

Draft: 3/29/21

International Insurance Relations (G) Committee
Virtual Meeting
March 25, 2021

The International Insurance Relations (G) Committee met March 25, 2021. The following Committee members participated: Gary D. Anderson, Chair (MA); Bruce R. Ramage, Vice Chair (NE); Evan G. Daniels (AZ); Andrew N. Mais (CT); Karima M. Woods (DC); David Altmaier (FL); Doug Ommen (IA); James J. Donelon (LA); Kathleen A. Birrane (MD); Anita G. Fox (MI); Chlora Lindley-Myers (MO); Marlene Caride (NJ); Andrew R. Stolfi (OR); Jessica K. Altman (PA); and Raymond G. Farmer (SC).

1. Discussed NAIC Comments on the IAIS Draft Application Paper on Supervision of Control Functions

Commissioner Anderson explained that the International Association of Insurance Supervisors (IAIS) draft Application Paper on Supervision of Control Functions aims to help supervisors address issues related to the supervision of control functions as described in Insurance Core Principles (ICPs) and the Common Framework for the Supervision of Internationally Active Insurance Groups (ComFrame)—in particular, material from ICP 8 (Risk Management and Control Functions), but also relevant to ICP 5 (Suitability of Persons) and ICP 7 (Corporate Governance).

Ryan Workman (NAIC) gave an overview of the NAIC's comments on the draft application paper, noting that some were editorial or for clarification. He provided more detail on those comments that were more substantial.

David Snyder (American Property Casualty Insurance Association—APCIA) noted agreement with the NAIC comments and said that the APCIA will submit their own comments. He stated that overall insurer corporate governance and insurance regulation has shown the stability of the sector throughout multiple crises. He commented that it is important that the application paper: 1) recognize the notion of proportionality; 2) reflect that the way insurance groups can effectively organize their control functions may vary based on the business model of the group; and 3) appropriately characterize the role of the supervisor when it comes to insurer governance areas such as remuneration, outsourcing, attendance at board meetings and succession planning.

Commissioner Caride made a motion, seconded by Director Farmer, to approve submission of the NAIC comments (Attachment A). The motion passed.

Having no further business, the International Insurance Relations (G) Committee adjourned.

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Draft: 4/1/21

International Insurance Relations (G) Committee
Virtual Meeting
February 3, 2021

The International Insurance Relations (G) Committee met Feb. 3, 2021. The following Committee members participated: Gary D. Anderson, Chair (MA); Bruce R. Ramage, Vice Chair (NE); Evan G. Daniels (AZ); Andrew N. Mais (CT); Karima M. Woods (DC); David Altmaier (FL); Doug Ommen (IA); James J. Donelon (LA); Kathleen A. Birrane (MD); Anita G. Fox (MI); Chlora Lindley-Myers (MO); Marlene Caride (NJ); Jessica K. Altman (PA); and Raymond G. Farmer (SC).

1. Discussed NAIC Comments on the IAIS Draft Application Paper on Resolution Powers and Planning and Consultation on the Development of Liquidity Metrics

Commissioner Anderson explained that the International Association of Insurance Supervisors' (IAIS') draft Application Paper on Resolution Powers and Planning aims to provide guidance on supervisory practices related to resolution, which the IAIS defines as "actions taken by a resolution authority towards an insurer that is no longer viable, or is likely to be no longer viable, and has no reasonable prospect of returning to viability."

Ryan Workman (NAIC) provided a detailed overview of the NAIC's comments on the draft application paper, which were mostly editorial or for clarification.

Commissioner Anderson explained that the consultation on the development of liquidity measures is part of the IAIS' development of its broader holistic framework for systemic risk that will serve as a tool for assessing insurers' liquidity exposures and will help the IAIS to identify trends in insurers and the insurance-sector.

Mr. Workman provided a detailed overview of the NAIC's responses on the consultation questions, including changes that were made in light of input received from interested parties in advance of the meeting (Attachment B).

Director Daniels questioned whether the NAIC response to the first consultation question was meant to be read as the NAIC seeing the several metrics being developed as duplicative or complementary and suggested that clarification could be helpful.

Ralph Blanchard (Travelers) provided an overview of Travelers' comments on the consultation, as well as on the draft NAIC responses, which highlighted flaws in some of the assumptions and approaches being used in Phase 1 of the liquidity metrics development process, including those that do not adequately reflect non-life insurance business. He suggested the need to address certain areas now instead of holding off until the Phase 2 consultation.

Director Ramage asked how the liquidity metrics being developed took into account different accounting treatments.

David Leifer (American Council of Life Insurers—ACLI) noted that the ACLI will be submitting its own comments, recommending that the IAIS needs to do more analysis on the differences of policy behavior, specifically in life annuities. He noted that the ACLI's comments largely aligned with the NAIC's comments.

Commissioner Anderson thanked Committee members and interested parties for their comments and asked Tim Nauheimer (NAIC) to respond to the points and questions raised. Mr. Nauheimer said that the NAIC response to the first consultation question was intended to convey that several metrics could provide different ways to achieve a similar outcome, not that they were duplicative, in part because the NAIC is supportive of the cash-flow approach being developed in Phase 2. He stated the points raised by Travelers were helpful as the IAIS liquidity metrics work progresses and encouraged Travelers to submit its own consultation responses. However, he noted the challenge of creating one ratio for both life and non-life insurers that would accurately be indicative of liquidity risk. Mr. Nauheimer acknowledged the concern that life insurance policies and annuities should be treated differently and would take it up as work continues within the IAIS. He also commented that different account treatments should not affect the liquidity metrics.

Commissioner Anderson suggested clarifying the NAIC's response to the first question, to which Mr. Workman suggested revising the response to: "Yes, we agree with the IAIS phased approach to develop liquidity metrics for monitoring as different metrics may achieve the same goal and be comparable."

Commissioner Caride made a motion, seconded by Director Ramge, to submit the NAIC's comments as drafted on the Application Paper on Resolution Powers and Planning and to submit the NAIC's responses, including the revisions proposed during the meeting, on the liquidity metrics consultation (Attachment A). The motion passed unanimously.

Mr. Workman noted the IAIS had released another public consultation on its draft Application Paper on the Supervision of Control Functions, with comments due March 26. He noted that the internal review process is underway and that a Committee meeting will be scheduled accordingly prior to the submission date to review and approve the submission of any NAIC comments.

Having no further business, the International Insurance Relations (G) Committee adjourned.

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Draft: 1/7/21

International Insurance Relations (G) Committee
Virtual Meeting
January 6, 2021

The International Insurance Relations (G) Committee met Jan. 6, 2021. The following Committee members participated: Gary D. Anderson, Chair (MA); Bruce R. Range, Vice Chair (NE); Andrew N. Mais (CT); Karima M. Woods (DC); David Altmaier (FL); Doug Ommen (IA); James J. Donelon (LA); Anita G. Fox (MI); Chlora Lindley-Myers (MO); Marlene Caride (NJ); Andrew R. Stolfi (OR); Jessica K. Altman (PA); and Carter Lawrence (TN).

1. Discussed NAIC Comments on the Joint SIF and IAIS Draft Application Paper on the Supervision of Climate-Related Risks in the Insurance Sector

Commissioner Anderson explained that the joint Sustainable Insurance Forum (SIF) and International Association of Insurance Supervisors (IAIS) application paper aims to provide background and guidance on how the IAIS supervisory material can be used to manage the challenges and opportunities arising from climate-related risks. Following an internal review, including by the Climate and Resiliency (EX) Task Force, draft NAIC comments were circulated on Dec. 15, 2020. He noted that no additional input from state insurance regulators or interested parties was received in advance of the conference call.

Ryan Workman (NAIC) provided a detailed overview of the NAIC's comments on the draft application paper.

David F. Snyder (American Property Casualty Insurance Association—APCIA) thanked the NAIC for its continued efforts at the international level and engagement with interested parties. He provided an overview of the APCIA's climate core principles, which guided its comments on the public consultation, highlighting core principles the APCIA would like the IAIS to focus on; and he relayed support for the NAIC's comments as drafted.

Robert Neill (American Council of Life Insurers—ACLI) noted that the ACLI is working on its environmental, social and governance (ESG) principles, and he suggested that the IAIS work in this area should focus on how climate risks affect the IAIS's core objectives related to insurance supervision, and broader policy decisions should be left to individual jurisdictions. He also stressed that IAIS guidance should remain flexible.

Commissioner Mais made a motion, seconded by Commissioner Caride, to approve the NAIC's comments (Attachment A). The motion passed unanimously.

Commissioner Anderson noted that the next calls of the Committee will be held on Jan. 21 and Feb. 3 to discuss additional IAIS public consultations.

Having no further business, the International Insurance Relations (G) Committee adjourned.

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Draft: 12/18/20

International Insurance Relations (G) Committee
Virtual 2020 Fall National Meeting
December 9, 2020

The International Insurance Relations (G) Committee met Dec. 9, 2020. The following Committee members participated: Gary D. Anderson, Chair (MA); Bruce R. Ramage, Vice Chair (NE); Ricardo Lara (CA); Andrew N. Mais (CT); Karima M. Woods (DC); David Altmaier (FL); Doug Ommen (IA); James J. Donelon (LA); Anita G. Fox (MI); Chlora Lindley-Myers (MO); Marlene Caride (NJ); Andrew R. Stolfi (OR); Jessica K. Altman (PA); Carter Lawrence (TN); and Tregenza A. Roach (VI).

1. Adopted its Oct. 28 and Summer National Meeting Minutes

The Committee met Oct. 28 and took the following action: 1) adopted the International Monetary Fund (IMF) Financial Sector Assessment Program (FSAP) referral plan; 2) heard an update on the International Association of Insurance Supervisors (IAIS); 3) heard an update on the Organisation for Economic Co-operation and Development (OECD); 4) heard an update on the NAIC International Fellows Program.

Commissioner Anderson noted that the Committee also met Sept. 30 in regulator-to-regulator session, pursuant to paragraph 8 (consideration of strategic planning issues) of the NAIC Policy Statement on Open Meetings, to discuss results of the September IAIS committee meetings and recommendations from the FSAP.

Director Lindley-Myers made a motion, seconded by Commissioner Mais, to adopt the Committee's Oct. 28 (Attachment One) and Aug. 12 (*see NAIC Proceedings – Summer 2020, International Insurance Relations (G) Committee*) minutes. The motion passed unanimously.

2. Adopted its 2021 Proposed Charges

Commissioner Anderson noted that the Committee's 2021 proposed charges are the same as those for 2020, and he explained that minor wording changes were made last year and some of the individual charges were reordered for a more logical flow.

Commissioner Lara made a motion, seconded by Commissioner Caride, to adopt the Committee's 2021 proposed charges (Attachment Two). The motion passed unanimously.

3. Heard an Update on Activities of the IAIS

a. Holistic Framework for Systemic Risk

Commissioner Anderson reported on recent IAIS activities, starting with an update on the first year of implementation of the holistic framework. He said the COVID-19 pandemic served as a good test for the IAIS's broader approach for the assessment and mitigation of systemic risk in the insurance sector, and he noted that this year's global monitoring exercise (GME) was focused on COVID-19 and a public report on this year's findings will be published later in December. He noted that while the IAIS plans a COVID-19-related data collection to cover the fourth quarter of 2020, the regular annual GME will return in 2021.

Commissioner Anderson said another important area of work underway is the implementation assessment of the supervisory material related to the holistic framework. He said the implementation assessment has proceeded in phases, starting with the baseline assessment carried out in 2020 and moving to more intensive, targeted jurisdictional assessments next year. He reminded the Committee that the IAIS's assessment of implementation will help inform the Financial Stability Board (FSB) review of the effectiveness of the holistic framework in November 2022.

b. ICS and AM

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Commissioner Anderson noted that the insurance capital standard (ICS) is in the first year of a five-year monitoring period, and an aggregation method (AM) data collection is also happening at the same time. He said the due date for this year's data was delayed to Oct. 31 in light of COVID-19, and analysis of data received is currently underway. He explained that though the delay has had a knock-on effect in being able to provide information to and receive feedback from the relevant supervisory colleges, the hope is that feedback received in time can help inform 2021's monitoring period.

Commissioner Anderson said, on Nov. 3, the IAIS released for consultation a draft definition and high-level principles for assessing comparability of the AM to the ICS with comments due Jan. 22, 2021. He said the IAIS held a public background session on the consultation on Dec. 3 as part of the IAIS virtual annual conference. He added that following consideration of comments, the IAIS will develop criteria for each high-level principle in such a manner that the AM is neither precluded at the outset as an outcome equivalent approach to the ICS for measuring group capital nor given a free pass.

Commissioner Anderson said a draft AM Level 1 document (Attachment Three) was circulated as a meeting document, and it largely reflects in narrative form information previously shared on the AM, such as at the Jan. 30, 2021, Committee meeting in Washington, DC. He said any comments or questions regarding the document are to be sent to Ned Tyrrell (NAIC) by Jan. 31, 2021.

Commissioner Anderson introduced three questions on the high-level principles to help generate some initial feedback and receive input from various interested parties:

- 1) Considering the overarching approach that came out of Abu Dhabi, do the high-level principles provide more clarity on what the comparability assessment process will entail? Are there points that are still unclear?
- 2) In light of the definition of comparable outcomes and the high-level principles, how do you see these translating to assessment criteria? What practical limitations may exist for what the criteria can assess?
- 3) Which of the high-level principles would lend themselves to more qualitative assessment criteria and which ones more quantitative?

Comments made in response to the questions on the high-level principles included the following:

- The work done in Abu Dhabi and the high-level principles are constructive, but there are some concerns, including how the advantages of the AM will be taken into account in the analysis.
- For Principle 2, it is unclear how one will look at things in totality while assessing individual elements. The assessment needs to recognize how the AM does things, and it will need to be holistic rather than granular.
- For Principle 3, it is unclear how one will assess how AM could be more but not less prudent than the ICS.
- Principle 6 is unclear, as there is no reporting of the ICS nor the AM at this time.
- There is concern that the principles as drafted differ from the NAIC's interpretive guidance that was issued following the Abu Dhabi meeting.
- The comparability assessment should be objective, utility-focused and holistic.
- The high-level principles suggest that the process will involve a mixture of both qualitative and quantitative criteria. There are inherent limits on quantitative criteria, and a comparison of outcomes will require significant judgment. Ultimately, the determination will need to be more qualitative versus quantitative.
- It is important to think about the principles in terms of the AM but also with respect to the group capital calculation (GCC) and the building block approach currently being developed in the U.S.
- The ICS is well-intentioned and ambitious, but there is a lack of political will to enact a globally converged group capital standard for the insurance industry. The comparability assessment is a good opportunity to show how U.S. insurance groups operate and are supervised.

Commissioner Anderson thanked interested parties for their comments, and he noted that the high-level principles are supposed to build upon the areas of focus that were agreed upon in Abu Dhabi, not rewrite or contradict them; so if there are principles or parts thereof that come across that way, it would be helpful for the IAIS to receive comments along those lines as part of the consultation. He encouraged other interested parties who may have additional thoughts on these questions to submit them in writing following the meeting.

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Commissioner Anderson said that, as usual, the Committee will meet in advance of the comment due date to discuss any draft NAIC comments, as well as hear input for consideration from interested parties. He also thanked those insurance groups that were providing data as part of the monitoring period, which will be important for the comparability assessment process.

Romain Paserot (IAIS) gave a presentation on the important IAIS workstreams underway or planned for 2021 to support a resilient insurance sector, including: 1) risk assessments; 2) finalization and implementation of key reforms; 3) peer exchange and supervisory guidance on emerging issues; and 4) implementation support and assessment. He also provided an overview of public consultations planned over the course of 2021, and he noted that the IAIS will continue to monitor the impact of COVID-19 and will adjust its work plans if necessary.

4. Heard an Update on International Activities

a. Regional Supervisory Cooperation

Director Ramege provided an update on some of the NAIC's other international activities that have taken place since the last Committee meeting. He said Director Cameron participated in the Taiwan Insurance Institute's virtual Insurance and Economic Development Forum 2021 and presented on U.S. state insurance regulators' response to COVID-19.

Director Ramege said the NAIC will be meeting with the Financial Services Agency (FSA) of Japan for a biannual bilateral dialogue to discuss a number of the NAIC's current and future priorities, as well as regulatory developments in Japan. He said the NAIC will be especially interested to hear about the FSA advisory council's report on its forthcoming "Economic-Value Based Solvency Regulation." He said the FSA will also provide state insurance regulators with updates on its implementation of the Common Framework for the Supervision of Internationally Active Insurance Groups (ComFrame) and the supervision of internationally active insurance groups (IAIGs). He said looking ahead to 2021, it is expected that meetings with the FSA will be held in a virtual manner, at least in the first half of next year; but hopefully they can revert back to in-person meetings for the second meeting.

Director Ramege said the NAIC also has a bilateral dialogue scheduled with representatives from the European Insurance and Occupational Pensions Association (EIOPA) and European Union (EU) member states to build on staff dialogues held earlier this year. He said this meeting will allow NAIC representatives to focus on strategic priorities on issues of mutual regulatory interest, including learning more about Europe's Solvency II review, which will be completed by the end of 2021; updates on the EU's implementation of the holistic framework; and sustainable finance related issues. He said summary reports of EU-U.S. Insurance dialogue project discussions should be published in early 2021.

David F. Snyder (American Property Casualty Insurance Association—APCIA) noted that the APCIA supports the NAIC's bilateral work and continuing dialogues with global regulators. He noted that cross-border interest by U.S. insurers remains strong, and joint meetings can help address shared problems while finding the best ways to carry out regulatory objectives.

b. OECD

Director Ramege said the OECD's Insurance and Private Pensions Committee (IPPC) began four days of virtual meetings on Dec. 9 with a roundtable to discuss the implications of increased outsourcing activity by insurers and potential implications in terms of operational resilience and compliance with regulatory and supervisory requirements. He said the IPPC and the Working Party on Private Pensions will hold a joint meeting to discuss potential next steps on the work on sustainable and environmental, social and governance (ESG) investment in cooperation with the United Nations (UN) Principles for Responsible Investment.

Director Ramege highlighted other topics of focus during the virtual meetings, including: 1) discussing a draft report examining the underinsurance of catastrophe perils, with a focus on natural catastrophes and climate change, cyber, pandemic, and political violence and social unrest; 2) receiving an update on the preliminary report on the take up of private long-term care (LTC) and health insurance relative to public health systems; 3) discussing the development of a document that will aim to bring together lessons from the IPPC's work on catastrophe perils; 4) reviewing a project proposal on "Digital Means to Improving Long-Term Care and Health Care: Risk Prevention and Mitigation" to help better understand the types of services that LTC and health insurers are providing to policyholders to prevent and mitigate risks and how regulation could support this; 5) discussing

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the next projects that the IPPC should undertake in 2021–2022; and 6) discussing updated draft guidance on private sector participation in the IPPC.

c. SIF

Director Ramage said the NAIC, alongside individual state Sustainable Insurance Forum (SIF) members—California, New York, and Washington—participated in several virtual calls to solidify the SIF’s workplan for 2021–2023. He said there will be three workstreams: 1) the impact of climate-related risk on the insurability of assets; 2) broader sustainability issues beyond climate risk; and 3) climate risks in the actuarial process. He noted that the first workstream aligns with the work of several of the workstreams of the new Climate and Resiliency (EX) Task Force.

5. Discussed Other Matters

Commissioner Anderson said the Committee’s next meeting has not been scheduled; however, the various IAIS public consultations underway will merit virtual meetings. He said that per the usual NAIC process, any draft NAIC comments on the consultations will be circulated in advance to discuss, as well as to receive any input for consideration from interested parties, before the Committee approves submission of comments. He said once the timing for these is set, a save-the-date will be sent.

Having no further business, the International Insurance Relations (G) Committee adjourned.

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APRIL 2021

**AGGREGATING REGULATORY CAPITAL
REQUIREMENTS ACROSS JURISDICTIONS:
THEORETICAL AND PRACTICAL CONSIDERATIONS**

American Academy of Actuaries
Research Paper 2021, No. 1



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EXECUTIVE SUMMARY

This research paper was written primarily by Steve Jackson, Ph.D., assistant director for research (public policy), American Academy of Actuaries (“Academy”). The paper was sponsored by Tom Wildsmith, Academy international secretary with advice and guidance from Academy members Elizabeth Brill, Maryellen Coggins, and William Hines. The paper also benefited from discussions with and helpful comments by Carmen Suro-Bredie, Qamar Islam, Ned Tyrrell, Matt Walker, and members of the Academy’s Solvency Committee.

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.



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Aggregating Regulatory Capital Requirements across Jurisdictions: Theoretical and Practical Considerations

Especially since the financial crisis of 2007–08, regulators in the U.S. and around the world have recognized that the solvency of insurance groups as well as that of their individual legal entities needs to be examined. Efforts toward global regulatory convergence were launched by the International Association of Insurance Supervisors (IAIS), initiated by the Financial Stability Board (FSB). These efforts include the negotiation of a group solvency capital standard for all Internationally Active Insurance Groups (IAIGs): Insurance Capital Standard 2.0 (ICS 2.0). The approach the IAIS has taken with the International Capital Standard has been largely resisted by regulatory and industry stakeholders in the United States (and some other countries) based on the nature of its current regulatory structures. The IAIS has agreed to consider an alternative approach based on comparability with ICS 2.0—referred to as the aggregation method (AM).

The AM was born of practical necessity. In the United States, the Dodd-Frank Wall Street Reform and Consumer Protection Act (Dodd-Frank) requires the Federal Reserve Board (FRB) to regulate holding companies, which include banks and insurance companies. In 2016, an FRB paper proposed a building block approach (BBA) to regulate the capital of these mixed entities. As banks and insurance companies do not “share any common capital assessment methodology,” the FRB proposed relying on the existing methodologies for each sector and to aggregate capital requirements across regulatory frameworks with the use of a “translating mechanism” called a “scalar.”¹

This paper is offered to help clarify the objectives, both conceptual and practical, of a scalar methodology. It assembles an inventory of possible methodologies. It derives a set of criteria for the evaluation of methodologies from existing discussions of possible methodologies and from standard statistical principles. It evaluates each of the methodologies according to the specified criteria.

¹ Board of Governors of the Federal Reserve System, “Comparing Capital Requirements in Different Regulatory Frameworks,” 2019, page iii.

Scalars are designed to allow regulators in a jurisdiction to have access to a metric of the capital adequacy of an insurance group—or more generally, of a financial services group—based on the capital adequacy metrics of its individual components, including those entities regulated in other jurisdictions. While scalars might be developed for all kinds of entities, the focus of this paper is on scalars for entities regulated by jurisdictions that specify a measure of capital adequacy based on the ratio of some measure of available capital to some measure of the risk inherent in their operations. This measure of inherent risk (which is also referred to as “required capital” in this paper) might vary: for insurance, it might express the capital required to account for asset, interest rate, underwriting and/or other risks; for banking, it might express a risk-weighted measure of assets.

The ideal form of scalars is one where an entity in one jurisdiction hypothetically calculates its available and required capital as if it operated in the originating jurisdiction while adjusting (or controlling for) other factors that might affect the safety of the group’s ongoing operations. Of course, this conceptual “ideal” may be impractical requiring, as it would, each entity with ownership in a different jurisdiction to maintain two sets of books: one with accounting principles and solvency measures calculated according to local requirements and a second one aligning with the principles and practices of the jurisdiction of its ownership. This ideal might also require adjusting for all other relevant factors, and doing so in a manner that recognizes the possibility that different accounting practices and/or different levels of safety inherent in calculations of required capital might already reflect awareness by jurisdictional regulators of some or all of these other factors.

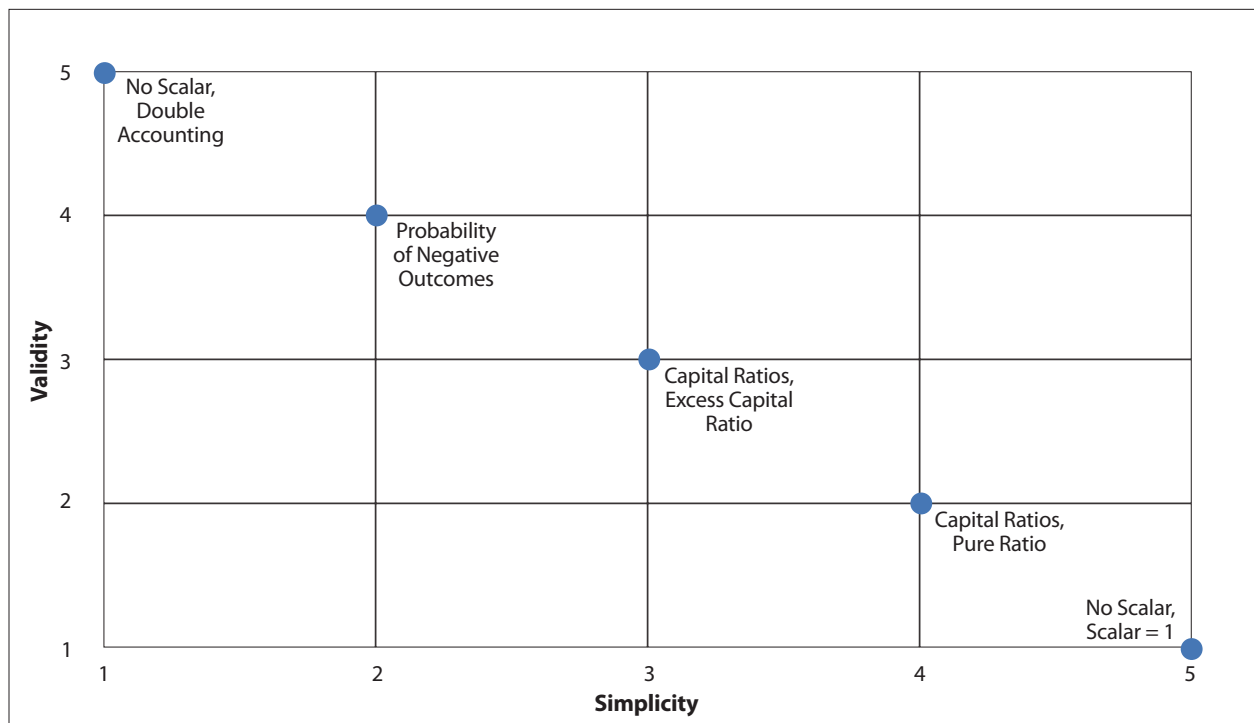
As this analysis examines possible scalar methodologies, four independent general criteria for assessment are introduced: validity, reliability, ease of implementation, and stability of parameters. Translating these criteria to explicitly apply to scalars and elaborating on specific factors that might be assessed under each of these four general criteria make the report’s assessments more comparable and more useful.

Four families of methodology for estimating scalars are assessed: No Scalars, Capital Ratios, Equivalence of Two Points, and Probability of Negative Outcomes. One of these families—Equivalence of Two Points—turns out to be a generalization of two other families. Each of the three distinct families include multiple variants. Two variants from each of two families are specifically assessed and the variants of the third family are assessed as a group. The evaluation of these methodologies by the criteria just suggested presents issues to consider, sometimes applying to all branches of a family and sometime applying to one branch but not others.

The assessments presented here suggest not only that any scalar methodology will be imperfect; they also suggest that the extent to which the results produced will vary from the “ideal” is itself variable, depending on the circumstances (e.g., how much of a company’s business is accounted for by entities in other jurisdictions). As a result, a final determination on preferred scalar methodologies likely will vary due to circumstances.

To summarize roughly the assessments of the five methodologies which are assessed in detail, it is useful to conceptualize two dimensions based on our four criteria of assessment: 1) validity; and 2) simplicity. Validity includes both conceptual validity as discussed in the paper and the lack of validity that follows from a lack of reliability. Simplicity includes both conceptual simplicity (discussed as part of validity) as well as ease of implementation. The best scalar methods would be very simple and highly valid. Unfortunately, none of the methods assessed here fit that description. Indeed, there is an ordinal inverse relationship between validity and simplicity, as can be seen in Figure A.

Figure A: Validity and Simplicity of Scalar Methodologies



Four issues arise to a greater or lesser extent for all of the methodologies assessed, and it seems prudent to highlight them before concluding. Those issues are:

1. *The application of these methodologies to entities in different industries:*
Jurisdictions differ by geography and/or by industry. The regulatory regime in a given geographic unit defines a jurisdiction. Most of the comments in this paper apply to scalars for entities in different jurisdictions, whether the basis for the difference is geography, industry, or both. However, it is true for all methodologies (with the exception of one of the No Scalar methods) that when the entities are in different industries, a second scalar element is required.
2. *The dependence of the anchors for these methodologies on regulatory actions and company responses (the “problem of endogeneity”):*
For all methods discussed in this paper (with the exception of one of the two No Scalar approaches), the anchors of these methods (e.g., the Capital Adequacy ratio, or the Probability of Default), are the result, in part, of companies acting under regulatory requirements. As illustrated in this paper, scalars may adjust for the differences in those requirements. However, anchors also reflect the actions of regulators within the various regulatory systems, and the responses of companies to those actions. The anchors then are products both of the different requirements (for which scalars aim to adjust) and the responses of regulators and companies to those anchors.
3. *The dependence of stability and validity of results on jurisdictional regime stability:*
For all methods discussed here, and likely for any other methods that might be contemplated, the validity of the results, and their stability over time, depends on regime stability.
4. *The value of sensitivity testing in selecting a most desirable method:*
In discussing the role of sensitivity testing throughout this paper, two different dimensions of sensitivity have been implied: 1) sensitivity of results to changes of parameters within a model; and 2) sensitivity of results to differences in methods of calculating scalars.

This paper provides a discussion of these issues in more detail as well as possible responses. As with scalars themselves, there are no perfect solutions.

While the Academy offers the considerations presented in this paper to be taken into account by regulators as they consider adoption of scalars as part of the group capital regulation process, the Academy does not make any specific recommendations in favor of or against any particular methodology. However, three conclusions do seem to follow from the analysis presented here:

1. Methodologies based on observable data are preferable to methodologies based on assumption, other things being equal. Only the approaches discussed under the Probability of Negative Outcomes are defined by reference to the analysis of observable data, and thus deserve heightened attention in any regulatory environment. However, as discussed, with the advantage of reliance on data come several challenges—many of them directly related to the reliance on available data. As such, regulators should consider whether adoption of this methodology, the Probability of Negative Outcomes, is advisable especially after careful consideration.
2. Almost all methodologies will be prone to increased imperfection if regulatory regimes change in a manner affecting capital adequacy standards after scalars have been estimated. While there might be attempts to develop methods by which to calculate adjustments to scalars based on the changes observed, the optimal way to adjust scalars for regime change and other changes in relevant conditions is to recalculate the scalars periodically. Hence, it may be advisable for a periodic recalculation to be made as an intrinsic element of any methodology adopted.
3. All of the methodologies discussed here are and will be imperfect. While factors that might be addressed to reduce some of those imperfections have been identified, it is impossible to find perfect solutions given the criteria of validity, reliability, ease of implementation, and stability of parameters and results. The question facing regulators then involves balancing degrees of validity (i.e., how imperfect the measures are, given what they would be if ideally conceptualized and measured) against degrees of reliability, ease, and stability. The only reliable way in which to regard those degrees, and to provide meaningful information with which to select a methodology based on some optimization of the criteria, is through the application of sensitivity testing as described. Hence, it may be advisable that the information required to examine the impact of each selected methodology under varying parameters, and to compare the impact of differing methodologies, be collected by regulators in order to allow them, at least initially, to rely on sensitivity testing to determine the best scalars in a particular jurisdiction.

The complete version of this research report will be released in the coming days; you will be able to access the report at actuary.org/scalars.



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