

THE Actuary

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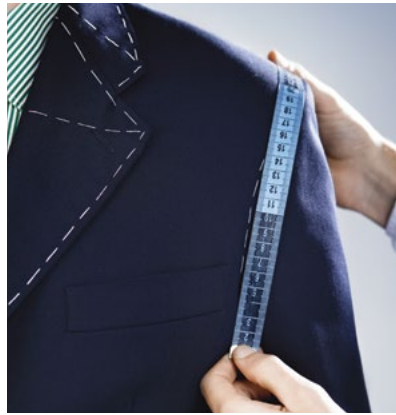


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THE Actuary

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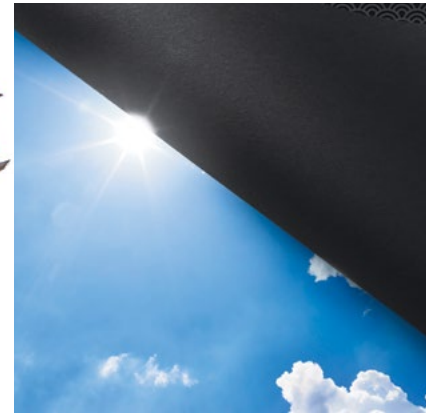
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SOA PRESIDENT

Jeremy J. Brown
FSA, MAAA
jjbrown@soa.org

SOA STAFF CONTACTS

Patrick Gould
Managing Director of
Marketing & Communications
pgould@soa.org

Cheré LaRose
Director of Member &
Candidate Communications
clarose@soa.org

Julia Anderson Bauer
Publications Manager
jandersonbauer@soa.org

Jacque Kirkwood
Magazine Staff Editor
jkirkwood@soa.org

CREATIVE SERVICES



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CONTRIBUTING EDITORS

Richard Berger, FSA, EA, MAAA
rberger5@ptd.net

Mark Birdsall, FSA, FCA, MAAA, MBA
mbirdsall@ksinsurance.org

Robert L. Brown, FSA, ACAS,
FCIA, HONFIA
rlbrown1949@gmail.com

Andy Ferris, FSA, FCA, MAAA
anferris@deloitte.com

Sarah Hinchey, FSA, CERA, MAAA
shinchey@deloitte.com

Achille Sime, FSA, CERA, MAAA, FIAF
asime@sl-financial.com

Ksenia Whittal, FSA, MAAA
ksenia.whittal@milliman.com

Xu (Vincent) Xuan, FSA, CFA, MAAA
Xu.xuan@prudential.com

Larry Zhao, FSA, CERA, CFA, Ph.D.
larry.zhao@axa.us.com

EDUCATION CONSULTANT

Lorne W. Schinbein, FSA, MAAA
lorne.schinbein@arcga.com

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A new era of global insurance regulation

BY VINCENT XUAN

As I write this editorial, my five-day-old daughter, Chloe, is sleeping in her nursery, adjacent to my home office. Chloe, a word of Greek origin, means “blooming green shoot” and symbolizes the beginning of a new generation. Just as newer generations will grow up and eventually reshape the world that was developed by preceding ones, so does the actuary—with the creation of new theories and practices that will redefine and rejuvenate the profession.

This is true even for an actuary’s core area of practice—regulatory and financial reporting—although it has long been viewed as fundamentally static. Benjamin Franklin warned us, “When you’re finished changing, you’re finished.” Compared to the technology industry that changes people’s lives every second, the insurance industry usually gives people a sense of sluggish progression. However, I feel more optimistic because insurance regulators and those who set the standards have achieved major progress to catch up with the rapidly changing world.

Within the past few decades, insurance regulation and financial reporting standards have experienced remarkable change. This is a direct response to today’s sophisticated product design, the ever-changing insurance market and the unforgettable financial crisis in 2008.

For instance, in the United States, the National Association of Insurance Commissioners (NAIC), alongside 46 states, adopted the policy of principle-based reserves (PBR) after a seven-year journey. With the valuation method becoming effective Jan. 1, 2017, many insurers have already started implementing it as the industry begins a three-year transition period. In Europe, the insurance industry has gone through the first year of execution on the Solvency II directive. Even in the eastern hemisphere, after pricing interest rates and investment allocation were liberalized, China implemented the China Risk-Oriented Solvency System (C-ROSS), which resembles Solvency II.

Globally, international standard advocates are actively coordinating with local regulatory bodies to enhance consistency and reasonability across countries. On the capital

side, the International Association of Insurance Supervisors (IAIS) continues to further clarify the technical details of the Insurance Capital Standards (ICS) to heighten the rate of adoption and implementation. On the financial reporting side, 126 jurisdictions have adopted the International Financial Reporting Standard (IFRS).

In this issue of *The Actuary*, I am excited to share insights on recent developments within the context of insurance regulation and financial reporting, with a taste of international flavor, from some of the industry’s leading practitioners.

Liz Dietrich, FSA, CERA, MAAA, and Ian Adamczyk, CPA, provide an update on IAIS’ activities on the technical development of the ICS in “Tailoring Global Capital Standards” on page 14. An introduction was published previously in the May 2016 issue of *International News*.

On page 22, the article “A Vibrant Insurance Industry” by Hans Wagner, FSA, introduces the overall insurance regulatory system and framework in China, explains current regulatory initiatives driven by the State Council’s milestone paper and paints a possible trajectory of the government’s focus in the coming years.

In “Time for Change” on page 28, Rob Curtis summarizes recent changes and forward-looking steps in insurance



regulation of various Asian countries, with an emphasis on capital and solvency, Own Risk and Solvency Assessment (ORSA), group supervision and consumer protection.

In “Back to the Beginning” on page 34, Henry Siegel, FSA, MAAA, tells a personalized account of IFRS 17 for insurance contracts through his participation in the process and stresses the importance of actuaries’ involvement to ensure the technical correctness and clarity of standards.

Mitchell Stephenson, FSA, MAAA, depicts a chronological picture of the model governance evolution and addresses the status of model governance in the actuarial profession in his article, “Navigating Risk,” on page 42.

An old Chinese proverb says, “分久必合,合久必分.” (“That which is long divided must unify; that which is long unified must divide.”) Although everyone has seen the fruits of globalization, the recent changes of the global political arena may threaten to reverse that path. While insurers in Europe face tighter regulation, their U.S. counterparts may see a push for significant deregulation from the executive branch. Even though IFRS garnered worldwide adoption, the two largest insurance markets—the United States and China—neither require nor permit

adherence. In the coming decades, whether insurance regulation across the globe will continue the path of unification or take a turn for separation, the result will likely be an outcome of the current battle between globalization and nationalism. And no one has a crystal ball. We must wait and see whether new regulations, such as PBR and Solvency II, will serve that purpose well.

Obviously, we are now in a new era of global insurance regulation. The regulatory environment today is strikingly different from the norm a few decades ago. Actuaries must stay abreast of upcoming changes and also constantly and actively engage themselves in the creation and ultimate implementation of such rules. ■



Vincent (Xu) Xuan, FSA, CFA, MAAA, is vice president and actuary at Prudential Financial in Newark, New Jersey.

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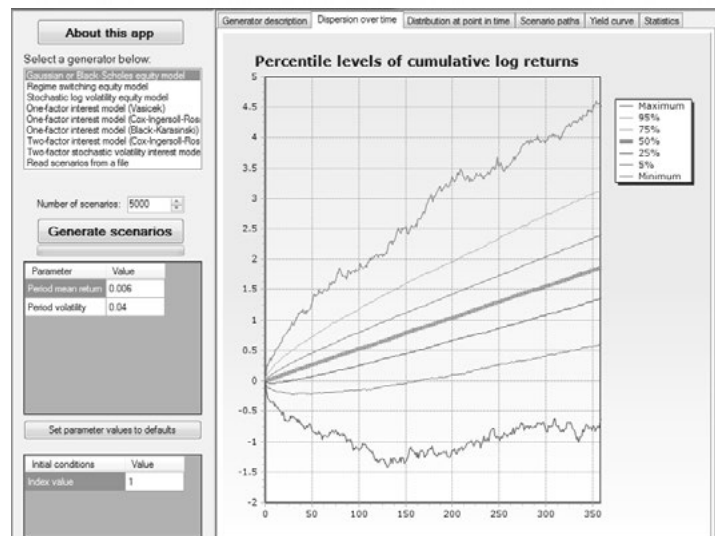
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from the **PRESIDENT**

BY JEREMY J. BROWN

Jeremy J. Brown, FSA, MAAA, is president of the Society of Actuaries.

jjbrown@soa.org

LinkedIn: bit.ly/JJBrownSOA

The global actuarial profession

As actuaries, we help represent the global profession. The role of actuaries continues to grow geographically, and new applications of our skills are being utilized in a variety of industries. Now I recognize in your day-to-day work it may not reach every continent. However, I'm proud to see the international span of both the overall profession and that of the Society of Actuaries (SOA). From education and research projects to continued partnerships with universities, employers and other actuarial organizations, we are part of this global profession.

Our 2017–2021 Strategic Plan taps into the global nature of our profession, our credentials and, of course, the knowledge base and perspectives around the world. We have the SOA's International Committee, whose activities involve four pillars: support for members and candidates, university relations, employer relationships and relationships with regulatory authorities. Our work includes activities in China, greater Asia and Latin America. For instance, volunteer fellows who practice in the local regions help guide development of tailored approaches to professional development, research, membership support and other activities via their membership in the China, Greater Asia and Latin America Committees.

From my international travels, I appreciate hearing first-hand about similar and differing challenges, in addition to the emerging opportunities for the profession. At the start of my presidency last fall, I attended the Caribbean Actuarial Association Conference, which provided a great way to connect with local actuaries. We discussed predictive

analytics, health care and a variety of actuarial research. I also was a keynote speaker and participated in several panels at the Asian Actuarial Conference in Gurgaon, India, where I enjoyed meeting actuaries from many parts of Asia. There, we discussed education, the SOA Learning Strategy and much more.

This spring, SOA members traveled to China to participate in the second Executive Education Exchange program jointly programmed with the China Association of Actuaries (CAA). It provided a unique opportunity in sharing and learning. Delegates from North America met with their counterparts from leading companies, met with academic leaders and also discussed actuarial career strategies with students at a leading university. The delegates networked with many local members at two receptions, in Shanghai and Beijing, and gave presentations on areas of interest, including international capital standards, cyber product delivery and U.S. group insurance practices. This program is a continuation of our collaboration with the CAA, as we jointly planned the first exchange for Chinese actuaries in New York, Hartford and Washington, D.C., in 2016.

As you read this column, our members are enjoying two blue-chip professional development events in Asia, the second SOA China Annual Symposium in Shanghai, and the SOA Asia-Pacific Annual Symposium in Kuala Lumpur, Malaysia. This year marks the 30th anniversary of our relationship with Nankai University, and we celebrate our history of helping to establish an actuarial science program so many decades ago by arranging for Western actuarial professors to teach the first generation of actuarial students

in modern China at Nankai University. Now hundreds of candidates graduate from dozens of universities across China each year.

I had the privilege of attending the International Actuarial Association (IAA) meetings in Budapest this past spring. The SOA, along with the Casualty Actuarial Society (CAS), the Conference of Consulting Actuaries (CCA), the ASPAA College of Pension Actuaries (ACOPA) and the American Academy of Actuaries (the Academy) are planning the President's Forum as part of the IAA Council and committee meetings in Chicago this Oct. 4–8. The SOA, CAS, CCA and ACOPA are also hosting the IAA gala dinner. In addition to all of this work, we are part of the North American Actuarial Council (NAAC), where we recently discussed predictive analytics and inclusion and diversity in the profession. I also want to mention that *beanactuary.org* is now available in Spanish. This website is geared toward students exploring actuarial careers, and we jointly developed it with the CAS.

From a global standpoint, our organization and the Institute and Faculty of Actuaries (IFoA) established CAA Global, a not-for-profit, public interest joint venture

organization. CAA Global oversees, delivers and promotes the certified actuarial analyst (CAA) qualification, which is for individuals working in actuarial support roles and in the broader financial services sector.

In conclusion, as the actuarial profession grows, so too do our organization's offerings and capabilities. Our profession is stronger based on the different connections and insights gathered in working together to address and solve emerging challenges affecting businesses and the public. ■

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SOA 2017–2021 Strategic Plan bit.ly/SOA-StratPlan	IAA Council bit.ly/IAA-Chicago-Mtg
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2016 Centers of Actuarial Excellence (CAE)
Summit in Chicago

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Symposiums and celebrations

A ROUNDUP OF NEWS FROM THE GLOBAL COMMUNITY

NANKAI UNIVERSITY 30TH ANNIVERSARY

In October 1987, the Society of Actuaries (SOA) Board of Governors unanimously passed a resolution approving a proposal for the SOA to assist in establishing an actuarial science program at Nankai University in Tianjin, China. This visionary exchange of actuarial teachers from Canada and the United States fostered the rebirth of one of China's most esteemed university programs. On July 3, Nankai University organized a celebration to commemorate the 30th anniversary of the agreement.

The SOA-Nankai program was inaugurated in September 1988 and had the first class of graduates in 1991. Dr. Kailin Tuan, who initiated the process to establish the program in Nankai, and then-SOA President Harold G. Ingraham Jr., FSA, MAAA, delivered the commencement address during the graduation ceremony.

Over the last 30 years, actuarial education at Nankai University has continued to grow and evolve, and the university now offers undergraduate and master's degrees for its actuarial programs.

SOA President-Elect Mike Lombardi, FSA, CERA, FCIA, MAAA; Greg Heidrich, SOA executive director; Ann Henstrand, SOA senior director, Asia and Latin America; Stuart Klugman, FSA, CERA, Ph.D., SOA staff fellow; Harry Panjer, FSA, CERA, FCIA, HONFIA; and Jessie Li, FSA, SOA's lead China representative; attended the event organized by Nankai University.

THE SOA CHINA ANNUAL SYMPOSIUM

The 2017 SOA China Annual Symposium took place June 29–30 in Shanghai, China. This symposium provided a platform for attendees to meet with industry leaders and share their experiences in the fields of actuarial science, finance and insurance in China.

Presenters from a variety of industries explored issues in financial environments, insurance regulation, International Financial Reporting Standards (IFRS) management, product development, asset-liability management (ALM) and investment. New techniques in actuarial practice were also discussed.

SOA President-Elect Mike Lombardi offered the welcome remarks and was followed by two keynote speakers, Songchen Sheng, former head of statistics and survey department at the People's Bank of China, and Yulong Zhao, general director of the finance and accounting solvency department for the China Insurance Regulatory Committee.

Sheng explored China's economic development stages and the expansion of insurance in China, comparing Chinese and foreign macro data and expanding on the future of the insurance industry in the region.

Zhao explained the opportunities and challenges that the booming insurance market presents and focused on C-ROSS Phase II and the indispensable role macroprudential regulation plays in enhancing capital efficiency, strengthening risk management awareness, protecting both the insured and insurer, and ultimately maximizing the possibilities for the potential of the Chinese insurance market.

THE SOA ASIA-PACIFIC ANNUAL SYMPOSIUM

The 2017 SOA Asia-Pacific Annual Symposium took place July 6–7 in Kuala Lumpur, Malaysia, under the theme "Beyond Traditions—A World of Opportunities."

The SOA was honored to receive support from the Actuarial Society of Malaysia (ASM) and Persatuan Insurans Am Malaysia (PIAM). During the first day, Gary Hoo, FSA, FCAS, president of ASM and delegate of PIAM, offered the welcome remarks, followed by keynote speakers Yew Khuen Yoon, FIA, FASM, director of insurance and development of the Bank Negara Malaysia (BNM), and SOA President Jeremy Brown, FSA, MAAA, who offered attendees insights into important issues facing the SOA and its members.

The first day closed with a networking reception where attendees shared their experiences in the actuarial, finance and insurance industries. Members exchanged stories about practicing in interesting roles, including Takaful and general insurance.

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Here's your source for industry briefings and SOA news. Important headline information, section highlights and current stories—in short, news to note.

FINANCIAL REPORTING SECTION UPDATE

BY JIM HAWKE

The purpose of the Financial Reporting Section is to encourage and facilitate the professional development of its members. To further our goal, we utilize activities such as our quarterly newsletter, meetings, seminars, webcasts, podcasts, research studies, and the generation and dissemination of literature in the field of life insurance company financial reporting. If you have an interest in helping with our efforts, we would love to have you join our section!

This is a particularly exciting time for financial reporting actuaries working in the arenas of U.S. statutory or generally accepted accounting principles (GAAP) reporting, as well as international financial reporting. In the United States, the National Association of Insurance Commissioners (NAIC) has adopted principle-based reserving effective for new business issued in 2017 and beyond. The change this represents versus prior formula-based minimum reserve requirements cannot be overstated. The Securities and Exchange Commission (SEC) is working through final drafts of its new guidance concerning insurance contracts, and we will most certainly see a thorough upheaval in the methods and underlying assumptions used to perform calculations under GAAP. This new GAAP regime is likely to be effective for 2021. On the international scene, revised insurance contract guidance is expected to be finalized in 2017, also possibly effective for 2021. Again, the differences seen in new guidance versus old are striking to say the least. Now more than ever, we need a vibrant section with a growing membership to keep pace with emerging requirements and provide practitioners with the information and continuing education they need.

The section has recently been focused on the new statutory requirements, sponsoring numerous meeting sessions and a multipart series of webcasts on principle-based reserves. We are also co-sponsoring research projects on principle-based methods with the Smaller Insurance Company Section and the Committee on Life Insurance Research (CLIR).

We also are pleased with progress being made on a new textbook we are sponsoring on the International Financial Reporting Standard on insurance contracts. Publication by the Society of Actuaries (SOA) should be completed in 2018. This textbook will become a mainstay of practitioner libraries, along with our GAAP book.

On the GAAP scene, we have reinstated our GAAP topics seminar and have begun a series of webcasts on GAAP practice. A third edition of the GAAP textbook is also on the horizon, incorporating the new SEC guidance on insurance contracts.

Again, if you are not currently a member of our section, please consider joining us! We need to grow just as the SOA grows in order to serve our membership. At \$25 per year, the fee is very attractive (considering the benefits) if you desire to influence the flow of continuing education materials to actuaries engaged in financial reporting work.

Jim Hawke, FSA, MAAA, is chairperson of the Financial Reporting Section.

jamesshawke@gmail.com

KAGGLE INVOLVEMENT PROGRAM

The Society of Actuaries has a new program to increase awareness of actuaries' abilities in working with predictive models. It taps into the Kaggle data science platform for competitions.

RELATED LINK

Kaggle Contest, open to SOA members (FSAs and ASAs)

bit.ly/2017KaggleContest

NEWS FROM WHARTON

Wharton School looks at digital disruption on multiple points within the insurance industry, such as insurtech, big data and machine learning.

RELATED LINK

Wharton Article

bit.ly/InsureDigitalDisrupt



Knowledge On-the-Go

SOA Podcasts

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SOA.org/Podcast



TAILORING GLOBAL CAPITAL STANDARDS



AN UPDATE ON THE IAIS’ EFFORT TO DEVELOP THE INSURANCE CAPITAL STANDARD

Authors’ Note: In the May 2016 issue of International News, we provided an overview of the International Association of Insurance Supervisors (IAIS) and its activities related to the development of global capital standards for insurers. This article provides an update on the IAIS activities, with a focus on the further technical development of the Insurance Capital Standard (ICS).

Established in 1994, the International Association of Insurance Supervisors (IAIS) is a standard-setting body comprised of member insurance regulators and supervisors from around the world. There are more than 200 jurisdictions from nearly 140 countries represented in the IAIS. The IAIS’ stated objectives are to promote effective and globally consistent supervision of the insurance sector and to contribute to global financial stability. As a global standard-setting body, the IAIS does not have authority within any jurisdiction to enact or enforce the policy measures it develops, or supervisory authority over insurers. Rather, the IAIS seeks to create principles, standards and other supporting materials for the supervision of the insurance sector and assist with their implementation should jurisdictional insurance authorities and governments choose to adopt them.

THE INSURANCE CAPITAL STANDARD

The Insurance Capital Standard (ICS) is contemplated as a common, global and consolidated capital standard for internationally active insurance groups (IAIGs).¹ The IAIS envisions the ICS serving as a minimum capital requirement for IAIGs and acting as a complement to other supervisory tools within the Common Framework for the Supervision of Internationally Active Insurance Groups (ComFrame),² of which the ICS is a component.



The IAIS seeks to create principles, standards and other supporting materials for the supervision of the insurance sector and assist with their implementation.

BY LIZ DIETRICH AND IAN ADAMCZYK

background

INSURANCE CAPITAL STANDARD PRINCIPLES

The Insurance Capital Standard (ICS) is being developed through a multiyear process of field-testing and public consultation. It is guided by the following 10 principles published by the International Association of Insurance Supervisors (IAIS).

- ICS
PRINCIPLE

1

The ICS is a consolidated groupwide standard with a globally comparable risk-based measure of capital adequacy for internationally active insurance groups (IAIGs) and global systemically important insurers (G-SIIs).¹
- ICS
PRINCIPLE

6

The ICS promotes sound risk management by IAIGs and G-SIIs.
- ICS
PRINCIPLE

2

The main objectives of the ICS are protection of policyholders and to contribute to financial stability.
- ICS
PRINCIPLE

7

The ICS promotes prudentially sound behavior while minimizing inappropriate procyclical behavior by supervisors and IAIGs.
- ICS
PRINCIPLE

3

One of the purposes of the ICS is the foundation for higher loss absorbency (HLA)² for G-SIIs.
- ICS
PRINCIPLE

8

The ICS strikes an appropriate balance between risk sensitivity and simplicity.
- ICS
PRINCIPLE

4

The ICS reflects all material risks to which an IAIG is exposed.
- ICS
PRINCIPLE

9

The ICS is transparent, particularly with regard to the disclosure of final results.
- ICS
PRINCIPLE

5

The ICS aims at comparability of outcomes across jurisdictions and therefore provides increased mutual understanding and greater confidence in cross-border analysis of IAIGs among groupwide and host supervisors.
- ICS
PRINCIPLE

10

The capital requirement in the ICS is based on appropriate target criteria, which underlie the calibration.

References

¹ Global systemically important insurers (G-SIIs) are designated annually by the G20's Financial Stability Board (FSB) based on a recommendation by the IAIS. Currently there are nine G-SIIs: Aegon N.V., Allianz SE, American International Group (AIG), Aviva plc, Axa S.A., MetLife, Ping An Insurance (Group) Company of China, Prudential Financial and Prudential plc.

² Higher loss absorbency (HLA), one of the FSB policy measures for systemically important financial institutions, represents additional capital requirements for G-SIIs, reflecting their systemic importance in the global financial system.

The ICS is being developed through a multiyear process of field-testing and public consultation and is guided by 10 principles published by the IAIS (see the “Background” sidebar). Annual quantitative field-testing exercises have occurred since 2014 and are scheduled through 2019. Public consultations were held in 2014 and 2016, and a third consultation is scheduled for 2018. The IAIS is scheduled to adopt a version of the ICS that is “fit for implementation” in late 2019, along with ComFrame implementation. The IAIS has noted that ongoing monitoring and evolution of the ICS is to be expected following its adoption due to the complexity of the supervisory tool and the importance of ensuring it is fit for purpose.

While the IAIS continues to evaluate and field-test several options for key technical design elements of the ICS, it will release “ICS Version 1.0” this year. ICS Version 1.0 is not intended to serve as a version that is fit for adoption by jurisdictions, but rather it represents the first developmental milestone in the multiyear ICS development process.

There are three major components of the ICS: valuation, qualifying capital resources and capital requirements. Each component is discussed in detail within this article, along with some of the key considerations in the current state of ICS development.

VALUATION

The ICS introduces a new valuation basis for valuing the consolidated insurance balance sheet, distinct from the existing generally accepted accounting principles (GAAP), International Financial Reporting Standards (IFRS) or statutory rules currently applicable in insurance accounting and regulation. Currently, two valuation bases are being developed and field-tested: a market-adjusted valuation (MAV) basis and a GAAP with adjustments (GAAP Plus) valuation basis. Within both approaches and central to the ICS balance sheet is the concept of “current estimate” liabilities. For global comparability and transparency on an “economic” basis, liabilities are valued using best-estimate actuarial assumptions without additional conservatism and reflect all relevant cash flows. The approach to asset valuation also varies between the two bases.

The approach to valuation is a matter of significant discussion and debate among the IAIS and stakeholder community, given the significant impact it can have on an IAIG’s overall ICS solvency ratio. Throughout the development of the ICS, stakeholders have called for the IAIS to employ methods that align the valuation of assets and insurance liabilities to properly reflect the economics of long-term life insurance products and related asset-liability

management (ALM). Symmetry between assets and liabilities is created through the linkage of the liability discount rate with the supporting assets on the balance sheet and the insurer’s ALM practice. Valuation asymmetry can result in mismeasurement of capital resources and requirements, as well as artificial volatility and procyclicality of the capital adequacy measurement.

Market-Adjusted Valuation

The MAV approach is based on the market value of assets, and current estimate liabilities are valued using a discount curve that reflects the risk-free curve plus a prescribed spread adjustment. The IAIS continues to explore various MAV discounting options through the field-testing exercises. The primary focus of the discount rate analysis relates to the spread adjustment, in particular whether the spread adjustment should be based on a single, consistently applied prescribed reference rate, a currency- and sector-specific representative portfolio, or the IAIG’s own asset portfolio. Another key question is whether the discount rate should reflect the full spread derived from such bases or a conservative, limited portion of the spread. A third key question is whether and how much of a spread should be reflected beyond the investable horizon, or the last observable point on the yield curve—an important consideration for liabilities cash flows that extend for decades beyond the investable horizon.

Appropriate outcomes on all three points are necessary to derive an appropriate current estimate liability and measurement of available and required capital. This is especially true for insurers with predominantly long-term liabilities, such as those in the life and retirement sectors, as long-term insurance liabilities are very sensitive to the discount rate. Some view the answers to these questions through a conservative lens, where the discount rate would reflect a reference rate rather than the invested assets supporting liabilities and the spread would be subject to conservative haircuts and limits based on the view that the valuation basis should serve as a means to deter insurers from improper investment behavior and reflect liability liquidity risk. Considering the fact that symmetry between assets and liabilities hinges on reflecting the insurer’s assets and ALM practice in the liability discount rate, the closer the spread adjustment is to the insurer’s own asset portfolio, the better the balance sheet symmetry will be.

GAAP With Adjustments (GAAP Plus)

The GAAP Plus valuation basis utilizes existing balances and defined adjustments anchored to local GAAP/IFRS

accounting rules in order to arrive at current estimate insurance liabilities. For instance, the U.S. GAAP Plus approach leverages the best estimate gross premium valuation within loss recognition testing rules to determine the current estimate liability. Assets are valued consistent with reported GAAP balances. Additional adjustments may be made to create symmetry between the valuation of assets and liabilities.

Since the GAAP Plus approach applies existing GAAP rules for determining best estimate liabilities (which typically are based on supporting asset portfolios), there has been less of a focus on potential alternative approaches for developing yield curves for discounting liability cash flows. However, the GAAP Plus approach is expected to evolve as changes to the underlying accounting frameworks—such as those proposed by the Financial Accounting Standards Board (FASB) and International Accounting Standards Board (IASB)—are made. Such changes may give rise to debate on the GAAP Plus discounting approach and potential approaches to explore in future ICS field-testing exercises.

QUALIFYING CAPITAL RESOURCES

The ICS has two tiers for qualifying capital resources, based on specific criteria for loss absorption and policyholder protection. Within each tier, certain capital resources are subject to limits. All potential capital resources are assessed against the ICS criteria to determine:

- 1 | If they qualify as available capital resources for purposes of the ICS
- 2 | If they are subject to any limits within each tier (for resources that qualify only)

Ensuring consistent treatment of comparable capital resources across jurisdictions, such as the treatment of the various and substantially similar forms of surplus notes and debt around the world, is a key topic of discussion in the current discourse.

A margin over current estimates (MOCE) is deducted from capital resources. The MOCE represents a provision for the inherent uncertainty in the current estimate liabilities and is applied in addition to the capital requirements described on page 19. Currently, two MOCE approaches are being considered: a Cost of Capital MOCE (CoC-MOCE), which is based on an assumed cost of holding ICS required capital; and a Prudence MOCE (P-MOCE), which determines a conservative buffer at the 75th percentile of an assumed loss distribution, assuming a normal distribution of losses between current estimate liabilities (50th percentile) and capital requirements (99.5th percentile). The potential redundancy of the MOCE with the required capital has been a key topic of discussion, given that both establish provisions related to risk in the liabilities (MOCE relates to risks associated with insurance liabilities only, while capital requirements relate to risk on the entire balance sheet).



“A flawed ICS would be a disservice to consumers and financial markets throughout the world, as it could inhibit insurers from offering sound, economically viable insurance products and from providing the associated capital investment to support their liabilities.”

CAPITAL REQUIREMENTS

The ICS capital requirement, calculated using a risk-based method, is the amount of capital resources needed to cover losses for the insurance, investment, market and operational risks to which the IAIG is exposed. The ICS capital requirement is intended to represent a one-year 99.5 percent Value-at-Risk (VaR) level of stress.

The design and calibration of stresses that determine the capital requirement are key areas of debate among the IAIS and stakeholders. Stakeholders have questioned the appropriateness of the current design and calibration relative to the target time horizon and severity level, and the inclusion of the MOCE provision described previously. For instance, many of the stresses for long-term insurance liabilities reflect a very severe stress over the life of the liability rather than a one-year period.

The IAIS is currently focused on developing a standard method for calculating required capital, but it may explore

the use of internal model approaches (similar to Solvency II) in the future. Some stakeholders have expressed the view that the ICS should permit the use of internal models, and that doing so would enable IAIGs to reflect their risk profiles more accurately. Other stakeholders have stressed the need for the IAIS to design a sound standard method before considering the use of internal models.

FIGURE 1 summarizes the key elements and considerations of the ICS.

KEY OBSERVATIONS

As the elements of the ICS are further developed and field-tested, discussions increasingly have focused on the implications of specific design and calibration decisions on the business models of insurers and the markets in which they operate. Some of these decisions may seem at the surface to be minor technical details, such as an aspect of the discount rate or a required capital stress. But the impact of

FIGURE 1 KEY ELEMENTS OF THE INSURANCE CAPITAL STANDARD (ICS)

ICS Element	Description	Key Considerations (Not Exhaustive)
Valuation Basis	<ul style="list-style-type: none"> ➤ Current estimate liabilities <ul style="list-style-type: none"> • Two approaches: market-adjusted valuation (MAV) and GAAP with adjustments (GAAP Plus) 	<ul style="list-style-type: none"> ➤ Potential volatility and procyclicality resulting from approach to discount rates ➤ MAV: symmetry between the valuation assets and insurance liabilities ➤ GAAP Plus: impact of changes to accounting standards
Capital Resources	<ul style="list-style-type: none"> ➤ Tier 1 and Tier 2: limited and unlimited <ul style="list-style-type: none"> • Criteria include: loss absorption, policyholder protection, availability, subordination • Margin over current estimate (MOCE): A provision for uncertainty in current estimate liabilities 	<ul style="list-style-type: none"> ➤ Surplus notes, subordinated debt ➤ MOCE and its relationship to capital requirements
Capital Requirements	<ul style="list-style-type: none"> ➤ Stress-based approach, one-year 99.5 percent VaR target ➤ Insurance: mortality, longevity, morbidity, lapse, catastrophe, expense ➤ Market: interest rates, equity returns and volatility, real estate, asset concentration ➤ Investment/Credit: factors based on asset type and credit quality ➤ Operational: factor based 	<ul style="list-style-type: none"> ➤ Appropriate design and calibration of stresses ➤ Redundancy with MOCE ➤ Standard method versus the use of internal models

“small” technical details on certain products and markets can be profound.

The robust dialogue facilitated by the IAIS on the technical design of the ICS has helped shed light on the underlying objectives of supervisors, such as incentivizing appropriate risk management by insurers, as well as concerns held by industry and other stakeholders, such as artificial volatility in capital measures or prohibitively conservative capital requirements that penalize certain types of insurance products. Both the supervisor and industry views and objectives are valid and must be taken into consideration, and the choices about if and how the ICS addresses these concerns are very important.

Two key ideas could help guide the technical design of the ICS in light of the various stakeholder concerns and objectives:

- 1 First, the ICS must not violate the fundamental economics of the insurance business model. The economics of the insurance business model entails the way risks manifest themselves through time, the effects of risk pooling and risk mitigation, and the role of ALM in determining the value of long-term insurance liabilities and the sensitivity of the balance sheet to risk over time.
- 2 Second, stakeholders should ensure that the ICS is viewed in conjunction with the broader ComFrame framework and not as a standalone “silver bullet” to address all supervisory objectives. Where certain ICS technical features introduced for prudential objectives would misrepresent the fundamental economics of the business model, designers should look to other aspects of ComFrame to address such objectives, so as not to create noneconomic outcomes in the ICS and potential further unintended consequences. ComFrame offers appropriate and targeted means to address prudential objectives, such as those pertaining to insurer risk management, ALM and investment behavior, and liquidity risk.

By integrating these key ideas into the design and field-testing of the ICS, the IAIS can ensure that the ICS becomes a meaningful and viable supervisory tool.

CONCLUSION

The engagement of industry players, regulators and other key stakeholders in the ICS development process underscores the interest in and significance of the ICS for insurance markets around the globe. Although the ICS remains a work in progress, it has become clear that it has

the potential to meaningfully influence the way the world looks at risks and capital for the insurance sector. For instance, some markets have started to explore what an ICS framework would mean for their jurisdictions through local field-test exercises and quantitative impact studies.

Given the potential impact to insurers and the markets in which they operate, it is imperative that the IAIS take the time necessary to ensure that the ICS provides a meaningful and appropriate measure of risks and loss absorption capacity, promotes appropriate outcomes and behavior, and avoids creating false positives/negatives of insurer solvency or other unintended consequences. A flawed ICS would be a disservice to consumers and financial markets throughout the world, as it could inhibit insurers from offering sound, economically viable insurance products and from providing the associated capital investment to support their liabilities. Constructive stakeholder engagement—through open dialogue with supervisors and participation in quantitative field tests—is critical for informing the design of the ICS and ensuring the final version of the framework is appropriate, an outcome that is in the interest of supervisors, industry players and other stakeholders alike. ■

References

¹ Internationally active insurance groups (IAIGs) are determined by supervisors based on size and global activity criteria established by the International Association of Insurance Supervisors (IAIS). There are roughly 50 to 60 IAIGs worldwide.

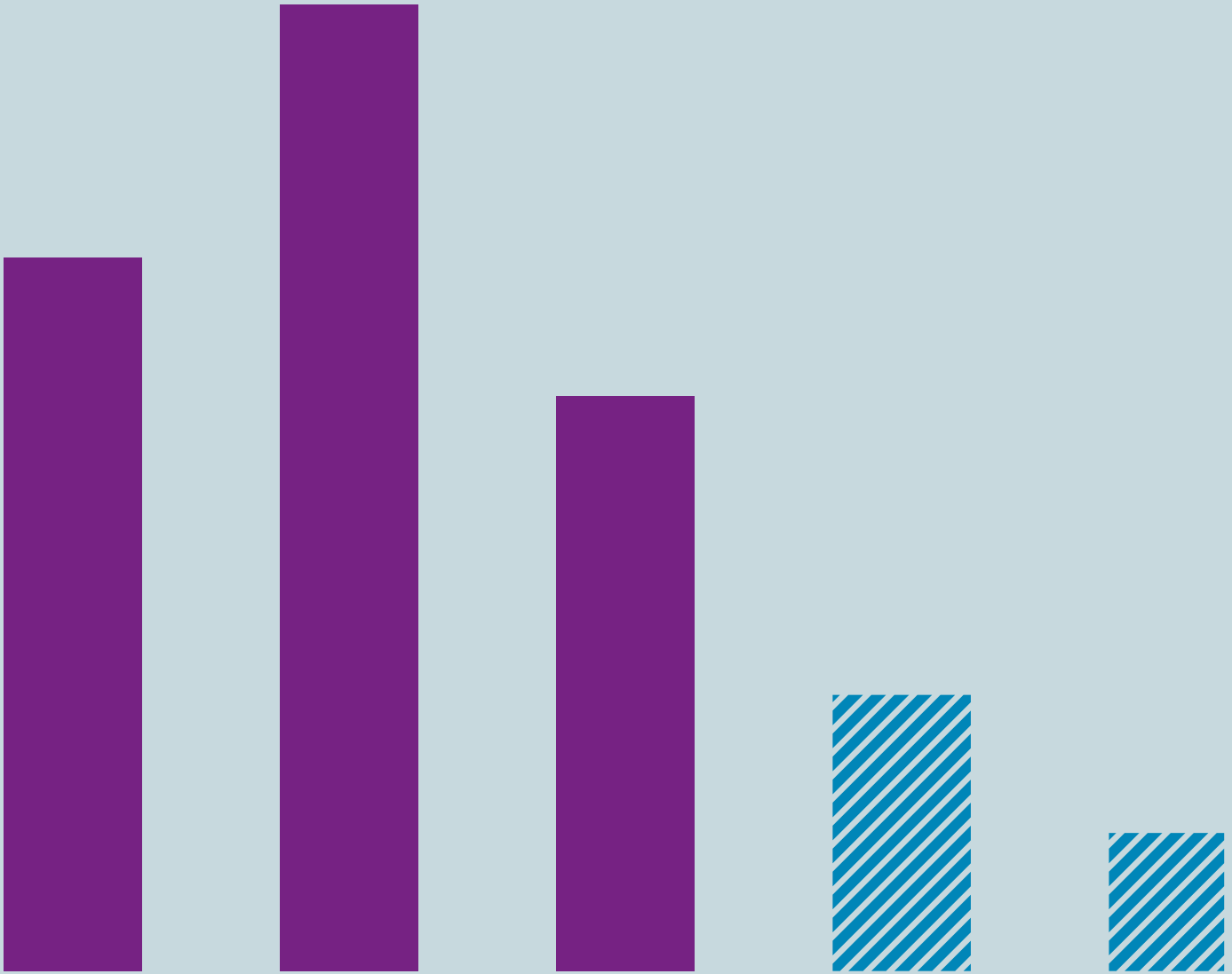
² ComFrame is primarily intended to be a framework for supervisors to efficiently and effectively cooperate and coordinate by providing a basis for comparability of IAIG regulation and supervisory processes. The IAIS is scheduled to adopt the final version of ComFrame in 2019.

Liz Dietrich, FSA, CERA, MAAA, is vice president, actuary, and head of Valuation and Reporting for Prudential Retirement in Newark, New Jersey.

elizabeth.dietrich@prudential.com

Ian Adamczyk, CPA, is vice president, Global External Affairs, at Prudential Financial in Newark, New Jersey.

ian.adamczyk@prudential.com



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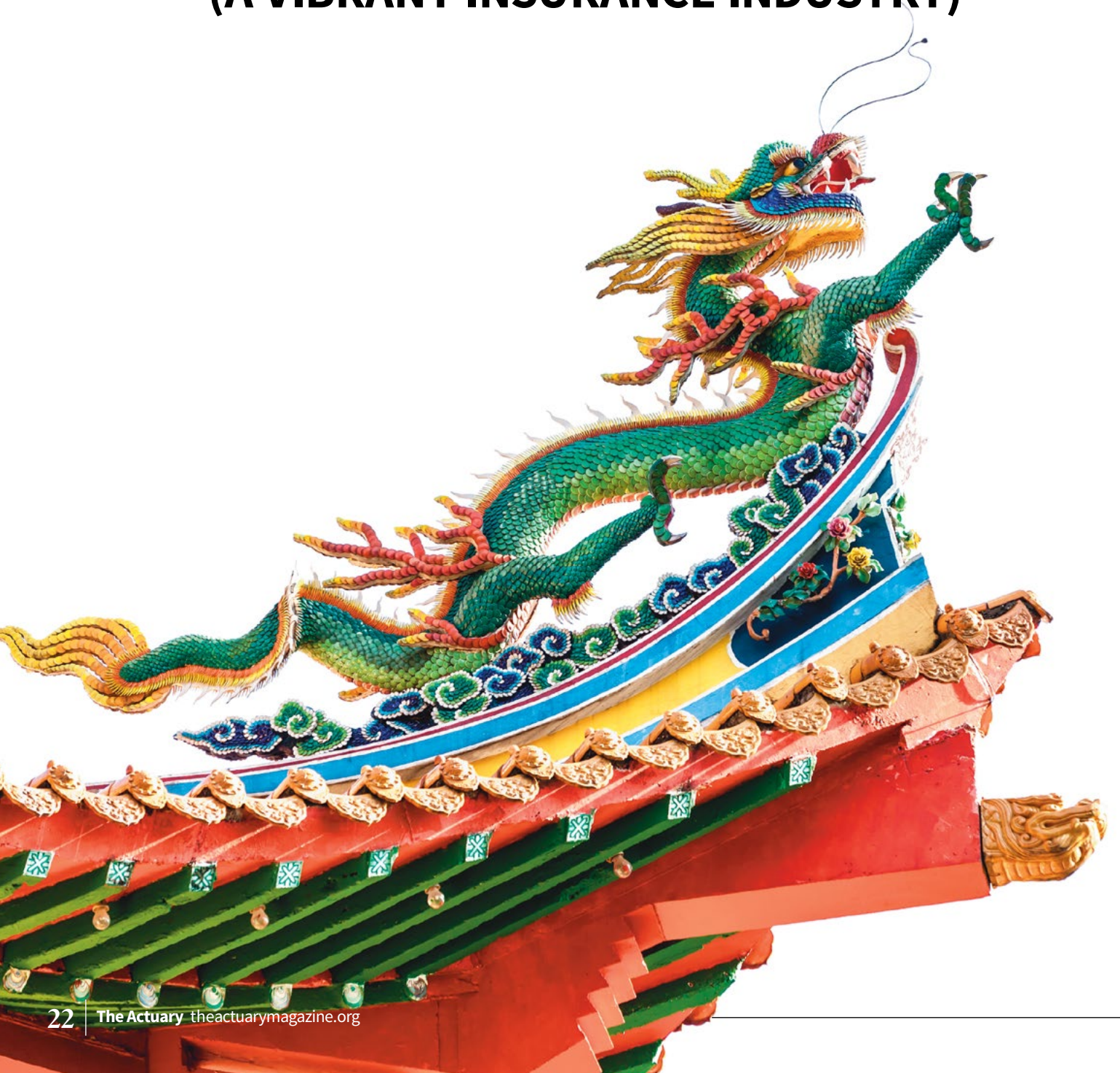
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EXPLORING TRENDS IN CHINESE INSURANCE REGULATION

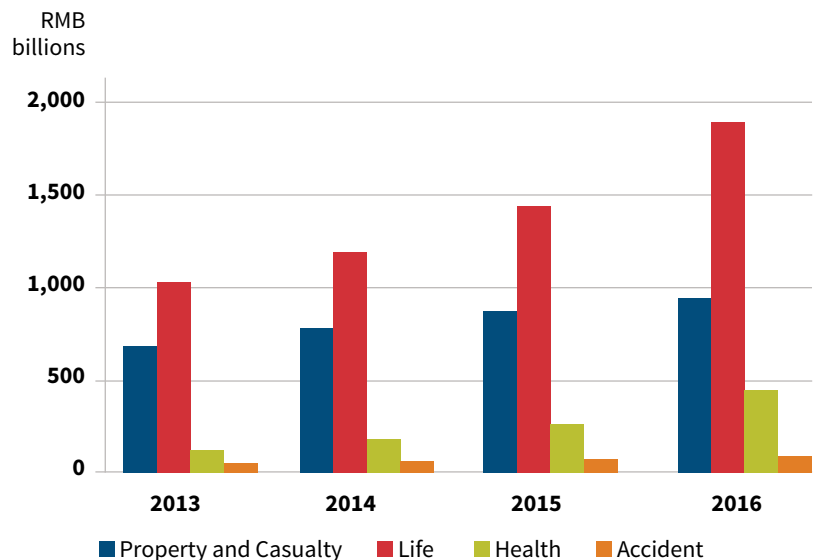
BY HANS WAGNER

China is well known internationally for a variety of different attributes, including its long history, historical monuments such as the Great Wall, its outstanding and varied regional cuisines, its large population and its growing share of the global economy. From 1979 to 2010, China's annual gross domestic product (GDP) growth was 9.91 percent. Since 2010, growth each year has trended down, from 10.6 percent to 6.7 percent in 2016. China passed Japan in 2009 and is the world's second-largest economy behind the United States. The digital economy has been especially rapid in its growth, with more than 20 percent annual growth since 2009 and about 47 percent of global retail e-commerce sales.

In this environment, the growth and change of the insurance market is also striking. Gross premium exceeded RMB 3 trillion (USD 455 billion) in 2016, with annualized growth of more than 20 percent since 2013. Life is the largest market segment, but health is the fastest growing. It is estimated that during 2016, the insurance premium growth in China represented 47 percent of the global growth in insurance premiums (see **FIGURE 1**). With the local economy still growing and much lower penetration rates than more developed markets, China's insurance industry still sees great opportunities for further growth.

This article provides an overview of China's insurance regulatory regime, news of recent developments and views on possible future developments. The author works primarily in life and health insurance, but some coverage of property and casualty (P&C) is provided.

FIGURE 1 CHINA MARKET PREMIUMS



Source: Chinese Insurance Regulatory Commission

REGULATORY SYSTEM OVERVIEW

Regulation of the insurance industry in China is the responsibility of the Chinese Insurance Regulatory Commission (CIRC). CIRC has sweeping powers to regulate all aspects of the industry. CIRC is a national regulator, but it has 31 provincial branches that sometimes issue supplementary local regulations and form local interpretations of national rules. Inside the CIRC are departments regulating finance, actuarial, investments, foreign insurers and other matters. Foreign insurers are subject to specific regulations—for example, ownership share limits and special rules for adding new provincial branches. CIRC is under the direct supervision of the State Council, which is the chief administrative authority of the People’s Republic of China. The State Council is essentially the top of China’s executive branch.

More broadly, the economy and finance industry is under the direction of the Ministry of Finance (MoF). The MoF is also under the direct supervision of the State Council. For the insurance industry, the most relevant roles of the MoF are in setting accounting rules and tax rules. The New Chinese Accounting Standards (NCAS) issued in 2006 are broadly aligned with International Financial Reporting Standards (IFRS), while implementation is adjusted to



**REGULATORS
MUST STRIKE
THE RIGHT
BALANCE IN
ENCOURAGING
GROWTH
WHILE
ENSURING
SOLIDITY.**

Chinese characteristics (e.g., held-to-maturity accounting classification of assets is still in widespread use). A schedule for incorporating IFRS 9 was announced in April 2017. For NCAS, CIRC gives advice to MoF but does not set rules for insurance liability valuation. CIRC directly controls the valuation basis for solvency measurement.

At the same ministerial level as the MoF is China’s central bank, the People’s Bank of China (PBoC). The PBoC has the key role in monetary policy and setting interest rates, along with regulating the money supply. The PBoC is also in charge of anti-money laundering activities, which for insurers have implications for policy issue and service.

Also quite relevant for publicly listed insurers is the Chinese Securities Regulatory Commission (CSRC), which is the main regulator for securities markets in China, similar in function to the Securities and Exchange Commission (SEC) in the United States. Bank distribution is a significant portion of the total market, so

the Chinese Banking Regulatory Commission (CBRC) also has relevance for many insurers. CBRC rules, for example, allow each banking outlet to cooperate with a maximum of three life insurance companies and forbid life insurance sales personnel from operating directly within bank outlets. As with CIRC rules, the interpretation of CBRC rules sometimes varies among different provinces.

No summary of the Chinese regulatory landscape is complete without mentioning the leading role of the Chinese Communist Party (CCP). While the governing and regulatory bodies are independent of the CCP, high-ranking government officials are usually also high-ranking party members. Individuals often rotate among roles in industry, government and the party, as well as between provincial and central roles. Party initiatives, such as the anti-corruption campaign of recent years, can make an impact. The chairman of CIRC, Xiang Junbo, who previously was chairman of one of the “big four” state-owned banks and had been vice governor of the PBoC, was placed under investigation in April 2017 by the CCP for “serious violations of discipline.” Shortly thereafter, he was removed from the CIRC organization chart on its website.

RECENT INSURANCE REGULATORY DEVELOPMENTS

In August 2014, the State Council released a milestone paper titled “Several Opinions on Accelerating the



Development of the Modern Insurance Service Industry.” This marked the first time that the State Council had specifically addressed the role of the insurance industry in assisting China’s development. In addition to setting out a broad agenda of modernization and reform for the industry, there are concrete insurance penetration and density goals for 2020 that would represent approximately 16 percent annual growth for the industry. This paper reinforced several previously existing regulatory thrusts, giving them much greater weight with the endorsement of China’s highest executive body.

The inclusion of explicit and ambitious growth targets in this paper, coupled with drives for modernization and reform, provide an indication of the balancing act required of the CIRC. There is a desire for a large insurance industry, and simultaneously a desire for a strong industry contributing to society. China’s growth history includes examples of high growth that was not sustainable or had unhealthy underpinnings, so regulators must strike the right balance in encouraging growth while ensuring solidity.

The full scope of all of the regulatory changes is beyond the scope of this article, but a summary of the key regulatory changes from CIRC and other regulators can be grouped into five main areas:

- ➔ Modernize and open up regulation to give market forces more scope.
- ➔ Improve customer services and sales practices.
- ➔ Improve capital management and industry stability mainly through solvency reform.
- ➔ Restrain market excesses and encourage the insurance market to focus on protection function.
- ➔ Improve corporate governance.

Allowing More Market Forces

Historically, like many developing insurance markets, CIRC kept close control of policy pricing both in life insurance and P&C. The liberalization of interest rates allowed in pricing has been progressively applied to different life product types between 2013 and 2015. While old regulations had a strict cap on the interest rates used in determining policy premiums, new regulations remove the cap but still require that products using rates higher than 3.5 percent for nonparticipating and 3.0 percent for participating receive permission from CIRC.

For P&C, the first emphasis of pricing liberalization has been on auto insurance, which is the dominant product. A pilot of pricing liberalization was rolled out to six

provinces in April 2015, followed by national liberalization in July 2016. Commercial insurance rates are still controlled, but further liberalization is expected.

In addition to liberalizing the pricing standards for insurance, CIRC also has greatly expanded the list of permitted investments, allowing insurers to improve their investment returns, create better diversification of risk and tools for risk management, and encourage insurance companies’ investments to help overall economic growth. In 2010 and 2012, CIRC began permitting investments in equity and real estate. Following the “Several Opinions” paper in 2014, CIRC also allowed venture capital and private equity investments. Insurers are required to meet various qualifications before investing directly in nonstandard asset classes.

Improving Customer Services and Sales Practices

One of the overriding goals of the CCP is to maintain social order. Accordingly, customer satisfaction is of prime importance, especially if potential dissatisfaction could rise from an individual case to the level of mass complaints. So it is no surprise that a number of initiatives have focused on both the insurance sales and servicing processes to protect consumers.

CIRC has issued controls both at a detailed operational level and with a broader top-down approach. These include regulations on what can be included in sales illustrations, a mandated “welcome call” after all life insurance sales, special protection for older consumers in some provinces and other initiatives. Since 2012, a series of scorecards has been developed for various aspects of sales and service quality.

With the importance of e-commerce in China and the potential for digital insurance operations, CIRC has encouraged innovation. However, a number of nontraditional players entering the areas of insurance—particularly wealth management products—have not pursued sustainable strategies. Some of these have exploited inconsistencies in approach among different Chinese regulators, and there are renewed efforts to rein these in. Guo Shuqing, head of CBRC since February 2017, has emphasized the need for coordination among regulators and ensuring consumers have appropriate protection through regulation.

Another area in which CIRC has liberalized the market, but also placed more responsibility on companies, is agent licensing. Old requirements for agents passing a regulatory exam have been eliminated, but companies are expected to ensure their agents are appropriately trained and are responsible for their behavior.


Improving Capital Management and Stability

Perhaps the recent Chinese regulatory innovation that is best known abroad is the Chinese Risk-Oriented Solvency System (C-ROSS). A more complete description can be found in *The Actuary's* February/March 2014 issue, but in brief, C-ROSS is structured with the multiple-pillar framework that is common to modern global solvency regulation and very much resembles the European Solvency II framework, but it limits required capital measurement to a standard formula. However, C-ROSS includes many features designed specifically to China or that are more appropriate to developing markets as opposed to Europe's mature industry. Its Pillar 1 measurement framework of available and required capital came into full effect at the beginning of 2016.

Pillar 2 qualitative requirements were implemented during 2016, with both the Integrated Risk Rating (IRR) and the Solvency Aligned Risk Management Requirements and Assessment (SARMRA) being completed for all companies. The IRR attempts to combine the quantitative assessment from Pillar 1 with monitoring of other indicators plus examinations of each company's operational, strategic, reputational and liquidity risks. SARMRA on-site inspection teams from CIRC provincial offices reviewed the completeness and effectiveness of risk management. Quantitative scores were then assigned, with companies scoring below 80 increasing required capital and those with scores higher than 80 reducing required capital.

With the adoption of the new capital standard, China also has moved to updating its embedded value (EV) reporting. EV reporting is required as a regulatory filing, though many investment analysts also use it as a metric. The Chinese Actuarial Association (CAA) was charged by CIRC with the task of updating the Chinese EV standard to reflect the new capital standard.

One of the less-healthy aspects of insurer growth in China has been a variety of companies wishing to apply variations of what they see as the "Buffett model" of using insurance as a cash cow for other corporate investment goals. The local adaptation has not always included the principles of avoiding hostile takeovers, running a sound insurance company and maintaining a solid, consolidated balance sheet supporting opportunistic risk-taking. Liu



ONE OF THE OVERRIDING GOALS OF THE CHINESE COMMUNIST PARTY IS TO MAINTAIN SOCIAL ORDER, SO IT IS NO SURPRISE THAT A NUMBER OF INITIATIVES HAVE FOCUSED ON BOTH THE INSURANCE SALES AND SERVICING PROCESSES TO PROTECT CONSUMERS.

Shiyu, the head of CSRC, in December 2016 described some leveraged takeover players as "barbarians" and "robbers." A number of companies recently have had product and investment restrictions placed upon them and executives banned from the industry.

Focusing on Protection Function of Insurance, Eliminate Excesses

One of the key focuses of the "Several Opinions" paper is to support the growth of the protective element of insurance in China, notably in health and pensions, but also for agricultural insurance and other areas. A large portion of the premium income historically has been from savings-oriented policies that customers expect to hold for a short term (anywhere from just a few months to a few years). In 2015, such products were 27 percent of total life insurance premiums, but CIRC has taken several steps to curb the sales of these products in recent years. Progress has been uneven, as CIRC has faced pressure to help companies deal with cash-flow issues from prior sales, as well as maintaining overall industry growth

goals. Products with an expected duration of less than one year have been banned, and progressively tighter limits are coming into force for products with an expected duration between one and five years.

A September 2016 regulations package also included updates across all life insurance products. These rules covered several areas, including mandating higher minimum death benefits (existing rules in China have death benefits that are more significant than in some European markets, but are much less than what is required to be tax-qualified life insurance in the United States), clarifying the responsibilities of the chief actuary for the reasonableness of assumptions and requiring new products to have a positive EV margin. Restrictions were placed on universal life products, which in China often are more akin to shells for short-term savings.

There have been carrots provided for transition, as well as sticks. 2016 saw the launch of a tax-advantaged health insurance scheme, although so far sales have been small. There also have been some pilots of tax-advantaged pension plans, as well as other pilot programs such as a micro-loan warranty pilot in Shanxi province in 2015.

China also has updated its official mortality tables, including for the first time a specific table for annuities

“ Various further regulatory refinements are likely as China’s economy and insurance industry continue to evolve and modernize.”

developed from annuity mortality experience rather than adjusted from life insurance experience.

Improving Corporate Governance

In 2015, in response to State Council requests to reinforce internal control and prevent financial risks, CIRC launched the “Two Reinforcements and Two Restraints” review. This consisted of extensive self-assessments by insurance companies and their branches to identify areas of failed controls. With the first round producing inadequate reporting in some cases, CIRC has followed up with on-site inspections and additional rounds of company self-inspections. Work in this area continues.

During 2017, CIRC launched provincial team on-site inspections of insurance company governance, similar to the SARMRA reviews where each province inspects companies that are not headquartered in that province.

The expanded responsibilities of the chief actuary and the company general manager under the September 2016 regulations also have the intention of strengthening governance.

Other Initiatives

Beyond the changes for mainland China’s insurance industry, it is worth noting a change related to Hong Kong. Due to various factors, a major percentage of Hong Kong life and health insurance sales come from mainland Chinese visitors. China still has controls on conversion of RMB into foreign currency, and these purchases were seen as a potential loophole in those controls. There have been several stages tightening restrictions in 2016 and 2017.

On a somewhat related note, after a period when Chinese insurers aggressively looked abroad for insurance acquisitions and other investment opportunities, offshore investing recently has been discouraged through various means, but some opportunities are still being explored.

POSSIBLE FUTURE TRENDS

Various further regulatory refinements are likely as China’s economy and insurance industry continue to evolve and modernize. Balancing healthy growth with strengthening the core will be a continued theme. Another balancing act is between investor interests and consumer interests, along

with the competing consumer interests of low prices and strong solvency. Required cash values for life products currently provide good liquidity for consumers, but providing this liquidity has an economic cost and is one reason that Hong Kong long-term products are priced attractively; perhaps the balance of liquidity and cost will shift. CIRC is working to improve the regulation of asset-liability management. There is continued interest in encouraging the insurance industry to invest in areas supporting the general economy, especially health care and an aging population. (China has a rapidly aging population following decades of improved longevity coupled with the one-child policy, which was driven by a desire to avoid a rapidly growing population straining limited resources.) Depending on movements in the broader capital account, overseas investments may again become more fashionable for Chinese insurers.

It is likely the regulators will accelerate efforts to close loopholes and inconsistencies among different regimes. On the other hand, it is rumored that a number of large domestic insurers have lobbied for a more segmented approach that recognizes the different nature of business at large companies compared to smaller companies. Foreign insurers are hoping for some relaxation of restrictions on their activities. As e-commerce continues to grow, and with the government’s interest in using digital advances as an economic accelerator, regulators likely will need to adapt to new players and plays in insurance.

CONCLUSION

China remains a dynamic economy and insurance market with exciting challenges. The regulatory framework is developing based on careful review of international practices, with adaptation to China’s needs. While the percentage growth in premiums may be slowing, the pace of change for the industry likely will not be! ■

Hans Wagner, FSA, is the chief actuary and chief risk officer of ICBC-AXA Life in Shanghai. He is also a member of the SOA China Committee. The views expressed in this article are his and not those of his employer or its shareholders.

Hans.Wagner@icbc-axa.com



FEATURE


INSURANCE REGULATION IN ASIA

TIME FOR

change

A CLOSER LOOK AT GENERAL AND
COUNTRY-SPECIFIC REGULATORY
TRENDS IN ASIA

BY ROB CURTIS

A large, stylized, yellow calligraphic graphic, possibly representing the word 'more', is positioned in the upper left corner of the page. The background is a dark, textured grey with a subtle pattern of overlapping circles in the top left corner.The background of the page is a bright blue sky with a sunburst effect in the upper right quadrant and white clouds in the lower left quadrant. A diagonal line separates the dark grey upper section from the blue sky lower section.

As insurance markets continue to develop globally, many Asian regulators are reviewing their current approaches to the supervision of insurers and insurance intermediaries. In several countries, changes in market characteristics—in particular, higher income per capita and technological uptake—have led to rapidly increasing consumer demand and insurance penetration, and have in turn driven regulatory change. In addition, historical solvency issues across Asia, coupled with changes in other regions, such as the recent implementation of Solvency II in Europe and the ongoing implementation of the global Insurance Core Principles (ICPs) of the International Association of Insurance Supervisors (IAIS) by insurance supervisors, have increased the pressure to modernize insurance capital regulation in the region. Hong Kong is the latest jurisdiction to reform capital requirements by working on the introduction of a risk-based capital regime supported by a new Own Risk and Solvency Assessment (ORSA) requirement. These evolving market needs and global regulatory drivers have accelerated the pace of existing reforms in many countries and have inspired other regulators to begin their own regime changes.

Several areas of regulatory change have emerged as areas of common focus. In particular, solvency and risk management reforms are at the center of most changes, with many mature insurance markets having already considered or implemented increasingly complex and nuanced frameworks, along with more extensive reporting and disclosure requirements. The supervision of insurance groups and treatment of consumers are other areas of focus, largely as a result of systemic issues in specific local insurance markets. Major reforms are planned

in many countries over the next three to five years, and these broad regulatory changes present a variety of new challenges to firms operating in Asia and may continue to do so if other countries in the region adopt them. The reforms will require many insurers to reconsider their risk and capital management strategies, corporate structures, and approach to ensuring consumer protection and embedding a good corporate culture. We summarize the key developments and set out country-specific changes in the rest of this article.

CAPITAL AND SOLVENCY

Perhaps the most significant change in Asian economies is the shift toward more advanced forms of capital and solvency regulation. Some insurance markets are now adopting risk-based capital (RBC) frameworks, which borrow significantly from the European Solvency II standard. South Korea, for example, plans to completely replace its regime in the coming years, requiring a capital injection of 50 trillion won (about 40 billion USD) into its life insurance industry. Additionally, Japan is conducting extensive fieldwork to evaluate the impact of an economic value-based solvency regime. Furthermore, Hong Kong is also significantly changing its current rule-based solvency regulations, moving toward a three-pillar approach similar to Solvency II and other developed markets.

Other jurisdictions continue to refine their existing RBC frameworks to better account for stakeholder needs. For example, monetary authorities in Singapore and Thailand have both engaged in extensive industry and expert consultations, and are considering changes that propose to improve their regimes' risk confidence, coverage and sensitivity. Although other Asian countries have not made explicit plans to fully reform or make major improvements to their capital frameworks, it is clear they are keeping a close eye on developments in these larger, more mature markets.

ORSA

ORSA requirements are also gaining traction in the Asian insurance sector, largely as a result of its inclusion in the IAIS ICPs. Recent regulations in several countries, including Japan, Singapore, Taiwan and Thailand, require annual submission of ORSA reports to the regulator. Others, such as Hong Kong, have plans to introduce similar schemes in coming years.

SUPERVISION OF GROUPS

The approach to the supervision of large insurance groups is also receiving more attention in recent years. In many countries, including India and Indonesia, governments

have altered foreign ownership restrictions in order to prevent local insurance industries from being overly affected by foreign-owned groups. Other economies, such as Hong Kong and Singapore, do not have these type of restrictions and have instead opted to regulate large groups separately. For example, Hong Kong recently introduced a recovery regime affecting global systemically important insurers (G-SIIs), which will establish two tribunals for the purpose of administering, mediating and reviewing recovery of these insurance conglomerates.

CONSUMER TREATMENT

Asian regulators also place an increased focus on insurers' conduct and treatment of consumers. Several countries have identified systemic issues within their insurance markets—largely due to lack of information and inappropriate outcomes for consumers, or lack of insurance availability and penetration—and are tackling this with tougher requirements targeted at both insurers and intermediaries. Hong Kong, Japan and Malaysia have recently enhanced regulations around product design, appropriateness of product for consumers, remuneration and commission structures, marketing and sales, while South Korea has announced a roadmap to strengthen regulations to achieve similar objectives. Singapore has taken a different track, focusing on the culture, corporate values, remuneration and accountability of senior management and its potential to effect change in consumer outcomes. Japan, Macau and Singapore have strengthened regulation of licensing and professional development of intermediaries and financial advisers in an attempt to ensure informed and appropriate treatment of consumers.

The likely effects on insurers from all of these changes are significant and involve:

- ➔ A continued move toward economic valuation basis and economic capital model builds
- ➔ Higher solvency control level requirements
- ➔ Increased need to improve enterprise risk management (ERM) standards and group ERM functions and capabilities
- ➔ Better data and systems requirements aligned to International Financial Reporting Standard (IFRS) 17
- ➔ Increased pressure on the conduct agenda and impact on internal approach, skills and resourcing
- ➔ Need to respond to jurisdiction-specific requirements, such as Hong Kong proposing to conduct risk analysis within the ORSA

See **FIGURE 1** for a summary of country-specific changes.

FIGURE 1 REGULATORY CHANGES BY COUNTRY/TERRITORY

Country/Territory	Capital Regulations	Other Regulations
Hong Kong	Hong Kong plans to steadily move toward a three-pillar risk-based approach to solvency (similar to Singapore) and is nearing a new round of consultations concerning a quantitative impact study (QIS) and Pillar 2. Notable enhancements to enterprise risk management (ERM) and the introduction of an Own Risk and Solvency Assessment (ORSA) for all insurers (in the second half of this year) are also anticipated. Additionally, groupwide supervision arrangements will be strengthened.	<ul style="list-style-type: none"> ➤ Hong Kong has increased its supervision of large insurance groups. Its most recent initiative is the introduction of a resolution regime covering global systemically important insurers (G-SIIs). The regime will establish two tribunals to supervise and review recovery and resolution compensation. ➤ Regulation of insurers and intermediaries has also been enhanced, with a focus on product design, commission structures, marketing disclosures and sales.
India	India has recently set a minimum threshold on net owned funds and assigned capital for foreign reinsurers setting up branches in India, but it has otherwise not yet commenced reforms to insurers' capital requirements.	<ul style="list-style-type: none"> ➤ India has issued regulations allowing corporate agents to distribute products from more than one insurance company and regulations that require policyholder records to be held electronically and physically in India.
Indonesia	Indonesia has issued new capital-related regulations that require insurance companies to determine target solvency margins over the minimum requirement, but it has not implemented a specific risk-based capital (RBC) regime. It also has temporarily relaxed its capital requirements for insurers as a form of economic stimulus, allowing new valuation methods and reducing required capital thresholds.	<ul style="list-style-type: none"> ➤ Indonesia recently issued regulations that stipulate the scope, type, registration and approval of insurance products—and which provide for consumer protection. The regulation requires approval prior to marketing new products and restricts alternative distribution channels. ➤ Indonesia has also recently set out new reinsurance regulations. These new rules provide for reinsurance support strategies, as well as mandated reinsurance coverage, which differs among insurance types.
Japan	Japan now requires all insurers to submit ORSA reports and has turned its focus to ERM implementation, regulation of groups and assessing performance against risk appetite statements. The Japanese Financial Services Agency (FSA) is currently conducting field tests in consideration of implementing economic-based valuation and supervision.	<ul style="list-style-type: none"> ➤ The FSA's newest regulations focus on consumer outcomes, requiring insurance companies to develop products that prioritize customers' interests and addressing disclosure of information. Implementation is complete as of April 2017. ➤ The regulations are also aimed at insurance intermediaries, requiring changes in corporate structure with regard to their business size and characteristics in some cases.
South Korea	South Korea is considering implementation of an RBC regime similar to Solvency II, with plans to release guidance in the near future. It also has recently enhanced its existing standards and will implement an ORSA requirement later this year. The Financial Supervisory Service (FSS) has renewed focus on internal risk management processes, scenario testing and recovery plans.	<ul style="list-style-type: none"> ➤ The FSS released a road map to enhance consumer protection and competition in the insurance industry. It plans to deregulate new product pre-approval and premium regulation, diversify capital financing and prevent incomplete sales.

Continued on page 32

FIGURE 1 REGULATORY CHANGES BY COUNTRY/TERRITORY (CONTINUED)

Country/Territory	Capital Regulations	Other Regulations
Macau	The Monetary Authority of Macau has introduced a requirement that the appointed actuary must file a peer-reviewed annual actuarial report. Otherwise, it has not introduced any new regulation of insurers' capital requirements.	<ul style="list-style-type: none"> Insurance intermediaries are now required to disclose certain information to consumers and to select appropriate products for each consumer. The Monetary Authority has consulted on professional development programs for intermediaries, but the substance or timeline of these changes remains uncertain.
Malaysia	Malaysia has an existing RBC framework for conventional insurers, which was recently extended to cover takaful (sharia) insurers. Bank Negara (the central bank of Malaysia) is looking to review risk parameters for the local insurance industry and has recently regulated dividend distribution to ensure capital adequacy. Otherwise, it is not moving toward substantial change in its capital framework.	<ul style="list-style-type: none"> Bank Negara's new life framework removes operational cost limits in order to promote innovation, diversify distribution channels and regulate market conduct in order to improve insurance penetration and consumer outcomes. Starting in mid-2018, life insurers and general businesses in Malaysia must be run by separate legal entities, which will require the restructuring of many firms holding dual licenses.
Philippines	The Insurance Commission continues to review its RBC framework and has recently issued new valuation standards. It has also set out a new Financial Reporting Framework that provides for new accounts, asset limitations and economic valuation. The Insurance Code also has been amended to place a minimum bound on new insurers' net worth of P 1 billion. The amendment also requires existing insurers to increase their net worths gradually over the next few years.	<ul style="list-style-type: none"> The Philippines recently abolished its insurance equity participation rule, which required banks to have equity holdings in insurers in order to partner with them. Therefore, it is now easier for banks to partner with insurers.
Singapore	The Monetary Authority of Singapore (MAS) continues to consult on proposed improvements to its existing RBC framework. The changes will align regulation of insurers and banks. The MAS will also introduce dual capital requirements, incorporating a prescribed capital requirement—the minimum for the insurer to operate—and an absolute minimum capital requirement at which the regulator will intervene.	<ul style="list-style-type: none"> In an effort to improve availability of insurance, the MAS intends to introduce consumer protection initiatives, expand distribution channels and reduce insurance costs. In particular, it has focused on insurers' boards and the tone they set, their corporate values and culture, employee compensation and commission structures, and accountability. The MAS also plans to increase regulation of financial advice, including compliance checks and adjustment to remuneration structures.

FIGURE 1 REGULATORY CHANGES BY COUNTRY/TERRITORY (CONTINUED)

Country/Territory	Capital Regulations	Other Regulations
Taiwan	Taiwan encourages insurers to use economic capital valuation, and production of ORSA reports became compulsory in 2016. Compulsory implementation of economic valuation of capital remains uncertain, and authorities are considering an alternative measurement designed to approximate economic capital.	➤ Taiwan is introducing legislation to encourage the sale of long-term care and products related to health management.
Thailand	Thailand continues to review its existing RBC framework, addressing gaps in the original regulations and updating risk charges and the overall confidence level. The Office of Insurance Commission (OIC) has implemented stress-testing frameworks and plans to increase insurance capital requirements in the near future.	<ul style="list-style-type: none"> ➤ The OIC is concerned about insurers' business conduct and consumer protection. Discussions are ongoing. ➤ Similarly, deregulation of pricing, commission and product approval structures continues to be considered.
Vietnam	Minimum capital levels in Vietnam are set for each type of insurance business using a simple calculation methodology. In recent years, insurers have been classified into different groups and are regulated based on certain calculated ratios. However, the future implementation of a RBC regime remains uncertain.	➤ New regulations that require bancassurance staff to undergo specific training have been introduced, with the purpose of ensuring appropriate product selection for consumers.

“We can expect to see a much greater emphasis placed on groupwide supervision and systemic risk analysis across Asia.”

CONCLUSION

It is clear that regulatory change in Asia is occurring quickly, with supervisors applying enhanced levels of supervision across all pillars, particularly in their pursuit to employ more risk-based techniques to accompany their off-site and on-site supervisory programs. Greater focus and accountability on boards and among senior management relating to the quality of their governance and risk assessment arrangements, particularly off-balance sheet and noninsurance exposures, will be at the heart of these new reviews. Similarly, we can expect to see a much greater emphasis placed on groupwide supervision and systemic risk analysis across Asia, combined with an increasing focus on conduct of business requirements. For many insurers, such changes will pose structural, data and resourcing challenges for many years to come. For most, now is just the beginning. ■

Rob Curtis is the Global Insurance Regulatory & ASPAC Risk lead at KPMG, and is co-located in Sydney and Hong Kong.

rcurtis1@kpmg.com.au



BACK TO THE

THE CREATION STORY OF IFRS 17 FOR INSURANCE CONTRACTS

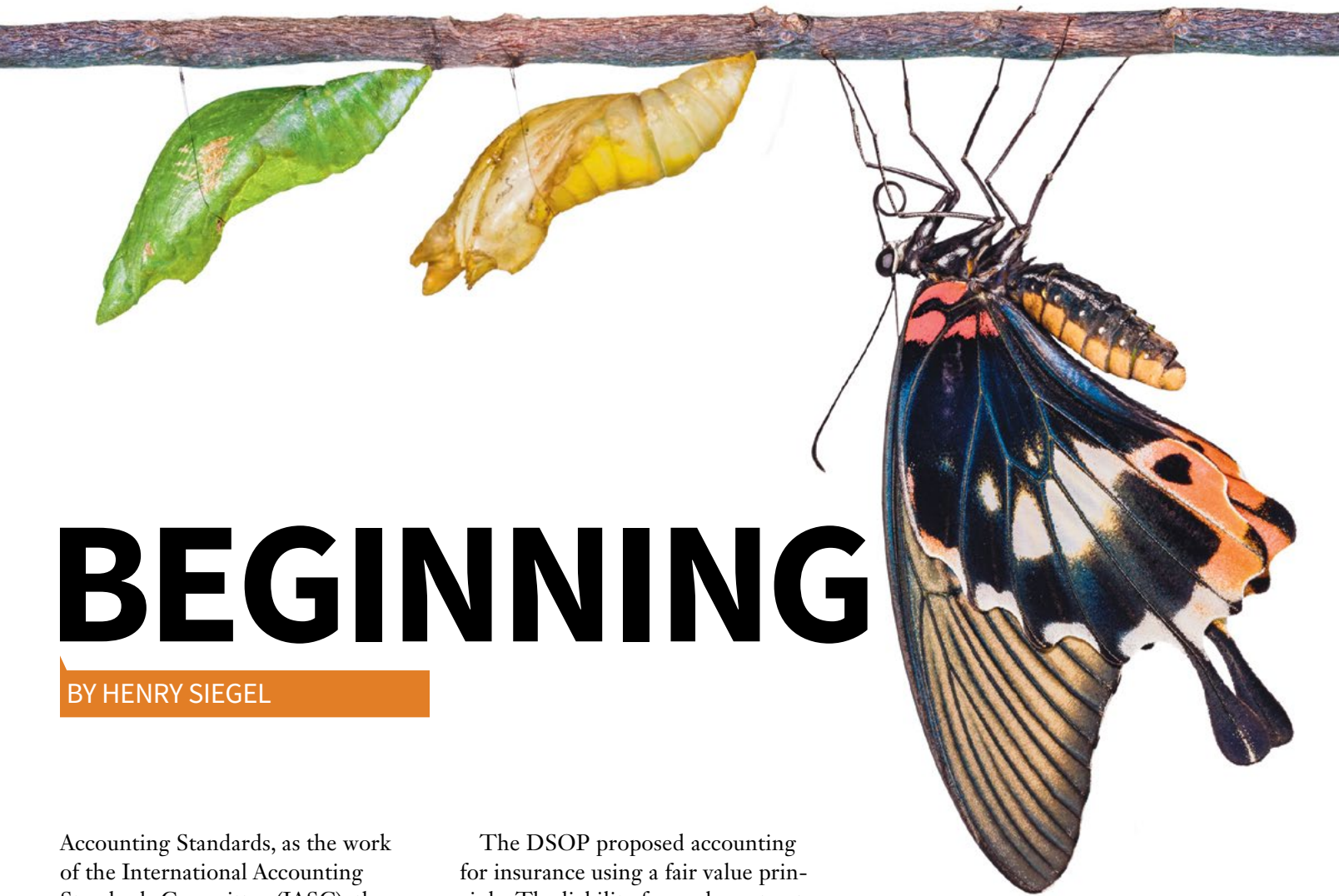
In the beginning, the International Accounting Standards Board (IASB) created International Financial Reporting Standards (IFRS). No international standards existed, and it was chaos across the face of the earth. Users saw a great darkness in insurance reporting, from which useful information could not be derived.

It seemed that each country had its own set of standards for public reporting, and it was not obvious how to compare one company's reporting with another. Those companies listed on the New York Stock Exchange were required to report their results using U.S. generally accepted accounting principles (GAAP), while

companies listed on non-U.S. stock exchanges used whatever standards those exchanges required. For many of the largest companies, therefore, U.S. GAAP became the de facto standard for insurance reporting, but there was still no generally accepted international standard.

EARLY STEPS—THE DSOP

The establishment of the European Union (EU) in 1993 changed everything and created the need for a common international accounting standard. One of the early decisions the EU made was that all companies listed on a European stock exchange needed to report using International



BEGINNING

BY HENRY SIEGEL

Accounting Standards, as the work of the International Accounting Standards Committee (IASC), the predecessor to the IASB, was called.

The IASC took up the insurance project in 1997. It produced two sets of papers, the first being a two-volume paper on insurance issues, and the second known as the Draft Standards of Practice for insurance accounting, or DSOPs. The DSOPs, based on comments received on the insurance issues papers, were an incomplete standard, lacking, among other things, a proposal for participating contracts. Nevertheless, they set the stage for the lengthy process that eventually produced a final standard.

The DSOP proposed accounting for insurance using a fair value principle. The liability for each contract was to be equal to the present value of future cash flows using market assumptions, including a current interest rate curve. This caused great concern among interested parties for a variety of reasons.

First, it allowed a gain to be recognized at issue for every profitable contract sold. The markets were just recovering from problems at companies like Enron that recognized profits on issue of contracts that eventually turned out to be unprofitable. In the view of many users, recognizing the present value of all future profits

Author's Note: This is a condensed history of the International Accounting Standards Board's (IASB's) Insurance Contracts project. Not every issue is discussed completely herein or in some cases at all, nor is every milestone noted. For a more complete history, visit the IASB website at IFRS.org.

EARLY ON, IT WAS A CHALLENGE FOR ACTUARIES TO PROVE THAT THEY HAD SOMETHING VALUABLE TO SAY ABOUT ACCOUNTING STANDARDS—MANY IASC AND IASB BOARD MEMBERS INITIALLY THOUGHT THAT ACTUARIES DID WHATEVER THE COMPANIES TOLD THEM TO DO.

immediately on issue created the opportunity for serious manipulation by management because there was no way to determine a fair value except through the use of assumptions set by the company's actuaries.

For their part, many actuaries were concerned about this proposal because it meant they needed to develop “market-based” assumptions when no such thing existed—or what did exist (e.g., those assumptions used for purchase accounting) would not be applicable to a specific company.

Companies also objected to the use of fair value since it seemed that it would create significant volatility in the earnings statement, as interest rates moved, sometimes significantly, between each reporting period. Companies were concerned that extensive volatility would cause analysts to downgrade their financial standing and reduce the value of their shares.

The Insurance Industry Response

In response to the formation of the EU, the IASB and the publication of the DSOPs, the European industry formed the CFO Forum (CFOF), a group of companies, each represented by its CFO. The CFOF worked initially on Solvency II, the new solvency regulation the EU was developing. It also produced a set of principles for deriving European embedded

values (EEVs) that were put forth as an improvement over normal accounting reports.

Partly in response to the European formation of the CFOF, several large North American companies formed the Group of North American Insurance Entities (GNAIE), with the goal of presenting a common position on international accounting for insurance. In 2004, GNAIE published a set of accounting principles for long- and short-duration insurance contracts.

Eventually, members of the CFOF and GNAIE, together with the four largest Japanese life insurers, came together to form the HUB group. This group also prepared position papers on IASB proposals and eventually adopted common accounting principles that it presented to the IASB in 2005.¹

The one area where consensus was not reached was on the issue of discounting claim reserves for short-duration contracts. From the beginning, U.S. property and casualty (P&C) insurers were quite happy with their current accounting system that used undiscounted calculations, whereas the European insurers were locked into a discounted system as part of Solvency II. Therefore, this issue is not addressed in the HUB group's principles.

The Actuarial Profession's Response

As noted, the actuarial profession was concerned about this project from the beginning. The International Actuarial Association (IAA) formed an Insurance Accounting Committee in 1997 to provide input to the IASC (and in turn the IASB), and provided valuable advice to the IASB throughout the course of the project. The American Academy of Actuaries (the Academy) also was heavily involved through its Financial Reporting Committee.

Early on, it was a challenge for actuaries to prove that they had something valuable to say about accounting standards—many IASC and IASB board members initially thought that actuaries did whatever the companies told them to do. There was a belief that actuaries often manipulated the results according to their employers' wishes. It was an important challenge that was only overcome through extensive discussion and very well thought-out comment papers.

For the remainder of the project, both the IAA and the Academy provided extensive and detailed comments on all exposure drafts, occasionally exceeding 20 pages in length. The primary concerns of both groups were:

- Avoiding creation of noneconomic earnings volatility—mainly by



consistent measurement of assets and liabilities (this had important implications for defining the discount rate to be used)

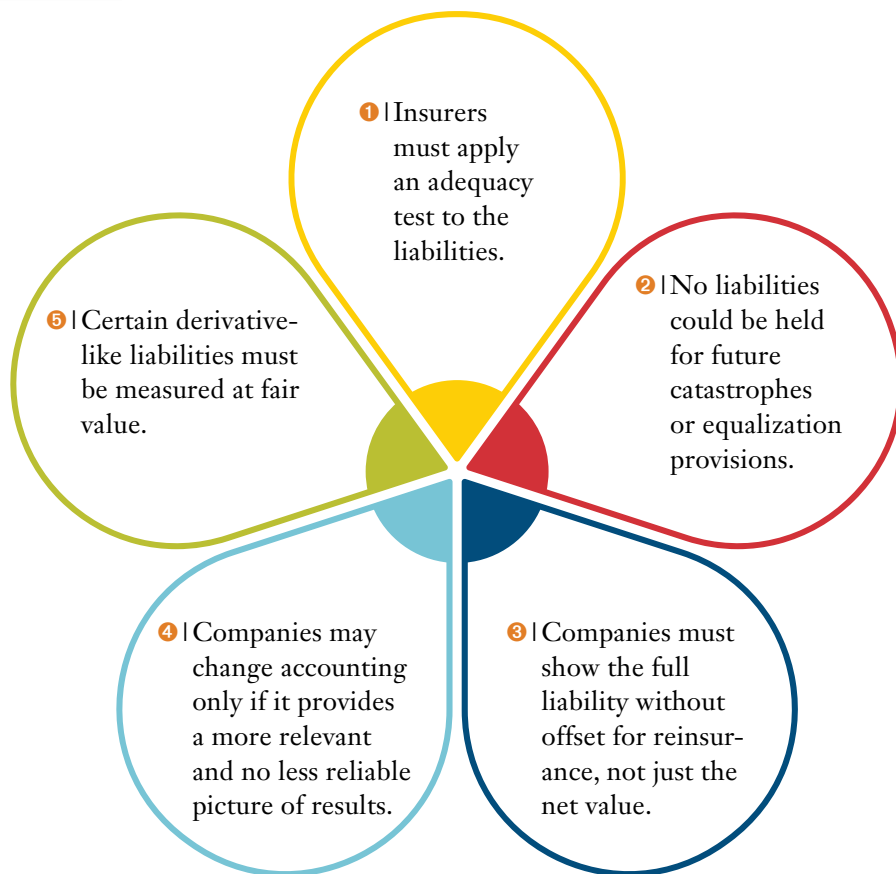
- ➔ Developing guidance both for accountants and actuaries that would be practical for preparers to implement in a cost-effective way
- ➔ Providing users with the information they need without simply producing numbers for numbers sake

Both groups had personal meetings with staff and board members to explain their positions and educate the boards and staff on the importance of actuarial science to the insurance business in general, and to accounting in particular.

The Development of IFRS 4

In light of the evident lack of agreement among the IASB, users and insurers, the IASB recognized the need to come up with a stopgap standard to meet the EU's target of using International Accounting Standards by 2005. This standard, IFRS 4, adopted March 31, 2004, essentially said that companies could continue to use whatever standard they had been using with a number of exceptions. See **FIGURE 1** on page 38 for the most important of those exceptions.

FIGURE 1 KEY PROVISIONS OF IFRS 4



Phase II of the Insurance Contracts Accounting Project

The IASB officially reopened the Insurance Contracts Project in 2005, producing an Issues Paper in May 2007. The Issues Paper reflected not only the DSOP, but also presentations and proposals made by the CFOF, GNAIE, IAA and the Academy, as well as other groups.

To facilitate discussion of the various issues, the ISAB created an Insurance Working Group (IWG) consisting of roughly 20 members from the user and preparer communities. Both the CFOF and GNAIE had representatives on the IWG, as did the major accounting firms and other national representatives. From the beginning, Sam Gutterman represented the IAA on the group and was the only actuary on the IWG until I joined as a representative of GNAIE

in 2010. The IWG met roughly twice a year until 2012, with open discussion of the key issues benefiting the board members.

In August 2007, responding to suggestions from the industry, the Financial Accounting Standards Board (FASB) published an invitation to comment that included the current IASB Issues Paper, asking whether it should join the project. Responding to the comments received, the FASB decided to join the Insurance Project in October 2008 in an attempt to produce a joint standard.

At first this process went well, with both boards making concessions to bring their viewpoints closer together. They produced two common exposure documents, the last ones in 2013, which received robust comments

from all interested parties. In the end, unfortunately, the two boards disagreed strongly on a few major issues, such as inclusion of the risk adjustment and discounting of P&C claim liabilities. The FASB withdrew from the project in 2014,² citing its existing standard and its belief it could live with only limited modifications rather than the complete rewrite a joint standard would require.

As previously noted, the IASB produced a revised exposure draft in 2013. After considering the 194 comment letters it received and doing additional fieldwork, the IASB revised its draft standard for the final time and decided the completed standard would be produced by June 30, 2017. The IASB held discussions of sweep issues in November 2016 and February 2017 to finalize the details of the standard.

There were numerous key issues identified from the beginning. The remainder of this article will outline the development of the IASB’s position on some of the most important ones.

BASIC MODEL FOR LIABILITIES

From the beginning, the IASB adopted the general approach of the DSOP, setting the basic liability equal to the present value of future cash flows (PVFCF) using current assumptions and current discount rates. This approach was named the building-block approach (BBA). It turned out, however, that stating that principle was easier than defining the details.

Short-Term Contracts

From the outset, U.S.-based P&C insurers strongly objected to both the use of the BBA for pre-claim liabilities and discounting for claim liabilities, particularly those with a relatively short claim period (e.g., auto and homeowners). They pointed out that

THE ESSENTIAL GOAL OF ALL PARTIES WAS TO DEVELOP A METHODOLOGY THAT GAVE A FAITHFUL REPRESENTATION OF ACTUAL PERFORMANCE WITHOUT CREATING NONECONOMIC VOLATILITY.

internationally, almost every insurer used the unearned premium approach for pre-claim liabilities and undiscounted cash flows for claim liabilities other than those of a long duration, where the payments were fixed and determinable (e.g., workers' compensation indemnity payments).

Eventually, the IASB agreed to allow the unearned premium approach, now called the premium allocation approach (PAA), considering it a simplification of the BBA. There was a long debate about discounting the claim liabilities, with U.S.-based firms objecting strenuously. But the IASB held firm, buttressed by the requirement for discounting already included in Solvency II.

Inclusion of a Risk Adjustment

The standard for liabilities under Solvency II included a provision for a risk adjustment to the basic PVFCF. Many U.S. firms failed to see the value of this adjustment, however, and it was one of the major disagreements between the IASB and FASB. Nevertheless, European companies and regulators were determined to keep IFRS consistent with Solvency II for this item, and the IASB held firm despite the United States' disagreement.

Gain at Issue

This was one of the major problems to which most parties objected with the DSOP. Very early in the process, the IASB concluded that there should be no gain on issue. This was not a problem for short-duration contracts measured under the PAA.

For long-duration contracts, this was solved by the introduction of a margin, eventually named the contractual service margin (CSM). The CSM was set equal at issue to the present value of future premiums less the present value of future outflows and the risk adjustment, thereby setting the gain at issue to zero. For claim liabilities, there was no CSM.

The BBA thus set liabilities equal to the present value of future cash flows plus the risk adjustment plus the CSM. The only remaining concern was how to amortize the CSM. Eventually, the IASB decided to simply amortize it over the lifetime of the contracts.

THE DETAILS

Once the basic models were agreed upon, the details occupied most of the lengthy discussion. In some cases, the discussions were theoretical in nature, and in others practical. The essential goal of all parties was to develop a methodology that gave a faithful representation of actual performance without creating noneconomic volatility. It was also important that the final result should permit comparisons among insurers without major use of "non-GAAP" measures.

Setting the Discount Rate

One of the early proposals was to use a risk-free rate for discounting future cash flows. Insurers immediately objected to this since it would create a very large liability relative to the liability they had held previously. The Academy wrote a paper to the IASB and FASB recommending instead that

the insurer be allowed to choose one of two methods.

One method, the bottom up, started with a risk-free rate and added a spread for illiquidity. The other method, called the top-down method, started with the actual earnings rate of the assets behind the liabilities and subtracted a provision for credit defaults and a few other items. In theory, the two interest rates should be equal (or very similar). The IASB adopted this proposal as a practical solution to the problem.

Setting Market-Level Assumptions for Long-Duration Contracts

Actuaries objected to the use of market-level assumptions for setting future cash flows on the grounds that no such assumptions could be identified that were both relevant and practical. The concept of an entry price approach was also suggested. Insurers noted that when there is an actual sale of insurance liabilities, the assumptions used for setting the liabilities were based on the best estimate of future experience of the companies involved. As a result, the IASB adopted the concept of fulfillment cash flows. For this, the assumptions were those that would be needed to fulfill the insurer's obligations under the contract. The assumptions would be set by each preparer based on its own expectations of future experience.

While this was different in perspective from market assumptions, it could be viewed as what the market would use in the event of an actual transaction.

Treatment of Participating Contracts

As noted, the DSOP didn't include a proposal for par contracts, and the initial IASB work didn't either. Both the IASC and the IASB worked initially on the non-par issues, assuming that once those were resolved, the par issues would follow in a straightforward manner. They realized that this would not be the case when the IAA presented a summary showing the great variation in contract types available worldwide.

Europe's unit-linked contracts, while seemingly similar to variable contracts in the United States and Canadian segmented fund products, actually had a significant difference in that their assets were in the insurer's general account. Europe's traditional par contracts either split earnings based on a formula (e.g., 90 percent of earnings go to policyholders) or paid very large terminal dividends.

The IASB first proposed a mirroring concept in which the liability equaled the assets supporting the liabilities. This would have worked reasonably well for unit-linked and variable contracts, but not for most other participating contracts.

Eventually, the IASB adopted the variable fee approach for most participating contracts. This approach applies only to direct participating contracts that meet the following requirements:

- The policyholder participates in a share of a clearly identified pool of underlying assets.
- The company expects to pay policyholders a substantial share of the return from those underlying assets.
- The contract's cash flows expect to vary substantially with underlying assets.

Under this approach, the measurement of the liability reflects the change

in the fair value of all underlying assets, and the fulfillment cash flow is calculated consistent with the general model. Exactly which contracts this will apply to and how it will work in detail is still being discussed at this writing and may not be clear until after implementation.

Use of OCI for Liabilities

One of the more difficult issues the IASB had to deal with was the effect of changes to interest rates on liabilities because, as rates change, there could be a major impact on earnings for the reporting period. In response to complaints from insurers, the IASB agreed that the effect of interest rate changes on earnings should flow to other comprehensive income (OCI) as they do for unrealized gains and losses on assets. This approach greatly limits the volatility in the income statement but means that preparers need to calculate liabilities using two separate interest rates, one for the balance sheet and one for the income statement.

Revenue

Some members of the IASB objected to the use of premiums for life insurance and annuities as revenue in the income statement, noting that much of it effectively went to a deposit fund rather than to pay immediate benefits. In the course of the insurance project, the IASB and FASB agreed on a revenue standard that was very different from the traditional use of premium for insurance revenue.

After another long discussion, the IASB agreed on an actuarial approach to the subject. Revenue would include only the expected charges for benefits and expenses included in premium for the year. Amounts that created "deposits," such as cash values on whole life policies, would be removed from premiums and treated as an amount on

deposit. This means that the amounts shown as income and benefit expenses for the income statement would be significantly less than traditionally shown for long-duration contracts.

As a result of these and other decisions, almost every figure on the insurance company income statement and balance sheet is now actuarially determined rather than determined by an inventory, cash flow or other traditional accounting method.

CONCLUSION

Over the decade and a half that the IASB worked on the insurance contracts project, the actuarial profession was always involved, but that involvement significantly deepened and broadened over time. It became increasingly clear to all that actuarial input was essential to assure both the technical correctness and clarity of the final standard. As a secondary effect, the U.S. actuarial profession has become far more internationally focused than it was due to the need to develop common positions with jurisdictions in Europe and Asia.

We will need to maintain this focus in the future and to always remind everyone that *insurance accounting is too important to be left just to the accountants!* ■

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- ¹ Siegel, Henry. "A Groundbreaking Agreement on International Accounting." *Contingencies*. Nov/Dec 2006. 34-41.
- ² The Financial Accounting Standards Board (FASB) subsequently adopted only minor changes to disclosures for short-duration contracts (including disclosure of the discounted value of liabilities). It is still discussing targeted changes for long-duration contracts.

Henry Siegel, FSA, MAAA, is a consulting actuary in New York.

henryactuary@gmail.com



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NAVIGATING

RISK

THE PAST, PRESENT AND FUTURE OF
ACTUARIAL MODEL GOVERNANCE

BY MITCHELL STEPHENSON

If you work for a mid- to large-sized insurance company, you've probably noticed recent activity in your organization in regard to building, maintaining or improving a model governance program. You may have wondered what triggered this. Recently, model governance has captured the attention of supervisory and regulatory authorities, as well as actuarial organizations. This includes the Society of Actuaries (SOA), American Academy of Actuaries (the Academy), Canadian Institute of Actuaries (CIA) and International Association of Actuaries (IAA). To understand the evolution and growth of this field, we must look to how the use of models has changed over the past few decades.

The IAA released a practice note in November 2010 that lists several reasons for increased use of internal models for insurer risk assessment and capital management. One reason is the development of increasingly sophisticated risk-based insurance regulatory capital requirements. Another reason is the availability of inexpensive and fast computers. Additionally, the availability of data has increased. Add to that increased computing power, sophisticated modeling techniques and complex modeling software, and the result is the prevalent use of models that are not easily validated. Nor are the results always easy to analyze or explain.

Additionally, the financial crisis of 2008 affected the way the insurance industry viewed modeling capability and output. A Chief Risk Officer (CRO) Council paper released in 2012 states, "During and after the financial crisis of 2008, models were perceived to be ineffective in producing sufficiently severe outcomes, which has put increased scrutiny on model risk management."¹ This increased scrutiny has been applied to the banking industry especially. However, it also has influenced the thinking of actuaries and actuarial organizations in their development of model risk management programs.

As we examine the evolution of model validation and governance guidance over the past few decades, there are three areas to note.

- Guidance on model validation grew to include model governance, of which validation is only one component.
- Regulation and supervisory guidance that applies to the banking industry has been considered and incorporated, in part, into recent actuarial guidance.
- We can identify consistent themes of a strong model governance program from this guidance.

PRE-FINANCIAL CRISIS

Much of the model governance activity in the banking and insurance industry occurred in the years following the financial crisis. However, there was some guidance in the banking industry in the years preceding. For example, the Office of the Comptroller of Currency (OCC) released OCC Bulletin 2000-16 in 2000. The topic of this bulletin was model validation. It provided “guidance to help financial institutions mitigate potential risks arising from reliance on computer-based financial models that are improperly validated or tested.”² The bulletin outlined elements of a sound model validation policy. These elements include independent review, defined responsibilities, model documentation, ongoing validation and audit oversight.

A good example of the evolution of model governance guidance comes from the Basel Accords. The Basel Committee on Banking Supervision issued recommendations on banking laws and regulations. The first report was issued in July 1988 and contained no reference to model validation, governance or documentation. The second of the Basel Accords, Basel II, was issued in June 2004. This report refers to validation and documentation dozens of times. In addition, the report includes a reference to “independent review of all elements of the internal modeling process.”³

On the actuarial modeling side, we can look to the description of past practices in a 2016 Milliman white paper. This paper states: “In the past, it was the norm to have each team—pricing, valuation, asset-liability modeling (ALM), etc.—create and manage its own functional models, even when there was overlap among the business needs being served or an absolute need for consistency across assumptions, calculations and results. From time to time, individuals might communicate with

other teams to try to reconcile the models, but in the end the organization still had separate models with separate ownership, often spread across a variety of different platforms. The result was typically a costly, confusing and opaque environment.”⁴

FINANCIAL CRISIS

The financial crisis of 2008 spurred many model validation and governance initiatives. In January 2009, the Federal Reserve Board issued Federal Reserve Bank Supervisory Letter SR Letter 09-01. This letter included a section called “Required Annual Independent Review of Market-Risk Measurement and Management Systems.” This section states, “At a minimum, the annual review should incorporate the following,” and includes several items such as requirements for documentation, independence and validation of any significant changes.⁵ Additionally, SR Letter 09-01 includes guidance on the verification of the model’s accuracy through backtesting.

There is early evidence of the concept of model governance becoming broader than validation. In 2009, the Federal Housing Finance Agency (FHFA), which regulates and supervises Fannie Mae, Freddie Mac and the Federal Home Loan (FHL) banks, released Advisory Bulletin 2009-AB-03, titled “Validation and Documentation of Models and Related Controls on Internal Processes.” It replaced a previous advisory bulletin by the same name issued in 2006, 2006-AB-02. The 2009 bulletin recommended that each FHL bank have policies and procedures to ensure all of its models are documented and validated. The bulletin discussed formal policies, documentation and the elements of a sound validation program.



Then there was the joint guidance from the OCC and the Federal Reserve Board. This guidance centered around model risk management and was released in April 2011. The guidance is listed under OCC 2011-12 as well as SR 11-7. It defined a model and described the need for a model inventory. It also emphasized the need for documenting—including methodologies and processing components that implement the theory—and testing the model. It stated that validation must involve a degree of independence from model development. It covered model development, implementation and use, and it stated that materiality is an important consideration in model risk management. Also, notably, the guidance discussed governance, policies and controls. This included the role of senior management in establishing a strong model risk management framework. It described senior management’s role in setting internal policies and controls and defining roles and responsibilities, including for both business units and internal audit functions.

In 2013, the FHFA issued advisory bulletin AB 2013-07, titled “Model Risk Management Guidance.” The bulletin expanded upon previous guidance issued by the FHFA, replacing 2009-AB-03. It set minimum thresholds for model risk management by outlining governance requirements, included a definition of model and model risk, and discussed model risk management and control frameworks. Additionally, it covered model validation programs and the model lifecycle.

The concept of model governance regulation is not limited to the United States. Solvency II is a European Union legislative program that was implemented on Jan. 1, 2016. One of the three pillars of Solvency II set out requirements for governance and risk management of insurers. Included

in the governance requirements is model validation, which is addressed in a Lloyd’s of London document, “Model Validation Guidance.” The stated purpose was, “This document provides guidance to agents in respect of internal model validation requirements under Solvency II.”⁶ The guidance covered the components of validation, including independence, risk coverage and indicators, risk ranking and the validation cycle.

Solvency II also addressed general governance requirements. The following are included among the requirements:

- ❶ Member States shall require all insurance and reinsurance undertakings to have in place an effective system of governance [that] provides for sound and prudent management of the business.
- ❷ The system of governance shall be proportionate to the nature, scale and complexity of the operations of the insurance or reinsurance undertaking.
- ❸ Insurance and reinsurance undertakings shall have written policies in relation to at least risk management, internal control, internal audit and, where relevant, outsourcing.⁷

In the years since the financial crisis, there has been a high degree of activity on the actuarial side as well. In 2010, the IAA released a practice note titled “Note on the Use of Internal Models for Risk and Capital Management Purposes by Insurers.” The note contained a section on model governance. In this section, the topics of testing and validation, documentation and audit review were discussed.

In 2012, the North American CRO Council released an article on applying model validation principles to risk and

The Federal Reserve Board issued
SR Letter 09-01

2009

The FHFA released
advisory bulletin
2009-AB-03

The OCC and Federal Reserve
Board released OCC 2011-12
and SR 11-7, respectively

2011

The IAA released
a practice note on
the use of internal
models

The SOA published a research
report on actuarial modeling
controls

2012

North American CRO Council released
an article on applying model validation
principles to risk and capital models

The ASB released ASOPs 46 and 47

capital models. The article focused on model validation, specifically for risk and capital models. It covered key principles of model validation. These principles included the following eight points:

- Model build and design need to be consistent with intended use.
- Validation should be independent.
- There should be an owner of model validation.
- The appropriateness of the governance structure should be ensured.
- Validation should be proportional to complexity and materiality.
- Inputs, calculations and outputs should be validated.
- Limitations should be addressed.
- Validation should be documented.

There were two recent Actuarial Standards of Practice (ASOPs) released regarding enterprise risk management. ASOP 46, “Risk Evaluation in Enterprise Risk Management,” was adopted in September 2012, and ASOP 47, “Risk Treatment in Enterprise Risk Management,” was adopted in December of that same year. Per the background given in ASOP 47, “This standard, along with ASOP 46, ‘Risk Evaluation in Enterprise Risk Management,’ is intended to cover the risk evaluation and risk treatment activities within enterprise risk management work.”⁸ ASOP 46 explicitly addressed model validation, including that “the actuary should disclose whether and how the modeled future economic conditions have been reviewed and tested for reasonableness.”⁹

Then, in December 2012, the SOA published a research report called “Actuarial Modeling Controls: A Survey of

Actuarial Modeling Controls in the Context of a Model-Based Valuation Framework.” In this report, there were several key findings. Of those, of significant note was, “Governance frameworks should be set forth in order to ensure the sustainability and repeatability of the modeling process by visibly demonstrating structure and oversight.”¹⁰ Also, “Companies that have established an independent, centralized model steward function, and appropriately empowered the steward, generally have more robust and effective controls in the current state, and as such have fewer areas to improve when moving toward controls under an MBV framework.”

The report also included recommendations about key next steps to move toward leading industry practices. These include, but are not limited to, the following:

- Establish formal documentation policy for actuarial modeling processes.
- Regularly review models and the modeling process against the governance policy.
- Develop a corporate culture that values and aligns with the governance policy.

In April 2014, the Casualty Actuarial Society (CAS), CIA and SOA Joint Risk Management Section released a paper titled “Model Validation for Insurance Enterprise Risk and Capital Models.” This paper defines the types of model risk as being conceptual, implementation, input, output and reporting risk. The paper also discusses mitigating techniques for each type of risk and the risk management control cycle, including governance.

Most recently, the guidance has been focused on governance, especially as it relates to principle-based reserves

The FHFA released advisory bulletin AB 2013-07

2013

The CAS, CIA and SOA Joint Risk Management Section released a paper titled “Model Validation for Insurance Enterprise Risk and Capital Models”

2014

2015

The ASB released ASOP exposure draft on PBR

(PBR). In August 2016, the Academy issued a model governance checklist. This nonexhaustive checklist was offered as a resource for practicing life actuaries involved in actuarial model governance. As the checklist states, “Its development was prompted in response to the need for good model governance as addressed in PBR regulation; however, it will also be of value wherever actuarial modeling is performed.”¹¹ The checklist covers 10 categories, including analysis and validation, reporting and governance standards.

In November 2016, the IAA adapted International Standards of Actuarial Practice (ISAP) 1A – Governance of Models. It states several noteworthy items that the actuary should do in selecting, modifying, developing or using models.

- Be satisfied that there is an appropriate model risk management framework in place that addresses identification of model risks.
- Be satisfied that an appropriate model validation has taken place.
- Understand the context in which the model will be used, how model input will be provided, and how the actuary expects the results of the model will be used.¹²

NOW AND INTO THE FUTURE

There also has been current and pending regulatory and actuarial guidance that we can expect to be implemented over the next few years.

On the banking side, the third Basel Accord, Basel III, is currently scheduled to be implemented in 2019. This report includes a section on model validation and backtesting and requirements for ongoing and independent validation. The report states: “The Committee’s

comprehensive reform package addresses the lessons of the financial crisis. Through its reform package, the Committee also aims to improve risk management and governance as well as strengthen banks’ transparency and disclosures.”¹³

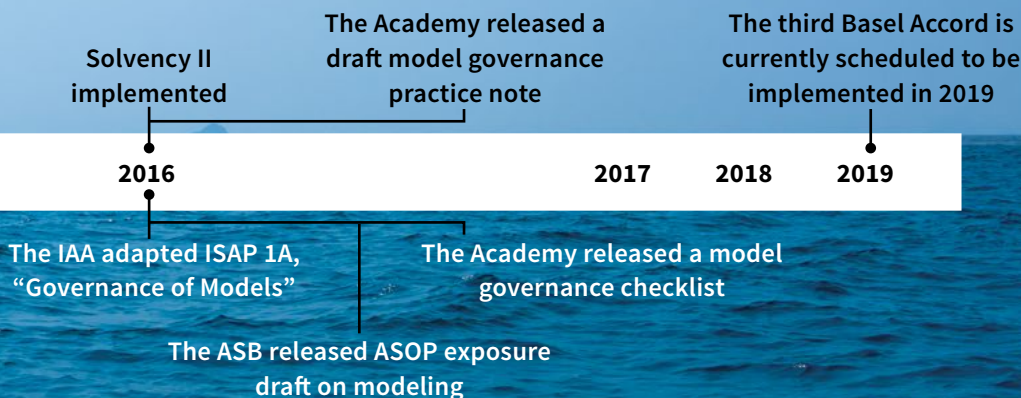
There is a pending ASOP exposure draft for PBR for life products. The draft is dated June 2015 and contains guidance on model validation, including static validation. It also indicates that the actuary should consider dynamic validations, consistency with results from other internal models and change management. And per the most recent draft, it “was revised to add references to chapter VM-G (“Corporate Governance Guidance for Principle-Based Reserves”) of the Valuation Manual to help clarify that compliance is the responsibility of the company.”¹⁴

Guidance on modeling has grown to include governance. The Actuarial Standards Board recently released a modeling ASOP exposure draft. The deadline for comments on the draft passed in October 2016. The draft ASOP includes a section on mitigation of model risk, validation, and appropriate governance and controls.

Most recently, in December 2016, the Academy released a draft model governance practice note. This note covers several areas, including model definition, development, and governance policy and standards. It also includes model process and controls, validation, documentation and PBR model governance considerations.

PUTTING IT ALL TOGETHER

One thing is clear: No matter the regulatory environment in the future, model governance has entered the actuarial profession to stay. We can point to all of the recent guidance issued by actuarial organizations as evidence of that.



Over the past few decades, several key themes important to future model governance have emerged. The following list covers common themes, but is not exhaustive:

- ① It is necessary to have a governance structure, including a formal policy, which should include defined responsibilities and audit oversight. Considerations of materiality, coverage and risk of the associated models should be included. The definition of what constitutes a model should be specified, and a model inventory created.
- ② Model validation and testing should be performed, including independent review. The validation should include verification of inputs, calculations and outputs.
- ③ Model documentation and documentation of validation should exist.
- ④ There should be ongoing validation, including that of changes. A formal model development lifecycle should be implemented.

As described in the CRO Council paper, “Model risk refers to the risk that a model is not providing accurate output, that a model is being used inappropriately, or that the implementation of a model is flawed.”¹⁵

A good model governance policy should reduce these risks and increase the confidence of model users that the model output is reliable. It should demonstrate to senior management that appropriate diligence has been applied to the development, testing and documentation of the model. It should set a standard that model developers and testers can follow consistently for future changes. And most important, if it meets these objectives, a strong model governance policy should, and will, add value to your organization. ■

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Mitchell Stephenson, FSA, MAAA, is director and actuary, actuarial model governance, at Prudential Financial in Hartford, Connecticut.

Mitchell.Stephenson@Prudential.com



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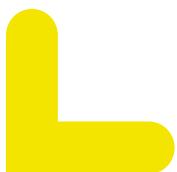
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EXTREME MEASURES

**HOW THE DESIGN OF THE FLORIDA “CAT FUND”
FAIRLY AND EFFICIENTLY PROVIDES FUNDING
FOR CATASTROPHIC HURRICANE LOSSES**

BY RADE MUSULIN AND JACK NICHOLSON



The beginning of the 2017 North Atlantic hurricane season is a good time to think about various government pools designed to address catastrophic losses from tropical cyclones. The Florida property insurance system has evolved in recent decades to become a stable public-private partnership capable of withstanding one or more strong hurricanes, as was demonstrated in 2004 and 2005. Aspects of its design illustrate the important tradeoffs that public policymakers face when enacting frameworks to deal with extreme events, such as hurricanes, floods and earthquakes, at both the state and federal levels. This article will examine one part of Florida’s hurricane financing system, the Florida Hurricane Catastrophe Fund (FHCF or “Cat Fund”).

The current reauthorization process for the National Flood Insurance Program (NFIP) provides an example of how Florida’s experience can inform public policy analysis for other programs. The NFIP faces a number of challenges similar to those in Florida, including how to depopulate a large government program through increased private sector participation, how to balance affordability for consumers buying policies with protection for taxpayers’ funding deficits, how to utilize private reinsurance in a government program, and how to interpret a mandate to implement actuarially sound rates in a government program, which can draw upon funding sources unavailable to private insurers, such as post-event bonding or similar borrowing schemes.

BACKGROUND

Florida has dramatically improved its hurricane resilience since the early 1990s by enacting tougher building codes, improving emergency management, and having stronger financial mechanisms in place to fund rebuilding. Florida has also been fortunate to have only experienced one landfalling and one bypassing hurricane (Hermine and Matthew, respectively) since 2005, both of which occurred in 2016. This allowed for a significant buildup of resources. The legislative environment has now stabilized and placed the state on a path to a financially stronger insurance system. Risk transfer products have also become more competitively priced, with contract terms and conditions resulting in an abundance of competitive options.

One critical part of Florida's hurricane loss financing system is the Cat Fund, which was enacted in a special session of the legislature in 1993 following the near meltdown of the property insurance market after Hurricane Andrew. Though less visible to consumers than its cousin, Citizens Property Insurance Corporation (Citizens), the Cat Fund is the lynchpin of the state's property insurance system, a statutorily mandated program that provides a type of low-cost coverage similar to private reinsurance to all companies (including Citizens) writing residential property insurance in the state.

If you have a residential property insurance policy in Florida, the Cat Fund is designed to provide a significant part of the funding to pay claims after a hurricane. Also, and less well understood, if you have almost any kind of property and casualty insurance (such as an automobile policy), you may be subject to paying assessments (surcharges) for decades after an event to retire bonds issued by the State Board of Administration Finance Corporation (a single-purpose public benefits corporation) on behalf of the Cat Fund to pay hurricane claims. Thus, the Cat Fund can affect almost every Floridian, whether or not the person experiences a hurricane loss.

The ability to draw upon assessments from a broad base of policyholders is one of the primary reasons for the low price charged to insurers for Cat Fund coverage, and it was also an essential factor in achieving federal tax-exempt status. The U.S. Internal Revenue Service recognizes the Cat Fund as an instrumentality of the state that serves a major purpose of not only providing resources for the payment of claims to rebuild after a catastrophic hurricane, but also serving to stabilize the economy by managing hurricane risk for the state of Florida under the executive leadership of its top elected officials—the governor, the chief financial officer and the attorney general.

In government and academic circles worldwide, the Cat Fund is often cited as an example of a sound public-private partnership created to tackle the very complicated problem of funding extreme event losses in a fair and efficient manner over time. While the details of its structure are complex and beyond the scope of this article, the following summary illustrates some of the important public policy choices its creators made.

In simple terms, it is a statutorily-created “reinsurance type” facility, providing for reimbursement to insurance companies for catastrophic hurricane losses. Insurers pay the Cat Fund a premium for this coverage, which becomes part of the cost of covered policies insurers sell to consumers. The Cat Fund is a nonprofit state facility exempt from federal income taxes and is able to pay its claims through tax-exempt bonds issued on its behalf by a special purpose finance corporation if its cash resources are insufficient. As such, it generally can offer prices far lower than private reinsurance alternatives, which results in reducing residential property insurance rates for Florida consumers.

It is important to note that this benefit is not “free”—those lower rates are made possible by exposing almost all Floridians to the risk of significant assessments in the future. This is an important (and sometimes controversial) aspect of many government insurance programs, which can spread losses across both space and time. Private sector (re)insurers must hold capital or reinsurance before policies are issued, limiting their ability to diversify risk to spreading losses across space (e.g., using the reinsurance system to diversify risk globally). Government entities, due to their ability to hold “negative capital” in the form of bonds secured by their ability to compel payment of assessments in the future, can also spread losses across time. This can allow government entities to reduce price volatility and lower upfront costs.

EFFICIENT AND FAIR BY DESIGN

Since the FHCF serves to lower premiums for high-risk policies by providing a partial subsidy from nonproperty sources and defers part of the cost to the future, it may dampen incentives for risk mitigation. The Cat Fund's unique design results in a number of efficiencies that result in cost savings, including:

- Not needing to charge a cost of capital—it benefits from its ability to assess or “tax” a broad base of policyholders
- Having no underwriting cost since it is a mandatory program
- Having no brokerage commissions

- It writes only one product (a reimbursement contract) where coverage is standardized with a clearly defined retention and limit of coverage for each participating insurer based on its residential property exposure in Florida.

In periods of benign hurricane activity (like the most recent decade), the Cat Fund accumulates funds and invests them, building capacity to pay claims when a storm hits. If its claims exceed assets, it can issue bonds, which are paid off by assessments on a wide range of policies written in Florida over many years. It can buy reinsurance or use capital market products to finance claims, a topic that is sometimes controversial because it shifts who pays for storms among various groups (such as today's policyholders versus future ones).

The Cat Fund's success over many years reflects some important aspects of its design, specifically:

- It was carefully designed and has a very technical statutory framework that has evolved over time. Generally, changes are made after thorough study.
- It achieved federal tax-exempt status to build cash balances more quickly, saving Florida's consumers billions of dollars.
- It had strong governance by being part of the State Board of Administration, and it follows a transparent rulemaking process "in the sunshine" to implement legislative directives with input from various stakeholders.
- It used a sophisticated premium formula reflecting hurricane risk.
- It set the retention and limit for insurers as a multiple of Cat Fund premium, creating incentives to write in riskier areas.
- It provides coverage subject to clear limits, retaining an important role for private reinsurance and limiting assessment exposure.
- Its design aligns private insurer incentives with public policy goals.

One aspect of its design is critically important. How should the Cat Fund's limited resources be apportioned between today's claims and those in future years? This question drives critical public policy choices that directly affect consumers. It also illustrates how program design, either explicitly or implicitly, can affect various stakeholders. This is an important insight about how government programs generally affect different groups in society.

For example, assume the Cat Fund has \$35 billion of capacity from accumulated premiums, investment income, and potential bonding. It could offer the full \$35 billion as

coverage in the current year. Since the Cat Fund's cost to insurers is far lower than alternatives like private reinsurance, this would lower consumer rates by a significant amount. Unfortunately, doing so exposes those consumers to a "triple whammy" when a storm hits.

First, private reinsurance costs almost always increase after large events. But because the Cat Fund used all of its capacity in the current event, its coverage level for the next year would drop considerably, to perhaps \$2 billion. This leads to the second "whammy," as insurers would then need to buy a large quantity of additional private reinsurance at precisely the worst time, driving up rates even more. Finally, the Cat Fund would begin imposing assessments in the following year, further increasing cost to consumers.

This scenario leads to low premiums in the current year and a rate explosion in following years, threatening a replay of the market turmoil following Hurricane Andrew. It should be remembered that the major problems after Andrew were rate increases and nonrenewals in subsequent years, not paying the claims due to the storm.

What could be done to avoid this problem? To take an opposite extreme, assume the Cat Fund offered no coverage for the current year, saving all of its capacity for the year after a storm hits. This would drive up premiums in the current year, as inexpensive Cat Fund coverage would need to be replaced by more expensive private coverage, but then would significantly reduce or eliminate rate increases in the years after a storm hits when inexpensive Cat Fund coverage could flood the market and replace more expensive private reinsurance. This would also eliminate consumer assessments in the year after a storm hits and beyond.

How should public policymakers choose between these options? Before outlining how the Cat Fund addresses this dilemma, a comment about which consumers are affected most by these scenarios is important. If losses are funded by rates based solely on the policies offering hurricane coverage, consumers will pay according to their risk. If bonds and assessments fund the losses, consumers will pay regardless of their risk (as the assessments are across policies like auto, business, etc.). Thus, one would expect consumers in Miami-Dade to prefer that the Cat Fund charge low rates with potentially high assessments, and consumers in North Florida to want aggressive rates and potentially low assessments. This dynamic also applies to how much consumers pay today versus how much debt is left to future generations. Finally, the mix of rate and assessment affects economic incentives for mitigation and construction in high-risk places.

“ This benefit is not ‘free’—lower rates are made possible by exposing almost all Floridians to the risk of significant assessments in the future.”

Florida’s public policymakers have adopted a balanced approach to addressing this conundrum. The statute caps the amount available for the current season and provides a mechanism to fund subsequent seasons. In 2016, there was approximately \$17 billion of coverage available, with a potential \$17 billion limit available for subsequent seasons depending on the size of an initial season hurricane event (e.g., the Cat Fund’s maximum ability to fund a subsequent season was estimated to be \$11.3 billion assuming a full loss in 2016, according to its May 2016 claims paying capacity estimates). This provided significant rate relief in 2016, minimized assessment risk from a first event (most of the \$17 billion can be funded from accumulated premium and investment income), and provided a potential for reinstating a significant part or all of the coverage in 2017. While not eliminating post-event rate increases, this approach will significantly reduce them, versus a case where the entire resources of the FHCF were used in 2016.

Subsequent season coverage is an example of a tradeoff of somewhat higher consumer premiums in the short run in exchange for market stability in the long run. The same considerations apply if the Cat Fund buys private reinsurance to spread risk across the global financial system. Current private reinsurance rates are quite low by historical standards, and if the Cat Fund takes, say, \$60 million and buys \$1 billion of private reinsurance, it lowers its cash by \$60 million but reduces assessment exposure by \$1 billion. Of course, if there is no covered hurricane loss during the period, the \$60 million is “lost,” but that is the nature of risk transfer. As with subsequent seasons, buying private reinsurance will tend to increase cost for current high-risk policyholders in exchange for protecting low-risk policyholders from future assessments.

WHAT LIES AHEAD

As we look to the future, remember that the Cat Fund is designed to handle relatively infrequent events; the recent lack of storms should not lull Florida to sleep. The state could easily experience a repeat of the 2004–2005 experience in coming years.

Public officials entrusted with managing the Cat Fund face choices about who pays for hurricanes and when.

Do we want the lowest possible consumer rates now, without regard to post-event disruption or incentives to mitigate? Do we want long-term market stability, including limiting post-event rate shocks for consumers? Do we want to reduce assessment exposure to the lowest level possible? Florida cannot have the lowest possible short-term rates, market stability, and minimized assessments all at once; choices need to be made.

To date, the Cat Fund has struck a balance between these policy options. It has helped stabilize the residential property insurance market from its inception and funded all of its obligations after the losses in 2004–2005. Its currently strong financial position makes it financially sustainable if it continues the course it has taken to date.

Similar choices face most government catastrophe programs, such as the Federal National Flood Insurance Program and the Federal Terrorism Risk Insurance Program. When governments form such catastrophe programs, it is important for public policymakers to understand how various groups are affected (and when). Only then can the government program be properly evaluated as to its fairness and economic efficiency. The Florida Cat Fund provides a useful example to illustrate how choices made in program design can be studied. ■

Rade Musulin, ACAS, MAAA, is vice president–Casualty, at the American Academy of Actuaries, and CEO of FBAlliance Insurance. He was deeply involved with the creation of the Cat Fund and served on its Advisory Council from 1994–2002. He has written extensively on issues involving the funding of large disasters and recently led the working group that produced the Academy’s monograph on the National Flood Insurance Program.

rmusulin@sprynet.com

Jack Nicholson, Ph.D., CLU, CPCU, was the chief operating officer of the Florida Hurricane Catastrophe Fund from 1994 until early 2016. In that capacity, he worked on all aspects of FHCF operations and advised public policymakers on strategic options. He is now an independent consultant in Tallahassee, Florida.

jacknicholson@comcast.net



Q&A

THINKING BIGGER

Q&A WITH CONSULTING ACTUARY DOROTHY ANDREWS

Q: Why did you become an actuary? What attracted you to actuarial science?

A: I learned of the actuarial profession while I was doing graduate work in mathematical statistics at Boston University. After doing some research, I felt the actuarial profession would allow me to apply my statistical background to solve real-world problems. In my first position in pursuit of an actuarial career, I applied my knowledge of statistics to build a capital asset pricing model (CAP-M) that could be applied to mutual insurance companies. This was a very challenging theoretical exercise because mutual companies don't have an observable measure of risk that is equivalent to Beta observable for publicly traded insurance companies. The model I built suffered some shortcomings and was eventually scrapped, but the project convinced me that I wanted a career as an actuary.

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Dorothy L. Andrews, ASA, MAAA, is consulting actuary at Merlinos & Associates Inc. in Peachtree Corners, Georgia.

dandrews@merlinosinc.com



Q: What prompted you to choose a nontraditional career path?

A: During my tenure at John Hancock Mutual Life Insurance Company, I was always attracted to projects requiring statistical and data analytics skills. I enjoyed working with information technology (IT) professionals to help them interpret the actuarial content of actuarial projects so they could correctly program actuarial solutions. During this time, I learned a lot about IT architectures and protocols. I found a common language with IT professionals, and I learned to appreciate them for their talents as much as they appreciated my ability to translate actuarial project requirements into terms they could understand.

Q: Would you provide some work history and how it segued into your interest in predictive analytics?

A: At one point I held a position as Statistician and Branch Chief of Field Operations with the United States Department of Agriculture (USDA). It involved very little insurance work, but it was very fulfilling to be a part of the team building the predictive analytics engine for the USDA's new Public Health Information System (PHIS). The PHIS is the food safety inspection system for the United States and is responsible for detecting the presence of residues and pathogens in the nation's food supply to prevent foodborne illness outbreaks. Working on the PHIS was one of the most satisfying positions I have ever held. Before the PHIS, there was a significant lag in the reporting of violations at slaughterhouses and food processing establishments and in the notifying of appropriate agency personnel of anomalous lab findings resulting from statistical sampling. My group developed statistical sampling techniques to determine the amount and frequency of laboratory testing necessary to identify threats to food safety. Reporting and data surveillance are now done on a near real-time basis to detect anomalies in collected data and lab testing results. When anomalies are detected, alerts are sent immediately to the appropriate agency department within the USDA, triggering corrective actions.

My interest in predictive analytics grew stronger after my stint at the USDA. I went on to lead a team of predictive analysts at a Property & Casualty (P&C) insurer. Despite a lack of prior experience with P&C insurance, I was hired to lead a small group of predictive analysts to rebuild the company's predictive models. There are natural synergies among the predictive modeling, underwriting and actuarial

pricing areas of a company, and each has a vital role to play in building predictive models. The models I was hired to replace were not built using an interdisciplinary approach and suffered from a number of shortcomings. As a result, they were not trusted by key areas of the organization. The new models were trusted and understood by key areas of the company, because it was a company effort to develop, vet and test them.

Q: With regard to predictive analytics, what skills positioned you for work in this area?

A: Without question, you need strong theoretical statistics skills. A modeler needs to be able to distinguish between statistical noise and true statistical signal in underlying data. Speaking of data, a modeler needs strong data modeling skills, which requires an ability to understand when statistical results fail to replicate significant business relationships.

Being able to work with an interdisciplinary team of professionals also is a must, and this requires strong communication, interpersonal and interviewing skills. It is often the case that people do not know how what they know is helpful to others. Modelers with little background knowledge of a business can use developmental questioning techniques to determine whether important business relationships are patterned in modeling data and research causes when those patterns are not present. The requisite communication style needs to give people a sense of inclusion in building predictive models in order to maximize the utility of the business experience of other team members. In summary, to work in this area, a modeler needs strong statistical, data mining and modeling skills, developmental questioning skills and an inclusive communication style—because models don't build themselves, people do!

Q: What skills do actuaries bring to predictive analytics that other professionals may not?

A: Actuaries are uniquely qualified to model complicated insurance concepts. They possess the requisite mathematical skills to build models that simulate insurance processes and reactions to economic conditions. The profession is moving toward measuring and assessing policyholder behaviors that adversely impact the quality of acquired business. Policyholder behavior is becoming more important for assumption-setting in life insurance and annuity lines of business. Actuaries have a lot to gain by observing the work of underwriters and agents in closing insurance sales. The sales process is a behavioral exercise that requires

“To work in this area, a modeler needs strong statistical, data mining and modeling skills, developmental questioning skills and an inclusive communication style—because models don’t build themselves, people do!”

being able to identify what motivates individuals to buy an insurance product. Actuaries can become more “streetwise” by observing how insurance transactions are executed. The behaviors of both parties to the transaction, including those of agents, will help explain a number of the patterns in insurance data.

Insurers are applying principles from behaviorism to influence the transacting of insurance contracts. At a predictive analytics conference I attended last year, a life company discussed how it used behavioral concepts like social norming and choice architecture techniques in the design of its website. These techniques can nudge honest responses to underwriting questions and steer customers to products that best suit their needs. Health care exchanges have been using choice architecture principles since the adoption of the Affordable Care Act. The labeling of health plans as gold, silver or bronze has been shown to influence a consumer’s choice of a health plan. Consumers will often select a gold plan, because gold is perceived as more valuable than bronze, despite the fact that the gold plan may not align well with their needs or financial resources. Actuaries are going to need to become more astute in the application of behavioral principles in predictive modeling as well.

Q: What opportunities do you see in the life sector for predictive analytics?

A: P&C actuaries can leverage predictive modeling in underwriting, marketing, assumption-setting and financial modeling for their companies. Insurance scoring models build upon credit models developed by credit rating agencies like TransUnion, Experian, Equifax and Dun & Bradstreet for modeling in commercial and personal lines of insurance. While these agencies possess an abundance of credit transaction data and the skills to model it, they often lack familiarity with insurance data and regulatory issues necessary to build and gain regulatory approval for insurance scoring models. Insurance scores can inform the underwriting process, assist with tailoring marketing programs and increase the power of financial models.

I think underwriting in the life sector is going to move toward predictive models that couple lifestyle attribute data to medical underwriting data to assess the extent to which a potential insured makes healthy lifestyle choices. Some life companies are already collecting data on policyholders through wearable devices and rewarding their healthy behaviors with premium discounts, gift cards, travel rewards and much more to incentivize them to engage in behaviors that improve their state of health.

Technology-driven insurance products have been successful in luring younger generations to buy life insurance products. The industry desperately needs to appeal to younger generations for future revenue streams. This generation likes quick and easy app-driven solutions. An example of a company taking advantage of mobile app technology is Lemonade Insurance, considered by some to be the first U.S.-based “peer-to-peer” (P2P) P&C insurance company. The P2P model is characterized by, among other features, a digitization of the insurance process, quickly issuing policies and paying claims, low cost for coverage and the return of some portion of the premiums through a “giveback feature.” The life industry may be a ways off from the P2P model, but life insurers are definitely moving toward digitization to respond to consumer preferences.

Q: How is working in predictive analytics different from a more traditional actuarial position?

A: I am not confined to building predictive models for life insurance. My skills are transferrable to building predictive models in health and P&C insurance, banking, government and any other industry needing data-driven solutions to business problems. As a consultant, I most recently worked on a predictive analytics project for a medical supply company. There were anomalous patterns in its data that were leading management to poor decision-making regarding its sales force. I was able to distinguish “fake” patterns from “real” patterns and advise the company on the treatment of both in its decision-making and recommend IT architecture changes to improve the quality of its current and future data.

Q: How do you see the role of predictive analytics changing in the next five to 10 years? Where will actuaries fit into the equation?

A: It is already changing, and big data analytics is leading the way. Big data analytics is simply data reduction techniques consisting of descriptive analytics, predictive analytics and prescriptive analytics. It is not enough to classify and score risks using descriptive and predictive analytics; the field is moving in the direction of developing prescriptive analytics that iteratively improve predictive models in near real-time and indicate corrective actions to mitigate risks. A major goal of this effort is to turn unprofitable customers profitable and identify consumers likely to select against the insurer.

Other industries are already building prescriptive models. The insurance industry is not too far behind, but it is definitely in catch-up mode, in my opinion. It is important to follow what data scientists are doing in other fields to inform on the developmental efforts in the insurance industry. If the current activity to build data science shops by companies like MetLife and New York Life is any indication, predictive analytics is fast becoming integral to decision-making by senior management. Many may soon wonder how on earth the insurance industry ever lived without big data analytics.

Q: What advice do you have for people who may be interested in positions in predictive analytics?

A: Learn the business for which you want to build predictive models. It is really important to understand how the business is transacted from the point of sale and related distribution channels to how the business is coded in company systems. Understand who the “hunters” are and how they transact business, and who the “gatherers” are in the company and the controls that govern the work they perform. Learning these roles is vital to understanding company data and how it got that way. The hunters in an organization acquire the business, while the gatherers prepare and process data related to the business. The modelers are the scavengers who pick through the data and prepare it for consumption by decision-makers responsible for ensuring the future profitability and stability of the company.

Q: What are some of your best professional experiences/memories as an actuary that may inspire others to explore different actuarial paths?

A: Working for the USDA ranks high on my list of experiences actuaries should consider when exploring different industries where their skill sets are highly valued. Also, working in Washington, D.C., is pretty exciting if the political machine on Capitol Hill fascinates you. There is always a protest in D.C. in which you can take part. Seriously, though, I took pride in helping build a predictive analytics engine to monitor and protect the nation’s food supply from the invasion of threats from residues and pathogens. Banking also offers some exciting challenges for actuaries, and actuarial skills are highly respected by banking professionals. You will be surrounded by a lot of mathematical talent, and you will fit right in.

I encourage actuaries to teach actuarial classes for universities or local actuarial clubs. I taught in the actuarial science program at Boston University for seven years and won the outstanding teaching award in 2002. Boston University likes hiring working actuaries as adjunct professors because of all the actuarial work experience they can impart to students. Actuaries who teach, on the other hand, benefit by learning how to explain complicated actuarial concepts in simple terms. If successful, those acquired skills will transfer in communicating your ideas and the results of your work to senior management. When you communicate actuarial results in crystal-clear terms to senior management (many of whom will not be actuaries), you empower them to make better decisions and you become a trusted adviser, someone they call on again and again for their analytical needs. It is important to always meet people where they are in explaining technical actuarial results.

Q: What is your dream job?

A: I am living my dream right now. At Merlinos & Associates, I get to do regulatory work to help protect consumers and develop actuarial models for traditional insurance products. I also build predictive models for life, health and P&C insurance, and other industries like banking, credit rating agencies and other companies needing data-driven solutions. I get invited to speak and write papers on the subject of predictive analytics. I serve on the Predictive Analytics and Futurism section of the Society of Actuaries (SOA) and will be organizing the involvement of the section to present on predictive analytics at this year’s Valuation Actuary Symposium. The predictive analytics mini-track I organized last year was strongly attended, and the expectation is that this year’s mini-track, which will focus on incorporating behaviorism in predictive analytics modeling, will draw even more participation. Make sure you attend! ■

Looking to be a leader in your workplace or in your profession? Here are some resources that can help you in that quest.



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This meeting application allows you to access important features of the event, including session information, speakers, presentations and more, right from your mobile device (e.g., Android, iPhone and iPad).

bit.ly/SOAEventApp



2016 SOA ANNUAL REPORT

The 2016 Society of Actuaries (SOA) Annual Report recaps major activities and milestones that support the SOA's strategic plan and mission. 2015–2016 SOA President Craig W. Reynolds, FSA, MAAA, discusses the year's efforts to advance the actuarial profession. The 2016 Annual Report also looks back at the major developments with education, research and the overall organization.

bit.ly/SOA2016Report



SOA PODCASTS: DECISIONS, DECISIONS

Section-sponsored podcasts go where you go. Listen to unique content and learn about topics outside of your specialty area. Check out these recent additions.

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Listen in as Anders Larson, FSA, MAAA, interviews Shea Parkes, FSA, MAAA, about Kaggle. Kaggle is an online community that brings together data scientists from across the globe to participate in predictive modeling contests. (Sponsored by the Predictive Analytics and Futurism Section)

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MACRA: Medicare Supplement in 2010 and Beyond

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Underscoring the importance of collaboration among actuarial, financial and legal departments is the focus of this podcast. (Sponsored by the Taxation Section)

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A NEW AND DIFFERENT PATHWAY

EXPLORING THE CERTIFIED ACTUARIAL ANALYST (CAA) QUALIFICATION

BY KEN GUTHRIE



The certified actuarial analyst (CAA) qualification is offered by a recently formed joint venture entity, CAA Global. The Institute and Faculty of Actuaries (IFoA) and the Society of Actuaries (SOA) joined forces to form CAA Global to offer this international qualification to individuals who have excellent technical and analytical expertise that they can leverage in analyst roles in the insurance and financial services industries.

The qualification equips individuals with financial, business, analytical and modeling skills, allowing candidates to differentiate themselves in the market while allowing employers to identify candidates who are best suited for these roles. The CAA qualification will help assure employers and the public of the quality of the work performed in support of insurance and financial services products.

ONGOING AFFILIATION FOR QUALIFIED INDIVIDUALS

With the addition of this qualification, there is now an opportunity for individuals to receive important training and ongoing professional development, and network with other CAAs. Once they complete the pathway, CAAs can choose among accredited organizations with which to affiliate—those that are accredited by CAA Global. The first accredited organizations are the IFoA and the

newly created SOA subsidiary, the SOA Center for Certified Actuarial Analysts. These organizations will offer the professionalism structure that maintains the value of the qualification for CAAs by holding affiliates up to high standards of conduct and practice. They also will provide access to networking, events, resources, continuing educational opportunities and more. In time, other actuarial associations will be able to apply to CAA Global to become accredited organizations to accept CAAs as members. CAAs can then choose those affiliations as well.

THE CAA PATHWAY

The CAA pathway to qualification has seven components. With the exception of Module 0, they should look familiar to actuaries, as the learning objectives span the breadth of subjects that actuarial practice comprises. Module 0 is a unique feature that allows candidates to verify at the outset if they have the ability to complete the subsequent requirements. It covers basic mathematics and statistics, with no reference to actuarial practice. It must be passed prior to attempting later modules.

The five modules that follow cover the fundamental areas in which actuaries work, but at an introductory level relative to the exams required for the ASA designation. Following is a description of the modules and how they



relate to the corresponding parts of the ASA pathway. The exam questions focus more on recollection and basic calculations rather than solving complex problems.

Module 1: Finance and Financial Mathematics

The time value of money, annuities, bonds and loans is covered. While the topics are similar to the SOA's Exam FM, only the most basic versions are included. For example, there is no coverage of increasing or decreasing payments, or of duration, convexity and immunization.

Module 2: Statistics and Models

While many of the same statistical methods are covered as in current Exam P and will be covered in the Mathematical Statistics VEE requirement beginning in 2018, there is less theory.

Module 3: Long-Term Actuarial Mathematics

This module covers life contingencies, including the basics of pricing and reserving for life insurance, annuities and retirement benefits.

Module 4: Short-Term Actuarial Mathematics

This module includes the basics for nonlife insurance products, such as health, property and liability.

Model 5: Models and Audit Trails

This module covers good practice in building and documenting models, particularly in a spreadsheet environment. The ASA pathway covers these topics in the Fundamentals of Actuarial Practice modules.

Online Professional Awareness Test (OPAT)

This component ensures that those who hold the CAA credential understand the professional requirements. As with the Associateship Professionalism Course, there is a Code of Conduct component to this test, and for OPAT, it is the CAA Global Code of Conduct. However, rather than using an in-person seminar, the CAA pathway does this through an online tutorial and assessment.

THE CAA DIFFERENCE

It is important to emphasize that the pathway for the CAA is entirely separate from the pathway to become a credentialed actuary. When comparing the CAA pathway to the incoming ASA requirements (effective 2018), there are some key elements of the ASA qualification that are not included. They are accounting, corporate finance, investments, predictive analytics, standards of practice and further exposure to more complex actuarial problems through case studies.

Given the separate pathway, requirements and expectations, it should be understood that individuals earning the CAA qualification are not expected to function at the same level as fully qualified actuaries. They are analysts expected to function in actuarial support roles. In fact, CAAs who wish to pursue an associateship must separately fulfill all requirements of an ASA.

CAAs who choose to affiliate with the SOA Center do not become members of the SOA. The SOA Center has a separate code of conduct appropriate for analysts and their professional roles.

ENHANCING SUPPORT FOR ACTUARIES

“We are hopeful that SOA members will see the significant benefits of the qualification and encourage their employees working with actuaries in support roles to pursue the CAA qualification,” says SOA President Jerry Brown, FSA, MAAA.

Working with our partner, the IFoA, the SOA’s involvement in CAA Global and offering the CAA helps fulfill our common objectives to advance—in the public interest—all matters relevant to actuarial science and to promote the actuarial profession. ■

Ken Guthrie is managing director, Education, at the Society of Actuaries.

kguthrie@soa.org

RELATED LINKS

CAA Global Qualification
caa-global.org

SOA Center for Certified Actuarial Analysts
SOAcenter.org

FIND OUT MORE

For more information, visit caa-global.org. You can send email inquiries to enquiries@caa-global.org, or call one of the following numbers:
U.K.: 44 (0) 1865 268 266
U.S.: 1-844-839-1679 (toll-free)
U.S.: 1-847-273-8890

EXAM EXEMPTIONS

If you have previously taken and passed Institute and Faculty of Actuaries (IFoA) or Society of Actuaries (SOA) exams, you may qualify for exemptions on the CAA pathway. Individuals with SOA and IFoA exam credits will be exempt from the CAA modules listed below, provided the credits were earned by June 30, 2018.

CAA MODULE	SOA EXAMINATION CREDIT	IFOA EXAMINATION CREDIT
Module 0	Any one SOA exam	Any one of CT1, CT3, CT4, CT5 or CT6
Module 1	Financial Mathematics (FM) Exam	Financial Mathematics (CT1)
Module 2	Probability (P) Exam and Construction & Evaluation of Actuarial Models (C) Exam	Probability and Mathematical Statistics (CT3) and Models (CT4)
Module 3	Models for Life Contingencies (MLC) Exam	Contingencies (CT5)
Module 4	Construction & Evaluation of Actuarial Models (C) Exam and Fundamentals of Actuarial Practice (FAP)	Statistical Methods (CT6)
Module 5	Fundamentals of Actuarial Practice (FAP)	Model Documentation Analysis and Reporting (CA2)
OPAT	Associateship Professionalism Course (APC)	Online Professional Awareness Test (OPAT)

THE CAA EXAM PROCESS

Module 0: Entry Test
(candidate must pass this before taking any further modules)

**Module 1:
Finance and
Financial Mathematics**

**Module 2:
Statistics and
Models**

**Module 3:
Long-Term Actuarial
Mathematics**

**Module 4:
Short-Term Actuarial
Mathematics**

When these modules have been passed, the candidate must then pass:

Module 5: Models and Audit Trails

Within one year, take the Online Professionalism Awareness Test (OPAT)

Show evidence of one year of relevant work-based skills



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UNDERSTANDING HEALTH CARE FINANCES

BY R. DALE HALL

Health care in the United States has become a hot topic in recent months as various plans to modify the existing law have been proposed and debated. If you've been following the news, you've seen an ongoing volume of stories about the Affordable Care Act (ACA) usage, costs and funding, plus the possible replacements to the ACA. As both a member and staff of the Society of Actuaries (SOA), I want to highlight some of the recent SOA health care research

resources we've been producing to shed more light on this important topic.

Leading up to the current discussions, the SOA released, in October 2016, a research paper on the accuracy of claims-based risk scoring models. Since the passage and implementation of the ACA, risk scoring models have taken on an important role with health care financing. This research examines the predictive abilities of more than 40 risk scoring models, looking at how closely the models are

able to estimate actual health care expenditures for individuals and groups of individuals.

Earlier this year, the SOA and its Health Section Research Committee released a research report on Medicaid managed care organizations (MCOs). The report focuses on the calculations of margin in rate setting and the practical issues involving MCOs. The report findings highlight the future role of MCOs and how Medicaid programs may evolve. This includes considering how the margin will support changes in cost, capital, taxes and more. While the report focuses on MCOs, many of the same ideas on the considerations of margins arise when looking at individual, small group and large group health markets.

Another report provided a comparative case study on risk adjustments for Texas Medicaid. This study focuses on the need for regular updates of pharmacy-based risk factor mappings using the National Drug Code. Health risk adjustment models are an important component of premium revenue for many types of health plans.

Additional health research includes updates to the Thomas E. Getzen model. Developed in conjunction with the SOA Pension Section and Health Section Research teams, it serves as a resource model for the projection of long-term health care cost trends.

At the 2017 SOA Health Meeting in Hollywood, Florida, we feature several concurrent sessions with actuarial research. For example, we have sessions on the long-term disability experience study, and a session on practical health research projects sponsored by the SOA Health Section's Research Committee, plus a multidisciplinary panel of experts discussing the impact of antibiotic-resistant bacteria on the health care industry. We've also included a session on long-term care (LTC) insurance consumer attitudes and financing, based on sponsored research from the SOA's Research Expanding Boundaries (REX) Funding Pool.

Stay tuned for more updates, and don't forget to visit SOA.org for more updates on SOA research. ■

ONLINE!

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latest updates on new
research opportunities,
data requests, experience
studies and completed
research projects.

action

GOOD RESEARCH READS

PREDICTIVE MODELS ON CONVERSION STUDIES

The SOA Reinsurance Section, Product Development Section and the Committee on Life Insurance Research sponsored a report on the third phase of results of a multiphase study on term conversions. This report explores conversion rates and post-conversion experience using predictive analytics.

bit.ly/PM-Conversion

HIDDEN MARKOV MODEL FOR PORTFOLIO MANAGEMENT WITH MORTGAGE-BACKED SECURITIES

Sponsored by the SOA Committee on Finance Research, this new research report provides a primer on the mechanics and uses of the Hidden Markov Model (HMM) for actuarial and financial applications. The report also includes development of a new application for the HMM to mortgage-backed securities exchange-traded funds.

bit.ly/SOA-HMM

MEDICAID MANAGED CARE ORGANIZATIONS

A new research report from the SOA Health Section Research Committee describes the components of margin for calculating capitation rates in a Medicaid context, along with a description of practical issues that may be encountered by managed care organizations (MCOs). The report includes observations from interviews with MCO executives as well as financial results analysis of MCOs nationwide.

bit.ly/Medicaid-Margins

RELATED LINK

Health Research Topics

bit.ly/SOA-HealthResearch

R. Dale Hall, FSA, CERA, MAAA, is managing director of Research at the Society of Actuaries.

dhall@soa.org

TAKE CHARGE

Continue the cycle of continuous improvement and identify new experiences to pursue. Attend a meeting or seminar. Tune in to a podcast. Take an e-course. These are great ways to take charge of professional development and can help you:

- 1 | Develop leadership skills.
- 2 | Stay up-to-date with current business trends.
- 3 | Expand your network base.
- 4 | Make meaningful contributions to your company, your team and the profession.

MEETINGS

Underwriting Issues and Innovation Seminar

July 30–Aug. 1, Chicago

Join colleagues for this highly regarded seminar that provides the latest information on underwriting topics. Presentations will cover insurance technology innovators, pricing accelerated underwriting programs, the latest risk assessment products and methodologies, some of the latest medical advances, and some surprises to celebrate the seminar's fifth anniversary. Register now.

SOA.org/2017UnderwritingSeminar

SOA 2017 Annual Meeting & Exhibit

Oct. 15–18, Boston

Save the date! Details on speakers, sessions and activities will soon be coming your way. Check back often for more information and to register for this annual event.

SOA.org/AnnualMeeting

E-COURSE

Decision-Making and Communication

Delve into the many facets of personal and decision-making skills. This e-course is specific enough to provide you with solid guidance, yet general enough to be applicable in a variety of situations. Learn more.

bit.ly/SOA-Decision-Making



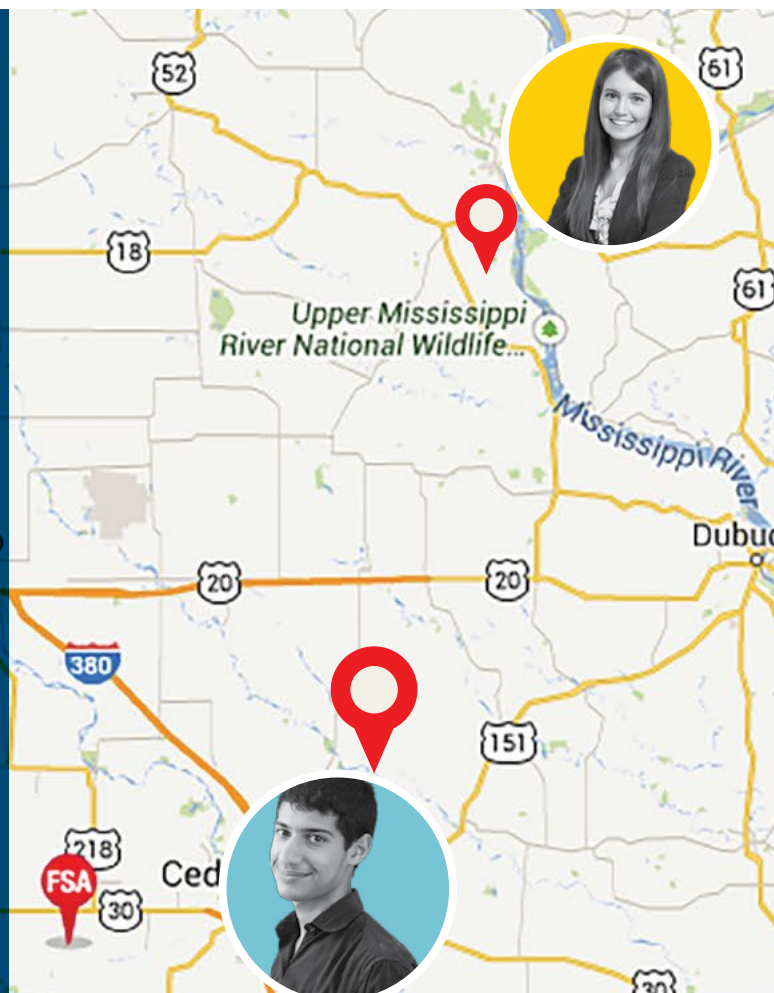
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