of Ls (22) through (24)	0	0	0	0	0.000	0
(26)	Total NAIC 06 Bonds	Footnote Amt 1 L000001F	0	0	0	0	0.000	0
(27)	Total Bonds RBC	L(9) + L(13) + L(17) + L(21) + L(25) + L(26)	0	0	0	0		0

Denotes items that must be vendor linked.

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FIXED INCOME ASSETS (cont.)
MISCELLANEOUS FIXED INCOME ASSETS

		Annual Statement Source	(1) Bk/Adj Carrying Value	Factor	(2) RBC Requirement
(28)	Cash	Page 2, Line 5, inside amount 1		0.0030	$0
(29)	Cash Equivalents	Page 2, Line 5, inside amount 2			
(30)	Less: Cash Equivalents, Total Bonds ~~included in Schedule D, Part 1A~~	Schedule E, Part 2, Column 7, Line 839999 ~~, in part~~			
(31)	Less: Exempt Money Market Mutual Funds ~~*~~ as Identified by SVO	Schedule E, Part 2, Column 7, Line 859999			
(32)	Net Cash Equivalents	Lines (29) - (30) - (31)	$0	0.0030	$0
(33)	Short-Term Investments	Page 2, Line 5, inside amount 3			
(34)	Short-Term Bonds ~~*~~	Schedule DA, Part 1, Column 7, Line 839999			
(35)	Total Other Short -Term Investments	Lines (33) - (34)	$0	0.0030	$0
(36)	Mortgage Loans - First Liens	Page 2, Column 3, Line 3.1		0.0500	$0
(37)	Mortgage Loans - Other Than First Liens	Page 2, Column 3, Line 3.2		0.0500	$0
(38)	Receivable for Securities	Page 2, Column 3, Line 9		0.0250	$0
(39)	Aggregate Write-Ins for Invested Assets	Page 2, Column 3, Line 11		0.0500	$0
(40)	Collateral Loans	Included in Page 2, Column 3, Line 8		0.0500	$0
(41)	NAIC 01 Working Capital Finance Investments	Notes to Financial Statement 5M(01a), Column 3		0.0038	$0
(42)	NAIC 02 Working Capital Finance Investments	Notes to Financial Statement 5M(01b), Column 3		0.0125	$0
(43)	Other Long-Term Invested Assets Excluding Collateral Loans and Working Capital Finance Investme	Included in Page 2, Column 3, Line		0.2000	$0
(44)	Federal Guaranteed Low Income Housing Tax Credits	Schedule BA Part 1, Column 12 Lines 3599999 + 3699999		0.0014	$0
(45)	Federal Non-Guaranteed Low Income Housing Tax Credits	Schedule BA Part 1, Column 12 Lines 3799999 + 3899999		0.0260	$0
(46)	State Guaranteed Low Income Housing Tax Credits	Schedule BA Part 1, Column 12 Lines 3999999 + 4099999		0.0014	$0
(47)	State Non-Guaranteed Low Income Housing Tax Credits	Schedule BA Part 1, Column 12 Lines 4199999 + 4299999		0.0260	$0
(48)	All Other Low Income Housing Tax Credits	Schedule BA Part 1, Column 12 Lines 4399999 + 4499999		0.1500	$0
(49)	Total Other Long-Term Invested Assets (Page 2, Col 3, Line 8)	Lines (40) + (41) + (42) + (43) + (44) + (45) + (46) + (47) + (48)	$0		$0
(50)	Derivatives	Page 2, Column 3, Line 7		0.0500	$0
(51)	Total Fixed Income Assets RBC	Lines (27) + (28) + (32) + (35) + (36) + (37) + (38) + (39) + (49) + (50)			$0

Denotes items that must be manually entered on filing software.

~~* These bonds appear in page XR007 Schedule D Part 1A Section 1 and are already recognized in the Bond portion of the formula.~~

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EQUITY ASSETS

		Annual Statement Source	(1) Bk/Adj Carrying Value	Factor	(2) RBC Requirement
PREFERRED STOCK - UNAFFILIATED					
(1)	NAIC 01 Preferred Stock	Included in Schedule D, Part 2, Section 1		0.003	
(2)	NAIC 02 Preferred Stock	Included in Schedule D, Part 2, Section 1		0.010	
(3)	NAIC 03 Preferred Stock	Included in Schedule D, Part 2, Section 1		0.020	
(4)	NAIC 04 Preferred Stock	Included in Schedule D, Part 2, Section 1		0.045	
(5)	NAIC 05 Preferred Stock	Included in Schedule D, Part 2, Section 1		0.100	
(6)	NAIC 06 Preferred Stock	Included in Schedule D, Part 2, Section 1		0.300	
(7)	~~Sub~~Total - Unaffiliated Preferred Stock	Sum of Lines (1) through (6)			
(Should equal Page 2, Column 3, Line 2.1 less Sch D Sum, Column 1, Line 18)					
~~HYBRID SECURITIES - UNAFFILIATED~~					
~~(8)~~	~~NAIC 01 Hybrid Securities~~	~~Schedule D, Part 1A, Section 1, Column 7, Line 7.1~~		~~0.003~~	
~~(9)~~	~~NAIC 02 Hybrid Securities~~	~~Schedule D, Part 1A, Section 1, Column 7, Line 7.2~~		~~0.010~~	
~~(10)~~	~~NAIC 03 Hybrid Securities~~	~~Schedule D, Part 1A, Section 1, Column 7, Line 7.3~~		~~0.020~~	
~~(11)~~	~~NAIC 04 Hybrid Securities~~	~~Schedule D, Part 1A, Section 1, Column 7, Line 7.4~~		~~0.045~~	
~~(12)~~	~~NAIC 05 Hybrid Securities~~	~~Schedule D, Part 1A, Section 1, Column 7, Line 7.5~~		~~0.100~~	
~~(13)~~	~~NAIC 06 Hybrid Securities~~	~~Schedule D, Part 1A, Section 1, Column 7, Line 7.6~~		~~0.300~~	
~~(14)~~	~~Subtotal - Hybrid Securities~~	~~Sum of Lines (8) through (13)~~			
~~(15)~~	~~Total Unaffiliated Preferred Stock and Hybrids~~	~~Lines (7) + (14)~~			
COMMON STOCK - UNAFFILIATED					
(8)	Federal Home Loan Bank Stock	Company Records		0.023	
(9)	Total Common Stock	Schedule D, Summary, Column 1, Line 25			
(10)	Affiliated Common Stock	Schedule D, Summary, Column 1, Line 24			
(11)	Other Unaffiliated Common Stock	**Lines (9) - (8) - (10)**		0.150	
(12)	Total Unaffiliated Common Stock	**Lines (8) + (11)**			

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ASSET CONCENTRATION

Issuer		(1) Issuer Name	(2) Bk/Adj Carrying Value	Factor	(3) Additional RBC
01	**(1) NAIC Designation Category 2.A Bonds**			**0.0000**	**$0**
01	**(2) NAIC Designation Category 2.B Bonds**			**0.0000**	**$0**
01	**(3) NAIC Designation Category 2.C Bonds**			**0.0000**	**$0**
01	**(4) NAIC Designation Category 3.A Bonds**			**0.0000**	**$0**
01	**(5) NAIC Designation Category 3.B Bonds**			**0.0000**	**$0**
01	**(6) NAIC Designation Category 3.C Bonds**			**0.0000**	**$0**
01	**(7) NAIC Designation Category 4.A Bonds**			**0.0000**	**$0**
01	**(8) NAIC Designation Category 4.B Bonds**			**0.0000**	**$0**
01	**(9) NAIC Designation Category 4.C Bonds**			**0.0000**	**$0**
01	**(10) NAIC Designation Category 5.A Bonds**			**0.0000**	**$0**
01	**(11) NAIC Designation Category 5.B Bonds**			**0.0000**	**$0**
01	**(12) NAIC Designation Category 5.C Bonds**			**0.0000**	**$0**
01	**(13)** Collateral Loans			0.0500	$0
01	**(14)** Mortgages			0.0500	$0
01	**(15)** NAIC 02 Unaffiliated Preferred Stock			0.0100	$0
01	**(16)** NAIC 03 Unaffiliated Preferred Stock			0.0200	$0
01	**(17)** NAIC 04 Unaffiliated Preferred Stock			0.0450	$0
01	**(18)** NAIC 05 Unaffiliated Preferred Stock			0.1000	$0
~~01~~	~~**(19)** NAIC 02 Hybrid Securities~~			~~0.0100~~	~~$0~~
~~01~~	~~**(20)** NAIC 03 Hybrid Securities~~			~~0.0200~~	~~$0~~
~~01~~	~~**(21)** NAIC 04 Hybrid Securities~~			~~0.0450~~	~~$0~~
~~01~~	~~**(22)** NAIC 05 Hybrid Securities~~			~~0.1000~~	~~$0~~
01	**(19)** Other Long-Term Invested Assets			0.1000	$0
01	**(20)** NAIC 02 Working Capital Finance Investments			0.0125	$0
01	**(21)** Federal Guaranteed Low Income Housing Tax Credits			0.0014	$0
01	**(22)** Federal Non-Guaranteed Low Income Housing Tax Credits			0.0260	$0
01	**(23)** State Guaranteed Low Income Housing Tax Credits			0.0014	$0
01	**(24)** State Non-Guaranteed Low Income Housing Tax Credits			0.0260	$0
01	**(25)** All Other Low Income Housing Tax Credits			0.1500	$0
01	**(26)** Unaffiliated Common Stock			0.1500	$0
01	**(27)** Total of Issuer = Lines (1) through **(26)**		$0		$0

Denotes items that must be manually entered on filing software.

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CALCULATION OF TOTAL RISK-BASED CAPITAL AFTER COVARIANCE

			(1) RBC Amount
H0 - INSURANCE AFFILIATES AND MISC. OTHER AMOUNTS			
(1)	Off-Balance Sheet Items	XR005, Off-Balance Sheet Page, Line (21)	$0
(2)	Directly Owned Insurer Subject to RBC	XR003, Affiliates Page, Line (1)	$0
(3)	Indirectly Owned Insurer Subject to RBC	XR003, Affiliates Page, Line (2)	$0
(4)	Directly Owned Health Entity Subject to RBC	XR003, Affiliates Page, Line (3)	$0
(5)	Indirectly Owned Health Entity Subject to RBC	XR003, Affiliates Page, Line (4)	$0
(6)	Directly Owned Alien Insurer	XR003, Affiliates Page, Line (7)	$0
(7)	Indirectly Owned Alien Insurers	XR003, Affiliates Page, Line (8)	$0
(8)	Total H0	Sum Lines (1) through (7)	$0
H1 - ASSET RISK - OTHER			
(9)	Investment Affiliates	XR003, Affiliates Page, Line (5)	$0
(10)	Holding Company Excess of Subsidiaries	XR003, Affiliates Page, Line (6)	$0
(11)	Investment in Parent	XR003, Affiliates Page, Line (9)	$0
(12)	Other Affiliates	XR003, Affiliates Page, Line (10)	$0
(13)	Fair Value Excess Affiliate Common Stock	XR003, Affiliates Page, Line (11)	$0
(14)	Fixed Income Assets	XR006, Off-Balance Sheet Collateral, Lines (27) + (37) + (38) + (39) + **XR008**, Fixed Income Assets Page Line (51)	$0
(15)	Replication & Mandatory Convertible Securities	**XR009**, Replication/MCS Page, Line (9999999)	$0
(16)	Unaffiliated Preferred Stock ~~**and Hybrid Securities**~~	XR006, Off-Balance Sheet Collateral, Line (34) + **XR010**, Equity Assets Page, Line **(7)**	$0
(17)	Unaffiliated Common Stock	XR006, Off-Balance Sheet Collateral, Line (35) + **XR010**, Equity Assets Page, Line **(12)**	$0
(18)	Property & Equipment	XR006, Off-Balance Sheet Collateral, Line (36) + **XR011**, Prop/Equip Assets Page, Line (9)	$0
(19)	Asset Concentration	**XR012**, Grand Total Asset Concentration Page, Line (**27**)	$0
(20)	Total H1	Sum Lines (9) through (19)	$0
H2 - UNDERWRITING RISK			
(21)	Net Underwriting Risk	**XR013**, Underwriting Risk Page, Line (21)	$0
(22)	Other Underwriting Risk	**XR015**, Underwriting Risk Page, Line (25.3)	$0
(23)	Disability Income	**XR015**, Underwriting Risk Page, Lines (26.3) + (27.3) + (28.3) + (29.3) + (30.6) + (31.3) + (32.3)	$0
(24)	Long-Term Care	**XR016**, Underwriting Risk Page, Line (41)	$0
(25)	Limited Benefit Plans	**XR017,** Underwriting Risk Page, Lines (42.2) + (43.6) + (44)	$0
(26)	Premium Stabilization Reserve	**XR017**, Underwriting Risk Page, Line (45)	$0
(27)	Total H2	Sum Lines (21) through (26)	$0

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CALCULATION OF TOTAL RISK-BASED CAPITAL AFTER COVARIANCE

			(1) RBC Amount
H3 - CREDIT RISK			
(28)	Total Reinsurance RBC	**XR020**, Credit Risk Page, Line (17)	$0
(29)	Intermediaries Credit Risk RBC	**XR020**, Credit Risk Page, Line (24)	$0
(30)	Total Other Receivables RBC	**XR021**, Credit Risk Page, Line (30)	$0
(31)	Total H3	Sum Lines (28) through (30)	$0
H4 - BUSINESS RISK			
(32)	Administrative Expense RBC	**XR022**, Business Risk Page, Line (7)	$0
(33)	Non-Underwritten and Limited Risk Business RBC	**XR022**, Business Risk Page, Line (11)	$0
(34)	Premiums Subject to Guaranty Fund Assessments	**XR022**, Business Risk Page, Line (12)	$0
(35)	Excessive Growth RBC	**XR022**, Business Risk Page, Line (19)	$0
(36)	Total H4	Sum Lines (32) through (35)	$0
(37)	RBC after Covariance Before Basic Operational Risk	H0 + Square Root of ($H1^2 + H2^2 + H3^2 + H4^2$)	$0
(38)	Basic Operational Risk	0.030 x Line (37)	$0
(39)	C-4a of U.S. Life Insurance Subsidiaries	Company Records	
(40)	Net Basic Operational Risk	Line (38) - (39) (Not less than zero)	$0
(41)	RBC After Covariance Including Basic Operational Risk	Lines (37) + (40)	$0
(42)	Authorized Control Level RBC	.50 x Line (41)	$0

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ASSETS
PR006 – PR014

PR006 - Bonds and Bond Size Factor Adjustment

Basis of General Bond Factors

The bond risk factors for investment grade bonds (NAIC Designation Category 1.A – 2.C) are based on cash flow modeling. Each bond of a portfolio was annually tested for default (based on a "roll of the dice") where the default probability varies by NAIC Designation category and that year's economic environment. The default probabilities were based on historical data intended to reflect a complete cycle of favorable and unfavorable credit environments. The risk of default was measured over a 5-year time horizon, selected considering the duration of property/casualty assets and liabilities.

The factors for NAIC Designation Category 3.A to 6 recognize that these non-investment grade bonds are reported at the lower of amortized cost or fair value. These bond risk factors are based on the market value fluctuation for each of the NAIC designation category compared to the market value fluctuation of stocks during the 2008-2009 financial crisis.

The bond risk factors are selected with consideration of the effect of the bond size factors.

Bond Size Factor

The bond factors assume a portfolio of 802 issuers. The size factor reflects that the risk increases as the number of bond issuers decreases. The bond size factor adjusts the computed RBC for those bonds that are subject to the size factor to more accurately reflect the risk.

The bond size factor is to be multiplied by the risk-based capital of the bonds subject to the size factor. This calculation produces the *additional* RBC required for a portfolio that has 801 or less bonds in it. Portfolios with 803 or more issuers will receive a discount. The bond size factor was developed as a step factor (as in a tax table) so that the overall factor decreases as the portfolio size increases. The bond size factors are the same for property/casualty and life insurance RBC Formulas.

Bonds should be aggregated by issuer (the first six digits of the CUSIP number should be used for aggregation). In determining the total number of issuers, do not count:

- U.S. government bonds that are direct and guaranteed and backed by the full faith and credit of the U.S. government, other U.S. Government Obligations, and NAIC U.S. Government Money Market Fund List which receive a zero factor (Definitions of these categories are in the Annual Statement Instructions).

The calculation shown below will not appear in the software but will be calculated automatically. However, you must enter the total number of issuers in the appropriate field on the RBC filing software. If you leave this field blank, the program will assume that there are less than 10 issuers and will default to the maximum bond size factor adjustment. The calculation to derive the bond size factor is:

	Source	(a) No of Issuers			(b) Wgtd Issuers
First 10	Co Records	_____	X	7.8=	_____
Next 90	Co Records	_____	X	1.75=	_____
Next 100	Co Records	_____	X	1.0 =	_____
Next 300	Co Records	_____	X	0.8 =	_____
Over 500	Co Records	_____	X	0.75 =	_____
Total	Co Records	_____			_____

Size Factor = Total Weighted Issuers/Total No of Issuers less 1

PR007 - Unaffiliated Preferred and Common Stock

Unaffiliated Preferred Stock

Detailed information on unaffiliated preferred stocks is found in Schedule D Part 2 Section 1 of the annual statement. The preferred stocks must be broken out by NAIC Designation (NAIC 01 through NAIC 06) and these individual groups are to be entered in the appropriate lines of the RBC software. The total amount of unaffiliated preferred stock reported should equal annual statement P2 L2.1 C3 less any affiliated preferred stock in Schedule D-Summary by Country C1 L18.

Unaffiliated Common Stock

The factor for other unaffiliated common stock is based on studies that indicate a 10 percent to 12 percent factor is needed to provide capital to cover approximately 95 percent of the greatest losses in common stock value over a one-year future period. The higher factor of 15 percent contained in the formula reflects the increased risk when testing a period in excess of one year. This factor assumes capital losses are unrealized and not subject to favorable tax treatment at the time loss in fair value occurs.

The total of all unaffiliated common stock reported should be equal to the total value of common stock in Schedule D-Summary by Country C1 L25 less the sum of Schedule D-Summary by Country C1 L24 and PR007, Column 1, Line 18.

PR009 - Miscellaneous Assets

Collateral loans and write-ins for invested assets are generally a small proportion of total portfolio value. A factor of 5 percent is consistent with other risk-based capital formulas studied by the working group.

The factor for cash is 0.3%. It is recognized that there is a small risk related to possible insolvency of the bank where cash deposits are held. This factor was based on the original unaffiliated NAIC 01 bond risk factor prior to the increased granularity of the NAIC Designation Categories in 2021, and reflects the short-term nature of this risk. The required risk-based capital for cash will not be less than zero, even if the company's cash position is negative.

If the book/adjusted carrying value of Aggregate Write-ins for Invested Assets (Page 2, Line 11, Column 3 of the annual statement) is less than zero, the RBC amount will be zero.

The Short-Term Investments to be included in this section are those short-term investments not reflected elsewhere in the formula. The 0.3% factor is equal to the factor for cash. The amount entered for short-term bonds should equal the total short-term investments found in Schedule DA Part 1 C7 L8399999. This amount is subtracted from the total of short-term investments, as they are captured with bonds on PR006.

PR011 - Asset Concentration

The purpose of the concentration factor is to reflect the additional risk of high concentrations in single exposures (represented by an issuer of a security or a mortgage borrower, etc.). The concentration factor basically doubles the risk-based capital factor (up to a maximum of 30 percent) of the 10 largest asset exposures excluding various low-risk categories or categories which already have a 30 percent factor. Since the risk-based capital of the assets included in the concentration factor has already been counted once in the basic formula, this factor itself only serves to add an additional risk-based capital requirement on these assets.

Concentrated investments in certain types of assets are not expected to represent an additional risk over and above the general risk of the asset itself. Therefore, prior to determining the 10 largest issuers, you should exclude those assets that are exempt from the asset concentration factor. Asset types that are excluded from the calculation include: NAIC 06 bonds and preferred stock, affiliated common stock, affiliated preferred stock, property and equipment, U.S. government guaranteed bonds, NAIC 01 bonds or preferred stock, any other asset categories with risk-based capital factors less that 1 percent, and investment companies (mutual funds) and common trust funds that are diversified within the meaning of the Investment Company Act of 1940 [Section 5(b) (1)]. The pro rata share of individual securities within an investment company (mutual fund) or common trust fund are to be included in the determination of concentrated investments, subject to the exclusions identified.

With respect to investment companies (mutual funds) and common trust funds, the reporting company is responsible for maintaining the appropriate documentation as evidence that such is diversified within the meaning of the Investment Company Act and provide this information upon request of the commissioner, director or superintendent of the department of insurance. The reporting company is also responsible for maintaining a listing of the individual securities and corresponding book/adjusted carrying values making up its investment companies (mutual funds) and common trust funds portfolio, in order to determine whether a concentration charge is necessary. This information should be provided to the commissioner, director or superintendent upon request.

The assets that ARE INCLUDED in the calculation are divided into two categories – Fixed Income Assets and Equity Assets. The following asset types should be aggregated to determine the 10 largest issuers:

FIXED INCOME ASSETS
Bonds – NAIC Designation Category 2.A
Bonds – NAIC Designation Category 2.B
Bonds – NAIC Designation Category 2.C
Bonds – NAIC Designation Category 3.A
Bonds – NAIC Designation Category 3.B
Bonds – NAIC Designation Category 3.C
Bonds –NAIC Designation Category 4.A
Bonds – NAIC Designation Category 4.B
Bonds – NAIC Designation Category 4.C
Bonds –NAIC Designation Category 5.A
Bonds – NAIC Designation Category 5.B
Bonds – NAIC Designation Category 5.C
Collateral Loans
Mortgage Loans
Working Capital Finance Investments – NAIC 02
Federal Guaranteed Low Income Housing Tax Credits
Federal Non-Guaranteed Low Income Housing Tax Credits
State Guaranteed Low Income Housing Tax Credits
State Non-Guaranteed Low Income Housing Tax Credits
All Other Low Income Housing Tax Credits

EQUITY ASSETS
Unaffiliated Preferred Stock –NAIC 02
Unaffiliated Preferred Stock –NAIC 03
Unaffiliated Preferred Stock –NAIC 04
Unaffiliated Preferred Stock –NAIC 05
-
-
-
Unaffiliated Common Stock
Investment Real Estate
Encumbrances on Inv. Real Estate
Schedule BA Assets (excluding Collateral Loans)
Receivable for Securities
Aggregate Write-ins for Invested Assets
Derivatives

The name of each of the largest 10 issuers is entered at the top of the table and the appropriate statement amounts are entered in C(2) Ls (01) through (20) for fixed income assets and C(2), Ls (22) through (32) for equity assets. Aggregate all similar asset types before entering the amount in C(2). For instance, if you own five separate $1,000,000 NAIC 03.A bonds from Issuer #1, enter $5,000,000 in C(2)L(02) – NAIC 03.A Unaffiliated Bonds.

OFF-BALANCE SHEET COLLATERAL AND SCHEDULE DL, PART 1 ASSETS PR015

Security lending programs are required to maintain collateral. Some entities post the collateral supporting security lending programs on their financial statements, and incur the related risk charges on those assets. Other entities have collateral that is not recorded on their financial statements. While not recorded on the financial statements of the company, such collateral has risks that are not otherwise captured in the RBC formula.

The collateral in these accounts is maintained by a third party (typically a bank or other agent). The collateral agent maintains on behalf of the company detail asset listings of the collateral assets, and this data is the source for preparation of this schedule. The company should maintain such asset listings, at a minimum CUSIP, market value, book/carrying value, and maturity date.

The asset risk charges are derived from existing RBC factors for bonds, preferred and common stocks, other invested assets, and invested assets not otherwise classified (aggregate write-ins).

Specific Instructions for Application of the Formula

Column (2) – Schedule DL, Part 1 Book/Adjusted Carrying Value comes from Annual Statement Schedule DL, Part 1, Column (6) Securities Lending Collateral Assets reported On-Balance Sheet (Assets Page, Line 10).

Off-balance sheet collateral included in General Interrogatories Part 1, Lines 24.05 and 24.06 of the Annual Statement should agree with Line (41), Column (1).

Lines (1) through (26) – Bonds
Bond factors described on PR006 –Bonds and Bond Size Factor Adjustment

Line (28) through (33) – Preferred Stocks
Preferred stock factors described on PR007 – Unaffiliated Preferred and Common Stock

Lines (35) – Common Stock
Common stock factors described on PR007 – Unaffiliated Preferred and Common Stock

Line (36) – Real Estate and Schedule BA - Other Invested Assets
Real Estate and other invested asset factors described on PR008 – Other Long-Term Assets

Line (37) – Other Invested Assets
Other invested assets factors described on PR009 – Miscellaneous Assets

Line (38) – Mortgage Loans on Real Estate
Mortgage Loans on Real Estate factor described on PR009 – Miscellaneous Assets

Line (39) – Cash, Cash Equivalents and Short-Term Investments
Cash, Cash Equivalents and Short-Term Investments factors described on PR007 – Unaffiliated Preferred, Common Stock and Hybrid Securities and PR009 – Miscellaneous Assets

BONDS PR006

		Annual Statement Source	(1) Long-Term Bonds Schedule D, Part 1 Book/Adjusted Carrying Value L2 thru 26 = Sch D Pt1F	(2) Short-Term Investments Schedule DA, Part 1 Book/Adjusted Carrying Value L2 thru 26 = Sch DA Pt1F	(3) Cash Equivalents Schedule E, Part 2 Book/Adjusted Carrying Value L2 thr 26 = Sch E Pt2F	(4) Subtotal C(1) + C(2) + C(3)	Factor	(5) RBC Requirement
(1)	NAIC 1.A - U.S. Government Full Faith and Credit, Other U.S. Government Obligations, and NAIC U.S. Government Money Market Fund List (Refer to A/S Instructions)	C(1)=Sch D, Pt 1, C11 L0599999 C(2)=Sch DA, Pt 1, C7 L0599999 C(3)=Sch E, Pt 2, C7 L0599999 + L8599999	0	0	0	0	0.000	0
(2)	NAIC Designation Category 1.A	Footnote Amt 1 L000001A- L(1)	0	0	0	0	0.000	0
(3)	NAIC Designation Category 1.B	Footnote Amt 2 L000001A	0	0	0	0	0.000	0
(4)	NAIC Designation Category 1.C	Footnote Amt 3 L000001A	0	0	0	0	0.000	0
(5)	NAIC Designation Category 1.D	Footnote Amt 4 L000001A	0	0	0	0	0.000	0
(6)	NAIC Designation Category 1.E	Footnote Amt 5 L000001A	0	0	0	0	0.000	0
(7)	NAIC Designation Category 1.F	Footnote Amt 6 L000001A	0	0	0	0	0.000	0
(8)	NAIC Designation Category 1.G	Footnote Amt 7 L000001A	0	0	0	0	0.000	0
(9)	Total NAIC 01 Bonds	Sum of Ls (1) through (8)	0	0	0	0		0
(10)	NAIC Designation Category 2.A	Footnote Amt 1 L000001B	0	0	0	0	0.000	0
(11)	NAIC Designation Category 2.B	Footnote Amt 2 L000001B	0	0	0	0	0.000	0
(12)	NAIC Designation Category 2.C	Footnote Amt 3 L000001B	0	0	0	0	0.000	0
(13)	Total NAIC 02 Bonds	Sum of Ls (10) through (12)	0	0	0	0		0
(14)	NAIC Designation Category 3.A	Footnote Amt 1 L000001C	0	0	0	0	0.000	0
(15)	NAIC Designation Category 3.B	Footnote Amt 2 L000001C	0	0	0	0	0.000	0
(16)	NAIC Designation Category 3.C	Footnote Amt 3 L000001C	0	0	0	0	0.000	0
(17)	Total NAIC 03 Bonds	Sum of Ls (14) through (16)	0	0	0	0		0
(18)	NAIC Designation Category 4.A	Footnote Amt 1 L000001D	0	0	0	0	0.000	0
(19)	NAIC Designation Category 4.B	Footnote Amt 2 L000001D	0	0	0	0	0.000	0
(20)	NAIC Designation Category 4.C	Footnote Amt 3 L000001D	0	0	0	0	0.000	0
(21)	Total NAIC 04 Bonds	Sum of Ls (18) through (20)	0	0	0	0		0
(22)	NAIC Designation Category 5.A	Footnote Amt 1 L000001E	0	0	0	0	0.000	0
(23)	NAIC Designation Category 5.B	Footnote Amt 2 L000001E	0	0	0	0	0.000	0
(24)	NAIC Designation Category 5.C	Footnote Amt 3 L000001E	0	0	0	0	0.000	0
(25)	Total NAIC 05 Bonds	Sum of Ls (22) through (24)	0	0	0	0	0.000	0
(26)	Total NAIC 06 Bonds	Footnote Amt 1 L000001F	0	0	0	0	0.000	0
(27)	Subtotal - Bonds Subject to Bond Size Factor	L(9) - L(1) + L(13) + L(17) + L(21) + L(25) + L(26)	0	0	0	0		0
(28)	Number of Issuers		0	0	0	0		
(29)	Bond Size Factor							6.800
(30)	Bond Size Factor RBC	C(5)L(27) x C(5)L(29)						0
(31)	Total Bonds RBC	L(27) + L(30)						0

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Denotes items that must be manually entered on the filing software.

UNAFFILIATED PREFERRED AND COMMON STOCK ~~AND HYBRID SECURITIES~~ PR007

	Unaffiliated Preferred Stock	Annual Statement Source	(1) Book/Adjusted Carrying Value	Factor	(2) RBC Requirement
(1)	NAIC 01 Preferred Stock	Sch D Pt 2 Sn 1	0	0.003	0
(2)	NAIC 02 Preferred Stock	Sch D Pt 2 Sn 1	0	0.010	0
(3)	NAIC 03 Preferred Stock	Sch D Pt 2 Sn 1	0	0.020	0
(4)	NAIC 04 Preferred Stock	Sch D Pt 2 Sn 1	0	0.045	0
(5)	NAIC 05 Preferred Stock	Sch D Pt 2 Sn 1	0	0.100	0
(6)	NAIC 06 Preferred Stock	Sch D Pt 2 Sn 1	0	0.300	0
(7)	~~SUB~~TOTAL - UNAFFILIATED PREFERRED STOCK (should equal P2 L2.1 C3 less Sch D-Sum C1 L18)	Sum of Ls(1) through (6)	0		0
~~(8)~~	~~NAIC 01 Hybrid Securities~~	~~Sch D Pt 1A Sn 1 C(7) L (7.1)~~	~~0~~	~~0.003~~	~~0~~
~~(9)~~	~~NAIC 02 Hybrid Securities~~	~~Sch D Pt 1A Sn 1 C(7) L (7.2)~~	~~0~~	~~0.010~~	~~0~~
~~(10)~~	~~NAIC 03 Hybrid Securities~~	~~Sch D Pt 1A Sn 1 C(7) L (7.3)~~	~~0~~	~~0.020~~	~~0~~
~~(11)~~	~~NAIC 04 Hybrid Securities~~	~~Sch D Pt 1A Sn 1 C(7) L (7.4)~~	~~0~~	~~0.045~~	~~0~~
~~(12)~~	~~NAIC 05 Hybrid Securities~~	~~Sch D Pt 1A Sn 1 C(7) L (7.5)~~	~~0~~	~~0.100~~	~~0~~
~~(13)~~	~~NAIC 06 Hybrid Securities~~	~~Sch D Pt 1A Sn 1 C(7) L (7.6)~~	~~0~~	~~0.300~~	~~0~~
~~(14)~~	~~SUBTOTAL - HYBRID SECURITIES~~	~~Sum of Ls(8) through (13)~~	~~0~~		~~0~~
~~(15)~~	~~Total Unaffiliated Preferred Stock and Hybrid Securities~~	~~Line (7) + Line (14)~~	~~0~~		~~0~~
	Unaffiliated Common Stock				
(8)	Total Common Stock	Sch D - Summary C1 L25	0		
(9)	Affiliated Common Stock	Sch D - Summary C1 L24	0		
(10)	Non-Admitted Unaffiliated Common Stock	P2 C2 L2.2 - Sch D Pt6 Sn1 C10 L1899999	0		
(11)	Admitted Unaffiliated Common Stock	**L(8) - L(9) - L(10)**	0	0.150	0
(12)	Fair Value Excess Affiliated Common Stock	PR003 C(14) L(9999999)			0
(13)	Total Unaffiliated Common Stock	**L(11) + L(12)**	0		0

MISCELLANEOUS ASSETS PR009

		Annual Statement Source	(1) Book/Adjusted Carrying Value	Factor	(2) RBC Requirement
(1)	Receivable for Securities	P2C3L9	0	0.025	0
(2)	Aggregate W/I for Invest Assets	P2C3 L11	0	0.050	0
(3)	Cash	P2 L5, inside amt 1	0	0.003	0
(4)	Cash Equivalents	P2 L5, inside amt 2	0		
(5)	**Less: Cash Equivalents, Total Bonds**	Sch E Pt 2 C7 L8399999	0		
(6)	**Less: Exempt Money Market Mutual Funds as Identified by SVO**	Sch E Pt 2 C7 L8599999	0		
(7)	Net Cash Equivalents	L(4)-L(5)-L(6)	0	0.003	0
(8)	Short-Term Investments	P2 L5, inside amt 3	0		
(9)	**Short-Term Bonds**	Sch DA Pt 1 C7 L8399999	0		
(10)	Total Other Short-Term Investments	L(8)-L(9)	0	0.003	0
(11)	Collateral Loans	Sch BA Pt1 C12 L2999999+3099999	0		
(12)	Less: Non-Admitted Collateral Loans	P2 L8 C2 in part	0		
(13)	Net Admitted Collateral Loans	L(11) - L(12)	0	0.050	0
(14)	Derivatives	P2C3 L7	0	0.050	0
(15)	Total Miscellaneous Assets	L(1)+L(2)+L(3)+L(7)+L(10)+L(13)+L(14)	0		0

~~* These bonds appear in Schedule D Part 1A Section 1 and are already recognized in the Bonds portion of the formula.~~

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ASSET CONCENTRATION PR011

		(1)	(2)		(3)
	ISSUER #1		Book/Adjusted Carrying Value	Factor	Additional RBC
(1)	NAIC Designation Category 2.A Bonds		0	0.0000	0
(2)	NAIC Designation Category 2.B Bonds		0	0.0000	0
(3)	NAIC Designation Category 2.C Bonds		0	0.0000	0
(4)	NAIC Designation Category 3.A Bonds		0	0.0000	0
(5)	NAIC Designation Category 3.B Bonds		0	0.0000	0
(6)	NAIC Designation Category 3.C Bonds		0	0.0000	0
(7)	NAIC Designation Category 4.A Bonds		0	0.0000	0
(8)	NAIC Designation Category 4.B Bonds		0	0.0000	0
(9)	NAIC Designation Category 4.C Bonds		0	0.0000	0
(10)	NAIC Designation Category 5.A Bonds		0	0.0000	0
(11)	NAIC Designation Category 5.B Bonds		0	0.0000	0
(12)	NAIC Designation Category 5.C Bonds		0	0.0000	0
(13)	Collateral Loans		0	0.0500	0
(14)	Mortgage Loans		0	0.0500	0
(15)	NAIC 02 Working Capital Finance Investments		0	0.0125	0
(16)	Federal Guaranteed Low Income Housing Tax Credits		0	0.0014	0
(17)	Federal Non-Guaranteed Low Income Housing Tax Credits		0	0.0260	0
(18)	State Guaranteed Low Income Housing Tax Credits		0	0.0014	0
(19)	State Non-Guaranteed Low Income Housing Tax Credits		0	0.0260	0
(20)	All Other Low Income Housing Tax Credits		0	0.1500	0
(21)	SUBTOTAL - FIXED INCOME		0		0
(22)	NAIC 02 Unaffiliated Preferred Stock		0	0.0100	0
(23)	NAIC 03 Unaffiliated Preferred Stock		0	0.0200	0
(24)	NAIC 04 Unaffiliated Preferred Stock		0	0.0450	0
(25)	NAIC 05 Unaffiliated Preferred Stock		0	0.1000	0
~~(26)~~	~~NAIC 02 Hybrid Securities~~		~~0~~	~~0.0100~~	~~0~~
~~(27)~~	~~NAIC 03 Hybrid Securities~~		~~0~~	~~0.0200~~	~~0~~
~~(28)~~	~~NAIC 04 Hybrid Securities~~		~~0~~	~~0.0450~~	~~0~~
~~(29)~~	~~NAIC 05 Hybrid Securities~~		~~0~~	~~0.1000~~	~~0~~
(26)	Property Held For Production of Income or For Sale Excluding Home Office		0	0.1000	0
(27)	Property Held For Production of Income or For Sale Encumbrances Excluding Home Office		0	0.1000	0
(28)	Schedule BA Assets		0	0.1000	0
(29)	Receivable for Securities		0	0.0250	0
(30)	Aggregate Write-Ins for Invested Assets		0	0.0500	0
(31)	Derivatives		0	0.0500	0
(32)	Unaffiliated Common Stock		0	0.1500	0
(33)	SUBTOTAL - EQUITY		0		0
(34)	TOTAL - ISSUER #1 (L21+L33)		0		0

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OFF-BALANCE SHEET COLLATERAL AND SCHEDULE DL, PART 1 ASSETS PR015

	Asset Category	Annual Statement Source	(1) Off-Balance Sheet Collateral Book/Adjusted Carrying Value	(2) Schedule DL, Part 1 Book/Adjusted Carrying Value	(3) Subtotal	Factor	(4) RBC Requirement
	Fixed Income Assets						
	Bonds						
(1)	**NAIC 1.A - U.S. Government Full Faith and Credit, Other U.S. Government Obligations, and NAIC U.S. Government Money Market Fund List (Refer to A/S Instructions)**	Company Records	0	0	0	0.000	0
(2)	NAIC Designation Category 1.A	Company Records	0	0	0	0.000	0
(3)	NAIC Designation Category 1.B	Company Records	0	0	0	0.000	0
(4)	NAIC Designation Category 1.C	Company Records	0	0	0	0.000	0
(5)	NAIC Designation Category 1.D	Company Records	0	0	0	0.000	0
(6)	NAIC Designation Category 1.E	Company Records	0	0	0	0.000	0
(7)	NAIC Designation Category 1.F	Company Records	0	0	0	0.000	0
(8)	NAIC Designation Category 1.G	Company Records	0	0	0	0.000	0
(9)	Total NAIC 01 Bonds	Sum of Ls (1) through (8)	0	0	0		0
(10)	NAIC Designation Category 2.A	Company Records	0	0	0	0.000	0
(11)	NAIC Designation Category 2.B	Company Records	0	0	0	0.000	0
(12)	NAIC Designation Category 2.C	Company Records	0	0	0	0.000	0
(13)	Total NAIC 02 Bonds	Sum of Ls (10) through (12)	0	0	0		0
(14)	NAIC Designation Category 3.A	Company Records	0	0	0	0.000	0
(15)	NAIC Designation Category 3.B	Company Records	0	0	0	0.000	0
(16)	NAIC Designation Category 3.C	Company Records	0	0	0	0.000	0
(17)	Total NAIC 03 Bonds	Sum of Ls (14) through (16)	0	0	0		0
(18)	NAIC Designation Category 4.A	Company Records	0	0	0	0.000	0
(19)	NAIC Designation Category 4.B	Company Records	0	0	0	0.000	0
(20)	NAIC Designation Category 4.C	Company Records	0	0	0	0.000	0
(21)	Total NAIC 04 Bonds	Sum of Ls (18) through (20)	0	0	0		0
(22)	NAIC Designation Category 5.A	Company Records	0	0	0	0.000	0
(23)	NAIC Designation Category 5.B	Company Records	0	0	0	0.000	0
(24)	NAIC Designation Category 5.C	Company Records	0	0	0	0.000	0
(25)	Total NAIC 05 Bonds	Sum of Ls (22) through (24)	0	0	0		0
(26)	Total NAIC 06 Bonds	Company Records	0	0	0	0.000	0
(27)	Total Bonds	**L(9) + (13) + (17) + (21) + (25) + (26)**	0	0	0		0
	Equity Assets						
	Preferred Stock - Unaffiliated						
(28)	NAIC 01 Unaffiliated Preferred Stock	Company Records	0	0	0	0.003	0
(29)	NAIC 02 Unaffiliated Preferred Stock	Company Records	0	0	0	0.010	0
(30)	NAIC 03 Unaffiliated Preferred Stock	Company Records	0	0	0	0.020	0
(31)	NAIC 04 Unaffiliated Preferred Stock	Company Records	0	0	0	0.045	0
(32)	NAIC 05 Unaffiliated Preferred Stock	Company Records	0	0	0	0.100	0
(33)	NAIC 06 Unaffiliated Preferred Stock	Company Records	0	0	0	0.300	0
(34)	Total Unaffiliated Preferred Stock	Sum of Ls (28) through (33)	0	0	0		0
(35)	Unaffiliated Common Stock	Company Records	0	0	0	0.150	0
(36)	Real Estate and Schedule BA - Other Invested Assets	Company Records	0	0	0	0.200	0
(37)	Other Invested Assets	Company Records	0	0	0	0.200	0
(38)	Mortgage Loans on Real Estate	Company Records	0	0	0	0.050	0
(39)	**Cash, Cash Equivalents and Short-Term Investments** (Not reported as Bonds above)	Company Records	0	0	0	0.003	0
(40)	Total	**L(27)+L(34)+L(35)+L(36)+L(37)+L(38)+L(39)**	0	0	0		0

Denotes items that must be manually entered on the filing software.

CALCULATION OF TOTAL RISK-BASED CAPITAL AFTER COVARIANCE PR030 R0-R1

R0 —Subsidiary Insurance Companies and Misc. Other Amounts		PRBC O&I Reference	(1) RBC Amount
(1)	Affiliated US P&C Insurers - Directly Owned	PR004 L(1)C(4)	0
(2)	Affiliated US P&C Insurers - Indirectly Owned	PR004 L(4)C(4)	0
(3)	Affiliated US Life Insurers - Directly Owned	PR004 L(2)C(4)	0
(4)	Affiliated US Life Insurers - Indirectly Owned	PR004 L(5)C(4)	0
(5)	Affiliated US Health Insurer - Directly Owned	PR004 L(3)C(4)	0
(6)	Affiliated US Health Insurer - Indirectly Owned	PR004 L(6)C(4)	0
(7)	Affiliated Alien Insurers - Directly Owned	PR004 L(8)C(4)	0
(8)	Affiliated Alien Insurers - Indirectly Owned	PR004 L(9)C(4)	0
(9)	Misc Off-Balance Sheet - Non-Controlled Assets	PR014 L(15) C(3)	0
(10)	Misc Off-Balance Sheet - Guarantees for Affiliates	PR014 L(16) C(3)	0
(11)	Misc Off-Balance Sheet - Contingent Liabilities	PR014 L(17) C(3)	0
(12)	Misc Off-Balance Sheet - SSAP No.101 Par. 11A DTA	PR014 L(19) C(3)	0
(13)	Misc Off-Balance Sheet - SSAP No.101 Par. 11B DTA	PR014 L(20) C(3)	0
(14)	Total R0	L(1)+L(2)+L(3)+L(4)+L(5)+L(6)+L(7)+L(8)+L(9)+L(10)+L(11)+L(12)+L(13)	0
R1 - Asset Risk - Fixed Income			
~~(15)~~	~~NAIC 01 U.S. Government Agency Bonds~~	~~PR006 L(2A)C(2)~~	~~0~~
(15)	Bonds Subject to Size Factor	PR006 L(27)C(**5**)	0
(16)	Bond Size Factor RBC	PR006 L(30)C(**5**)	0
(17)	Off-balance Sheet Collateral & Sch DL, PT1 - Total Bonds	PR015 L(27)C(4)	0
(18)	Off-balance Sheet Collateral & Sch DL, PT1 - Cash, Cash Equi, non-govt MMF & S.T. Invest and Mort Loans on Real Est.	PR015 L(38)+(39)C(4)	0
(19)	Other Long- Term Assets - Mortgage Loans, LIHTC & WCFI	PR008 L(10)+L(13)+L(14)+L(15)+L(16)+L(17)+L(20)+L(21)C(2)	0
(20)	Misc Assets - Collateral Loans	PR009 L(13)C(2)	0
(21)	Misc Assets - Cash	PR009 L(3)C(2)	0
(22)	Misc Assets - Cash Equivalents	PR009 L(7)C(2)	0
(23)	Misc Assets - Other Short-Term Investments	PR009 L(10)C(2)	0
(24)	Replication -Synthetic Asset: One Half	PR010 L(9999999)C(7)	0
(25)	Asset Concentration RBC - Fixed Income	PR011 L(21)C(3) Grand Total Page	0
(26)	Total R1	L(15)+L(16)+L(17)+L(18)+L(19)+L(20)+L(21)+L(22)+L(23)+L(24)+L(25)	0

CALCULATION OF TOTAL RISK-BASED CAPITAL AFTER COVARIANCE PR031 R2-R3

R2 - Asset Risk - Equity		PRBC O&I Reference	RBC Amount
(27)	Common - Affiliate Investment Subsidiary	PR004 L(7)C(2)	0
(28)	Common - Affiliate Hold. Company. in excess of Ins. Subs.	PR004 L(10)C(2)	0
(29)	Common - Investment in Parent	PR004 L(11)C(2)	0
(30)	Common - Aff'd US P&C Not Subj to RBC	PR004 L(12)C(2)	0
(31)	Common - Affil US Life Not Subj to RBC	PR004 L(13)C(2)	0
(32)	Common - Affil US Health Insurer Not Subj to RBC	PR004 L(14)C(2)	0
(33)	Common - Aff'd Non-insurer	PR004 L(15)C(2)	0
(34)	Preferred - Aff'd Invest Sub	PR004 L(7)C(3)	0
(35)	Preferred - Aff'd Hold. Co. in excess of Ins. Subs.	PR004 L(10)C(3)	0
(36)	Preferred - Investment in Parent	PR004 L(11)C(3)	0
(37)	Preferred - Affil US P&C Not Subj to RBC	PR004 L(12)C(3)	0
(38)	Preferred - Affil US Life Not Subj to RBC	PR004 L(13)C(3)	0
(39)	Preferred - Affil US Health Insurer Not Subj to RBC	PR004 L(14)C(3)	0
(40)	Preferred - Affil Non-insurer	PR004 L(15)C(3)	0
(41)	Unaffiliated Preferred Stock ~~and Hybrid Securities~~	PR007 L(7)C(2)+PR015 L(34)C(4)	0
(42)	Unaffiliated Common Stock	PR007 L(21)C(2)+PR015 L(35)C(4)	0
(43)	Other Long -Term Assets - Real Estate	PR008 L(7)C(2)	0
(44)	Other Long-Term Assets - Schedule BA Assets	PR008 L(19)C(2)+PR015 L(36)+L(37)C(4)	0
(45)	Misc Assets - Receivable for Securities	PR009 L(1)C(2)	0
(46)	Misc Assets - Aggregate Write-ins for Invested Assets	PR009 L(2)C(2)	0
(47)	Misc Assets - Derivatives	PR009 L(14)C(2)	0
(48)	Replication - Synthetic Asset: One Half	PR010 L(9999999)(7)	0
(49)	Asset Concentration RBC - Equity	PR011 L(34)C(3) Grand Total Page	0
(50)	Total R2	**L(27)+L(28)+L(29)+L(30)+L(31)+L(32)+L(33)+L(34) +L(35)+L(36)+L(37)+L(38)+L(39)+L(40)+L(41)+L(42) +L(43)+L(44)+L(45)+L(46)+L(47)+L(48)+L(49)**	0
R3 - Asset Risk - Credit			
(51)	Other Credit RBC	PR012 L(8))-L(1)-L(2)C(2)	0
(52)	One half of Rein Recoverables	0.5 x (PR012 L(1)+L(2)C(2))	0
(53)	Other half of Rein Recoverables	**If R4 L(57)>(R3 L(51) + R3 L(52)), 0, otherwise, R3 L(52)**	0
(54)	Health Credit Risk	PR013 L(12)C(2)	0
(55)	Total R3	**L(51) + L(52) + L(53) + L(54)**	0

CALCULATION OF TOTAL RISK-BASED CAPITAL AFTER COVARIANCE PR032 R4-Rcat

			(1)
R4 - Underwriting Risk - Reserves		PRBC O&I Reference	RBC Amount
(56)	One half of Reinsurance RBC	If R4 L(57)>(R3 L(51) + R3 L(52)), R3 L(52), otherwise, 0	0
(57)	Total Adjusted Unpaid Loss/Expense Reserve RBC	PR0017 L(15)C(20)	0
(58)	Excessive Premium Growth - Loss/Expense Reserve	PR016 L(13) C(8)	0
(59)	A&H Claims Reserves Adjusted for LCF	PR024 L(5) C(2) + PR023 L(6) C(4)	0
(60)	Total R4	**L(56)+L(57)+L(58)+L(59)**	0
R5 - Underwriting Risk - Net Written Premium			
(61)	Total Adjusted NWP RBC	PR018 L(15)C(20)	0
(62)	Excessive Premium Growth - Written Premiums Charge	PR016 L(14)C(8)	0
(63)	Total Net Health Premium RBC	PR022 L(21)C(2)	0
(64)	Health Stabilization Reserves	PR025 L(8)C(2) + PR023 L(3) C(2)	0
(65)	Total R5	**L(61)+L(62)+L(63)+L(64)**	0

Rcat- Catastrophe Risk			
(66)	Total Rcat	PR027 L(3) C(1)	0

(67)	Total RBC After Covariance Before Basic Operational Risk = R0+SQRT(R1^2+R2^2+R3^2+R4^2+R5^2+Rcat^2)	0

(68)	**Basic Operational Risk = 0.030 x L(67)**	0
(69)	C-4a of U.S. Life Insurance Subsidiaries (from Company records)	0
(70)	**Net Basic Operational Risk = Line (68) - Line (69) (Not less than zero)**	0
(71)	**Total RBC After Covariance including Basic Operational Risk = L(67)+ L(68)**	0

(72)	**Authorized Control Level RBC including Basic Operational Risk = .5 x L(71)**	0

Capital Adequacy (E) Task Force

RBC Proposal Form

[x] Capital Adequacy (E) Task Force [ ] Health RBC (E) Working Group [ ] Life RBC (E) Working Group
[ ] Catastrophe Risk (E) Subgroup [ ] Investment RBC (E) Working Group [ ] Longevity Risk (A/E) Subgroup
[ ] C3 Phase II/ AG43 (E/A) Subgroup [ ] P/C RBC (E) Working Group

	DATE: 1-28-21	**FOR NAIC USE ONLY**
CONTACT PERSON:	Crystal Brown	Agenda Item # 2021-02-CA
TELEPHONE:	816-783-8146	Year 2021
EMAIL ADDRESS:	cbrown@naic.org	**DISPOSITION**
ON BEHALF OF:	Health RBC (E) Working Group	[ ] ADOPTED
NAME:	Steve Drutz	[ ] REJECTED
TITLE:	Chief Financial Analyst/Chair	[ ] DEFERRED TO
AFFILIATION:	WA Office of Insurance Commissioner	[ ] REFERRED TO OTHER NAIC GROUP
ADDRESS:	PO Box 40255	[ ] EXPOSED
	Olympia, WA 98504-0255	[ ] OTHER (SPECIFY)

IDENTIFICATION OF SOURCE AND FORM(S)/INSTRUCTIONS TO BE CHANGED

[x] Health RBC Blanks [x] Property/Casualty RBC Blanks [x] Life and Fraternal RBC Instructions
[x] Health RBC Instructions [x] Property/Casualty RBC Instructions [x] Life and Fraternal RBC Blanks
[ ] OTHER _____

DESCRIPTION OF CHANGE(S)

Incorporate references for “Incentives” under the managed care instructions and blank as “Bonuses/Incentives.”

REASON OR JUSTIFICATION FOR CHANGE **

Currently the managed care instructions and blank only reference the bonuses, this change would clarify that both incentives and bonuses are to be included.

Additional Staff Comments:

02-10-21 cgb The Proposal was exposed to the Health Risk-Based Capital (E) Working Group for a 30-day comment period that ends on Mar. 12, 2021.
03-17-21 cgb No comments were received during the comment period. The Working Group referred the proposal to the Capital Adequacy (E) Task Force for a 30-day comment period for all lines of business, with any comments to come back to the Working Group.

**** This section must be completed on all forms.** **Revised 2-2019**

HEALTH

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UNDERWRITING RISK – MANAGED CARE CREDIT
XR017

The effect of managed care arrangements on the variability of underwriting results is the fundamental difference between health entities and pure indemnity carriers. The managed care credit is used to reduce the RBC requirement for experience fluctuations. It is important to understand that the managed care credit is based on the reduction in uncertainty about future claims payments, not on any reduction in the actual level of cost. Those managed care arrangements that have the greatest reduction in the uncertainty of claim payments receive the greatest credit, while those that have less effect on the predictability of claims payments engender less of a discount.

There are currently five levels of managed care that are used in the formula, other than for Medicare Part D Coverage, although in the future as new managed care arrangements evolve, the number of categories may increase, or new arrangements may be added to the existing categories. The managed care categories are:

* Category 0 – Arrangements not Included in Other Categories
* Category 1 – Contractual Fee Payments
* Category 2 – Bonus and/or Incentives / Withhold Arrangements
* Category 3 – Capitation
* Category 4 – Non-Contingent Expenses and Aggregate Cost Arrangements and Certain PSO Capitated Arrangements

For Medicare Part D Coverage, the reduction in uncertainty comes from two federal supports. The reinsurance coverage is optional in that a plan sponsor may elect to participate in the Part D Payment Demonstration. The risk corridor protection is expected to have less impact after the first few years. To allow flexibility within the RBC formula, Lines (10) through (13) will be used to give credit for the programs in which the plan sponsor participates. While all PDPs will have formularies and may utilize other methods to reduce uncertainty, for the near future, no other managed care credits are allowed for this coverage.

The managed care credit is based on the percentage of paid claims that fall into each of these categories. Total claims payments are allocated among these managed care "buckets" to determine the weighted average discount, which is then used to reduce the Underwriting Risk-Experience Fluctuation RBC. Paid claims are used instead of incurred claims due to the variability of reserves (unpaid claims) in incurred claim amounts and the difficulty in allocating reserves (unpaid claims) by managed care category.

In some instances, claim payments may fit into more than one category. If that occurs, enter the claim payments into the highest applicable category. CLAIM PAYMENTS CAN ONLY BE ENTERED INTO ONE OF THESE CATEGORIES! The total of the claim payments reported in the Managed Care Credit Calculation page should equal the total year's paid claims.

Line (1) – Category 0 – Arrangements not Included in Other Categories. There is a zero managed care credit for claim payments in this category, which includes:

- Fee for service (charges).
- Discounted FFS (based upon charges).
- Usual Customary and Reasonable (UCR) Schedules.
- Relative Value Scales (RVS) where neither payment base nor RV factor is fixed by contract or where they are fixed by contract for one year or less.
- Stop-loss payments by a health entity to its providers that are capitated or subject to withhold/incentive programs.
- Retroactive payments to capitated providers or intermediaries whether by capitation or other payment method (excluding retroactive withholds later released to the provider and retroactive payments made solely because of a correction to the number of members within the capitated agreement).
- Capitation paid to providers or intermediaries that have received retroactive payments for previous years (including bonus arrangements on capitation programs).

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This amount should equal Exhibit 7, Part 1, Column 1, Line 5 of the annual statement excluding Stand-Alone Medicare Part D business reported in Lines (12) and (13).

Line (2) – Category 1 – Payments Made According to Contractual Arrangements. There is a 15 percent managed care credit for payments included in this category:

- Hospital per diems, DRGs or other hospital case rates.
- Non-adjustable professional case and global rates.
- Provider fee schedules.
- RVS where the payment base and RV factor are fixed by contract for more than one year.
- Ambulatory payment classifications (APCs).

This amount should equal Exhibit 7, Part 1, Column 1, Line 6 of the annual statement excluding Stand-Alone Medicare Part D business reported in Lines (12) and (13).

Line (3) - Category 2a - Payments Made Subject to Withholds or Bonuses/Incentives With No Other Managed Care Arrangements. This category may include business that would have otherwise fit into Category 0. That is, there may be a bonus/incentives/withhold arrangement with a provider who is reimbursed based on a UCR schedule (Category 0).

The maximum Category 2a managed care credit is 25 percent. The credit is based upon a calculation that determines the ratio of withholds returned and bonuses and/or incentives paid to providers during the prior year to total withholds and bonuses and incentives available to the providers during that year. That ratio is then multiplied by the average provider withhold ratio for the prior year to determine the current year's Category 2a managed care credit factor. Bonus and/or incentive payments that are not related to financial results are not included (e.g., patient satisfaction). Therefore, the credit factor is equal to the result of the following calculation:

EXAMPLE – **2019** Reporting Year

2018 withhold / bonus/incentive payments	750,000
2018 withholds / bonuses/incentives available	1,000,000
A. MCC Factor Multiplier	75% – Eligible for credit
2018 withholds / bonuses/incentives available	1,000,000
2018 claims subject to withhold - gross*	5,000,000
B. Average Withhold Rate	20%
Category 2 Managed Care Credit Factor (A x B)	15%

The resulting factor is multiplied by claim payments subject to withhold - net** in the current year.

*** These are amounts due before deducting withhold or paying bonuses and/or incentives.**
**** These are actual payments made after deducting withhold or paying bonuses and/or incentives.**

Enter the paid claims for the current year where payments to providers were subject to withholds and bonuses/incentives, but otherwise had no managed care arrangements. This amount should equal Exhibit 7, Part 1, Column 1, Line 7 of the annual statement excluding Stand-Alone Medicare Part D business reported in Lines (12) and (13).

Line (4) – Category 2b – Payments Made Subject to Withholds or Bonuses/Incentives That Are Otherwise Managed Care Category 1. Category 2b may include business that would have otherwise fit into Category 1. That is, there may be a bonus/incentives/withhold arrangement with a provider who is reimbursed based on a provider fee schedule (Category 1). The Category 2 discount for claim payments that would otherwise qualify for Category 1 is the greater of the Category 1 factor or the calculated Category 2 factor.

The maximum Category 2b managed care credit is 25 percent. The minimum of Category 2b managed care credit is 15 percent (Category 1 credit factor). The credit calculation is the same as found in the previous example for Category 2a.

Enter the paid claims for the current year where payments to providers were subject to withholds and bonuses/incentives AND where the payments were made according to one of the contractual arrangements listed for Category 1. This amount should equal Exhibit 7, Part 1, Column 1, Line 8 of the annual statement excluding Stand-Alone Medicare Part D business reported in Lines (12) and (13).

Line (5) – Category 3a – Capitated Payments Directly to Providers. There is a managed care credit of 60 percent for claims payments in this category, which includes:

- All capitation or percent of premium payments directly to licensed providers.

Enter the amount of claim payments paid DIRECTLY to licensed providers on a capitated basis. This amount should equal Exhibit 7, Part 1, Column 1, Line 1 + Line 3 of the annual statement excluding Stand-Alone Medicare Part D business reported in Lines (12) and (13).

Line (6) – Category 3b – Capitated Payments to Regulated Intermediaries. There is a managed care credit of 60 percent for claim payments in this category, which includes:

- All capitation or percent of premium payments to intermediaries that in turn pay licensed providers.

Enter the amount of medical expense capitations paid to regulated intermediaries. An *intermediary* is a person, corporation or other business entity (not licensed as a medical provider) that arranges, by contracts with physicians and other licensed medical providers, to deliver health services for a health entity and its enrollees via a separate contract between the intermediary and the health entity. This includes affiliates of a health entity that are not subject to RBC, except in those cases where the health entity qualifies for a higher managed care credit because the capitated affiliate employs providers and pays them non-contingent salaries, and where the affiliated intermediary has a contract only with the affiliated health entity. A *Regulated Intermediary* is an intermediary (affiliated or not) subject to state regulation and files the Health RBC formula with the state.

Line (7) – Category 3c – Capitated Payments to Non-Regulated Intermediaries. There is a managed care credit of 60 percent for claim payments in this category, which includes:

- All capitation or percent of premium payments to intermediaries that in turn pay licensed providers. (Subject to a 5 percent limitation on payments to providers or other corporations that have no contractual relationship with such intermediary. Amounts greater than the 5 percent limitation should be reported in Category 0.)

Enter the amount of medical expense capitations paid to non-regulated intermediaries.

IN ORDER TO QUALIFY FOR ANY OF THE CAPITATION CATEGORIES, SUCH CAPITATION MUST BE FIXED (AS A PERCENTAGE OF PREMIUM OR FIXED DOLLAR AMOUNT PER MEMBER) FOR A PERIOD OF AT LEAST 12 MONTHS. Where an arrangement contains a provision for prospective revision within a 12-month period, the entire arrangement shall be subject to a managed care credit that is calculated under category 1 for a provider, and for an intermediary at the greater of category 1 or a credit calculated using the underlying payment method(s) to the providers of care. Where an arrangement contains a provision for retroactive revisions

either within or beyond a 12-month period, the entire arrangement shall be subject to a managed care credit that is calculated under category 0 for both providers and intermediaries.

Line (8) – Category 4 – Medical & Hospital Expense Paid as Salary to Providers. There is a managed care credit of 75 percent for claim payments in this category. Once claim payments under this managed care category are totaled, any fee for service revenue from uninsured plans (i.e., ASO or ASC) that was included on line 7 in the Underwriting Risk section should be deducted before applying the managed care credit factor. This category includes:

- Non-contingent salaries to persons directly providing care.
- The portion of payments to affiliated entities, which is passed on as non-contingent salaries to persons directly providing care where the entity has a contract only with its affiliated health entity.
- All facilities related medical expenses and other non-provider medical costs generated within a health facility that is owned and operated by the health entity.
- Aggregate cost payments.

Salaries paid to doctors and nurses whose sole corporate purpose is utilization review are also included in this category if such payments are classified as “medical expense” payments (paid claims) rather than administrative expenses. The "aggregate cost" method of reimbursement means where a health plan has a reimbursement plan with a corporate entity that directly provides care, where (1) the health plan is contractually required to pay the total operating costs of the corporate entity, less any income to the entity from other users of services, and (2) there are mutual unlimited guarantees of solvency between the entity and the health plan, which put their respective capital and surplus at risk in guaranteeing each other.

This amount should equal Exhibit 7, Part 1, Column 1, Line 9 + Line 10 of the annual statement excluding Stand-Alone Medicare Part D business reported in Lines (12) and (13).

Line (9) – Sub-Total Paid Claims. The total of paid claims for Comprehensive Medical, Medicare Supplement and Dental [should equal the total claims paid for the year as reported in Exhibit 7, Part 1, Column 1, Line 13 less Line 11 of the annual statement and the sum of Lines (8.3), (12) and (13) on page XR017 – Underwriting Risk – Managed Care Credit.

Line (10) – Category 0 – No Federal Reinsurance or Risk Corridor Protection. Category 0 for Medicare Part D Coverage would be all claims during a period where neither the reinsurance coverage or risk corridor protection is provided.

Line (11) – Category 1 – Federal Reinsurance but no Risk Corridor Protection. Category 1 for Medicare Part D Coverage would be all claims during a period when only the reinsurance coverage is provided. This is designed for some future time period and is not to be interpreted as including employer-based Part D coverage that is not subject to risk corridor protection.

Line (12) – Category 2a – No Federal Reinsurance but Risk Corridor Protection. Category 2a for Medicare Part D Coverage would be for all claims during a period when only the risk corridor protection is provided.

Line (13) – Category 3a – Federal Reinsurance and Risk Corridor Protection. Category 3a for Medicare Part D Coverage would be for all claims during a period when both reinsurance coverage and risk corridor protection are provided.

Line (14) – Sub-Total Paid Claims. The total paid claims for Medicare Part D Coverage, excluding supplemental benefits.

Line (16) – Weighted Average Managed Care Discount. These amounts are calculated by dividing the total weighted claims by the comparable sub-total claim payments. For Column (3), this is Column (3), Line (9) divided by Column (2), Line (9). For Column (4), this is Column (4) Line (14) divided by Column (2), Line (14).

Line (17) – Weighted Average Managed Care Risk Adjustment Factor**.** These are the credit factors that are carried back to the underwriting risk calculation. They are one minus the Weighted Average Managed Care Discount values in Line (16).

Lines (18) through (24) are the calculation of the weighted average factor for the Category 2 claims payments subject to withholds and bonuses/incentives. This table requires data from the PRIOR YEAR to compute the current year's discount factor. These do not apply to Medicare Part D coverage.

Line (18) – Withhold & Bonus/Incentive Payments**, *prior year*.** Enter the prior year's actual withhold and bonus/incentive payments.

Line (19) –Withhold & Bonuses/Incentives Available**, *prior year*.** Enter the prior ~~year's~~years withholds and bonuses/incentives that were available for payment in the prior year.

Line (20) – MCC Multiplier – Average Withhold Returned**.** Divides Line (18) by Line (19) to determine the portion of withholds and bonuses/incentives that were actually returned in the prior year.

Line (21) – Withholds & Bonuses/Incentives Available, ***prior year*.** Equal to Line (19) and is automatically pulled forward.

Line (22) – Claims Payments Subject to Withhold, ***prior year*.** Claim payments that were subject to withholds and bonuses/incentives in the prior year. Equal to L(3) + L(4) of the managed care credit claims payment table FOR THE PRIOR YEAR.

Line (23) – Average Withhold Rate, ***prior year*.** Divides Line (21) by Line (22) to determine the average withhold rate for the prior year.

Line (24) – MCC Discount Factor, Category 2**.** Multiplies Line (20) by Line (23) to determine the discount factor for Category 2 claims payments in the current year, based on the performance of the health ~~entity's~~entities withhold/bonus/incentive program in the prior year.

LIFE

UNDERWRITING RISK - MANAGED CARE CREDIT

LR022

This worksheet LR022 Underwriting Risk – Managed Care Credit is optional. It may be completed for only part of the comprehensive medical dental business, Stand-Alone Medicare Part D Coverage or all of them. Line (1) will be filled in as the balancing item if any of Lines (2) through (8) are entered (and then Line (9) will be required).

The effect of managed care arrangements on the variability of underwriting results is the fundamental difference between coverages subject to the managed care credit and pure indemnity insurance. The managed care credit is used to reduce the RBC requirement for experience fluctuations. It is important to understand that the managed care credit is based on the reduction in uncertainty about future claims payments, not on any reduction in the actual level of cost. Those managed care arrangements that have the greatest reduction in the uncertainty of claims payments receive the greatest credit, while those that have less effect on the predictability of claims payments engender less of a discount.

There are five levels of managed care that are used in the RBC formulas other than for Stand-Alone Medicare Part D Coverage, although in the future as new managed care arrangements evolve, the number of categories may increase or new arrangements may be added to the existing categories. The managed care categories are:

- Category 0 - Arrangements not Included in Other Categories
- Category 1 - Contractual Fee Payments
- Category 2 – Bonus and/or incentives / Withhold Arrangements
- Category 3 - Capitation
- Category 4 - Non-contingent Expenses and Aggregate Cost Arrangements and Certain PSO Capitated Arrangements

For Stand-Alone Medicare Part D Coverage, the reduction in uncertainty comes from two federal supports. The reinsurance coverage is optional in that a plan sponsor may elect to participate in the Part D Payment Demonstration. The risk corridor protection is expected to have less impact after the first few years. To allow flexibility within the RBC formula, Lines (10) through (13) will be used to give credit for the programs in which the plan sponsor participates. While all PDPs will have formularies and may utilize other methods to reduce uncertainty, for the near future no other managed care credits are allowed for this coverage.

The managed care credit is based on the percentage of paid claims that fall into each of these categories. Total claims payments are allocated among these managed care "buckets" to determine the weighted average discount, which is then used to reduce the Underwriting Risk-Experience Fluctuation RBC. Paid claims are used instead of incurred claims due to the variability of reserves (unpaid claims) in incurred claim amounts and the difficulty in allocating reserves (unpaid claims) by managed care category.

In some instances, claims payments may fit into more than one category. If that occurs, enter the claims payments into the highest applicable category. CLAIMS PAYMENTS CAN ONLY BE ENTERED INTO ONE OF THESE CATEGORIES! The total of the claims payments reported in the managed care worksheet should equal the total year's paid claims. Category 2a, Category 2b and Category 3c are not allowed to include non-regulated intermediaries who are affiliated with the reporting company in order to insure that true risk transfer is accomplished.

Line (1)
Category 0 - Arrangements not Included in Other Categories. There is a zero managed care credit for claim payments in this category, which includes:

- Fee for service (charges).
- Discounted fee for service (based upon charges).

- Usual customary and reasonable (UCR) schedules.
- Relative value scale (RVS), where neither payment base nor RV factor is fixed by contract or where they are fixed by contract for one year or less.
- Retroactive payments to capitated providers or intermediaries whether by capitation or other payment method (excluding retroactive withholds later released to the provider and retroactive payments made solely because of a correction to the number of members within the capitated agreement).
- Capitation paid to providers or intermediaries that have received retroactive payments for previous years (including bonus arrangements on capitation programs).
- Claim payments not included in other categories.

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Line (2)
Category 1 - Payments Made According to Contractual Arrangements. There is a 15 percent managed care credit for payments included in this category:

- Hospital per diems, diagnostic related groups (DRGs) or other hospital case rates.
- Non-adjustable professional case and global rates.
- Provider fee schedules.
- Relative value scale (RVS), where the payment base and RV factor are fixed by contract for more than one year.

Line (3)
Category 2a - Payments Made Subject to Withholds or Bonuses/Incentives with No Other Managed Care Arrangements. This category may include business that would have otherwise fit into Category 0. That is, there may be a bonus/incentives/withhold arrangement with a provider who is reimbursed based on a UCR schedule (Category 0).

The maximum Category 2a managed care credit is 25 percent. The credit is based upon a calculation that determines the ratio of withholds returned and bonuses and/or incentives paid to providers during the prior year to total withholds and bonuses and incentives available to the providers during that year. That ratio is then multiplied by the average provider withhold ratio for the prior year to determine the current year's Category 2a managed care credit factor. Bonus and/or incentive payments that are not related to financial results are not included (e.g., patient satisfaction). Therefore, the credit factor is equal to the result of the following calculation:

EXAMPLE - 1998 Reporting Year	
1997 withhold / bonus/incentive payments	750,000
1997 withholds / bonuses/incentives available	1,000,000
A . MCC Factor Multiplier	75% - Eligible for credit
1997 withholds / bonuses/incentives available	1,000,000
1997 claims subject to withhold -gross†	5,000,000
B. Average Withhold Rate	20%
Category 2 Managed Care Credit Factor (A x B)	15%

The resulting factor is multiplied by claims payments subject to withhold - net‡ in the current year.

† These are amounts due before deducting withhold or paying bonuses and/or incentives.
‡ These are actual payments made after deducting withhold or paying bonuses and/or incentives.

Enter the paid claims for the current year where payments to providers were subject to withholds and bonuses/incentives, but otherwise had no managed care arrangements.

Line (4)

Category 2b - Payments Made Subject to Withholds or Bonuses/Incentives That Are Otherwise Managed Care Category 1. Category 2b may include business that would have otherwise fit into Category 1. That is, there may be a bonus/incentive/withhold arrangement with a provider who is reimbursed based on a provider fee schedule (Category 1). The Category 2 discount for claims payments that would otherwise qualify for Category 1 is the greater of the Category 1 factor or the calculated Category 2 factor.

The maximum Category 2b managed care credit is 25 percent. The minimum of Category 2b managed care credit is 15 percent (Category 1 credit factor). The credit calculation is the same as found in the previous example for Category 2a.

Enter the paid claims for the current year where payments to providers were subject to withholds and bonuses/incentives AND where the payments were made according to one of the contractual arrangements listed for Category 1.

Line (5)
Category 3a - Capitated Payments Directly to Providers. There is a managed care credit of 60 percent for claims payments in this category, which includes:

- All capitation or percent of premium payments directly to licensed providers.

Enter the amount of claims payments paid DIRECTLY to licensed providers on a capitated basis.

Line (6)
Category 3b - Capitated Payments to Regulated Intermediaries. There is a managed care credit of 60 percent for claims payments in this category, which includes:

- All capitation or percent of premium payments to regulated intermediaries that, in turn, pay licensed providers.

Enter the amount of medical expense capitations paid to regulated intermediaries (see Appendix 2 for definition). In those cases where the capitated regulated intermediary employs providers and pays them non-contingent salaries or otherwise qualifies for Category 4, the insurer may include that portion of such capitated payments in Category 4.

Line (7)
Category 3c - Capitated Payments to Non-Regulated Intermediaries. There is a managed care credit of 60 percent for claims payments in this category, which includes:

- All capitated or percent of premium payments to non-affiliated intermediaries that, in turn, pay licensed providers (subject to a 5 percent limitation on payments to providers or other corporations that have no contractual relationship with such intermediary. Amounts greater than the 5 percent limitation should be reported in Category 0).

Enter the amount of medical expense capitations paid to non-regulated intermediaries not affiliated with the reporting company. Do not include the amount of medical expense capitations paid to non-regulated intermediaries affiliated with the reporting company. These amounts should be reported in Category 0. Non-regulated intermediaries are those organizations that meet the definition in Appendix 2 for Intermediary but not regulated intermediary. In those cases where the capitated non-regulated intermediary (even if affiliated) employs providers and pays them non-contingent salaries or otherwise qualifies for Category 4, the insurer may include that portion of such capitated payments in Category 4.

IN ORDER TO QUALIFY FOR ANY OF THE CAPITATION CATEGORIES, SUCH CAPITATION MUST BE FIXED (AS A PERCENTAGE OF PREMIUM OR FIXED DOLLAR AMOUNT PER MEMBER) FOR A PERIOD OF AT LEAST 12 MONTHS. Where an arrangement contains a provision for prospective revision within a 12-month period, the entire arrangement shall be subject to a managed care credit that is calculated under Category 1 for a provider, and for an intermediary at the greater

of Category 1 or a credit calculated using the underlying payment method(s) to the providers of care. Where an arrangement contains a provision for retroactive revisions either within or beyond a 12 month period, the entire arrangement shall be subject to a managed care credit that is calculated under Category 0 for both providers and intermediaries.

Line (8)
Category 4 - Medical & Hospital Expense Paid as Salary to Providers. There is a managed care credit of 75 percent for claims payments in this category. Once claims payments under this managed care category are totaled, any fee for service revenue from uninsured plans (i.e., ASO or ASC) that was included on Line (7) in the underwriting risk section should be deducted before applying the managed care credit factor.

- Non-contingent salaries to persons directly providing care.
- The portion of payments to affiliated entities passed on as non-contingent salaries to persons directly providing care where the entity has a contract only with the company.
- All facilities-related medical expenses and other non-provider medical costs generated within health facility that is owned and operated by the insurer.
- Aggregate cost payments.

Salaries paid to doctors and nurses whose sole corporate purpose is utilization review are also included in this category if such payments are classified as "medical expense" payments (paid claims) rather than administrative expenses. The Aggregate Cost method of reimbursement means where a health plan has a reimbursement plan with a corporate entity that directly provides care, where (1) the health plan is contractually required to pay the total operating costs of the corporate entity, less any income to the entity from other users of services; and (2) there are mutual unlimited guarantees of solvency between the entity and the health plan, which put their respective capital and surplus at risk in guaranteeing each other.

Line (9)
Subtotal Paid Claims – The total of Column (2) paid claims should equal the total claims paid for the year as reported in Schedule H, Part 5, Columns 1 and 2, Line A.4 of the annual statement.

Line (10)
Category 0 for Stand-Alone Medicare Part D Coverage would be all claims during a period where neither the reinsurance coverage or risk corridor protection is provided.

Line (11)
Category 1 for Stand-Alone Medicare Part D Coverage would be for all claims during a period when only the reinsurance coverage is provided. This is designed for some future time period and is not to be interpreted as including employer-based Part D coverage that is not subject to risk corridor protection.

Line (12)
Category 2a for Stand-Alone Medicare Part D Coverage would be for all claims during a period when only the risk corridor protection is provided.

Line (13)
Category 3a for Stand-Alone Medicare Part D Coverage would be for all claims during a period when both reinsurance coverage and risk corridor protection are provided.

Line (16)
Weighted Average Managed Care Discount – The amounts in Column (3) and Column (4) are calculated by dividing the total weighted claims in Column (3) by the total claims paid in Column (2) for Lines (9) and (14) respectively.

Line (17)

Weighted Average Managed Care Risk Adjustment Factor – These are the credit factors that are carried back to the underwriting risk calculation. They are one minus the Weighted Average Managed Care Discount (Line (16)).

Lines (18) through (24)
Lines (18) through (24) are the calculation of the weighted average factor for the Category 2 claims payments subject to withholds and bonuses/incentives. This table requires data from the PRIOR YEAR to compute the current year's discount factor.

Line (18)
Enter the prior year's actual withhold and bonus/incentive payments.

Line (19)
Enter the prior year's withholds and bonuses/incentives that were available for payment in the prior year.

Line (20)
Divides Line (18) by Line (19) to determine the portion of withholds and bonuses/incentives that were actually returned in the prior year.

Line (21)
Equal to Line (19) and is automatically pulled forward.

Line (22)
Claims payments that were subject to withholds and bonuses/incentives in the prior year. Equal to Line (3) + Line (4) of LR022 Underwriting Risk – Managed Care Credit FOR THE PRIOR YEAR.

Line (23)
Divides Line (21) by Line (22) to determine the average withhold rate for the prior year.

Line (24)
Multiplies Line (20) by Line (23) to determine the discount factor for Category 2 claims payments in the current year, based on the performance of the insurer's withhold/bonus/incentive program in the prior year.

PR021 - Underwriting Risk – Managed Care Credit

This worksheet PR021 Underwriting Risk – Managed Care Credit is optional. It may be completed for only part of the Comprehensive Medical, Stand-Alone Medicare Part D Coverage, Dental business or all of them. Line (1) will be filled in as the balancing item if any of Lines (2) through (8) are entered (and then Line (9) will be required).

The effect of managed care arrangements on the variability of underwriting results is the fundamental difference between coverages subject to the managed care credit and pure indemnity insurance. The managed care credit is used to reduce the RBC requirement for experience fluctuations. It is important to understand that the managed care credit is based on the reduction in uncertainty about future claims payments, not on any reduction in the actual level of cost. Those managed care arrangements that have the greatest reduction in the uncertainty of claims payments receive the greatest credit, while those that have less effect on the predictability of claims payments engender less of a discount.

There are currently five levels of managed care that are used in the RBC formulas other than for Stand-Alone Medicare Part D Coverage, although in the future as new managed care arrangements evolve, the number of categories may increase or new arrangements may be added to the existing categories. The managed care categories are:

* Category 0 - Arrangements not Included in Other Categories
* Category 1 - Contractual Fee Payments
* Category 2 – Bonus and/or Incentives / Withhold Arrangements
* Category 3 - Capitation
* Category 4 - Non-contingent Expenses and Aggregate Cost Arrangements and Certain PSO Capitated Arrangements

For Stand-Alone Medicare Part D Coverage, the reduction in uncertainty comes from two federal supports. The reinsurance coverage is optional in that a plan sponsor may elect to participate in the Part D Payment Demonstration. The risk corridor protection is expected to have less impact after the first few years. To allow flexibility within the RBC formula, Lines (10.1) through (10.4) will be used to give credit for the programs in which the plan sponsor participates. While all PDPs will have formularies and may utilize other methods to reduce uncertainty, for the near future no other managed care credits are allowed for this coverage.

The managed care credit is based on the percentage of paid claims that fall into each of these categories. Total claims payments are allocated among these managed care "buckets" to determine the weighted average discount, which is then used to reduce the Underwriting Risk – Premium Risk for Comprehensive Medical, Medicare Supplement and Dental RBC. Paid claims are used instead of incurred claims due to the variability of reserves (unpaid claims) in incurred claim amounts and the difficulty in allocating reserves (unpaid claims) by managed care category.

In some instances, claims payments may fit into more than one category. If that occurs, enter the claims payments into the highest applicable category. CLAIMS PAYMENTS CAN ONLY BE ENTERED INTO ONE OF THESE CATEGORIES! The total of the claims payments reported in the managed care worksheet should equal the total year's paid claims. Category 2a, Category 2b and Category 3c are not allowed to include non-regulated intermediaries who are affiliated with the reporting company in order to ensure that true risk transfer is accomplished.

Line (1)
Category 0 - Arrangements not Included in Other Categories. There is a zero managed care credit for claim payments in this category, which includes:

* Fee for service (charges).
* Discounted fee for service (based upon charges).
* Usual customary and reasonable (UCR) schedules.
* Relative value scale (RVS) where neither payment base nor RV factor is fixed by contract or where they are fixed by contract for one year or less.

* Retroactive payments to capitated providers or intermediaries whether by capitation or other payment method (excluding retroactive withholds later released to the provider and retroactive payments made solely because of a correction to the number of members within the capitated agreement).
* Capitation paid to providers or intermediaries that have received retroactive payments for previous years (including bonus arrangements on capitation programs).
* Claim payments not included in other categories.

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Line (2)
Category 1 - Payments Made According to Contractual Arrangements. There is a 15 percent managed care credit for payments included in this category:

* Hospital per diems, diagnostic related groups (DRGs) or other hospital case rates.
* Non-adjustable professional case and global rates.
* Provider fee schedules.
* Relative value scale (RVS) where the payment base and RV factor are fixed by contract for more than one year.

Line (3)
Category 2a - Payments Made Subject to Withholds or Bonuses/Incentives with No Other Managed Care Arrangements. This category may include business that would have otherwise fit into Category 0. That is, there may be a bonus/incentive/withhold arrangement with a provider who is reimbursed based on a UCR schedule (Category 0).

The maximum Category 2a managed care credit is 25 percent. The credit is based upon a calculation that determines the ratio of withholds returned and bonuses and/or incentives paid to providers during the prior year to total withholds and bonuses and incentives available to the providers during that year. That ratio is then multiplied by the average provider withhold ratio for the prior year to determine the current year's Category 2a managed care credit factor. Bonus and/or incentive payments that are not related to financial results are not included (e.g., patient satisfaction). Therefore, the credit factor is equal to the result of the following calculation:

EXAMPLE - 1998 Reporting Year	
1997 withhold / bonus payments	$750,000
1997 withholds / bonuses available	$1,000,000
A. MCC Factor Multiplier	75% - Eligible for credit
1997 withholds / bonuses available	$1,000,000
1997 claims subject to withhold -gross†	$5,000,000
B. Average Withhold Rate	20%
Category 2 Managed Care Credit Factor (A x B)	15%

The resulting factor is multiplied by claims payments subject to withhold - net‡ in the current year.

† These are amounts due before deducting withhold or paying bonuses and/or incentives.
‡ These are actual payments made after deducting withhold or paying bonuses and/or incentives.

Enter the paid claims for the current year where payments to providers were subject to withholds and bonuses/incentives, but otherwise had no managed care arrangements.

Line (4)
Category 2b - Payments Made Subject to Withholds or Bonuses/Incentives That Are Otherwise Managed Care Category 1. Category 2b may include business that would have otherwise fit into Category 1. That is, there may be a bonus/incentive/withhold arrangement with a provider who is reimbursed based on a provider fee schedule

(Category 1). The Category 2 discount for claims payments that would otherwise qualify for Category 1 is the greater of the Category 1 factor or the calculated Category 2 factor.

The maximum Category 2b managed care credit is 25 percent. The minimum Category 2b managed care credit is 15 percent (Category 1 credit factor). The credit calculation is the same as found in the previous example for Category 2a.

Enter the paid claims for the current year where payments to providers were subject to withholds and bonuses/incentives AND where the payments were made according to one of the contractual arrangements listed for Category 1.

Line (5)
Category 3a - Capitated Payments Directly to Providers. There is a managed care credit of 60 percent for claims payments in this category, which includes:

* All capitation or percent of premium payments made directly to licensed providers.

Enter the amount of claims payments paid DIRECTLY to licensed providers on a capitated basis.

Line (6)
Category 3b - Capitated Payments to Regulated Intermediaries. There is a managed care credit of 60 percent for claims payments in this category, which includes:

* All capitation or percent of premium payments to regulated intermediaries that in turn pay licensed providers.

Enter the amount of medical expense capitations paid to regulated intermediaries (see Appendix 1 for definition). In those cases where the capitated regulated intermediary employs providers and pays them non-contingent salaries or otherwise qualifies for Category 4, the insurer may include that portion of such capitated payments in Category 4.

Line (7)
Category 3c - Capitated Payments to Non-Regulated Intermediaries. There is a managed care credit of 60 percent for claims payments in this category, which includes:

* All capitated or percent of premium payments to non-affiliated intermediaries that in turn pay licensed providers. (Subject to a 5 percent limitation on payments to providers or other corporations that have no contractual relationship with such intermediary. Amounts greater than the 5 percent limitation should be reported in Category 0).

Enter the amount of medical expense capitations paid to non-regulated intermediaries not affiliated with the reporting company. Do not include the amount of medical expense capitations paid to non-regulated intermediaries that are affiliated with the reporting company. These amounts should be reported in Category 0. Non-regulated intermediaries are those organizations which meet the definition of Intermediary but not regulated intermediary in Appendix 1. In cases where the capitated non-regulated intermediary (even if affiliated) employs providers and pays them non-contingent salaries or otherwise qualifies for Category 4, the insurer may include that portion of such capitated payments in Category 4.

IN ORDER TO QUALIFY FOR ANY OF THE CAPITATION CATEGORIES, SUCH CAPITATION MUST BE FIXED (AS A PERCENTAGE OF PREMIUM OR FIXED DOLLAR AMOUNT PER MEMBER) FOR A PERIOD OF AT LEAST 12 MONTHS. Where an arrangement contains a provision for prospective revision within a 12-month period, the entire arrangement shall be subject to a managed care credit that is calculated under Category 1 for a provider, and for an intermediary at the greater of Category 1 or a credit calculated using the underlying payment method(s) to the providers of care. Where an arrangement contains a provision for retroactive

revisions either within or beyond a 12-month period, the entire arrangement shall be subject to a managed care credit that is calculated under Category 0 for providers and intermediaries.

Line (8)
Category 4 - Medical & Hospital Expense Paid as Salary to Providers. There is a managed care credit of 75 percent for claims payments in this category. Once claims payments under this managed care category are totaled, any fee for service revenue from uninsured plans (i.e., ASO or ASC) that was included on Line (7) in the underwriting risk section should be deducted before applying the managed care credit factor.

* Non-contingent salaries to persons directly providing care.
* The portion of payments to affiliated entities which is passed on as non-contingent salaries to persons directly providing care where the entity has a contract only with the company.
* All facilities related medical expenses and other non-provider medical costs generated within health facility that is owned and operated by the insurer.
* Aggregate cost payments.

Salaries paid to doctors and nurses whose sole corporate purpose is utilization review are also included in this category if such payments are classified as "medical expense" payments (paid claims) rather than administrative expenses. The Aggregate Cost method of reimbursement means where a health plan has a reimbursement plan with a corporate entity that directly provides care, where (1) the health plan is contractually required to pay the total operating costs of the corporate entity, less any income to the entity from other users of services; and (2) there are mutual unlimited guarantees of solvency between the entity and the health plan, that put their respective capital and surplus at risk in guaranteeing each other.

Line (10.1)
Category 0 for Stand-Alone Medicare Part D Coverage would be all claims during a period where neither the reinsurance coverage or risk corridor protection is provided.

Line (10.2)
Category 1 for Stand-Alone Medicare Part D Coverage would be for all claims during a period when only the reinsurance coverage is provided. This is designed for some future time period and is not to be interpreted as including employer-based Part D coverage that is not subject to risk corridor protection.

Line (10.3)
Category 2a for Stand-Alone Medicare Part D Coverage would be for all claims during a period when only the risk corridor protection is provided.

Line (10.4)
Category 3a for Stand-Alone Medicare Part D Coverage would be for all claims during a period when both reinsurance coverage and risk corridor protection are provided.

Line (10.6)
Total Paid Claims – The total of Column (1) paid claims should equal the total claims paid for the year as reported in Schedule H, Part 5, Columns 1 and 2, Line D16 of the annual statement.

Line (11)
Weighted Average Managed Care Discount – This amount is calculated by dividing the total weighted claims (Line (9) Column (2)) by the total claim payments (Line (9) Column (1).

Line (12)

Weighted Average Managed Care Risk Adjustment Factor - This is the credit factor that is carried back to the underwriting risk calculation. They are one minus the Weighted Average Managed Care Discount (Line (11)).

Lines (13) through (19)
Lines (13) through (19) are the calculation of the weighted average factor for the Category 2 claims payments subject to withholds and bonuses/incentives. This table requires data from the PRIOR YEAR to compute the current year's discount factor.

Line (13)
Enter the prior year's actual withhold and bonus/incentive payments.

Line (14)
Enter the prior year's withholds and bonuses/incentives that were available for payment in the prior year.

Line (15)
Divides Line (13) by Line (14) to determine the portion of withholds and bonuses/incentives that were actually returned in the prior year.

Line (16)
Equal to Line (14) and is automatically pulled forward.

Line (17)
Claims payments that were subject to withholds and bonuses/incentives in the prior year. Equal to Line (3) + Line (4) of Underwriting Risk–Managed Care Credit FOR THE PRIOR YEAR.

Line (18)
Divides Line (16) by Line (17) to determine the average withhold rate for the prior year.

Line (19)
Multiplies Line (15) by Line (18) to determine the discount factor for Category 2 claims payments in the current year, based on the performance of the insurer's withhold/bonus/incentive program in the prior year.

HEALTH, LIFE AND PROPERTY AND CASUALTY

APPENDIX 1 – COMMONLY USED TERMS

The Definitions of Commonly Used Terms are frequently duplicates from the main body of the text. If there are any inconsistencies between the definitions in this section and the definitions in the main body of the instructions, the main body definition should be used.

Incentives, Withhold and Bonus Amounts – Are amounts to be paid to providers by the Health entity as an incentive to achieve goals such as effective management of care. An incentive arrangement may involve paying an agreed-on amount for each claim (e.g. provider agrees practice in an underserved area). While a bonus arrangement may be paid at the end of a contact period after specific goals have been met. Withhold arrangements can involve a set amount to be withheld from each claim, and then paying a portion (which could be none or all) of the withheld amount at the end of the contract period.

Incentive pool, withhold, and bonus amounts are defined as: amounts to be paid to providers by the Health entity as an incentive to achieve goals such as effective management of care. Some arrangements involve paying an agreed-on amount for each claim, and then paying a bonus at the end of the contract period. Other arrangements involve a set amount to be withheld from each claim, and then paying a portion (which could be none or all) of the withheld amount at the end of the contract period.

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Commented [BC1]: This could also be worded as "(e.g. provider is paid on a per claim basis for practicing in an underserved area.)"

Commented [BC2]: This is directly from the A/S instructions. It used as a basis for the definition drafted above.

UNDERWRITING RISK - Managed Care Credit Calculation

	Managed Care Claims Payments	Annual Statement Source	(1) Factor	(2) Paid Claims	(3) Weighted Claims†	(4) Part D Weighted Claims‡
(1)	Category 0 - Arrangements not Included in Other Categories	Exhibit 7, Part 1, Column 1, Line 5, in part §	0			
(2)	Category 1 - Payments Made According to Contractual Arrangements	Exhibit 7, Part 1, Column 1, Line 6, in part §	0.150			
(3)	Category 2a - Subject to Withholds or Bonuses/**Incentives** - Otherwise Catego	Exhibit 7, Part 1, Column 1, Line 7, in part §	*			
(4)	Category 2b - Subject to Withholds or Bonuses/**Incentives** - Otherwise Catego	Exhibit 7, Part 1, Column 1, Line 8, in part §	*			
(5)	Category 3a - Capitated Payments Directly to Providers		0.600			
(5.1)	Capitation Payments - Medical Group - Category 3a	Exhibit 7, Part 1, Column 1, Line 1, in part §				
(5.2)	Capitation Payments - All Other Providers - Category 3a	Exhibit 7, Part 1, Column 1, Line 3, in part §				
(6)	Category 3b - Capitated Payments to Regulated Intermediaries	Included in Exhibit 7, Part 1, Column 1, Line 2 §	0.600	$0		
(7)	Category 3c - Capitated Payments to Non-Regulated Intermediaries	Included in Exhibit 7, Part 1, Column 1, Line 2 §	0.600	$0		
(8)	Category 4 - Medical & Hospital Expense Paid as Salary to Providers		0.750			
(8.1)	Non-Contingent Salaries - Category 4	Exhibit 7, Part 1, Column 1, Line 9, in part §				
(8.2)	Aggregate Cost Arrangements - Category 4	Exhibit 7, Part 1, Column 1, Line 10, in part §				
(8.3)	Less Fee For Service Revenue from ASC or ASO	Company Records				
(9)	Sub-Total Paid Claims	Exhibit 7, Part 1, Column 1, Lines 13 - 11 - (8.3) - (12) - (13)				
	Stand-Alone Medicare Part D Coverage Claim Payments					
(10)	Category 0 - No Federal Reinsurance or Risk Corridor Protection	Company Records	XXX	XXX		XXX
(11)	Category 1 - Federal Reinsurance but no Risk Corridor Protection	Company Records	XXX	XXX		XXX
(12)	Category 2a - No Federal Reinsurance but Risk Corridor Protection	Company Records	0.667			
(13)	Category 3a - Federal Reinsurance and Risk Corridor Protection Apply	Company Records	0.767			
(14)	Sub-Total Paid Claims	Sum of Lines (10) through (13)				
(15)	Total Paid Claims	Sum of Lines (9) and (14)				
(16)	Weighted Average Managed Care Discount					
(17)	Weighted Average Managed Care Risk Adjustment Factor					

† This column is for a single result for the Comprehensive Medical & Hospital, Medicare Supplement and Dental/Vision Managed Care Discount factor.
‡ This column is for the Medicare Part D Managed Care Discount factor.
§ Stand-Alone Medicare Part D business reported in Lines (12) and (13) would be excluded from these amounts.
* The factor is calculated on page XR018.

Denotes items that must be manually entered on filing software.

		Annual Statement Source	(1) Amount
*** Calculation of Category 2 Managed Care Factor**			
(18)	Withhold & Bonus/**Incentive** Payments, ***Prior Year***	Company Records	
(19)	Withhold & Bonuses/**Incentives** Available, ***Prior Year***	Company Records	
(20)	MCC Multiplier - Average Withhold Returned [Line (18)/(19)]		
(21)	Withholds & Bonuses/**Incentives** Available, ***Prior Year***	Company Records	
(22)	Claims Payments Subject to Withhold, ***Prior Year***	Company Records	
(23)	Average Withhold Rate, Prior Year [Line (21)/(22)]		
(24)	MCC Discount Factor, Category 2 Min{.25,[Lines (20) x (23)]}		

* The factor is pulled into Lines (3) and (4) on page XR017.

Denotes items that must be manually entered on filing software.

UNDERWRITING RISK – MANAGED CARE CREDIT

	Comprehensive Medical, Medicare Supplement and Dental Claim Payments	Annual Statement Source	(2) Paid Claims		Factor		(3) Weighted Claims*	(4) Part D Weighted Claims**
(1)	Category 0 - Arrangements not Included in Other Categories	Company records		X	0.000	=		
(2)	Category 1 - Payments Made According to Contractual Arrangements	Company records		X	0.150	=		
(3)	Category 2a - Subject to Withholds or Bonuses/**Incentives** – Otherwise Category 0	Company records		X	†	=		
(4)	Category 2b - Subject to Withholds or Bonuses/**Incentives** – Otherwise Category 1	Company records		X	‡	=		
(5)	Category 3a - Capitated Payments Directly to Providers	Company records		X	0.600	=		
(6)	Category 3b - Capitated Payments to Regulated Intermediaries	Company records		X	0.600	=		
(7)	Category 3c - Capitated Payments to Non-Regulated Intermediaries	Company records		X	0.600	=		
(8)	Category 4 - Medical & Hospital Expense Paid as Salary to Providers	Company records		X	0.750	=		
(9)	Subtotal Paid Claims	Sum of Lines (1) through (8)						
	Stand-Alone Medicare Part D Coverage Claim Payments							
(10)	Category 0 - No Federal Reinsurance or Risk Corridor Protection	Company records	XXX	X	xxx	=		XXX
(11)	Category 1 - Federal Reinsurance but no Risk Corridor Protection	Company records	XXX	X	xxx	=		XXX
(12)	Category 2a - No Federal Reinsurance but Risk Corridor Protection	Company records		X	0.667	=		
(13)	Category 3a - Federal Reinsurance and Risk Corridor Protection apply	Company records		X	0.767	=		
(14)	Subtotal Stand-Alone Medicare Part D Paid Claims	Sum of Lines (10) through (13)						
(15)	Total Paid Claims	Line (9) + Line (14)						
(16)	Weighted Average Managed Care Discount	Column (3) = Column (3) Line (9) / Column (2) Line (9) Column (4) = Column (4) Line (14) / Column (2) Line (14)						
(17)	Weighted Average Managed Care Risk Adjustment Factor	1.0 - Line (16)						

	Calculation of Category 2 Managed Care Factor (Comprehensive Medical and Dental only)		(1) Amount
(18)	Withhold & bonus/**incentive** payments, prior year	Company Records	
(19)	Withhold & bonuses/**incentives** available, prior year	Company Records	
(20)	Managed Care Credit Multiplier – average withhold returned	Line (18) / Line (19)	
(21)	Withholds & bonuses/**incentives** available, prior year	Line (19)	
(22)	Claims payments subject to withhold, prior year	Company Records	
(23)	Average withhold rate, prior year	Line (21) / Line (22)	
(24)	Managed Care Credit Discount Factor, Category 2	Minimum of 0.25 or Line (20) x Line (23)	

† Category 2 Managed Care Factor calculated on Line (24).
‡ Category 2 Managed Care Factor calculated on Line (24) with a minimum factor of 15 percent.
* This column is for a single result for the Comprehensive Medical & Hospital, Medicare Supplement and Dental managed care discount factor.
** This column is for the Stand-Alone Medicare Part D managed care discount factor.

Denotes items that must be manually entered on the filing software.

UNDERWRITING RISK - MANAGED CARE CREDIT PR021

	Comprehensive Medical, Medicare Supplement and Dental & Vision Claim Payments	Annual Statement Source	(2) Paid Claims	Factor	(3) Weighted Claims†	(4) Part D Weighted Claims††
(1)	Category 0 - Arrangements not Included in Other Categories	Company records	0	0.000	0	
(2)	Category 1 - Payments Made According to Contractual Arrangements	Company records	0	0.150	0	
(3)	Category 2a - Subject to Withholds or Bonuses/**Incentives** – Otherwise Category 0	Company records	0	*	0	
(4)	Category 2b - Subject to Withholds or Bonuses/**Incentives** – Otherwise Category 1	Company records	0	**	0	
(5)	Category 3a - Capitated Payments Directly to Providers	Company records	0	0.600	0	
(6)	Category 3b - Capitated Payments to Regulated Intermediaries	Company records	0	0.600	0	
(7)	Category 3c - Capitated Payments to Non-Regulated Intermediaries	Company records	0	0.600	0	
(8)	Category 4 - Medical & Hospital Expense Paid as Salary to Providers	Company records	0	0.750	0	
(9)	Sub-Total Paid Claims	Sum of Lines (1) through (8)	0		0	
	Stand-Alone Medicare Part D Coverage Claim Payments					
(10.1)	Category 0 - No Federal Reinsurance or Risk Corridor Protection	Company records	XXX	XXX		XXX
(10.2)	Category 1 - Federal Reinsurance but no Risk Corridor Protection	Company records	XXX	XXX		XXX
(10.3)	Category 2a - No Federal Reinsurance but Risk Corridor Protection	Company records	0	0.667		0
(10.4)	Category 3a - Federal Reinsurance and Risk Corridor Protection apply	Company records	0	0.767		0
(10.5)	Sub-Total Paid Claims	Sum of Lines (10.1) through (10.4)	0			0
(10.6)	Total Paid Claims	Sum of Lines (9) and (10.5)	0			
(11)	Weighted Average Managed Care Discount	Col (3) = Col (3) Line (9) / Col (2) Line (9) Col (4) = Col (4) Line (10.5) / Col (2) Line (10.5)			0.000	0.000
(12)	Weighted Average Managed Care Risk Adjustment Factor	Col (3) = 1.0 - Col (3) Line (11) Col (4) = 1.0 - Col (4) Line (11)			0.000	0.000

	Calculation of Category 2 Managed Care Factor		(1) Amount
(13)	Withhold & bonus/**incentive** payments, prior year	Company Records	0
(14)	Withhold & bonuses/**incentives** available, prior year	Company Records	0
(15)	Managed Care Credit Multiplier – average withhold returned	Line (13) / Line (14)	0.000
(16)	Withholds & bonuses/**incentives** available, prior year	Line (14)	0
(17)	Claims payments subject to withhold, prior year	Company Records	0
(18)	Average withhold rate, prior year	Line (16) / Line (17)	0.000
(19)	Managed Care Credit Discount Factor, Category 2	Minimum of 0.25 or Line (15) x Line (18)	0.000

* Category 2 Managed Care Factor calculated on Line (19)

**Category 2 Managed Care Factor calculated on Line (19) with a minimum factor of 15 percent.

† This column is for a single result for the Comprehensive Medical & Hospital, Medicare Supplement and Dental managed care discount factor.

†† This column is for the Stand-Alone Medicare Part D managed care discount factor.

Denotes items that must be manually entered on the filing software.

Capital Adequacy (E) Task Force

RBC Proposal Form

[ ] Capital Adequacy (E) Task Force
[X] Catastrophe Risk (E) Subgroup
[ ] C3 Phase II/ AG43 (E/A) Subgroup
[ ] Health RBC (E) Working Group
[ ] Investment RBC (E) Working Group
[ ] P/C RBC (E) Working Group
[ ] Life RBC (E) Working Group
[ ] Operational Risk (E) Subgroup
[ ] Longevity Risk (A/E) Subgroup

DATE:	**10/19/2020**
CONTACT PERSON:	**Jean Buckley**
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ON BEHALF OF:	
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	New York, NY 10004

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Agenda Item # 2020-08-CR

Year 2021

DISPOSITION

[ ] ADOPTED
[ ] REJECTED
[ ] DEFERRED TO
[ ] REFERRED TO OTHER NAIC GROUP
[x] EXPOSED 10/19/20
[ ] OTHER (SPECIFY)

IDENTIFICATION OF SOURCE AND FORM(S)/INSTRUCTIONS TO BE CHANGED

[ ] Health RBC Blanks
[ ] Property/Casualty RBC Blanks
[ ] Life and Fraternal RBC Instructions
[ ] Health RBC Instructions
[x] Property/Casualty RBC Instructions
[ ] Life and Fraternal RBC Blanks
[ ] OTHER _____

DESCRIPTION OF CHANGE(S)

Add instructions to PR027 Interrogatories that clarify how insurers with no gross exposure to earthquake or hurricane should complete the Interrogatories.

REASON OR JUSTIFICATION FOR CHANGE **

Some insurers with no earthquake and/or hurricane exposure did not file PR027A, PR027B and the Interrogatories on PR027. This results with situation that it is not clear if the insurers fail to complete the exhibits or they simply have no gross exposure, thus creating cross-check problem. The clarification wording will reduce the cross-check problems experienced by NAIC.

Additional Staff Comments:

10/19/20 – The Cat Risk SG exposed the proposal for a thirty-day public comment period ending Nov. 18.
03/08/21 – The Cat Risk SG adopted the proposal.
03/15/21 – The P/C RBC WG adopted the proposal.

**** This section must be completed on all forms.** **Revised 2-2019**

CALCULATION OF CATASTROPHE RISK CHARGE RCAT
PR027

The catastrophe risk charge for earthquake (PR027A) and hurricane (PR027B) risks is calculated by multiplying the RBC factors by the corresponding modeled losses and reinsurance recoverables. The risk applies on a net basis with a corresponding contingent credit risk charge for certain categories of reinsurers. Data must be provided for the worst year in 50, 100, 250, and 500; however, only the worst year in 100 will be used in the calculation of the catastrophe risk charge. While projected losses modeled on an Aggregate Exceedance Probability basis is preferred, companies are permitted to report on an Occurrence Exceedance Probability basis if that is consistent with the company's internal risk management process.

The Grand Total (PR027) page includes an interrogatory to support an exemption from filing the catastrophe risk charge. Any company qualifying for exemption from the earthquake risk charge must identify the particular criteria from among (1a), (1b), (2) and (3) that provides its qualification for exemption, and may leave the other three items from this group of four possible qualifications for exemption blank; except identification of criteria (3) as the basis for the exemption requires a further answer to (3a) and (3b). If an insurer does not write or assume earthquake risks leaving no gross exposure, enter an "X" in interrogatory 3, with no need to fill in (3a) and (3b). Any company qualifying for exemption from the hurricane risk charge must identify the particular criteria from among (4a), (4b), (5) and (6) that provides its qualification for exemption, and may leave the other three items from this second group of four possible qualifications for exemption blank. If an insurer does not write or assume hurricane risks leaving no gross exposure, enter an "X" in interrogatory 6.

If the company qualifies for exemption from the earthquake risk charge, page PR027A and line (1) on this page may be left blank. If the company qualifies for exemption from the hurricane risk charge, page PR027B and line (2) on this page may be left blank.

In general, the following conditions will qualify a company for exemption: if it uses an intercompany pooling arrangement or quota share arrangement with U.S. affiliates covering 100% of its earthquake and hurricane risks such that there is no exposure for these risks; if it has a ratio of Insured Value – Property to surplus as regards policyholders of less than 50%; or if it writes Insured Value – Property that includes hurricane and/or earthquake coverage in catastrophe-prone areas representing less than 10% of its surplus as regards policyholders.

"Insured Value – Property" includes aggregate policy limits for structures and contents for policies written and assumed in the following annual statement lines – Fire, Allied Lines, Earthquake, Farmowners, Homeowners, and Commercial Multi-Peril.

"Catastrophe-Prone Areas in the U.S." include:

i. For hurricane risks, Hawaii, District of Columbia and states and commonwealths bordering on the Atlantic Ocean and/or the Gulf of Mexico including Puerto Rico.
ii. For earthquake risk or for fire following earthquake, any of the following commonwealth or states: Alaska, Hawaii, Washington, Oregon, California, Idaho, Nevada, Utah, Arizona, Montana, Wyoming, Colorado, New Mexico, Puerto Rico, and geographic areas in the following states that are in the New Madrid Seismic Zone - Missouri, Arkansas, Mississippi, Tennessee, Illinois and Kentucky.

Capital Adequacy (E) Task Force

RBC Proposal Form

[ ] Capital Adequacy (E) Task Force [ ] Health RBC (E) Working Group [ ] Life RBC (E) Working Group
[ ] Catastrophe Risk (E) Subgroup [ ] Investment RBC (E) Working Group [ ] Operational Risk (E) Subgroup
[ ] C3 Phase II/ AG43 (E/A) Subgroup [ ] P/C RBC (E) Working Group [ ] Longevity Risk (A/E) Subgroup

DATE:	**10/27/20**
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NAME:	**Tom Botsko**
TITLE:	**Chair**
AFFILIATION:	**Ohio Department of Insurance**
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	Columbus, OH 43215

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Agenda Item # 2020-11-CR

Year 2021

DISPOSITION

[ ] ADOPTED _____
[ ] REJECTED _____
[ ] DEFERRED TO _____
[ ] REFERRED TO OTHER NAIC GROUP
[x] EXPOSED 10/27/20
[ ] OTHER (SPECIFY) _____

IDENTIFICATION OF SOURCE AND FORM(S)/INSTRUCTIONS TO BE CHANGED

[ ] Health RBC Blanks [x] Property/Casualty RBC Blanks [ ] Life and Fraternal RBC Instructions
[ ] Health RBC Instructions [x] Property/Casualty RBC Instructions [ ] Life and Fraternal RBC Blanks
[ ] OTHER _____

DESCRIPTION OF CHANGE(S)

The proposed change would remove the embedded 3% operational risk component contained in the reinsurance contingent credit risk factor of Rcat.

REASON OR JUSTIFICATION FOR CHANGE **

Operational risk is now separately addressed in RBC as a stand-alone capital add-on. When this factor was implemented, it borrowed from the credit risk factors in R3 that included a load for operational risk. This is assessment of operational risk is duplicative and is inadvertently being applied in Rcat. The gross modeled Rcat risk does not apply this duplicative assessment of operational risk to Rcat, and it follows that it should not be applied to ceded modeled Rcat risk either.

Additional Staff Comments:

10/27/20 – The PCRBC WG exposed this proposal for a 35-day public comment period ending Dec. 1.
03/08/21 – The Cat Risk SG adopted the proposal.
03/15/21 – The P/C RBC WG adopted the proposal.

**** This section must be completed on all forms.** **Revised 2-2019**

Specific Instructions for Application of the Formula

Column (1) – Direct and Assumed Modeled Losses
These are the direct and assumed modeled losses per the first footnote. Include losses only; no loss adjustment expenses. For companies that are part of an inter-company pooling arrangement, the losses in this column should be consistent with those reported in Schedule P, i.e. losses reported in this column should be the gross losses for the pool multiplied by the company's share of the pool.

Column (2) – Net Modeled Losses
These are the net modeled losses per the footnote. Include losses only; no loss adjustment expenses.

Column (3) - Ceded Amounts Recoverable
These are the modeled losses ceded under any reinsurance contract. Include losses only, no loss adjustment expenses, and should be associated with the Net Modeled Losses.

Column (4) - Ceded Amounts with Zero Credit Risk Charge
Per the footnote, modeled catastrophe losses that would be ceded to the categories of reinsurers that are not subject to the RBC credit risk charge (i.e., U.S. affiliates and mandatory pools, whether authorized, unauthorized, or certified).

Column (6) – Amount
These are automatically calculated based on the previous columns.

Column (7) - RBC Requirement
A factor of 1.000 is applied to the reported modeled catastrophe losses calculated on both AEP and OEP basis, and a factor of **0.018** is applied to the reinsurance recoverables. The RBC Requirement is based on either AEP reported results or OEP reported results (not both), consistent with the way the company internally evaluates and manages its modeled net catastrophe risk.

Column (5) – Y/N
Please indicate "Y" for OEP basis and "N" for AEP basis. This column should not be blank.

CALCULATION OF CATASTROPHE RISK CHARGE FOR EARTHQUAKE PR027A

Earthquake	Reference	Modeled Losses (1) Direct and Assumed	(2) Net	3† Ceded Amounts Recoverable	(4)†† Ceded Amounts Recoverable with zero Credit Risk Charge
(1) Worst Year in 50	Company Records				
(2) Worst Year in 100	Company Records				
(3) Worst Year in 250	Company Records				
(4) Worst Year in 500	Company Records				

		(5) Y/N
(5)	Has the company reported above, its modeled earthquake losses using an occurrence exceedance probability (OEP) basis?	

		Reference	(6) Amount	Factor	(7) RBC Requirement (C(6) * Factor)
(6)	Net Earthquake Risk	L(2) C(2)	0	1.000	0
(7)	Contingent Credit Risk for Earthquake Risk	L(2) C(3) - C(4)	0	**0.018**	0
(8)	Total Earthquake Catastrophe Risk (AEP Basis)	If L(5) C(5) = "N", L(8) C(6) = L(6) C(7)+ L(7) C(7), otherwise "0"	0	1.000	0
(9)	Total Earthquake Catastrophe Risk (OEP Basis)	If L(5) C(5) = "Y", L(9) C(6) = L(6) C(7)+ L(7) C(7), otherwise "0"	0	1.000	0
(10)	Total Earthquake Catastrophe Risk	L(8) C(7) + L(9) C(7)			0

Lines (1)-(4): Modeled losses to be entered on these lines are to be calculated using one of the following NAIC approved third party commercial vendor catastrophe models - AIR, EQECAT, RMS, the ARA HurLoss Model, or the Florida Public Model for hurricane; or a catastrophe model that is internally developed by the insurer and has received permission of use by the lead or domestic state. The insurance company's own insured property exposure information should be used as inputs to the model(s). The insurance company may elect to use the modeled results from any one of the models, or any combination of the results of two or more of the models. Each insurer will not be required to utilize any prescribed set of modeling assumptions, but will be expected to use the same data, modeling, and assumptions that the insurer uses in its own internal catastrophe risk management process. An attestation to this effect and an explanation of the company's key assumptions and model selection may be required, and the company's catastrophe data, assumptions, model and results may be subject to examination.

† Column (3) is modeled catastrophe losses that would be ceded under reinsurance contracts. This should be associated with the Net Modeled Losses shown in Column (2).

††Column (4) is modeled catastrophe losses that would be ceded to the categories of reinsurers that are not subject to the RBC credit risk charge (i.e., U.S. affiliates and mandatory pools, whether authorized, unauthorized, or certified).

Denotes items that must be manually entered on the filing software.

CALCULATION OF CATASTROPHE RISK CHARGE FOR HURRICANE PR027B

Hurricane	Reference	Modeled Losses (1) Direct and Assumed	(2) Net	3† Ceded Amounts Recoverable	(4)†† Ceded Amounts Recoverable with zero Credit Risk Charge
(1) Worst Year in 50	Company Records				
(2) Worst Year in 100	Company Records				
(3) Worst Year in 250	Company Records				
(4) Worst Year in 500	Company Records				

	(5) Y/N
(5) Has the company reported above, its modeled hurricane losses using an occurrence exceedance probability (OEP) basis?	

	Reference	(6) Amount	Factor	(7) RBC Requirement (C(6) * Factor)
(6) Net Hurricane Risk	L(2) C(2)	0	1.000	0
(7) Contingent Credit Risk for Hurricane Risk	L(2) C(3) - C(4)	0	**0.018**	0
(8) Total Hurricane Catastrophe Risk (AEP Basis)	If L(5) C(5) = "N", L(8) C(6) = L(6) C(7)+ L(7) C(7), otherwise "0"	0	1.000	0
(9) Total Hurricane Catastrophe Risk (OEP Basis)	If L(5) C(5) = "Y", L(9) C(6) = L(6) C(7)+ L(7) C(7), otherwise "0"	0	1.000	0
(10) Total Hurricane Catastrophe Risk	L(8) C(7) + L(9) C(7)			0

Lines (1)-(4): Modeled losses to be entered on these lines are to be calculated using one of the following NAIC approved third party commercial vendor catastrophe models - AIR, EQECAT, RMS, the ARA HurLoss Model, or the Florida Public Model for hurricane; or a catastrophe model that is internally developed by the insurer and has received permission of use by the lead or domestic state. The insurance company's own insured property exposure information should be used as inputs to the model(s). The insurance company may elect to use the modeled results from any one of the models, or any combination of the results of two or more of the models. Each insurer will not be required to utilize any prescribed set of modeling assumptions, but will be expected to use the same data, modeling, and assumptions that the insurer uses in its own internal catastrophe risk management process. An attestation to this effect and an explanation of the company's key assumptions and model selection may be required, and the company's catastrophe data, assumptions, model and results may be subject to examination.

† Column (3) is modeled catastrophe losses that would be ceded under reinsurance contracts. This should be associated with the Net Modeled Losses shown in Column (2).

††Column (4) is modeled catastrophe losses that would be ceded to the categories of reinsurers that are not subject to the RBC credit risk charge (i.e., U.S. affiliates and mandatory pools, whether authorized, unauthorized, or certified).

Denotes items that must be manually entered on the filing software.

Priority 1 – High priority
Priority 2 – Medium priority
Priority 3 – Low priority

CAPITAL ADEQUACY (E) TASK FORCE
WORKING AGENDA ITEMS FOR CALENDAR YEAR 2020

Capital Adequacy (E) Task Force

2020 #	Owner	2020 Priority	Expected Completion Date	Working Agenda Item	Source	Comments	Date Added to Agenda
				Ongoing Items – Life RBC			
1	Life RBC WG	Ongoing	Ongoing	Make technical corrections to Life RBC instructions, blank and /or methods to provide for consistent treatment among asset types and among the various components of the RBC calculations for a single asset type.			
2	Life RBC WG	1	2021 or later	1.Monitor the impact of the changes to the variable annuities reserve framework and risk-based capital (RBC) calculation and determine if additional revisions need to be made. 2.Develop and recommend appropriate changes including those to improve accuracy and clarity of variable annuity (VA) capital and reserve requirements.	CATF	Being addressed by the Variable Annuities Capital and Reserve (E/A) Subgroup	
3	Life RBC WG	1	2021 or later	Provide recommendations for recognizing longevity risk in statutory reserves and/or RBC, as appropriate.	New Jersey	Being addressed by the Longevity (E/A) Subgroup	
				Carry-Over Items Currently being Addressed – Life RBC			
4	Life RBC WG	1	2021 or later	Update the current C-3 Phase I or C-3 Phase II methodology to include indexed annuities **with consideration of contingent deferred annuities as well**	AAA		
5	Life RBC WG	1	2021	Determine if any adjustment is needed to the XXX/AXXX RBC Shortfall calculation to address surplus notes issued by captives.	11/1/17 Referral from the Reinsurance (E) Task Force		3/24/2018
6	Life RBC WG	1	2021	Determine if any adjustment is needed due to the changes made to the *Life and Health Guaranty Association Model Act, Model #520.*			9/1/2018
7	Life RBC WG	1	2021	Determine if any adjustment is needed to the reinsurance credit risk in light of changes related to collateral and the changes made to the property RBC formula.			9/1/2018
8	Life RBC WG	1	2021	Discuss and determine the bond factors for the 20 designations.	Referral from Investment RBC July/2020		
9	Life RBC WG	1	2021	Discuss and determine the need to adjust the real estate factors.	Referral from Investment RBC July/2020		
				New Items – Life			
10	Life RBC WG	1	2021 or later	Work with the Life Actuarial (A) Task Force and Conning to develop the economic scenario generator for implementation.			
				Carry-Over Items Currently being Addressed – P&C RBC			
1	Cat Risk SG	1		Continue development of RBC formula revisions to include a risk charge based on catastrophe model output:			
			Year-end 2022 or later	a) Evaluate other catastrophe risks for possible inclusion in the charge - determine whether to recommend developing charges for any additional perils, and which perils or perils those should be.		~~The SG agreed on adding Wildfire Peril to Rcat.~~	~~10/19/2020~~

Priority 1 – High priority
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CAPITAL ADEQUACY (E) TASK FORCE
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Capital Adequacy (E) Task Force

2020 #	Owner	2020 Priority	Expected Completion Date	Working Agenda Item	Source	Comments	Date Added to Agenda
2	P&C RBC WG	1	Year-end 2020 or later	Evaluate a) the current growth risk methodology whether it is adequately reflects both operational risk and underwriting risk; b) the premium and reserve based growth risk factors either as a stand-alone task or in conjunction with the ongoing underwriting risk factor review with consideration of the operational risk component of excessive growth; c) whether the application of the growth factors to NET proxies adequately accounts for growth risk that is ceded to reinsures that do not trigger growth risk in their own right.	Refer from Operational Risk Subgroup	1) Sent a referral to the Academy on 6/14/18 conference call.	1/25/2018
3	P&C RBC WG	1	2020 Summer Meeting or later	Continue development of RBC formula revisions based on the Covered Agreement: 'a) consider eliminating the different treatment of uncollateralized reinsurance recoverable from authorized versus unauthorized, unrated reinsurers; 'b) consider whether the factor for uncollateralized, unrated reinsurers, runoff and captive companies should be adjusted ~~c) Evaluate the possibility of using NAIC as a centralized location for reinsurer designations~~.		12/5/19 - The WG exposed Proposal 2018-19-P (Vulnerable 6 or unrated risk charge) for a 30-day exposure period. 2/3/20 - The WG adopted Proposal 2018-19-P. However, the WG intended to evaluate the data annually until reaching any agreed upon change to the factor and the structure. 3/15/21 - The WG exposed Proposal 2021-03-P (Credit Risk Instruction Modification) for a 30-day exposure period.	8/4/2018
4	P&C RBC WG	1	Year-end 2021 or later	Evaluate the proposed changes from the Affiliated Investment Ad Hoc Group related to P/C RBC Affiliated Investments			6/10/2019
5	P&C RBC WG	1	2021 Summer Meeting or later	Continue working with the Academy to review the methodology and revise the underwriting (Investment Income Adjustment, Loss Concentration, LOB UW risk) charges in the PRBC formula as appropriate.			6/10/2019
~~6~~	~~P&C RBC WG~~	~~1~~	~~Year-end 2020~~	~~Evaluate the RBC impact on two different retroactive reinsurance exception approaches.~~		~~1/7/20 - received a referral from the SAPWG~~	~~1/9/2020~~
6	Cat Risk SG	1	Year-end 2020 or later	Evaluate the possibility of allowing additional third party models or adjustments to the vendor models to calculate the cat model losses			12/6/2019
7	P&C RBC WG	1	2021 Spring Meeting	Evaluate if changes should be made to the P/C formula to better assess companies in runoff.		1/29/20 - received a referral from the Restructuring Mechanisms (E) WG	2/3/2020
8	P&C RBC WG	1	2021 Spring Meeting	Evaluate the Underwriting Risk Line 1 Factors in the P/C formula.			7/30/2020
9	Cat Risk SG	1	2021 Spring Meeting	Modify instructions to PR027 Interrogatories that clarify how insurers with no gross exposure to earthquake or hurricane should complete the interrogatories		10/27/20 - expose the propsal for 30 day comment period	10/19/2020
10	P&C RBC WG/Cat Risk SG	1	2021 Spring Meeting	Remove the embedded 3% operational risk component contained in the reinsurance contingent credit risk factor of Rcat		10/27/20 - expose the propsal for 35 day comment period	10/27/2020
11	P&C RBC WG	1	2021 Summer Meeting	Evaluate R3 Adjustment for Operational Risk Charge			10/27/2020

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Priority 3 – Low priority

CAPITAL ADEQUACY (E) TASK FORCE
WORKING AGENDA ITEMS FOR CALENDAR YEAR 2020

Capital Adequacy (E) Task Force

2020 #	Owner	2020 Priority	Expected Completion Date	Working Agenda Item	Source	Comments	Date Added to Agenda
				New Items – P&C RBC			
12	Cat Risk SG	1	2022 Spring Meeting or later	Implement Wildfire Peril in the Rcat component (For Informational Purpose Only)			3/8/2021
				Ongoing Items – Health RBC			
1	Health RBC WG	3 ~~1~~	Year-end **2022~~21~~** RBC or later ~~2021 Spring Meeting~~	Evaluate the impact of Federal Health Care Law on the Health RBC Formulas	4/13/2010 CATF Call	Adopted 2014-01H Adopted 2014-02H Adopted 2014-05H Adopted 2014-06H Adopted 2014-24H Adopted 2014-25H Adopted 2016-01-H Adopted 2017-09-CA Adopted 2017-10-H The Working Group will continually evaluate any changes to the health formula as a result of ongoing federal discussions and legislation. ~~Consider and refer~~ **Adopted proposal 2020-02-CA** ~~to the TF for the deletion of the ACA Fee Sensitivity Test~~.	~~07/30/2020~~
2	Health RBC WG	3	Year-end **2022~~21~~** RBC or later	Discuss and monitor the development of federal level programs and actions and the potential impact of these changes to the HRBC formula: - Development of the state reinsurance programs; - Association Health Plans; - Cross-border sales	HRBCWG	Discuss and monitor the development of federal level programs and the potential impact on the HRBC formula.	1/11/2018
				Carry-Over Items Currently being Addressed – Health RBC			
3	Health RBC WG	3	Year-End 2023 RBC or Later	Consider changes for stop-loss insurance or reinsurance.	AAA Report at Dec. 2006 Meeting	(Based on Academy report expected to be received at YE-2016) 2016-17-CA	
4	Health RBC WG	2	Year-end 2023 RBC or later	Review the individual factors for each health care receivables line within the Credit Risk H3 component of the RBC formula.	HRBC WG	Adopted 2016-06-H Rejected 2019-04-H **Annual Statement Guidance (Year-End 2020) and Annual Statement Blanks Proposal (Year-End 2021) referred to the Blanks (E) Working Group**	

Priority 1 – High priority
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CAPITAL ADEQUACY (E) TASK FORCE
WORKING AGENDA ITEMS FOR CALENDAR YEAR 2020

Capital Adequacy (E) Task Force

2020 #	Owner	2020 Priority	Expected Completion Date	Working Agenda Item	Source	Comments	Date Added to Agenda
5	Health RBC WG	1	Year-end 2022 or later	Establish an Ad Hoc Group to review the Health Test and annual statement changes for reporting health business in the Life and P/C Blanks	HRBCWG	Evaluate the applicability of the current Health Test in the Annual Statement instructions in today's health insurance market. Discuss ways to gather additional information for health business reported in other blanks.	8/4/2018
6	Health RBC WG	1	Year-end 20222~~20~~ RBC or later	Review the Managed Care Credit calculation in the Health RBC formula - specifically Category 2a and 2b. **Review Managed Care Credit across formulas.**	HRBCWG	Review the Managed Care Category and the credit calculated, more specifically the credit calculated when moving from Category 0 & 1 to 2a and 2b.	12/3/2018
7	Health RBC WG	1	Year-end 20222~~20~~ or later	Review referral letter from the Operational Risk (E) Subgroup on the excessive growth charge and the development of an Ad Hoc group to charge.	HRBCWG	Review if changes are required to the Health RBC Formula	4/7/2019
~~8~~	~~Health RBC WG~~	~~1~~	~~2021 Spring Meeting~~	~~Review and consider the formula for the MAX function in Line 17 of the Excessive Growth Charge.~~	~~HRBCWG~~	~~Adopted 2020-04-H~~	~~4/3/2020~~
9	Health RBC WG	1	Year-End 20222~~21~~ or later	Consider impact of COVID-19 and pandemic risk in the Health RBC formula.	HRBCWG		7/30/2020
10	**Health RBC WG**	**1**	**Year-End 2021 or later**	**Work with the Academy to evaluate incorporating and including investment income in the Underwriting Risk component of the Health RBC formula.**	**HRBCWG**	**Referral Letter was sent to the Academy on Sept 21.**	**8/18/2020**
11	**Health RBC WG**	**1**	**2021**	**Discuss and determine the bond factors for the 20 designations.**	**Referral from Investment RBC July/2020**	**Working Group will use two- and five-year time horizon factors in 2020 impact analysis.**	**9/11/2020**
				New Items – Health RBC			
				New Items – Task Force			
12	CADTF	1	2021 or Later	**Supplementary Investment Risks Interrogatories (SIRI)**	Referral from Blackrock and IL DOI	The Task Force received the referral on Oct. 27. This referral will be tabled until the bond factors have been adopted and the TF will conduct a holistic review all investment referrals.	11/19/2020
				Ongoing Items – Task Force			

Priority 1 – High priority
Priority 2 – Medium priority
Priority 3 – Low priority

CAPITAL ADEQUACY (E) TASK FORCE
WORKING AGENDA ITEMS FOR CALENDAR YEAR 2020

Capital Adequacy (E) Task Force

2020 #	Owner	2020 Priority	Expected Completion Date	Working Agenda Item	Source	Comments	Date Added to Agenda
13	CADTF	1	2020	Consideration given to 20 designations for bonds in all RBC formulas so that an impact analysis can be provided on 2020 year-end data to determine the bond RBC factors. The Task Force will need to discuss and determine whether Hybrids are included with the new bond's structure. History In 2012 /13 as part of the Solvency Modernization Initiative "roadmap" and subsequent White Paper roadmap, the Capital Adequacy (E) Task Force identified increased granularity in the asset and investment risk charges as a priority area. It was originally targeted at the Life RBC formula and was referred to as the "C1 factor review". The project was assigned to a newly formed Investment RBC (E) Working Group in 2013. Work was conducted by the Life C-1 Work Group of American Academy of Actuaries (Academy) at the instructions of the working group using defined criteria for the analysis: The C1 bond factors are defined as the amount needed to pre-fund losses at the 96th percentile minus the amount assumed to be funded in statutory policy reserves. The credit loss distribution is skewed with the mean occurring at approximately the 60th percentile. The RP does not vary by economic scenario.	IRBCWG - Dec 2019	An Academy report issued in 2015 and updated 2017 report recommended an increase in the number of designations. Ultimately, the WG members agreed that the number of designations should be increased to 20. In 2017//2018, the PRBC and HRBC (E) Working Groups began discussion of the change to 20 designations. In 2019 both working groups concurred with the LRBC WG position that the number of designations should be increased to 19 in their respective formulas Proposal # 2019 – 16CA	
14	CADTF	2	2022	Affiliated Investment Subsidiaries Referral Ad Hoc group formed Sept. 2016	Ad Hoc Group	Ad Hoc group will provide periodic updates on their progress.	
				Carry-Over Items not Currently being Addressed – Task Force			
15	CADTF	3	2021	Receivable for Securities factor		Consider evaluating the factor every 3 years. (2021, 2024, 2027, etc.)	
16	CADTF	3	2021 or Later	NAIC Designation for Schedule D, Part 2 Section 2 - Common Stocks Equity investments that have an underlying bond characteristic should have a lower RBC charge? Similar to existing guidance for SVO-identified ETFs reported on Schedule D-1, are treated as bonds.	Referral from SAPWG 8/13/2018	10/8/19 - Exposed for a 30-day Comment period ending 11/8/2019 3-22-20 - Tabled discussion pending adoption of the bond structure and factors.	10/11/2018
17	CADTF	3	2021 or Later	Structured Notes - defined as an investment that is structured to resemble a debt instrument, where the contractual amount of the instrument to be paid at maturity is at risk for other than the failure of the borrower to pay the contractual amount due. Structured notes reflect derivative instruments (i.e. put option or forward contract) that are wrapped by a debt structure.	Referral from SAPWG April 16, 2019	10/8/19 - Exposed for a 30-day Comment period ending 11/8/2019 3-22-20 - Tabled discussion pending adoption of the bond structure and factors.	8/4/2019
18	CADTF	3	2021 or Later	Comprehensive Fund Review for investments reported on Schedule D Pt 2 Sn2	Referral from VOSTF 9/21/2018	Discussed during Spring Mtg. NAIC staff to do analysis. 10/8/19 - Exposed for a 30-day comment period ending 11/8/19 3-22-20 - Tabled discussion pending adoption of the bond structure and	11/16/2018

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Priority 2 – Medium priority
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CAPITAL ADEQUACY (E) TASK FORCE
WORKING AGENDA ITEMS FOR CALENDAR YEAR 2020

Capital Adequacy (E) Task Force

2020 #	Owner	2020 Priority	Expected Completion Date	Working Agenda Item	Source	Comments	Date Added to Agenda
				Carry-Over Items Currently being Addressed – Task Force			
19	CADTF	2	2020 or Later	XXX/AXXX Captive Reinsurance RBC Shortfall	Referral from Reinsurance Task Force /RITF	Referred to Life RBC WG for consideration and comment	11/1/2017
20	CADTF	2	2020 or Later	Payout Annuities for RBC	Referral from Allstate and IL DOI	Referred to Life RBC WG for consideration and comment	3/25/2018
21	CADTF	2	2020 or Later	Guaranty Association Assessment Risk	Referral from Receivership and Insolvency (E) Task Force 5/1/2018	Referred to the Life RBC WG and Health RBC WG for consideration and comment.	6/30/2018

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