DECEMBER 2020

DISCUSSION PAPER

ASSET ADEQUACY TESTING CONSIDERATIONS FOR YEAR-END 2020

American Academy of Actuaries
Asset Adequacy Testing Task Force (AATTF)

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Asset Adequacy Testing Considerations for Year-End 2020

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This discussion paper was prepared by the Asset Adequacy Testing Task Force (AATTF) of the American Academy of Actuaries' Life Practice Council. Its charge was to raise awareness and summarize actuarial practices for life financial reporting actuaries involved with asset adequacy testing (AAT) and related activities in 2020's extreme economic environment. The AATTF expects this discussion paper to generate discussion among actuaries about the unusual events of 2020 and how those events shape AAT, and to provide a reminder of the relevant actuarial standards of practice (ASOPs) and regulatory standards.

Purpose and Highlights

This paper was developed to encourage discussion among actuaries about the unusual events of 2020 and how those events influence the assumption-setting, scenarios analysis, modeling, and analysis performed in conjunction with year-end AAT. Some aspects of 2020 experience could affect mortality and capital market assumptions. Some experience could be considered temporary, while other experience may be considered a more permanent change. While the impact of COVID-19 continues to evolve, some effects of the virus and the fallout resulting from changes in business practices and the capital markets could become permanent.

The AATTF conducted a survey of appointed actuaries in an effort to understand how appointed actuaries intend to approach various aspects of AAT in light of current conditions. This paper highlights responses that the AATTF considered to be of particular interest. However, it is important to note that the survey covered various aspects of AAT that are not highlighted in the text of this discussion paper. Readers of this paper may have other insights from the survey that we did not emphasize. So, the AATTF would encourage readers to review the results of the survey for additional information. Complete survey results are available here.

The intended audience of this paper, and the survey upon which it is based, are appointed actuaries and those actuaries involved with developing the analytical tools to support appointed actuaries' opinions. The issues raised in this paper assume that the reader is familiar with actuarial practices and professional standards. This paper is not a promulgation of the Actuarial Standards Board, is not an actuarial standard of practice (ASOP), is not binding upon any actuary and is not a definitive statement as to what constitutes generally accepted practice in the area under discussion. In writing this paper, there is no intention to prescribe practices and/or to suggest that existing practices are not appropriate. Rather, the purpose of the paper is to stimulate discussion and consideration of those aspects of asset adequacy analysis that warrant additional focus in this unusual environment.

In the spirit of getting the actuarial conversation started, the AATTF identified a few major themes and noteworthy topics from the survey results. The following sections of this paper provide comments along with references to relevant professional guidance on those highlighted items. The following topics were identified for this purpose:

- The Appointed Actuary's Criteria for Adequacy
- The Level Interest Rate Scenario and Moderately Adverse Conditions
- Liability Assumptions Changes Anticipated for Year-End 2020 Analysis
- Other Findings

In addition to these highlights, complete survey results can be found here.

Finally, it is hoped that this paper will encourage actuaries practicing in this area to review the existing literature and engage in thoughtful discourse and reflection as they consider the challenges of asset adequacy testing in 2020.

Introduction

An appointed actuary within a life or health insurance company is responsible for providing a public statement of actuarial opinion that the reserves and related actuarial items, when considered in light of the assets held by the company, "make adequate provision, according to presently accepted ASOPs, for the anticipated cash flows required by the contractual obligations and related expenses of the company."[1] The actuary's opinion is commonly based on an AAT—primarily cash flow testing (CFT)—where the performance of the inforce assets and liabilities are projected forward under various economic scenarios. In this analysis, the CFT could utilize stochastically generated economic scenarios as well as deterministic scenarios designed to stress certain assumptions.

In forming an opinion, generally, the actuary looks to better understand the conditions that may lead to a situation where future cash flows are unable to fund the current obligations of the company. For situations where shortfalls occur, the actuary uses judgment to determine whether the reserve amount, and thus the asset amounts, should be increased to address these shortfalls. The Standard Valuation Law (SVL)[2] requires that reserves be established at a level of conservatism that reflects conditions that include unfavorable events that have a reasonable probability of occurring. (Section 11.D.4.b). The actuary's opinion is further guided by the ASOPs, including ASOP No. 22, *Statements of Opinion Based on Asset Adequacy Analysis by Actuaries for Life or Health Insurers* ("ASOP No. 22").

Background

To gather information for this issue brief, the AATTF created a survey to be completed by appointed actuaries. Given the confluence of a sustained low-interest-rate environment, the novel coronavirus pandemic, and the recent upheaval in U.S. equity markets, the AATTF queried through the survey specific questions in the following broad topic areas: 1. Liabilities; 2. Assets and Economic Assumptions; 3. Modeling of Reinsurance; 4. Use of a Gross Premium Valuation (GPV); 5. Adequacy Criteria; 6. Management Actions; 7. Modeling Methodology; and 8. Data Sources.

1 Actuarial Opinion and Memorandum Regulation (#822) of the National Association of Insurance Commissioners (NAIC) enacted by legislation, including substantially similar terms and provisions, by state jurisdictions. https://content.naic.org/sites/default/files/inline-files/MDL-822.pdf and 2020 Valuation Manual of the NAIC, enacted by reference by state jurisdictions. https://content.naic.org/sites/default/files/pbr_data_valuation_manual_current_edition.pdf

2 Standard Valuation Law, Model Law (#820) of the National Association of Insurance Commissioners (NAIC) enacted by legislation, including substantially similar terms and provisions, by state jurisdictions.

The survey was conducted through SurveyMonkey, and was available for responses from Aug. 5 through Aug. 24, 2020 (the survey instrument can be found here). A letter introducing the survey and ensuring confidentiality for any responses was distributed to appointed actuaries on Aug. 5.

There were 787 life insurance entities identified from the National Association of Insurance Commissioners' (NAIC's) database of actuarial opinions that submitted opinions for 2019; 706 of those entities had named appointed actuaries. Because some appointed actuaries file actuarial opinions for more than one entity, there were 329 distinct appointed actuaries identified. The AATTF, through the Academy's research staff, was able to associate email addresses with 309 of those actuaries, responsible for opinions for 672 of the entities; the task force was then able to reach 303 of those actuaries with our SurveyMonkey invitation, reaching appointed actuaries responsible for reporting on 660 entities. Of those 303 actuaries, 156 responded to the survey, a response rate of 51%. Those responding actuaries report on 387 entities, 59% of the 660 possible.

For more details on the responding actuaries, their companies and their responses, and for tables summarizing the responses to all 95 questions, see the report here.

The Appointed Actuary's Criteria for Adequacy

When forming a statement of actuarial opinion regarding asset adequacy, ASOP No. 22 states the actuary should use professional judgment in determining whether certain considerations apply. Considerations specifically listed in ASOP No. 22, section 3.4 include reasonableness of results, adequacy of reserves and other liabilities, analysis of scenario results, aggregation, trends, management action, and subsequent events. Actuaries typically understand that many factors weigh into the asset adequacy criteria determination.

The survey keyed in on three specific items with respect to determining adequacy:

- Regarding the approach to the primary scenario set used in stating appointed actuaries' opinions, are they contemplating changes for year-end 2020?
- For actuaries who base the adequacy criteria on stochastic scenario testing, how will the pass rate for 2020 testing compare to that used for 2019?
- What guidance do actuaries use in shaping their criteria for adequacy?

There were 27 participants indicating use of a stochastic set of scenarios as their primary set for the 2019 analysis, and 104 participants used sets of deterministic scenarios as their primary set for the 2019 analysis. This is roughly an 80% deterministic/20% stochastic split.

All participants indicated the approach used for 2020 will remain the same—i.e., no company is planning to move from the primary set being deterministic to a stochastic approach, or vice versa.

For those using a deterministic set of scenarios, a majority (57 of 104) uses the basic seven (NY7) scenarios *plus* auxiliary scenarios and do not plan to change this approach. This may imply the primary set is robust enough to accommodate the low-interest-rate environment we find ourselves in today. Twenty-seven of the 104 respondents indicated changes to their deterministic scenario set, ranging from adding several scenarios to making material changes to the scenario set. While there could be valid reasons for limiting the analysis to the basic seven scenarios, the results of the survey indicate that most actuaries are basing the criteria for adequacy on more than these basic seven scenarios, and for 2020, are contemplating adding scenarios to the primary set.

While the numbers indicate that 80% of participants report using deterministic scenarios in their analysis, 20% use stochastic scenarios. In stochastic scenarios, the reasonableness of the scenarios depends on the economic scenario generator's underlying algorithm and the parameterization of the generator, such as the mean reversion parameter and the speed of reversion. For an actuary using stochastic scenarios as the primary set, adequacy criteria may be stated as passing X% of the scenarios; or using the stochastic set to determine the additional reserve that results in passing X% of the scenarios. The majority of participants responding in this category anticipate no changes to the passing rate for 2020 adequacy analysis. While the criteria, or passing rate, is not expected to change, certainly each scenario result (present value of ending surplus, for example) will indeed be different for the 2020 analysis as compared to 2019. Nearly half of the responding actuaries indicate that they plan to reduce the stochastic mean reversion target interest rate for their 2020 testing. This reduction may provide additional insights to the actuary regarding the impacts of adverse interest rate risk on the company's asset liability management practices.

The Appointed Actuary's criteria for adequacy involves many factors and is based on actuarial judgement. Participants indicated they look to ASOPs in general (ASOP No. 22 in particular), and the Academy's practice note, *Asset Adequacy Analysis*.[3] The New York Special Considerations letter[4] was also noted as a reference that many use. While not an official requirement for non-New York companies, the Special Considerations letter has become somewhat of a benchmark most appointed actuaries are aware of, even if not using the standards in testing.

Clearly, appointed actuaries review available guidance to support their professional judgment in selecting adequacy criteria parameters for 2020 and may find it beneficial to reach out to the domestic regulator to discuss expectations for year-end 2020 testing and the topic of adequacy criteria. Likewise, state regulators might be proactive in outreaches to domestic companies to discuss year-end 2020 testing.

The Level Interest Scenario and Moderately Adverse Conditions

Is the level interest rate scenario beyond a moderately adverse condition (MAC)? This question is clearly a matter of professional judgment, and a wide range of judgments was evident in the survey responses; this range of judgments will be discussed below. The survey questions (questions numbered 21-24) on the level interest scenario in the context of MAC are variations on a theme. Where do appointed actuaries think the MAC line should be drawn in the context of low interest rates?

Before getting too far into the discussion of the level interest rate in the context of an MAC, it is important to define what is meant by an MAC. ASOP No. 22 defines an MAC as "Conditions that include one or more unfavorable, but not extreme, events that have a reasonable probability of occurring during the testing period." In this section, as we discuss the level interest scenario in the current economic environment, the phrase "beyond a moderately adverse condition" reflects an interest rate event(s) that practitioners consider to be extreme or to have an unlikely probability of occurring.

One of the more interesting results is that an overwhelming majority (close to 85%) of the survey respondents view the current interest rate environment held level for the entire projection period as being beyond an MAC. Beyond that clear consensus, views about alternatives to a purely level scenario that would be within an MAC were quite varied.

3 *Asset Adequacy Analysis*, American Academy of Actuaries, September 2017.
4 https://www.dfs.ny.gov/system/files/documents/2020/11/spec_con_2020.pdf

However, a similar question asked from the perspective of what appointed actuaries think are within an MAC produced different results. Specifically, about a quarter of respondents think an MAC is defined by some reduction in interest rates, and another quarter think the level scenario is within the range of an MAC. Almost half believe some manner of increase should be incorporated to stay within an MAC scenario. Three out of four of those respondents believe an increase should occur after the current levels are held for a period of time, with the remainder preferring a gradual increase.

While only approximately 15% consider the current interest-rate environment held level for the entire projection period as being an MAC, about half of respondents consider the level scenario to be a required "pass" for their criteria, regardless of how low interest rates are at the valuation date. This indicates that some who view the scenario to be beyond an MAC still consider it to be a required "pass". Potential reasons for this discrepancy include a situation where a company's liabilities are not materially impacted by yields (i.e., term or group products) or their products' formulaic reserves are conservatively set and thus will pass. There could also be some recognition that a regulator's judgment might be more conservative than their own.

Opinions seem to be almost evenly split, with 47% of the respondents having not changed their opinion this year about whether the level scenario is beyond moderately adverse relative to the interest-rate environment that existed for their 2019 testing.

In considering alternatives to the level scenario, one might refer to the deterministic scenario (scenario number 12) used in VM-20[5] for the deterministic reserve. The basis of the VM-20 deterministic scenario is persistent downward shocks to interest rates over the first 20 years.[6] In terms of the random shocks, it is a "creep down" scenario. The shocks, however, are applied in the context of a stochastic process that involves mean reversion. The current calibration of the generator makes the force of mean reversion under current conditions stronger than the downward shocks. As a result, in the current very-low-interest-rate environment, the path of interest rates in that scenario is slowly upward. That scenario could be considered a reasonable standard adopted by regulators to represent what is an MAC.

5 See here for the current edition.
6 VM-20 Appendix 1, Paragraph E.

Current economic conditions bring the current calibration of the generator into question, however. When asked whether they plan to use the Academy's Economic Scenario Generator with VM-20 parameterization, 69.5% of survey respondents said "no," suggesting that the VM-20 deterministic scenario that is based on that parameterization may not be a widely accepted standard for an MAC.

The nature of current economic conditions emphasizes the importance of professional judgment on this issue. The survey responses indicate a diversity of opinion under such unprecedented conditions.

Another item of interest is the discussion in New York State (NYS) around MAC and an alternate approach to the level scenario. In light of the unprecedented economic situation of 2020, the NYS Department of Financial Services (NYSDFS) is allowing a modification to the level interest scenario that will assume the 10-year Treasury grades up to 1.5%, starting at the very low current levels and grading up over the first 10 years of the projection, with other yield curve tenors adjusted in parallel shift.. The implication is that the level scenario held constant for the entirety of a projection is considered beyond an MAC. However, spreads to Treasury may decrease over the first 10 years depending on the relationship of the NAIC current to long-term spreads. Also interesting is the NYSDFS waiver of the requirement to pass deterministic scenario 6, the down/up scenario. In recent years, both scenarios 5 and 7—the falling and the pop-down—have been waived, so with the addition of a waiver to scenario 6, passing of decreasing scenarios is not required in demonstrating asset adequacy.

Liability Assumption Changes Anticipated for Year-End 2020 Analysis

For each liability assumption addressed in the survey, respondents were asked about anticipated changes for 2020 compared to the 2019 analysis. Most respondents do not anticipate making changes in 2020 as a result of current conditions. The impact of current economic conditions on key liability assumptions may be assessed at least to some extent via expanded sensitivity testing.

Survey questions 13-16 asked appointed actuaries what changes they anticipate making to the following base liability assumptions in 2020 as a result of current market conditions: mortality for life insurance policies; mortality for contracts with longevity risk (e.g., payout annuities, long-term care [LTC]); morbidity assumptions for LTC and accident and health insurance policies; and policyholder behavior assumptions. In addition, survey questions 17-18 asked appointed actuaries whether they anticipate making changes to dynamic policyholder behavior parameters and premium persistency behavior parameters. Detailed survey responses are included in the report found here.

For most liability assumptions, more than two-thirds of the respondents indicated that either no changes were anticipated to the assumption or that they would make changes to the assumption, but not due to COVID-19. For example, for the base mortality assumptions for life insurance policies, survey responses were as follows:

Answer Choices	**Responses**	
No changes anticipated	44%	63
Increase long-term mortality	4%	5
Decrease long-term mortality	0%	0
Temporary additional mortality, constant by age	6%	9
Temporary additional mortality, varying by age	18%	26
Will make changes, but not due to COVID-19	23%	33
N/A	5%	7
Total	100%	143

For the base morbidity assumptions for LTC and accident and health insurance policies, only 40% of the respondents indicated that either no changes were anticipated (33%) or that they would make changes but not due to COVID-19 (7%). However, 45% of the respondents indicated that the question was not applicable, as compared to a much smaller percentage of respondents indicating that the question was not applicable for other assumptions. Therefore, 73% (40/55) of those for whom the question was applicable anticipated no changes or changes for reasons other than COVID-19.

Some respondents did indicate that they anticipate making adjustments to certain liability assumptions as a result of current conditions. For example, 28%of respondents indicated that some change would be made to the base mortality assumptions for life insurance policies as a result of current conditions (4%—increase long-term mortality; 6%—temporary additional mortality, constant by age; 18%—temporary additional mortality, varying by age). However, for each liability assumption addressed in the survey, those who anticipated making such changes represented a clear minority of respondents.

With respect to applicable guidance, some actuaries indicated that there was no guidance that they would look to or need as they reviewed the assumptions related to liabilities. However, many actuaries indicated that they are reviewing current trends and information related to COVID-19 and/or that that they would be reviewing applicable actuarial standards of practice or regulatory guidance. Other general comments indicate that some of the appointed actuaries will be looking to actuarial literature and/or their peers or reinsurers for guidance. Others will be reviewing emerging experience and antidotal information to assess whether or not the impacts will be short term or long term.

ASOP No. 7, section 3.2 provides that in deciding the level of analysis of insurer cash flows, if any, appropriate for the circumstances, "the actuary should consider the type of asset, policy, or other liability cash flows and the severity of risks associated with those cash flows. As part of that consideration, the actuary should consider those risks and options embedded in the asset, policy, or other liability cash flows that the actuary judges to be material. In addition, the actuary should consider the risks that are being undertaken and determine what types of deviations from expected experience should be taken into account, if any, given the purpose of the analysis."

The liability assumptions included in the survey are generally considered material for purposes of assessing policy cash flow risk and are assumptions that the AATTF believe could be impacted by current market conditions. Policy cash flow risk, as defined in both ASOP No. 7 and ASOP No. 22, is "[t]he risk that the amount or timing of cash flows under a policy or contract will differ from expectations or assumptions for reasons other than a change in investment rates of return or a change in asset cash flows. This risk is commonly referred to as C-2 risk."

While both favorable and unfavorable deviations in future experience are possible, given the "moderately adverse" framework of AAT, many actuaries believe the appointed actuary's primary focus regarding any policy cash flow risk is the potential for adverse deviation. The

potential for adverse deviation is generally assessed via sensitivity testing. In response to Question 79 of the survey, 50% of the respondents indicated that 2020 AAT will include more sensitivity tests than were performed for 2019. The response to Question 80 of the survey indicates that these appointed actuaries intend to expand sensitivity testing as follows:

I intend to expand my sensitivity testing for...
(*check all that apply*)

Item	Percentage	Number
Premium persistency	14.71%	10
Mortality	50.00%	34
Morbidity	16.18%	11
Lapses	22.06%	15
Renewal expenses	2.94%	2
Inflation	8.82%	6
Spreads	38.24%	26
Defaults	39.71%	27
Option/rider election rates	2.94%	2
Other (please describe)	20.59%	4
	Answered	**68**

Other Findings

There are many interesting observations one can draw from reviewing the survey responses. First, there remains a large amount of diversity in practice in many aspects of AAT. Second, even though we are in the midst of a global pandemic and the lowest level of interest rates in history, many appointed actuaries appear to see AAT in a view that is strikingly similar in terms of methodology and framework to the prior year, pre-pandemic. As such, we take this opportunity to point out areas where there is a wide diversity in the responses.

- **Relevant Literature**—Earlier in this paper, we observed that the survey respondents indicated an overwhelming reliance on both ASOP No. 22 and the AAT practice note. In the context of the former, it is important to highlight that at the time of drafting of this paper, ASOP No. 22 is being (second exposure). Although the exposed revision is not currently effective, we strongly encourage practitioners to review the exposure and provide comments. For the *Asset Adequacy Analysis* practice note, we observe that while it was released in September 2017, it is predicated on a 2012 survey and the work in developing it was largely completed in 2014; hence, the user needs to keep in

mind that since publication, practice has likely changed because it tends to evolve over time. Many actuaries also cited the Valuation Manual (specifically VM-30) as a formal guidance that was heavily relied on when performing their responsibility with respect to AAT.

One takeaway from the diversity of responses to this question is that many actuaries cited multiple sources as their most useful reference for guidance. We believe this should be taken as encouragement for all actuaries as an opportunity to refresh their skills, and as a reminder that actuaries should be rereading these sources periodically.

- **Negative Interest Rates—**Twenty respondents are considering reflecting negative interest rates in their modeling. Many indicated that they were restricted in their use of negative interest rates by modeling limitations, so perhaps there is more concern about the need to model negative interest rates than can be inferred from the survey results.

- **Projection Start Date—**We observed that many actuaries plan on using data earlier than the valuation date—which, again, in the context of the question, appears to imply that approximately 65 actuaries are entirely basing their conclusion on assets, liabilities, and economic conditions that are not updated at December 31. At least one state requires that testing be performed as of December 31. However, ASOP No. 22 provides guidance and an example where testing is based on a date earlier then December 31. Within the appointed actuary's report, actuaries should be prepared to discuss why updated testing with December 31 assets, liabilities, or economic conditions was not necessary.

In summary, reviewers noted a range of responses on the topic of timing of testing and inclusion of subsequent events. This may reflect a distinction between model changes and relevant opinions or other considerations. Relevant references for guidance on this issue include ASOP No. 22, ASOP No. 41, and the AAT practice note, among others.

- **Gaps In Guidance—**In Question 95, 10 actuaries out of the 60 that answered expressed concerns with large gaps in existing guidance. These gaps provide the opportunity for a beneficial interaction between those companies and their regulators to work together to reach full transparency. On the flip side of that question, however, it is noted that 50 actuaries indicated that no gaps in authoritative literature exist. We encourage all practitioners to review the guidance in light of the current environment, and to use their judgment to determine whether there are areas within the guidance that could be considered outdated. Again, as some of the previous answers might indicate, there appears to be more diversity around interpretation of the literature. By itself, diversity in opinion does not imply the literature is lacking.

- **Reliance on Others—**We observed that many actuaries have decided to use judgment, historical experience, or company-specific support related data rather than VM-20 for credit spreads and default costs. We encourage these actuaries to review ASOP No. 22 with respect to reliance on other support professionals for assistance with assumptions when necessary. Specifically, when practicable, the actuary should review the data and any supporting analysis for reasonableness and consistency. For further guidance, the actuary should refer to ASOP No. 23, *Data Quality*, and ASOP No. 41, *Actuarial Communications*. The actuary should disclose the extent of any such reliance (which would be required under both ASOP No. 22 and VM-30).

- **Reflection of 2020 Events on Assumptions—**Reviewers of the survey noticed that while several actuarial assumption topics could be affected by the current environment (e.g., mortality, investments, policyholder behavior), there is no consensus on whether or how those assumptions would be changed in this year's AAT. This lack of consensus reflects a diversity of opinion on the impact of those issues on longer-term experience (i.e., whether those issues will have a temporary or more permanent impact as experience continues to emerge). Relevant references for guidance includes the *Asset Adequacy Analysis* practice note, ASOP No. 22, and New York Regulations 126 and 147.

- **Asset Assumptions—**A large majority of respondents indicated no plans to revise default assumptions or equity returns in 2020. This may imply that the risk of a further downturn (a "w-shaped" recovery) is not seen as a major concern given the current level of interest rates. Other areas that seemed as if participants weren't considering the current environment, or had considered but don't think there is any need for changes, include mortgage experience and counter-party credit risk (particularly with respect to reinsurance recoveries) as well as additional asset sensitivity testing. Again, these actuaries may have determined that their current asset sensitivity testing is robust enough even considering the current conditions.

We have summarized the survey findings and provided some observations in addition to the numerical findings. Our purpose in highlighting these areas is to generate discussion on the wide range of risks that the actuary considers in forming his/her formal opinion. Calendar-year 2020 poses unprecedented challenges in establishing assumptions and forming an opinion on asset adequacy.

References:

- *Standard Valuation Law*, by the NAIC
- *Actuarial Standards of Practice*, by the Actuarial Standards Board
  - ASOP No. 1, *Introductory Actuarial Standard of Practice*
  - ASOP No. 2, *Nonguaranteed Charges or Benefits For Life and Annuity*
  - ASOP No. 5, *Incurred Health and Disability Claims*
  - ASOP No. 7, *Analysis of Life, Health, or P&C Insurer Cash Flows*
  - ASOP No. 11, *Financial Statement Treatment of Reinsurance Transactions*
  - ASOP No. 15, *Dividends for individual Participating life, Annuities and Disability Insurance*
  - ASOP No. 18, *Long Term Care Insurance*
  - ASOP No. 21, *Responding to or Assisting Auditors or Examiners*
  - ASOP No. 22 (current or revised exposure), *Statements of Opinion Based on Asset Adequacy Analysis by Actuaries for Life or Health Insurers*
  - ASOP No. 23, *Data Quality*
  - ASOP No. 25, *Credibility Procedures*
  - ASOP No. 28, *Statements of Actuarial Opinion Regarding Health Insurance Liabilities and Assets*
  - ASOP No. 40, *Compliance with Valuation of Life Insurance Policies Model Regulation with Respect to Deficiency Reserve Mortality*
  - ASOP No. 42, *Health and Disability Actuarial Assets and Liabilities Other Than Liabilities for Incurred Claims*
  - ASOP No. 52, *Principle-Based Reserves for Life Products under the NAIC Valuation Manual*
  - ASOP No. 56, *Modeling*
- *The Application of Precept 13 of the Code of Professional Conduct*, a discussion paper by the Academy's Council on Professionalism
- *Valuation Manual*, by the National Association of Insurance Commissioners (NAIC)
  - VM-20, *Requirements for Principle-Based Reserves for Life Products*
  - VM-21, *Requirements for Principle-Based Reserves for Variable Annuities*
  - VM-22, *Statutory Maximum Valuation Interest Rates for Income Annuities*
  - VM-25, *Health Insurance Reserves Minimum Reserve Requirements*
  - VM-30, *Actuarial Opinion and Memorandum Requirements*
- *Structural Framework of U.S. Actuarial Professionalism*, a discussion paper by the Academy's Council on Professionalism
- *The Academy and the Web of Professionalism*, by Tom Wildsmith
- "Fundamental Changes," *Contingencies,* November/December 2005, by Paul McCrossan
- *Special Considerations Relating to December 31, 2020 Reserves and Other Solvency Issues*, by the NYSDFS8

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