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The 2021 CAS Volunteer Awardees: In Their Own Words

Actuarial Evolution: Climate Risk is Our Next Frontier

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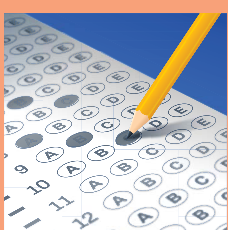
March-April 2022

departments



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on the cover

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editor's NOTE By ELIZABETH A. SMITH, *AR* MANAGING EDITOR

Timely Subjects

Rating factors seem to be on insurers' minds — and rightly so. In our cover story, Annmarie Geddes Baribeau explores how fairness comes into play regarding predictive insurance rating factors. Because of their profound understanding, actuaries have the authority to speak on the subject as they attempt to maintain a balance between insurers and policyholders.

Last February the U.S. National Oceanic and Atmospheric Administration (NOAA) issued a report predicting that sea levels along the coast of the U.S. will rise a foot or more by the year 2050. Rade Musulin, who is no stranger to sea level rise, was in the midst of writing our feature story, "Actuarial Evolution: Climate Risk is Our Next Frontier," when the report dropped. Musulin contends that actuaries have the pertinent skills that can be repurposed to aid companies with decarbonization and sustainability practices for Earth. Actuaries will also need to develop new skills for this new frontier.

Volunteers are the lifeblood of an organization. In this issue, those members who have received the CAS's highest honors tell their stories of dedication and contributions to the Society. Their work has enriched the CAS and the award winners themselves.

I hope you enjoy this issue.

Corrections

The November-December 2021 and the January-February 2022 issues of *Actuarial Review* contain errors of photo misidentification.

In the November-December *AR* story, "2021 CAS Trust Scholarship Recipients Announced," Joshua Gordon is misidentified as Reiner Atstathi. Gordon is the recipient of a $5,000 scholarship from the CAS Trust.

In the January-February photo spread of the 2021 Annual Meeting, Jacob Galecki is misidentified as Jacob Kuhn. Galecki is the founder of Galecki Search Associates.

Actuarial Review regrets these errors.

Joshua Gordon

Jacob Galecki

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Follow the CAS

May 15–18, 2022

Disney's Coronado Springs Resort

Orlando, FL

SPRING MEETING

Be An Actuary Month: A Shining Example of Staff, Volunteer and Partner Collaboration

How do people learn what it takes to become an actuary? How do they even know what actuaries are and do?

The CAS has focused on these important questions for years and has developed extensive university engagement programs as well as effective methods of reaching high school students through the Be An Actuary website.

This February, I'm proud to say that the CAS went above and beyond in targeting students who wouldn't normally learn about the actuarial career through our first-ever Be An Actuary Month.

How did we do it?

Be An Actuary Month was a joint venture with the Society of Actuaries and also involved The Actuarial Foundation. (The CAS and SOA also manage the joint website beanactuary.org.) The month of February was selected because we knew the message would be amplified through the activities of Insurance Careers Month, an industry-wide campaign launched in 2016, taking place concurrently. The Joint CAS & SOA Committee on Inclusion, Equity and Diversity (JCIED) helped manage February's activities; we also collaborated with the International Association of Black Actuaries, the Organization of Latino Actuaries and the Sexuality and the Gender Alliance of Actuaries, in recruiting volunteers and attracting more participants.

CAS members also responded enthusiastically to the call for volunteers. We had more than 100 CAS members and candidates volunteer to participate, both in the planning process and in the programs themselves, as emcees, breakout session hosts and in other vital roles.

We are fortunate to have the support of key staff members: CAS University Engagement Manager Margaret Kerr, who manages Be an Actuary Month, and PR and Marketing Coordinator Lily Rozenstrauch, who helps oversee the CAS's participation in Insurance Careers Month. Member volunteers like CAS Fellows Alejandro Ortega, Mallika Bender (also CAS staff), and Frank Chang helped fill in where they were needed, whether emceeing a program or recording short videos about the profession to be played during the various sessions. All of these people made February a very special and productive month.

The CAS went above and beyond in targeting students who wouldn't normally learn about the actuarial career.

What did we do?

We conducted four virtual events for high school and community college students over the course of the month. One of our goals was to reach certain demographic groups. We relied on The Actuarial Foundation for a list of Title IX[1] schools, and from our academic connections, we found nine universities to partner with contacts at high schools from that list.

For community college students, the programs covered such items as information on where they can continue their actuarial pursuit at four-year colleges and universities. The programs also welcomed several career changers from around the world. It was truly an international event with attendees spanning multiple continents and hailing from Accra, Jakarta, Amsterdam, Singapore and Quito, to name a few.

Taking a cue from Insurance Careers Month, we promoted the idea of an "insurance careers trifecta," or three key attributes of a job in insurance: stable, rewarding and limitless.

At in-person and virtual events, math games were not only fun but highly educational — and extremely competitive. The games pitted one group of attendees against another, each vying to get the right answer first. Games asked 10 math problems in 15 minutes. When time was up, solutions were given and those who got the wrong answer had to sit down. The last one standing was declared a winner. It was all in good fun.

One of the most satisfying moments for volunteers helping with these math competitions was seeing the students' faces when they were told that questions 9 and 10 were actually taken from Exams P and FM (Exam 2). The students were pleased and shocked that they were

President's Message, page 8

[1] Title IX of the Education Amendments of 1972 (Title IX) prohibits sex (including pregnancy, sexual orientation, and gender identity) discrimination in any education program or activity receiving federal financial assistance.


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President's Message

from page 6

already answering questions from an actuarial exam!

Conclusion

In this column, I focus on one particular, action-packed month, but members should know that our efforts to reach students and career changers has been a long-term, multi-year project. The CAS is fortunate to have vital programs in place to promote the profession and grow the pipeline of members. These include the CAS University Liaison Program, which matches CAS members directly with universities, and CAS Student Central, our free student membership boasting more than 8,000 student members worldwide, and several other programs!

We could always use more help, and I encourage you to volunteer or to get your employer involved in these fine programs. If you are not a current volunteer and would like to contribute, send an email to volunteer@casact.org sharing how you'd like to get involved.

ACTUARIAL REVIEW *LETTERS POLICIES*

Letters to the editor may be sent to ar@casact.org or to the CAS Office address. Please include a telephone number with all letters. Actuarial Review *reserves the right to edit all letters for length and clarity and cannot assure the publication of any letter. Please limit letters to 250 words. Under special circumstances, writers may request anonymity, but no letter will be printed if the author's identity is unknown to the editors. Event announcements will not be printed.*

A Codification

Dear Editor,

In response to "Undivided" (In My Opinion, *AR*, November-December 2021), I agree that the CAS needs to adopt a method similar as to how the ASOPs are developed for the board to obtain comments on key changes before moving on those changes. I became a member of the CAS in May 1980, and our organization has grown since then. At the first CAS meeting I attended, I overheard one member saying to another that he no longer recognized all of the members present. Given that we are now at 9,000 plus members, I can relate to Stan Khury's observation that relying on informal communication between members to ensure the board is in harmony worked at one time but is impractical today. The world around us is changing and we need to adapt to those changes, but surprising the membership and failing to obtain comments and respond to those member comments publicly in writing before enacting key changes is not an acceptable practice. Then too, there are some "rules of the road" in terms of how we operate beyond those in our Constitution that would be useful to codify. For example, we should formally state that all we know when deciding whether a candidate passes or fails an exam is the candidate's number for that exam and the candidate's score for that exam. A candidate's gender, race, creed and LGBTQ status are irrelevant to the decision to give credit for an exam.

—Michael R. Larsen, FCAS, MAAA

DE&I Is Here To Stay

Dear Editor:

As a former teacher of a Tier 1 school, I am encouraged that the CAS, like many other companies and organizations, has increased their commitment to diversity, equity and inclusion (DE&I) in recent years. Looking at it from the perspective of an actuary, I don't see any politics involved. Applying first principles from actuarial science, the CAS membership can be considered a sample of the population where the members are from. As with any other credible sample from a dataset, we should test for sample bias. One way is to compare the distribution of known characteristics between the sample and the dataset. That comparison is shown in the infographics and videos published on the CAS DE&I webpage. Since most of us believe the exam process to be unbiased, one has to conclude that there is a bias in the funnel, which is supported by the "Barriers to Entry Study." The study concludes that there is a lack of awareness among underrepresented groups about actuaries. The good news is that the CAS DE&I initiatives focus on correcting the bias in the funnel. However, the only way to measure effectiveness is to measure the bias. Correcting the bias in the funnel means attracting the talent that we are currently missing out on, which will help make the CAS the best it can possibly be. If you have been energized by the CAS initiatives like I have, I encourage you to get involved by volunteering to help shape the future of the CAS.

—Kyle Bartee, ACAS

2021 Annual Report of the CAS Discipline Committee

The CAS Rules of Procedure for Disciplinary Actions (as amended May 3, 2009, by the Board of Directors) require an annual report by the Discipline Committee to the CAS Board of Directors and the membership.

This report shall include a description of the Discipline Committee's activities, including commentary on the types of cases pending, resolved and dismissed. The annual report is subject to confidentiality requirements.

2021 Activity

As noted in the 2020 Annual Report of the Discipline Committee, the Discipline Committee was asked in December 2019 to make inquiry concerning a matter that involved 67 individuals, 21 of whom were CAS members and the remainder CAS candidates.

The matter involved potential violations of Precept 1 of the Code of Professional Conduct by CAS members and of Rules 1 and 2 of the CAS Code of Professional Ethics for Candidates by the CAS candidates.

The inquiry concluded in the first quarter 2021; the Discipline Committee sent letters to affected members and candidates regarding the conclusions of the inquiry. A report on this matter was finalized in March 2021 and forwarded to the CAS Executive Council meeting for review and action.

The Discipline Committee chair discussed findings and recommendations with the CAS Executive Council at its June 2021 meeting. Following deliberations by the Executive Council, the report is scheduled for action by the CAS Board at its February 2022 meeting.

In February 2021, a complaint was received alleging that a candidate had materially violated Rules 1 and 2 of the CAS Code of Professional Ethics for Candidates by posting inappropriate messages on social media.

In accordance with the CAS Rules of Procedure for Disciplinary Actions involving Candidates, the chair of the Discipline Committee requested that the subject candidate respond to the allegations. Considering the candidate's response and remedial actions, the Discipline Committee chair dismissed the case with professional guidance to the candidate.

There were no cases pending before the Discipline Committee as of December 31, 2021.

—Pat Teufel, Chairperson of the 2021 Discipline Committee
January 10, 2022

CALENDAR OF EVENTS

April 6, 2022
CAS Virtual Trunk Show

May 15–18, 2022
Spring Meeting
Disney's Coronado Springs Resort
Orlando, FL

June 21–24, 2022
Actuarial Colloquia
Virtual Event

June 13–14, 2022
Seminar on Reinsurance
Virtual Conference

September 19–21, 2022
Casualty Loss Reserve Seminar
TBD

November 6–9, 2022
Annual Meeting
TBD

Visit casact.org for updates on meeting locations.

IN MEMORIAM

Christy B. Olson (FCAS 2001)
1970-2022

COMINGS AND GOINGS

Jon Laux, FCAS, has been named vice president, analytics, by the risk management firm CyberCube, where he will oversee the company's actuarial and cyberrisk modeling teams. He formerly worked at Aon, where he held senior roles over a 15-year period. Most recently he was head of cyber and analytics, holding the position for more than five years. His other roles include director of operations and associate director and actuary.

Walter Matthews, FCAS, has been promoted to vice president of AF Specialty. The announcement came from AF Group, a national specialty insurance solutions provider. Since joining AF Group in 2010, Matthews has held various positions within the actuarial department, providing oversight of the organization's actuarial services related to reserving, pricing, underwriting strategies, forecasting and reinsurance. Additionally, he led the launch of the company's assumed reinsurance business and has cultivated strong relationships with valued reinsurance and program partners.

Pinnacle Actuarial Resources, Inc. has promoted **Gregory Fears Jr., FCAS, MAAA,** and **Radost Roumenova Wenman, FCAS, CSPA,** to positions of senior consulting actuary, and **Trenton James Lipka, ACAS, MAAA,** to consulting actuary. Fears has been in the property-casualty insurance industry since 2001 and has experience in loss reserving, funding studies, loss cost projections, captive feasibility studies, risk margin calculations and a variety of actuarial analyses for insurance companies. He serves on the CAS and American Academy of Actuaries Casualty Loss Reserve Seminar Joint Program Committee. Wenman joined Pinnacle in 2016, and has worked in the P&C industry since 2006. She has specialized in pricing and product development, with a focus on developing homeowners, private passenger auto and commercial lines pricing solutions via advanced predictive models. Wenman is a member of the CAS *Actuarial Review* Working Group. Lipka is Pinnacle's newest consulting actuary. He has experience in assignments that include loss reserving and loss cost projections, and with loss reserve analyses for group captive insurers writing workers' compensation, general liability, auto liability, auto physical damage and inland marine. Lipka joined Pinnacle in 2017, and served most recently in an associate actuary role.

David Spiegler, FCAS, has been appointed chief actuary by AMS Management Group. In his position, Spiegler will drive actuarial analytics to assist AMS and Applied Medico-Legal Solutions Risk Retention Group, Inc., in the execution of its strategic initiatives. Prior to assuming the role of chief actuary at AMS, Spiegler served as executive vice president & chief actuary of BMS Re, an independent reinsurance intermediary, as well as senior vice president & chief actuary of American Re-Insurance Company (now Munich Re America) a leading international reinsurance company.

Douglas Min, ACAS, has been appointed to oversee Vesttoo's Korean operation in Seoul as general manager of Vestoo Korea. Vestoo is an AI-based insurance-linked investment platform. Previously, Min was CEO of AIG Korea. In more than 35 years of international reinsurance experience, he has held various senior roles in business development, underwriting and risk.

Steve Armstrong, FCAS, MAAA, has been promoted to chief actuary and senior vice president for Allstate Insurance Company in Chicago. He previously served as the company's vice president, pricing analytics and actuarial services, property-liability product management. Armstrong is an industry expert with nearly 30 years of experience in pricing, product design, underwriting and regulatory work. He has led actuaries, predictive modelers and product analysts throughout his career and is a highly sought-after industry speaker. Armstrong served the CAS as president (2020), board chair (2021) and member of the Board's Diversity, Equity and Inclusion Committee (2021).

EMAIL "COMINGS AND GOINGS" ITEMS TO AR@CASACT.ORG.

See real-time news on our social media channels. Follow us on Twitter, Facebook, Instagram and LinkedIn to stay in the know!

CAS Marketing and Communications Efforts Win Industry Awards

The CAS has received awards across three association award programs for exemplary work completed in 2020. The three programs include the EXCEL Awards, TRENDY Awards and the Communicator Awards, which is a leading awards program across many industries. CAS CEO Victor Carter-Bey said, "The CAS is exceptionally proud to be recognized for our creativity, innovation and differentiation by receiving these six industry awards." Following is the complete listing of awards.

Student Central Summer Program

The Communicator Award of Excellence

Silver TRENDY Award from Association TRENDS for e-Learning and Live Training

Established to fill the void created by cancelled internships because of the COVID-19 pandemic, the CAS Student Central Summer Program was an eight-week-long curriculum offering students short courses on a variety of actuarial skills as well as a mentoring element made up of 93 seasoned actuaries. In just a few short weeks, CAS staff and volunteers created the program, and when it was officially announced, over 630 students applied to participate. The CAS was able to accommodate 155 students whose internships had been cancelled into the mentor-led program and offered an independent-study version of the program to the remaining applicants.

Actuary to Actuary: How to Help Combat Racism in the Workplace

The Communicator Award of Excellence

The September 2020 edition of *Future Fellows* featured an article written by Gloria Asare, FCAS, a leader and mentor for the International Association of Black Actuaries (IABA). Asare, then a CAS Associate, shares her experiences and those of other members in dealing with racism in and outside the workplace. The article also contains research about diversity in the actuarial profession and IABA recommendations about what White actuaries and other insurance professionals can do to work toward eradicating racism in the P&C insurance industry. "It only requires you to be intentional, vulnerable and open to learning," Asare writes, providing a list of dos and don'ts that starts with acknowledging the issue.

Celebration of New Members

The Communicator Award of Distinction

Because of COVID-19, the CAS shifted to a virtual environment for the 2020 Annual Meeting. The CAS embraced this new setting as an opportunity to re-envision the Celebration and engage our audience in a new and different way. The virtual 2020 Celebration of New Members featured engaging and unique content interspersed among the newly recognized individuals. First, the CAS asked those being honored to submit photos to share on-screen. All photos submitted were placed into a large montage that morphed into the CAS logo. Also featured was a fun, new twist with congratulations from guests outside our community: celebrity cameos. In addition, several past CAS presidents were featured in congratulatory videos.

Thanks for Stepping Up Campaign

Gold EXCEL Award from Association Media and Publishing for Direct Mail – Single Piece

Bronze TRENDY Award from Association TRENDS for Promotional Item

In 2020 the CAS wanted to recognize the volunteers who put in extra effort to assist in the execution of new and existing programs in the face of the challenges that COVID-19 presented. These volunteers "stepped up" to help as we transitioned in-person events to virtual, shifted our credentialing exams from paper-and-pencil to computer-based testing, and among many other contributions, served as mentors for students who had unexpectedly had their summer internships cancelled. The "Thanks for Stepping Up" campaign paired custom CAS socks with a thank-you note sent to key volunteers who stepped up in this unprecedented time of need. With this campaign, the CAS was able to recognize over 250 volunteers who "knocked our socks off" in 2020.

CAS Volunteer-Staff Framework Continues Its Evolution

By VICTOR CARTER-BEY, CAS CHIEF EXECUTIVE OFFICER

In spring 2021, the CAS introduced the Volunteer-Staff Framework (VSF), an evolving model that streamlines the CAS governance structure, better leverages volunteers for their subject matter expertise and business skills, and holds accountable and empowers CAS Staff for the organization's operations. The CAS has made much progress since the VSF's launch, and the evolution is continuing into 2022.

VSF origins

The Volunteer-Staff Framework was developed to address findings from the Future of Volunteerism Task Force, which determined that the CAS volunteer staffing model did not fully and efficiently meet the Society's current and long-term initiatives. The task force shared these findings after directing an extensive study that included conducting a SWOT analysis of the current volunteer-staff model, taking inventory of the skills and knowledge necessary to support the current initiatives, reviewing volunteer-staff functions and benchmarking the CAS's model against similar industry organizations. The task force concluded that the CAS would benefit from reorganizing its existing committee structure and empowering staff members.

Town Hall introduces VSF to CAS volunteer leaders

In March 2021, CAS President Jessica Leong, President-Elect Kathy Antonello and I joined CAS Vice Presidents Kim Guerriero (Marketing & Communications) and William Wilder (Admissions) to host a Town Hall for the more than 100 volunteer leaders. These volunteers represented all areas of the CAS, from admissions to university engagement, and the Town Hall was their opportunity to learn about the new framework and understand how it was organized into three distinct components:

- Establishing board committees.
- Transitioning vice presidents to the role of senior advisors and sunsetting the executive council.
- Transitioning committee structure to councils, working groups and task forces.

This initial exposure collected much feedback from volunteer leaders, who asked questions, responded to polls and completed a post-event survey.

Sharing VSF with CAS volunteers

The staff and volunteer chairs then partnered to share details of the evolving framework directly with their committee members. Talks included the various ways committees would be affected. In some cases, the changes to committees were minimal, while in others, changes included shifting staff and volunteer responsibilities and merging or sunsetting committees that had achieved their goals.

Sharing VSF with CAS members

In May 2021, the CAS announced VSF's details more broadly through a news announcement and a member-wide Town Hall held in conjunction with the virtual Spring Meeting. This Town Hall conducted polls to gauge initial member reactions and gave members the opportunity to ask questions. The event recording was posted along with a set of FAQs on the CAS VSF webpage, the hub of information about this initiative.

Implementing the changes at the board level

The CAS Board of Directors added a new Operational Oversight Committee and a Diversity, Equity and Inclusion Committee to the five standing groups of board committees: Leadership Development, Nominating, Discipline, Audit and Risk Management. The addition of these new committees has enhanced the board's oversight and effectiveness, while allowing the board to stay focused on developing CAS strategy and engaging with membership.

Executive council and committee structure

Although the plan to sunset the executive council-level of governance through a bylaws proposal in summer 2021 was not approved by the Fellows, the role of vice presidents continues to evolve. VPs remain advisors and partners to senior staff in providing guidance and member perspectives.

The reorganization of the committee structure went into effect in November 2021, as CAS committees below the board level transitioned into working groups and task forces charged with measurable goals and deliverables tied to the CAS Strategic Plan. This shift reorganized the CAS's long-standing and expansive committees into a structure that supports innovation and diversity. As working groups and task forces accomplish their goals, they can disband,

making way for new volunteer groups to form.

CAS staff chairs and volunteer chairs/vice-chairs

The vision for the new VSF was for CAS staff and volunteer leadership to have more clearly defined roles as they partner together: Staff chairs assume responsibility and accountability for operational execution of committees; volunteer chairs provide subject matter expertise, thought leadership and general business skills. To bolster staff capabilities, staff chairs have completed an extensive series of professional development training courses focused on building upon their skillsets. Staff are empowered to make decisions quickly, increasing speed to market for CAS work products. Volunteer chairs have been able to spend less time on administrative duties, ensuring that time volunteering makes the best use of their time and talents.

On the horizon: Enhancing the volunteer experience

Volunteers are the lifeblood of the CAS. Because of this, the new VSF could not be successful without the dedication and passion of CAS members who give their time to team up with CAS staff to achieve the Society's Strategic Plan. The CAS Volunteer Task Force is launching a series of added resources to improve the volunteer experience in 2022 as part of phase two of the evolving VSF. These resources include:

- **Volunteer matching with meaningful CAS opportunities —** Under the new VSF, volunteer recruitment will be a year-round effort instead of a once-a-year event. Recruitment efforts will match volunteers with their areas of interest and expertise, including short-term, micro-volunteering opportunities. These personalized details will be incorporated into a new Volunteer Management System that is being implemented. Last year's Volunteer Interest and Participation (VIP) Survey collected general interest areas from CAS members, and this new data will be used as recruitment opportunities arise. The CAS will also be reaching out to those who missed the VIP Survey to obtain their volunteer preferences.
- **Volunteer feedback form —** Capturing input biannually from members of each committee, working group and task force will allow CAS staff chairs and volunteer chairs to improve the volunteer experience, course correcting mid-stream and prior to the new cycle.
- **Volunteer trainings and infographics —** These tools will better orient volunteers on how their work fits into the broader CAS structure and vision, as well as ensure a clear understanding of the goals and expectations in the upcoming year.
- **Volunteer appreciation and recognition program expansion —** The CAS is building upon efforts made in recent years to make volunteers feel valued and recognized, such as through the CAS website and its social media pages.

Moving forward

The CAS will continue to update its members and stakeholders as it introduces new components of the evolving VSF. Members can view updates on the CAS webpage dedicated to this topic at https://www.casact.org/about/cas-evolving-volunteer-staff-framework.

The 2021 CAS Volunteer Awardees: In Their Own Words

About one third of the CAS membership volunteers every year. Some of these volunteers go above and beyond for a focused and finite project over the course of a year. Some are new to volunteering and to the CAS but have shown themselves to be outstanding leaders. Others are long-time volunteers who have devoted themselves throughout their careers to elevate and advance the actuarial profession.

Based on nominations from their peers, the CAS honored 13 exceptional volunteers during last year's Annual Meeting. With National Volunteer Work happening on April 17-23, we thought it was the perfect time to honor these volunteers by giving them an opportunity to speak out on their experiences volunteering with the CAS — why they do it, what they enjoy most about it and what means the most to them.

The New Member Awards

Recognizes volunteer contributions during an individual's first five years after their most recent credential.

Gloria Asare (FCAS 2021)

Recognized for her work with the International Association of Black Actuaries (IABA).

"Since a young age, I have always enjoyed volunteer work. Not only is it an impactful way to give back, it is also an opportunity to learn something new and is an easy way to meet and get to know new people. I decided to start volunteering with the International Association of Black Actuaries (IABA) specifically after attending my first ever Annual Meeting in 2018. The warmth, energy, vulnerability and openheartedness of fellow attendees caught me right away. Being surrounded by fellow aspiring actuaries that looked like me, who shared stories of similar struggles, while there purely to support each other, had me think right away of wanting to expand the IABA's reach to Canada. I started the Toronto affiliate six months later and continue to have the privilege of serving as a co-leader in addition to having the role of Friend of the Board. With Black actuaries making up less than 2% of fully credentialed actuaries across North America, hearing the direct feedback of how the Toronto affiliate and the larger IABA organization has touched numerous individuals and supported them in their goal to become successful actuaries is immensely rewarding. Many actuarial organizations have a great need for volunteers and everyone has skills that could benefit them. If you're not already, please consider contributing in any way — big or small."

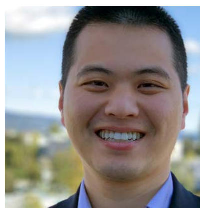
Sara Chen (FCAS 2021)

Recognized for her work with the Microlearning Task Force.

"What I enjoy the most about volunteering is the sense of community and the passion that the volunteers and CAS staff bring. When I started volunteering, it was earlier in my actuarial career, and I was uncertain of how much I could contribute. But the volunteer groups that I joined were all very welcoming and supportive, and I was able to contribute in more ways than I initially imagined. One of the aspects that makes volunteering for the CAS unique is the many opportunities that span a variety of interests and time commitments, so I was able to find the opportunities that suited my schedule and skillsets. I've met so many amazing people through volunteering that I wouldn't have been able to meet otherwise, and I love being able to work with them to continue to push the organization and the P&C actuarial field forward."

Kenneth S. Hsu (FCAS 2021)

Recognized for his work with the Professionalism Education Committee.



"My first ever CAS-sponsored event was the Course on Professionalism in Fort Lauderdale, Florida, a few years ago. I was extremely impressed by the selflessness of all the volunteers, and I knew I wanted to give back to the community when I could. Since then, I have participated on a few committees to work on various projects. The best thing about volunteering is you get to meet and work with people outside of your company. It is one of the easiest ways to expand your knowledge and network. Through volunteering, I also learned how to communicate better and work on skills that I couldn't get on the job, such as project management and professional writing — skills that I always wanted to develop. Still not convinced that you should volunteer? Another benefit of being a volunteer is that you get all the inside scoops early! A benefit to help you schedule your travel plans ahead!"

Erin Lachen (FCAS 2017)

Recognized for her work with the Syllabus and Examination Committee.

"As with most candidates trekking through the exam process, I was determined to spend some time on the other side of the exams to give back. I was glad to find a volunteer role that aligns well with my expertise and my passion. I love meeting up with like-minded folks twice a year to work through the exam-writing and grading process. I always find myself reenergized and excited about my job and the profession afterward."

Allison Newhouse (FCAS 2017)

Recognized for her work with the CAS Student Central Summer Program and University Engagement Committee.

"Volunteering on the University Engagement Committee has been a fun way to work with actuaries across the industry and have an impact on university students, professors and curriculums to build awareness of the actuarial profession and showcase the career opportunities available as a CAS actuary. Our working group has a lot of fun putting together programming and networking opportunities for students throughout the year. The CAS Student Central Summer Program was such a hit in its first year — it was a great challenge for us to continue the tradition and make the program even better in its second year. The elements of volunteering I enjoy the most are brainstorming and executing new creative ways to engage students and working with a group of volunteers and CAS staff that are equally as passionate about teaching students about the actuarial profession."

Above and Beyond Achievement Award

Recognizes outstanding volunteer contributions during the previous year.

Patrick Ford, FCAS

Recognized for his work with the Syllabus and Examination Committee.

"Since finding value in the credentialing process and the community events, I feel it's only right to give back to the organization that has provided that value. I enjoy playing a small part in shaping future actuaries that will go on to lead the profession. I also enjoy networking and getting to share ideas with actuaries outside of my sphere. Honestly, the one thing that stands out is how critical it is to the ecosystem. Without sustainable levels of volunteering, becoming and being an actuary would be a lot more expensive and thus a lot less inclusive."

Patricia Hladun, FCAS

Recognized for her work with the Syllabus and Examination Committee.

"After qualifying as an FCAS in 2002, I received a call from [a Syllabus and Examination Committee member to volunteer as a subject matter expert]. Even though I worked in financial reporting, I didn't consider myself an 'expert' and was a bit hesitant. However, I decided to help out. Since then, I have volunteered for the CAS almost exclusively for the Examination Committee and have held many committee roles including … question writer, grader, consultant and syllabus liaison. As someone who has mostly worked in organizations with very small numbers of credentialed P&C actuaries, volunteering has provided me with a network of contacts to lean on (the "call-a-friend" option) and, as a plus, the work has been a lot of fun! I really enjoy meeting people, both professionally and personally, from around the industry. Volunteering can give you a broader view of the industry, particularly if you work in a small organization or in a narrow role. I also volunteer for the Canadian Institute of Actuaries on a P&C financial reporting committee and can say that I am continually learning from my volunteer roles.

Shengli Huang, FCAS

Recognized for her work with the Syllabus and Examination Committee.

"Volunteering helps me get experience in the areas that I am interested in or want to develop further. It provides opportunities to learn and to practice important work and life skills such as communication, organization and teamwork. Volunteering connects me to others. Dedicating my time volunteering is a great way to meet new people, expand my network and boost social skills. Doing good for others and the community provides a natural sense of accomplishment. I have found that volunteering increases self-confidence as I continuously meet and learn from different people. It also made me feel that I am making an impact."

Stephanie Gould Rabin, ACAS

Recognized for her work with the Reinsurance Seminar Committee, Annual and Spring Meeting Planning Committees and Learning Enhancement Process.

"Without our volunteers, the CAS would not be the professional organization we need it to be: one that provides professional certification, intense knowledge, and depth of content to drive our actuarial expertise forward. For event planning, the content is best served coming from people who live and breathe the insurance industry. And, from me specifically — Much like our program of exams themselves, I feel it is important to bring the wealth of knowledge of the insurance industry to the table. By bringing in information from outside our "box" of actuarial knowledge, we can actually expand that box and become more innovative, relevant and forward thinking. I enjoy being able to use my own expertise to fill in for potential gaps that help the CAS. I'm currently an actuary working outside the actuarial track in a corporate strategic role with responsibilities across a wide range of functionalities. So, I *love* that I can share some of my own experiences — even in some small ways — with volunteering. It gives all of my hard work more meaning. And let's face it … actuaries rock! My work with Learning Enhancement (Brain Rules and More!), the Insurance On-Demand Working Party and CARe have also given back to me both personally and professionally. I reference this work with clients and colleagues all the time in support of what I do. So, how can you not enjoy volunteering? When I transitioned away from a pure actuarial role and became credentialed as an industrial organizational psychologist, I never thought the two would meet! The CAS has been incredibly fashion-forward in hiring a learning specialist to enhance people's experience at our meetings. And while I like to think of myself as an experienced presenter who has expertise in people's motivation, leadership and learning, I still learned more! And so, the Learning Enhancement Program (LEP) at our meetings is such a great step for the CAS. As a coach of our LEP mentors, I love that I can keep searching for more and better ways to get the message and learning out there. It is an ever-changing process that is incredibly fulfilling. I only wish I could spend more time, but the day job calls me back!"

Lisa Yeung, FCAS

Recognized for her work with the Syllabus and Examination Committee.

"Volunteering for the CAS gives me the opportunity to meet new people outside of work. Also, this is a great opportunity to meet the new generations. You will get to see the future of this actuarial community. Meeting new people is what I enjoy the most. Also, the feeling of accomplishment is what keeps me going as well."

The Matthew Rodermund Memorial Service Award

Acknowledges CAS members who have made considerable volunteer contributions to the actuarial profession over the course of their careers

Rick Gorvett, FCAS

Recognized for over 30 years of volunteerism.

"Helping to enhance one's profession is important to me, and so it's always been very satisfying to volunteer for the CAS — our professional society.

As an academic, I'm helping to prepare the next generation or two of actuaries, and I'd like them to experience the same kind of up-to-date, dynamic professional society and environment as I was fortunate enough to experience throughout my career. In addition to the satisfaction of helping the Society and profession, volunteering has most certainly helped me to become a better actuary, colleague and person. The opportunities to work with intelligent people on important and relevant issues have been a huge factor in the development and enjoyment of my actuarial career. Meeting, working with, and getting to know some incredible colleagues — both members and staff of the CAS — has always been the aspect of volunteering that stands out for me. The consistently high level of professionalism, energy and dedication of CAS volunteers and staff is something for which I am truly thankful."

Leslie Marlo, FCAS

Recognized for over 24 years of volunteerism.

The CAS has been instrumental to me in furthering my career aspirations. I would not be where I am today without the CAS, so it seemed only appropriate to give back to the organization — and there are so many ways to give back. After receiving my Fellowship, I started my volunteerism on the Exam Committee — as have so many volunteers over the years — but I quickly realized my interests lie elsewhere. That was not a problem, since there are so many ways to be involved and help out in areas that are meaningful to each individual. I get fulfillment from the sense of accomplishment and productivity that comes from a job well done, all the more so when knowing that volunteerism directly helps our profession and our actuarial community. It is gratifying to see what can be done when combining our expertise and skill sets as actuaries with the expertise and skill sets of the CAS staff. Another very significant component of volunteering from my perspective is the opportunity to meet and interact with professionals — both CAS staff and other actuaries — that I would never otherwise have had the opportunity to meet. I have made multiple lifelong friends through volunteering over the years.

Robert F. Wolf, FCAS

Recognized for over 28 years of volunteerism.

Early in my career, I was so intrigued about how special an institution the CAS is in its dedication to its high standards of practice. This propelled me to contribute to help maintain these high standards of practice. Time and time again, our profession has been praised and respected as trusted advisors. It is this very bedrock that sets the CAS apart and that continues to determine who we are and evolve to be. It is the endless chain of volunteers stemming from mentors to candidates, who then become mentors to the next set of candidates, and so on, that serve as the "essence" of the CAS. I am humbled to achieve the Matthew Rodermund Award in recognition of my contribution to this wonderful, endless chain of volunteers. What I enjoy most about volunteering is experiencing the fact that, while I have extreme passion to give back to the profession as my mentors have given to me, I receive more than I give.

Whether it is in writing and grading exam questions, speaking and debating topics at our meetings and seminars, writing articles, being elected and serving on the CAS Board of Directors, or serving other various committees, the one thing that stands out for me is realizing the blessing of all the friendships I have made with other volunteers serving with common dedication and passion along with the wonderful, equally passionate dedicated CAS staff. It is in these relationships that make the CAS, the CAS. ●

Nominate CAS Members for Volunteer Awards

Please visit the CAS website under the volunteer tab (https://www.casact.org/awards-prizes-scholarships), where you can find more information on award eligibility.

The nomination window will open in mid-May 2022, so look for that announcement! In the meantime, feel free to download the forms and fill them out at any time. Once the nomination window is open, we will accept your nomination form. We encourage nominations from any and all members. If you have any questions, email Mikey Bevarelli at mbevarelli@casact.org.

7 Reasons to ditch link ratios

- Link ratios cannot measure calendar year social inflation
- The assumptions are rarely met by the data
- No insight into trends in the business
- Too slow to review
- No connection to the risk characteristics of the data
- No early warning system
- No way to determine whether an answer is good, bad, or ugly

The Mack method is a regression formulation of volume weighted average link ratios (chain ladder). The regression formulation means the method can be tested statistically. Other method variants can be included such as different weights, an intercept (Murphy) and an accident year trend for each development year. All these methods are included in the Extended Link Ratio Family (ELRF) modeling framework.

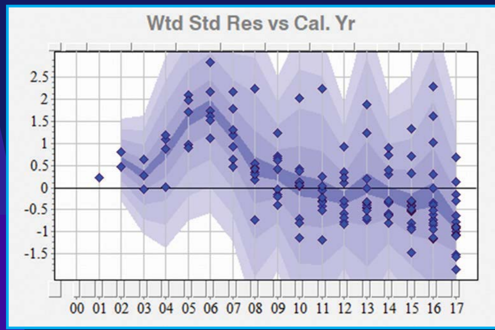
In the Probabilistic Trend Family (PTF) modeling framework, we mitigate model specification risk by identifying a parsimonious model describing the trends in the three directions (development, accident, and calendar), along with the volatility about the trend structure.

Link ratio methods residuals trend down: Projections too *high*

Consider anonymized Paid Loss data for an Auto Insurance provider (segment: Bodily Injury). The data can be downloaded from: icrfs.me/7reasons

The display on the right shows a strong downward trend in the residuals (trend in data minus trend in method) versus calendar year.

This means a link ratio method will grossly overstate the reserve estimates. The Mack method (volume weighted average) gives a total reserve of 902M. The arithmetic average link ratios gives a total reserve of 1.16B.

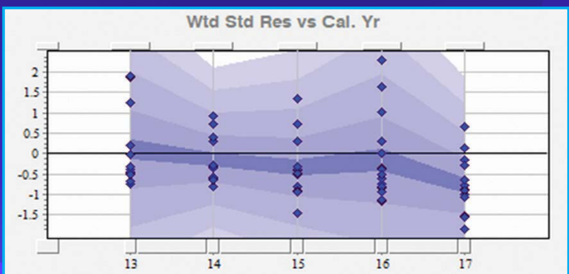


Incremental | Cumulative

Accident Period vs Development Period

	Cal.Per.Total.	0	1	2
2015	163,954	9,618	54,613	88,669
	160,899	9,618	75,810	62,653
2016	210,078	15,225	86,451	86,647
	216,417	15,225	68,255	15,012
2017	289,335	13,628	77,383	94,464
	201,780	13,628	11,493	19,398
	Fitted/Observed		2018	2019
Cal. Yr Totals	1,629,546		284,355	241,747
	1,625,059		30,270	34,119

1 Unit = £1,000



Left is the forecast table (incremental version) for the Mack method.

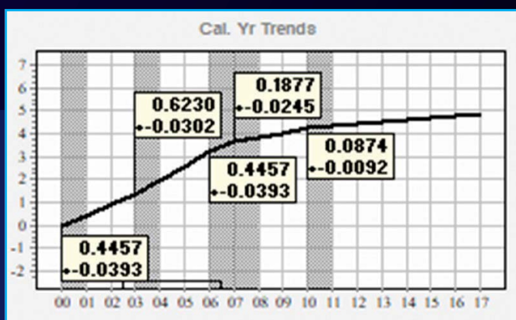
The company just paid 202M GBP in 2017 (blue numbers are observed) but the fitted mean value (black numbers) is much higher at 289M. Further, the method is projecting the company will pay 284M GBP in the next calendar year!

The method clearly provides false indications.

The optimal model identified in the Extended Link Ratio Family (ELRF) modeling framework applied to the last five calendar years has trends, intercepts, and very few ratios (because they have no predictive power). The residuals are much improved (left). The trends in the data are more in line with the trends in the method.

The total reserve mean projected from this identified model is 504M – around half the original Mack method projected mean reserve! This is a much better estimate of the reserve mean, but how do we know it's the best?

Let's see what is really going on



The identified model in the PTF modeling framework has calendar year trends as seen on the right. The calendar year trends are much lower more recently. Trends in other loss types (for instance: Case Reserve Estimates or Number of Claims Closed) can be related to the trends in the paid losses.

The actuary now has a narrative about the data.

Projections from the PTF model are much more realistic. The forecast scenario in PTF, using the 8.7%+_ calendar year trend, projects a mean payment of 223M GBP next year – much more in line with the recent history. The total mean reserve is 598M.

The actuary has control over all future trend assumptions in the PTF modeling framework. These can be related directly to the trends (or volatility) observed in the past – including CREs or NCC.

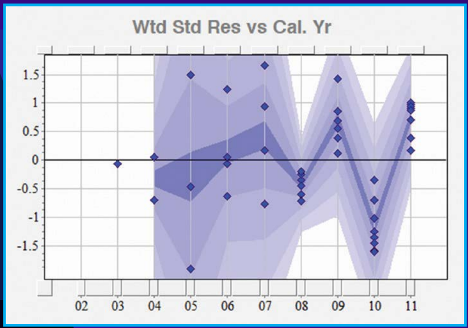
To get in the ballpark of the original forecasts of the Mack method, the future calendar year trend has to increase from the most recent 8.7%+_ calendar year trend to more than 25%+_ for the entire run-off period!

Link Ratio Methods residuals around zero: Projections too *low*

Maybe you think using Incurred Losses gives better estimates than Paid Losses?

Consider the Incurred Loss data from Best's Schedule P (2011) for Tower Group.

The data can be downloaded from: icrfs.me/7reasons



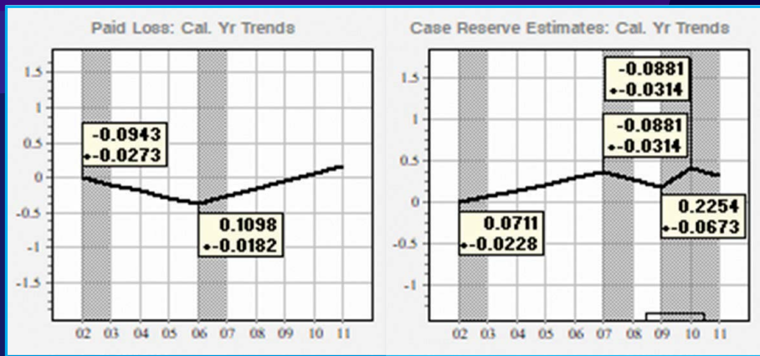
On the left are residuals from the Mack method applied to the Incurred Losses. The zig-zag conflates what is going on.

The total mean reserve projected by the Mack method is: 1.059B. The held reserves by the company as of 2011 were 921.9M. By calculating chain ladder ratios excluding the 'high' calendar years of 2009 and 2011, the forecasted total reserve drops to 950M.

The held reserves were supported by link ratio methods.

In the PTF modeling framework, Paid Losses and Case Reserves are modeled separately. Note the calendar year trends are not the same in the Paid Losses (left) and Case Reserves (right).

In order to reach the reserves held, the calendar year trend for the future has to change from +11%+_ to -16.85%+_ – a total difference in trend of nearly 28%!! This is impossible!



Without access to the PTF modeling framework, how would you know whether your projections are meaningful?

- Since 2006 the paid losses have been increasing 11%+_ faster than Earned Premium. This is high social inflation. This leads to increases in loss ratios (not reflected in the company's held ultimates).
- Since 2007 the Case Reserve Estimates have been fluctuating (thus the masking of trends in the Incurred Losses).

Accident Period vs Development Period

	Cal. Per. Total	0	1	2	3	4
2007	219,293	111,061	80,663	58,661	54,577	40,347
	221,653	115,284	89,880	56,719	25,047	34,904
2008	316,836	152,248	110,608	80,460	74,870	55,355
	324,522	143,386	121,849	38,678	67,792	14,165
2009	432,067	194,065	141,026	102,614	95,502	70,616
	427,253	181,575	108,336	95,660	13,288	18,302
2010	523,492	197,170	143,320	104,312	97,099	71,803
	393,802	209,186	140,943	14,492	14,224	18,940
2011	675,179	277,671	201,890	146,980	136,840	101,201
	694,364	319,844	27,323	21,663	21,305	27,286
	Fitted/Actual		2012	2013	2014	2015
Cal. Per.	2,645,737		512,550	394,896	317,782	232,166
Total	2,526,865		45,323	41,549	39,884	38,057

1 Unit = $1,000; Forecast Scenario: Data trend: 11%+_

Accident Period vs Development Period

	Cal. Per. Total	0	1	2	3	4
2007	219,293	111,061	80,663	58,661	54,577	40,347
	221,653	115,284	89,880	56,719	25,047	34,904
2008	316,836	152,248	110,608	80,460	74,870	41,909
	324,522	143,386	121,849	38,678	67,792	10,725
2009	432,067	194,065	141,026	102,614	72,304	40,476
	427,253	181,575	108,336	95,660	10,060	10,491
2010	523,492	197,170	143,320	78,973	55,656	31,159
	393,802	209,186	140,943	10,972	8,153	8,219
2011	675,179	277,671	152,849	84,246	59,382	33,249
	694,364	319,844	20,686	12,417	9,245	8,965
	Fitted/Actual		2012	2013	2014	2015
Cal. Per.	2,645,737		388,046	226,348	137,902	76,276
Total	2,526,865		34,314	23,815	17,308	12,503

1 Unit = $1,000; Forecast Scenario: Reserves held: -16.85%+_

The forecast table on the left assumes the 11%+_ trend continues. The projections are increasing down the accident periods (eg: dev 4) just like the observed paid losses (blue numbers) in dev 0.

On the right is the forecast where the assumed future trend is set to -16.85%. Projected payments are decreasing down the accident periods (dev 4) despite the significant increases in observed paid losses and Earned Premium.

(Tower Group went into administration in the fourth quarter 2013).

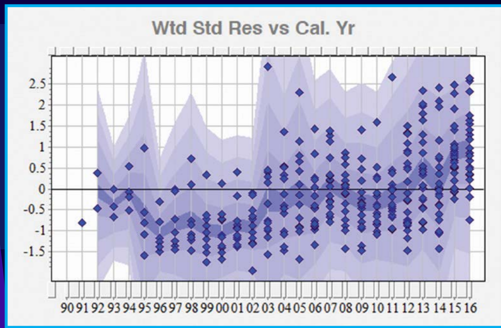
Insureware
Innovative Statistical Solutions for P&C Insurance

Link Ratio Methods residuals trend up: Projections too *low*

Consider anonymized Paid Loss data for a large Worker's Comp provider.
The data can be downloaded from: icrfs.me/7reasons

The display on the right shows a strong upward trend in the residuals (trend in data minus trend in method) versus calendar year.

Any link ratio method will grossly understate the reserves – the trend in the method is less than the trend in the data. Using the Mack method (volume weighted average), the total reserve is 839M.



Incremental | Cumulative

Accident Period vs Development Period

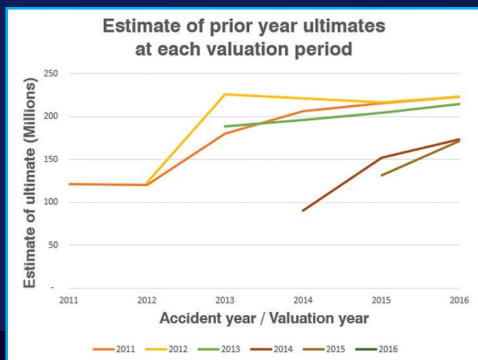
	Cal.Per.Total.	0	1	2
2014	162,300	228	10,944	18,627
	179,707	228	14,998	27,366
2015	151,130	275	13,200	19,782
	181,395	275	15,895	3,810
2016	147,829	400	19,200	23,979
	188,415	400	3,537	6,058
	Fitted/Observed		2017	2018
Cal. Yr Totals	2,916,318		152,317	129,915
	2,732,505		9,023	9,309

1 Unit = $1,000

The company just paid 188M USD in 2016 (blue numbers are observed) and the method is projecting the company will pay 152M USD in the next calendar year (black numbers are fitted means).

The method clearly provides false indications.

If every successive year you take weighted average link ratios of the last four years, each year the estimates of the prior year ultimates will increase, and projections of the paid losses for the next year will be too low.



To illustrate this, estimate the four year weighted average each valuation period from 2011 through to 2016 and plot the prior year ultimates.

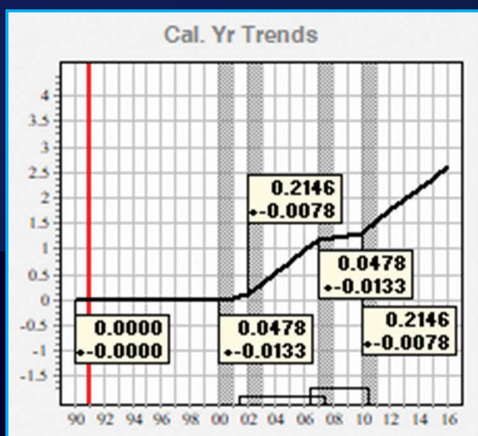
Assuming the same link ratio method is applied in each of the four years, the company is in catch up mode.

For this particular portfolio, the social inflation is very high.

The optimal PTF model, whose calendar year trends are displayed on the right, projects a total mean reserve of 1.309B if the trend of 21.46%+_ continues for several years.

Link ratio type methods cannot measure social inflation.

The PTF modeling framework enables you to mitigate model specification risk and extract maximum information from the data.




SENSE
& SENSITIVITY
By ANNMARIE GEDDES BARIBEAU

Should fairness be a reason to eliminate predictive insurance rating factors?

For more than 70 years, insurers and insurance regulators have been sensitive to the issue of potentially discriminatory or unfair rating factors.

While assuring fairness to everyone's satisfaction is a laudable objective worthy of pursuit, it is elusive by its very nature. Fairness, or impartiality, can be a matter of perception. Many questions arise when considering personal auto insurance, which is this article's focus.

Is it fair for senior citizens to get a premium discount due to high credit scores and lower driving frequency, while at the same time their driving ability deteriorates with age? Is it discriminatory to use location as a factor in a densely populated, high-crime area when residents cannot afford to move away? Is it acceptable to consider education as a factor when people, for reasons that can be both beyond and within their power, do not attain it? What about telematics? How much should driver behavior impact rates when other factors influence the cost of claims?

Ultimately, if certain rating factors are banned despite their statistically sound predictability of future claims, how will that shift the perception of unfairness to other groups of drivers? How will eliminating predictive factors impact solvency?

These questions, which have been the subject of public policy debate for more than two decades, are gaining greater traction. During the last two congressional sessions, legislators have introduced bills to eliminate so-called "income proxies" including credit scoring, education level and employment status that could greatly impact how actuaries develop rates. In 2021 three states, Colorado, Michigan and Washington, either enacted legislation or implemented regulation in response to those who insist personal auto insurance rates are unfair or discriminatory.

That's part of why property-casualty actuaries — who are required to adhere to the highest standards of professional independence — are weighing in on the conversation. In March 2022, the Casualty Actuarial Society published four papers that consider issues including fairness and disparate impact on protected classes in the United States as part of a Research Paper Series on Race and Insurance Pricing.

"There are a lot of discussions happening now to incorporate ideas of social fairness into actuarial fairness," observed Roosevelt C. Mosley, CAS president-elect, principal for Pinnacle Actuarial Resources and co-author of the recently released CAS Research Paper, "Methods for Quantifying Discriminatory Effects in Insurance." Mosley said, "Actuarial fairness centers around whether a risk characteristic is actuarially justified, while social fairness is about avoiding bias against certain classes."

Factor fairness

"There is a larger trend that concerns us," said David Snyder, vice president of international policy for the American Property Casualty Insurance Association (APCIA), "which is the politicization of rate regulation that has increased quite a bit in the past year or so."

In general, insurance rates are guided by states' regulations that rates should not be excessive, inadequate or unfairly discriminatory. Ironically, personal auto insurers are generally prohibited from collecting policyholder data regarding race, income and religion, making it difficult to prove directly if insurers are unfairly pricing certain groups. More to the point, Snyder said, insurers do not want to collect such data.

However, to consumer advocates and some regulators and legislators, some variables, such as occupation, education, location and credit-based insurance scores, are unfair to African American, Hispanic and low-income policyholders.

Rep. Bonnie Watson Coleman (D-N.J.) introduced the Prohibit Auto Insurance Discrimination Act (PAID Act) in the United States Congress last year to exclude "income proxies" including credit scores and credit-based insurance scores. Other factors on the chopping block include gender, ZIP code, census tract and marital status.

During the previous session in 2020, Sen. Cory Booker

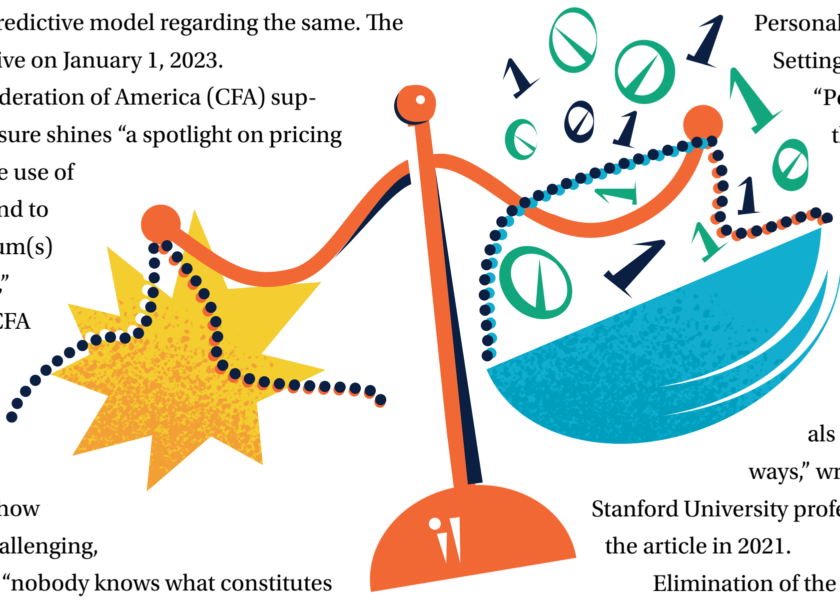
(D-N.J.) introduced a bill with the same name to ban the same variables. Although the PAID Act has a low chance of passage, its introduction appears contrary to the 1945 McCarran-Ferguson Act, which assigns insurance regulation to the states. Insurance regulators had objected to The Dodd-Frank Act of 2010, which was adjusted post enactment in response to their concerns (see, "Demystifying the Regulatory Web: Dodd-Frank and Its Complex Impact," *AR*, March/April 2016).

Although the PAID Act has a low chance of passage, its introduction appears contrary to the 1945 McCarran-Ferguson Act, which assigns insurance regulation to the states.

Using factors such as location and credit-based insurance scores can imply that insurers are deliberately discriminating against certain policyholders. "I have not seen anything from a pricing perspective to say insurers are intentionally discriminatory," observed Mosley, a 28-year auto insurance actuarial veteran. However, he explained that there could be inadvertent discrimination in the insurance system that should be examined.

In Colorado, a bill was enacted in 2021 which, among other measures, requires insurers to provide statistical evidence that the data and predictive analytics for determining premium rates do not cause unfair discrimination based on an individual's race, color, national or ethnic origin, religion, sex, sexual orientation, disability, gender identity or gender expression in any insurance practice. Insurers are also barred from using any external consumer data and information source, algorithm or predictive model regarding the same. The law will become effective on January 1, 2023.

The Consumer Federation of America (CFA) supports the bill. The measure shines "a spotlight on pricing practices — such as the use of credit scores — that tend to result in higher premium(s) for consumers of color," according to a June 9 CFA news release.



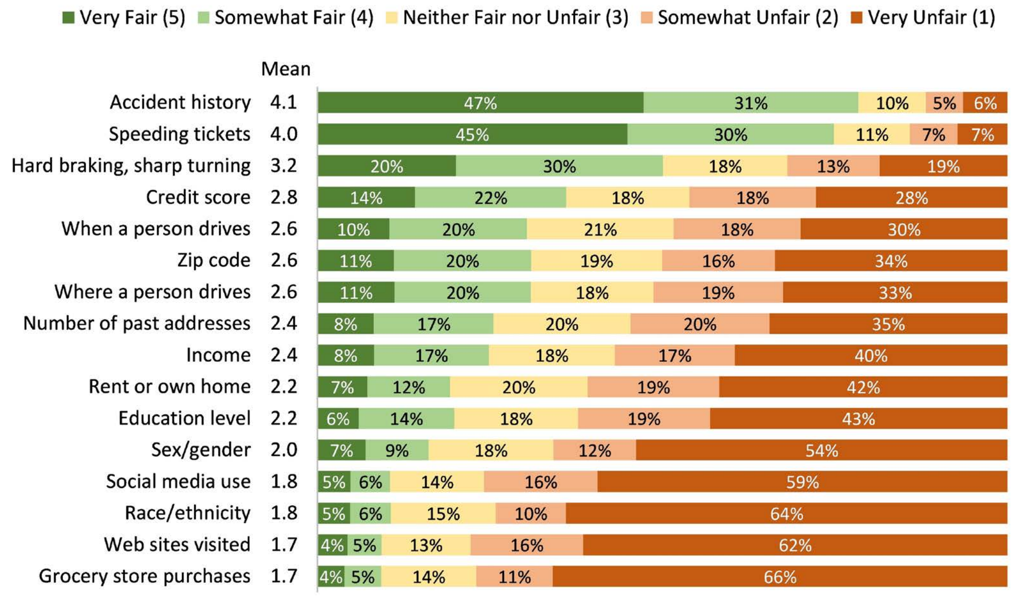
Snyder of APCIA sees the Colorado law differently. Determining how to comply has been challenging, he explained, because "nobody knows what constitutes an acceptable balance of correlation to a protected class versus correlation to a business operation," he said. "And there isn't even data for many of the protected classes to even begin the analysis," he added, observing that the situation "will have a negative impact on all companies and especially smaller companies who would have to comply with the law."

In 2020 Michigan also took steps to combat suspected unfair discernments, but the impact is unclear. Documentation from the Michigan Department of Insurance and Financial Services says that credit score was eliminated. When asked for clarification, Michigan's insurance department withdrew from a scheduled interview with *Actuarial Review*. "The legislation *banned insurers* from using credit scores used by lenders for setting insurance rates," Mosley said, "but *did not ban insurers* from using credit-based insurance scores for setting rates." Rating factors that some label as discriminatory can be predictive of future costs. Consider gender. Some states, such as California, Hawaii, Massachusetts, Michigan, North Carolina and Pennsylvania, already ban the use of the gender factor.

Gender is considered one of the most unfair rating factors by 66% of respondents in a nationally representative survey of 1,095 U.S. adults called, "Which Data Fairly Differentiate? American Views on the Use of Personal Data in Two Market Settings" (see Figure 1). "People largely make these distinctions according to whether they see data as *logically related* to the behaviors companies are trying to predict and whether data sort individuals in *morally consistent* ways," wrote Barbara Kiviat, the Stanford University professor who published the article in 2021.

Elimination of the gender factor helps

Figure 1. How Americans rate the fairness of companies using various types of data in car insurance decisions.



Notes: *Survey conducted by YouGov for the author February 11 to 14, 2019. N = 1, 095. Values weighted to be nationally representative.*
Source: *Barbara Kiviat, "Which Data Fairly Differentiate? American Views on the Use of Personal Data in Two Market Settings," Sociological Science 8: 26-47. © 2021.*

to avoid potential discrimination against transgender people and others who do not identify as men or women. According to Pew Research, an estimated 1.4 million adults in the United States identify as transgender.

In states without a ban on gender in pricing, insurers tend to ask people their sex identification at birth, Mosley said. Still, there is discussion to permit policyholders to identify as they are now. He also points out that the gender factor demonstrates that the predictive value of variables can change in relevance. Teenage female drivers are becoming as risky as males in the same age group.

Mosley's observation also raises the reality that factors can impact each other. Age, which is not on the list of questionable factors, can interact with the gender rating variable.

Other factors that some believe should be eliminated — education, occupation, marital status, location and credit-based insurance scoring — are correlated with riskier driving, according to "Behavioral Validation of Auto Insurance Rating Variables," published by the APCIA in November 2021. The white paper's authors are Dr. Robert Hartwig, director of the Risk and Uncertainty Management Center and clinical associate professor in the finance department at the University of South Carolina, and Robert Gordon, APCIA's senior vice president of policy, research and international.

Drivers with some college education or less engage in hard braking 5% more frequently and generate claim costs about 5% to 10% higher than the study's population overall, according to the white paper. The analysis reflects telematics data based on billions of miles driven from January 2017 to June 2019 submitted by APCIA member companies.

In contrast, drivers with higher educational attainment hit the brakes 5% less often and are associated with at least 5% to 20% lower claim costs compared to the study's population overall.

Although the education factor is predictive statistically, 62% of respondents in the Kiviat study considered education an unfair variable for personal auto insurance rating. At the same time, hard braking/sharp turning was the third fairest rating variable (see Figure 1). Based on the consumer responses, the perception of fairness could improve if consumers are better educated about rating factors.

Occupation also correlates to hard braking and claim costs, according to the Hartwig/APCIA study. Depending on the policyholder's job, claim costs can be 5% to 10% higher or lower than the study's population of drivers. Hartwig pointed out that the occupational risk groups evaluated are not income-based and represent people in every race and ethnicity. The Hartwig/APCIA study noted that teachers, for instance, do not hit the brakes as often as real estate agents, who are often driving in unfamiliar neighborhoods.

Looking at marital status, the Hartwig/APCIA study shows that married people hit the brakes about 10% to 15% less frequently than the general population, compared to single people who do so 10% more frequently. Being married is associated with 20% lower claim costs compared to the general population, while claim costs were 15% greater for singles.

"With telematics becoming more popular, marital status will likely become a less important factor," Mosley said. Telematics data will likely show that married people often travel together, reducing the potential miles of exposure.

Telematics demonstrates that population density is a "highly accurate predictor of insurance costs," according to the Hartwig/APCIA analysis. Drivers in densely populated areas engage in hard breaking about 10% more frequently than the overall study population, the study noted. In contrast, motorists in lower populated areas hit the brakes 20% less.

Where a policyholder lives, often characterized by ZIP code, can be viewed as discriminatory against low-income policyholders. Location relates to accident exposure potential, Mosley said. "It is related to where you drive most often," he explained, pointing out that densely populated areas tend to have higher accident rates.

Telematics demonstrates that population density is a "highly accurate predictor of insurance costs," according to the Hartwig/APCIA analysis. Drivers in densely populated areas engage in hard breaking about 10% more frequently than the overall study population, the study noted. In contrast, motorists in lower populated areas hit the brakes 20% less. Claim costs are 20% higher in densely populated areas and 20% lower in rural areas. The location factor involves myriad risks including weather, repair costs and litigiousness.

To evaluate potential unequitable pricing by location, the Pennsylvania Department of Insurance looked at loss ratios in 2016 by ZIP codes characterized by majority populations of African Americans, Hispanics, low income and less educated citizens. For majority Hispanic ZIP codes, the loss ratio was 71.3% compared to the statewide average of 64%. Those representing low median income and the lowest percentage of college graduates experienced 67.8% and 67.4% loss ratios, respectively. African American jurisdictions' loss ratios were the closest to the average at 66.9%.

"Many of these studies try to find specific groups that are paying more for insurance than another group," Hartwig said. "In reality, insurance rating is completely blind to race and ethnicity," he offered, adding, "These studies fail to provide any proof that insurers are discriminating against anyone."

Credit-based insurance scoring

FICO reports that 95% of all personal lines insurers use credit-based insurance scores — and for good reason. An insurance score is one of the most statistically predictive factors around.

Attacks on credit-based insurance scores are not about actuarial soundness, Mosley said, and the contention that credit-based insurance scores are harmful to minorities and the poor is "not a universal truth." Eliminating credit score to avoid bias, he added, "actually could end up causing more harm than good."

The Washington state experience is a case in point. Last year, the state's insurance commissioner banned the use of credit-based insurance scoring, but a judge later overturned it. Removing credit scoring reportedly increased premium for more than one million policyholders. Senior citizens, who tend to have favorable credit scores and may not drive as often, were purportedly the hardest hit. Since then, the state's insurance department attempted to temporarily ban credit scoring through rulemaking. Three insurance industry groups filed a lawsuit against the ban and the matter is on hold.

"People across the socioeconomic spectrum have good credit and bad credit," Hartwig said. State insurance departments and the federal government have studied the efficacy and fairness of credit-based insurance scores for decades, he explained. They reach the same conclusion that "credit-based insurance scores are highly correlated with loss, and their use in rating models increases rate accuracy, enhances competition and contributes to an overall rate structure that is fair."

Years before the credit score ban in Washington, the Arkansas Insurance Department found the rating factor was advantageous for the 57.4% of consumers who received a decrease in their auto insurance premium. About 19.2% saw no effect and 23.4% realized an increase, according to a 2017 report.

The cost to insure policyholders with low credit-based insurance scores, as measured by pure premium, is about 28% higher than the driving population overall, according to the Hartwig/APCIA report. Using insurance scoring has also reduced the population of state auto insurance plans of last resort because insurers can take on higher risks, the report noted.

Consumers are mixed on using credit information to rate personal auto coverage. The Kiviat study ranked it fourth in fairness. Thirty-six percent believe its use is fair and 18% were neutral, but 46% saw it as unfair (see Figure 1).

Revealing Telematics

A couple of insurtech companies are looking to get away from credit-based insurance scoring by relying more on telematics data. Root Insurance has committed to eliminating credit-based insurance scoring for rating by 2025 to reduce what it calls "unfair discriminatory biases" in insurance rates.

Lemonade will use "a continuous stream of data" in lieu of proxies, said Yael Wissner-Levy, the insurtech's vice president of communications, in a November 2021 news release announcing the company's purchase of Metromile.

These proxies, she wrote to *Actuarial Review* in an email, are age, gender, marital status and profession. "To be clear, Metromile does use those proxies at the moment, but their architecture underweights them already, and over time, should do away with them entirely," she explained.

However, some telematics measures could be considered discriminatory. Tracking time of day, for example, could be regarded as unfair to blue collar workers who are more likely to be working at night and thus driving at more risky times, Mosley said. When a person drives was considered less fair than credit scoring, according to the Kiviat study.

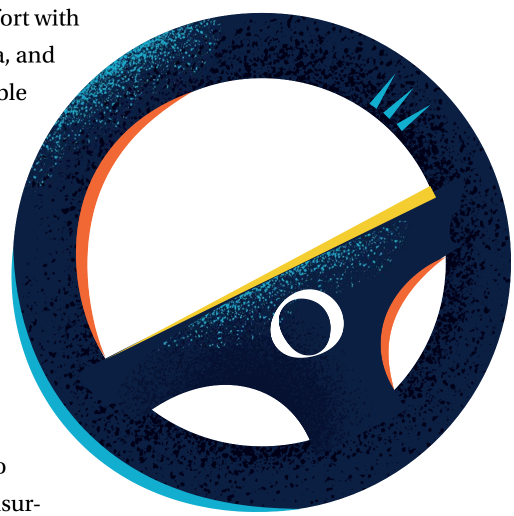
According to an October 2021 *Consumer Reports* article, "What You're Giving Up When You Let Your Car Insurer Track You In Exchange for Discounts," nine out of the 10 insurers' telematics programs included in the article, including those of Allstate and USAA, track time of day. All 10 insurers track hard breaking. Six monitor distance and phone use. Five record speeding and accelerating. Insurers also vary on data use.

Telematics-based insurance is still evolving and is relied upon by nine out of the top 10 personal auto carriers for collecting data for their telematics programs, observed Ryan McMahon, vice president of strategy at Cambridge Mobile Telematics. Soon, data "is going to be more contextual with better sensors, revealing better granularity of risk," he explained. For instance, telematics can now track whether a driver is distracted not from holding a smart device but from touching it.

Despite the presence of telematics for well over a decade, driver adoption has been slow. Depending on the study, many drivers are not aware of it or do not know what it is. A survey by J.D. Power released in June 2021 reports that 16% of respondents are using telematics and 34% of auto insurance customers are willing to try usage-based insurance.

However, telematics can also lead to premium increases, (see "Getting Personal — Can IoT do for Homeowners Insurance What Telematics Did for Auto Coverage?", *AR*, May/June 2021). Although the *Consumer Reports* article is positive about the potential for basing premiums on how people drive instead of "biographical details" such as location, the article also expresses concerns about consumer privacy.

Some consumers and actuaries share concerns about personal data privacy. Sixty percent of the youngest generation of drivers, known as Generation Z, feel some discomfort with sharing location data, and 45% are uncomfortable sharing driving data, according to a survey conducted by The Zebra in 2021. The elder Gen X age group (45 to 54) is more likely to understand what telematics is but are the most unwilling to select a telematics insur-



ance policy. Millennials tend to be more comfortable with sharing data, but not by high percentages.

"Some concerns include unwanted and illegal surveillance by government or corporate entities, use of personal data for predatory practices, and repeated breaches of security of credit card and financial institutions' financial data," said Louise Francis, president of Francis Analytics and Actuarial Data Mining. "[This] suggests [that] many collections of personal data are not secure," she said.

McMahon offered that one way to promote trust in sharing data is for telematics companies to be more transparent. "We have consistently seen that consumer trust is built by showing drivers what constitutes risk, how that data is used and how it is not used," he said. "Consumers need to know how to reduce their risk and that data is limited to a specific use."

Conclusion

Developing fair rates requires a sensitive balance between multiple rating factors to assure fairness to policyholders while helping insurers achieve business goals.

Insurers rely on actuarial soundness to assure rates are fairly discriminatory to all policyholders, regardless of how they are divided into groups. Assigning individuals to clusters of socioeconomic similarity can be fraught with unfair assumptions. Even if it were possible to base rates on a person's character, the algorithm could be unfair.

Since actuaries are intimately acquainted with rating factors and the data behind them and are required to uphold the highest standards of professional independence, they should have a greater voice in the rating variable conversation. ●

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ETHICAL ISSUES

The Professionalism Discussion Continues

By MICHAEL SPEEDLING AND KENNETH HSU, MEMBERS OF THE CAS PROFESSIONALISM EDUCATION WORKING GROUP

In the September/October 2021 issue of *Actuarial Review*, we published an Ethical Issues column ("I am Confused? Which Actuarial Standards Apply to Me?") covering the requirements of a CAS credentialed actuary performing work for a client or employer in Canada. We researched and referenced the Canadian Qualification Standards, the Cross-Border Discipline Agreement between the Canadian Institute of Actuaries (CIA) and the U.S.-based organizations, and the CIA Standards of Practice. We drew our conclusions from our interpretations of these references.

But, to quote Robert Burns, "The best laid schemes o' Mice an' Men. *Gang aft agley*," or to translate from Scottish, "The best laid plans of mice and men can still go wrong."

Since the article appeared last fall, we have been made aware of additional considerations and possible interpretations by our Canadian colleagues. We are pleased that our article has been the catalyst for spirited discussion and even more pleased that people read our articles!

We are in the process of gathering, evaluating and responding to the feedback we've heard. If you'd like to join the conversation, send an email to ar@casact.org with "CIA professionalism requirements" in the subject line. We intend to provide a follow-up article with clearer practical strategies in a later issue. Stay tuned.

Actuarial Evolution: Climate Risk is Our Next Frontier

By RADE MUSULIN

When I first considered joining the actuarial profession after finishing university in 1979, I expected to be working on ratemaking and reserving, hopefully moving on to a senior position after spending my actuarial student years as a human spreadsheet. For those of you too young to remember, there was a time before Lotus (later Excel) spreadsheets, smartphones and the internet, when actuarial students spent most of their time multiplying and dividing numbers using a Hewlett-Packard calculator and recording the results with a pencil on a green sheet of accounting paper. I dreaded my boss having me change a number late in the day, necessitating a lot of erasing and recalculating.

When spreadsheets came on the scene, I feared for my job as they could do in milliseconds what took me hours to do. This fear turned out to be unfounded, for the profession vastly increased its scope through many waves of automation and the development of exciting new techniques. Actuaries expanded roles in capital management, enterprise risk management, extreme events (through catastrophe modeling), big data and much more. We are fortunate to belong to a dynamic profession that has been reinventing itself to tackle new challenges throughout my entire career.

Today the world is embarking on a journey to decarbonize its energy systems and use more sustainable practices. Actuaries have the potential to play an important role in this process. Opportunities will arise for three primary reasons: Almost every aspect of economic activity will be impacted, many of our insurance specific work products will be affected, and we have relevant skills. As a bonus, working in this space will offer rewards for those who want to make a positive social impact by helping tackle myriad problems — and opportunities — represented by climate risk.

Change is inevitable; resistance is futile

The scientific community has achieved an increasing degree of consensus on the challenges facing Earth's climate. The recently released International Panel on Climate Change (IPCC) 6th Assessment report,[1] compiled by 234 authors from 65 countries, laid out several clear conclusions. At the CAS Annual Meeting, Dr. Linda Mearns of the National Center for Atmospheric Research, who was one of its lead authors, outlined these points:

- Recent changes in the climate are widespread, rapid and intensifying. They are at levels not seen in thousands of years.
- It is indisputable that human activities are causing climate change. Human influence is making extreme climate events, including heat waves, heavy rainfall and droughts, more frequent and more severe.
- Climate change is already affecting every region on Earth in multiple ways.
- Unless there are immediate, rapid and large-scale reductions in greenhouse gas emissions, limiting warming to 1.5°C will be beyond reach.
- To limit global warming, strong, rapid and sustained reductions in carbon dioxide, methane and other greenhouse gases are necessary.

At the recent COP 26 meeting in Glasgow, nations pledged to act to reduce emissions. Regardless of whether governments act, however, other forces are driving the world to decarbonize. The cost of renewable power has been dropping rapidly, and many countries are using renewables to generate substantial proportions of electricity. For example, in November 2021 solar power met more than half of Australia's electricity demand for several hours.[2] In 2020 renewables represented 38% of the European Union's electricity, exceeding the 37% generated by fossil fuels.[3] Technological advances in a wide range of products, including batteries and hydrogen, promise to further drive affordable alternatives to fossil fuels in years to come.

Investors are increasingly demanding that companies disclose their carbon footprints and act to become more sustainable. In his 2022 CEO letter, BlackRock's Larry Fink wrote:[4]

> "It's been two years since I wrote that climate risk is investment risk. And in that short period, we have seen a tectonic shift of capi-

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[1] https://www.ipcc.ch/assessment-report/ar6/
[2] https://reneweconomy.com.au/solar-powers-more-than-half-of-australias-grid-for-first-time-coal-at-record-low/
[3] https://ember-climate.org/project/eu-power-sector-2020/
[4] https://www.blackrock.com/corporate/investor-relations/larry-fink-ceo-letter

tal. Sustainable investments have now reached $4 trillion. Actions and ambitions towards decarbonization have also increased. This is just the beginning — the tectonic shift towards sustainable investing is still accelerating … Every company and every industry will be transformed by the transition to a net-zero world. The question is, will you lead, or will you be led?"

These are but a few quick examples among many that change is coming and nothing, including the huge resources of the fossil fuel lobby, is going to lead us back to the old ways of powering our economy.

Financial services will be a key part of that, and actuaries' work will be affected.

In the financial services industry, regulators around the world are increasing requirements for disclosure of climate-related risks and its inclusion in enterprise risk management frameworks. The Financial Services Board Report on Promoting Climate Related Disclosures says:[5]

"… there is a strong focus across the majority of jurisdictions on implementing climate-related disclosures . . . with a large majority of jurisdictions setting or planning to set requirements, guidance or expectations for both financial institutions and non-financial corporates."

Actuaries can play an important role in helping firms with reporting under frameworks like the Task Force on Climate-Related Financial Disclosures (TCFD), such as in risk assessment and measurement, as well as internal metrics settings to monitor and formulate strate-

Case study: Compound effects

In December 2021, a tornado outbreak in Kentucky killed 74 people and caused massive property losses. It was one of the most severe December events in history, reflecting abnormally high temperatures and unusual jet stream patterns. It was one of several extreme events affecting the U.S. in 2021, such as the Texas cold spell (Winter Storm Uri) in February and unprecedented heat in the Northwest in June.

At the same time, lumber, a key component of home construction and rebuilding, hit $1,700/thousand board feet, far above its historical range of $300-$400. A recent article in *The Atlantic* magazine[1] points to climate-related drivers for this increase, including beetle infestations and extreme fires as well as floods in timber-producing regions in Canada.

While it is not certain these incidents are directly related to climate change, they are examples of compound events that can affect insurers and the uncertainty that climate risk can pose. An actuary working for an insurer underwriting homes in Kentucky could consider the following:

- Is the likelihood of extreme tornados changing from historical norms?
- Is the cost of rebuilding being affected by high lumber prices?
- Are these random unusual events or part of a long-term trend?
- Are catastrophe models used to manage extreme event risk still accurate?
- Is my reinsurance program sufficient?
- Do I need to adjust rates to reflect these trends?

[1] https://www.theatlantic.com/science/archive/2022/01/why-climate-change-pushing-lumber-prices/621288/

[5] https://www.fsb.org/wp-content/uploads/P070721-4.pdf

gies for managing risk and pursuing opportunities.

We have useful skills, but need more.

Climate risk and moves towards sustainability will also affect actuarial work in many ways, including:

- Assessing how changes in the frequency and severity of extreme events will affect pricing, capital requirements and reinsurance needs, among others.
- Understanding how new products, such as electric vehicles or rooftop solar panels, will change loss patterns and repair costs.
- Identifying how prices may change as the economy transforms, affecting most components of insurance coverage, including replacement costs for buildings.
- Evaluating the firm's risk from climate change for financial condition reports or risk management.
- Managing significant changes in insurer investment practices.
- Targeting new products and services at changing demographics as customers and their needs change.

In November 2020, the Actuaries Institute of Australia published "Climate Change — Information Note for Appointed Actuaries,"[6] which provides a useful summary of the ways actuarial work may be affected by climate risk, including sections specifically targeted at general insurance (property-casualty), life and health.

Actuaries are well-suited to play an important role in climate risk and sustainability. Firms' responses to shareholder expectations and regulatory requirements will be based on risk and risk assessment, our core strengths. Our models, such as economic capital and catastrophe models, can be repurposed to address climate challenges. Our skills in big data can help firms navigate the complex analysis of things like demographic changes or carbon footprints in supply chains. Our numeric skills can help with the development of new metrics to measure decarbonization.

Some specific things firms need include the following:

- **Education and guidance,** with an emphasis on understanding how climate risk may affect their organizations.
- **Assistance with synthesizing the vast amount of information** on climate risk into actionable intelligence.
- **Physical risk assessment** for relevant perils, such as how hurricane patterns will change.
- **Transition risk assessment** for their markets, investment portfolios and operations.
- **Processes** to embed climate risk into the overall risk management framework.
- **Reporting** to various stakeholders.
- **Measurement of emissions** for their business.
- **Strategies** for product design, pricing, underwriting, reinsurance, technologies, etc.

To provide these services, actuaries will need to augment the skills traditionally acquired in our training with disciplines, such as natural perils, climate modeling, macroeconomics and social science. We will also need to work in multidisciplinary teams, where we will not be the only subject matter experts in the room. Data will come from external sources instead of the insurance-specific information (such as premium and losses) we are accustomed to dealing with. And since the future may not resemble the past, we will need to place greater reliance on scenario building.

Up Your Climate and Sustainability Game

Please see these resources to learn more about climate change and sustainability:

- Institute and Faculty of Actuaries (U.K.) Sustainability Hub
  https://www.actuaries.org.uk/about-us/sustainability-hub
- Actuaries Institute (Australia) Climate Risk Resource Center
  https://actuaries.asn.au/microsites/climate-risk-resource-centre
- The Task Force on Climate-Related Disclosures Knowledge Hub Learning modules
  https://www.tcfdhub.org/online-courses/

[6] https://www.actuaries.asn.au/Library/Standards/MultiPractice/2020/INCCFinal121120.pdf

Actuarial organizations around the world are gearing up to help their members upskill in this area. The CAS has launched a Climate Change Resource Library,[7] which includes recordings of climate risk sessions at recent meetings. The CAS is hosting the 2022 Climate Risk Seminar virtually. The Institute and Faculty of Actuaries in the U.K. and the Actuaries Institute in Australia are beginning to discuss adding climate topics to examinations. The International Actuarial Association has been producing a series of papers on climate risk and is working with the IPCC to produce a "Summary for Actuaries" of the 6th Assessment Report. Many resources are available to actuaries to learn more about climate and sustainability (see "Up Your Climate and Sustainability Game").

Another phase in our evolution

Climate and sustainability represent another great opportunity for our profession to evolve and grow. The demand for services in this area is increasing exponentially and many other professions are clamoring to provide service. We have unique skills, a strong reputation for providing unbiased advice, recognized standards and great professional organizations like the CAS backing us. I feel fortunate to have chosen a profession which has been able to evolve alongside us, and am glad I persevered through the human spreadsheet phase to have participated in many of its changes.

Rade Musulin, ACAS, MAAA, CCRMP, is a principal at Finity Consulting in Sydney, Australia, specializing in natural perils and climate risk. He serves as convenor of the Actuaries Institute Climate Risk Working Group and chair of the International Actuarial Association's Resource and Environment Virtual Forum. He was vice president-casualty for the American Academy of Actuaries from 2016-2018.

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7 https://www.casact.org/publications-research/research/climate-change-resource-library

IN MY OPINION By J. ROBERT HUNTER

Transparency, Conflicts of Interest and Bias — What Should be Done?

Members of the Casualty Actuarial Society, like me, want our Society to be viewed as an organization of the highest professional and ethical standards undertaking the tasks of education and accreditation of professional casualty actuaries. This goal requires that the CAS be a trusted source of unbiased professional analysis of important questions pertaining to actuarial matters — a trust that must be continually earned and renewed.

In December 2020, when the CAS rescinded the "Statement of Principles Regarding Property/Casualty Insurance Ratemaking" (SOP on ratemaking) without warning to its own members, regulators or the public, trust in the Society's leadership was diminished. The protests — about substance and process — from regulators, consumer stakeholders and CAS members to the sudden action led the CAS to reverse itself and reinstate the ratemaking SOP in May 2021.

Former CAS President Stan Khury's thoughtful commentary, "Undivided" (*Actuarial Review*, November-December 2021), makes the point about members not being sufficiently involved in certain key leadership decisions. His proposal to develop a process similar to the Actuarial Standards Board to rectify this problem is worthy of deep consideration by the CAS.

The episodes to which Khury points illustrate why the Society must improve its procedures to prevent flawed decision-making and actions. But the need for reform extends beyond just involving members more completely in decision-making. I have identified four areas where CAS decision-making should be reengineered and made more accountable, not only to the members but to regulators and the public.

1. Transparency and representation issues

Not fully informing members was only part of the problem with the events Khury describes. There are key structural issues with the CAS that need to be addressed:

- There should be more public meetings of the board, perhaps on Zoom, and fewer non-public meetings.
- The CAS should increase representation of non-industry members and include more diverse members, such as consumer group and regulator representatives, on committees and task forces.
- All major CAS proposals should be published in advance with an opportunity for comment by members and regulators.

Also, the CAS should broaden the availability of minutes and agendas to members to include key documents mentioned therein. In the SOP on Ratemaking matter, I found it impossible to track what was going on when, for one of several examples, the minutes mentioned an analysis of the current value of the ratemaking SOP, but Board agenda material is not available to members.

2. Conflicts of interest

The volunteer system of committee selection at the CAS invites a serious problem if conflicts of interest go unchecked. Some of the participants who volunteer for committees deal with subjects in which their employers have a large stake in the outcome. For instance, the chair of the working party on price optimization was in charge of implementing price optimization at one of the nation's largest personal lines insurance carriers. Earlier in my career, in the 1980s, I had a similar experience before the U.S. Congress at a hearing addressing medical malpractice issues, when the chair of the CAS working group who was testifying worked for medical malpractice insurance interests. Industry can speak for itself, and the CAS needs to vet volunteers to avoid conflicts of interest when members speak on behalf of the Society. At the very least, the CAS should require that each volunteer's complete CV accompany any statement made to regulators, legislators or the public.

3. Educational materials

I have not done a full analysis of materials on the syllabus, but without looking very hard I found reason to be concerned. For example, learning objective 6 for Exam 5 in the materials required for study to become an Associate member provides only one study reference: Chapter 13 of "Basic Ratemaking," the first edition of which was written by two actuaries from the consulting firm EMB; subsequent editions were produced when the authors were employed by Willis Towers Watson. The copyright for the book is in the name of the CAS although produced by an industry source working for insurers. (Editor's note: The CAS conducted a rigorous request for proposal process for writing "Basic Ratemaking," which is in its fifth edition. The CAS Syllabus Committee reviewed proposals and selected the writers.)

Learning objective 6 states: "Describe, analyze, and validate the considerations *beyond the calculated cost-based estimate* of the rate when selecting a final rate change to implement" (emphasis added). Among the items the student is to study is price optimization. While the text clearly states that regulatory considerations apply, I cannot find any mention of the CAS SOP on ratemaking's cost-based final rates principle, potentially misleading students into thinking the CAS endorses price optimization rather than disfavoring it, as we do under the ratemaking SOP. I strongly suggest that the CAS Syllabus and Examination Working Group add this disclaimer to the Exam 5 Syllabus, if not appending it to the Ratemaking text.

The study materials should be peer reviewed by not just by CAS members but by professors and other qualified independent professionals with perspectives that are broader than the insurance industry point of view. Students should be taught to systematically ask themselves the question, "How does my work as an actuary impact my insurer employer and, also, how does it impact the insureds purchasing this product?"

I highlight the training piece, because, as an actuary who moved from industry work to public service, I know that there were elements of my actuarial training that did not properly prepare me to be an actuary working for the interests of consumers of insurance.

My personal revelation might be informative: In the early 1970s, I went to Washington, D.C., as chief actuary of the Federal Insurance Administration. When I got my first paycheck, it said, "The people of the United States Pay to: J. Robert Hunter…." When I read that, it was a deeply moving, life-changing moment. I thought to myself, "Now I have to think about insurance from the people's perspective." From that viewpoint, I found several questionable aspects in what I had been taught.

4. CAS statements on politically charged issues

The CAS sometimes issues comments on political issues that go beyond education and wade into advocacy for a position. For example, the CAS worked with the industry-based Insurance Information Institute on an Educative Statement. The document, "Insurance Rating Variables: What They Are and Why They Matter," I believe was intended to fend off consumer groups' attempts to reform the use of socioeconomic rating factors in auto insurance that could make auto insurance unaffordable for many poorer persons and that are often surrogates for income and race. The paper did not even mention the rating factors at the center of the issue, such as education, occupation, homeownership and other socioeconomic characteristics. The paper left me with the impression that the consumer groups wanted to remove driving-related factors such as accidents, tickets and miles driven. That was inaccurate and seemed designed to mislead.

I believe that there are important public policy debates that touch on issues of concern to actuaries, but the CAS needs to have a better process to ensure that it is not drawn into making sweeping statements in the midst of a political debate, particularly when those can be seen as slanted toward industry positions rather than issues related to the profession itself.

I am deeply committed to the health and independence of the actuarial profession. While many of us work for insurance companies, many of us do not, and, more importantly, the work all of us do has an impact that extends far beyond whomever employs us. This is why I feel that it is so important to press for self-reflection at the CAS.

I encourage the CAS to identify and implement procedural changes to address problems such as those mentioned above. Reforms would make a repeat of the statement of principles affair much less likely. They would also demonstrate that action is being taken to strengthen our Society with respect to our position as a truly independent professional and ethical organization. ●

J. Robert Hunter, FCAS, is insurance director emeritus at the Consumer Federation of America. He served as federal insurance administrator during the administrations of U.S. Presidents Ford and Carter and as Texas insurance commissioner.

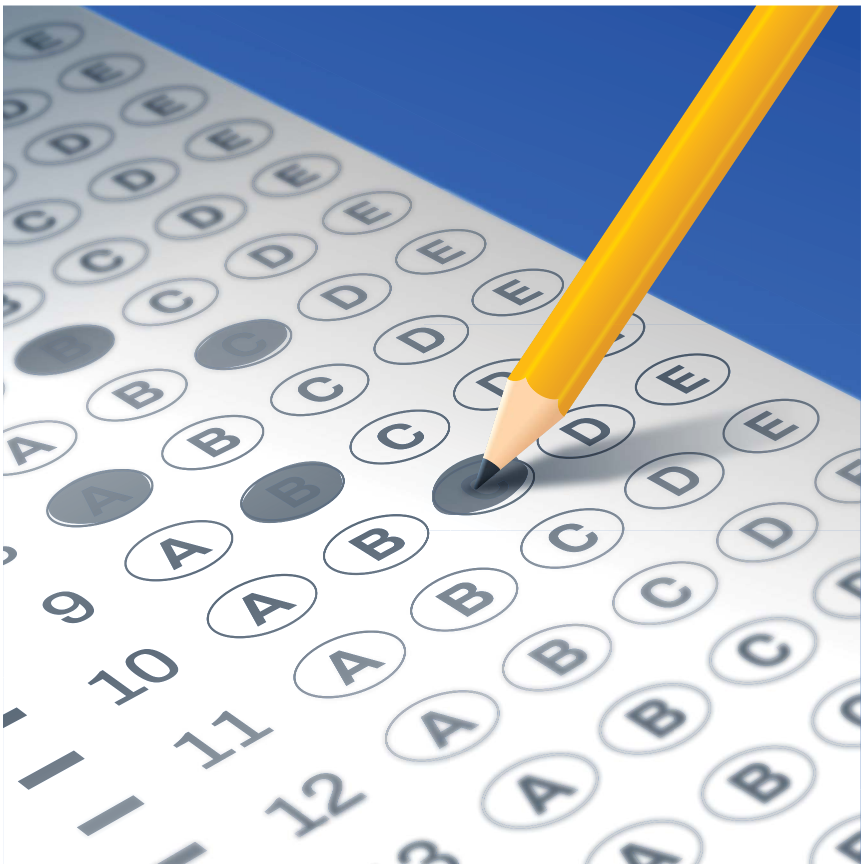
IT'S A PUZZLEMENT By JON EVANS

An Equitable Pass Curve

Professor Mannboltz (who previously appeared in the July/August 2019 Puzzle column) has been contracted by a testing service once again. This time the problem is an inequitable outcome for another standardized test *T*. Scores on *T* range continuously from 0 to a maximum of *M*, where $M > 0$. Ten percent of all test takers pass by scoring at or above the pass score *P*. Of all test takers, 80% belong to group *G*1 and the remaining 20% belong to *G*2. However, only 2% of those who pass *T* belong to *G*2. Mannboltz has been tasked to estimate separate pass scores, *P*1 for *G*1 and *P*2 for *G*2, which would still result in an overall pass rate of 10% for *T* but would also result in 20% of those who pass *T* belonging to *G*2. Due to various privacy laws, Mannboltz is given no other statistical information about the test — not even the numerical values of *M* and *P*. He must state his estimates for *P*1 and *P*2 as formulas including *M* and *P* as unknown inputs. What estimation formulas do you think he produces?

Proof of Crypto Mining Work

This puzzle was to find a number (a



"nonce") that, when appended to "Casualty Actuarial Society," results in a SHA-256 hash with at least 20 leading binary 0s (same as at least five leading 0s in hexadecimal representation), or equivalently smaller than 2^{236}.

Jordan Bonner submitted the nonce 7180096807, which results in nine leading hex 0s and 37 leading binary 0s in the hash value of: 0000000004e11d-3163164d3485ad2588f56eda-9630c71405acf23f004c9060f9.

Mike Convey submitted the nonce 6517fb2e4, which results in nine leading hex 0s and 36 leading binary 0s in the hash value of: 000000000fe517e-99bbed66b8ca53bea56d9b06e-097d8292e1829af86e10f19e.

Shyam Bihari Agarwal, John Berglund, Eamonn Long, Stephen Mildenhall and William Volterman also submitted solutions.

Know the answer? Send your solution to ar@casact.org.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