

actuarial REVIEW

VOL 49 / NO 6 / NOVEMBER-DECEMBER 2022

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**School Ties: Olson Connects
with Students through
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CAS Trust Scholarship Winners — Where They Are Now

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editor'sNOTE By ELIZABETH A. SMITH, AR MANAGING EDITOR

Volunteers Get it Done

It's become an *AR* tradition with the last issue of the year to honor our volunteers and the tremendous work that they do for the organization. But we don't want to forget the employers who support the work of our volunteers. For that we thank them.

This issue is extra special in that our own Editorial-Production Manager Sarah Sapp interviews CAS member Erin Olson, who tells all about the University Engagement Advisory Working Group. The UEAWG concentrates on the crucial first element of the pipeline to grow the CAS membership. It hardly seems like work to hear Olson tell it, however. If you'd like to see the taped interview between the two, please check out the *AR* Web Exclusives page. Another *AR* print and Web Exclusive combo features the CAS Director of Professional Education Dave Core interviewing Amy Juknelis, who completed her three-year term this November as vice president-professional education.

We are excited to be offering more videos on the *AR* website and would be remiss not to credit the pioneering efforts of our outgoing CAS Board Chair Jessica Leong. President Leong got us started with her award-winning video

series of interviews with inspiring actuaries, and *AR* is not looking back. Thank you, Jessica Leong!

Promising future

For 20 years, the CAS Trust has given promising students scholarships to pursue the actuarial profession. There is no guarantee that a scholarship recipient will follow the actuarial path, but in this issue, we tracked down some of these recipients who became or are on their way to becoming actuaries. Besides the career, there's a familiar theme of dedication in their journeys.

Also in this issue, Kathy Antonello writes her last column as CAS President, which also serves as her presidential address to the membership. Although CAS Presidents are all very different, they share one important attribute: their commitment to and hope for the profession. Antonello reminds us of the terrible workplace conditions and the stark societal need that formed the basis of the Casualty Actuarial Society. Even though the impediments may have seemed insurmountable, actuaries have always faced obstacles and used their insights and expertise to solve problems and transform situations. ●

Actuarial Review welcomes story ideas from our readers. Please specify which department you intend for your item: Member News, Solve This, Professional Insight, Actuarial Expertise, etc.

SEND YOUR COMMENTS AND SUGGESTIONS TO:

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Change is Hard

Socrates once said, “The secret of change is to focus all of your energy not on fighting the old, but on building the new.” But change is hard.

A quick internet search will reveal the top stressors in a person’s lifetime, and they’re all related to change — grieving the death of a loved one, starting a new job, moving to a new city and so forth.

We were born from change

But the CAS was born out of change — 108 years ago. That’s a long time, and we’ve successfully navigated a lot of change since then. For instance, think of how insurance has changed over that period.

Back in 1911, a tragedy in Manhattan known as the Triangle Shirtwaist Factory fire brought awareness of the need for workers’ compensation insurance. To make this new line of business a reality, a group of very smart statisticians, using very little data, determined base rates for workers’ comp and formed a Society to publish research that would build upon and improve their work. Over the next century, the CAS expanded quickly, and we put our unique skills to work to help the world protect its homes, automobiles and businesses. Really intelligent people know how to adapt and know that you have to move forward or risk being left behind.

Move forward but maintain the secret sauce

We’ve done just that for over a century, and we will continue to move forward and, as Socrates said, “build the new,” thoughtfully and carefully. We will con-

tinue to position ourselves as that group of very smart statisticians using very little data to quantify risk. Of course, the tools and techniques will change, and the lines of business will evolve, but the CAS will always be relevant if we adapt

which has allowed us to navigate change, thrive and grow for over a century.

A 100-year-old message rings true

So, I will end my term as president

Back in 1911, a tragedy in Manhattan known as the Triangle Shirtwaist Factory fire brought awareness of the need for workers’ compensation insurance.

while not losing sight of what’s important to our members. These are the ingredients of our secret sauce:

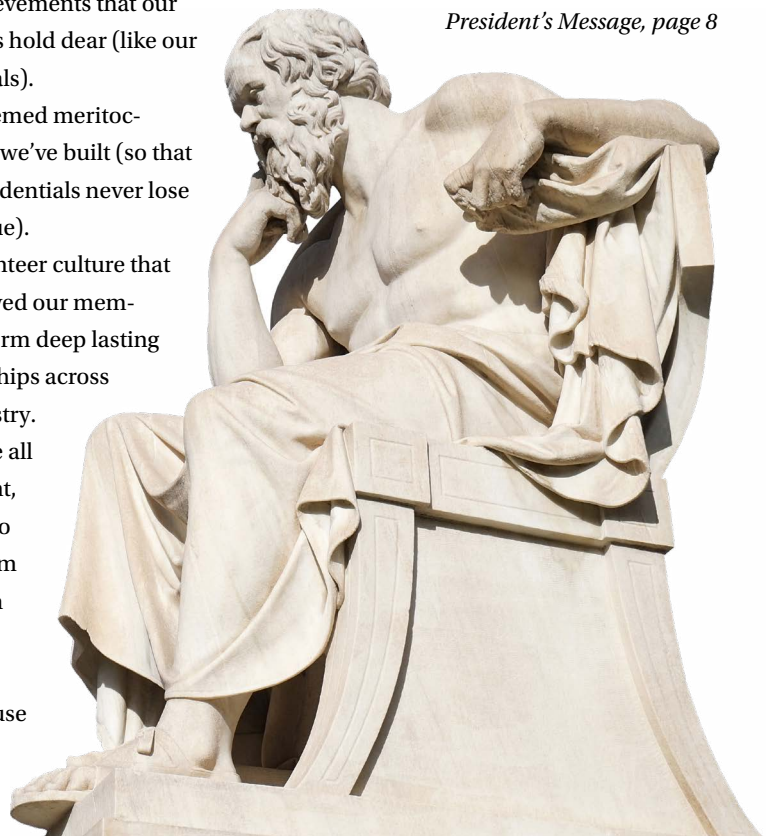
- The traditions that our members cherish (like grading exams).
- The principles that our members stand for (like the Ratemaking Principles).
- The achievements that our members hold dear (like our credentials).
- The esteemed meritocracy that we’ve built (so that those credentials never lose their value).
- The volunteer culture that has allowed our members to form deep lasting relationships across the industry.

These are all very important, and we have to recognize them and give them the care and feeding they deserve because they are our secret sauce,

and this President’s Message with the thoughts of I.M. Rubinow, the CAS’s first president. He delivered this message in 1924 when the CAS was celebrating its 10th anniversary, and the words, after so much change has occurred, continue to ring true today:


... Insurance organizations of all

President’s Message, page 8



DON'T STAY UP LATE SETTING RESERVES.

(UNLESS THAT'S YOUR THING.)

A man in a dark shirt and glasses is sitting at a desk in a dark office, working on a computer. The office has large glass windows and a green exit sign is visible in the background. The scene is dimly lit, with the primary light source being the computer screen and some ambient office lights.

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President's Message

from page 6

types, whether private, mutual or State, have derived a tremendous advantage from the organization and work of the Casualty Actuarial Society. Whether this advantage has expressed itself in higher profits or larger dividends, or lower rates, is immaterial. These advantages have not been paid for, no payment has been exacted. In a true scientific spirit, the Society has remained, and I hope always will remain, an organization of individual professional workers and scientific students. Actuarial science is a legitimate and important aspect of social, as well as of mathematical science. The method of approach in this branch of scientific inquiry will always remain primarily a statistical one, for insurance to a very large extent is the very embodiment of practical applications of the statistical method. May I, therefore, conclude with a plea for the preservation of statistics as such, if not in the name, at least in the spirit of the Casualty Actuarial Society? ●

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.

Board Transparency and Social Inflation

Dear Editor:

Thank you for an excellent edition ([AR September-October 2022](#)). I found it very informative and have comments on the following items: I commend the movement to greater [transparency](#) to CAS members regarding CAS Board discussions and actions. Having served on a town Board of Education, I've seen how having a public and transparent discussion eases the concerns of affected parties and sometimes can lead to more thoughtful analysis by the policy makers. On the discussion of [social inflation](#), I am concerned that many involved in the analysis don't consider the split between economic and non-economic damages. Having served on several civil juries, I was made aware of the timing of the purchase of goods and services (i.e., economic damages) related to an injury/accident versus the timing of the final claim settlement or jury trial. Economic goods are purchased soon after the injury/damage, reflecting the price levels soon after the accident, while non-economic costs reflect the social inflation at the time of the settlement or payment. (No one is going to wait several years for the court case to settle before going to the doctor, fixing the car, or repairing the house.) Some of the social inflation analyses discussed assumed that the claim payments reflect the CPI level at the time of claim payment rather than the CPI level around the accident date. This is an erroneous assumption. It is important in such analyses to be aware of the split between economic and non-economic goods, and when the value of those goods is being set.

—Ralph S. Blanchard III, FCAS, MAAA

Exam Restructuring Proposal

Dear Editor:

We are writing in response to Michael Larsen's thoughtful "Proposed New Direction for the CAS Syllabus and Exams." (In My Opinion, *AR* September-October 2022) Overall, we favor the proposals, but we want to highlight one enhancement. Larsen's proposal for the content of Exam 9 is spot-on. There should be less finance and more actuarial topics. He recommends "that we use the existing readings from the current set of exams for the proposed Exam 9 readings." This recommendation ignores the evolution of risk theory over the last 25 years. Just as there have been enormous strides in statistics and machine learning algorithms, so has risk theory evolved substantially since most of the current syllabus was written. The syllabus does not mention coherent risk measures, and the readings do not provide a single definition of tail value at risk, to mention just two shortcomings. These shortcomings motivated us to write a unified treatment of risk and risk pricing, *Pricing Insurance Risk: Theory and Practice* (Wiley 2022). Our book is reviewed elsewhere in this edition. It was written with a view to becoming a unified text for the risk and return sections of Exam 9, replacing several existing readings, and we strongly urge its adoption.

—John Major, FSA, AFFI, and Stephen Mildenhall, FCAS, CERA, PhD, MAAA, ASA, CCRMP, CSPA ●

COMINGS AND GOINGS

Megann Kellom, FCAS, has been appointed chief operating officer at Tokio Marine HCC–Public Risk Group, a leading provider of insurance solutions for public entities. Kellom has more than 20 years of insurance industry experience. Most recently she served as president of the public entities group at Intact Insurance Specialty Solutions. Previously she held key executive and operational leadership positions including head of national operations, director of corporate affairs and actuarial director at Intact (formerly known as OneBeacon Insurance Group), as well as actuarial roles at Arch, Liberty Mutual and Safeco.

Stacy Blatz, ACAS, has been promoted to associate actuary at Acuity Insurance. Blatz started her Acuity career in June 2016 as an actuarial analyst. She has a bachelor's degree from Bradley University, where she majored in actuarial science–business and minored in

economics.

Michelle Cui, FCAS, has been appointed as actuarial P&C director at Willis Towers Watson (WTW) in its insurance consulting and technology business. In this role, Cui is responsible for contributing to the development of WTW P&C product and service offerings while also serving clients. Cui joined WTW from Zurich North America, where she served as vice president and actuarial director. Her career also includes actuarial and leadership roles at the American Association of Insurance Services and Allstate Insurance Company, specializing in pricing, predictive analytics and product development for both commercial and personal lines. Cui's experience in both advisory and insurance industry roles will be great assets in bringing value-add business solutions to WTW's clients.

John Bogaardt, FCAS, MAAA, has

been named WCF Insurance's first chief actuary. Bogaardt was previously the company's vice president of actuary and business intelligence. In his new role, Bogaardt oversees all actuarial functions for the company, including reserving and pricing practice areas. He has more than 18 years of actuarial experience. Prior to his time at WCF Insurance, Bogaardt was chief actuary of business insurance at Farmers Insurance and held various roles at Zurich Financial Services and Towers Perrin. ●

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

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on our social media
channels. Follow us
on Twitter, Facebook,
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Notice of Disciplinary Action — Expulsion of Ryan Patterson

Ryan Patterson has been expelled as a member of the Casualty Actuarial Society (CAS), effective June 30, 2022. The Discipline Committee Panel of the CAS, acting in accordance with the CAS Bylaws and Rules of Procedure for Disciplinary Actions and with consideration of the findings from the Actuarial Board for

Counseling and Discipline, voted unanimously to expel Mr. Ryan Patterson for materially violating Precept 1 of the Code of Professional Conduct (Code).

The charges against Patterson are related to a criminal charge and guilty plea of Mr. Patterson for aggravated criminal sexual abuse, a Class 2 Felony under Illinois state law. Mr. Patterson's

actions, by their very nature, damaged the reputation of the actuarial profession.

The 45-day period for Patterson to appeal the Panel's decision to the CAS Board of Directors expired without any communication from Patterson. ●

IN REMEMBRANCE

In Remembrance is an occasional column featuring short obituaries of CAS members who have recently passed away. These obituaries and sometimes longer versions are posted on the CAS website; search for "Obituaries."

William Nesthus "Bill" Herr Jr. (FCAS 1998)

1961-2022

William Nesthus "Bill" Herr Jr. died peacefully among his family. He was born in Youngstown, Ohio, to William and Joanne Herr. He moved to Toledo when he was young and attended St. John's Jesuit High School, where he was a National Merit Scholarship finalist and a successful varsity athlete in football, wrestling and track. Herr earned a degree in chemical engineering from Cornell University and taught math at his former high school while earning a Master's in Education at the University of Toledo. He also assisted with coaching several sports, including wrestling, track and football. His sharp analytical mind, unflagging work ethic and toughness helped lead the teams he coached to success, and he was at his happiest when he was prowling the sidelines as defensive coordinator. He married Eleanor "Ellie" Chamberlin in 1996, and they raised two children together. He was quiet but possessed a snappy wit and impeccable timing. He loved classic rock music, especially Bob Dylan, and sports, particularly wrestling and football. His undeniable intellect was matched by his sense of responsibility. He was a kind, tough, generous and fair person who worked hard to do the right thing, even if it was difficult or unpleasant. Preceded in death by his parents, Herr is survived by his wife; children, Elece and

Liam; siblings, Mary, Mike and Chris; his in-laws; and many extended family members.

James Crowley (FCAS 1960) 1929-2022

James H. Crowley, Jr. of West Hartford, Connecticut died at his home. Born in Macwahoc, Maine, he was the son of the late James and Laura (Pratt) Crowley. He moved to Connecticut as a teenager and was the valedictorian of the East Hartford High School Class of 1946. He received a B.A. in mathematics from Wesleyan University, an M.A. in economics from Trinity College and an M.S. in professional accounting from the University of Hartford. He was a U.S. Navy Veteran of the Korean War, serving as an officer in submarines. He continued as an active reservist until the end of the Vietnam War and retired as a Lieutenant Commander. He joined Aetna in 1955 as an actuarial trainee and was vice president of the tax department at the time of his retirement. He was a member of the American Academy of Actuaries and an affiliate of the Connecticut Society of CPAs. He is survived by his daughter, Anne C. James; son-in-law, Glenn Pilczak; three sisters, Madeline McGibbon, Patricia Jobs and Mary Crowley; a cousin, Lillian Harpin; a close friend, Marilyn Harmon; and extended family. He was preceded in death by a daughter, Lynn Pilczak; a brother, Terrence Crowley, and a sister, Nancy Wilde. ●

CALENDAR OF EVENTS

December 2, 2022

Trunk Show
Virtual

January 10-18, 2023

Technology, Innovation
and Insurance Seminar
Virtual

March 13-15, 2023

Ratemaking, Product
and Modeling Seminar
San Diego, CA

May 7-10, 2023

CAS Spring Meeting
Boston, Massachusetts

June 5-6, 2023

Seminar on Reinsurance
Philadelphia, PA

Visit casact.org for updates on meeting locations.

IN MEMORIAM

James H. Crowley (FCAS 1960)
1929-2022

William Nesthus "Bill" Herr Jr.
(FCAS 1998)
1961-2022

The CAS 2022 Employer Honor Roll

Now more than ever, the CAS is grateful for the support of employers that encourage their actuaries to volunteer their time and effort to the CAS.

Top Ten Employers and Organizations with the Largest Number of Members Volunteering

Liberty Mutual Insurance
Travelers
Allstate Insurance Company
Milliman
The Hartford

Intact Insurance Company
WTW
Zurich North America
USAA
Chubb

Large Employers with at Least 40% of Members Volunteering

Allstate Insurance Company
The Hartford
Milliman
Zurich North America

CNA Insurance Companies
Verisk Underwriting Solutions
EY

CAS STAFF SPOTLIGHT

Meet Katie Mulembe, Director of International Relations and Affairs

Welcome to the CAS Staff Spotlight, a column featuring members of the CAS staff. For this spotlight, we are proud to introduce you to

Katie Mulembe.

- **What do you do at the CAS?**

In April 2022, I took on the role of director of international relations and affairs, which means that I have the opportunity to connect all of our international efforts and enhance our strategy as we grow into a more global community. I work closely with many of our volunteers and international committees to develop outreach strategies that are relevant to the needs of specific international markets. Together with the other members of the international team, Country Manager-China Ran Guo and Asia Regional Director Bo Lin, we are working to strengthen our connections with members, candidates, universities and employers in Asia. We are also building relationships in emerging markets in Latin America and Africa. In the coming year, we have a variety of plans in place that will advance our strategic goals, such as working more closely with universities in Asia to strengthen their P&C curricula and participating in more than 20 international actuarial conferences and events. The one thing I'm most excited about is creating opportuni-

ties to strengthen our connections with our international candidates. I'm looking forward to talking with many of them one-on-one to learn more about why they chose the CAS and what challenges they face as they pursue their credentials. These relationships will help inform our international outreach strategy.

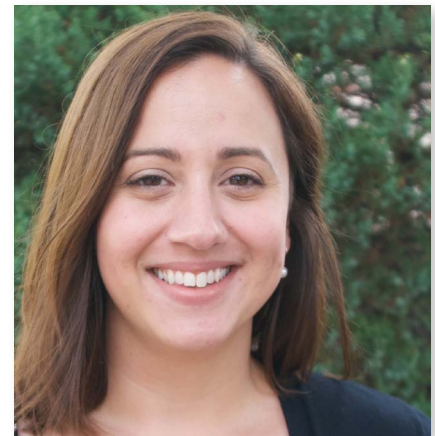
- **What inspires you in your job?**

What do you most love about your job?

I really enjoy how this position merges many of the skills I gained through past work and life experiences. I get to take on a variety of projects that use my skills in project management, cross cultural communication, marketing, recruitment and more. No two days are the same. I have also loved working with so many dedicated and inspiring volunteers who help us build key relationships and share our expertise with actuaries in emerging markets around the world.

- **Describe your educational and professional background.**

I earned a B.A. in Religious Studies from the University of Dayton. In 2020 I decided to go back to school and recently completed an M.A. in Transformational Leadership from Eastern Mennonite University. Professionally, I spent 13+ years working with a faith-based, non-profit association supporting inter-



Katie Mulembe

national and domestic volunteer programs. I had many responsibilities during my time there, including program management, grant writing and fundraising, board development and volunteer recruitment. I also have experience engaging in DEI work with organizations and universities.

- **What is your favorite hobby outside of work?**

This summer, gardening alongside my husband and our three-year-old daughter has been a new hobby. I also enjoy reading, knitting, live music and brewing the perfect cup of coffee.

- **If you could visit any place in the world, where would you go and why?**

I haven't traveled much since the onset of the pandemic, but I'm really starting to crave a vacation



at the beach. I once traveled to the island of Zanzibar, and it was the most beautiful and relaxing experience. I would love to go back.

- **What would your colleagues find surprising about you?**

Many people are surprised to learn that right after college I spent three years living in Zambia, where I worked with local initiatives sup-

porting children orphaned by AIDS and their communities. It was a transformative experience — I will be forever thankful for the lessons I learned and the friendships I gained there. My work kept me very busy, but I did find some time for travel, which included adventures like traveling on a bus across two countries, attending traditional

African wedding ceremonies and finding myself in close encounters with hungry baboons.

- **How would your friends and family describe you?**

I did a quick survey of a few close friends and family for this, and they described me as loyal, dependable, adaptable, creative and loving. ●

Companies Contribute Generously to the CAS Trust

The Trustees for the CAS Trust are pleased to announce that D.W. Simpson Global Actuarial Recruitment donated \$5,000 to the Trust in 2021 and \$10,000 in 2022, bringing the company's total lifetime contributions to \$245,000.

In addition to the recent D.W. Simpson contributions, CNA contributed \$15,000 and Red Mountain Technolo-

gies contributed \$6,500 to the CAS Trust.

Established in 1979, the CAS Trust is a non-profit organization that funds actuarial research and education. One of its most notable programs is the CAS Trust Scholarship, which aims to build students' interests in the P&C actuarial profession and to encourage the pursuit of CAS designations. The CAS Trust offers \$30,000 in scholarships each year —

four \$5,000 scholarships and four \$2,500 scholarships.

The CAS sincerely thanks our supporting companies for continued support of the CAS mission to advance actuarial science.

Inquiries and contributions to the CAS Trust should be addressed to the CAS's chief financial officer, Todd Rogers, at tr Rogers@casact.org. ●

Meet the Veep: Amy Juknelis, Vice President-Professional Education

By DR. SARAH SAPP, CAS EDITORIAL/PRODUCTION MANAGER

Amy Juknelis has questions. “How do we build skills of the future for our members?” “How do we prepare members with skills in predictive analytics, problem solving, soft skills and continued domain knowledge?”

These and other inquiries are what motivate Juknelis in her role as CAS vice president of professional education (PE). This CAS Fellow works with CAS staff and volunteers to implement the CAS Board’s vision and strategy for all aspects of PE.

The CAS prides itself on offering world-class professional education throughout its members’ careers by keeping them informed of the latest developments in actuarial science, technology, soft skills and more — and Juknelis is committed to this objective.

Building a competency-based professional education program is chief among her objectives.

Since the start of her term in November 2019, she has anchored her PE goals to the CAS Strategic Plan and has led CAS staff on how to ensure that PE offerings continue to provide effective benefits to CAS members. Juknelis will complete her term at the 2022 Annual Business Meeting in Minneapolis.

Building a competency-based professional education program is chief among her objectives. “It starts with the creation of a capability model that

communicates the knowledge, skills and attributes that actuaries must have to function professionally in our industry. It outlines those at various skill levels. It’s going to help us learn where we have gaps in our current education, so we can design and fill some of those gaps.” Juknelis has high hopes for developing this capability model as a planning tool for members. “We can help them figure out where most effectively to spend their continuing education time in order to grow their knowledge in their career,” she said.

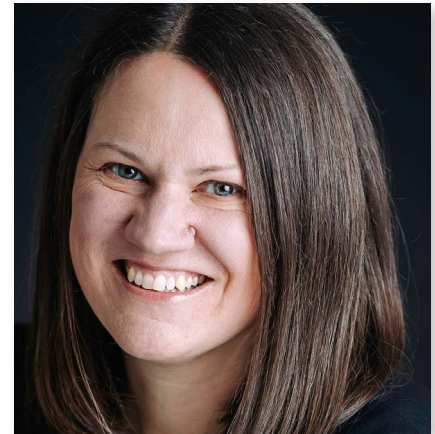
Juknelis is particularly excited about helping members build soft skills. “We’re working with some outside partners to build programs specifically for actuaries in communication and leadership, among others,” she said. These programs will leverage the experiences of

experts in these critical areas to produce applications specific for actuaries.

Overcoming obstacles

When Juknelis thinks back over her tenure as VP, she is most proud of the work that the CAS staff and volunteers put in to ensure that robust PE offerings were available during the pandemic, when in-person meetings were no longer feasible.

“Professional education is a critical component of what we do every year



Amy Juknelis

at the CAS and what we provide to members,” Juknelis said. “It’s critical to advancing our profession and meeting our requirements to issue statements of actuarial opinion. All our plans and models had to be thrown out the window in March of 2020, but teams worked so quickly to move seminars to virtual. We had to pivot when numbers changed, and now teams are standing up these hybrid models to allow participants flexibility in how they want to consume professional education. Not only did we have to pivot, but the teams also reacted to what could be — permanent changes in the way people consume education. No one would have predicted this.”

Becoming a volunteer

Like many members, Juknelis began volunteering after she got her Fellowship. She started by grading exams. It wasn’t long after that she moved on to Regional Affiliate leadership, spending four years

as the secretary/treasurer, vice president and president of the Midwestern Actuarial Forum.

Another opportunity to volunteer came about when she was working at Allstate. A coworker who was part of the CAS Ratemaking, Product and Modeling (RPM) Committee had planned to step back from volunteering and was looking for a replacement. "With the close tie of that work to what we do at Allstate, they asked for someone to replace them internally," said Juknelis. "I place a huge amount of value on continuous learning and development professionally and personally, so I was eager and happy to raise my hand for that opportunity."

Juknelis spent several years on the Planning Committee of the RPM Seminar, ultimately chairing it for a few years and then working to set up a few of the first microlearning offerings. After years of volunteering in leadership roles in the PE space, she became a natural fit for nomination for the VP role.

"I was just very interested in leading the group because of the large value I place on continuous learning and development," said Juknelis. "At Allstate, I rarely stayed in one position for longer than three years. I continually have this itch of, 'How do I keep growing and challenging myself with something new?'" She said that it can be easy to think about education as just something you need — that 30 hours every year to sign statements of actuarial opinion. "I think being really deliberate about developing ourselves is what keeps us

sharp, innovative and future-focused as actuaries," she said. "It allows us to continue to add value within society and the profession."

Becoming and being an actuary

Juknelis was drawn to the actuarial profession through her uncle who was an actuary. Her love of math spurred a major in the subject, alongside a major in computer science at a small liberal arts school in Illinois. She interned and worked full-time with State Farm for a few years in their auto actuarial business unit. She then moved to Allstate and has been with the company for nearly 20 years, working her way up to supervisor, manager and director, taking on different assignments in pricing for home, auto and commercial lines. After

“... Being really deliberate about developing ourselves is what keeps us sharp, innovative and future-focused as actuaries,”

branching out into broader product management, she now serves as vice president of Cross Line Management, designing cross-product strategies and capabilities and working to enable the delivery of the company's suite of products and services into the market.

Today, Juknelis feels compelled to continue her volunteerism with the CAS.

"I love to continue to push myself and develop, and this has been a great experience to do that," Juknelis said.

"Even though I'm not in the actuarial space, I'm eager to continue to stay connected, develop myself and give back."

Words of wisdom

Juknelis has some advice for fellow CAS members, the first of which is to focus on something you care about. "When you have passion for something, it doesn't seem like work to spend the time, and it shows up in what you deliver," she said.

She also advises keeping collective success in mind. "We're a really tight community of actuaries and staff, and we need each other to make meaningful progress," said Juknelis. "So build those relationships, work collectively across your teams and with the staff, and I think that makes a meaningful impact."

Her last piece of advice is to just say

"yes" a lot. "It's easy to pass up a volunteer role when it comes up, but if you say 'no' a lot, you find that people stop asking," she said. "Be ready when those roles come up, and when the VP role comes up and you have that opportunity, say yes to that one."

Visit bit.ly/CASJuknelis to watch Juknelis's full interview on the AR Web Exclusives page. ●

Mosley Awarded IABA Lifetime Achievement Award

The International Association of Black Actuaries (IABA) honored CAS President-Elect Roosevelt Mosley Jr., FCAS, MAAA, CSPA, with the IABA Lifetime Achievement Award at its annual meeting in New Orleans in September. IABA cited Mosley's newly appointed leadership position at CAS as a testament to the progress IABA and other affinity organizations are making towards a more diverse, equitable and inclusive actuarial profession.

Mosley is a principal and consulting actuary with Pinnacle Actuarial Resources and has been in the P&C industry since 1994. His skill set includes

predictive analytics applications for all insurance functions, ratemaking and product development, competitive analysis and litigation support. He has served as a member of the CAS/SOA Joint Committee on Inclusion, Equity and Diversity; the board of trustees of the Actuarial Foundation; and the CAS Public Relations Advisory Committee. He has also served as a member of the American Academy of Actuaries (AAA) Racial Equity Task Force.

"Affinity organizations like the IABA are continuing to grow both in numbers and impact," said Mosley. "Playing a role in a more equitable future for actuarial professions is a formidable and excit-

ing endeavor. Whether it be as the president elect of the CAS or as a former board member of the IABA, I'm proud of the progress we continue to make."

Ushering in its 30th year, IABA remains committed to increasing the number of successful Black actuaries through strong leadership and engagement across the profession. To learn more about IABA, visit www.blackactuaries.org. ●



CAS President-Elect Roosevelt Mosley Jr.

CAS Announces Winners of \$15,000 Hacktuary Challenge

By KATE NISWANDER, CAS DIRECTOR OF MARKETING AND COMMUNICATIONS

The Casualty Actuarial Society announced the winners of the first-ever [CAS Hacktuary Challenge](#), a contest designed to showcase the actuarial skill set in developing novel risk engineering solutions. Entrants were challenged to create an end-user application that would be actuarially grounded but address a risk management problem of relevance to a typical consumer. The challenge also required that all code for the application be made publicly available on the CAS's [GitHub site](#).

Because the quality of the submissions was so outstanding, the selection panel chose to award the prize to two submitters, Caesar Balona and Michaël Bordeleau-Tassile, FCAS, who will split the cash prize of \$15,000 and receive \$7,500 each.

Balona's entry, [Risky Router](#), al-

lows users to enter start and destination points to obtain a driving route that shows just how risky that path is. This estimate flexes based on weather conditions, time of day, year of the car, whether the driver is impaired and other factors.

Bordeleau-Tassile's entry, [Consumer Vehicle Toolkit](#), compares the insurance costs of cars by make, model, color and other factors to help the user decide which car they should buy next. In addition, it shows the places in Toronto and Montréal with the highest likelihood of vehicle collision and theft. Finally, it illustrates the way that time of year, time of day, road surface and other factors contribute to the risk of vehicular accidents.

"Both entries represent fantastic examples of how actuaries can use technology to bring risk management

closer to consumers," said CAS Research Actuary, Brian Fannin, ACAS, CSPA.

GitHub is the leading cloud-based, public platform for collaborative code development. Since the creation of the [CAS organizational GitHub account](#) in 2019, CAS members have added 25 projects that provide code for everything from chain ladder loss development in Python and individual claim simulation in R to construction of double lift charts and web scraping of COVID data and more. To date, over 2,000 code contributions have been made to the various projects on the CAS GitHub site.

Entries for the challenge were judged by a panel selected by the CAS Research Council. For questions regarding the challenge or the CAS's GitHub organizational account, please contact Brian Fannin at bfannin@casact.org. ●

Certify CAS CE Policy Compliance by Year's End

All Fellows and Associates need to certify their compliance with the CAS Continuing Education (CE) Policy's requirements by **December 31, 2022**. Members must certify compliance at the end of each calendar year as compliance with the [CAS CE Policy](#) allows the member to provide actuarial services in the year immediately following certification of compliance. This means that members should be attesting as to whether they have complied with their CE/CPD requirements during calendar year 2022 to be able to provide actuarial services in 2023.

If a member is practicing as an actuary, the member should indicate the proper [attestation](#) year as the year dur-

ing which they are able to practice after having met the prior years' necessary CE/CPD requirements. For example, members who completed their required CE/CPD requirements during 2022 will be able to provide actuarial services in 2023.

Note that even members who are *not* in actuarial roles should review the requirements, as CE compliance may still be required.

If members are not providing actuarial services, they must still attest within their CAS membership account. Members who do not provide actuarial services do not have to earn CE or meet the CAS CE Policy. The CAS CE Policy defines "Actuarial Services" as "Professional Services provided to a Principal

by an individual acting in the capacity of an actuary. Such services include the rendering of advice, recommendations, findings or opinions based upon actuarial considerations."



How to Certify Compliance

To certify compliance, members should [attest](#) for 2023 by December 31, 2022, by following these steps:

1. Go to www.casact.org.
2. Sign into your CAS member account by clicking on the "Login" tab at the top of the page.
3. Click on the "Profile" tab.
4. Under the "My Account Links," click on "My Attestation."
5. Click the "Add" button found in the upper right-hand corner.
6. Select attestation year "2023."
7. Under the "Compliance Attestation" field, select which statement applies to you.
8. Under the "Method" field, select the Recognized National Standard with which you are complying.

Members who do not certify their compliance or who do not indicate they are not providing actuarial services by **February 1, 2023**, will be shown as "Non-Compliant" under the Continuing Education heading of the membership directory on the CAS website. Members who are listed as Non-Compliant may be subject to further administrative penalties as determined by the CAS Board.

For more information on certification, visit the [Continuing Education Policy](#) webpage, review the [CAS CE Policy](#) or email ce-review@casact.org. ●

Should you certify compliance if ...

Circumstance	Answer
You recently became a new ACAS/FCAS member and are still taking actuarial exams?	YES , the time you spend in independent study for exams may be counted toward CE requirements.
You are an actuary working in a nontraditional area of practice (e.g., underwriter, risk manager, CEO)?	YES , actuaries in nontraditional areas may still be providing "actuarial services" as defined above.
You did not complete the relevant amount of CE/CPD needed for your chosen Qualification Standard or Requirement?	YES , even if members have not yet met their CE/CPD needed for their chosen Qualification Standard or Requirement, they must still attest. If actuaries attest as non-compliant, they may not provide actuarial services until they become compliant with their chosen Recognized National Standard. Actuaries may update their attestation at any time of the year to "compliant" once they have met the requirements.
You are no longer providing actuarial services?	YES , if you recently stopped providing actuarial services, you must attest this year. Members that attested "not providing actuarial services" last year and plan to continue not providing actuarial services in 2023 will not be required to attest again unless their status changes.
You are retired?	YES , members who are retired may still be subject to CE Policy. Only if you are not currently providing actuarial services, are you exempt from attesting on an annual basis and exempt from meeting the CE requirements. If you are retired but continue to provide actuarial services from time to time, you should attest appropriately and meet CE requirements.
You are an Affiliate of the CAS?	NO , you do not need to attest because Affiliates are not subject to the CAS CE Policy.

Expanding Globally

Expanding Globally: The CAS in Brazil

By RAFAEL COSTA, MEMBER OF THE CAS LATIN AMERICA REGIONAL WORKING GROUP

CAS Fellow Nicolás Vega and I joined more than 450 actuaries at the Brazilian Actuarial Congress on September 14-15, 2022. One of the largest events ever hosted by the Brazilian Institute of Actuaries, the São Paulo meeting's theme was "Actuarial Disruption."

Vega chairs and I am a member of the CAS Latin America Regional Working Group, and we represented the CAS as part of the effort to expand the Society's global presence. The CAS was also one of the sponsors of the Congress.

In the session titled "Innovation and Technology in the Actuarial Market," I talked about steps one can take to be an "actuary of the future," which is a movement inspired by a recent change to the CAS Envisioned Future, a concept that is also relevant throughout the world.

Many Brazilian actuaries showed strong interest in pursuing CAS credentials, despite having a few obstacles. Currently, there is little to no support from employers in terms of study hours



Latin America Regional Working Group Chair Nico Vega (left) and Rafael Costa (right) at the Brazilian Actuarial Congress "Actuarial Disruption" meeting.

or reimbursement for exam registration fees and materials, and taking difficult exams in a foreign language requires extreme dedication.

Actuaries are in very strong demand in Brazil. Some employers told CAS representatives that they are struggling to find and keep talent, especially now that remote work opportunities are abun-

dant. One of the main challenges facing Brazilian actuaries now is the implementation of IFRS 17, though unfamiliar to many actuaries in the United States, is a major topic in the international actuarial community. ●

Rafael Costa, FCAS, is an actuary partner at Cruise in Los Angeles.





Access More Qualified Applicants. Period.



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<https://careers.casact.org/employers/>

CAS Society Partners receive a discount on all Career Center advertising. **Learn more at**
<https://www.casact.org/advertising>

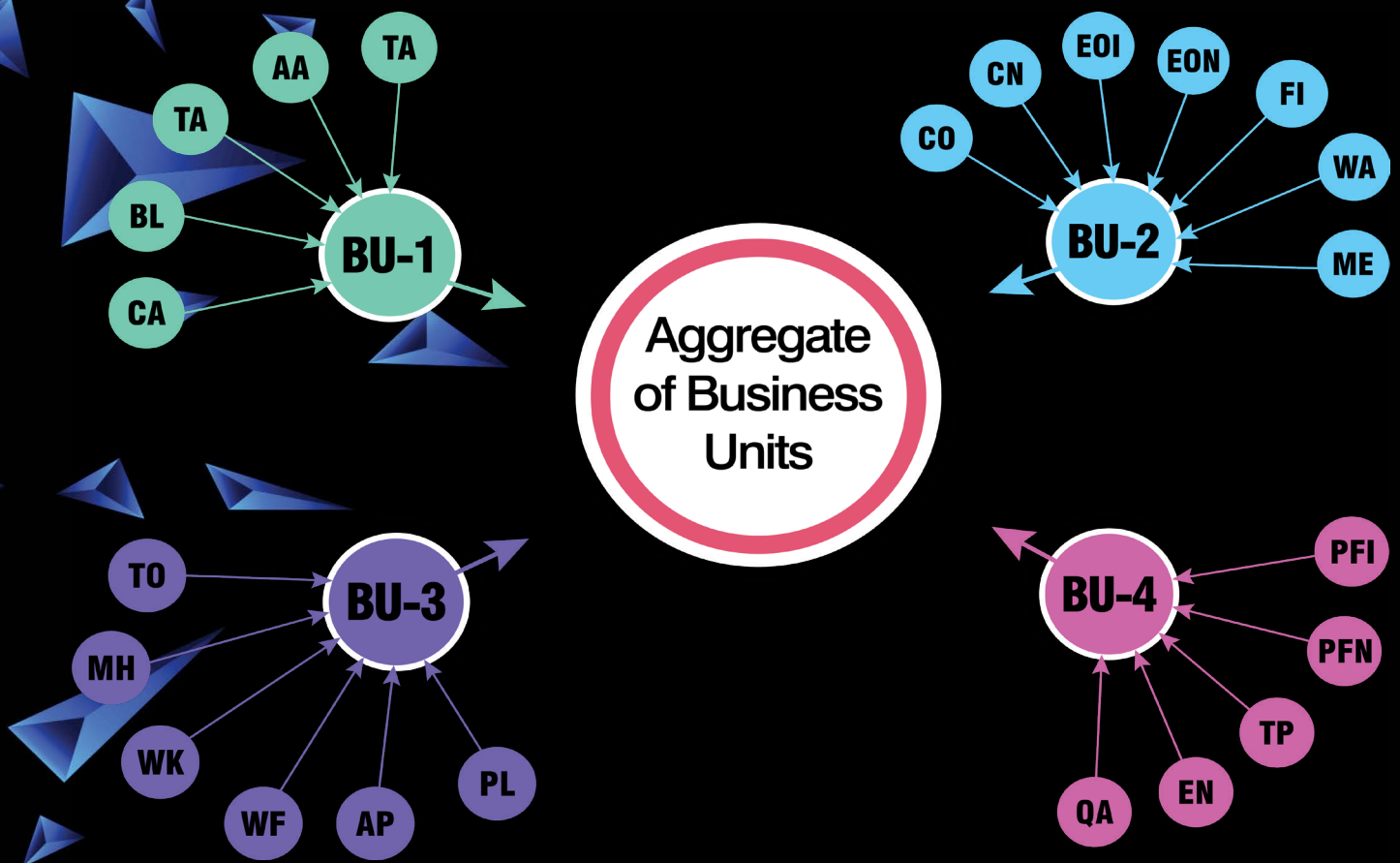
One Single Composite Model

▶ The Multiple Probabilistic Trend Family (MPTF) modeling framework of ICRFS™ gives:

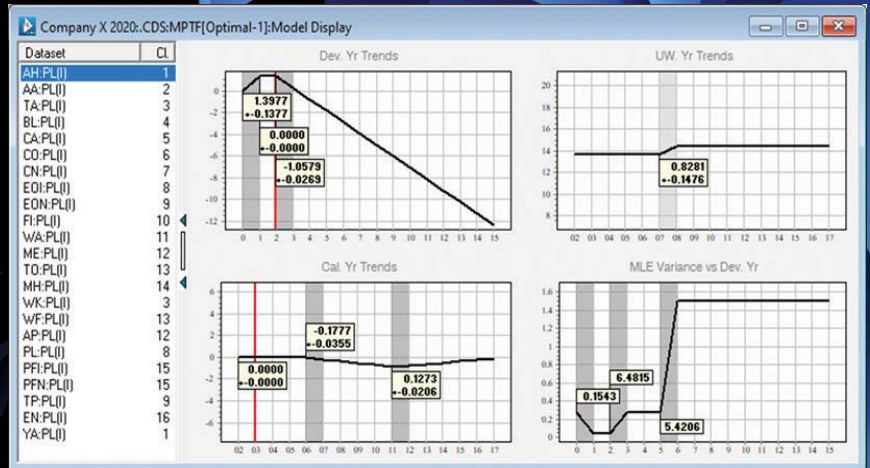
- one single optimal composite model identified from the data for multiple lines of business and segments
- a company wide picture encapsulating trends (including social inflation) and volatility in each line (or segment) and relationships between them
- the diversification credit based on volatility correlations between lines/segments and any common drivers all driven by the data
- risk capital metrics for optimal risk capital management - including reinsurance

Access to much information by segment, business unit, or any combination of aggregates with a few mouse clicks!

Company X: One Composite Model



The composite model retains the trend and volatility structure identified for each individual segment. Segments are linked by volatility correlations. Common drivers across segments, if found, form a stronger relationship than volatility correlation as movement in means is a more direct relationship than randomness.



Company X 2020: CDS:MPTE[Optimal-1]: Reserve Forecast Table

Underwriting Period vs Development Period

	Cal. Per. Total	0	1	2	3	4	5	6	7	8
2009	267,057	25,142	114,509	85,675	51,204	28,299	16,186	10,313	6,679	3,943
2010	300,906	25,263	110,444	94,970	104,240	23,158	16,212	6,833	5,851	2,925
2011	293,727	23,346	126,867	92,720	58,999	31,706	16,196	9,148	4,879	2,662
2012	295,988	23,102	100,896	87,138	54,300	33,053	19,164	6,112	3,526	1,072
2013	333,771	27,091	126,125	103,515	64,826	30,401	14,842	7,559	4,186	2,380
2014	344,726	31,711	111,713	87,170	63,636	51,497	8,287	6,515	1,700	984
2015	350,852	23,903	138,632	109,094	72,210	36,220	14,667	7,599	4,142	2,386
2016	381,175	24,552	143,001	95,354	44,180	47,132	14,202	2,969	1,614	956
2017	392,558	27,359	145,786	99,278	51,907	24,010	11,263	6,374	3,792	2,253
2018	364,858	21,990	135,947	92,003	81,632	16,055	3,147	1,920	1,379	862
2019	422,052	28,769	145,655	104,486	52,017	24,011	10,720	6,144	3,704	2,215
2020	401,091	32,755	150,201	103,029	36,244	5,861	2,725	1,786	1,349	852
2021	400,538	28,566	161,275	105,021	49,777	22,271	10,162	6,003	3,709	2,188
2022	402,844	26,287	160,097	91,624	16,190	5,511	2,547	1,776	1,432	892
2023	427,881	31,404	162,250	108,058	50,602	22,596	10,466	6,152	3,808	2,231
2024	445,536	22,289	134,799	23,360	16,250	5,547	2,803	1,907	1,547	948
2025	415,653	33,194	168,780	112,600	51,884	23,238	10,876	6,392	3,982	2,325
2026	354,736	42,032	47,723	23,560	16,313	5,589	2,980	2,022	1,692	1,024
Total Fitted/Actual			2018	2019	2020	2021	2022	2023	2024	2025
Cal. Per.	4,120,644	384,289	216,043	103,023	51,130	27,920	16,888	10,368	6,305	
Total	4,082,563	57,353	30,719	18,001	7,051	4,226	2,979	2,223	1,428	

1 Unit = \$1,000; Forecast Scenario: Optimal EB Combined TOTAL

The forecast tables are available for all individual segments, as well as any selection of aggregates, or aggregates of aggregates. As usual the black numbers are fitted [projected] mean values, the blue numbers are observed values, and the red [burgundy] values are standard deviations for each cell [aggregate]. For each segment the forecast distribution for each cell is lognormal.

Forecast summary breakdowns are available for each aggregate - and include a number of tables showing allocations into each element comprising the selected aggregate (here business unit).

Company X 2020: CDS:MPTE[Optimal-1]: Reserve Forecast Summaries

Summary by Datasets Summary Graphs Summary by Datasets UW. Yrs Cal. Yrs Observed vs Mean Estimate Loss Ratios Incurred Losses Periods Settings (% Differences Comparisons

LOB Comparisons Risk Capital Allocation Correlations

Breakdown by LOB Reserve Mean/CV Percentages Earned/Unearned Basis

Reserve Breakdown by LOB

	Written Premium	Paid To 2017	Incurred To 2017	CRE 2017	Mean		Std Dev	UL: Loss Ratios (%)	
					Outstanding	Ultimate		Mean	Std Dev
BU1	1,364,012	963,082	1,075,888	113,806	198,064	1,160,146	14,640	85.054	1.073
BU2	1,857,697	956,404	1,155,929	199,524	214,736	1,171,140	20,910	63.043	1.126
BU3	2,134,065	973,348	1,077,714	105,365	245,494	1,217,843	63,169	57.067	2.960
BU4	2,134,393	1,191,729	1,308,756	117,027	167,586	1,359,315	23,337	63.686	1.093
Total	7,490,168	4,082,563	4,618,285	535,722	825,880	4,908,444	72,830	65.532	0.972

1 Unit = \$1,000
Forecast scenario: Optimal EB Combined TOTAL

Company X 2020-CDS:MP(T)Optima...
Covariances
Correlations

Optimal-1) Reserve Forecast Summaries
Loss Ratios
Comparisons
Periods Settings
Cal. Yrs

Observed vs Mean Estimate
Incurred Losses
Summary Graphs
Summary by Datasets

Differences
Clusters
UW. Yrs

Weighted Residual Correlations Between Datasets

	Correlations	
AH:PL(I)	1	0.275
YA:PL(I)	0.275	1
AA:PL(I)	1	
TA:PL(I)	1	0.187
WK:PL(I)	0.187	1

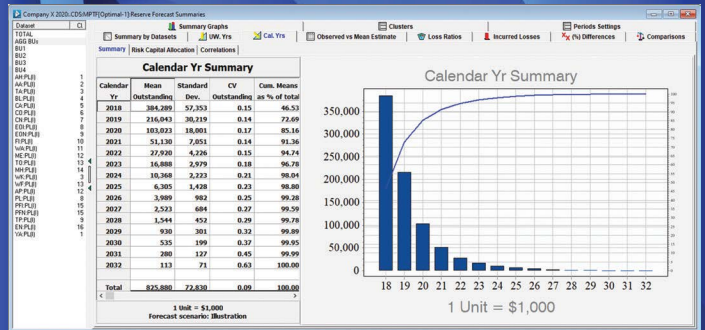
Clusters have been set 4 iterations were executed
Residuals correlation difference tolerance 0.010%

Reserve Forecast Distributions Correlations Within Combination (Totals)

	BU1	BU2	BU3	BU4
BU1	1	0.000000	0.021448	0.006548
BU2	0.000000	1	0.020718	0.019270
BU3	0.021448	0.020718	1	0.000000
BU4	0.006548	0.019270	0.000000	1

Totals
UW. Yrs
Cal. Yrs
Cal. Yrs Consolidated

LOB Comparisons
Risk Capital Allocation
Correlations



Company X 2020.CDS:MPTF[Optimal-1]Reserve Forecast Table

Dataset

CI

Underwriting Period vs Development Period

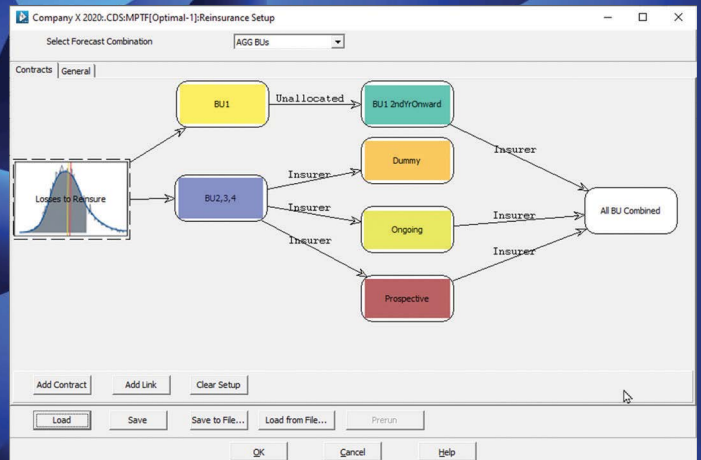
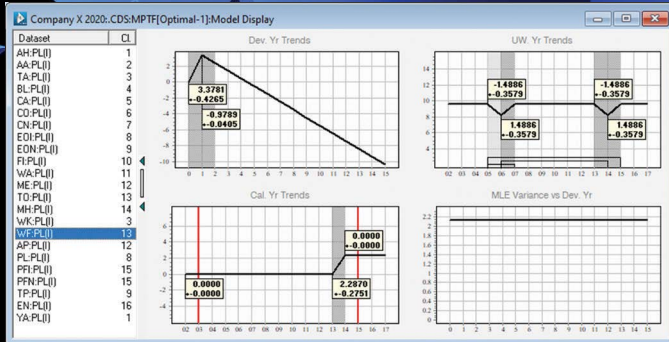
	Cal. Per. Total	0	1	2	3	4	5	6	7	8	9	10
2010	293,727	23,346	126,867	92,720	58,999	31,706	16,196	9,148	4,879	2,662	1,702	1,171
BUT												
BUD												
2011	295,988	23,102	100,896	87,138	54,300	33,053	19,164	6,112	3,526	1,022	746	617
AHPLI												
2012	333,771	27,091	126,125	103,515	64,826	30,401	14,842	7,559	4,186	2,380	1,544	1,074
TAPLI												
2013	344,726	31,711	111,713	87,170	63,636	51,497	8,287	6,915	1,700	984	730	609
BLPLI												
2014	350,852	23,903	138,632	109,094	72,210	36,220	14,667	7,509	4,142	2,386	1,559	1,087
COPLI												
2015	381,175	24,552	143,001	95,354	44,180	47,132	14,209	2,969	1,614	956	722	608
ENPLI												
2016	392,558	27,359	145,786	99,278	51,907	24,010	11,263	6,374	3,792	2,253	1,448	974
ENPLI												
2017	364,858	21,990	135,947	92,003	81,632	16,056	3,147	1,920	1,379	862	603	457
WAPLI												
2018	422,052	28,769	145,655	104,486	52,017	24,011	10,720	6,144	3,704	2,215	1,432	968
TOPLI												
2019	401,091	32,755	150,201	103,029	36,244	5,861	2,725	1,786	1,349	852	601	457
TOPLI												
2020	420,388	28,566	161,275	105,021	49,777	22,721	10,162	6,003	3,709	2,188	1,401	943
WAPLI												
2021	402,844	26,287	160,097	91,624	16,190	5,511	2,547	1,776	1,432	892	618	464
APPLI												
2022	427,881	31,404	162,250	108,058	50,602	22,596	10,466	6,152	3,808	2,231	1,419	950
PLPLI												
2023	445,536	22,289	134,799	23,360	16,250	5,547	2,803	1,907	1,547	948	644	475
PNPLI												
2024	415,653	33,194	168,780	112,600	51,884	23,238	10,876	6,392	3,982	2,325	1,471	978
TPPLI												
2025	354,736	47,032	47,723	23,560	16,313	5,589	2,980	2,022	1,692	1,074	681	492
ENPLI												
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Company X 2020.CDS:MPTF[Optimal-1]AGG BUS:Reserve VMU Summary

VMU-Based Statistics

Underwriting	Year	VMU Mean	True Mean	VMU S.D.	True S.D.
2003	-0.031	0	-26	101	103
2004	-0.259	0	-50	217	199
2005	-1	0	-83	328	339
2006	3	0	-122	515	520
2007	14	0	-258	1,101	1,115
2008	-9	0	-385	1,664	1,696
2009	-35	0	-407	1,643	1,729
2010	-7	0	-201	1,067	1,100
2011	-3	0	-337	1,768	1,778
2012	-20	0	-614	3,537	3,056
2013	-35	0	-597	3,215	3,276
2014	8	0	-1,037	6,274	6,063
2015	24	0	-2,995	15,958	16,536
2016	-56	0	-3,626	23,518	24,302
2017	-573	0	-7,636	43,317	49,223
Total	-651	0	-8,688	57,195	62,125

10,000 Simulations. 1 Unit = \$1,000

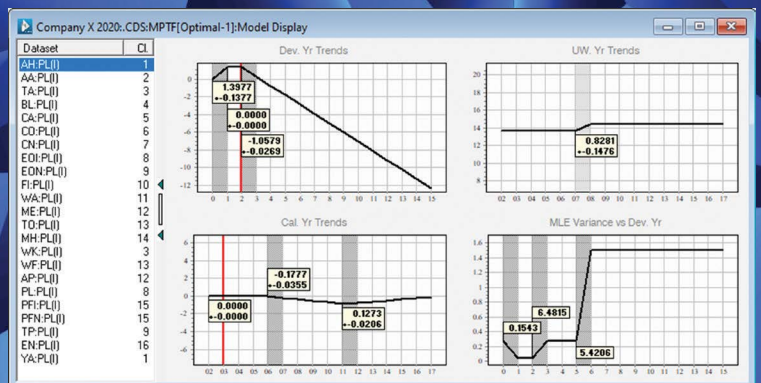


Company X 2020.CDS:MPTF[Optimal-2]AGG BUS:Reinsurance

Sample-Based Statistics (Incremental)

Calendar	Mean	S.D.	CV	Mean	S.D.	CV	Mean	S.D.	CV	Mean	S.D.	CV
2018	383,695	53,474	0.14	377,598	48,175	0.13	474	14,586	30.79	5,624	5,373	0.96
2019	215,811	28,801	0.13	213,540	28,668	0.13	2,269	16,675	7.35	1	149	100.00
2020	103,192	19,639	0.19	97,015	20,765	0.21	6,155	21,218	3.45	23	385	16.93
2021	51,082	7,582	0.15	41,904	15,024	0.36	8,620	15,295	1.77	559	2,032	3.64
2022	27,990	4,605	0.16	18,173	10,526	0.58	8,201	10,067	1.23	1,617	2,908	1.80
2023	16,870	2,918	0.17	8,192	6,763	0.83	6,687	6,535	0.98	1,986	3,374	1.20
2024	10,381	2,310	0.22	3,923	4,184	1.07	4,850	4,190	0.87	1,638	3,550	0.95
2025	6,285	1,388	0.22	1,955	2,416	1.24	3,132	2,443	0.78	1,198	3,009	0.84
2026	3,990	974	0.24	1,093	1,483	1.36	2,066	1,564	0.76	831	664	0.80
2027	2,521	703	0.28	631	919	1.46	1,333	1,013	0.76	557	438	0.79
2028	1,543	455	0.30	359	554	1.54	822	613	0.75	262	305	0.84
2029	927	299	0.32	207	331	1.60	491	373	0.76	230	199	0.87
2030	536	203	0.38	116	192	1.66	282	224	0.79	139	134	0.96
2031	280	124	0.44	60	103	1.72	145	126	0.86	75	77	1.04
2032	113	70	0.62	24	47	1.96	58	59	1.02	31	43	1.40
Total	825,217	69,072	0.08	764,794	16,153	0.02	45,554	61,263	1.34	14,870	10,953	0.74

Paid to date within contract period: 686,773
10,000 Simulations. 1 Unit = \$1,000



comes a wealth of information

Get more from ICRFS™

Quantify social inflation in long-tail LoBs

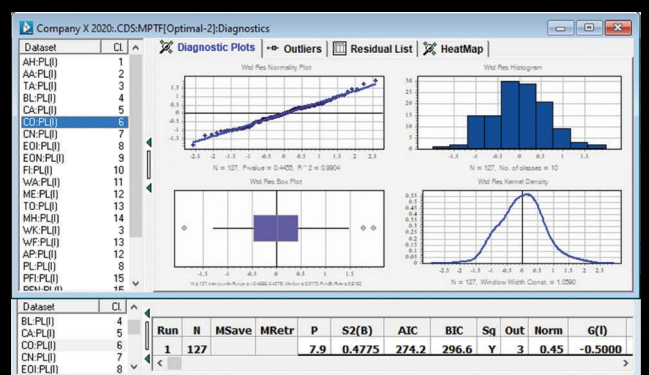
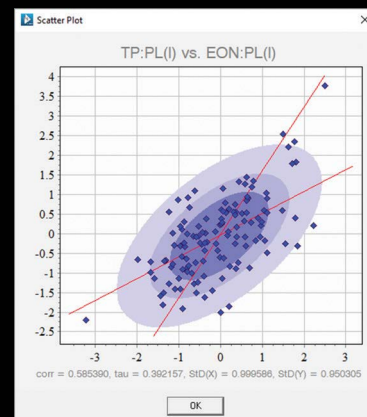
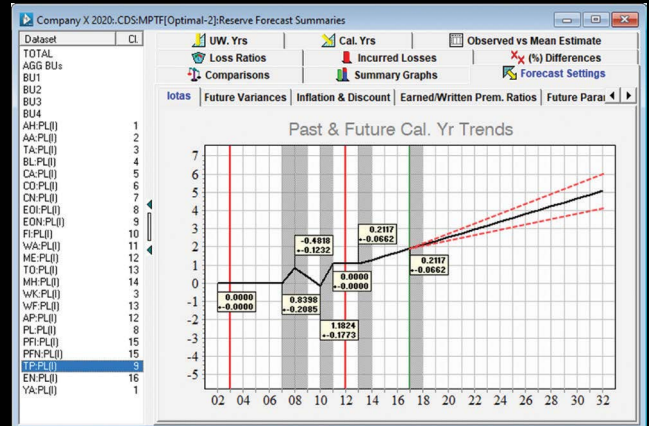
There are many reasons for insurance and reinsurance companies to have concerns about inflation – not only economic inflation (which is rising around the world), but also social inflation. With the Multiple Probabilistic Trend Family modeling frameworks, actuarial analysts can identify the inflationary trends in their Lines of Business.

Common drivers versus correlation

Common drivers have much stronger impact on reserving and pricing than correlations in the randomness. Trends imply means moving in tandem, typically arising from social or economic sources. The ICRFS™ software solution allows you to quickly distinguish between common drivers and volatility correlation.

Mitigate model specification risk

It is not enough to have a model crunching out forecasts. The model, and forecast, must project the future losses utilising all information available and have clear markers to determine quality of the projection. ICRFS™ modeling frameworks have diagnostics that enable analysts to minimise the risk of selecting a poor model. Forecast scenarios are interpretable relative to historical trends.



Sensitivity testing

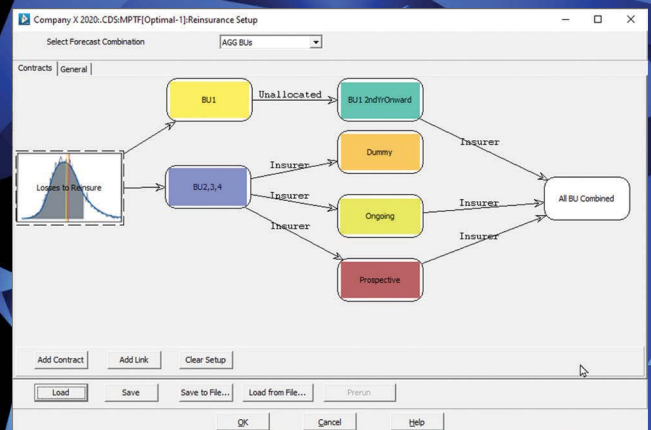
The Multiple Probabilistic Trend Family modeling frameworks have calendar period trends as a fundamental feature of the model definition. They are also an essential component of any future forecast scenario. Assessing the impact of increases/decreases in social or economic inflation is a trivial analysis step.

	Inflation(%)	Discount(%)
2018	1.00000	0.00000
2019	1.00000	0.00000
2020	1.00000	0.00000
2021	1.00000	0.00000

Comprehensive Reinsurance module

ICRFS™ includes a comprehensive reinsurance component for assessing and monitoring any reinsurance applying to the aggregate of claims – like an LPT or ADC.

Further, reinsurance contracts can be stacked sequentially or in parallel with capital being distributed in any number of ways.



IFRS 17 ready metrics

- Liability stream by calendar period - including the application of discount rates
- Models for underwriting year, accident year, or report year
- Separation of Earned and Unearned reserves
- Various methods for calculating risk margins
- Complete data integrity by separating data management from software users - source data are read only
- Complete history retained in database

Calendar Yr	Mean Outstanding	Standard Dev.	CV	Cum. Means	Cond. on Next Cal. Per.
2019	216,043	30,219	0.14	72.69	4,769
2020	103,023	18,001	0.17	85.16	2,624
2021	51,130	7,051	0.14	91.36	1,256
2022	27,920	4,226	0.15	94.74	725
2023	16,888	2,979	0.18	96.78	487
2024	10,368	2,223	0.21	98.04	347
2025	6,305	1,428	0.23	98.80	248
2026	3,989	982	0.25	99.28	185
2027	2,523	684	0.27	99.59	134
2028	1,544	452	0.29	99.78	92
2029	930	301	0.32	99.89	62
2030	535	199	0.37	99.95	40
2031	280	127	0.45	99.99	23
2032	113	71	0.63	100.00	10
Total	825,880	72,830	0.09	100.00	62,125

Insureware provides more than just software. We create a collaborative relationship with all our clients. Contact Insureware (info@insureware.com) to arrange a virtual coffee meeting to discuss how ICRFS™ can work for you!

Insureware
Innovative Statistical Solutions for P&C Insurance

CAS Trust Scholarship Winners – Where They Are Now

Since 2002, the CAS Trust Scholarship has provided funds for students who are pursuing a career in actuarial science to further their interest in the P&C actuarial profession and to encourage the pursuit of the CAS designations. The CAS reached out to the following recipients to share the importance of the scholarship during their journeys to becoming actuaries.

Reward of giving back

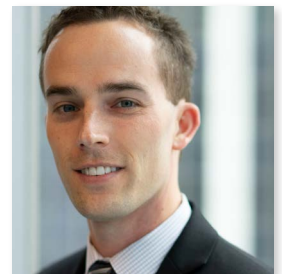
Brett Jaros, FCAS

2008 Recipient

The CAS Trust Scholarship served as a great encouragement to keep up with the hard work Brett Jaros had already started in school. The funding cemented in his mind that the P&C pathway was the actuarial course for him.

He was fortunate to hear about actuarial science from a math teacher in high school, so he studied it for four years at the University of Illinois at Urbana-Champaign. Jaros completed internships at State Farm, Zurich and CNA. He then worked for 12 years at CNA in a variety of roles, and now, most recently, has spent one year at Lexington/AIG.

For 12 years, Jaros has volunteered in the CAS. He has done everything from exam writing and grading to working with the CAS Trust Scholarship, where he has served nine years as a member and three years as chair,



Brett Jaros

where he currently serves.

"It's been a rewarding experience being able to give back to students in a way that I personally know can be very impactful," Jaros said.

He encourages students who are thinking about the actuarial path to gain as many experiences as possible as early as possible. "This will make you a more well-rounded actuary but will also likely expose you to opportunities and roles that can bring great long-term success," Jaros said.

Encouraging diligence

Alexander Rosteck, FCAS, CPCU

2006 recipient

For Alexander Rosteck, the CAS Trust Scholarship gave him the opportunity to take exams and get ahead while still in school, which was a big draw to the career. Receiving the scholarship reinforced to him that an independent group of professionals were interested in supporting and acknowledging his growth and development.

"I figured that one day, professional achievement would transcend scholastic achievement, and the scholarship did encourage me to take the professional educational process seriously and diligently," Rosteck said.

Academics were a given in Rosteck's family, and he appreciates how his parents made having a good K-12 educational experience a high priority in their own lives. For university, he wanted his coursework to align with and support his actuarial ambitions without being overly focused on exam prep, so he chose a bachelor's degree in statistics with a minor in economics. But some of the courses he enjoyed the most at Rutgers and in study abroad were in history and socioeconomics. He doesn't regret any of the computer science and programming knowledge he picked up in school either.

Rosteck worked for 10 years for the Fireman's Fund. It offered the mid-sized company experience he was looking for with actuarial support, a diversity of lines of business and international connections.

"I stayed there for 10 years, making internal moves, while eventually building on the work I had done there to



Alexander Rosteck

move on to a wider world beyond the corporate role," Rosteck said. "Building relationships with the underwriting business partners I supported facilitated a move to Southern California, supporting that group, entertainment insurance, in a broader role. Even now I work with great people I met at my prior company, though my role now in alternative risk transfer is even more heavily weighted towards underwriting than towards the supporting pricing work."

He enjoyed being part of the Student Central Summer Program the CAS held during the summer in the height of the COVID-19 pandemic. While he is not formally a volunteer with the CAS, he tries to represent and broaden perception of the profession while outside of the actuarial world.

He encourages students who are thinking about the actuarial path to learn about the world, to pass their exams and contribute to their company always and all at the same time. He also wants them to remember that being an actuary is not a math job; it is a business job leveraging quantitative and modeling skills.

The chance to help

Jim Arns, ACAS

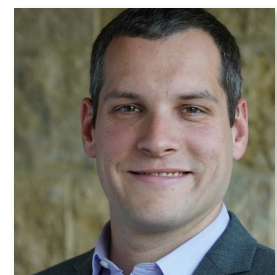
2009 recipient

The CAS Trust Scholarship made Jim Arns more aware of the CAS and showed him that the CAS cares about education and not of growth of the profession.

Arns received his Bachelor of Science from the University of Iowa in actuarial science with a minor in business administration in 2010.

In May of 2008, he interned with Zurich North America within the corporate reserving department. Following his junior year, he was at Deloitte Consulting as a P&C intern for half the summer and a health intern for the other half. Upon graduation, he rejoined Deloitte as a P&C actuary. Over the past 12 years, he has progressed in his career and is currently a senior manager at Deloitte working toward becoming a principal (equivalent to a partner).

"I specialize in helping clients with reserving across all lines of business and enjoy solving my clients' most challeng-



Jim Arns

ing problems,” Arns said.

Arns is currently volunteering with the CAS in a joint committee of the International Association of Black Actuaries (IABA) and INROADS, a non-profit organization that creates pathways to careers for diverse high school and college students across the country. This coalition is working to attract young, empowered and ambitious people of color into the actuarial field. In addition, he recently presented at the IABA Annual Meeting.

“Volunteering is very important to the profession and where I have the opportunity, I help,” Arns said.

His message to students pursuing an actuarial path: “Don’t give up!”

“Working toward your credentials is not an easy process. Every actuary has a moment, or two or three, where giving up will cross their mind, but if you continue, the personal reward of getting your credentials is worth a thousand times more than every time you thought of giving up.”

Gained a valuable career mentor

Jake Akstins, ACAS

2017 recipient

When Jake Akstins was in college, he always worked two or three jobs at a time, about 30-40 hours per week. These jobs were in addition to being a full-time student and studying for actuarial exams. Winning the scholarship allowed him to work only one job about 20 hours per week, which gave him time to focus more on his studies. More importantly, it allowed him to enjoy his senior year with friends.

“During my senior year, I spent time volunteering and finding passion projects outside of actuarial ones,” said Akstins. “[This] helped me in ‘adulthood’ once I graduated from school.”

“At one of the CAS Annual Meetings, I was able to network with CAS staff and members, and one became a monumental career mentor to me. Paying for school and exams, along with the moving costs of transitioning into the full-time workplace, was incredibly expensive; the scholarship was a game changer.”

Akstins attended and graduated from the Illinois Mathe-

matics and Science Academy for high school, a public residential boarding school that was critical in changing his educational trajectory for the better. The courses were extremely challenging and required immense creativity to approach the unique problems given to the students to solve. He attended the University of Illinois at Urbana-Champaign where he majored in actuarial science and minored in business. He is currently completing a certificate program with Cornell University on diversity and inclusion for human resources.

During his last two summers before graduation, he interned at CNA Insurance. His first internship was in commercial pricing, focusing on workers’ compensation, and his second was in specialty pricing, focusing on management liability.

“When I was invited to join their full-time rotational program, it was an easy ‘yes’ from me. I spent a year and a half in commercial lines reserving; here, I completed quarterly reserve reviews and also helped onboard a new reserving technology within the department,” Akstins said.

His next rotation was in health care pricing, where he gained a passion for working with the business.

“I loved working with underwriters on rate change questions and pricing large accounts. I loved my actuarial roles at CNA, but their nonactuarial leadership development opportunities were even greater. I had the opportunity to serve as the organization’s Global Pride Employee Research Group (ERG) Co-Chair and serve on Diversity & Inclusion and Recruiting committees, which helped me network across the company and build on my passion for working with people from different backgrounds.”

After three years at CNA, he decided to try a new company and served in the excess and surplus and specialty pricing team at Nationwide, focusing on large general liability and umbrella accounts.

“I learned so much at Nationwide from some phenomenal actuaries and underwriters. I also helped start a Virtual Pride ERG,” Akstins said.

In early 2022, he embarked on a new journey and moved to Austin, Texas, to become Visa’s first manager of inclusion & diversity analytics.

“The role felt like it was made for me, as it brings together my passion and experience with DE&I and my background as a credentialed actuary,” said Akstins. “In typical Jake fashion, I also recently became co-chair of Visa’s Austin Pride employee resource group. I’m excited to see how the Inclusion and Di-



Jake Akstins

versity and People Analytics teams will continue to grow and prosper at Visa and other organizations, as there is so much power in using analytics to tell stories of all kinds of trends,” he said.

Akstins co-founded and served as the president of the Sexuality and Gender Alliance of Actuaries (SAGAA), a non-profit organization that advocates for LGBTQ+ inclusion in the actuarial profession. SAGAA partners heavily with the CAS. He is also a member of the CAS Diversity Impact Group.

He wants students considering an actuarial path to understand that getting through the exam process is difficult. “If you feel you are struggling, or it is taking you longer than others, it is OK for you to face some struggles along the way,” Akstins said. “I failed one of my early exams three times and learned so much about how I can best learn because of my failures. Take time for yourself: find a hobby, go to the gym and have fun! The actuarial profession is an amazing career, but it is important to take time for yourself and have an identity outside of work.”

CAS meeting was pivotal to career

Catherine Erdelyi, FCAS

2015 Recipient

The CAS Trust Scholarship brought Catherine Erdelyi down an avenue that she knew little about at the time.

“I attended a university without an actuarial science major and was taking exams independently, so the scholarship was a great financial help for exam costs and study materials that my parents and actuarial club were otherwise providing,” said Erdelyi.

“More importantly, attending the CAS Annual Meeting to receive the scholarship and getting to sit in on some of the sessions was an immeasurable experience at such a pivotal point of deciding my career,” she said. “It really pulled me into the CAS community and gave me a glimpse of what my future could be, thus motivating me to continue with exams and inspiring me to pursue my career as an actuary.”

She attended Northeastern University and graduated in



Catherine Erdelyi

2016 with a dual major in mathematics and business administration with a finance concentration. When she graduated, she had passed exams P/1 and FM/2. She then attained her ACAS in 2019 and her FCAS in 2021.

As a part of modeling and advanced analytics teams, she focused on a lot of personal development learning R, Python and GitHub, alongside a variety of modeling techniques and agile project management frameworks. On her co-op at AIR Worldwide (now Verisk), she also attained their Certified Extreme Event Modeler certification, formerly known as their Certified Catastrophe Modeler certification.

During college, she completed several internships and co-op experiences at Liberty Mutual, The Hartford, AIR Worldwide, John Hancock and Taprogge. Two were actuarial roles, two were catastrophe modeling roles and one was international accounting.

“I ultimately decided to pursue an actuarial career with the CAS and accepted a position at Liberty Mutual in Boston,” Erdelyi said. “I completed three rotations through their actuarial development program across workers’ compensation reserving, farm insurance product design and pricing and personal lines modeling and analytics teams.”

Since graduating from the rotational program, she has been with a commercial lines modeling and analytics team as a director of data science product management.

“I strongly believe that my actuarial skillset and understanding of the full insurance value chain supports my team to successfully build and implement advanced analytical capabilities across the organization,” Erdelyi said.

Erdelyi began volunteering this year and was a part of the CAS Trust Scholarship Committee to award the latest round of scholarships. As someone who benefited from this generous award, she is excited to pay it forward and get to know more about the next generation of actuaries.

For those pursuing an actuarial path, she recommends finding the balance between saying “yes” to new opportunities to grow outside of your comfort zone and protecting your study time to learn the fundamentals and pass exams successfully.

An honor to receive it

Jason Rohlfs, FCAS, CPCU

2009 recipient

The CAS Trust Scholarship was a confidence booster for Jason

Rohlfs to continue down the path of the actuarial profession and achieve his designation.

“It was an honor to receive it and to list it on a resume when seeking internships and full-time employment,” Rohlfs said. “The financial support is obviously a huge help when trying to cover all the expenses of college. I’ve been so excited to see how much the scholarship program has grown in both number and amount since I received it in 2010. It’s a wonderful way to recognize and support actuarial students.”

Rohlfs received a bachelor’s degree in actuarial science from Illinois State University (ISU).

“The CAS Trust Scholarship was only possible through the education, resources and opportunities that Dr. Krzysztof Ostaszewski and the rest of the actuarial faculty at ISU provided me,” Rohlfs said. “I’ve always viewed the scholarship as also recognizing the university in that sense, so I was proud that it highlighted the ISU actuarial program.”

He started his career with an internship at Pinnacle Actuarial Resources, which, for Rohlfs, was a great learning experience and opportunity to see the consulting world. He then had another productive internship with State Farm and has continued there since. Most of his experience has been in personal automobile pricing as an actuarial analyst and then as a pricing manager. He currently has pricing manager responsibilities but also splits his time as an implementation manager representing the actuarial function on enterprise projects to implement new rating enhancements.

“This dual role provides a great opportunity for what I enjoy most in my work — collaborating with other functional areas to determine strategy, execute initiatives and achieve company goals,” Rohlfs said.

Rohlfs offers this advice to students considering a career as an actuary: “First, take full advantage of the resources and opportunities made available to you, and learn as much as you can before graduating and embarking on full-time employment. Join the actuarial club or other organizations. Network with past graduates who are in the field as well as other actuaries. Seek internships to explore different paths in the actuarial profession.

“Second, and it almost goes without saying, study hard for

actuarial exams and chip away at them as quickly as you can. There are no shortcuts. Simply set aside the time to get high quantity and high quality of study hours. It’s so much better to ‘overstudy’ (if there is such a thing) and pass, rather than failing an exam due to lack of preparation and having to continue studying to retake it.”

Confidence builder

Danielle Creem, FCAS

2011 recipient

Receiving the CAS Trust Scholarship helped Danielle Creem network with other successful actuaries who gave her sound advice on how to navigate passing exams while working and finishing college. “By receiving this scholarship, I also gained confidence in my ability to complete my designation, since it proved to me that the CAS had that confidence in me already,” Creem said.

During college, after receiving the scholarship, she had two internships in the field of actuarial science: one at a small investment company and another at a large consulting firm. Upon graduation in 2012, she began working at Deloitte Consulting where she supported several different clients on a wide variety of actuarial needs. Her main focus was reserving for self-insured companies, as well as supporting the preparation of statements of actuarial opinion. During her tenure at Deloitte, she obtained her ACAS designation from the CAS.

“Starting my career at Deloitte Consulting was the best career decision I’ve made thus far. Their onboarding for campus hires is second-to-none, which is tremendously helpful during the transition from college to working full-time ‘in the real world,’” Creem said.

In March 2018, she left Deloitte to work for AXA XL, previously XL Catlin, as the reserving actuary for professional (E&O and architects and engineers) and cyber products. She also supported primary casualty (XS workers’ compensation, general liability and commercial auto liability) reserving during her last year at AXA XL. She very recently began working at AIG as the senior lead actuary of professional and cyber.



Jason Rohlfs



Danielle Creem

She previously volunteered as a member of the Syllabus and Examination Working Group and plans to continue to volunteer in this capacity and others in 2023.

For students contemplating an actuarial career path, she advises taking actuarial exams while working at a consulting firm, as it is the fastest way to obtain a broad depth of experience across many different actuarial projects without having to be in a strict rotation program.

"My best study advice would be to find two or three friends or colleagues with whom you can study regularly," Creem said. "This support network does not need to be other actuaries but can be anyone pursuing higher ed after college (law students, doctors, accountants, etc.) who is studying on the weekends and on weeknights after work just like you. It might take you a decade or more to complete your Fellowship, and that is quite a long time to spend in an isolated environment without a support group of like-minded students to study with."

Gratitude for those who believed in her

Lily Cook, ACAS

2017 recipient

The CAS Trust Scholarship helped Lily Cook financially in her last year of college. Each dollar meant fewer hours lifeguarding at the YMCA. It also introduced her to the P&C actuarial community.

"It was a great feeling to know others were invested in my career and believed in my future. I hope to pay it forward by passing that feeling to future students," Cook said.

Cook attended the University of Wisconsin-Eau Claire where she majored in actuarial science. The program provided her with lifelong friends and mentors that she keeps in touch with today. She was introduced to the actuarial career through summer internships in college. One internship led to a full-time job at CUNA Mutual Group, where she gained experience in pricing and reserving. She gravitated towards the reserving side and focused on personal auto and homeowners reserving.

"This January I made a change into asbestos, pollution



Lily Cook

and health hazard reserving work at Enstar. It's been a wonderful learning experience and a great opportunity to try out a completely different side of P&C reserving," Cook said.

Last summer Cook was a mentor for the CAS Student Central Summer Program. "This was a great way to meet students interested in the career and to help them pursue their goals," Cook said. She warns students pursuing the actuarial path that during the exam journey it's easy to compare your progress to others. "Be cognizant of this and remember to be proud of each accomplishment along the way. You do not have to be finished with exams or in a dream job to celebrate your hard work," Cook said.

Repayment in kind

Kinsey Turk, Future Fellow

2020 recipient

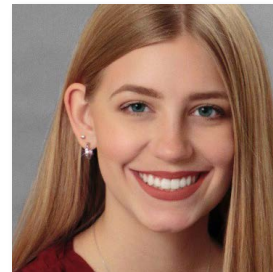
The CAS Trust Scholarship provided Kinsey Turk with the financial support to be able to graduate college with four exams under her belt, far exceeding her expectations for herself. By receiving the scholarship, she was also able to attend the 2021 CAS Annual Meeting in San Diego.

"There I had the amazing opportunity to expand my actuarial knowledge through educational sessions, form lasting connections with actuaries across the nation and learn about the different diversity and inclusion organizations the CAS partners with," Turk said.

Turk studied at Arizona State University, where she graduated with her bachelor's and master's in actuarial science. August 2022 marked her one-year anniversary of working full-time with Allstate.

"Reflecting on where I started to where I am now, I am amazed by the growth I have shown and eagerly await what another year of learning will bring me," said Turk.

Turk recently volunteered as a mentor for the CAS Student Central Summer Program, where she met with a group of students weekly to discuss what they had been learning, provide insight on the actuarial career and answer any questions they had. "I received so much support when I was a student from the CAS, so it was great to pay it forward to future genera-



Kinsey Turk

tions,” Turk said.

She wants students considering an actuarial path to understand that almost everyone has failed an exam at some point in their actuarial career, and they will likely be no different.

“Failing an exam is not the end of the world, even if it feels like it is at the time,” Turk said. “What is most important is knowing how to pick yourself back up again and not allowing failure to stop you from pursuing this field. I speak from personal experience, having failed my first-ever exam only to pass one a month later.”

Happy to have this career

Chloe Marshinski, FCAS

2016 recipient

Chloe Marshinski appreciated the financial support the CAS helped provide during college — especially the chance to attend a CAS Annual Meeting. “The meeting got me really excited about joining the profession and was a great way for me to network with other actuaries so early on in my career,” Marshinski said. Marshinski received her bachelor’s degree from the University of Illinois at Urbana-Champaign with a double major in actuarial science and statistics. She also minored in Spanish and studied abroad in Costa Rica for a semester.



Chloe Marshinski

After interning at CNA for two summers, Marshinski has worked at CNA for the past five years. “My current role is in health care pricing, and previously I’ve held roles in reserving analytics and small business pricing,” Marshinski said.

Marshinski has also volunteered with the CAS with various activities related to Admissions.

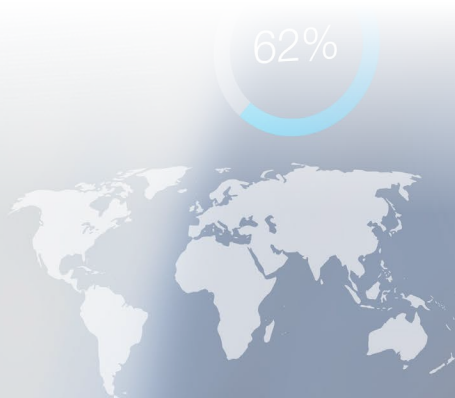
Her advice for rising actuaries is to take advantage of any opportunities to hear from full-time actuaries about their experiences — whether it’s attending job shadow events, presentations or finding a mentor. “There are a lot of different paths you can take as an actuary, and it’s hard to know which path you would like best based on school alone,” she said. ●

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www.casact.org/trustscholarship



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- The Cat Modeling Process
- Online Course on Ethics and Professionalism

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VOLUNTEERS MAKE THINGS HAPPEN

By DR. SARAH SAPP

School Ties: Olson Connects with Students through University Outreach

Full disclosure and fun fact: The author of this article is the sister of the featured member, Erin Olson, FCAS.

As soon as she became a CAS member, Erin Olson, FCAS, knew she wanted to volunteer. Olson chairs the University Engagement Advisory Working Group (UEAWG) and has been a part of the working group since its establishment in 2013. Her full-time role is director of property claims decision science analytics at USAA.

University outreach resonated with Olson. “I came from a school and a part of the country where not very many people know what an actuary is,” she said. “I knew there had to be a lot of people like me out there.”

She first volunteered to help build the initial Auto Safety Features Case Competition toolkit. Later she was asked to serve as the vice chair and then chair of the broader UEAWG, where she has been able to steward the work of all the task forces.

To Olson, leading volunteers is the most exciting and rewarding kind of leadership there is.

“Everyone who volunteers gives up their time for no reason other than to support our goals to promote the career of actuarial science and to provide opportunities to help students become successful,” Olson said. “We challenge each other to share new ideas to reach students and professors. Then we get to work with our amazing CAS staff team who bring all those ideas to life.”

Olson credits the CAS Volunteer-Staff Framework as the secret to the UEAWG’s success.

“We come up with content for course work or case competitions, and the CAS staff makes it look professional and ensures that it reaches the desired audience,” Olson said. “We put together a framework for what a summer program would look like and what pieces would have to come together, and our CAS teammates put that puzzle together. This makes for highly engaged volunteers that want to challenge themselves and each other to keep coming up with new ideas because we are confident that the staff will deliver a world-class product.”



Erin Olson

Student ambassadors

Olson is particularly excited about getting to meet the young people who serve as student ambassadors. The CAS hosted an in-person event for the student ambas-

“We challenge each other to share new ideas to reach students and professors. Then we get to work with our amazing CAS staff team who bring all those ideas to life.”

sadors at the 2022 CAS Annual Meeting. These students are liaisons between the CAS and other actuarial students at their colleges and universities. Ambassadors champion the CAS message to their fellow students and help promote webinars and other resources that the CAS makes available. Currently, over 30 students from more than 20 universities volunteer on their campuses.

“This student leadership program gives students across the country the chance to learn from each other about what makes each of their universities’ actuarial programs successful,” Olson said. “We first brought together student ambassadors at the 2018 Annual Meeting and had intended to hold this event every other year before COVID-19 derailed that plan for 2020.”

Student Central Summer Program

The CAS Student Central Summer Program is a point of pride for Olson. It

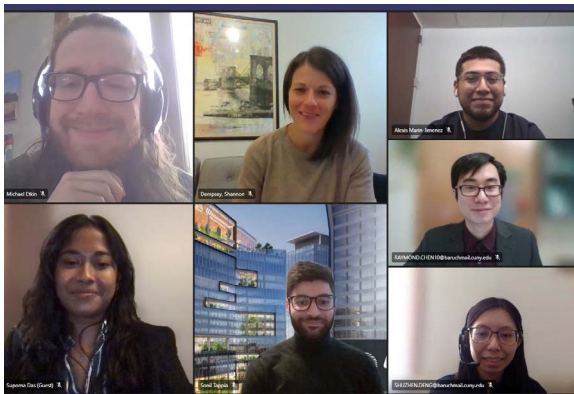
came about from a need to help students whose internships had been cancelled in 2020 due to the pandemic. The online program, designed by practicing actuaries, supports students’ career growth by providing technical and soft skill development, as well as mentorships and networking opportunities. Over 750 students have participated in the program since its inception.

“We had no idea if there would even be enough interest from students for it to be successful, but we were quickly overwhelmed by the response. After all the positive feedback coming out of that inaugural year, we knew we really had something and wanted to keep it going.”

In the two summers since, the target audience has shifted to students who were unable to secure paid summer internships. The program enables these students to have experience that will make them strong candidates for future internships and entry-level positions. The program’s virtual platform can reach a diverse group of students around the

Volunteers, CAS Staff Actuaries and students visited the CAS booth at the Gamma Iota Sigma Conference in 2021. The booth promoted Student Central, the CAS membership program for university students.





Five teams of students from four universities participated virtually in the spring 2022 multi-school Case Competition. Prizes went to Baruch College Team 1, University of Manitoba and Roosevelt College.

world, many of whom don't have access to the same kind of employer recruitment available to students at schools with well-established actuarial programs.

Olson sees this program as a key element in achieving the strategic goal to diversify the pipeline. She saw firsthand the effectiveness of the Student Central Summer Program at the employer networking event at the end of the eight-week program. "It was so exciting to see the dozens of employers there engaging with these students and sharing with them valuable tips for pursuing a successful actuarial career," Olson said.

Case competitions

Olson returned to her CAS volunteer roots with her work on the working group's Case Competition Task Force, which recently hosted its first virtual multi-school case competition. CAS University Liaisons helped identify schools that had not previously hosted a CAS case competition. In total, five teams across four universities signed up to participate in the competition: Baruch College (two teams), Brooklyn College, Roosevelt College and the University of

Manitoba.

In the first week, a kickoff meeting was held to introduce the case and field questions. Participants were then given access to a CAS volunteer team advisor who watched them practice their presentations and offered feedback to prepare them for the event day. The event culminated with the online case competition presentations and an award ceremony designating the first place prize of \$2,000 to Baruch College Team 1, the second place prize of \$1,500 to University of Manitoba and the third place prize of \$1,000 to Roosevelt College.

The task force has created five different toolkits that universities can use to run their own case competitions and is working on a new toolkit that will be ready at the end of 2022.

Olson is also excited about the new Ratemaking Case Competition toolkit that is well underway. It will replace





CAS President Steve Armstrong (right) presents a CAS Trust Scholarship award in the amount of \$5,000 to 2020 recipient Kinsey Turk (left).



CAS President Steve Armstrong (right) presents Anas Abdallah (left), actuarial and financial mathematics program director at McMaster University, with a 2020 CAS University Award for his institution.

the Auto Safety Features toolkit that has been used extensively by numerous universities as well as by the CAS Student Central Summer Program over the last eight years.

CAS Trust Scholarships

Olson also oversees the CAS Trust Scholarship Task Force, which reviews applications for those applying for a scholarship. This task force maintains and updates the application to make sure it remains relevant and collects pertinent information, so they can accurately award the scholarships. In total, 75 students have been awarded scholarships totaling \$266,000. (See p.26 for the story on some past recipients)

“The task force relies on a personal statement from each candidate in order to award scholarships based on not only their demonstrated achievements (e.g., exams and internships), but also on their potential for success in an actuarial career,” Olson said.

The CAS awards up to eight scholarships each year — four \$5,000 scholarships and four \$2,500 scholarships.

Other task forces include the Student Programs Task Force, University

Awards Task Force and the University Liaison Task Force.

The aptly named Student Programs Task Force runs student programs at in-person meetings. During the pandemic, they built out virtual student programs. They set students up with mentors for the day, held a networking event and recommended certain sessions for them to attend. They also facilitate the student ambassador program at priority schools and some of the target schools.

Each year, the University Awards Task Force awards up to three universities for their achievements in exposing students to the P&C insurance industry through curriculum, research, engagement and innovation.

The CAS University Liaison Task Force was established in 1999 and has grown to 200 CAS members who have volunteered to be liaisons to over 130 colleges and universities around the world.

“There is great importance in building relationships with our schools,” Olson said. “We want to get to know the professors and understand the challenges they face in preparing students for their careers after graduation. Develop-

ing a personal connection helps these partners feel more comfortable reaching out to the CAS and asking for resources and guidance.”

The University Liaison Task Force matches CAS members with a university to provide academics and students direct support and guidance from a practicing P&C actuary. The task force helps facilitate the partnership between the academic community and the actuarial profession.

Goals and aspirations

Olson’s objective for the University Engagement Advisory Working Group has always been to make resources available to any motivated student with the aptitude and creativity to thrive in an actuarial career.

“In searching out innovative ways to promote the P&C actuarial career path to a larger audience of talented university students, it is important that our message remains consistent,” Olson said. “No matter the target student audience, we want to provide the same resources that would make any student successful in their career. Partnering with the Diversity, Equity and Inclusion (DE&I) Committee helps us better understand the barriers for some underrepresented groups so that we can more effectively market our materials to reach these audiences.” In 2021 the CAS increased the number of schools on its target list from 163 to 251, thus strengthening relationships and enhancing communications with a broader array of schools.

Olson explained that the CAS efforts in advancing DE&I is critical to the success of the working group.

Olson believes that CAS DE&I efforts will sustain a strong pipeline of future CAS members. “It helps us

credibly establish and solidify the CAS as a major presence among universities worldwide,” Olson said. She pointed to evidence such as the CAS’s strong university partnerships, the widespread incorporation of P&C concepts into actuarial science curriculum, the use of CAS resources and the continued interest from students in pursuing CAS credentials.

Gratitude

Olson deeply values and appreciates all the work her vice chair, Jaris Wicklund, FCAS, and the chairs of the working group’s task forces have put in throughout her tenure, acknowledging that all the progress the working group has recently made has been under their strong leadership. These members include Brett Jaros, FCAS, CAS Trust Scholarship Task Force; Courtney Rohde, FCAS, Case Competition Task Force; Allison Newhouse, FCAS, Student Programs Task Force; Anson Lo, FCAS, University Award Task Force; and Jamie Doyle, ACAS, University Liaison Task Force. She is also grateful for the CAS University Engagement Manager and Staff Chair Margaret Gaddy.

For Olson volunteering is a truly rewarding experience where all participants are working toward the same goals in ways that they may not find in other organizations.

“I am so thankful to have stumbled into this career, having come from a small school without an actuarial program,” she said. “I want to share these opportunities with as many students as possible.”

Visit bit.ly/CASOlson to watch Olson’s full interview on AR Web Exclusives. ●

“I am so thankful to have stumbled into this career, having come from a small school without an actuarial program. I want to share these opportunities with as many students as possible.”

ON THE SHELF By RICHARD GOLDFARB

Fairness for Insureds and Investors

***Pricing Insurance Risk: Theory and Practice* by Stephen J. Mildenhall and John A. Major, Wiley; 1st edition (June 15, 2022), 566 pp, \$83.99.**

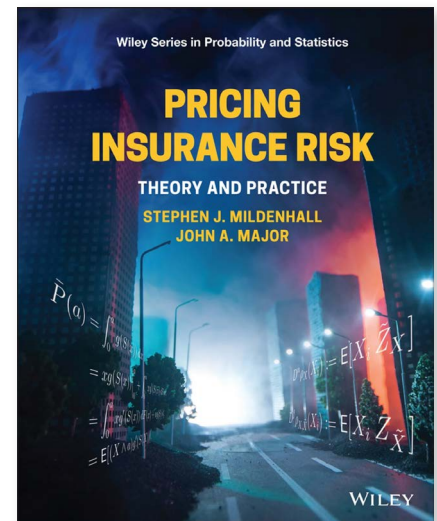
Pricing actuaries have developed a vast set of tools to parameterize loss distributions and use them to quantify mean values, as well as higher quantiles, for potential claim costs. While that is an important element of any pricing exercise, the critical task for the pricing actuary is to convert these loss distributions into prices that incorporate *risk margins* that are both fair to the insureds and fair to investors whose capital is put at risk. There are, to be sure, a number of widely used methods (premium calculation principles) for pricing individual risks or entire portfolios. But attempts to develop a unified approach to pricing entire portfolios and then allocating or attributing the resulting risk margins to individual business segments have proven more challenging. Practitioners are left to rely on ad hoc methods that lack a coherent and consistent basis, which often produces results that are inconsistent or difficult to explain.

Stephen J. Mildenhall, FCAS, and John A. Major, FSA, take up this challenge in their mathematically rigorous but inherently practical new book, *Pricing Insurance Risk: Theory and Practice*. Drawing on research from over 300 academic and practitioner publications, as well as the authors' extensive industry experience, the book deftly summarizes

existing practice, vividly highlighting not only the connections between various classical approaches but also their shortcomings. They then present a compelling argument for a modern approach that addresses these shortcomings and demonstrates how their approach can be implemented in practical applications.

"Part I: Risk Measures" introduces critical background information on risk measures used for both pricing and capital assessment, and it presents the mathematical elements used throughout the book. In particular, the authors extensively discuss quantiles, value at risk and tail value at risk, three key risk measures that represent the foundation of a range of risk measures. They present a thorough treatment of the properties of these different risk measures referenced later in the book. Part I closes with a series of case studies that the authors use extensively in the book's numerical examples.

"Part II: Portfolio Pricing" begins with two important chapters that serve as a comprehensive summary of the existing literature, covering both the financial theory behind portfolio pricing and specific pricing methodologies commonly used by actuaries, including a number that have historically received more attention by academics than by practitioners. Chapter 10 presents what the authors refer to as modern portfolio pricing theory. They first establish the important and well-known connection



between risk margins, which insureds pay as part of their premiums, and capital contributed by investors placed at risk. Mildenhall and Major argue that the proper foundational building block of insurance risk pricing is to treat any loss distribution as a series of *thin layers*, each with its own (Bernoulli) probability of attaching, its own required capital amount and potentially its own cost of capital. Each thin layer can be priced in a consistent manner using a *distortion function* that elegantly captures the relationship between the attachment probability, the capital, the expected loss, the risk margin and the return on capital. Pricing, or establishing the risk margin for, any specific loss distribution can then be done by summing (or integrating) across these various thin layers, giving rise to the concept of a *spectral risk measure*. Chapter 11 then presents numerical examples of their approach,

first in a discrete case that is easy for the reader to replicate in a spreadsheet, and then for each of the case studies previously presented. Throughout Part II, the important point the authors make is that pricing insurance risk is fundamentally about establishing risk margins for the total portfolio that sufficiently compensate investors whose capital is at risk. They are careful to present an approach in which the capital can be layered, allowing them to explicitly recognize that different layers of capital may command

the fact that different layers of capital command different rates of return. They then show in Chapter 14 that the *spectral risk measure* approach presented in Part II gives rise to two *natural* allocations of the portfolio risk margin to segments. For many readers, this will be the most mathematically challenging chapter of the book because of the authors' rigorous treatment of the methodology, their attention to many special cases and their care to give due credit to previous researchers. The reader is nonetheless

they discuss how to use their approach to evaluate alternative reinsurance strategies and to perform portfolio optimization as different business segments grow or shrink.

Pricing Insurance Risk is thoroughly researched and brings together the insights from hundreds of published papers in a unified, well-organized and mathematically rigorous manner. But what makes this work such an important contribution to the literature and to actuarial practice is the insightful commentary and the integration of the case studies into the text, which allows the authors to demonstrate realistic implementation of the concepts, methods and algorithms presented.

The authors are aware that they are presenting material that will be of particular interest to practitioners and actuarial students. To make the material accessible to those audiences, two important pedagogical elements are included. First, they have incorporated more than 300 technical remarks, examples and exercises, and many of the exercises include fully worked out solutions. Second, they have included specific learning objectives for each chapter. These carefully identified learning objectives could be of great value to the CAS Syllabus & Examination Working Group and should facilitate making this expertly written textbook the foundation for educating future actuaries in the theory and practice of insurance pricing. ●

Richard Goldfarb, FCAS, is the president of Ventus Risk Management, a past CAS board member and the author of two papers that appear on the CAS Exam Syllabus.

Drawing on research from over 300 academic and practitioner publications, as well as the authors' extensive industry experience, the book deftly summarizes existing practice, vividly highlighting not only the connections between various classical approaches but also their shortcomings.

a different risk margin.

"Part III: Price Allocation," the technical heart of the book, builds on the approach used to price the entire portfolio and addresses how the resulting portfolio-level risk margin can be attributed to (or allocated to) individual segments and ultimately to individual insureds. As the authors are careful to do in Part II, they begin with a presentation of current practice and use that presentation and the case studies to highlight some weaknesses in those approaches. They pay particular attention to the well-known problem with *constant cost of capital pricing*, which gained popularity when practitioners adopted capital models to allocate capital to business segments but often failed to account for

rewarded with great insights into the problems that other work has not previously addressed. They close Part III with Chapter 15, which presents algorithms to implement their natural allocations and contains exhaustive numerical and graphical output from applying their approach to the case studies.

Finally, in "Part IV: Advanced Topics," they whet the appetite of the interested reader with a series of brief but insightful discussions of advanced topics. For instance, they discuss how to incorporate asset risk into the pricing exercise, how to think about the existence of loss reserves and how to account for insurers as going concerns in a multi-year setting. In two chapters that will be of particular interest to practitioners,

IN MY OPINION By GROVER EDIE, AR EDITOR IN CHIEF

We Have a New Team Member (We Got a Puppy)

My wife had been “suggesting” we get a dog for a long time. Our last dog passed away more than 20 years ago, and with my traveling, I didn’t want to have another. But this year I relented, and it took Diane only four days before “Snickers,” a female blue merle pug, joined us.

Not being an animal trainer, I have been trying to use my supervisory skills with Snickers. I thought those skills might be appropriate. This chronicles some of what I found.

First impressions

New hires are greatly influenced by what happens to them on the first day of the job. Large corporations offer a few hours

to a few days of employee orientation. You may remember your own company orientation.

I recall my first week as an underwriter trainee. I was feeling good that I had finally found a job, and a good one, too. I was feeling triumphant and leaned back in my chair in an “I’ve-finally-made-it” moment. It was short lived. The new guy, who was me, got the oldest and worst office furniture in the office. When I leaned back, my chair just kept going until it went over backwards and I ended up falling to the floor, feeling not quite so triumphant.

That incident shaped my attitude.

The first day we brought Snickers home, she wandered too close to the basement stairs and fell down about

two-thirds of the way to the basement. Fortunately, the stairs are carpeted and she seemed uninjured, but to this day, she doesn’t “do stairs.” Our “new employee orientation” was a flop.

It’s about time

I have known for a long time that a new hire actually reduces a team’s productivity for a few months. Read *The Mythical Man-Month* by Fred Brooks if you don’t believe me. A puppy not only reduced our productivity, but she also decreased our sleep and interrupted our meals.

Whether it’s feeding the puppy or “feeding” information to the new hire, either one can take a big toll on time. Starting a schedule helps, but there still are those unforeseen issues that come up — the puppy eats something she is not supposed to or the new hire fails to follow a procedure. A puppy will demand all of your attention while she is awake, which is worse than a new hire.

When I had new hires, I often scheduled short (15 minutes) daily meetings with them to ask questions and otherwise discuss what was going on with their projects. Rather than interrupting me frequently during the day, they saved their questions for this meeting. Oftentimes, they found answers to their questions before we met, saving me time and instilling in them the skill of finding answers on their own.

Snickers is now on a schedule, but she still has occasions when she wants to go outside when it isn’t on the schedule.



Pay attention

We learned that Snickers will sometimes misbehave when she wants our attention. I firmly believe some of my employees did that as well. It would happen when they didn't get the "minimum daily requirement" of attention from their supervisor or colleagues.

Snickers loves to chew on things. Not just puppy toys and chewy things we buy, but the handles on our kitchen drawers, the corners in our kitchen, the exposed wood on our deck, and just about anything we think would taste terrible. The pet store said to give her something to chew on when that happens, that is, replace the focus of her chewing. But sometimes, she doesn't make the exchange. Then we place her in a playpen. Now we think sometimes she wants to go to her playpen and misbehaves because that is how she gets there — possibly a consequence unintended on our part.

Sometimes a new employee will pick up a bad habit that isn't acceptable. I have had more than one employee who would interrupt people, essentially letting them know why the speakers' ideas should be scrapped and that they had a better idea. Like chewing on the kitchen drawer handles, it was annoying and disruptive. I "gave them something else to do" (besides interrupting), by suggesting they write up their ideas and present them to me later — that way we'd have it in writing, they would get the credit and it wouldn't offend the person speaking. Without an audience, they usually decided not to pursue their position with a memo.

The corrections

Housebreaking has radically changed since our last puppy. In the old days,

I "gave them something else to do" (besides interrupting), by suggesting they write up their ideas and present them to me later — that way we'd have it in writing, they would get the credit and it wouldn't offend the person speaking.

when the puppy "had an accident" in the house, you were supposed to rub her nose in it, say "bad dog" and put her outside. That didn't seem to work for us with our previous pets. Today's training philosophy is, if that happens, you almost ignore it. You certainly don't rub her nose in it, but you do take her outside immediately. When she does "go" outside, they recommended that you give her a treat. The old method reminds me of "management by exception." The supervisor wouldn't say anything if everything is okay, but takes action if things are not. Which came first, the current method of housebreaking a dog or training employees, I couldn't say.

The new housebreaking style and getting her to stop chewing things got us discussing "Who is training whom?" If Snickers doesn't get enough attention, sometimes she will misbehave just to get us to place her in her playpen, especially if there is something in it she wants to play with or chew.

I wonder how I would have approached being a supervisor if I were to think about how my subordinates were training me.

Early habits are hard to break, so correcting a puppy or a new hire is essential. When we first got her, Snickers liked to get into the refrigerator when we opened it and sit on the bottom of the opening. We thought it was cute. At first! Now it is a nuisance, but the habit has been formed. Ignoring the frequent

late arrival of a new hire can have similar consequences.

Regardless, we have to monitor Snickers more now than we will when she learns the rules (if she does), just like new employees require more monitoring than seasoned ones.

Clear communication

We learned that dogs have a vocabulary of about 165 words. I think "no" is so general that Snickers only thinks it is an interjection, not a command to "stop doing that."

When I started one of my jobs, I was confused by the vocabulary: Words that were used in my prior company meant different things in the new one. I was involved in a number of confusing conversations until I started to ask, "What do you mean by (that word)?" Because my consulting involves different clients, I have tried to create a dictionary of *their* terms, so I won't get caught up in a language issue. New hires might not even know that some of the terms used in the company differ from their customary meaning.

By the way, to Snickers, "Give it to me" means "Spit it out."

You may be able to come up with other parallels between supervising a new hire and a pet. But don't let either pet or employee maintain a bad habit or you may end up with a pug in the refrigerator. ●

IT'S A PUZZLEMENT By JON EVANS

Picking a Trusted Fiduciary

Moronocles has just inherited a huge fortune. He plans to dedicate his life to charitable outreach, splitting his time between needy communities in Amsterdam, Las Vegas and Bangkok. He has carefully selected a group of candidates for the job of managing his finances while he is busy with his altruism: Delilah, Eve, Gomer, Ilse, Irma, Jezebel, Leni, Medea, Salome and Squeaky.

Although Moronocles believes they are all completely trustworthy, he hires Deckard, a professional investigator, to make the final selection. In Deckard's experience, candidates for this sort of job either always tell the truth or lie about everything. Deckard's interviews reveal the following:

- Irma says Squeaky is truthful.
- Delilah says over half of the other candidates are truthful
- Leni says fewer than half of the other candidates are truthful.
- Either Medea, Salome and Squeaky are all truthful or they are all liars.

Whom do you think Deckard picks for the job?

A Numerical Bar Game

Steve Mildenhall contributed this puzzle and the solution, which makes use of Goodstein sequences.

As you recall from this May-June Puzzle, the nerdier regulars at the Bon Pint pub enjoy a peculiar number game, where they start with an integer n and expand it in powers of 2. Then they

expand all the exponents in powers of 2, and so on, until n is written with just 1s and 2s, e.g., $9 = 2^3 + 1 = 2^{(2^1+1)} + 1$. The puzzle asks how often the sequences stop and if they stop, how long the players play.

The game for $n = 2$, $n = 3$, and the initial terms for $n = 4$ are online. First, decide the outcome for $n = 4$. Then try to generalize.

The sequence terminates for all initial n , but it can take a *very long time*. If you approached the problem empirically by building a spreadsheet, that might be a surprising result since it seems to increase forever (in terms of normal-sized numbers).

Let's work out the case $n = 4$. Following the instructions, write n in base 2, $n = 2^2$. Now, introduce the character \square , and replace 2 with \square : $n = \square^2$. Think of \square as a special kind of fuel cell. It starts with 2 units of fuel. While it is unopened, its capacity increases by 1 each iteration. But as soon as it is opened, it stops growing and gets used up one unit at a time.

The Goodstein iteration is $f(\square) \rightarrow f(\square) - 1$, where f is a function involving sums, products and exponentials, with the understanding that the right-hand side is rewritten with no negative coefficients in the same way you "borrow" when learning subtraction in grade school. When you borrow, a new cell is "opened" to create a finite number of new fuel units that are used to rewrite the right-hand side as a sum of terms with positive coefficients.

For $n = 4$, this conversion hap-

pens at the first iteration when each \square contains three fuel units. To write $\square^2 - 1$ with positive coefficients, we "open" one tank and get $2\square^2 + 2\square + 2$. Iterations two and three take us to $2\square^2 + 2\square$. Iteration four yields $2\square^2 + 2\square - 1$ and each \square contains 6 units. To avoid minuses, we need to crack open another cell, obtaining $2\square^2 + \square + 5$. The new cell covers the next five iterations.

At iteration 10, we open a new cell that contains 11 units and arrive at $2\square^2 + 11$. And so on. We start with finitely many cells, and each cell, once opened, has a finite capacity. Thus, eventually, we'll use up all the fuel.

We're adding \square as a new number greater than any finite number. Expressions involving \square are ordered by comparing like terms, and so each Goodstein iteration makes them smaller. Since they are all ≥ 0 , eventually, the iteration must terminate. It can be shown that you cannot prove the Goodstein sequence terminates without introducing a new "number" like \square .

How many iterations are required? The answer has more digits than we can print in *AR*. In exponential notation, it is

$$3 \cdot 2^{3+3 \cdot 2^3+3 \cdot 2^4+2^{2^{2^2}}} - 3 = 2^{402,653,211} - 3 \approx 10^{121,210,694}.$$

This is the result of an iterative formula. It is described in Wikipedia and the references therein. That article quotes numbers in the chain, whereas we quote iteration steps, so the answer above is one less than shown.

Shyam Bihari Agarwal provided a detailed solution. John Jansen also supplied the answer. ●

Know the answer?
Send your solution to
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