

**Information Paper  
for  
CAS Board of Directors  
February 1, 2022**

**Subject: Annual Research Report**

**Responsible Officer: Jim Weiss, Vice President – Research and Development**

**Background**

CAS [governing documents](#) require the VP-Research and Development to submit an annual report to the Board. If we (rightfully) regard “CAS Research” as the entirety of intellectual property developed by, for, or in collaboration with CAS members in order to solve important insurance and risk management problems, then this industry could hardly be contained by a single document. However, one useful barometer of the overall state of this industry is the activity of the dedicated Research Function – which consists of volunteers in research-remitted working groups (e.g. “the four Rs”); staff including research actuary Brian Fannin; and third parties engaged or contracted by CAS to produce research.<sup>1</sup> This report summarizes projects originated, supported, or sponsored by the Research Function during fiscal year ended 9/30/2021, and provides commentary regarding how these initiatives are executing on specific CAS strategic plan goals.

**Information**

**Exhibit A** presents fiscal year 2021 activities according to how each project originated:

- *Recurring Projects* – regularly scheduled activities conducted by volunteers, such as calls for papers/essays, updates to Actuaries Climate Index, and so on
- *Working Group / Task Force Projects* - self-publications and RFPs developed, conducted by, or tasked to units within the volunteer organization
- *Grant Papers* – projects sourced through an annual competitive grants process, typically conducted by researchers at colleges and universities
- *Commissioned Work* – extemporaneous research opportunities brought to or about by members, staff, and third parties
- *Staff Projects* – initiatives completed by or in partnership with staff (with volunteer oversight), typically with involvement from staff research actuary

The categories above are not mutually exclusive, therefore, actuarial judgment was exercised in assigning each project to the most relevant of the above categories.

Fiscal year 2021 activities helped advance several aspects of the [2021-2023 CAS Strategic Plan](#), including “building skills for the future” across three different areas:

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<sup>1</sup> Additional channels include CAS media (e.g. Variance), non-CAS publications (e.g. trade media), and working groups organized outside the CAS research function (e.g. marketing and communications).

- Problem solving – several of the Research Function’s prioritization decisions were oriented towards “tackling the important and insurance and risk management problems in our data rich world,” including:
  - *Climate change* – two works were commissioned to better understand the urgent problem of wildfire, including one involving community mitigation that is likely to have broad utility beyond insurance. One grant paper will also focus on the correlations between different natural hazards.
  - *Social inflation* – a commissioned work by the Insurance Information Institute evidencing social inflation is close to completion, and two additional works involving a research dataset licensed from Advisen are in progress.
  - *Cyber* – Two grant papers will focus on “time to emerge” and “infection spread” respectively (i.e. frequency and severity), the former of which will involve the compilation of a breach dataset using public data.
  - *Pandemic* – Staff and volunteers partnered on a paper exploring COVID-19 in the broader context of insurability, and one of the grant papers will build a bridge between epidemiological and actuarial modeling. The continuation of the auto loss cost trends partnership with APCIA and SOA will see the next update explore pandemic-related impacts on mobility.
  - *Disparate impact* – A paper commissioned in mid-2021 is already close to publication and will explore the profound and timely topic of quantifying potentially discriminatory impacts on protected classes.

The Actuaries Climate Index and Emerging Risks Surveys also continued to provide drumbeats of thought leadership at their typically reliable cadences.

- Analytics – To effectively build skills for the future, one must understand the foundation being built upon - which is why Brian Fannin’s first annual Actuarial Technology Survey will be an invaluable resource for both members and leadership in charting future strategy. A commissioned market intelligence study by McKinley will also scan the environment in which CAS and its members operate and help identify gaps and opportunities for CAS to address in the years ahead.

Tactically the 2021 grants process had a significant focus on developing data science aspects of the CAS research library, with proposals selected on natural language processing/artificial intelligence, dimension reduction, machine learning (in the context of actuarial credibility), and continuing to advance claims-level reserving. Five new repositories were also added to the CAS GitHub in 2021, which will make code-based renderings of actuarial techniques more accessible to members and the public, who can in turn not only use but also collaborate to advance the techniques.

- Domain Knowledge – The Research function continues to invest in practical research to help actuaries further develop knowledge of property-casualty insurance. In fiscal 2021 the Reserving working group released guidance related to IFRS 2017, the Conning project on Economic Scenario Generators sponsored by the Risk working group was published, and CAS funded part of an SOA project oriented to help

organizations manage regulatory and accounting risks. A final draft was furnished for primary research into the potential for microinsurance in developed nations, and research continues into business models underlying peer-to-peer insurance.

In addition to its extensive volunteer and staff apparatus, CAS research is supported by an annual allocation of approximately 7% of member dues subject to relevant caps and restrictions. As of the end of fiscal year 2021, the research fund stands at \$1,069,707. **Exhibit B** illustrates how this fund has been consumed. Research funding needs will continue to be monitored and addressed in conjunction with the Operational Oversight Committee.

Effective internal and external partnerships are critical for the Research function to make maximum positive impact in North America and globally. Research works closely with CAS Professional Education and Marketing and Communication to disseminate results, for example, the winner of the Reinsurance Call for Papers was first made available to members in the form of a webinar in 2021. Several joint projects with the CIA, SOA, and others are noted above, and Brian, Dave Core, and/or I generally dialog with counterparts in peer organizations such as these, the IFoA, and the Australian Institute approximately monthly. Brian led a virtual networking session at the Actuarial Research Conference in August 2021, and then-CAS President Jessica Leong keynoted.

The CAS Research Function should continue building on the strong momentum described above during fiscal year 2022. The new [Research Council](#) already held its first meeting one week into the new fiscal year to begin charting top priorities, which should in turn help working parties and task forces even more effectively bring fiscal year 2022's Exhibit A to life and make research accessible to even broader stakeholder audiences. Lessons learned from proofs of concept in 2021, designed to reduce turnaround time, should improve "speed to market." The evolving volunteer-staff model should continue to enhance collaboration in a manner that allows all parties to continue doing what they do best and have fun doing it. Thank you for the Board's continued support and investment in research, and please of course do not hesitate to provide questions and feedback in general or as relates to the content herein.

Jim Weiss  
VP – Research & Development