



**Casualty Actuarial Society
Request for Proposals for
Paper / Monograph on Stripping out, Evaluating and
(Re)Combining Variables in a Predictive Model
August 2023**

The Casualty Actuarial Society (CAS) Syllabus and Examination Working Group is interested in developing an educational publication tentatively entitled: Stripping out, Evaluating and (Re)Combining Variables in a Predictive Model. The publication would support topics included in CAS examination 8, Advanced Ratemaking, which are provided in this document, in both a comprehensive and integrated manner and become study material for candidates of CAS examinations.

This Request for Proposals (RFP) is addressed to both actuaries and professionals in the field of education. The CAS welcomes responses from both groups as well as combined responses from professional writers working with practicing actuaries. The proposed agreement in Attachment D is structured for a writer and presumes that the CAS would publish the educational material. If a publisher, however, submits a proposal, the CAS would entertain alternative proposals for compensation where the publisher or other revenue generating business, e.g., consulting company, would produce and sell the educational material. The CAS is also open to receiving proposals for a publication above and beyond the scope of this work (e.g., a single source textbook production of education material for a specific exam), provided that the requested materials outlined in this RFP can be produced and published first and within the needed timelines.

This RFP is organized in the following sections:

1. Description of the CAS
2. Proposal Requirements
3. Process and Timeline
4. Presentation, Ownership, and Publication of Educational Material
5. Compensation
6. Hold Harmless
7. Proposed Agreement

1. Description of the CAS

Background Information

The CAS was organized in 1914 as a professional society with the purpose of advancing the body of knowledge of actuarial science applied to property, casualty and similar risk exposures. This is accomplished through the presentation and discussion of papers, conducting seminars and workshops, maintenance of a lending library, funded research activities, and other means. The membership of the CAS includes over 10,000 actuaries employed by insurance companies, industry advisory organizations, national brokers, accounting firms, educational institutions, state insurance departments, the federal government, and independent consultants. Additional information about the CAS can be found at www.casact.org.

The CAS Board of Directors and Syllabus and Examination Working Group are continually striving to improve the credentialing process. One effort is to focus on the consistency of study material. Currently, some of the content outline¹ material is comprised of disparate articles, various chapters from textbooks, and topic-specific study notes written for the purpose of a specific exam. The Board has encouraged the Syllabus and Examination Working Group to create or commission integrated study materials on major topics of CAS examinations.

2. Proposal Requirements

The CAS requests that proposals contain the following information, in the specified order:

- a. Cover letter
- b. Table of contents for the material included in the proposal.
- c. Description of professional experience including knowledge of the topic of ratemaking for unique insurance exposures and experience in producing study materials. Also include knowledge of other major topics on the CAS content outline as well as relevant work and/or research experience and professional accomplishments. This should include a listing of previous publications.
- d. An outline of your process for developing the publication, including an initial draft outline of the contents of the publication
- e. Projected timeline for this engagement (see next Section 6 of this RFP, Process and Timeline, for guidance)
- f. Pricing requirements including a not-to-exceed amount.
- g. Any required changes to the CAS Agreement in Attachment E or other terms and conditions contained in this RFP.

¹ Formally Syllabus

3. Process and Timeline

If you are interested in responding to this RFP, you must declare your intention by e-mail to Karen Sonnet (ksonnet@casact.org) by **August 21st**, 2023 Full submission of the RFP can follow your declaration of interest. In addition, questions regarding this RFP should be directed by e-mail to ksonnet@casact.org.

Submitted proposals will be considered the property of the CAS and will not be returned. The information contained in the proposals will be treated in the strictest of confidence and shall not be used for any purpose other than the purpose for which it was submitted, without the express written permission of the author or collaborating authors.

Authors are solely responsible for their own expenses in preparing a proposal and for subsequent negotiations with the CAS.

This RFP should be reviewed with the attached agreement (Attachment E), which defines the terms and conditions under which work is to be performed.

Timeline

The projected timeline for this engagement is summarized below.

08/01/2023	RFP is Issued
8/21/2023	Proposals Due
8/24/2023	Recommendation Finalized
9/4/2023	Author/Vendor Notified
9/15/2023	Author/Vendor Contract Signed
10/5/2023	Detailed Outline Delivered
12/20/2023	First Draft Delivered
02/28/2024	Final Draft Delivered

¹ This includes a detailed outline of every section and a sample of material written to demonstrate style, to the extent it differs materially from the existing version.

² The first draft may contain some sections in formative stages. Interim dates will be required for various stages of the drafts.

³ After this date, there may be a nominal amount of interaction for editing prior to publication.

Selection Process

The proposal will be reviewed by members of the Syllabus and Examination Working Group and may be reviewed by members of the Executive Council and Board of Directors. The CAS may request oral presentations. These presentations could take place virtually or at the CAS Office in Arlington, Virginia and would be at the expense of the author(s).

The CAS will award the contract to the author or collaborating authors who, in the judgment of the CAS, is best able to perform the work as specified herein. In evaluating the responses to this RFP, the Syllabus and Examination Working Group will heavily weigh the ability of the author(s) to develop integrated study materials in a clear and succinct manner within the requested timeline. Pricing will be considered in the decision process but will not be the primary consideration.

After an author (or collaborating authors) has been selected, an implementation task force will assign a liaison to the author(s) to provide guidance and feedback as requested to keep the publication properly focused. The author(s) is expected to make revisions based on implementation task force feedback before the publication will be accepted.

Interested parties should submit their proposals in e-mail to:

Casualty Actuarial Society
Attn: Karen Sonnet
4350 N. Fairfax Drive, Suite 250
Arlington, Virginia 22203
Telephone: 703.276.3100
ksonnet@casact.org

This RFP should not be construed as an agreement to purchase services. The CAS is not bound to enter into any contract. Furthermore, the CAS may enter into contracts with more than one author.

4. Presentation, Ownership, and Publication of Educational Material

The CAS will acquire all proprietary rights, including copyright pertaining to the deliverables and any work product developed by the selected author(s) in connection with this Agreement. The selected author(s) must assign to the CAS all right, title, and interest in and to the work resulting from the services under this Agreement, including but not limited to all copyright and all rights subsumed thereunder. Details are provided in the attached agreement.

5. Compensation

Respondents are solely responsible for their own expenses in preparing a proposal and for subsequent negotiations with the CAS.

Proposals must include a proposed fee structure. Section B of the proposed agreement in Attachment C describes payment for services. It is structured for a writer and presumes that the CAS would publish the final product. If a publisher or related business entity submits a proposal, however, the CAS will entertain alternative proposals for compensation where the publisher or related business entity would produce and sell the study material. The RFP should include a recommendation on the business model and all pricing proposed, if the interested party is seeking a revenue generating opportunity.

Payment will only be made for successful completion of agreed upon deliverables, not for hours billed.

6. Hold Harmless and Indemnification

Any author submitting a proposal will indemnify and hold harmless the CAS, its staff and member volunteers for any liability resulting from the materials contained in the deliverables and work product. The CAS, its staff and member volunteers shall not have any liability or obligation of any kind to the author(s) in connection with the use, appropriate or otherwise, of materials prepared by the author(s).

7. Proposed Agreement

The proposed agreement terms and conditions are provided in Attachment C. The author(s) or company should raise questions about the agreement along with other questions in accordance with the deadlines presented previously. The author(s) should also note any changes they wish the CAS to consider as part of their response to the RFP.

Attachment A

Casualty Actuarial Society Summary of Basic Education

Validation by Educational Experience

- VEE-Accounting and Finance
- VEE-Economics

Online Courses

- DISC Course 1: Risk Management and Insurance Operations
- DISC Course 2: Insurance Accounting, Coverage Analysis, Insurance Law, and Insurance Regulation
- DISC Course 3: Introduction to Data and Analytics

Course on Professionalism

Examinations

Exam 1 Probability

Exam 2 Financial Mathematics

Exam MAS-I Modern Actuarial Statistics I

Exam MAS-II Modern Actuarial Statistics II

Exam 5 Basic Techniques for Ratemaking and Estimating Claim Liabilities

Exam 6 Regulation and Financial Reporting (Nation-Specific)

Exam 7 Estimation of Policy Liabilities, Insurance Company Valuation, and Enterprise Risk Management

Exam 8 Advanced Ratemaking

Exam 9 Financial Risk and Rate of Return

Attachment B

Background Preparation

The following Ratemaking Classification Topics are the primary focus for this RFP, and proposals/finished work must address these topics:

Ratemaking Classification

1. Approaches to stripping out rating factors using predictive models for further analysis.
 - Examples: Territorial
 - Tasks associated:
 1. Stripping out the control variables from GLM.
 2. Removing variables without having to refit the original model.
 3. Usable for PA models, other than GLM.
 4. If a GLM is not able to grasp territory or vehicle symbol or credit (some examples) and therefore another method is needed to estimate this/these factor(s)
 5. The stripped-out variables can be added back in by a multiplicative process
 6. Double check results by using a PA models other than GLM to reproduce results

2. Approaches to modeling with high dimensional variables.
 - Examples: vehicle make and model, workers compensation classes.
 - Tasks associated with:
 1. There can be multiple rating factors that are highly correlated. How can a modeler reduce the number of columns, if desired.
 2. Possible methods to use PCA, Clustering analysis.
 3. High cardinality factors (e.g. vehicle make)
 4. How group, how price, how chain together – credibility or judgement
 5. Lines affected other than personal lines (not all inclusive) – Workers Comp, General Liability (Prem Ops, Brands), Jewelry

3. Combinations of ratemaking component models
 - Examples: frequency and severity
 - Tasks associated with:
 1. How to put back in the factors stripped out.
 2. Data adjustments.

3. How to fit for deficits in the data.
4. How does one trust the data – make it valuable for predictive uses.
5. Credibility & the complement(s) of credibility – multivariate credibility, regularize regression, elasticized return, Linear mixed models.
6. Offsets.
7. Regulatory constraints / legal constraints.
8. Ensemble models.

Under this examination, the following source materials are already provided. Please note that Exam 8 domain changes have been announced for 2024 (<https://www.casact.org/article/domain-changes-cas-exams-7-8-and-9>).

Actuarial Standards Board of the American Academy of Actuaries, "Actuarial Standard of Practice No. 12, Risk Classification (for all Practice Areas)," December 2005, updated for deviation language in May 2011.
Bahnemann, D., "Distributions for Actuaries," CAS Monograph #2, Chapters 5 and 6. Including errata. It is highly recommended that candidates should read the entire monograph, as the material in Chapters 1-4 will be assumed to be familiar to candidates.
Bailey, R. A. and Simon, L. J., "An Actuarial Note on the Credibility of Experience of a Single Private Passenger Car," PCAS XLVI, 1959, pp. 159-164. Including discussion of paper: Hazam, W. J., PCAS XLVII, 1960, pp. 150-152.
Couret, J. and Venter, G., "Using Multi-Dimensional Credibility to Estimate Class Frequency Vectors in Workers Compensation," ASTIN Bulletin, Vol. 38, No. 1, May 2008, pp. 72-85.
Fisher, G., et al., Case Study for "Individual Risk Rating Study Note." Candidates are responsible for the Case Study presented in the Excel file, which can be downloaded at: https://www.casact.org/sites/default/files/2021-03/8_Fisher_et_al_Case_Study.xlsx
Fisher, G., et al., "Individual Risk Rating Study Note," CAS Study Note, Version 3, October 2019.
Goldburd, M., et al., "Generalized Linear Models for Insurance Rating," CAS Monograph #5, 2nd edition, Chapters 1-9.
Insurance Services Office, Inc., Commercial General Liability Experience and Schedule Rating Plan — Multistate, Manual Notice GL-MU-2019-CGLES-001. Candidates are not required to memorize the details but will be expected to be able to use them on the examination. The entire manual will be provided both in the study kit and on the exam.
Mahler, H. C., "An Example of Credibility and Shifting Risk Parameters," PCAS LXXVII, 1990, pp. 225-282. Candidates will not be tested on the Appendices.
National Council on Compensation Insurance, Experience Rating Plan Manual for Workers Compensation and Employers Liability Insurance, 2003 Edition, Issued 10 Jan 2022. Candidates are not required to memorize the details but will be expected to be able to use them on the examination. The entire manual will be provided both in the study kit and on the exam
National Council on Compensation Insurance, Retrospective Rating Plan Manual for Workers Compensation and Employers Liability Insurance, Circular CIF-2018-28, 06/21/2018, selected pages as included in the Study Kit. The manual consists mostly of two tables: • pp. 9-728: "Tables of Aggregate Loss Factors – sub tables 1 through 18" and • pp. 735-882: tables for "Sample Values for a Policy with No Loss Limit and All Exposure in Single Hazard Group" by state. Candidates are not required to memorize the details but will be expected to be able to use them on the examination. The entire manual will be provided both in the study kit and on the exam.

Attachment C

AGREEMENT **for Paper / Monograph on Stripping out, Evaluating and** **(Re)Combining Variables in a Predictive Model**

Agreement is made effective the ____ day of _____, 2023 by and between the Casualty Actuarial Society (“CAS”) and _____ (“CONSULTANT”). Based on mutual consideration, the receipt and adequacy of which are acknowledged, the CAS agrees to contract for the services of the CONSULTANT, and the CONSULTANT agrees to provide services under the terms and conditions of this Agreement.

A. STATEMENT OF WORK

The CONSULTANT shall provide consulting services on behalf of the CAS to produce an educational publication on the topic of insurance accounting.

B. PAYMENT FOR SERVICES (*To Be Determined*)

In full consideration of the services provided hereunder, the CAS agrees to pay CONSULTANT a maximum fee of \$[*To Be Determined*], plus reasonable expenses incurred at the request of, and subject to advance approval by, the CAS.

The CAS agrees to pay twenty percent of the fee at the time of contract award, twenty percent when the first draft is submitted, and sixty percent of the fee upon receipt and acceptance of the final product. Final payment for such services and pre-approved expenses shall be rendered by the CAS within 30 days after acceptance of the final product.

C. PERIOD OF PERFORMANCE

CONSULTANT shall provide the services until the educational publication on the specified topic(s) has been completed and accepted by the CAS. A maximum period will be described in a detailed Statement of Work agreed to at the commencement of the project. This period of performance shall not be changed without the written authorization of the CAS.

D. NOT-TO-EXCEED TOTAL LIMIT (*To Be Determined*)

Total payment under this contract including reasonable expenses incurred at the request of the CAS shall not exceed \$[*To Be Determined*], unless authorized in writing by the CAS.

E. INDEPENDENT CONTRACTOR

It is understood and agreed that CONSULTANT is an independent contractor in the performance of this Agreement, CONSULTANT is not an agent or employee of, or partner or joint venture with the CAS, and CONSULTANT is not authorized to act on behalf of the CAS.

CONSULTANT shall assume full responsibility for payment of all federal, state and local taxes with respect to performance of the CONSULTANT's obligations under this Agreement, and the CAS shall not be responsible for any benefits, insurance, or other payments not specifically agreed to in writing or under this Agreement.

F. RIGHT TO ACT AS CONSULTANT; REPRESENTATIONS

CONSULTANT warrants to the CAS that he/she is not subject to any obligations, contracts, covenants or restrictions that would prevent him or her from entering into or carrying out the provisions of this Agreement. CONSULTANT represents and warrants that the work prepared under this Agreement is the CONSULTANT's own original work; that the CONSULTANT is the sole owner of the work and all the rights being granted to the CAS in this Agreement; that the CONSULTANT has full right and power to make the assignment in this Agreement; that the work does not violate any copyright, proprietary, or personal rights of others; that the work shall contain no material from other copyrighted works without the written permission of the owner of such copyrighted material; that the work is factually accurate and contains no matter scandalous, libelous, unlawful, or otherwise actionable; that the CONSULTANT has not previously in any manner disposed of any of the rights granted to the CAS or previously granted any rights adverse or inconsistent with such granting of rights; that there are no rights outstanding which would diminish, encumber or impair the full enjoyment or exercise of the rights granted to the CAS under this Agreement; and that nothing contained in the contents of the work shall be injurious to the health of the user.

G. TERMINATION

This Agreement may be terminated by the CAS at any time by giving written notice of such termination to CONSULTANT and paying to CONSULTANT any amounts owed for the pro-rata performance of the services under this Agreement. Upon receipt of such written notice, no further charges will be made under this Agreement. Termination shall not affect the CONSULTANT's obligations under articles I, J, K, and L. CONSULTANT shall not terminate this Agreement except upon material breach by the CAS of its obligations under the Agreement.

H. HOLD HARMLESS

CONSULTANT shall indemnify and hold the CAS harmless from any and all suits, claims, damages or losses whatsoever, resulting from any act or omission or breach of any representation, warranty, or obligation under this Agreement by the CONSULTANT, his employees, agents, and subcontractors.

I. CONFIDENTIALLY

CONSULTANT warrants that, to protect the privacy of respondents to surveys conducted, CONSULTANT will collect only the data needed for the purpose of their inquiry and inform each potential survey respondent about the general nature and sponsorship of the inquiry and the intended uses of the data. CONSULTANT also acknowledges that information it obtains in the performance of this Agreement is valuable and confidential. Accordingly, CONSULTANT agrees not to disclose any such information to any person not authorized by the CAS to receive it. Upon completion of the work, CONSULTANT shall deliver to the CAS all data, documents, reports, surveys, or other materials prepared by CONSULTANT in his performance under this Agreement.

J. COPYRIGHT

CONSULTANT hereby assigns to the CAS all right, title, and interest in and to the work resulting from the services under this Agreement, including but not limited to all copyright and all rights subsumed thereunder. CONSULTANT grants the CAS permission to evaluate requests from other actuarial organizations to translate the work and/or reproduce, reprint, distribute, and sell the final version of the work for educational purposes. CONSULTANT will retain copyright to the work but will receive no royalty or other compensation for use of the work by the organization granted permission by the CAS. CONSULTANT [and the company that CONSULTANT is affiliated with at the time the work was written (if appropriate)] retains the right to use the work for both internal and external projects.

K. DISCOVERIES

CONSULTANT will promptly disclose to the CAS all discoveries made and ideas conceived by CONSULTANT in his performance of the services under this Agreement. CONSULTANT assigns to the CAS all right and title to such discoveries and ideas, and agrees to execute any and all such documents, as the CAS deems necessary to secure to it all right, title and interest in such discoveries and ideas.

L. PATENTS

CONSULTANT hereby grants a perpetual royalty free license to any of CAS members or other users of the CAS' publications for use of any patents or other procedures described in the work.

M. AMENDMENT

This Agreement may be amended only by a written document, signed by both the CAS and CONSULTANT.

N. ASSIGNMENT

CONSULTANT may not assign this Agreement or any right hereunder. Any such attempted assignment shall be void.

O. GOVERNING LAW

This Agreement shall be governed by the laws of the Commonwealth of Virginia, and CONSULTANT hereby agrees to the exclusive jurisdiction of the courts of Virginia.

CONSULTANT

CASUALTY ACTUARIAL SOCIETY

By
Name _____

By
Name _____

Title _____

Title _____

Date _____

Date _____