Financial Reporting Through the Lens of a Property/Casualty Actuary

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FOREWORD

EY was originally retained by the Casualty Actuarial Society (CAS) to write a text on financial reporting and taxation as it affects reserving and statutory reporting for use in the CAS basic education process. The CAS had two key objectives for this text:

1. Replace a number of readings that existed on the CAS *Syllabus of Basic Education* as of 2011 with a single educational publication.
2. Refine the content of the syllabus material to focus on financial accounting and taxation topics that are of particular relevance to the property/casualty actuary.

The CAS specified that the text would focus on the learning objectives contained within the syllabus as of 2011.

This publication has been prepared from an actuary's lens, highlighting those areas of financial reporting and taxation deemed to be relevant by the CAS Syllabus Committee and the authors of this text. The learning objectives contained within the 2011 syllabus provided the underlying direction of the content contained herein. Further, the core content was originally developed based on the NAIC Annual Statement Instructions in 2011.

Subsequently, EY was requested to update the original textbook to:

- Add specific examples to illustrate differences between SAP and GAAP
- Include tax implications of investment strategies
- Reflect the new tax law enacted in the U.S. in December 2017
- Bring IFRS and Solvency II current (to 2018) and include discussion of the NAIC's Own Risk and Solvency Assessment (ORSA)
- Bring Schedule F current (to 2018)
- Provide discussion as to why companies use intercompany pooling arrangements and their impact on surplus
- Reflect any resolution of discrepancies between the NAIC's written and electronic instructions for risk-based capital (RBC) regarding Asset Risk associated with insurance company subsidiaries
- Bring the Canadian chapter current (to 2018)
- Reflect comments and questions received by the CAS from candidates and others, as well as errata previously submitted

This version of the text reflects the above specified changes. In doing so, we have updated the Annual Statement for Fictitious Insurance Company to 2018. No other changes have been incorporated, other than minor typographical edits. Further, we have not accounted for any changes to the Exam 6 Syllabus, other than those resulting in the above requested updates from the CAS. The Exam 6 learning

objectives and examination material may have changed and may continue to change in the future. Therefore, the content of this publication may need to be updated in the future.

This text does not represent the position of EY or the authors with respect to interpretations of accounting or tax guidance. Nor is this text intended to be a substitute for authoritative accounting or insurance regulatory and related guidance issued by the National Association of Insurance Commissioners (NAIC), American Institute of Certified Public Accountants (AICPA), Financial Accounting Standards Board (FASB), Governmental Accounting Standards Board (GASB), Securities and Exchange Commission (SEC), Internal Revenue Service (IRS), Chartered Professional Accountants Canada (CPA Canada)[1], International Federation of Accountants (IFAC), Global Accounting Alliance (GAA), International Financial Reporting Standards Foundation (IFRS)/International Accounting Standards Board (IASB), or any other regulatory body. Authoritative guidance from regulatory bodies trumps the writings contained herein. Furthermore, accounting standards are continuously evolving. As a result, readers of this text should be aware that the accounting standards referenced in this publication may have changed since the time of writing. The CAS may request that this publication be updated to reflect such changes.

While the authors of this publication have taken reasonable measures to verify references, content and calculations, it is possible that we may have inadvertently missed something. We would appreciate being informed of any inaccuracies so that an errata sheet(s) may be issued, and/or future editions of this publication may be corrected.

This publication has been prepared for general informational purposes only, and is not intended to be relied upon as accounting, tax or other professional advice. It is not intended to be a substitute for detailed research or the exercise of professional judgement. Neither Ernst & Young LLP nor any other member of the global Ernst & Young organization can accept any responsibility for loss occasioned to any person acting or refraining from action as a result of any material in this publication. Please refer to your advisors for specific advice.

[1] In October 2014, the Certified General Accountants Association of Canada (CGA-Canada) joined Chartered Professional Accountants of Canada (CPA Canada) to complete the integration of the country's national accounting bodies. CPA Canada was established the previous year by the Canadian Institute of Chartered Accountants (CICA) and The Society of Management Accountants of Canada (CMA Canada).

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The authors would also like to acknowledge those individuals within EY who assisted us by creating certain content, tables and exhibits and performing editorial reviews. These individuals include Dave Osborn, Kishen Patel, and Yan Ren. Particular credit goes to David Payne, who rewrote Chapter 19. *Risk-Based Capital*, Ian Sterling and Mike McComis, who contributed to Part VI. *Differences from Statutory to other Financial/Regulatory Reporting Frameworks in the U.S.*, and Liam McFarlane and Shams Munir, who contributed to Part VII. *Canadian-Specific Reporting*.

Finally, the authors of this text would like to express their deep gratitude to the actuarial professionals who have invested their time writing publications for the CAS examination process. Although this publication will serve as a consolidation of many of the papers formerly on the Exam 6 Syllabus, we acknowledge the significant contributions that those papers have made in advancing the actuarial profession, as well as the knowledge of the authors of the text.

In preparing *Financial Reporting through the Lens of a Property/Casualty Actuary*, we relied extensively on the following publications and resources:

PUBLICATIONS

2018 Insurance Expense Exhibit.

American Academy of Actuaries Committee on Property and Liability Financial Reporting, *Statements of Actuarial Opinion on P&C Loss Reserves,* Washington, DC: American Academy of Actuaries, December 2018.

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Canadian Institute of Actuaries, "Educational Note: Premium Liabilities", http://www.cia-ica.ca/docs/default-source/2016/216076e.pdf.

Cantin, Claudette, and Phillippe Trahan. “Study Note on the Actuarial Evaluation of Premium Liabilities,” *Journal of Actuarial Practice*, 1999: 7, pp. 5- 72, http://www.casact.org/library/studynotes/cantin7can.pdf.

Feldblum, Sholom. “Completing and Using Schedule P,” CAS Exam Study Note, Arlington, VA: Casualty Actuarial Society, 2003, 8th Edition, http://www.casact.org/library/studynotes/feldblum7usP.pdf.

Feldblum, Sholom. “Reinsurance Accounting: Schedule F,” CAS Exam Study Note, Arlington, VA: Casualty Actuarial Society, 2003, 8th Edition, http://www.casact.org/library/studynotes/feldblum7usF.pdf.

Feldblum, Sholom. “Computing Taxable Income for Property-Casualty Insurance Companies,” CAS Exam Study Note, Arlington, VA: Casualty Actuarial Society, 2007, pp. 1-13, http://www.casact.org/library/studynotes/7U_Feldblum2007.pdf.

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National Association of Insurance Commissioners, *Accounting Practices and Procedures Manual*, March 2019.

National Association of Insurance Commissioners, *NAIC Insurance Regulatory Information System (IRIS) Ratios Manual,* 2017 edition.

National Association of Insurance Commissioners, *Official 2011 NAIC Annual Statement Blanks, Property and Casualty,* 2011.

National Association of Insurance Commissioners, *Official 2018 NAIC Annual Statement Blanks, Property and Casualty,* 2018.

National Association of Insurance Commissioners, *Property and Casualty Risk-Based Capital Forecasting and Instructions,* 2018.

Steeneck, Lee R., “Commutation of Claims," CAS Exam Study Note, Arlington, VA: Casualty Actuarial Society, 1998, pp. 1-26, http://www.casact.org/library/studynotes/steeneck6.pdf.

Troxel, Terrie T., and George E. Bouchie, *Property-Liability Insurance Accounting and Finance*. 3rd ed. Malvern, PA: American Institute for Property and Liability Underwriters, 1990.

RESOURCES

Actuarial Standards Board, Canada, http://www.actuaries.ca/ASB/index.cfm.

Website of Office of the Superintendent of Financial Institutions, http://www.osfi-bsif.gc.ca/

- MCT effective January 1, 2018
- The Canadian Annual Statement Blank — P&C

Website of Chartered Professional Accountants Canada (CPA Canada), https://www.cpacanada.ca/.

Canadian Institute of Actuaries, http://www.actuaries.ca/

- Dynamic Capital Adequacy Testing, Educational Note, November 2017
- Draft Educational Note – Financial Condition Testing, December 2019

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PART I. INTRODUCTION

CHAPTER 1. FINANCIAL REPORTING IN THE PROPERTY/CASUALTY INSURANCE INDUSTRY

IMPORTANCE AND OBJECTIVES OF FINANCIAL REPORTING

Financial reporting serves as a means to communicate a company's financial results and health. Financial reporting is accomplished through a series of financial statements that consolidate a company's transactions and events into a summarized form under specified accounting rules. The purpose of these rules is to provide companies with a framework for measuring and recording transactions and the related revenue, expenses, assets and liabilities on a consistent basis.

Financial reports enable stakeholders and regulators to track financial performance, compare a company's performance to others and make informed financial decisions under a set of common rules. The stakeholders of an insurance company include policyholders, claimants, investors, directors of the board and company management. The regulators primarily include state governmental authorities, as we shall see below.

OVERVIEW OF THE BASES OF FINANCIAL REPORTING (STATUTORY, GAAP, IFRS, TAX, CANADIAN) AND DIFFERENCES IN TERMS OF USE

The accounting standards that govern financial reporting for insurance companies are numerous and complex. As we write this publication these standards are evolving, and this evolution is resulting in much debate among industry participants. Regardless, the intent of accounting standards is to promote a consistent framework for reporting insurance company transactions such that comparisons of financial performance and health of insurance companies can be made within the industry.

In the U.S., insurance companies are regulated by the individual state governments within which they are licensed to transact business. Within each state government there is an insurance division led by an insurance commissioner, director, superintendent or administrator (commissioner). The National Association of Insurance Commissioners (NAIC) serves as an organization of state regulators that facilitates and coordinates governance across the U.S. The NAIC itself is not a regulator; regulatory authority remains with the individual states. Therefore, model laws and regulations established by the NAIC are not law; individual states have the authority to decide whether to adopt NAIC model laws and regulations.

Statutory Accounting Principles (SAP) is a framework of "accounting principles or practices prescribed or permitted by an insurer's domiciliary state."[2] Most insurance companies are licensed to transact business in more than one state. Having to follow the accounting rules and regulations of each state in

[2] Preamble to the NAIC *Accounting Practices and Procedures Manual,* March 2019 version.

which the company is licensed can be cumbersome and result in inconsistent reporting practices. To minimize the varying complexities of different rules and facilitate commonality in reporting practices, the NAIC adopted Codification of SAP effective January 1, 2001. Codification does not prevent individual state regulation but rather provides a common set of principles that individual states can follow to ease the regulatory burden on companies and promote consistency.

Statements of Statutory Accounting Principles (SSAPs) are published by the NAIC in its *Accounting Practices and Procedures Manual*. The manual includes more than 100 SSAPs and references related statutory interpretations, NAIC model laws and actuarial guidelines which collectively serve as the basis for preparing and issuing statutory financial statements for insurance companies in the U.S. in accordance with, or in the absence of, specific statutes or regulations promulgated by individual states.

From a financial reporting perspective, regulatory oversight by state governments focuses on insurance company solvency to ensure that policyholders receive the protection they are entitled to and claimants receive the applicable compensation for damages incurred. SAP and associated monitoring tools are intended to provide regulators with early warning of deterioration in an insurance company's financial condition. SAP tends to be conservative in order to provide that early warning. For example, certain illiquid assets are not admitted (excluded from the balance sheet) under SAP, despite having economic value.

Generally Accepted Accounting Principles (GAAP) provides another set of common rules under which publicly traded insurance companies and privately held companies report their financial transactions and operating results. GAAP does have certain specialized rules for insurance companies, but unlike SAP, this framework is not built on the principle of conservatism. Rather, the primary focus of GAAP is the presentation of a company's financial results in a manner that more closely aligns with the company's financial performance during the period. Historically, this has been accomplished by matching revenues and expenses. For example, under GAAP, expenses incurred by an insurance company in conjunction with successful acquisition of business are deferred to match the earning of associated premium. In contrast, under SAP, all costs associated with policy acquisition are expensed at the time they are incurred by the insurance company.

The Securities and Exchange Commission (SEC) is the authoritative body for establishing accounting and reporting standards for publicly traded companies in the U.S., including publicly traded insurance or insurance holding companies. As highlighted on the SEC's website, "The mission of the U.S. Securities and Exchange Commission is to protect investors, maintain fair, orderly and efficient markets, and facilitate capital formation."[3] The SEC has designated the Financial Accounting Standards Board (FASB) with the responsibility of developing and establishing GAAP, with the SEC operating in an overall

[3] U.S. SEC, *The Investor's Advocate: How the SEC Protects Investors, Maintains Market Integrity, and Facilitates Capital Formation,* http://www.sec.gov/about/whatwedo.shtml, March 30, 2020.

monitoring role. The FASB is the private organization providing authoritative accounting guidance for nongovernmental entities.

The Governmental Accounting Standards Board (GASB) is the private organization providing authoritative accounting guidance for the public sector. According to the GASB's website, the GASB "is the independent organization that establishes and improves standards of accounting and financial reporting for U.S. state and local governments ... the official source of generally accepted accounting principles (GAAP) for state and local governments."[4] Although this publication does not discuss accounting for governmental entities, we note that the accounting for such entities differs from the accounting for insurance companies. Knowledge of the GASB as it relates to insurance-related activities of governmental entities is important for the property/casualty actuary who performs actuarial services for the public sector.

The Internal Revenue Service (IRS) is the U.S. government agency responsible for enforcing tax laws and collecting taxes. Every business paying taxes in the U.S. must compute taxable income based on the tax laws passed by Congress and the related regulations issued by the IRS. For insurance companies, the starting point for taxable income is income determined under SAP. SAP income is adjusted based on the provisions of the various tax laws and regulations. While SAP is generally conservative, tax-basis accounting may be more or less conservative depending on how political and other factors affect tax legislation. While some adjustments result in a decrease to taxable income (e.g., tax-exempt income), adjustments specific to the insurance industry tend to focus on the acceleration of income for tax purposes (e.g., the discounting of loss reserves and the reduction of unearned premiums).

The Canadian Institute of Chartered Accountants is the body in Canada that defines Canadian Generally Accepted Accounting Principles (CGAAP). At one time, SAP applied to the preparation of the Annual Return for Canadian-domiciled insurers. However, this is no longer the case, and the financial statements included in the Annual Return are prepared in accordance with CGAAP.

Under CGAAP, policy liabilities can be recorded in accordance with accepted actuarial practice in Canada, which means that the recorded liabilities are discounted to reflect the time value of money and include a provision for adverse deviation.

International Financial Reporting Standards (IFRS) provide an accounting framework used by many countries outside the U.S. IFRS are established by the International Accounting Standards Board (IASB).

IFRS already affects companies in the U.S. that currently have international subsidiaries or are subsidiaries of IFRS filers. At the time of the writing of this publication, IFRS 4, which pertains to the recognition and measurement of insurance contracts, permits insurance companies to report under the current accounting rules of their local country with slight modifications. An example of one such

[4] GASB, *Facts About GASB*, http://www.gasb.org/cs/BlobServer?blobcol=urldata&blobtable=MungoBlobs&blobkey=id&blobwhere=1175824006278&blobheader=application%2Fpdf, 2012.

modification is requiring companies to establish premium deficiency reserves, as needed, regardless of local requirements. Given the current lack of a detailed measurement model under IFRS for insurance contracts, one of the key initiatives of the IASB is the development of a new accounting standard for insurance contracts. We will discuss the standard developed by the IASB (and the FASB developments in this area) and how it differs from the measurement of insurance liabilities today.

CHAPTER 2. RELEVANCE OF FINANCIAL REPORTING TO THE ACTUARY

IMPORTANCE AND OBJECTIVES OF FINANCIAL REPORTING

Actuaries estimate the financial impact of insurable events. As such, actuaries need to understand the accounting rules under which the financial impact is being reported. Consider the actuary providing an estimate of an insurance company's unpaid claims for purposes of comparison to recorded loss reserves on the company's balance sheet. If the balance sheet is prepared under Statutory Accounting Principles (SAP), then the loss reserves are recorded on a net of reinsurance basis. If the company's financial statements are prepared under Generally Accepted Accounting Principles (GAAP), then the loss reserves are recorded gross of reinsurance. For comparison purposes, the actuarial estimate of unpaid claims would need to be prepared on a net basis for SAP and gross basis for GAAP. The actuary might also provide an estimate of unpaid claims ceded to the company's reinsurers, for comparison to the reinsurance recoverable amount recorded as an asset on a GAAP basis.

Actuaries providing estimates of unpaid claims on a SAP basis must also be aware of state regulations under which the company is recording its loss reserves. For example, while the National Association of Insurance Commissioners *Accounting Practices and Procedures Manual* permits companies to discount workers' compensation reserves on a tabular basis,[5] certain states have varying requirements with respect to whether and how the tabular discount is applied. For instance, as of December 31, 2018, the state of Montana permitted discounting of both workers' compensation indemnity and medical tabular reserves (excluding LAE) but required use of a specific interest rate in the calculation (4%).[6]

To take this one step further, actuaries issuing Statements of Actuarial Opinion should include a statement within the opinion stating that the company's recorded loss and loss adjustment expense reserves "meet the requirements of the insurance laws of (state of domicile)."[7] The opining actuary is therefore required to read the state regulations and confirm that the recorded reserves meet the state laws.

The accounting convention is not only important to the reserving actuary for an insurance company, but also to actuaries who perform other jobs, including but not limited to the following:

- Working with regulators to monitor the financial health of insurance companies
- Pricing and designing insurance products, including development of profit margins
- Determining capital requirements to support the various risks of an insurer
- Evaluating risk transfer of reinsurance contracts

[5] According to page C-3 of the American Academy of Actuaries, *2018 Property/Casualty Loss Reserve Law Manual*, tabular reserves are defined as "indemnity reserves that are calculated using discounts determined with reference to actuarial tables that incorporate interest and contingencies such as mortality, remarriage, inflation, or recovery from disability applied to a reasonably determinable payment stream. This definition shall not include medical loss reserves or any loss adjustment expense reserves."

[6] American Academy of Actuaries, *Property/Casualty Loss Reserve Law Manual, 2018,* page 250.

[7] NAIC, *Annual Statement Instructions Property/Casualty,* 2018, page 12.

- Assessing reserve adequacy for non-insurance entities, such as organizations that self-insure or retain a portion of their property/casualty insurance exposures
- Preparing tax returns
- Appraising and valuing insurance companies in merger and acquisitions

For each of the above, the result of the work performed will differ depending on the accounting framework used, illustrating the need for actuaries in different disciplines to be knowledgeable about the various accounting and financial reporting frameworks.

CHAPTER 3. OVERVIEW OF THIS PUBLICATION

ROADMAP

This publication begins with an overview of basic accounting concepts (*Part II. Overview of Basic Accounting Concepts*) and then delves into the fundamental aspects of the statutory Annual Statement and certain supplemental filings, that provide the means for financial reporting in the U.S. under Statutory Accounting Principles (SAP) (*Part III. SAP in the U.S.: Fundamental Aspects of the Annual Statement* and *Part IV. Statutory Filings to Accompany the Annual Statement*). Measurement tools used to evaluate the financial health of a property/casualty insurance company are discussed in *Part V. Financial Health of Property/Casualty Insurance Companies in the U.S.* These tools are particularly important to regulators in monitoring solvency for the purpose of protecting the stakeholders of an insurance company. We then investigate differences between statutory reporting and other financial reporting frameworks in the U.S., namely Generally Accepted Accounting Principles, International Financial Reporting Standards and tax accounting in *Part VI. Differences from Statutory to other Financial/Regulatory Reporting Frameworks in the U.S.* We move on to Canada to provide a discussion of Canadian accounting principles (*Part VII. Canadian-Specific Reporting*). The publication closes with a discussion of the future of SAP and evolution of new accounting frameworks, differentiating between what is "real" and what is only in the discussion phase at the time of publication of this text (*Part VIII. The Future of SAP*).

ANNUAL STATEMENTS REFERENCED THROUGHOUT THE PUBLICATION

The Casualty Actuarial Society (CAS) Syllabus Committee and authors of this publication agreed that it would be helpful for students studying for the CAS exams to be able to rely as much as possible on one insurance company throughout the publication to illustrate the major concepts. For the U.S. examples, the CAS Syllabus Committee has assisted us in creating excerpts of a 2011 Annual Statement for a fictional insurance company named Fictitious Insurance Company (Fictitious). The excerpts of this statement are contained in Appendix I of this publication.

We have relied on the Annual Statement excerpts for Fictitious for the more detailed examples and calculations. We also referenced the National Association of Insurance Commissioners *2011 Property and Casualty Annual Statement Blank*, which was also included on the CAS Exam 6 U.S. Syllabus at the time this publication was originally written. We have updated the dates in the Fictitious Annual Statement to year-end 2018, as well as specific schedules noted in the Foreword of this edition. We recommend that the current version of the Annual Statements (Blank and those for specific companies referenced on the current Exam 6 U.S. Syllabus) be viewed side by side with this publication when reading and working through examples and following the flow of exhibits, notes, interrogatories, and schedules within the Annual Statement.

For Canada, we have used the 2018 aggregate experience of Canadian insurers as published on the website of the Office of the Superintendent of Financial Institutions (OSFI). As with the U.S. chapters, we

recommend that the student have this information by his or her side when reading the Canadian chapters of this publication.

We also acknowledge that there may be differences between exhibits within an Annual Statement; such differences are due to rounding.

BACKGROUND ON FICTITIOUS INSURANCE COMPANY

The authors of this publication felt it important to provide some background information on Fictitious and describe the landscape in which Fictitious was operating during the time period covered when the Annual Statement was originally compiled (December 31, 2011). This will provide additional context for students when reading and interpreting the figures contained therein.

Fictitious is a publicly held property/casualty insurance company in the U.S. As displayed in Table 1, approximately one-third of the company's writings in 2018 were in personal lines markets, with the remainder in commercial markets. Homeowners multiple peril (homeowners) was the largest single line written in 2018 on a net of reinsurance basis (17% of net written premium), followed by workers' compensation (15% of net written premium) and other liability — occurrence (13% of net written premium). The company wrote business in all 50 states in the U.S. and was therefore exposed to natural catastrophes and weather-related events in 2018.

TABLE 1

Fictitious Insurance Company
Distribution of 2018 Written Premium (WP) by Line of Business (USD in 000s)

Line of Business	Direct WP $	Direct WP %	Net WP $	Net WP%
Personal lines				
Homeowners multiple peril	4,646	16%	4,555	17%
Private passenger auto liability	2,804	10%	2,804	10%
Private passenger auto physical damage	1,661	6%	1,665	6%
Subtotal, personal lines	9,111	32%	9,024	34%
Commercial lines				
Fire	3,254	11%	2,484	9%
Commercial multiple peril (non-liability portion)	3,243	11%	3,032	11%
Commercial multiple peril (liability portion)	1,760	6%	1,645	6%
Workers' compensation	4,394	15%	4,022	15%
Other liability — occurrence	3,749	13%	3,502	13%
Commercial auto liability	2,334	8%	2,250	8%
Commercial auto physical damage	651	2%	647	2%
Fidelity	138	0%	146	1%
Subtotal, commercial lines	19,523	68%	17,728	66%
Total	28,634	100%	26,752	100%

Insurers were hit hard by record levels of catastrophe losses in 2017 and 2018, following a sustained period of benign activity from 2012 through 2016. Headline events included hurricane activity in North America (Harvey, Irma and Maria in 2017; Florence and Michael in 2018) and Japan (Jebi, Trami and Mangkhut in 2018). California saw its most costly wildfire season for the second year running, with the Camp Fire alone leading to approximately $10 billion of insured losses.

2017 events in the U.S. are estimated to have cost the (re)insurance industry approximately $106 billion, with a further $50 billion in 2018, significantly exceeding the prior 10-year average of just under $20 billion.[8]

As we shall see through examination of the company's 2018 Annual Statement, Fictitious did not escape the financial impact of the natural catastrophes in the U.S., but surprisingly was relatively unscathed by the events in 2017. During 2018, Fictitious experienced a net loss from underwriting of $2 million, largely due to events including Hurricanes Florence and Michael and the California wildfires. The company's net loss and loss adjustment expense (LAE) ratio for accident year 2018 was about 10 percentage points higher than that for accident year 2017.

[8] https://www.iii.org/article/spotlight-on-catastrophes-insurance-issues, December 20, 2019

When reading this publication and reviewing the 2018 Annual Statement for Fictitious Insurance Company, note that Fictitious tightened its underwriting standards in reaction to the soft insurance market in commercial lines.[9] Despite the company's efforts, soft market conditions also contributed to the increasing loss and LAE ratio in 2018.

[9] A soft market is one where insurance prices are low and therefore insurance is cheaper for the consumer. The insurance industry tends to observe increasing loss ratios in a soft market because the consumer is paying less in premiums for the same level of insurance protection.

PART II. OVERVIEW OF BASIC ACCOUNTING CONCEPTS

INTRODUCTION TO PART II

Part II of this publication will provide a detailed discussion on the construction, use and interpretation of an insurance company's financial statements and other financial information. Before beginning that detailed discussion, we will introduce two important accounting topics: primary financial statements and key accounting concepts. Both are recurring topics throughout this publication, and a basic understanding will be helpful to students.

CHAPTER 4. PRIMARY FINANCIAL STATEMENTS

PRIMARY FINANCIAL STATEMENTS

Although there are numerous accounting frameworks, they generally rely on a few primary financial statements. Of these, the two most commonly referenced are the balance sheet and the income statement. Other primary financial statements include the statement of capital and surplus (or equity) and the statement of cash flow. The financial statements are accompanied by subsequent pages of notes, which provide additional information that helps explain balances within the financial statements.

BALANCE SHEET

The balance sheet presents all of a company's assets and liabilities as of a specific point in time. Assets are defined as resources obtained or controlled by a company as a result of past events that have a probable future economic benefit to the company. Liabilities are probable sacrifices of economic benefits arising from present obligations of a company to transfer assets or provide services to other entities in the future as a result of past events. The relationship between the assets and the liabilities of a company is important, because it is a measure of the company's ability to use its assets to fully satisfy its liabilities. The difference between assets and liabilities is generally referred to as net worth (or equity); in the case of an insurance company reporting under Statutory Accounting Principles (SAP), this difference is referred to as statutory surplus (or policyholders' surplus)[10].

One unique aspect of insurance companies' balance sheets is the inherent uncertainty associated with the estimation of the liability for unpaid claims and claim adjustment expenses (loss reserves). While a certain amount of estimation is involved in other industries' accounting, the more significant estimates are generally with respect to asset valuation and collectability and pale in comparison to the uncertainties involved in estimating loss reserves. Actuaries typically have an important role in valuing insurance company liabilities and are therefore critical to the accurate preparation of the balance sheet.

INCOME STATEMENT

While the balance sheet presents the financial balances of a company at a point in time, the income statement reveals a company's financial results during a specific time period. The general types of accounts that are used as a means to measure these results are revenue and expenses. Revenues are inflows or enhancements of assets or settlement of liabilities (or a combination of both) from delivering goods or services during the specific time period. Expenses are outflows or other use of assets or incurrence of liabilities (or a combination of both) from delivering or producing the goods and services that were provided during the specific time period. The difference between the amount of the revenues and expenses during the period is referred to as net income if it is positive or net loss if it is negative.

[10] Note that the assets reflected in this relationship only include "admitted" assets because Statutory Accounting Principles (SAP) do not allow insurers to take credit for nonadmitted assets in surplus. Admitted versus nonadmitted assets are discussed later in this text.

The nature of the service provided by insurance companies, which is a promise to pay claims in the future if some specific criteria are met, creates unique accounting challenges. Insurance accounting standards address how to earn the premiums insurance companies are paid and how to measure and when to record claim costs resulting from the insurance coverage. Again, actuaries usually play a significant role in the estimation of the amount and timing of these future payments and therefore are critical to the accurate preparation of the income statement. Another important source of revenue for insurance companies is investment income, which will be discussed in Chapter 8. *The Statutory Income Statement: Income and Changes to Surplus*.

CAPITAL AND SURPLUS

The statement of capital and surplus reflects certain changes in surplus that are not recorded in the income statement and reconciles the beginning surplus to the ending surplus for the reporting period. This statement is similar for insurance companies and for other types of companies; however, there are several items within the statement of capital and surplus, such as those related to nonadmitted assets and the provision for reinsurance, that are unique to insurers. These items and others will be discussed in Chapter 7. *Statutory Balance Sheet: A Measure of Solvency* and Chapter 8. *The Statutory Income Statement: Income and Changes to Surplus*.

CASH FLOW

The cash flow statement receives less attention but is also important. This financial statement is necessary because the timing of the receipt or payment of cash for a revenue or expense does not necessarily coincide with the recognition of that revenue or expense from an income statement perspective. In other words, even if the cash payment is received sometime before or sometime after the good or service is provided, the associated revenue is generally recognized at the time the good or service is provided. The cash flow statement presents all operations strictly from a cash perspective.

In other industries, companies face liquidity issues when they cannot collect revenue in cash on a timely basis, and this type of liquidity issue would be made evident by the statement of cash flows. An example of this would be a manufacturing company that sold products on credit but was not able to collect the cash on a timely basis to pay their expenses. For insurance companies, this specific type of liquidity issue is less likely to occur due to the collection of premiums at the onset of the policy and the subsequent payment of losses. This difference in the order of cash receipts and disbursements somewhat diminishes the importance of cash flow statements for insurance companies. Further, actuaries are not generally involved in or necessary for the preparation of the cash flow statement, so this financial statement is not covered in detail in this publication.

NOTES TO FINANCIAL STATEMENTS

In addition to the four primary financial statements already discussed, another important element is the notes to financial statements. The notes include quantitative and qualitative disclosures regarding the significant accounts presented in the financial statements. This includes matters that are relevant or

may be relevant to the users of the financial statements. For instance, the notes will typically describe the basis of accounting used in the preparation of the financial statements, as well as any important details on specific aspects of the financial statements that are based on estimates or subject to uncertainty. We will discuss several of the footnotes to the financial statements that are of specific importance to actuaries in Chapter 10. *Notes to Financial Statements*.

CHAPTER 5. KEY ACCOUNTING CONCEPTS

Throughout each major accounting framework, there are several common key concepts. Understanding these key concepts will be beneficial to anyone who is involved in using or preparing financial statements because it will allow them to appreciate the purposes of and the differences between each framework. A few of the most important and relevant concepts are below.

- Liquidation vs. going concern: When preparing financial statements, it is possible to view the company as either an ongoing business (going concern) or as a run-off of the current assets and liabilities (liquidation). Either perspective may be appropriate depending on the user and purpose of the financial statements. For instance, investors would generally be most interested in the value of a business as a going concern, whereas regulators may think in terms of a liquidation perspective, given that they are primarily interested in the ability of the company to satisfy its policyholder obligations.

- Fair value vs. historical cost: There are often multiple possible approaches to valuing a given asset or liability. The choice of approach is of particular importance when the value of that asset or liability is uncertain. Recording an asset or liability at fair value means recording it at a value that it would be bought or sold for in the open market, while recording at historical cost means valuing it at the original purchase price less depreciation. In cases where the value of an asset or liability is uncertain, there is a trade-off between the reliability of the historical cost method (in that it is objectively verifiable) and accuracy of the fair value approach (in that it is more consistent with the actual market value).

- Principle-based vs. rule-based: Each aspect of any accounting framework is generally guided by either a principle or a rule. A principle describes a general accounting approach that must be interpreted and applied, while a rule provides specific accounting guidance on how something should be done. There is a trade-off because the rules-based guidance may be easier to understand and to audit, but a principles-based approach is generally more adaptable to changes in the business environment.

PART III. SAP IN THE U.S.: FUNDAMENTAL ASPECTS OF THE ANNUAL STATEMENT

INTRODUCTION TO PART III

In the U.S., property/casualty insurance companies report their financial results to state insurance regulators in what is called the Annual Statement. For those who have never used or seen an Annual Statement, it is an 8.5" x 14" book. The Property/Casualty Annual Statement is identified by its yellow cover, while the Life Annual Statement's cover is blue (known as the yellow book and blue book, respectively). Both types of Annual Statements are publicly available documents.

The Annual Statement is developed and maintained by the National Association of Insurance Commissioners and is often referred to as "the Blank." The Blank is the template that insurance companies use to report under Statutory Accounting Principles (SAP), and is uniformly adopted by all states. This allows insurance companies licensed in multiple states to prepare one Annual Statement for filing with all states. The Annual Statement is accompanied by NAIC instructions that are generally adopted by all states, though there are instances of specific differences and exceptions.

The first page in the Annual Statement is the Jurat page, which provides basic information about the reporting entity, such as name, NAIC code, address, name of preparer and title, and officers of the reporting entity. The notarized signatures of officers of the reporting entity are included on this page, attesting to the accuracy of the information contained therein.

Following the Jurat page are the statutory financial statements. The statutory Annual Statement contains other exhibits and schedules that provide further insight into the insurance company's statutory financial statements and historical experience. These include General Interrogatories; Five-Year Historical Data; and Schedules A, B, BA, D, DA, F, P, T and Y.

In Part III. *SAP in the U.S.: Fundamental Aspects of the Annual Statement*, we will walk through the Property/Casualty Annual Statement, beginning with the financial statements, and discuss the related accounting requirements. We provide examples to illustrate the uses of the Annual Statement and how certain amounts are calculated and compiled.

CHAPTER 6. INTRODUCTION TO STATUTORY FINANCIAL STATEMENTS

INTRODUCTION

This chapter focuses on Statutory Accounting Principles (SAP) and specifically discusses the fundamental aspects of the Annual Statement, including the financial statements themselves (the balance sheet and income statement, for example), as well as the other exhibits and filings that accompany the Annual Statement (such as various schedules, the Insurance Expense Exhibit and the Risk-Based Capital calculation). Part V. *Financial Health of Property/Casualty Insurance Companies in the U.S.* will discuss how this information can be used to assess the financial health of an insurance company and Part VI. *Differences from Statutory to other Financial/Regulatory Reporting Frameworks in the U.S.* will focus on differences between SAP and the other financial and relevant regulatory reporting regimes.

SAP AND THE NAIC

The National Association of Insurance Commissioners (NAIC) operates through various committees that comprise state insurance commissioners and their staff. Through these committees, the NAIC regularly updates SAP and creates model insurance laws and regulations that individual states may elect (or be required) to adopt. While this generally leads to a good deal of uniformity in insurance regulation, there are still instances of differences between states. For example, individual states have the ability to permit accounting practices that differ from NAIC SAP ("permitted practices") and model laws and regulations are not always enacted by all states exactly as adopted by the NAIC.

It is worth noting that the NAIC may revise the Annual Statement each year, and these changes are described on the NAIC website. The basis of the examples and exhibits provided in this section of the publication are based in part on the structure and information provided in the 2011 industry Annual Statement, with specified updates based on the 2018 Annual Statement as noted in Foreword of this publication.[11]

[11] Accessed via a sector-specific information and research firm in the financial information marketplace.

CHAPTER 7. STATUTORY BALANCE SHEET: A MEASURE OF SOLVENCY

As previously noted, the primary focus of statutory accounting is to highlight potential solvency issues (an insurance company's capability to meet its obligations to its policyholders and creditors when due). Consequently, the most important aspect of an insurance company's financial statements to an insurance regulator is the strength of its balance sheet (i.e., the extent to which its admitted assets are sufficient to meet all liabilities).

RELEVANCE TO ACTUARIES

Solvency and the balance sheet are relevant to the actuary for two primary reasons.

First, actuaries traditionally have some responsibility for the loss and loss adjustment expense (LAE) reserves, which represent the majority of the liabilities for property/casualty insurance companies. Actuaries may either participate directly in the reserve-setting process, or they may assess the reasonableness of the reserves established by company management. Actuaries involved in either of these functions are focused on the liabilities for losses and LAE on the Liabilities, Surplus and Other Funds page of the Annual Statement (page 3).

Second, actuaries often have a role in determining or assessing the amount of capital that an insurance company requires to support the risks that it has taken through its business operations. In the context of statutory accounting, this would be based on an actuary's understanding of the Risk-Based Capital (RBC) framework to calculate the required capital at a given point in time (see Chapter 19. *Risk-Based Capital*). More broadly speaking, actuaries may evaluate the surplus needs on other bases, including on an economic basis, which is guided by the insurer meeting some economically defined criteria for solvency. In both of these cases, an actuary who is evaluating an insurance company's capital will need to be familiar with the admitted assets and the liabilities on the balance sheet (pages 2 and 3), as well as the risk characteristics of each of those items.

This chapter will provide an overview of the composition of the two main categories in the statutory balance sheet:

- Assets (page 2)
- Liabilities, Surplus and Other Funds (page 3)

ASSETS[12]

Assets can be broadly defined as a property, right or claim arising from past events that has future value. From an individual perspective, we are all accustomed to the concept of owning financial assets, such as

[12] In general, this section aligns with Chapter 2 (Assets) of Property Casualty Insurance Accounting by the Insurance Accounting and Systems Association (IASA). References to other sections in IASA that were previously on the CAS Syllabus will be included throughout. Readers seeking additional detail may consult with IASA on these topics or other topics.

stocks and bonds, and owning real assets, such as a home or vehicle. Insurance companies own various assets in the same way that an individual does, and those assets are summarized on page 2 of the Annual Statement Blank (the balance sheet). Some of these assets are consistent with assets of non-insurance entities, and some are specific to insurance companies.

Table 2 summarizes the major assets held by the U.S. property/casualty insurance industry as of December 31, 2018.[13] The first column indicates the numerical label for each item, as presented on page 2 of the Annual Statement. Only the material line items are shown in this summary.

[13] Accessed via a sector-specific information and research firm in the financial information marketplace.

TABLE 2

Assets: Total U.S. P&C Insurance Industry
U.S. 2018 Statutory Financials, NAIC Format (USD in OOOs)

Line	Description	Assets	% of Total	Nonadmitted Assets	Net Admitted Assets	% of Total
1.	Bonds	1,027,815,046	49%	312,840	1,027,502,206	51%
2.1	Preferred stocks	5,454,309	0%	7,203	5,447,106	0%
2.2	Common stocks	395,451,664	19%	5,734,811	389,716,853	19%
4.	Real estate	13,727,077	1%	43,525	13,683,552	1%
5.	Cash, cash equivalents and short-term investment	101,993,264	5%	29,624	101,963,640	5%
8.	Other invested assets	149,642,333	7%	14,765,778	134,876,555	7%
12.	**Subtotal, cash and invested assets**	**1,725,865,280**	**83%**	**22,972,981**	**1,702,892,299**	**84%**
15.1	Uncollected premiums and agents balances	66,184,809	3%	3,309,043	62,875,766	3%
15.2	Deferred premiums and agents balances	121,849,858	6%	316,170	121,533,688	6%
16.1	Amounts recoverable from reinsurers	42,558,949	2%	4,258	42,554,691	2%
18.2	Net deferred tax asset	25,779,026	1%	6,952,286	18,826,740	1%
23.	Receivables from parent, subsidiaries and affiliates	22,055,541	1%	427,692	21,627,850	1%
25.	Aggregate write-ins	33,353,894	2%	10,307,386	23,046,508	1%
	Other non-invested assets	41,352,758	2%	9.766,723	31,586,035	2%
	Subtotal, non-invested assets	**353,134,835**	**17%**	**31,083,558**	**322,051,277**	**16%**
28.	**Total**	**2,079,000,115**	**100%**	**54,056,540**	**2,024,943,576**	**100%**

As shown in Table 2, the U.S. property/casualty industry held $2.1 trillion dollars of assets as of December 31, 2018. The statutory balance sheet makes two broad distinctions regarding assets held by insurers:

- Cash and invested assets vs. non-invested assets: Assets are categorized by this criterion to identify the proportion of an insurer's asset that is readily convertible to cash. The "cash and invested assets" are assets that could be readily sold in near term to meet the insurer's liabilities, while the "non-invested assets" are less liquid. This distinction is in line with the emphasis that statutory accounting places on solvency. Rows 1 through 12 on the Assets page include cash and invested assets, while rows 13 through 25 include non-invested assets.

- Admitted vs. nonadmitted assets: As shown in Table 2, there are separate columns that depict the amount of assets that are nonadmitted. These nonadmitted assets, which represent about 3% of total assets, are not recognized by state insurance departments in evaluating the solvency of an insurance company for statutory accounting purposes. The rationale for this exclusion is that those nonadmitted assets are not readily convertible for use to meet an insurer's liabilities

now *or in the future* and thus would not be reasonable to consider in evaluating a company's solvency. In many cases nonadmitted assets are determined by formulae established by the National Association of Insurance Commissioners (NAIC). As shown in Table 2, there are nonadmitted assets in the cash and invested assets categories and the non-invested assets categories, though the proportion of nonadmitted assets is much lower for cash and invested assets. Several common examples of nonadmitted assets will be discussed in the description of the specific asset classes below (such as certain uncollected and deferred premiums and agents' balances and net deferred tax assets), which will help to demonstrate this point.

Those distinctions aside, it is clear from Table 2 that the largest asset class for the property/casualty industry in 2018 was bonds, which represented 49% of the industry's total assets, followed by common stocks, which represented 19% of the industry's total assets. These statistics have remained relatively consistent over the years. While most actuaries will not need to have a deep understanding of each of the asset classes on the balance sheet, is it worthwhile to know a few relevant details on the largest classes to have a fundamental understanding of the balance sheet.

Bonds (Line 1)

Bonds are securities that pay one or more future interest payments according to a fixed schedule. The face value of a bond refers to the amount that is to be paid in the final single payment at the maturity of a bond. When an insurance company purchases a bond, the current value of that bond is recorded as the actual cost, including brokerage and other fees. This purchase price may be more or less than the face value of the bond.

To the extent that the purchase price is higher (or lower) than the face value of the bond, a bond premium (or discount) is recorded as a part of the recorded amount. Over the life of the bond, that bond premium or bond discount will be amortized according to a constant yield approach. The reason for this amortization is that when the bond ultimately matures, the amortized value will be equal to the face value, eliminating a lump sum gain or loss at the maturity of the bond.

After the purchase, statutory accounting indicates that bonds be recorded at one of the following bases:

- Amortized cost
- The lower of amortized cost or fair value

The designation that the NAIC's Security Valuation Office (SVO) assigns to the bond determines the applicability of the two bases above. The six possible designations are NAIC 1 through NAIC 6, which range from the "highest quality" bonds to "bonds in or near default," respectively. Bonds with the two highest designations (NAIC 1 and 2) are carried at amortized cost, while bonds with designations of NAIC 3 ("medium quality") and below are carried at the lower of amortized cost or fair value. The amount at which a bond is recorded, following these criteria, is referred to as the adjusted carrying value.

Schedule D of the Annual Statement provides details on the specific bonds that are held by an insurance company, including the following:

- Type of issuer (e.g., federal, state or corporate)
- Maturity (e.g., one year, one year to five years)
- NAIC Class (Class 1 through Class 6)

Based on the industry aggregate Annual Statement as of December 31, 2018, insurance companies' bond portfolios were made up of approximately 44% industrial bonds, 24% special revenue bonds, and 17% U.S. government bonds. By maturity, just over half of bonds held were 5 years to maturity or less, with the majority of the remainder having maturities between 5 and 10 years. Furthermore, approximately 80% of bonds held by insurers were in the NAIC Class 1.

Given that bonds are the largest asset class for property/casualty insurers, an actuary or other user of the financial statements who is reviewing the financial health of an insurance company may benefit from reviewing the detail in Schedule D.

Stocks (Lines 2.1 and 2.2)

As shown in Table 2, approximately 19% of insurers' assets were in common or preferred stock. Stocks are securities that represent an ownership share in a company. Those ownership shares are subordinate to bondholders and creditors. Common stock ownership confers voting privileges and may pay a dividend, though the dividend is not guaranteed. Preferred stock does not confer voting privileges but usually provides a guarantee on dividends to be paid, and usually has preference to common stock in the event of liquidation.

At purchase, stocks are valued at cost plus any brokerage or related fees. After purchase, publicly traded stocks are recorded at fair value, which is based on the market price that is readily available to the public and which can generally be determined from external pricing services. If a stock is not publicly traded or a price is not available, the NAIC's SVO will determine a fair value. Preferred stocks are assigned similar NAIC designations as bonds with six rating levels, which dictate whether they are valued at cost, amortized cost or fair value based on the NAIC designation.

An actuary or other user of the financial statements who is evaluating the financial health of an insurance company should take note of a property and investigate further if an insurance company has a relatively larger portion of their assets in stocks, compared to the overall industry.

Real Estate (Line 4)

Three classes of real estate are presented separately on the Assets page of the Annual Statement:

- Properties occupied by the company
- Properties held for the production of income
- Properties held for sale

These classes are relatively self-explanatory, though one detail to be aware of is that if a company and its affiliates occupy less than 50% of a property, it is classified as either a property held for production of income or a property held for sale (as opposed to a property occupied by the company). Properties in the first two categories are generally recorded at depreciated cost, while properties that are held for sale are recorded at the lower of depreciated cost (i.e., carrying amount) or fair value less encumbrances and estimated costs to sell the property.

Details of a company's real estate transactions and holdings are presented in Schedule A of the Annual Statement.

Cash, Cash Equivalents and Short-Term Investments (Line 5)

This asset class generally includes assets that are immediately convertible to cash. As of December 31, 2018, these assets represented nearly 5% of insurers' total assets, and approximately two-thirds of these assets were in short-term investments.

Cash equivalents must have an original maturity of less than three months, and short-term investments must have an original maturity of one year or less. In the Annual Statement, details on cash are provided in Schedule E-1, cash equivalents are described in Schedule E-2, and short-term investments are found in Schedule DA. Further, a reconciliation is made in the Cash Flow statement showing cash, cash equivalents and short-term investments at the beginning of the year, adjusted for net cash (inflows minus outflows from operations, investments, financing and miscellaneous sources) during the year. The result is the amount of cash, cash equivalents and short-term investments at the end of the year, which is shown in line 5 of the Assets page.

Uncollected and Deferred Premiums and Agents' Balances (Lines 15.1 and 15.2)

These two asset classes represent premiums that have been written but have not yet been received. Although the names of the asset classes refer to "agents' balances" (or balances due from policies sold by insurance agents, as intermediaries between the insurance company and the policyholder), both asset classes may also include uncollected premiums for policies sold directly to policyholders.

Uncollected premiums and agents' balances include premiums due on or before the financial statement date, while deferred premiums and agents' balances include premiums due after the financial statement date. Both classes include installment premiums that meet those timing criteria as well.

Premiums that are more than 90 days past due from an agent or a direct policyholder are considered nonadmitted assets. Furthermore, an insurer may determine that agents' balances that are 90 days or more overdue are unlikely to be collected (or "impaired"). In this event, the insurer should write-off the uncollectable balance.

These two classes together represented nearly 10% of the industry assets as of December 31, 2018, highlighting that collectability of these assets is relevant to a company's financial health and a measure

of the efficiency of its collections' department. An actuary or other user of the financial statements who is reviewing the financial health of an insurer may consider the overall magnitude of a company's uncollected and deferred agents' balances and the percentage of agents' balances that are nonadmitted. Either one of these metrics could be benchmarked to the overall industry; a company having a significantly higher portion of its assets in these two classes relative to the industry would warrant further analysis to understand the impact to liquidity.

Amounts Recoverable from Reinsurers (Line 16.1)

This asset class reflects amounts that are expected to be recovered from a reinsurer on losses and LAE that have been paid by the company, but do not include expected reinsurance recoveries for loss and LAE reserves. The reason that expected recoveries for loss and LAE reserves are not included is that loss and LAE are already reflected net of reinsurance on the balance sheet. Additional detail on expected recoveries for both paid amounts and reserves are included in Schedule F, which will be discussed in detail in Chapter 14. *Schedule F*. The detail included in Schedule F allows an actuary or other user of the financial statements to assess the quality and collectability of the reinsurance recoverables.

Net Deferred Tax Assets (Line 18.2)

Deferred tax assets (DTAs) represent expected future tax benefits related to amounts previously recorded in the statutory financial statements and not expected to be reflected in the tax return as of the reporting date. They are referred to as "net" DTAs because they are recorded net of any deferred tax liabilities (DTLs) that exist. Two common sources of DTAs relevant to the actuary are the following:

- The difference in tax accounting and statutory accounting for loss reserves
- The carryforward of net operating losses from previous years

The first source of DTAs is particularly relevant to actuaries. For tax reporting purposes, loss reserves are discounted when determining taxable income. This means that an insurance company is not able to deduct from taxable income the full amount of losses that are incurred during a year. Therefore, assuming loss reserves are growing, a company's income on a tax basis is higher than the company's pre-tax income on a statutory basis in the current year. In the future, as this discounting unwinds, the insurer will get a tax deduction, which will not be recorded in statutory financial statements because it was already recorded in the year the reserves were established. The value of this future deduction (21% of the deduction) represents the DTAs. This asset can be particularly significant for growing companies.

The second source of DTAs of relevance to the actuary (carryforward of net operating losses) occurs when an insurance company has net operating losses in one financial year and expects those losses to offset taxable income in the future, thereby reducing future tax liability.

For any DTA, an insurer can only record the portion of the asset that is expected to be realized, based on available evidence. Furthermore, the insurer must perform an admissibility test to determine the amount of a DTA that can be considered as an admitted asset.

As shown in Table 2, DTAs were one of the largest components of nonadmitted assets reported at December 31, 2018, representing $7 billion of the total $54.1 billion in nonadmitted assets, or 13%.

Receivables from Parent, Subsidiary and Affiliates (Line 23)

Many insurance companies are members of a national or international insurance group or may be affiliated with other insurance companies that are owned by the same ultimate parent company. These affiliates often share services or resources, such as internal support staff or third-party vendor agreements. In these cases, receivable balances for these services or resources exist between the parties.

As shown in Table 2, these receivables accounted for about 1% of assets held by the industry at December 31, 2018. If an individual company had a significantly larger portion of their assets in the form of receivables, a user of those financial statements may consider investigating further, as those receivables may not be as liquid or available as other asset types. More specifically, the user could attempt to ascertain the specific source of the receivables and the proportion of the receivables that are paid on time.

Other Nonadmitted Assets

In addition to the examples of nonadmitted assets already mentioned (agents' balances more than 90 days overdue and net DTAs that are do not meet the statutory admissibility test), there are other sources of nonadmitted assets. Several common examples include:

- Amounts held of specific types of bonds, stocks, mortgage loans or real estate that are in excess of limitations that exist in specific states
- Electronic data processing equipment and operating system software in excess of specified limits (i.e., percentage of adjusted capital and surplus)
- Nonoperating system software
- Furniture, fixtures, equipment and leasehold improvements
- Balances due from a broker when a security has been sold but the proceeds have not been received that are still outstanding more than 15 days after settlement
- Funds held or deposited with reinsured companies that exceed the associated liabilities or are held by an insolvent reinsured company
- 10% of deductibles recoverable on high deductible insurance policies in excess of collateral specifically held and identifiable on a per policy basis

As previously noted, nonadmitted assets only represented about 3% of the total industry assets at December 31, 2018. However, due to their importance when measuring solvency, an actuary should be familiar with the sources of nonadmitted assets. If an actuary or other user of the financial statements observes that an insurer has a larger proportion of nonadmitted assets than the industry average, it may be worthwhile to investigate further to understand the source of those nonadmitted assets because they could be indicative of a problem with the business.

LIABILITIES AND SURPLUS[14]

A liability is an obligation that the company must fulfill, based on past events or transactions, which will require the use of the company's resources. Under the literal definition of solvency, a company must have assets that are at least equal to its liabilities to remain solvent.

To be prudent and to comply with RBC requirements (see Chapter 19. *Risk-Based Capital*), most insurance companies have admitted assets that significantly exceed their liabilities. The amount of this excess of admitted assets over liabilities is generally referred to as surplus. Surplus can be viewed as the equity in the business or as the source of protection to the policyholders. These three amounts follow the relationship shown below:

Admitted Assets = Liabilities + Surplus

Or, equivalently,

Admitted Assets – Liabilities = Surplus

Because the combination of liabilities and surplus are equal to assets, liabilities and surplus are presented on the same page (page 3) of the Annual Statement. The assets reflected in the relationship above include only admitted assets because Statutory Accounting Principles (SAP) do not allow insurers to take credit for nonadmitted assets in surplus.

A breakdown of the industry liabilities and surplus amounts (page 3 of the Annual Statement) by significant account is provided in Table 3 as of December 31, 2018.[15]

TABLE 3

Liabilities, Surplus and Other Funds: Total U.S. Property/Casualty Insurance Industry
U.S. 2018 Statutory Financials, NAIC Format (USD in 000s)

Line	Description	Liabilities	% of Total
1.	Losses	547,217,016	27%
2.	Reinsurance payable on paid loss and loss adjustment expenses	29,393,074	1%
3.	Loss adjustment expenses	114,072,279	6%
5.	Other expenses (excluding taxes, licenses and fees)	8,191,309	0%
9.	Unearned premiums	275,398,145	14%
12.	Ceded reinsurance premiums payable	59,593,117	3%
13.	Funds held under reinsurance treaties	31,513,557	2%
16.	Provision for reinsurance	2,745,410	0%
25.	Aggregate write-in for liabilities	77,254,001	4%
	Other liabilities	122,643,849	6%
28.	**Subtotal, liabilities**	**1,268,021,758**	**65%**

[14] Aligns with IASA Chapter 5.

[15] Accessed via a sector-specific information and research firm in the financial information marketplace.

29.	Aggregate write-ins for special surplus funds	83,179,182	4%
30.	Common capital stock	3,982,853	0%
34.	Gross paid in and contributed surplus	197,134,014	10%
35.	Unassigned funds	459,882,311	23%
	Other surplus and capital	12,743,455	1%
37.	**Subtotal, surplus as regards policyholders**	**756,921,815**	**37%**
38.	**Total**	**2,024,943,573**	**100%**

First, note that the total amount of liabilities and surplus shown in Table 3 ($2.025 trillion) is exactly equal to the amount of net admitted assets that were shown in Table 2. This relationship must be true given the fundamental equation of Admitted Assets = Liabilities + Surplus.

The next observation that can be made is that the insurance industry's admitted assets equal 1.6 times its liabilities as of December 31, 2018. On the surface, this suggests that the industry as a whole had sufficient assets to be able to sustain a sizeable increase in liabilities (or reduction in asset values) while still maintaining solvency, due to the current positive difference of assets relative to liabilities.

However, this may not be true at the individual company level, and there are also other risks that could affect surplus that are not reflected in either the recorded assets, admitted assets or liabilities (such as catastrophe risk or liquidity risk). An actuary can benchmark a company's ratio of liabilities to surplus against the current industry average. Further investigation may be warranted if the ratio is significantly higher than that of the industry. A review of the company's RBC would be the next logical step.

We can also measure each of the underlying accounts in relation to total liabilities or surplus. Together, loss and LAE reserves (lines 1 and 3) have historically been the largest liability item on a property/casualty insurance company's balance sheet. As of December 31, 2018, this item represented over 50% of total industry liabilities. This speaks to the importance of property/casualty actuaries to the financial reporting process because they are often the most suited to evaluate and establish those liabilities. The next largest liability class is unearned premium reserves, which made up approximately 22% of the industry liabilities as of December 31, 2018. Given actuaries' involvement in pricing products, actuaries certainly play a role in this premium account. To the extent the unearned premium is not adequate to cover expected future losses, LAE and maintenance expenses, additional liabilities need to be recorded. Actuaries often play a key role in that analysis.

A brief description of each of the key liabilities and surplus classes is provided below.

Loss and Loss Adjustment Expense Reserves (Lines 1 and 3)

The required basis for loss and LAE reserves under SAP is defined by Statement of Statutory Accounting Principles (SSAP) 55, *Unpaid Claims, Losses, and Loss Adjustment Expenses*. SSAP 55 states that the recorded liabilities for loss and LAE reserves, for each line of business and for all lines of business in the aggregate, should be based on "management's best estimate" (note that this term is not explicitly defined in the accounting guidance). Further, SSAP 55 requires that management consider the variability

in the estimate of these liabilities. The standard states that management's best estimate may consider a range of estimates; in the rare instances when no point within the range is considered to be a better estimate than other points within the range, the midpoint of the range should be used.

Note that SSAP 55 refers to management's best estimate and not the actuary's best estimate or central estimate. However, management will often rely on an actuary's estimate, in whole or in part, in establishing their own best estimate to be recorded on the balance sheet. Whether or not management relies on an actuary in establishing the recorded reserves, the NAIC Model Law for Property and Casualty Actuarial Opinions (MDL-745)[16] requires that a Statement of Actuarial Opinion be provided that attests to the adequacy of the recorded liabilities (see *Chapter 16. Statement of Actuarial Opinion*).

Significant detail on the loss and LAE reserves is included in Schedule P of the Annual Statement. Schedule P provides loss and LAE reserves both gross and net, and also breaks down the total reserves by line of business and accident year. Further detail on the data in Schedule P and the potential uses of that data are described in Chapter 15. *Schedule P*. There are also relevant references to loss and LAE reserves in the Notes to Financial Statements within the Annual Statement (see Chapter 10. *Notes to Financial Statements*).

Because loss and LAE reserves are often the largest most variable liability on an insurer's balance sheet, they are of critical importance to the financial health of an insurance company.

Reinsurance Payable on Losses and Loss Adjustment Expenses (Line 2)

Reinsurance payable on losses and LAE includes liabilities related to assumed reinsurance contracts and is for loss and LAE that have already been paid by the reinsured. A detailed breakdown of this amount by type of reinsurer (e.g., affiliated, authorized and unauthorized as well as U.S. and non-U.S.) is provided in Schedule F, Part 1, column 6. Liabilities under assumed reinsurance contracts for loss and LAE that are reserved by the reinsured, but not paid, are included in lines 1 and 3 of the Liabilities, Surplus and Other Funds page (loss and LAE reserves).

Other Expenses (Excluding Taxes, Licenses and Fees) (Line5)

In general, an insurance company's expenses can be separated into two broad categories: LAE and underwriting and investment expenses. Further divisions can be made within each category. The underwriting and investment expense category can be further divided into the following subcategories:

- Commission and brokerage expenses
- Taxes, licenses and fees
- General and administrative expenses
- Investment expenses

[16] NAIC, NAIC, *Model Laws, Regulations, Guidelines and Other Resources,* – MDL-745, October 2003, https://www.naic.org/store/free/MDL-745.pdf, 2019.

The other expenses liability item on the balance sheet generally represents incurred but not yet paid expenses from the third and fourth categories listed above. Additional detail on these expenses can be found in the Underwriting and Investment Exhibit (U&IE), Part 3, Expenses, where the unpaid expenses are shown on line 26. Although this exhibit does not provide the breakdown of the unpaid expenses by expense category, the total incurred expenses during the calendar year for these other expenses are included on lines 3 through 18.

An additional observation from U&IE, Part 3 is that each category of other underwriting expenses is split between column 1 (Loss Adjustment Expenses), column 2 (Other Underwriting Expenses) and column 3 (Investment Expenses). This is based on an allocation that is performed by the company, and that allocation determines whether unpaid amounts in these categories appear on the balance sheet as LAE reserves or as other expenses liabilities. Additional discussion regarding other expenses is provided in Chapter 8. *The Statutory Income Statement: Income and Changes to Surplus*. Further detail regarding the allocation of expenses by category is also provided in the following chapter (Chapter 18. *Insurance Expense Exhibit*).

Unearned Premiums (Line 9)

Unearned premium represents a liability related to the unexpired portion of all policies in force. For any individual in-force policy, the total amount of written premium can be separated into earned and unearned portions. In the simplest and most common case, this split is made by the number of coverage days in the total policy period that are expired or unexpired, respectively. This approach is referred to as the daily pro rata method and is the standard method used for lines such as automobile insurance, homeowners, general liability or property.

Another approach that is sometimes used is called the monthly pro rata method. This method assumes that policies are written evenly over the course of the month. Based on that assumption, 1/24 of the premium written in a given month is expected to earn in that month. Subsequent to that, 1/12 is expected to be earned in the next 11 months, and the remaining 1/24 is earned in the thirteenth month. This abbreviated method allows for a calculation of the earned premium in each month with less data and calculations.

Some specific types of coverage require different approaches to calculating earned premium (e.g., title insurance, financial guaranty and ocean marine).

The unearned premium reserve serves the important purpose of recognizing revenue over the time period the policy is in force. Unearned premium reserves represent an insurer's obligation to provide future coverage and the potential obligation to refund the unexpired portion of the premium to a policyholder, in the event that a policy is cancelled.

While this accrual of unearned premium and the subsequent earning of that premium may appear to be an attempt to match revenues with expenses, this is not the case. Statutory accounting requires that expenses related to the acquisition of an insurance policy be realized as an expense at the time of

acquisition. Despite that, the full amount of the written premium is still recorded as an unearned premium reserve at the inception of the policy. This departure from the matching principle that is commonly followed in accounting regimes exists to allow for a more conservative solvency-focused presentation because it results in lower policyholders' surplus, which is consistent with the objective of SAP.

Additional detail of the composition of the unearned premium recorded on page 3 (Liabilities, Surplus and Other Funds) of the Annual Statement can be found on page 7, which is part of the U&IE. Page 7 (U&IE Part 1) shows the breakdown of the total unearned premium into the following four categories:

- Amount unearned (running one year or less from date of policy)
- Amount unearned (running more than one year from date of policy)
- Earned but unbilled premiums
- Reserve for rate credits and retrospective adjustments based on experience

The first two categories above are relatively self-explanatory and separate the unearned premium related to policies with effective periods that are one year or less and policies with effective periods that are longer than one year. The third category, earned but unbilled (EBUB) premiums, includes estimated adjustments that will occur to the premium on audit-type policies where the actual amount of premium depends on some exposure measure, such as payroll, and is unknown until the end of the policy period. EBUB premiums are only recorded if they are reasonably estimable in the aggregate. The fourth category represents the expected adjustments that will occur on retrospectively rated policies, where the premium is variable based on the loss experience on the policy.

In addition, SAP and GAAP require an insurer to establish a separate premium liability, referred to as a premium deficiency reserve, if the unearned premium reserve for a portion of the business is not sufficient to cover the expected corresponding losses, expenses and other costs. An actuary in either a reserving or pricing role should be aware of the criteria that dictate when a premium deficiency reserve is required so they can advise management accordingly. Different criteria apply for short-duration and long-duration contracts. Additional discussion of premium deficiency reserves is included in Chapter 10. *Notes to Financial Statements* and Chapter 22. *U.S. GAAP, including Additional SEC Reporting*.

Ceded Reinsurance Premiums Payable (Line 12)

Ceded reinsurance premiums payable represent premiums that are owed to reinsurers for ceded reinsurance. This liability is recorded net of any commission retained to cover expenses that were incurred in issuing the reinsured policies. This line item does not include ceded reinsurance that are owed to the reinsurer or other funds that are being held as a deposit by the ceding company as collateral for payment of the reinsurer's obligations under specific terms of the reinsurance treaty, which is reflected in the next item, "Funds Held Under Reinsurance Treaties," discussed below.

Funds Held Under Reinsurance Treaties (Line 13)

These liabilities relate to funds that are held by a ceding company as collateral from a reinsurer. The funds provide security to the ceding company that the reinsurer will pay losses as they come due. This is particularly common in the case of unauthorized reinsurers (companies not authorized or licensed to do business in the ceding company's state of domicile) because it allows the ceding company to avoid a statutory accounting penalty on the recoverables from the unauthorized reinsurer. This penalty is described in SSAP 62R, which states that a recoverable from an unauthorized reinsurer that is not sufficiently collateralized is a nonadmitted asset. As noted above, this category also included ceded reinsurance premiums that were payable but were held according the terms of the reinsurance agreement.

Provision for Reinsurance (Line 16)

Although the magnitude of this liability category is not large for most insurers, it is worth mentioning because it is unique to statutory accounting. The provision for reinsurance is a statutory liability established for reinsurance recoverables that may not be collectable. The change in this provision is recorded directly to surplus. This penalty applies to all reinsurers that are slow to pay or that are disputing amounts owed to the ceding company and unauthorized reinsurers that do not meet the collateral requirements of the ceding company's domiciliary state. The actual details of the calculation of the provision for reinsurance are shown in Schedule F, Part 3 (Chapter 14. *Schedule F*) provides the details underlying this calculation).

Note that the net loss reserves, net unearned premium and the amounts recoverable from reinsurers for paid losses on page 2 of the Annual Statement are net of reinsurance but are stated without regard for the provision for reinsurance. The provision for reinsurance appears on page 3 and is a direct reduction to surplus and does not affect a company's admitted assets or income. This direct reduction to surplus and other direct reductions to surplus will be discussed in Chapter 8. *The Statutory Income Statement: Income and Changes to Surplus*.

Common Capital Stock (Line 30)

Common capital stock is a surplus account that is equal to the par value of the common stock issued and outstanding. This account only applies to stock insurance companies and does not exist for mutual insurance companies. Par value is an amount set by the issuer of a stock (the insurer, in this case) when the stock is initially offered that serves as a minimum value for which the stock can be sold in that initial offering. Par value has no relation to the market value of a stock and is often set at a low amount, so this common capital stock is not a material item for most insurers (it is only included here to allow for a complete explanation). Certain state regulators have specific requirements for how the par value of shares is established. A separate, similar account is maintained for preferred stock.

Gross Paid in and Contributed Surplus (Line 34)

This account represents amounts received through the sale of stock in excess of the par value for each share. This account also exists only for stock insurers. As shown Table 3, gross paid in and contributed surplus makes up 26% of the industry surplus, and it is much larger than the common capital stock account.

Unassigned Funds (Line 35)

Unassigned funds primarily represents surplus that has been accumulated over time through retained earnings of the business. For mutual companies, all surplus will generally be reflected in the unassigned funds account because none of those funds were received due to the sale of stock. However, there are some cases in which mutual insurance companies have changed their capital structure through the creation of a mutual holding company. In those situations, the insurance companies issue stock to the holding company and will have common capital stock and gross paid in and contributed surplus accounts. Unassigned funds represented 61% of the industry surplus as of December 31, 2018.

SUMMARY

This chapter has explained the basic structure of the statutory balance sheet and has introduced some of the more significant and relevant accounts. An actuary's involvement is often primarily focused on the loss and LAE reserves, which are the largest liability on the balance sheet, but it is also important for an actuary to understand the bigger picture of an insurer's balance sheet in order to better assess the overall financial health of an insurance company.

In Chapter 13. *Overview of Schedules and Their Purpose*, we will discuss other schedules in the Annual Statement that provide details beyond what we have touched upon here. We will also discuss how that additional detail can be used with the contents of the balance sheet to assess the financial health of an insurance company.

CHAPTER 8. THE STATUTORY INCOME STATEMENT: INCOME AND CHANGES TO SURPLUS

While the balance sheet is of key importance to regulators and the focal point of statutory accounting, the income statement is of equal importance to the ongoing viability of an insurance company. The income statement illustrates the revenue, expenses and net income of an insurance company.

The income statement is presented on the top portion of the Statement of Income on page 4 of the Annual Statement and provides the three sources of income, before federal and foreign income taxes and dividends to policyholders, separately: underwriting income, investment income and other income.

A sample of the statutory income statement for the industry as of December 31, 2018, is presented in Table 4.[17]

TABLE 4

Statement of Income, Income Section: Total U.S. Property/Casualty Insurance Industry U.S. 2018 Statutory Financials, NAIC Format (USD in 000s)		
Line	**Description**	**Amount**
1.	Premiums earned	599,736,478
2.	Losses incurred	364,129,084
3.	Loss adjustment expenses incurred	64,189,428
4.	Other underwriting expenses incurred	167,668,693
5.	Aggregate write-ins for underwriting deductions	1,026,092
6.	Total underwriting deductions	597,093,278
8.	**Underwriting income**	**2,618,240**
9.	Net investment income earned	57,036,856
10.	Net realized capital gains (losses) less capital gains tax	10,691,626
11.	**Investment income**	**67,728,482**
12.	Net gain (loss) from agents' or premium balances charged off	(1,674,331)
13.	Finance and service charges not included in premiums	3,725,717
14.	Aggregate write-ins for miscellaneous income	(690,778)
15.	**Other income**	**1,360,608**
16.	**Net income before dividends to policyholders and federal/foreign income tax**	**71,707,330**
17.	Dividends to policyholders	3,709,994
19.	Federal and foreign income taxes incurred	7,244,680
20.	**Net income**	**60,752,655**

As shown in Table 4, the net income for the industry during 2018 was $60.8 billion. The subtotals for each source of income show that the industry experienced gains in underwriting, investment income and other income during 2018. Each of the three sources of income is discussed further below.

[17] Accessed via a sector-specific information and research firm in the financial information marketplace.

UNDERWRITING INCOME

Underwriting income is the most familiar and relevant source of income to most actuaries. Underwriting income is calculated as earned premium minus loss and loss adjustment expense (LAE), other underwriting expenses incurred, any aggregate write-ins for underwriting deductions and net income of protected cells (not shown). We note that aggregate write-ins and net income of protected cells are generally immaterial if not 0.

Actuaries are typically involved in estimating incurred losses and LAE and possibly in the calculation of earned premium, so these terms should already be familiar. On the income statement, each of the amounts labeled incurred presented also include the ultimate amount of those liabilities that occurred in the current year, and any changes in the ultimate amount of the liabilities that occurred in previous years (as shown in the formula below).

Income statement incurred = Current period ultimate + Change in prior period ultimate

where,

Change in prior period ultimate = (total all periods ultimate at end of period – total all periods ultimate at beginning of period) - current period ultimate

Actuaries may be less familiar with the item labeled "other underwriting expenses incurred." Further discussion on this other underwriting expense category is provided below.

Other Underwriting Expenses Incurred (Line 4) [18]

We already encountered other underwriting expenses briefly during our discussion of the liability for "Other Expenses (Excluding Taxes, Licenses and Fees)" in Chapter 7. *Statutory Balance Sheet: A Measure of Solvency*. The "Other Expenses" account represents all other expenses that were incurred but not paid at the end of the fiscal year, while this line on the income statement represents the total amount of other expenses incurred during the course of the year, whether or not they have already been paid.

As shown in Table 4, the amount of the other underwriting expenses that were incurred by the industry in 2018 was $167.7 billion, which is about 28% of net premiums earned in 2018. The magnitude of these other underwriting expenses highlights the importance of other underwriting expenses to the profitability of the industry and the importance of ensuring that they are accurately reflected in the financial statements.

Expense accounting requires that expenses be allocated in three ways:

1. NAIC operating expense classifications, which represent various types of expenses, some of which have sub-types. These 24 types are listed in the rows Underwriting and Investment

[18] Aligns with *IASA* Chapter 8.

Exhibit (U&IE), Part 3. Examples of these expense classifications are "commission and brokerage," "salary and related Items," and "taxes, licenses and fees." It is suggested that the reader review the U&IE, Part 3, now to see the full list of classifications.

2. Expense categories, which are broader groupings of expenses that align with the different operational functions of an insurance company. There are three of these broad categories: LAE, other underwriting expenses and investment expenses. These categories are presented in the columns of the U&IE, Part 3.

3. Line of business, of which there are 33, some of which have sub-lines. These lines of business are listed in the U&IE, Part 2A. The lines of business used for expense reporting are similar to those lines of business used in Schedule P, but not the same.

Each time an insurance company has an expense, the appropriate expense classification needs to be determined and an allocation must be made by line of business and expense category. In some cases, the entire amount of the expense can be specifically identified with one expense classification, within one expense category and for one line of business (for instance, a commission paid on a policy within a specific line of business); however, this is often not the case, such as the salary of an employee who oversees several products and functions. In those instances, an allocation of that expense must be made. Some expenses may require several allocation steps.

When an allocation is required, it will be performed based on information that is relevant to that expense. Examples of potential allocation bases are policy counts, which may be appropriate in the case of policy administration expenses; employee headcount, which may be reasonable for supervisors' salaries; or other measures of business or employee activity.

An example of a complex expense allocation would be one related to the rent that is paid for a home office that serves as a center for all operating functions. The allocation process could take place as follows:

- This expense can be specifically identified as the "rent and rent items" expense classification and therefore assigned fully to that classification.

- Because the home office is used for all company functions, its expenses would need to be allocated between all three categories: LAE, other underwriting expenses and investment expenses. One possible approach to this is to allocate the rent to those three categories by headcount of personnel associated with each function.

- The home office is also the base for all lines of business, so the expenses may be allocated to each line of business by premium volume. This allocation to line of business could differ by expense category.

The result of the first two of these allocations can be observed in the U&IE, Part 3, and the line of business allocation is reflected in the Insurance Expense Exhibit, Part 2, which will be discussed in more detail in Chapter 18. *Insurance Expense Exhibit*.

Guidance for allocation of expenses is provided in the NAIC Annual Statement Instructions, and also in Statement of Statutory Accounting Principles (SSAP) 70, *Allocation of Expenses*. These are the sources of the uniform classifications and categories that are described above, as well as additional allocation rules. In general, the guidance indicates that specific identification of expenses is preferable to allocation but that when allocation is required, it should be apportioned based on pertinent factors or ratios such as premium, number of claims or headcount. The decision to allocate and the factors or ratios that are used when allocation is required will require judgment on the part of a company.

While the topic of expense accounting and specifically other underwriting expenses may seem of questionable relevance to an actuary, it is important to have a basic awareness and knowledge of the topic. The reason for this is twofold.

First, the overall level of company expenses will directly affect the pricing (or the adequacy of pricing) of its insurance products. A company with lower expenses relative to its competitors has the potential to be more competitive and or more profitable. Actuaries can contribute by participating in the planning and control of expenses.

Second, if the relative allocation of expenses across functions and products is not accurate, it can lead to subsidies between products that may obscure the true profitability of those products and lead to inefficient allocation of resources or even anti-selection. An actuary who understands expense allocation can prevent or minimize such subsidies and their consequences by striving to allocate expenses as accurately as possible.

The expense allocation process described above and presented in the U&IE is the driver of the other underwriting expense account on the income statement, as well as other references to expenses elsewhere in the Annual Statement.

INVESTMENT INCOME[19]

Investment income is an important source of income to insurance companies and a unique aspect of an insurer's business relative to other industries. The importance of investment income was already highlighted by the summary of the industry income statement. There we saw that in 2018 the insurance

[19] Aligns with *IASA* Chapter 9.

industry's positive net income was nearly entirely attributable to investment income, with limited contribution from underwriting and other income.

Because there is a delay (significant in some cases) between the time insurers receive premiums and the payment of claims, they have an opportunity to earn investment income on those funds. This makes consideration of investment income fundamental to the pricing of insurance products, which is not the case for most other industries.

The investment income item on the income statement consists of the following:

- Net investment income earned
- Net realized capital gain (loss)

Net investment income earned is primarily related to interest and dividends received on investment assets held over the course of the year. Net investment income earned does not include changes to the prices of invested assets that are sold (those are included in net realized capital gain described below). Furthermore, it is recorded on an accrual basis, meaning that it is reflected in the year in which it is earned and not necessarily the year in which the actual cash related to the income is received. The amount of this income is shown net of investment expenses and other costs, but gross of federal income taxes, on the income statement.

Net realized capital gain (loss) generally results from the sale of investments for more or less than original cost, adjusted for the amortization of premiums or accretion of discounts (amortized cost). Realized losses also result from impairment adjustments. Certain investments (primarily common stock) are recorded at fair value. The changes in the value of these investments (unrealized gains (losses)) are not included as income and instead reflected as direct adjustments to surplus. These direct adjustments to surplus are necessary because these items do not flow through net income for the current period, but the surplus must still be adjusted to maintain the admitted assets equal liabilities plus surplus relationship.

In 2018, industry net investment income earned was $57 billion, and the net realized capital gain was $10.7 billion. Detail of both the net investment income and the net realized capital gain (loss) amounts that are shown in the income statement is provided on page 12 of the Annual Statement, which includes the Exhibit of Net Investment Income and the Exhibit of Capital Gains (Losses). These exhibits provide the detail of both sources of income by asset class. The Exhibit of Net Investment Income also differentiates between the amount of income collected and the amount of income earned in the year and describes the deductions for investment expenses and other costs. The Exhibit of Capital Gains (Losses) shows the split of the gains (losses) between those gains (losses) that were realized on the sale or maturity of an asset and those that were due to impairments (labeled "other realized adjustments").

The details underlying these two exhibits are provided in Schedules A, B, D, DA and DB of the Annual Statement, which describe the assets held in each asset class as of the evaluation date of the financial statement and the assets that were sold, redeemed or disposed of during the current year.

While property/casualty actuaries are not typically involved in the investment reporting and valuation, they should have a basic understanding of these items due to their significance to product pricing and overall insurer operating results. For that reason, a discussion of the statutory reporting and valuation guidelines for each major asset class is included below. More detail will be provided on bonds and stocks because they represent the vast majority of assets held, but several other asset classes will also be discussed briefly.

Bonds

Bonds represent a majority of the assets held by insurance companies. On the Exhibit of Net Investment Income and the Exhibit of Capital Gains (Losses), bonds are reported in four categories: U.S. government bonds, bonds exempt from U.S. tax, other bonds (unaffiliated) and bonds of affiliates. The underlying detail is primarily provided in Schedule D, Part 1 (Long-Term Bonds Owned) and Schedule D, Part 4 (Long-Term Bonds Sold, Redeemed or Disposed of). Bonds that mature in one year or less are reported in Schedule DA, Part 1 (Short-Term Investments Owned).

The net investment income earned from bonds, as shown in the Exhibit of Net Investment Income, is based on the following four amounts:

1. Interest received during the year (Schedule D, Part 1, column 20 and Part 4, column 20).
2. Interest due and accrued (Schedule D, Part 1, columns 19 and 20).
3. Current year's (amortization)/accretion (Schedule D, Part 1, column 13 and Part 4, column 12)
4. Interest paid for accrued interest on dividends (Schedule D, Part 3, column 9).

The first of the four items, interest received during the year, represents all coupon payments that were received on bonds held during the year. This includes coupon payment on bonds owned at the end of the year and on bonds that were owned at the beginning of the year but sold, redeemed or disposed of during the year. This is presented on the basis of when the actual interest coupon was actually received, so an adjustment is required to convert it to an accrual basis. This adjustment is made by adding the change in the interest due and accrued account (the second item from above) over the last year to the interest received during the year.

The explanation of the third item above, current year's (amortization)/accretion, requires us to revisit basic bond valuation. Recall that when a bond is purchased, the actual purchase price is usually different from the face value due to the difference between the coupon rate on the bond and the market interest rates at the time of purchase. To provide the buyer with an effective interest rate equal to the current market interest rate, the bond is sold at either a discount or a premium to the face value. For financial reporting purposes, that discount or premium is then realized as either positive (in the case of a discount) or negative (in the case of a premium) interest income over the life of the bond. This is referred to as either the amortization of the premium or the accretion of the discount and is reported for each bond in Schedule D, Parts 1 and 4.

The following example illustrates the accounting for a bond purchased at a discount. Assume a five-year bond with face value of $100 is purchased for $90. The purchase price is less than the face value because the coupon rate on the bond is less than the current market interest rate. This difference between the face value and purchase price is referred to as a discount, and the amount of the discount is set such that the effective yield on the bond will equal the current market interest rates at the time of purchase. The $10 discount is realized over the remaining five-year duration of the bond as investment income in addition to the actual coupon payments, such that the effective yield in each period also matches the market interest rate at the time of purchase.

The same example can be reversed for bonds that are purchased at premium (when the coupon rate exceeds the market interest rate), and that premium is amortized as negative investment income over the life of the bond to achieve an overall investment income equal to the market interest rate at the time of purchase.

The fourth and final item above, interest paid on accrued interest and dividends, is related to coupon payments that are received on bonds acquired during the year. When a bond is acquired between coupon payments, the buyer of the bond (in this case the insurance company) is required to pay the seller of the bond the portion of the coupon payment that was earned while they owned the bond. This amount is presented on Schedule D, Part 3 (Long-Term Bonds and Stocks Acquired During Current Year), column 9 (Paid for Accrued Interest and Dividends).

Each of these three items (interest received, accrual/amortization of discount/premium, interest due and accrued, and payments for accrued interest on purchases) is reflected in the investment income collected and earned columns in the Exhibit of Net Investment Income.

The other aspect of investment income related to bonds, net realized capital gains (losses), comprises the following components:

- Realized gain (loss) on sale or maturity (Schedule D, Part 4, column16)
- Foreign exchange gain (loss) on disposal (Schedule D, Part 4, column 17)
- Other than temporary impairments recognized (Schedule D, Part 1, column 14 and Part 4, column 13)

Before we discuss these items in more detail, we will first review the basic statutory accounting concepts for bonds. When a bond is purchased, it is recorded at actual cost, including brokerage and other fees. This amount is recorded as the “actual cost” in Schedule D, Part 1, column 7 and Schedule D, Part 4, column 7. In each statutory Annual Statement after the purchase of the bond, the bond is recorded at “adjusted carrying value,” which is based on one of two amounts:

- Amortized cost
- The lower of amortized cost or fair value

Amortized cost represents the actual cost of the bond adjusted for the amortization of any premium or discount from the face amount (as described in the paragraphs above). Fair value generally refers to the value that an asset could be sold for in the open market.

For bonds that are designated as National Association of Insurance Commissioners (NAIC) 1 and 2 and carried at amortized cost, the adjusted carrying value of the bond is updated each year to reflect the amortization of premium or the accretion of discount. As a result, the adjusted carrying value of the bond will converge with the par value as a bond matures. For bonds that are designated as NAIC 3 through 6, the value of the bond is shown as the lesser of fair value or amortized cost. All of this information is summarized on Schedule D, Part 1, including the NAIC designation, actual cost, fair value, par value and book/adjusted carrying value.

To the extent the adjusted carrying value of a bond is adjusted to fair value, the adjustment is considered an unrealized loss and is reflected in Schedule D, Part 1, column 12. Once the bond is sold, the difference between the consideration received and the adjusted carrying value is considered a realized gain or loss and is recorded in Schedule D, Part 4, column 18. Many bonds held by insurance companies are designated as NAIC 1 or 2 and held to maturity, so there is never any capital gain or loss over the life of the bond.

Bonds denominated in a foreign currency will also be affected by changes in foreign exchange rates over time. These changes are reflected in the adjusted carrying value but are unrealized until the bond is sold, redeemed or otherwise disposed of. The change in the unrealized amount of this foreign exchange gain or loss is found on Schedule D, Part 1, column 15, and the amount of foreign exchange gain or loss that is realized upon disposal is found on Schedule D, Part 4, column 17.

The sum of the realized gain or loss on disposal and the foreign exchange gain or loss on disposal equals the total gain or loss on disposal, which is shown on Schedule D, Part 4, column 19.

One important exception to the reporting and valuation rule described above relates to the third source of the net realized capital gains and losses, which is referred to as “other than temporary impairments recognized.” In general, an impairment occurs when it is deemed probable that the insurer will not collect all amounts due according to the contractual terms of a debt security at the date of acquisition. Whether or not impairment is temporary is a subjective judgment of the company. Impairments can occur on bonds with any NAIC designation, and they result in the realized capital losses even though a bond has not been sold, redeemed or disposed.

The total realized capital gain or loss for a year is calculated in the Exhibit of Capital Gains (Losses). Column 1 represents the “Realized Gain (Loss) On Sales or Maturity,” which is calculated in Schedule D, Part 4, and shown in column 18 of that exhibit. Column 2 is labeled “Other Realized Adjustments” and includes the foreign exchange gain (loss) on disposal and other than temporary impairments recognized in the first year.

Stocks

Like bonds, investment income from stocks comprises investment income earned and realized capital gains.

Preferred stocks and common stocks are reported on separate lines on the Exhibit of Net Investment Income and the Exhibit of Capital Gains (Losses), and they have separate supporting schedules, Schedule D, Part 2, Section 1 and Section 2, respectively. Disposals of preferred and common stocks are reflected in Schedule D, Part 4.

Investment income for stocks is simply the amount of dividends received during the year plus the change in the accrual for dividends declared but unpaid (dividends are accrued on the ex-dividend date). These dividends are included in Schedule D, Part 2-Section 2, column 11 for stocks owned at year end and in Schedule D, Parts 4 and 5, column 20 for stocks sold during the year.

When either common stocks or preferred stocks are purchased, the actual cost plus any commissions or taxes becomes the initial carrying value. Subsequently, the valuation of preferred stocks and common stocks differ, so each is discussed separately.

Common stocks of unaffiliated companies listed on the major U.S. exchanges (NYSE and NASDAQ) are recorded at fair value. Changes to fair value after purchase are recorded as unrealized valuation increases (decreases) in Schedule D, Part 2, Section 2, column 13. When a stock (common or preferred) is disposed of, the difference between the consideration received and the original cost is recorded as a realized gain (loss) on disposal and a foreign exchange gain (loss) on disposal (if applicable) in Schedule D, Part 4, columns 17 and 18.

The rules governing the accounting for investments in subsidiaries, controlled and affiliated entities are complex and beyond the scope of this publication. A brief description of the accounting for investments in insurance company affiliates is discussed in the RBC chapter of this publication (see Chapter 19. *Risk-Based Capital*), where accounting background is needed on the accounting for determination of the asset risk charge.

The valuation of preferred stock of unaffiliated entities is dictated by the form of the instrument and the designation assigned by the NAIC Securities Valuation Office. The two common forms of preferred stock are redeemable and perpetual (i.e., non-redeemable) preferred stock. Redeemable preferred stock, also known as callable preferred stock, is preferred stock that is redeemable at the option of the issuer at a specified maturity date or after a specific period of notice, for a preset price. Perpetual preferred stock is preferred stock with no maturity date that cannot be redeemed by the issuer. For redeemable preferred stock, the highest two designation categories are recorded at the original purchase price (i.e., cost) plus brokerage and other related fees, with any discount or premium amortized over the life of the redeemable preferred stock; for perpetual preferred stock, the highest two designation categories are recorded at fair value; for redeemable and perpetual preferred stock, the lower four designation categories are recorded at the lower of cost, amortized cost or fair value.

As with fair value changes, market value changes to common and preferred stock after purchase are also shown in Schedule D, Part 2, Section 2, column 13 as unrealized valuation increases (decreases). Again, when a stock is disposed of, the difference between the consideration received and the original cost is recorded in Schedule D, Part 4, columns 17 and 18 as a realized gain (loss) on disposal and a foreign exchange gain (loss) on disposal (if applicable).

Both common stocks and preferred stocks are subject to impairment charges if there is a decline in fair value that is deemed to be "other than temporary" by the company. This determination must be made by the company based on available information (e.g., published reports, bankruptcy notifications). When impairment is made, it is recorded in Schedule D, Part 2, Section 1, column 17 and Schedule D, Part 2, Section 2, column 14 (as well as Part 4 for stocks that are disposed of during the year). Impairments made in a given year are included in the "Other Realized Adjustments" of the Exhibit of Capital Gains.

Each component of investment income from stocks is included in the Exhibit of Net Investment Income (page 12). Dividends received plus the change in dividends declared but unpaid are shown in the Exhibit of Net Investment income. In the Exhibit of Capital Gains (Losses), the realized gain or loss on disposal is shown in column 1, and the realized foreign exchange gain (loss) on disposal and other than temporary impairments are shown in column 2.

Cash, Cash Equivalents and Short-Term Investments

This class includes assets that are immediately convertible to cash and have an original maturity of one year or less. Short-term investments are reported in Schedule DA, Part 1, cash is reported in Schedule E, Part 1, and cash equivalents are reported in Schedule E, Part 2.

The short-term investments presented in Schedule DA, Part 1 are composed of bonds or other securities with a maturity of one year or less (at acquisition) and follow the same reporting and valuation rules as long-term bonds. When a short-term bond or other investment is purchased, the security is recorded at cost and the premium or discount (if any) is amortized or accreted until maturity. Other than temporary impairments are also possible, though they are less common given the short duration of these investments.

The reporting and valuation of cash and cash equivalents is similar but relatively simpler than short-term investments, as evidenced by the fewer columns that are included in Schedule E, Parts 1 and 2 relative to Schedule DA.

Derivatives

Derivatives are financial contracts between two parties for which the value depends on the performance of other assets or variables. While derivatives are not a major asset class for most property/casualty insurance companies, they are becoming more common, and they are of heightened importance due to

the financial crisis that occurred in the late 2000s. During the financial crisis, one large insurance group nearly collapsed due to derivatives that had been sold by one of its units.

A list of outstanding derivatives owned, sold ("written"), and terminated during the year is provided in Schedule DB. Companies that are not involved in any open derivatives may omit Schedule DB.

Schedule DB provides the number of contracts for each derivative and the notional amount, which represents the number of units of the underlying asset that are involved. The original trade date and the maturity or expiration date are also provided. The two prices listed are the transaction price, which is the price that the company agreed to buy or sell at, and the reporting date price, which is the current price.

One common reason a company may buy or sell derivatives is to hedge, or offset, the exposure they have to changes in price for an underlying asset or variable, such as an interest rate. For this reason, Schedule DB includes information on the item that is hedged with each derivative position and on the type of risk being hedged.

If a derivative position is held for hedging purposes and a company can demonstrate that the hedge has sufficiently reduced the risk related to the specific underlying asset or assets (known as a "highly effective" hedge), then that derivative may qualify for hedge accounting. Under hedge accounting, the derivative is accounted for in the same way as the asset that is hedged, which allows for any changes in the value of the hedged asset and the derivative to offset (or be unrecorded in cases where the hedged item is recorded at amortized cost). For instance, if an interest rate swap is held to specifically hedge the value of a bond portfolio and that interest rate swap qualifies as a highly effective hedge (i.e., effectively neutralizes any changes in the value of the bond portfolio), then that interest rate swap can be accounted for on an amortized cost basis.

If a derivative no longer qualifies for hedge accounting (i.e., is no longer highly effective), then the mark-to-market accounting method should be used, and any changes in the fair value of the derivative should be recorded as unrealized gains (losses) directly to surplus in the current period. The accounting for derivatives used in income-generation transactions depends on the nature of the transaction and the accounting for the covering asset or underlying interest.

Schedule E is also related to derivatives and lists the counterparty exposure for all derivatives that are open at year-end. Counterparty is the person or institution on the other side of a transaction. This is important because it provides information to the regulators and any other users of the financial statements regarding any concentration of exposure to a specific counterparty. If the exposure to a counterparty becomes large enough that it is material relative to the surplus of a company, it should be considered as a potential warning sign.

Derivative accounting is very complex and beyond the scope of this publication. More detail regarding derivative accounting can be found in SSAP 86, *Derivatives.*

Other Sources of Investment Income

Although we have covered the largest and most common sources of investment income, there are other sources. For additional information on those other sources, or for additional detail regarding any of the sources discussed here, refer to the corresponding statutory accounting guidance.

Investment Guidelines

As discussed, there is a variety of investment asset classes available to insurers, and there is a wide range of specific assets within each class. When purchasing a bond, an insurer needs to make decisions on the type of issuer (e.g., government, corporate, asset-backed), industry, quality, maturity and country. Each company will make these decisions based on a set of investment guidelines, which are governed by state investment laws applicable to insurers. Each state has established investment laws, which provide guidance and limits regarding the allowable investments for insurers domiciled in their jurisdiction. Although the NAIC has established model laws governing various aspects of insurers' operations (including investments), the laws adopted by individual states may vary from those model laws. For purposes of this discussion, we will focus on the NAIC Model Investment Law.[20] The NAIC Model Investment Law allows for two alternative types of investment guidelines, which are referred to as Defined Limits and Prudent Person.

The Defined Limit system of investment guidelines follows a rule-based approach and prescribes specific quantitative limits for the invested assets that a company may hold. Examples of some of the prescribed limits include the following:

- 5% limit of admitted assets with any single issuer (exceptions for government bonds)
- 1% limit of admitted assets with any single issuer with a designation of NAIC 3
- 0.5% limit of admitted assets with any single issuer with a designation of NAIC 4 or lower
- 20% limit of admitted assets in all securities designated NAIC 3 or lower
- 10% limit of admitted assets in all securities designated NAIC 4 or lower
- 5% limit of admitted assets in all securities designated NAIC 5 or lower
- 1% limit of admitted assets in all securities designated NAIC 6
- 25% limit of admitted assets or 100% of surplus in all common stocks

The Prudent Person system of investment guidelines follows a principles-based approach and requires an insurance company to develop its own investment guidelines. If a company chooses to use the Prudent Person approach, it should develop the investment guidelines with the protection of the policyholder in mind, and it should consider the specific investment expertise and resources available.

Measuring Investment Performance

[20] NAIC, *Model Laws, Regulations, Guidelines and Other Resources* MDL-280, 282, 283, and 340, https://www.naic.org/prod_serv_model_laws.htm2019.

Although investment income is a critical aspect of an insurer's profitability, it can be difficult to measure investment performance and make comparisons between insurance companies. Several factors to consider are the size of the asset base of a company, the level of risk inherent in a company's investment portfolio and the impact of taxes on a company's investment income. Each of these considerations will be discussed below.

It may be tempting to compare the amount of investment income from one company to another or to create the ratio of investment income to written or earned premium. Neither of these approaches is an accurate measure of investment performance because they ignore the size of a company's invested assets. All things being equal, a company with 10 times the invested assets of another company would also be expected to generate 10 times the investment income. For that reason, one metric to consider is the ratio of the investment income for the year to the average invested assets.

That ratio will provide a basic comparison between two companies and how much investment income they are generating relative to their invested assets. However, this ratio does not consider the inherent risk to the assets that are being held. If one company has a significantly higher percentage of its assets in common stocks or lower-rated bonds, it would be expected to achieve a higher investment return during a good year, but the level of risk is significantly higher. While there may not be a single ratio or metric that measures this inherent level of risk, it is at least possible to qualitatively compare the types of assets held by two companies to see if there are significant differences.

Measurement and comparison of investment performance is also difficult due to taxes. As discussed earlier in this chapter, net investment income earned is presented on the income statement before the effects of federal income taxes. On the other hand, net realized capital gain (loss) is presented after capital gains tax. Two companies that had the same net investment income earned may be subject to different taxation. The full implications of the impact of taxes on investment income are beyond the scope of this publication, but a user of the financial statements should be aware of this potential difference and seek input from a tax professional as needed.

OTHER INCOME

As shown in the summary of the industry income statement, the other income category is relatively small compared to the other two categories. For that reason, only a few of the significant sources of other income will be discussed below. Although they are not technically considered to be part of other income, dividends to policyholders and federal and foreign income taxes are also discussed below because they are part of the consideration of net income.

Net Gain (Loss) from Agents' or Premium Balances Charged Off (Line 12)

In Chapter 7. *Statutory Balance Sheet: A Measure of Solvency*, we discussed the assets related to uncollected and deferred agents' balances. If a company determines that a portion of those balances will not be collected, those balances should be charged off as a loss and are recorded as an expense under this category in other income. Conversely, if an agents' balance that was previously written off is

recovered, that recovery would be included as a gain in this category. Losses can be used to offset gains that occur during the same period.

Finance and Service Charges not Included in Premiums (Line 13)

Insurers will often offer financing or payment plans to the insured that allow the insured to spread out premium payment over time. Typically, the insured will pay an additional flat service charge to pay through these financing or payment plans. Those service charges are not recorded as a part of written or earned premium and are instead included in this category under other income.

Aggregate Write-ins for Miscellaneous Income (Line 14)

While the amounts included as miscellaneous write-ins are not usually material, several of the common entries are the following:

- Gain or Loss on Sale of Equipment: When furniture, equipment or automobiles are sold, the sale price may differ from the current depreciated cost. That difference may be recorded as either a gain or a loss under other income.
- Retroactive Reinsurance: An insurer may purchase reinsurance on existing liabilities, and the reinsurance premium paid may be more or less than the previously recorded value of the liabilities transferred. That gain or loss is recorded as other income.
- Gain or Loss on Foreign Exchange: When payments are made or received in a foreign currency, the ultimate settlement of the payment may be at a different exchange rate than the exchange rate at which the payment was originally recorded, and the resulting gain or loss is recorded as other income. This does not include changes in investment income due to foreign exchange, which were already discussed.
- Corporate Expense: Some insurers will record some corporate expenses that are not allocable to underwriting or investments, such as national advertising, to other expenses.
- Fines and Penalties of Regulatory Authorities: As per the Annual Statement Instructions, all fines and penalties imposed by regulatory authorities must be disclosed separately, regardless of materiality.

Dividends to Policyholders (Line 17)

The board of directors of a mutual insurance company may elect to pay a dividend to the policyholders. A dividend is effectively a return of a portion of the premium that was originally paid by the policyholder, and for a dividend to be paid, there are typically state requirements. When the decision is made to pay a dividend, it is considered to have been “declared,” and payment won’t actually be issued until a later date.

This item on the income statement includes dividends that were actually paid plus the change in accrued dividends.

Federal and Foreign Income Taxes Incurred (Line 19)

All foreign and federal income taxes that are incurred during the current year, including amounts related to prior years, are recorded on this line. This amount of income taxes incurred represents an estimate of the current income taxes incurred during the reporting period and excludes any amounts that would be deferred to later years. Further detail on taxation appears in Chapter 26. *Taxation in the U.S.*

CHAPTER 9. CAPITAL AND SURPLUS ACCOUNT

In addition to various income items that have already been discussed, the Statement of Income within the Annual Statement also includes a section referred to as the "Capital and Surplus Account." This section is important because it reflects certain changes in surplus that are not recorded in the income statement and it reconciles the beginning surplus to the ending surplus for the reporting period.

In its simplest form, the key components of the Capital and Surplus Account are listed in Table 5 as follows:

Current Year Surplus (line 39) =
- Prior Year Surplus (line 21)
- \+ Current Year's Net Income (line 22)
- \+ Other Surplus Changes (lines 24 through 31)
- \+ Additional Capital Contributions (lines 32 and 33)
- \+ Stockholder Dividends (line 35)[21]

Under Statutory Accounting Principles, certain transactions are recorded directly to surplus, so the Other Surplus Changes component includes a number of important subcomponents. Table 5 is an excerpt of the Capital and Surplus Account for the U.S. property/casualty insurance industry as of December 31, 2018.[22]

[21] Stockholder dividends represent a charge to surplus for amounts paid during the year plus the change in the amount of dividends declared but unpaid during the year. These amounts are shown as a negative number in line 35 of the Capital and Surplus Account and therefore added, as a negative number, to calculate current year surplus. Table 5 demonstrates this calculation.

[22] Accessed via a sector-specific information and research firm in the financial information marketplace.

TABLE 5

Statement of Income, Capital and Surplus Account Section: Total U.S. Property/Casualty Insurance Industry U.S. 2018 Statutory Financials, NAIC Format (USD in 000s)

Line	Description	Amount
21.	Surplus as of December 31 of prior year	765,448,283
22.	Net income	60,752,655
24.	Change in net unrealized capital gains (losses) less capital gains tax	(45,399,542)
25.	Change in net unrealized foreign exchange capital gain (loss)	(585,099)
26.	Change in net deferred income tax	324,683
27.	Change in nonadmitted assets	(818,259)
28.	Change in provision for reinsurance	139,053
31.	Cumulative effect of changes in accounting principles	58,650
32.	Capital changes	(197,375)
33.	Surplus adjustments	9,197,233
35.	Dividends to stockholders	(32,085,308)
37.	Aggregate write-ins for gains or losses to surplus	235,593
38.	Changes to surplus for the year (lines 22 through 37 and **)	(8,526,468)
39.	**Surplus as regards policyholders, December 31 current year**	**756,921,815**

The first item of Table 5, surplus as of December 31 of prior year, is taken directly from the Capital and Surplus Account from the prior year. Net income comes from the Statement of Income. The remaining rows describe the direct adjustments to surplus. An explanation of some of the important adjustments is below.

Change in Unrealized Capital Gains (Losses) (Line 24)

We previously discussed the concept of realized and unrealized capital gains in the discussion of investments and investment income. Capital gains (losses) occur when the carrying value of an asset changes, but those capital gains (losses) are only realized when an asset is either disposed of or impaired.

Recall that in the investment income section of the Statement of Income, realized capital gains (losses) are recorded in income, but unrealized capital gains (losses) are not. Unrealized capital gains (losses) occur when the fair value of investments carried at fair value changes during the reporting period. Because these unrealized capital gains (losses) are reflected in the balance sheet but not in net income, an adjustment to surplus is required to maintain the Admitted Assets – Liabilities = Surplus relationship.

Because the current year's surplus is being calculated with the prior year's surplus as a starting point, the required adjustment is the *change in* net unrealized capital gains (losses) relative to the prior year,

not the absolute amount of unrealized capital gains for the current year. This amount can be found in column 4 of the Exhibit of Capital Gains (Losses).

Unrealized capital gains (losses) most frequently occur with respect to stock holdings that are held at fair value because any change in the fair value from year to year affects capital gains (losses). Bonds may also produce unrealized capital gains, but this would typically only occur when a bond is designated as National Association of Insurance Commissioners (NAIC) 3 or lower and is therefore recorded at fair value. Perpetual preferred stock and redeemable preferred stock that is designated in the four lowest NAIC categories could also produce unrealized gains since they also may be recorded at fair value.

Change in Net Unrealized Foreign Exchange Capital Gains (Losses) (Line 25)

This item is similar to the change in unrealized capital gains (losses), but it is specifically related to unrealized capital gains (losses) due to changes in the foreign exchange rate. When an asset is purchased in a foreign currency, any subsequent change in value due to changes in foreign exchange rates as long as that asset is held are considered to be unrealized capital gains (losses). This amount can be found in column 5 of the Exhibit of Capital Gains.

Change in Net Deferred Income Tax (Line 26)

Deferred tax assets (DTAs) and deferred tax liabilities (DTLs) were already discussed in the previous discussion of the balance sheet (Chapter 7. *Statutory Balance Sheet: A Measure of Solvency*). DTAs and DTLs can arise for a variety of reasons, but the most common are differences in statutory and tax accounting (such as in the discounting of loss reserves, unrealized gains/losses and unrealized foreign exchange gains/losses) and carryforward of previous operating losses to future tax years. DTAs are only considered admitted assets if a strict admissibility test is met. All surplus adjustments are recorded net of deferred taxes if there is a difference in the treatment of the item for statutory accounting and tax purposes. Similar to unrealized capital gains, net DTAs affect the balance sheet but do not flow through to income. As a result, a direct adjustment is required to surplus to maintain the equality of Admitted Assets – Liabilities = Surplus. The change in deferred taxes is determined before consideration of the nonadmitted portion because the change in nonadmitted DTAs is captured with all the other nonadmitted assets.

Change in Nonadmitted Assets (Line 27)

The concept of nonadmitted assets was introduced in the previous discussion of the balance sheet. Nonadmitted assets are assets that are not allowed to be considered part of surplus for the purpose of statutory accounting. This creates a violation of the Admitted Assets – Liabilities = Surplus relationship.

As with the previous items, the adjustment required is based on the *change* in nonadmitted assets relative to the prior year, not the current absolute amount. There is a specific exhibit in the Annual Statement, the Exhibit of Nonadmitted Assets (page 13 of the 2018 Annual Statement), which calculates the change in nonadmitted assets relative to last year by asset class and in total. The total change in

nonadmitted assets from that exhibit is the source for the amount used as the change in nonadmitted assets in the Capital and Surplus Account.

Change in Provision for Reinsurance (Line 28)

Like nonadmitted assets, the provision for reinsurance is a concept that reduces surplus and is unique to statutory accounting. While nonadmitted assets are essentially treated as assets that are excluded from surplus, the provision for reinsurance is treated as an additional liability on the balance sheet (though no real liability exists). The provision for reinsurance is included on the balance sheet, but it does not flow through to the Statement of Income, which is why a direct adjustment to surplus is required.

The Liabilities page of the balance sheet shows the current year and the prior year provision for reinsurance, so the change in the provision for reinsurance can be calculated from those amounts. The amount of the change in the provision for reinsurance is included in the Capital and Surplus Account.

Cumulative Effect of Changes in Accounting Principles (Line 31)

Sometimes a company must adopt changes in accounting principles, either due to new accounting guidance, or a change in accounting policy. When such a change occurs, a company must determine the cumulative effect of the change (as if the accounting principle had always been in place) as of the beginning of the reporting period the change is made. The cumulative effect of the change is recorded as a direct adjustment to surplus.

Although an entry for a cumulative effect of changes in accounting principles could be required for many reasons, here are two examples:

- Anticipated salvage and subrogation: Companies have the option to record unpaid losses net of anticipated salvage and subrogation. When a company elects to change the recording from gross of salvage and subrogation to net of salvage and subrogation, the cumulative effect of this change should be reported here.
- Tabular discounting: When companies record loss reserves for life pension reserves, they have the option to discount for interest and mortality according to a prescribed actuarial table and interest rate. This is referred to as tabular discounting. When a company makes a change in its use of tabular discounting, the cumulative impact of that change should be recorded here.

Capital Changes and Surplus Adjustments (Lines 32 and 33)

The lines for capital changes and surplus adjustments primarily describe inflows and outflows of capital from the new issuance of stock or return of capital, as well as transfers from surplus to capital when stock dividends are issued. When new stock is issued, the portion of the proceeds related to the par

value of that stock is recorded as paid-in capital on line 32.1. The portion of the proceeds in excess of the par value is recorded as paid-in surplus on line 33.1.

Dividends to Stockholders (Line 35)

The board of directors of an insurance company may elect to pay a dividend to the stockholders, which serves as a return on the stockholders' investment. Stockholder dividends may only be paid out of unassigned surplus, which is surplus that is not assigned to the par value or paid in value of stock, special surplus funds, surplus notes or treasury stock. There are also specific state requirements that must be met for a stockholder's dividend to be paid.

The amount shown as dividends to stockholders equals the actual amount paid during the year plus the change in the amount of dividends declared but unpaid during the year.

SUMMARY

This section described the three sources of income on the Statement of Income (underwriting, investment and other) and discussed the Capital and Surplus Account within the Statement of Income, where total change in surplus is determined.

While actuaries are most familiar with the aspects relating to underwriting income, they should also be familiar with investment income, given the significance of investment income to the pricing and profitability of an insurer. Understanding the various items that affect the change in surplus is also important because this not only provides the link between the profitability and the solvency of a company (or the income statement and the balance sheet), but it also highlights several direct adjustments to surplus that may require input from an actuary.

CHAPTER 10. NOTES TO FINANCIAL STATEMENTS

We have now covered the numerical aspects of three of the primary financial statements: the balance sheet, income statement, and statement of capital and surplus. For some of the balances, Statutory Accounting Principles (SAP) requires additional qualitative or quantitative information in order to more fully portray the financial condition of an insurer. The Notes to Financial Statements include some of this additional qualitative and quantitative information.

This publication will focus on specific notes that often require direct involvement by actuaries and the notes that are potentially relevant to actuaries. The notes within each of those two categories are described below:

- Notes often requiring direct involvement by actuaries:
    - Reinsurance (23)
    - Change in incurred loss and loss adjustment expense (LAE) (25)
    - Premium deficiency reserves (30)
    - Discounting of liabilities for unpaid loss and LAE (32)
    - Asbestos/environmental reserves (33)
- Notes that are potentially relevant to actuaries:
    - Summary of significant accounting policies and going concern (1)
    - Events subsequent (22)
    - Intercompany pooling arrangements (26)
    - Structured settlements (27)
    - High deductibles (31)

The numbers listed next to each note above are the numbers corresponding to that note in the 2018 Notes to Financial Statements included in the Annual Statement Blank, which are the same as those in 2011. These numbers may change from year to year due to the addition or subtraction of the notes that are required, so these numbers will not be used in the rest of this discussion. Examples will be drawn from the 2018 Notes to Financial Statements for Fictitious Insurance Company (referred to as the 2018 Fictitious Notes). It is also suggested that the reader review an example of the Notes to Financial Statements from a current insurance company Annual Statement as they review this section.[23]

For each of the notes described, the following information will be provided:

- Information contained in the note
- Importance of the note to actuaries
- Example of information from the 2018 Fictitious Notes

[23] The Notes to the Financial Statements are included only in individual company Annual Statements, not in group Annual Statements.

Readers seeking more detail on any notes listed above or on other notes to financial statements can refer to either the National Association of Insurance Commissioners (NAIC) Annual Statement Instructions or the paper *Notes to the NAIC Property/Casualty Annual Statement* by Sholom Feldblum and Ralph Blanchard (October 2010).

NOTES OFTEN REQUIRING DIRECT INVOLVEMENT BY ACTUARIES

These five notes typically require direct input from the actuaries at an insurance company, though in each case the management of the company is ultimately responsible (and in some cases the actuary may be a member of management). Because actuaries will likely be the primary source of input in these cases, readers should review these notes in detail and understand what information is needed to complete them.

Reinsurance

The loss and LAE reserve liabilities on the balance sheet and the underwriting income on the income statement are expressed net of reinsurance. Given that reinsurance can significantly lower the loss and LAE reserves on the balance sheet and affect the level of surplus, disclosures regarding the reinsurance in place are important to assessing the financial health of a company. Actuaries typically estimate the ceded reserves on reinsurance contracts and are therefore directly involved in the preparation of this note.

In particular, it is important to understand the potential credit risk associated with the assumed reinsurance recoverables (the risk that the reinsurer will not pay). This note provides information on specific liabilities for which the credit risk may be heightened, such as unsecured recoverables, recoverables in dispute and recoverables that have been deemed uncollectible.

In addition to the assessment of credit risk, there are also some specific accounting rules related to reinsurance that require additional disclosure. The note includes several of these matters, namely the commutation of ceded reinsurance, retroactive reinsurance, reinsurance accounted for as a deposit and run-off agreements.

There are nine sections of this note labeled A through I. A brief summary is provided on each of these sections:

- Unsecured Reinsurance Recoverables (Section A): The credit risk related to recoverables with a specific reinsurer is often mitigated by the reinsured having access to a letter of credit, trust agreement or funds withheld. This note discloses reinsurers for which no such security exists, but only in cases where the recoverable from that reinsurer exceeds 3% of the reporting entity's (i.e., the reinsured's) policyholder surplus. The mention of a reinsurer in this note is not necessarily a problem because those reinsurers may be highly rated and financially sound. The amounts shown for each include paid losses billed but not yet collected, ceded reserves and ceded unearned premium.

- Reinsurance Recoverables in Dispute (Section B): Even when a recoverable is secured, it is possible for a reinsurer to dispute (or refuse to pay) a recoverable. A reinsurer may dispute either because they are unwilling to pay due to a disagreement on the coverage or amount or because they are unable to pay due to insolvency. A recoverable is considered to be in dispute once a formal written refusal to pay is received from the reinsurer. In addition to identifying a credit risk, recoverables in dispute might represent attempts by a financially troubled insurer to over-recover from reinsurers.

- Reinsurance Assumed and Ceded (Section C): Although unclear from the vague naming, this section includes information on ceding commissions to reinsurers related to the ceded unearned premium reserve. These ceding commissions received from reinsurers are treated as revenue by the insurer and therefore benefit the insurers' surplus position. This section helps regulators to identify situations where an insurer may be abusing ceding commissions to artificially enhance its surplus position, and it provides information on ceding commissions that would need to be returned in the event of cancellation. Specific disclosure is also required for contingent ceding commissions.

- Uncollectible Reinsurance (Section D): If an insurer deems that it is unlikely to collect a specific reinsurance recoverable, it must write off that recoverable as uncollectible and treat it as an expense. This section of the note includes a description of any recoverables that were written off as uncollectible during the course of the year. The disclosures in this note may help an actuary or other user of the financial statements to assess provisions set aside for future uncollectible reinsurance, which is reflected in the Provision for Reinsurance derived in Schedule F.

- Commutation of Ceded Reinsurance (Section E): A commutation is a "transaction which results in the complete and final settlement and discharge of all, or the commuted portion thereof, present and future obligations between the parties arising out of a reinsurance agreement."[24] This note requires disclosure of any commutations that occurred during the year. This information is important to a user of the financial statements because a commutation may cause a distortion to the income statement and balance sheet because the commutation payment received from the reinsurer may be reflected as a negative paid loss and the net loss reserves may increase to reflect the elimination of the reinsurance.

- Retroactive Reinsurance (Section F): Retroactive reinsurance refers to reinsurance that is purchased for liabilities that occurred prior to the effective date of the reinsurance contract. Retroactive reinsurance must be accounted for differently than normal prospective reinsurance to avoid distortion of the balance sheet and income statement. Instead of reducing the net loss reserves, retroactive reinsurance reserves are recorded separately as a write-in item on the balance sheet with any gain recorded in the income statement and as a restricted special

[24] SSAP 62R.

surplus amount. This section of the note includes disclosure of any retroactive reinsurance, including reserves transferred, consideration paid or received, paid losses reimbursed or recovered, special surplus generated, and other reinsurers involved in the transaction. This section allows a user of the financial statements to verify that retroactive reinsurance is being accurately accounted for and to understand its impact on the financial statements.

- Reinsurance Accounted for as a Deposit (Section G): To be accounted for as reinsurance, a reinsurance contract must meet certain risk transfer criteria. When a reinsurance contract does not qualify for reinsurance accounting, it must be accounted for as a deposit. This means that it is directly accounted for as a deposit asset or liability (depending on if amounts are owed from or to, respectively, other parties under the contract), instead of flowing through underwriting income. If a company has any reinsurance contracts that are accounted for as deposits, a schedule showing the historical changes to the balance since inception of each contract is included.

- Disclosures for the Transfer of Property and Casualty Run-off Agreements (Section H): Run-off agreements are reinsurance agreements intended to transfer the risks and benefits of a specific line of business or market segment that is no longer actively marketed by the transferring insurer to a third party. This third party is often another insurance or reinsurance company. If certain criteria are met, a run-off agreement can be accounted for differently than is typically required for retroactive reinsurance. If these criteria are met, the transferring entity records the consideration paid to the assuming entity as a paid loss. If the consideration paid by the transferring entity is less than the loss reserves transferred, the difference is recorded by the ceding entity as a decrease in losses incurred. As noted above, retroactive reinsurance that is not considered a run-off agreement is recorded as a separate item on the balance sheet with no reduction in incurred losses at the time of the transaction.

- Certified Reinsurer Rating Downgraded or Status Subject to Revocation (Section I): A certified reinsurer is an assuming insurer that has been certified as a reinsurer in the domiciliary state of the ceding insurer and secures its obligations in accordance with the requirements of *Appendix A-785, Credit for Reinsurance* of the NAIC Accounting Practices and Procedures Manual. Certified reinsurers that have their ratings reduced or their certified status revoked by the ceding company's state of domicile may have to provide increased collateral. This footnote requires disclosure of the impact on any reporting period in which a certified reinsurer's rating has been downgraded or its certified reinsurer status is subject to revocation and additional collateral has not been received as of the filing date.

In summary, this note is helpful to an actuary or other user of the financial statements because it identifies potential credit risks (Sections A, B, D and I) and identifies types of reinsurance that are subject to specific accounting treatment (Sections C, E, F, G and H). For the sections related to credit risk (A, B, D and I), the user of the financial statements may ask the following kinds of questions if material balances exist:

- Section A (Unsecured Recoverables): Why wasn't security provided? Are there concerns of the financial health of either the reinsurer or the reinsured? Was there a catastrophe that led to a large amount of recoverables? Are all of these unsecured recoverables concentrated with one reinsurer?

- Section B (Recoverables in Dispute): What is the point of disagreement with the reinsurer? Is the amount in dispute material to either the reinsured or the reinsurer? Are there legal opinions available on the validity of each side's claim?

- Section D (Uncollectible Reinsurance): What was the reason for the uncollectible reinsurance? Could other outstanding recoverables also be uncollectible in the future for the same or similar reasons? How long did it take the company to write off any uncollectible reinsurance that was disclosed?

- Section I (Certified Reinsurer Rating Downgraded or Status Subject to Revocation): What was the reason for the downgrade or revocation? Why wasn't the additional collateral provided as of the filing date?

The disclosures in this note are of specific interest to an actuary who is opining on a company's loss reserves because several of these items are referred to explicitly in the Statement of Actuarial Opinion (SAO).

A review of the 2018 Fictitious Notes indicates that Fictitious provided disclosures related to unsecured reinsurance, commissions and retroactive reinsurance. The other items were not applicable for the 2018 year.

Change in Incurred Loss and Loss Adjustment Expense

The total incurred loss and LAE for a year can be thought of in two categories: (1) loss and LAE that were incurred on liabilities occurring during the current accident year and (2) any changes in incurred loss and LAE from previous accident years. This note relates only to the second of these two items. The content of this note should include the amount of the change (i.e., reserve strengthening or weakening) in liabilities for previous accident years, the segments or lines of business that led to that change, and the reason for the change.

The importance of this note to the financial health of an insurance company is two-fold. First, the existence of a material change in prior accident years' incurred losses and LAE affects the current year's underwriting income and could obscure the true underlying experience of the current in-force business. A company that achieved positive underwriting income solely as a result of decreases to prior years' loss and LAE estimates may have profitability issues on their current business.

Second, recurring material changes in prior accident year incurred loss and LAE may be indicative of a bias or problem with a company's reserving process. For instance, if a company consistently experiences significant decreases in their estimates of prior accident years' losses, then there may be inherent conservatism to the company's process for establishing loss and LAE reserves. Schedule P provides additional information that may assist in this assessment, and it will be discussed in more detail in Chapter 15. *Schedule P*.

Actuaries should be familiar with the required content of this note so that they are prepared to provide input to management. Also, when reviewing a company's financial statements, actuaries may be in the best position to identify one of the two problems noted above. This note should be consistent with information included in a similar note to the annual Generally Accepted Accounting Principles financial statements and also to the one-year development column from Schedule P, Part 2 (with the exception of Adjusting & Other Loss Adjustment Expenses, which are included in this note but not in Schedule P, Part 2).

Finally, if the actuary is the Appointed Actuary for the company, the actuary may be called on to understand the difference in estimates underlying the loss reserves since the prior year's estimates and comment on those changes in the Appointed Actuary's Statement of Actuarial Opinion. For that reason, the actuary needs to be aware of the content of this note.

In the case of the 2018 Fictitious Notes, it is disclosed that the prior year-end total loss and LAE reserves developed favorably by $875,000, and several specific segments were cited as the major drivers of this favorable development. According to Fictitious' income statement, the company's net income in 2018 was $2.2 million. This tells the user of the financial statements that the favorable reserve development was a significant factor in the financial results of the company for the year. Chapter 12. *Five-Year Historical Data Exhibit* will provide guidance on how to assess whether this favorable development has been occurring consistently over time.

Premium Deficiency Reserves

Premium deficiency reserves must be recorded when the unearned premium of in-force business is not sufficient to cover the losses, LAE and maintenance expenses that will arise as that premium is earned. Companies have the option to consider investment income when performing this calculation. Also, before performing the calculation, the business should be grouped in a manner that is consistent with how it is marketed, serviced and measured.

Most insurance policies sold by insurance companies are priced with rates that are greater than the expected losses and expenses, especially after consideration of investment income. Furthermore, if there is a segment of the business that is underpriced, it may be a part of a larger grouping where the

deficiency in that segment is offset by other more profitable segments. For these reasons, the premium deficiency reserve will be zero for a majority of companies. However, there are cases where a non-zero premium deficiency reserve exists due to regulatory, competitive or other conditions that led to inadequate rates.

When a non-zero premium deficiency reserve does exist, a company may record it as either a write-in liability or a part of the unearned premium reserve on the balance sheet. When it is recorded as a part of the total unearned premium reserve liability, the Notes to Financial Statements is the only way to identify whether a premium deficiency reserve exists and the amount of the reserve.

In the note relating to premium deficiency reserves, the company must disclose the amount of the premium deficiency reserve. The company also needs to disclose whether investment income was considered in the determination of the premium deficiency reserve (although this is often disclosed in the accounting policy note).

This note is relevant to users of the financial statements because the existence of a premium deficiency reserve is usually a clear indication that issues of rate adequacy exist for at least the affected segment. However, the absence of a non-zero premium deficiency reserve does not necessarily indicate that rates for all business segments are adequate, due to the ability to consider investment income and to group segments into broad categories.

As a result of actuaries' involvement in the pricing and reserving of business, actuaries are in a position to provide input on whether a premium deficiency reserve is necessary and on the amount of the premium deficiency reserve. The analytical approach for this is beyond the scope of this publication, but there are other resources available that provide direction.

In the 2018 Fictitious Notes, the note on premium deficiency reserves indicates that at December 31, 2018, the company had liabilities of $0 related to premium deficiency reserves, and anticipated investment income was considered in that determination. If an insurer were to elect to change its consideration of investment income from one year to the next for the purposes of calculating the premium deficiency reserve, that change would likely need to be disclosed, along with the amount of the impact, in the Note called "Accounting Changes and Correction of Errors."

Discounting of Liabilities for Unpaid Loss and Loss Adjustment Expenses

This note indicates whether a company discounts loss reserves, and if so, it also describes the basis for calculating the amount of the discount. There are two types of discounting that need to be disclosed: tabular discounting and non-tabular discounting.

Tabular discounting applies specifically to outstanding annuity-type claims that pay pension benefits. These claims arise most commonly from workers' compensation coverage but may also arise from other types of liability coverage. A tabular discount reflects mortality assumptions according to a specific life table and a defined interest rate. Both the life table and the interest rates may be specified by the state

regulator. Not all insurance companies that have these eligible liabilities choose to utilize tabular discounts.

In the first part of this note, the company needs to indicate whether any liabilities are discounted using tabular discounting. If any tabular discounting is used, the company also needs to indicate the basis and assumptions used in calculating the tabular discount. For instance, in the 2018 Fictitious Notes, the company disclosed that tabular workers' compensation case reserves were discounted under various state laws, reflected a discount rate of 3.5% or a rate prescribed by the state regulator, and were derived based on a defined set of U.S. life tables.

In the second part of this note, any non-tabular discounting needs to be disclosed and described. This should reconcile to the amount of the non-tabular discount that was disclosed in Schedule P, Part 1, columns 32 and 33. Non-tabular discounting is less common than tabular discounting and is typically only done in specific cases where a company has been permitted by its state regulator to discount a specific type of liability. Two lines of business most commonly used for non-tabular discounting are workers' compensation and medical professional liability.

While tabular discounts are calculated for specific pension claims, non-tabular discounts are typically calculated on the aggregate amount of a specific segment of reserves by using a projected payment pattern and an assumed discount rate. If a company applies any non-tabular discounting, they must disclose that and describe the basis in this note. We can see from the 2018 Fictitious Notes that the company did not apply non-tabular discounting.

The note also requires a company to disclose whether any of the key assumptions used to discount loss reserves (whether for tabular or non-tabular discounting) have changed relative to the prior year.

It is important for actuaries and other users of the financial statement to be familiar with this note because different companies have different discounting policies, and those differences must be considered to make a consistent comparison. Non-tabular discounts may be of particular interest because they usually exist due to a specific exception granted by the regulator, which may relate to the solvency of an insurer. Furthermore, an actuary that is opining on the loss reserves of a company must disclose and describe any discounting of loss reserves in the SAO.

Asbestos/Environmental Reserves

Asbestos and environmental liability reserves have developed adversely over the past several decades. Therefore, exposure to asbestos or environmental liabilities can represent a significant source of uncertainty in a company's loss and LAE reserves. Furthermore, asbestos and environmental liabilities have consistently developed adversely over the past several decades. For these reasons, specific qualitative and quantitative disclosure is required regarding a company's asbestos and environmental reserves.

This note requires a company to disclose whether it has identified a potential exposure to asbestos or environmental reserves. These disclosures specifically exclude exposures relating to policies that were issued specifically to cover asbestos and environmental exposure. If the company answers affirmatively for either asbestos or environmental exposures, it must disclose the lines of business affected, the nature of the exposures and the reserving methodology used to estimate the liability. In addition to those qualitative disclosures, the company must complete a table that provides the following information for each of the past five years:

- Beginning reserves (including case, bulk + IBNR Loss & LAE)
- Incurred loss and LAE
- Calendar year payments for losses and LAE
- Ending reserves (including case, bulk + IBNR Loss & LAE)

This information must be provided separately for asbestos and environmental reserves on a direct, assumed and net of reinsurance basis. The company must also disclose the amount of the reserves that relate to unreported claims (i.e., pure incurred but not reported (IBNR)).

This note is important to the users of the financial statements because it discloses the existence of asbestos and environmental exposure, the magnitude of that exposure and the recent development of that exposure. In cases where these liabilities are material relative to a company's overall reserves and/or have consistently been developing adversely, it should serve as a potential warning sign to the financial health of the company.

Actuaries at insurance companies are often directly involved in the estimation, monitoring and reporting of asbestos and environmental reserves. In situations where the financial statements of a company are under financial review, actuaries may also be in the best position to evaluate the disclosures made here for potential impact on the financial health of the company.

In the 2018 Fictitious Notes, the company acknowledged exposure related to asbestos and environmental liabilities. The company then described its process for identifying, monitoring and estimating these exposures.

The excerpt below in Table 6 shows an example of the five-year history of the calendar year incurred and paid asbestos losses and LAE on a net of reinsurance basis for Fictitious. In this case, we see that the net asbestos liability as of December 31, 2018, was $3.28 million. We also see that there was adverse development in Fictitious' asbestos reserves from 2015 through 2018, as evidenced by the incurred losses and LAE each year.

TABLE 6

Net of Ceded Reinsurance — Asbestos	2014	2015	2016	2017	2018
a. Beginning reserves (including Case; Bulk + IBNR Loss & LAE)	$5,450,000	$5,023,000	$3,920,000	$3,709,000	$3,426,000

b.	Incurred losses and LAE	—	$49,000	$249,000	$188,000	$236,000
c.	Calendar-year payments for losses and LAE	$427,000	$1,153,000	$459,000	$471,000	$382,000
d.	Ending reserves (including Case, Bulk + IBNR Loss & LAE)	$5,023,000	$3,919,000	$3,710,000	$3,426,000	$3,280,000

The excerpt below in Table 7 includes the information on the portion of these reserves that relates to unreported claims.

TABLE 7

Ending Loss and LAE Reserves for Unreported Claims Included in Part A Above	
1. Direct basis	$3,116,000
2. Assumed reinsurance basis	$0
3. Net of ceded reinsurance basis	$2,782,000

From Tables 6 and 7 we see that $2.78 million out of the total $3.28 million in asbestos reserves (85%) related to unreported claims. The majority of the liability that is related to unreported claims underscores the high level of uncertainty in these liabilities.

NOTES THAT MAY BE POTENTIALLY RELEVANT TO ACTUARIES

In addition to the five notes described above, there are several other notes that may be potentially relevant to actuaries. Actuaries should be familiar with these notes and their significance, and they may need to review them when they are evaluating the reserves for a company (particularly if they are the opining actuary).

Summary of Significant Accounting Policies and Going Concern

This note describes the accounting rules used to produce the Annual Statement, including:

- The source of the accounting rules (typically the NAIC *Accounting Practices and Procedures Manual*)
- Any exceptions that were made in applying those rules and the basis for those exceptions, such as an exception that made with specific state approval
- Additional detail on the company's significant accounting policies

Where exceptions are made to the rules in the NAIC *Accounting Practices and Procedures Manual*, they must be either prescribed or permitted by the domiciliary state. "Prescribed" refers to practices that are required by state law, and "permitted" refers to approval by the state regulator.

An actuary who is evaluating the reserves of a company will want to review this note to identify prescribed or permitted practices or other accounting policies that relate to loss reserves. Any unexpected deviations described in this note should be evaluated for their impact on the reserves and general financial health of the insurance company.

The following provides an excerpt of this note as provided in the 2018 Annual Statement for Fictitious:

> 1. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES AND GOING CONCERN
>
> A. Fictitious Insurance Company prepares its statutory financial statements in conformity with accounting practices prescribed or permitted by the state of Florida. The state of Florida requires that insurance companies domiciled in Florida prepare their statutory basis financial statements in accordance with the National Association of Insurance Commissioners (NAIC) Accounting Practices and Procedures Manual, subject to any deviations prescribed or permitted by the Florida Insurance Commissioner. The impact of any permitted accounting practices on policyholder surplus of the Company is not material.

As shown in this excerpt, the company prepared its statutory financial statements in conformity with the practices prescribed or permitted by the State of Florida and with the NAIC *Accounting Practices and Procedures Manual*, subject to deviations prescribed or permitted by the Florida Insurance Commissioner. Further, the note indicates that the impact of any permitted practices on policyholder surplus was not material.

Events Subsequent

Subsequent events are broadly defined as events that occur between the date of the financial statements (for instance, December 31) and the date that the financial statements are issued (for instance, March 1). Within the broad category of subsequent events, there are also two specific types that should be defined:

- Type 1 (Recognized Subsequent Events) subsequent events provide "additional evidence with respect to conditions that existed as of the date of the Balance Sheet." An example of this type of information would be if updated information was received on a large claim on January 15, when that claim had already been reported and known of prior to December 31, and the company deemed that insufficient IBNR was carried to cover the additional needed reserve.
- Type 2 (Nonrecognized Subsequent Events) subsequent events provide "evidence with respect to conditions that did not exist at the time of the Balance Sheet." An example of a Type 2 subsequent event would be if a new large claim occurred on January 15 and was not previously known.

Type 1 subsequent events should already be reflected in the recorded amounts of the financial statements because the financial statements should reflect all information that is known up until the

day that the financial statements are issued relating to the conditions that existed as of the accounting date. Disclosure is not needed unless it is "necessary to keep the financial statements from being misleading." For example, if the booked reserves could not be adjusted in time to incorporate the revised reserve amount necessary to reflect the Type 1 event, this note would disclose the amount by which the reserves need to be adjusted. Note that changes that are made to reserves due to their normal continual review are not considered Type 1 events.

Type 2 subsequent events are not already, and should not be, reflected in the financial statement. However, they should be described in this note if they "may have a material effect on the financial condition of the company." The guidance says "may have," which means that even if a company has determined that the impact is not material, it should still be disclosed as long as it "may have" a material impact. Type 2 subsequent event disclosure, of course, requires use of management's judgment.

An actuary or other user of the financial statement may consider reviewing this note to verify whether there are any material subsequent events that are not reflected in the financial statements. This is of specific importance to an actuary that is opining on a company's loss reserves because the opining actuary will need to determine whether a subsequent event is material to the estimate of the loss reserves and whether that subsequent event should be considered.

Review of the 2018 Fictitious Notes indicates that no subsequent events were disclosed.

Intercompany Pooling Arrangements

Intercompany pooling is a common arrangement among companies in a group in which each of the participants fully cedes all of its business to the pool leader, and then each participant assumes back a specific percentage of the total.

In these situations, it is important for a regulator or any other user of the financial statements to understand the pooling arrangement to assess the solvency of the group as a whole. This note discloses the existence of the pooling arrangement and also describes the cessions and assumptions that occur. Typically, this includes identification of each company in the group, the lead company and the pooling percentages for each participant.

In cases where pooling exists, it will affect the various aspects of the Annual Statement in different ways. Some examples include the following:

- The Underwriting and Investment Exhibit will show direct business written by each company and the amounts ceded to the lead company in the pool and the portion of the pool assumed specifically by affiliates.

- Schedule F will show the cessions to the lead company as ceded reinsurance in Part 3 and the assumed business in Part 1.
- Schedule P will show only the pool member's share of the pooled results.

The 2018 Fictitious Notes indicate that this company did not participate in any intercompany pooling.

Structured Settlements

A structured settlement refers to a situation where an insurance company settles a claim by purchasing an annuity on behalf of a claimant. This is most commonly observed on workers' compensation or general liability claims, and the annuity is usually purchased from a life insurance company.

When the annuity is purchased (and the claimant is the payee), it is recorded as a paid loss by the original insurance company, and the claim is considered to be closed. However, if the life insurance company providing the annuity was ever to become insolvent, it is possible that the original insurer could still be liable for the remaining portion of the annuity payments.

The purpose of this note is to disclose the total amount of structured settlement payments for which an insurer could be held liable. Furthermore, if the amount of these remaining payments from a single life insurance company exceeds 1% of surplus, specific disclosure of the amount and the company from which the structured settlement was purchased is required.

This note is relevant to users of the financial statements because it describes a potential liability, or credit risk, that is not reflected on the balance sheet. The identification of life insurers that provide coverage for remaining payments exceeding 1% of surplus allows for further review of their financial condition to identify any significant issues.

Review of this note in the 2018 Fictitious Notes indicates that in total the company purchased structured settlements with a statement value of $4.3 million.

High Deductibles

High-deductible policies are commercial insurance policies that have a significant deductible, such as $250,000, giving the insured a substantial retention on each claim. Under these high-deductible policies, the insurer pays the full amount of the claim and then seeks reimbursement from the insured for the portion within the deductible. These types of policies are most commonly seen in workers' compensation but also may be used for liability business. Similar to the situation with structured settlements, these policies can present a credit risk to the insurer that is not apparent in the financial statements. For unpaid claims, the portion of the unpaid amount within the deductible is not included within the insurance company's booked loss reserve in the Annual Statement. The treatment for both paid and unpaid deductible losses creates a credit risk for the insurer due to the possibility that the insured will not reimburse them for the deductible portion of the loss.

This note requires disclosure of the following:

- The amount of reserve credit (i.e., the amount of case reserves established for the deductible portion of a loss) recorded by the company for unpaid claims.
- The amount of billed but not yet collected deductible reimbursements for paid claims.

To understand the potential impact of this credit risk, an actuary or other user of the financial statements who is reviewing the financial health of a company can consider the total amount of credit risk relative to the total unpaid claims and to the company's surplus.

As noted in the Notes to Financial Statements for Fictitious, Fictitious does not issue any policies with high deductible plans.

SUMMARY

Notes to financial statements provide additional qualitative and quantitative disclosure to support the numerical information provided in the statutory financial statements. The Notes provide additional detail to assist the user of the financial statement in understanding the numerical exhibits and provide a source of publicly available information on off-balance sheet items.

CHAPTER 11. GENERAL INTERROGATORIES

In the previous chapter we discussed the Notes to Financial Statements. These notes provide additional information at the end of the financial statements in the interest of full disclosure of a company's financial condition. The notes address accounting policy and provide explanatory data and supplemental information to the financial statements. They assist the reader in interpreting some of the more complex items within a company's financial statements by expanding upon and adding clarity to specific items contained in the balance sheet and income statement. In contrast, the General Interrogatories are a series of questions within the statutory Annual Statement to which the insurance company is required to respond. The questions are divided into two parts:

- Part 1, Common Interrogatories, provides general questions applicable to life, health and property/casualty insurers.
- Part 2 provides questions that are specific to the type of insurance company (e.g., life, health or property/casualty). In the Property/Casualty Annual Statement, this section is Property & Casualty Interrogatories.

Similar to the Notes to Financial Statements, the responses provided in the General Interrogatories provide additional clarity to the reader of the Annual Statement but also serve to identify additional areas that warrant closer review by regulatory officials.

COMMON INTERROGATORIES

Part 1 contains of the following subheadings: General, Board of Directors, Financial, Investment and Other. The purpose of each section is to give the reader an understanding of the company's operations, business practices, and the types of internal and external controls in place.

General

The General subsection asks questions pertaining to the following topics:

- Holding company relationships
- Latest regulatory financial examinations
- Excessive sales commission levels
- Merger activity
- Suspension of licenses
- Foreign control
- Exemptions from required regulations
- Whether senior management is subject to a code of ethics

Answers to these questions provide the reader with additional information about the company and its discipline in following the "rules." For example, if a company has suspended licenses or does not comply with recommendations from the latest financial examinations, there may be a lack of internal discipline, and this company would therefore be looked at with further scrutiny by external parties. Likewise, further inquiry may be appropriate if a company reports excessive commission levels, as this might be a sign that the company is conceding on commission to maintain business or achieve growth.

The General subsection also provides the name and address of the independent certified public accountant (CPA) or accounting firm (the auditor) conducting the annual audit and the appointed actuary.

While important to peruse all the interrogatories, knowledge of the auditor, appointed actuary and latest financial exam(s) are of particular relevance to the property/casualty actuary.

Audit firm: The CPA opines as to whether the insurance company's financial statements are free of material misstatement and prepared in accordance with the accounting principles used. The audit firm is responsible for reconciling figures contained in a company's financial statements to detailed underlying balances and confirming amounts due to or from third parties.

It is important for the actuary to be aware of any misstatements in the financial statements or errors in the underlying data relied upon. Further, in accordance with National Association of Insurance Commissioners (NAIC) data testing requirements,[25] a company's independent accountant and appointed actuary are required to communicate so the accountant can determine which data relied upon by the actuary should be subject to audit testing procedures.

Actuary: The name, address and affiliation of the appointed actuary are provided in the General Interrogatories. The appointed actuary is the actuary explicitly appointed by the insurance company's board of directors, or equivalent body, to opine on the loss and loss adjustment expense (LAE) reserves reported in the company's Annual Statement. It is important for the user of the Annual Statement to know who the appointed actuary is; questions pertaining to the Statement of Actuarial Opinion should be addressed to the appointed actuary.

Latest financial examination: The General Interrogatories also provide information regarding the latest financial examination performed by state regulatory officials. The interrogatories include:

- The date of the latest financial exam
- The date through which financial statements were evaluated
- The release date of the examiner's report
- The name of the department performing the exam

[25] *2018 NAIC Annual Statement Instructions Property/Casualty*, page 19.

- Whether the insurance company has complied with all adjustments and recommendations from the examination report

Regulatory examination reports are generally available to the public through the state insurance department in which the exam was performed. The examination report will provide the state's findings with respect to the adequacy of the company's loss and LAE reserves.

Board of Directors

The Board of Directors subsection of the Common Interrogatories focuses on the board's role in overseeing the company's operations. In particular, it includes questions regarding the board's approval of the purchase or sale of investments and whether the company has a process in place to notify the board of conflicts of interest within the company's senior management. The company is also asked whether permanent records of board proceedings are retained; this enables tracking and monitoring of the board's oversight role.

Financial

While it is generally assumed that the Annual Statement is prepared in conformity with Statutory Accounting Principles (SAP), the first question within the Financial subsection asks if the statement was prepared using another basis (e.g., Generally Accepted Accounting Principles). The basis of accounting is important for users of the statement and should probably be read first when opening an Annual Statement. If it is assumed that the Annual Statement is prepared in conformity with SAP, but it is prepared using a different accounting basis, then the user may misinterpret individual figures and ultimately a company's financial position.

The questions within the remainder of the Financial subsection pertain to loans made to senior leadership and other stakeholders of the company, assets that the company was obliged to transfer to another party that were not reported as a liability in the statement, assessments other than those to a guaranty fund or guaranty association, and amounts due from affiliates. The purpose is to understand if the company has financial obligations that have not previously been reported in the Annual Statement and/or if the company is providing financial support or a lifeline to stakeholders or affiliates.

Investment

The Investment subsection has the most questions within the General Interrogatories (more than 30). They cover control over assets and investment decisions, security lending programs and associated collateral, hedging programs, mandatorily convertible preferred stocks or bonds, and compliance with the *Purposes and Procedures Manual* of the NAIC Securities Valuation Office, among other topics. Here again, the questions pertain to the level of control the company has over its operations and compliance with the rules.

Other

The Other subsection captures information about payments made to trade associations, service organizations, statistical or rating bureaus, attorneys or others in connection with legislative or regulatory matters. Examples of such organizations include the Insurance Services Office and A.M. Best Company. The company is required to list the names of organizations where payment exceeded 25% of the subtotal so that the reader can get an idea of the amount of influence or reliance that the company has on a particular organization, bureau or legislative matter.

PROPERTY & CASUALTY INTERROGATORIES

Part 2 of the General Interrogatories is specific to property/casualty insurers and provides more details about the company's exposures that are not readily determinable based on the quantitative information contained in the schedules and exhibits within the Annual Statement. Many of these questions focus on specific exposures that are not generally dealt with by the property/casualty actuary on a daily basis, such as those pertaining to Medicare supplement insurance, health lines of business or health savings accounts. However, other questions are of major interest to actuaries. For example, certain questions center on the company's exposure to catastrophic events and excessive loss, the process by which probable maximum loss is determined and the level of reinsurance protection afforded to protect the company's net results against catastrophic losses. These questions (requests) include the following:

- "What provision has this reporting entity made to protect itself from an excessive loss in the event of a catastrophe under a workers' compensation contract issued without limit of loss?" [26]
- "Describe the method used to estimate this reporting entity's probable maximum insurance loss, and identify the type of insured exposures comprising that probable maximum loss, the locations of concentrations of those exposures and the external sources (such as consulting firms or computer software models), if any, used in the estimation process." [27]
- "What provision has this reporting entity made (such as a catastrophic reinsurance program) to protect itself from an excessive loss arising from the types and concentrations of insured exposures comprising its probable maximum property insurance loss?" [28]
- "Does the reporting entity carry catastrophe reinsurance protection for at least one reinstatement, in an amount sufficient to cover its estimated probable maximum loss attributable to a single loss event or occurrence?" [29]

[26] *2018 Property/Casualty Annual Statement*, General Interrogatory 6.1 (Part 2 Property & Casualty Interrogatories).
[27] Ibid., General Interrogatory 6.2 (Part 2 Property & Casualty Interrogatories).
[28] Ibid., General Interrogatory 6.3 (Part 2 Property & Casualty Interrogatories).
[29] Ibid., General Interrogatory 6.4 (Part 2 Property & Casualty Interrogatories).

- "If no, describe any arrangements or mechanisms employed by the reporting entity to supplement its catastrophe reinsurance program or to hedge its exposure to unreinsured catastrophic loss." [30]

Although the General Interrogatories are not included for Fictitious Insurance Company, the aforementioned questions would be of particular interest to users of Fictitious' Annual Statement in light of the company's catastrophic loss experience in 2018. Review of answers to the above questions in conjunction with the information provided in Schedules F and P about Fictitious' reinsurers and ceded loss ratios would assist the user in evaluating the adequacy of Fictitious' reinsurance protection relative to its catastrophe exposures. Other questions within the Property & Casualty Interrogatories that are of interest include those pertaining to the use of finite reinsurance. Finite reinsurance was a hot topic in the property/casualty insurance industry in 2005 when several large insurance companies were fined by the Securities and Exchange Commission for accounting for finite reinsurance deals in a way to bolster their financial position.

In its simplest form, finite reinsurance does not transfer underwriting risk; rather it is a play on interest. Assume an insurance company knows it will have to pay a fixed amount in losses, say $10 million, in two years. Under a finite reinsurance deal, the insurance company could take the present value of $10 million and give it to a reinsurance company as "premium," in exchange for an agreement that the reinsurer pay the $10 million in losses two years from now. The amount the reinsurer will have to pay is fixed ($10 million), and the time the reinsurer will have to pay the losses is fixed (two years); there is no underwriting or timing risk involved in the transaction.

Using a simplified example, assuming a 5% rate of interest, if the insurance company were to account for this contract as reinsurance, its balance sheet would show a reduction of approximately $9 million in cash for premium paid (the present value of $10 million at 5% interest per year for two years) in return for a corresponding reduction of $10 million in loss reserves, resulting in a net increase to surplus of approximately $1 million. However, since there is no underwriting or timing risk, this is more akin to a deposit, such as one with a bank, and this is how such contracts must be accounted for. There is no surplus relief as a result of this contract; the insurer still has to pay $10 million in two years.

Several high-profile insurance companies engaged in finite reinsurance arrangements in the early 2000s to boost their financial results through improper accounting. This behavior prompted the NAIC to adopt additional disclosure requirements, including an expansion of the Property & Casualty Interrogatories. One such interrogatory requires insurers to answer affirmatively if they ceded reinsurance that:

1. Resulted in underwriting gain (or loss) of more than 5% of prior year surplus or ceded premiums or loss and LAE reserves of more than 5% of surplus.
2. Was accounted for as reinsurance rather than as a deposit.

[30] Ibid., General Interrogatory 6.5 (Part 2 Property & Casualty Interrogatories).

3. Had one or more of the following features ("or other features that would have similar results"[31]):
    a. Duration of at least two years and is non-cancelable during the term.
    b. Limited cancellation provisions such that the ceding company is required to enter into a new contract with the same reinsurer or its affiliate.
    c. Aggregate stop loss coverage.
    d. The right by either party to commute, unless triggered by a downgrade in the credit rating of the other party.
    e. The ability to report or pay losses less frequently than quarterly.
    f. Delayed timing of reimbursement to the ceding company.[32]

A following interrogatory requires insurers to answer affirmatively if they have entered any ceded reinsurance contracts where ceded premium is 50% or more than the insurer's gross written premium, or 25% or more of the ceded written premium is retroceded to the insurer. Reinsurance ceded to entities other than captives under the insurer's control or approved pooling arrangements is excluded from this interrogatory.[33]

If either interrogatory is answered affirmatively by the insurance company, the insurer is required to file the Reinsurance Summary Supplemental Filing to the Annual Statement. This filing is due on March 1. Within this filing the insurer is required to disclose:

1. The financial impact on the balance sheet and statement of income if such contracts were excluded (i.e., the restatement of assets, liabilities, surplus and net income gross of the reinsurance contract(s)).
2. A summary of the applicable terms of the contract(s) that triggered the affirmative response.
3. The reasons management entered into the contract, including the expected financial gain.[34]

The intent of these additional interrogatories and the supplemental filing is to identify those contracts that may be accounted for improperly and therefore warrant further review by regulatory officials. Knowledge of such contracts is relevant to the actuary as the accounting treatment may impact the actuary's evaluation of unpaid claims. If a ceded contract is accounted for as reinsurance, it will serve to reduce the unpaid claim liabilities; if accounted for as a deposit, it will not.

Examples of other items addressed within the Property & Casualty Interrogatories that tend to be a focus of the actuary include:

[31] Ibid., General Interrogatory 9.1 (Part 2 Property & Casualty Interrogatories).
[32] Ibid., General Interrogatory 9.1 (Part 2 Property & Casualty Interrogatories).
[33] Ibid., General Interrogatory 9.2 (Part 2 Property & Casualty Interrogatories).
[34] *2018 NAIC Annual Statement Instructions Property/Casualty*, page 440.

- Whether there are specific limiting provisions within reinsurance contracts, guaranteed policies and retrospectively rated policies, as these features may affect the actuary's evaluation of unpaid claims.[35]
- Any releases of liability under reinsured policies, such that the company could reassume liability and potentially have its surplus position weakened as a result.[36]
- Exposure to warranty business, whereby the adequacy of the unearned premium reserve would be the focus of attention as the contract terms, and therefore exposure, tends to continue beyond 12 months.[37]

[35] 2018 *Property/Casualty Annual Statement*, General Interrogatory 7.1 (Part 2 Property & Casualty Interrogatories).
[36] Ibid., General Interrogatory 8.1 (Part 2 Property & Casualty Interrogatories).
[37] Ibid., General Interrogatory 16.1 (Part 2 Property & Casualty Interrogatories).

CHAPTER 12. FIVE-YEAR HISTORICAL DATA EXHIBIT

OVERVIEW

Most other exhibits and schedules within the Annual Statement provide only one or two years of financial data for a company. The Five-Year Historical Data exhibit is valuable because it provides a summarization of key financial figures and statistics from historical Annual Statements going back five years: the current and prior four. Key line items from the balance sheet and income statement are included. Also included are operating ratios and ratios showing one- and two-year development in loss reserves relative to policyholders' surplus. This compilation facilitates the identification of trends when evaluating the health of a property/casualty insurance company.

Following is a brief overview of content that actuaries tend to focus on within this exhibit, with illustrations using data from Fictitious' 2018 Annual Statement where deemed relevant.

WRITTEN PREMIUM

The first page of the Five-Year Historical Data exhibit begins with the insurance company's revenue. For an insurance company, revenue is in the form of written premium. Gross and net written premium information is provided. Gross and net amounts are summarized into the following five lines of business categories:

1. Liability
2. Property
3. Property and liability combined
4. All other
5. Non-proportional reinsurance

A sixth line contains the totals.

This information shows how the company's premium volume, use of reinsurance and business mix have changed over time. Things to look out for when assessing the health of an insurance company include rapid growth or decline in revenue, increases or decreases in the use of reinsurance protection, and changes in business mix toward riskier or unprofitable lines. Observations such as these would prompt additional inquiry through review of other schedules, exhibits and notes within the Annual Statement and a meeting with company management. For example, if a company significantly increased its use of ceded reinsurance, we would want to understand the quality of the reinsurance. The Notes to Financial Statements and Schedule F provide additional information on the company's reinsurers.

Total gross and net written premium figures from Fictitious' Five-Year Historical Data exhibit are displayed in Table 8.

TABLE 8

Data from Fictitious Insurance Company 2018 Five-Year Historical Data (USD)					
	2018	**2017**	**2016**	**2015**	**2014**
6. Gross premiums written	28,634,000	28,085,000	29,519,000	31,238,000	31,670,000
	2%	-5%	-6%	-1%	
12. Net premiums written	26,752,000	25,936,000	25,521,000	25,583,000	25,363,000
	3%	2%	0%	1%	
Net/gross ratio	93%	92%	86%	82%	80%

Fictitious experienced an approximate 5% decline in gross writings in 2016 and 2017. This could have been attributed to many things, including a decrease in concentration in a certain line of business or risk class, the continued softening of the market observed over this time period or a decrease in the amount of coverage purchased. Gross written premiums increased by 2% in 2018, which again could have been a function of the economy or insurance prices starting to rebound or both.

Over the same period, net written premium volume was relatively flat and even slightly positive. Calculation of the net-to-gross ratio shows that the company's net retention had been growing since 2014, from 80% in 2014 to 93% in 2018. This means that the company was ceding fewer premium dollars to its reinsurers. This could have been attributed to either a decision by the company to retain more business or a softening in reinsurance prices over the period or both. Observations such as these would warrant further inquiry of company management to fully understand the cause for changes in the company's direct, assumed and ceded business volume.

Table 9 shows the gross written premium figures by line of business segment as reported by Fictitious, below which the corresponding distribution of gross written premium by segment is shown.

TABLE 9

Data from Fictitious Insurance Company 2018 Five-Year Historical Data (USD)					
Gross premiums written (GPW)	**2018**	**2017**	**2016**	**2015**	**2014**
1. Liability lines	13,281,000	13,843,000	15,075,000	16,422,000	16,815,000
2. Property lines	5,566,000	4,990,000	5,436,000	5,925,000	6,155,000
3. Property and liability lines	9,649,000	8,936,000	8,651,000	8,544,000	8,355,000
4. All other lines	138,000	316,000	357,000	347,000	345,000
5. Non-proportional reinsurance lines	–	–	–	–	–
6. Total	**28,634,000**	**28,085,000**	**29,519,000**	**31,238,000**	**31,670,000**
Distribution of GPW	**2018**	**2017**	**2016**	**2015**	**2014**
Liability lines	46%	49%	51%	53%	53%
Property lines	19%	18%	18%	19%	19%
Property and liability lines	34%	32%	29%	27%	26%
All other lines	0%	1%	1%	1%	1%
Non-proportional reinsurance lines	0%	0%	0%	0%	0%
Total	**100%**	**100%**	**100%**	**100%**	**100%**

For Fictitious, the lines of business flowing into the segments identified in Table 9 are as follows:[38]

1. Liability lines: workers' compensation, other liability and automobile liability
2. Property lines: fire and auto physical damage
3. Property and liability lines: homeowners and commercial multiple peril
4. All other lines: fidelity

Fictitious does not write any non-proportional reinsurance (line 5).

Over the five-year period ending in 2018, Fictitious' writings declined in the liability lines (line 1) and grew in the property and liability lines (line 3). Writings in the straight property lines (line 2) remained consistent over the period.

Property lines tend to be short-tailed in nature; property claims are reported and paid relatively quickly when compared to liability claims. Shifts from liability to property lines would tend to result in a reduction in uncertainty surrounding the company's loss and loss adjustment expense (LAE) reserves. However, shifts to the property lines increase uncertainty due to the exposure to catastrophe loss.

A similar analysis can be performed on Fictitious' net written premium data.

[38] Written premium by line of business is shown in Part 1B, Premiums Written, of the U&IE.

STATEMENT OF INCOME

The Five-Year Historical Data exhibit also provides summarized information from the Statement of Income that is useful in identifying components of changes in a company's net income (e.g., whether attributed to underwriting or investments or other income). Table 10 shows this data for Fictitious.

TABLE 10

Data from Fictitious Insurance Company 2018 Five-Year Historical Data (USD)					
Statement of Income	**2018**	**2017**	**2016**	**2015**	**2014**
13. Net underwriting gain (loss)	(2,133,000)	1,488,000	2,544,000	1,883,000	2,773,000
14. Net investment gain (loss)	4,305,000	4,415,000	2,850,000	3,993,000	4,747,000
15. Total other income	33,000	47,000	38,000	143,000	47,000
16. Dividends to policyholders	46,000	32,000	23,000	29,000	31,000
17. Federal and foreign income taxes incurred	(20,000)	963,000	1,489,000	1,378,000	1,304,000
18. Net income	2,179,000	4,955,000	3,920,000	4,612,000	6,232,000
Increase/(decrease) year-over-year	(2,776,000)	1,035,000	(692,000)	(1,620,000)	
Percentage increase/(decrease) year-over-year	-56%	26%	-15%	-26%	

We see that Fictitious' net income was been positive in each of the years 2014 through 2018, with growth achieved in 2017 over 2016 after two years of decline. The $1 million (+26%) growth observed in 2017 was predominantly attributed to improvements in the financial markets and a reduction in taxes. Investment gains improved in 2017

Despite relatively strong return on investments in 2018, Fictitious experienced a 56% decline in net income in 2018 over 2017 due to a net underwriting loss of $2 million. Given what we know about the company's shift toward property lines over the period 2014 through 2018, and consequential increase in exposure to catastrophe losses, we can hypothesize that the underwriting loss in 2018 was due to the high frequency of catastrophe events during the year. Investigation of other statements and exhibits within Fictitious' Annual Statement can help us validate our theory.

As discussed in Chapter 8. *The Statutory Income Statement: Income and Changes to Surplus*, the Statement of Income on page 4 of the Annual Statement provides the components of net underwriting gain (loss), net investment income gain (loss) and other income, and each component can be further investigated through various supporting schedules. For example, as displayed in the Statement of Income for Fictitious, the net underwriting loss of $2 million was primarily driven by an increase in losses incurred during 2018 ($17 million in 2018 versus $13 million in 2017, per line 2 of the Statement of Income).

We can drill down further by looking at the one-year development line (Development in estimated losses and loss expenses incurred prior to current year) within the five-year exhibit to see whether this increase was attributed to prior-year development or current-year incurred losses.

TABLE 11

Data from Fictitious Insurance Company 2018 Five-Year Historical Data (USD in 000s)					
	2018	**2017**	**2016**	**2015**	**2014**
73. Development in estimated losses and loss expenses incurred prior to current year (Schedule P, Part 2, Summary, Line 12, Column 11)	(875)	(1,354)	(1,618)	(1,959)	(918)

As displayed in the one-year development line, loss and defense and cost containment (DCC) development in 2018 on prior accident years was *negative* $875,000.[39] This means that the company experienced favorable development in 2018 on the prior years in the aggregate. As a result, the underwriting loss in 2018 must have been due to current (2018) accident year incurreds, providing further evidence that catastrophes were the cause. A review of accident year 2018 loss and DCC experience per Schedule P can confirm this.

Turning to Schedule P, Part 2, Summary, we see that accident year 2018 incurred loss and DCC was $19 million, approximately $3 million higher than it had been in the company's 10-year history. Later in Schedule P, the line of business detail shows that the company experienced higher incurred loss and DCC on the homeowners/farmowners line (roughly $4 million on accident year 2018 versus $2.5 million on accident year 2017). This further suggests that Fictitious, like the rest of the insurance industry, was adversely impacted by the natural catastrophes in 2018. However, Fictitious appeared to have been relatively unscathed by the 2017 catastrophes. A review of Fictitious' mix of business by and within affected state(s) and discussions with management might help explain why Fictitious was not as impacted as the rest of the industry by catastrophes in 2017.

With respect to investment gains in 2017, a line-by-line comparison of the Exhibit of Net Investment Income within the company's current-year and prior-year Annual Statements can provide further details on changes in the company's investment income, as can a line-by-line comparison of changes in amounts by asset class within the Exhibit of Capital Gains (Losses). While these two exhibits are not included in the Annual Statement excerpts provided for Fictitious, a study of the changes in net investment income can be made by reviewing these exhibits for one of the (real) insurance companies on the CAS Exam 6 U.S. Syllabus.

Absent these exhibits for Fictitious, we expect that the growth in investment income in 2017 was most likely due to a rebound in the financial markets post crisis.

As displayed in the Five-Year Historical Data exhibit for Fictitious, the decline in taxes in 2018 is directionally consistent with what one would expect with a decline in income. We also expect the

[39] We acknowledge that Schedule P, Part 2, Summary, provides both loss and DCC, while we are focusing on the change in incurred losses only. However, as shown in the Statement of Income, loss adjustment expenses have not changed significantly in dollar terms. We therefore feel this comparison is reasonable for illustration purposes.

decline in taxes in 2018 to be in part attributed to the Tax Cuts and Jobs Act of 2017 ("TCJA"), which became effective beginning tax year 2018 and changed key federal tax rules. The changes most significant to property/casualty insurance carriers were related to the corporate tax rate, the loss reserve discounting rules, and the base erosion and anti-abuse tax. Further details on the impact of TCJA on property/casualty insurers are provided in Chapter 26.

However, the decrease in taxes between 2016 and 2017 by approximately $0.5 million (from $1,489,000 to $963,000) is somewhat counterintuitive. Generally, one would expect to pay more taxes the higher the income. While not included in the Annual Statement excerpts provided for Fictitious, the note in the financial statements titled "Income Taxes" (number 9 in the Notes to Financial Statements of the 2018 Annual Statement) can be helpful in explaining movements in taxes from year to year, such as that which occurred for Fictitious. This note provides details on deferred tax assets and losses and shows what taxes would have been if a straight 35% statutory tax rate was used. It also provides the reasons for differences between the total recorded income tax and taxes at the statutory rate, which might in turn explain higher or lower taxes paid in a particular year.

BALANCE SHEET

The balance sheet section of the Five-Year Historical Data exhibit contains summarized information that is useful in identifying components of changes in surplus (e.g., whether attributed to changes in assets or certain liability items) over time.

Only two major asset categories are provided: (1) total admitted assets and (2) premiums and considerations. However, the distribution of assets by class is provided further along in the exhibit (percentage distribution of cash, cash equivalents and invested assets). For trend analysis, the distribution of assets by class is more useful than the actual dollar amounts. When analyzing the health of a property/casualty insurer, things to look out for include large holdings in risky asset classes or changes in mix to riskier classes. However, the user would also look to the company's use of hedging vehicles to mitigate increased holdings in riskier investments, such as derivative instruments (see Chapter 8. *The Statutory Income Statement: Income and Changes to Surplus*).

The remaining lines within the balance sheet section of the exhibit are summarized items from the Liabilities, Surplus and Other Funds page. Of most relevance to the property/casualty actuary is the level of loss and LAE reserves, unearned premiums, and surplus relative to the actuary's knowledge of the underlying business and the changes therein.

A review of Fictitious' data shows no significant changes in these items other than a dip in surplus in 2015 (6% decrease from 2014) and 2017 (12% decrease from 2016). The capital and surplus account within the Statement of Income shows that the large decrease in 2017 was attributed to sizeable dividends paid to stockholders during the year (approximately $10 million). This can also be seen in the Capital and Surplus Account section of the Five-Year Historical Data exhibit. This section provides two

sources of the change in surplus: that due to unrealized capital gains (losses) and that resulting from dividends paid by the company to its stockholders.

RISK-BASED CAPITAL

We will discuss Risk-Based Capital (RBC) in detail in Chapter 19. *Risk-Based Capital*. It is a solvency framework developed by the National Association of Insurance Commissioners from which an amount of regulatory capital is determined formulaically based on the application of specified factors to an insurance company's recorded admitted assets and liabilities as of year-end. The calculated amount of regulatory capital, or RBC, is compared to the total adjusted capital recorded by the insurance company at year-end to determine the level, if any, of company or regulatory action required from a solvency perspective.

The components of the RBC ratio are provided in the Five-Year Historical Data exhibit but not the RBC ratios themselves. However, the user can calculate the RBC ratios from the information provided in the Five-Year Historical Data exhibit. Table 12 provides the figures shown in lines 28 and 29 of Fictitious Insurance Company's 2018 Five-Year Historical Data, below which we show the RBC ratios that we calculated from lines 28 and 29.

TABLE 12

Data from Fictitious Insurance Company 2018 Five-Year Historical Data (USD)					
Risk-Based Capital analysis	**2018**	**2017**	**2016**	**2015**	**2014**
28. Total adjusted capital	31,024,000	31,608,000	35,793,000	32,572,000	34,567,000
29. Authorized control level RBC	5,588,000	6,097,300	5,854,000	5,685,000	6,517,000
Total adjusted capital as a percent of ACL (= Line 28 / Line 29)	555%	518%	611%	573%	530%
Total adjusted capital as a percent of RBC (= Line 28 / (Line 29*2))	278%	259%	306%	286%	265%
Reduction in capital to next RBC level (= Line 28 - (Line 29*2))	19,848,000	19,413,400	24,085,000	21,202,000	21,533,000

Table 98 of this publication provides the various levels of company and/or regulatory action in response to a company's calculated RBC ratios. For Fictitious, the percentage of adjusted capital to authorized control level (ACL) RBC ranged between 518% to 611% over the five-year period 2014 through 2018, which is 2.6 to 3.1 times the first level requiring action (company action level, which is equal to 200% of ACL). This means that Fictitious' capital in 2018 could have been reduced by $20 million before any action was required under the RBC requirements. This was computed by taking the total capital in line 28 and subtracting from it the upper bound of the range of the first action level of RBC requirements (i.e., 200%).[40]

[40] $19.920 million = $31.024 million - (2 * $5.552 million).

In establishing a materiality standard for Statement of Actuarial Opinion purposes, some actuaries look at the impact on surplus from a change in RBC levels. In these circumstances, an increase in reserves by an amount that would cause the company (or regulator) to take action under RBC is thought to be material. This is discussed further in Chapter 16. *Statement of Actuarial Opinion*.

OPERATING PERCENTAGES

Operating percentages provide the distribution of earned premium into its components of loss, LAE, other underwriting expenses and the profit (loss) from underwriting (net underwriting gain (loss)) that remains. For Fictitious, the ratios were reasonably consistent over the five-year period with the exception of 2018. The high loss ratio in 2018 relative to prior years highlights the spike in losses in 2018 and resulting loss from underwriting.

Spikes or changes in other underwriting expenses directly impact profitability and would be investigated further as to whether such costs were necessary and/or indicative of costs to be incurred by the company in the future.

ONE- AND TWO-YEAR LOSS DEVELOPMENT

Actuaries, in particular those that work in the reserving area, pay considerable attention to the last four lines of the Five-Year Historical Data exhibit (lines 73 through 76 of 2018 Five-Year Historical Data exhibit), as this information shows how the company's prior-year loss and DCC reserves have developed over one- and two-year time horizons.

We already presented the one-year development line (line 73) when interpreting the cause of the underwriting loss incurred by the company in 2018. The subsequent line (line 74) shows the relationship of one-year loss and DCC development to the company's surplus as recorded in the prior year's balance sheet. The purpose is to show the impact of adverse or favorable reserve development on policyholders' surplus. That is, it shows the percentage of surplus that would have been absorbed (enhanced) as a result of adverse (favorable) loss development.

In a perfect world, development would be nil. However, loss reserves represent estimates made by a company's management based on information available as of a certain point in time. It is expected that actual loss emergence will differ from expected, and company management will revise its estimates each year as additional information becomes available. As a result, it's not often that $0 is observed in the one-year (or two-year) development line. The issue here is not that a company experiences development in its loss reserves, but rather how big the development is and its significance to surplus.

Stakeholders tend to be concerned when large positive numbers are shown in the development lines as this means that the prior-year reserves were deficient. The question is whether the increase is attributed to an anomaly or if it is symptomatic of a trend of under-reserving. Further investigation could be made within the Annual Statement by reading the Notes to Financial Statements, specifically the note on changes in incurred loss and LAE, and looking at Schedule P, Part 2, which may show that

the adverse development is coming from a particular year or line of business. Oftentimes, such development is also discussed in public reports by and on behalf of the company (e.g., Form 10-K for public companies or the AMB Credit Report for the company published by A.M. Best). However, nothing supplants discussion with company management.

Table 13 provides both the one-year development line and the relationship of one-year development to prior-year surplus (line 74) for Fictitious.

TABLE 13

Data from Fictitious Insurance Company 2018 Five-Year Historical Data					
	2018	**2017**	**2016**	**2015**	**2014**
73. Development in estimated losses and loss expenses incurred prior to current year (Schedule P, Part 2, Summary, Line 12, Column 11)*; USD in 000s*	(875)	(1,354)	(1,618)	(1,959)	(918)
74. Percent of development of losses and loss expenses incurred to policyholders' surplus of prior year-end (line 73 divided by Page 4, Line 21, Column 1 x 100)	(2.8)	(3.8)	(5.0)	(5.6)	(2.6)

During 2018, Fictitious' booked net ultimate loss and DCC reserve estimates on accident years 2017 and prior developed favorably by $0.9 million (line 73). This means that, with the benefit of one year's hindsight, the net loss and DCC reserves recorded by the company as of December 31, 2017, were overstated by $0.9 million. That overstatement represented 3% of the company's surplus as of December 31, 2017 (line 74).

Going back a year, with the benefit of one year's hindsight, recorded net loss and DCC reserves as of December 31, 2016, were overstated by $1.4 million, or 4% of surplus.

We can continue going back and observe development in years 2014 through 2016 on prior-year reserves. For Fictitious, the result was consistent over the five-year period; recorded loss and DCC reserves (or ultimate loss and DCC estimates) developed favorably in the following year. This implies that the company was relatively conservative in establishing its reserve estimates.

While stakeholders and regulators of insurance companies tend to be more concerned when development is adverse, large favorable development also raises an issue with certain parties. For example, the Internal Revenue Service pays close attention to favorable emergence as overstatements in reserves reduce the amount of taxable income. Additionally, investors would be concerned that the company is accumulating funds that could be better invested elsewhere, thereby suppressing the investor's rate of return.

The two-year development lines show similar information as contained in the one-year lines, with the exception that development over a two-year period is provided. For example, Fictitious' recorded net

loss and DCC reserves as of year-end 2016 developed favorably by $2.6 million in 2017 and 2018. This represents 7.3% of surplus recorded at the end of 2016.

TABLE 14

Data from Fictitious Insurance Company 2018 Five-Year Historical Data					
	2018	**2017**	**2016**	**2015**	**2014**
75. Development in estimated losses and loss expenses incurred two years before the current year and prior year (Schedule P, Part 2, Summary, Line 12, Column 12); *USD in 000s*	(2,602)	(2,906)	(3,680)	(2,544)	(1,059)
76. Percent of development of losses and loss expenses incurred to policyholders' surplus of second prior year-end (Line 75 divided by Page 4, Line 21, Column 2 x 100)	(7.3)	(8.9)	(10.6)	(7.3)	(3.0)

This information enables the actuary to see whether the development tends to be isolated to the first year of development or continues to the next. In Fictitious' case, the favorable development continued through year two. For example, one-year development on year-end 2016 reserves developed by $1.4 million in 2017 (line 73) and then another $1.2 million in 2018 (per line 75, computed by taking $2.6 million and subtracting the one-year development of $1.4 million).

CHAPTER 13. OVERVIEW OF SCHEDULES AND THEIR PURPOSE

OVERVIEW

Schedules A through E

The first eight schedules (Schedules A through E) of the Annual Statement provide further transparency of the company's assets, as displayed in the balance sheet of the statutory financial statements. The purpose of these schedules is to assist stakeholders and regulators in identifying and analyzing risks inherent in those assets, changes in those assets and differences in their valuation.

The following outlines the contents of Schedules A through E:

TABLE 15

Schedule	Part	Title
A	1	Real Estate Owned December 31 of Current Year
A	2	Real Estate Acquired and Additions Made During the Year
A	3	Real Estate Disposed During the Year
B	1	Mortgage Loans Owned December 31 of Current Year
B	2	Mortgage Loans Acquired and Additions Made During the Year
B	3	Mortgage Loans Disposed, Transferred or Repaid During the Year
BA	1	Other Long-Term Invested Assets Owned December 31 of Current Year
BA	2	Other Long-Term Invested Assets Acquired and Additions Made During the Year
BA	3	Other Long-Term Invested Assets Disposed, Transferred or Repaid During the Year
D	Part 1	Long-Term Bonds Owned December 31 of Current Year
D	Part 2 - Section 1	Preferred Stocks Owned December 31 of Current Year
D	Part 2 - Section 2	Common Stocks Owned December 31 of Current Year
D	Part 3	Long-Term Bonds and Stocks Acquired During Current Year
D	Part 4	Long-Term Bonds and Stocks Sold, Redeemed or Otherwise Disposed of During Current Year
D	Part 5	Long-Term Bonds and Stocks Acquired During the Year and Fully Disposed of During Current Year
D	Part 6 - Section 1	Valuation of Shares of Subsidiary, Controlled or Affiliated Companies
D	Part 6 - Section 2	Valuation of Shares of Lower Tier Company
DA	Part 1	Short-Term Investments Owned December 31 of Current Year
DB	Part A - Section 1	Options, Caps, Floors, Collars, Swaps and Forwards Open December 31, of Current Year
DB	Part A - Section 2	Options, Caps, Floors, Collars, Swaps and Forwards Terminated During Current Year
DB	Part B - Section 1	Futures Contracts Open December 31 of Current Year
DB	Part B - Section 2	Futures Contracts Terminated During Current Year
DB	Part C - Section 1	Company's positions in replication (synthetic asset) transactions Open December 31 of Current Year
DB	Part C - Section 2	Company's positions in replication (synthetic asset) transactions Terminated During Current Year
DB	Part D	Counterparty Exposure for Derivative Instruments Open December 31 of Current Year
DL	Part 1	Securities Lending Collateral Assets (Reinvested Collateral Assets Owned December 31 Current Year)
DL	Part 2	Securities Lending Collateral Assets (Reinvested Collateral Assets Owned December 31 Current Year)
E	Part 1	Cash
E	Part 2	Cash Equivalents
E	Part 3	Special Deposits

There is considerable information within each schedule, including a description of each asset, its value and the basis for valuation. We do not intend to provide all the details of each asset schedule. As discussed previously, most property/casualty actuaries will not need to have a deep understanding of all of the asset classes on the balance sheet. Therefore, we only provide a brief description of each

schedule and show how the reader can source the items listed in the asset side of the balance sheet (page 2 of the Annual Statement) to these schedules.

While we will present each of Schedules A through E in order of presentation in the Annual Statement, keep in mind the distribution of admitted assets by class for the property/casualty industry as a whole, as was provided in Chapter 7. *Statutory Balance Sheet: A Measure of Solvency*. Table 16 provides a comparison of the distribution for the industry to that of Fictitious Insurance Company as of December 31, 2018.

TABLE 16[41]

Summary of Net Admitted Assets (column 3) on Page 2 of the Annual Statement				
Assets	**Line Number per Page 2**	**Schedule Reference**	**Property Casualty Industry**	**Fictitious Insurance Company**
Investments				
Bonds	1	D – Part 1	50.7%	58.7%
Preferred stocks	2.1	D – Part 2 – Section 1	0.3%	0.0%
Common stocks	2.2	D – Part 2 – Section 2	19.2%	19.3%
Mortgage loans	3.1 + 3.2	B	1.0%	0.2%
Real estate	4.1 + 4.2 + 4.3	A	0.7%	3.8%
Cash and short-term investments	5	E, DA	5.0%	1.0%
Contract loans	6		0.0%	0.0%
Derivatives	7	DB	0.0%	0.0%
Other investments	8 + 9 + 10 + 11	BA, DL	6.7%	4.7%
Total cash and investments	**12**		**84.1%**	**87.8%**
Total assets	**28**		**100.0%**	**100.0%**

Note: Contract loans are loans on contracts issued by the insurance company. They typically pertain to life insurance contracts. There is no schedule within the Annual Statement that pertains to or provides additional disclosure about contract loans.

The assets detailed in Schedules A through C and E make up a relatively small portion of the total admitted assets of the property/casualty insurance industry at year-end 2018 (less than 15%). This relationship has remained relatively consistent over the years. Property/casualty insurers tend to invest in relatively short-term, fixed assets of low risk given their need to be able to pay claims emanating from short-term contracts (as opposed to long-term life insurance contracts). As a result, the largest holding of a property/casualty insurer tends to be in bonds, followed by common stocks. Therefore, Schedule D tends to be the most populated of the asset schedules within the Annual Statement.

In assessing the financial health of an insurance company, it is important to understand differences in the distribution of assets by class relative to the industry. In particular, large concentrations in riskier asset classes would warrant additional scrutiny. The information contained in Schedules A through E and in the notes and interrogatories within the Annual Statement will provide some level of quantitative and

[41] The distribution of assets by class within this table is based on admitted assets. Schedules A through E provide supporting detail for total assets, including amounts that become nonadmitted in column 2 of the asset side of the statutory balance sheet.

qualitative detail to aid in the assessment. However, enhanced understanding will come through inquiries of management as to its investment policy, including any hedging strategies that have been implemented to mitigate investments in higher-risk asset classes.

Schedules F and P

Property/casualty actuaries tend to spend more time focusing on page 3 (Liabilities) of the balance sheet than on page 2 (Assets). Therefore, of all the schedules within the Annual Statement, property/casualty actuaries tend to spend the most time with Schedules F and P, in particular Schedule P. Schedule F pertains to reinsurance accounting, and Schedule P pertains to loss and loss adjustment expense reserves. We will devote much of our attention to these Annual Statement schedules in separate chapters for each (Chapter 14. *Schedule F* and Chapter 15. *Schedule P*).

Schedules T and Y

The remaining two schedules, Schedule T and Schedule Y, will be discussed at the end of this chapter. These schedules provide details on the insurance company's premium writings by state and organizational structure, respectively.

SCHEDULE A

Schedule A provides information on real estate directly owned by the insurance company. Schedule A, Part 1 provides a detailed listing of all real estate owned by the company as of December 31 of the current year, while Parts 2 and 3 provide a detailed listing of real estate acquired and disposed during the year, respectively.

Schedule A, Part 1, column 9, Book/Adjusted Carrying Value Less Encumbrances, is the source of the information provided in line 4 of the asset side of the balance sheet. Amounts are provided for each property that the reporting entity owns, grouped in the same three parts as shown in line 4 of page 2:

- 4.1 Properties occupied by the company
- 4.2 Properties held for the production of income
- 4.3 Properties held for sale

All figures are shown less the amount of any encumbrances, which include items such as a lien on the company's property or outstanding principal balance of a mortgaged property.

Consistent with the rest of the property/casualty insurance industry (1%), real estate was a small asset class for Fictitious in 2018, representing less than 4% of its total assets. Although small, actuaries will look at the level of an insurance company's investment in long-term assets and associated cash flows relative to the cash outflows of its liabilities. For example, a property/casualty insurer writing short-tailed lines of business (e.g., homeowners) will require relatively liquid and continual flows from its assets to pay its claims. A large proportion of this company's assets in real estate holdings, or other longer-term assets that do not have constant outflows, might raise questions about liquidity of the

company's assets. This is particularly true during unstable economic times when the real estate market is at a low and the seller may not be able to dispose of the investment let alone get the expected value. Schedule A, Part 3 shows what the reporting entity was able to sell real estate investments for over the past year, relative to the value of the investment as shown in the entity's prior-year statement.

SCHEDULE B

Schedule B provides information on mortgage loans owned by the insurance company that are secured by real estate. These are instances where the insurance company has issued a mortgage loan to another party.

Schedule B is organized in the same three parts as Schedule A. Part 1 provides a detailed listing of all mortgage loans owned by the company as of December 31 of the current year, while Parts 2 and 3 provide a detailed listing of mortgage loans acquired and disposed during the year, respectively. Part 3 includes mortgage loans transferred or repaid during the year.

Part 1 is the source of the information provided in line 3 of the asset side of the balance sheet. Line 3 of the asset side of the balance sheet is broken up into two parts:

3.1 First liens
3.2 Other than first liens

The source of the figures provided in line 3 is column 8, book value/recorded investment excluding accrued interest, of Schedule B, Part 1. The figures in column 8 reconcile to the amounts in lines 3.1 and 3.2 on the asset side of the balance sheet. However, it is not evident from Schedule B as to which loans are first liens.

Part 1 provides a detailed listing of mortgage loans owned by the company in the following groupings:

- Mortgages in good standing, which are those loans where the terms are being met by borrowers.
- Restructured mortgages, which are those loans where the terms have been restructured in 1986 or subsequent due to delinquency.
- Mortgages with interest more than 90 days due and not in the process of foreclosure.
- Mortgages in the process of foreclosure.

Issuing mortgages is not a core business strategy of a property/casualty insurance company. Further, mortgage loans are relatively illiquid assets. Therefore, insurers don't have large holdings in Schedule B assets. However, for those insurance companies that do invest in mortgage loans, the groupings provided in Schedule B provide the reader with a sense of the risk associated with the company's mortgage loan investments. For example, investments in mortgages in the process of foreclosure are riskier than those in good standing.

Only 0.2% of Fictitious' assets were invested in mortgage loans on real estate as of December 31, 2018, as compared to 0.3% for the industry.

SCHEDULE BA

Schedule BA provides information on other long-term invested assets owned by the insurance company. These are assets not included in any of the other invested asset schedules, such as real estate that is not owned directly by the insurance company and therefore excluded from Schedule A. Other examples of BA assets include investments in joint ventures, partnership interests and surplus debentures.

Schedule BA, Part 1 provides a detailed listing of other long-term invested assets owned by the company as of December 31 of the current year, while Parts 2 and 3 provide a detailed listing of other long-term invested assets acquired and disposed during the year, respectively. Part 3 includes other long-term invested assets transferred or repaid during the year.

The total in column 12, book/adjusted carrying value less encumbrances, of Schedule BA, Part 1, is the source of the figure provided in line 8 of the asset side of the balance sheet.

As with real estate investments, actuaries will look at the level of cash flows from a company's long-term invested assets relative to the duration of its liabilities for liquidity purposes.

As displayed in Table 17, Fictitious had only 5% of its assets invested in Schedule BA assets at year-end 2018. Schedule BA assets are included within the other investments line. Other investments also include receivables for securities, securities lending reinvested collateral assets and aggregate write-ins for invested assets.

TABLE 17

Current-Year Assets, 2018 Annual Statement Page 2, Column 1 (USD)	
8. Other invested assets (Schedule BA)	4,726,000
28. Total assets	101,454,000
Percentage of total assets (Row 8 / Row 28)	4.7%

SCHEDULE D

Schedule D provides information on bonds and stocks owned by the insurance company. It is broken into six parts, 1 through 6. The amounts shown on the assets side of the balance sheet for bonds and stocks comes from the book/adjusted carrying value column, within Schedule D, Parts 1 and 2.

Part 1

Part 1 provides a detailed listing of the long-term bonds and certificates of deposit (CDs) *owned* by the insurance company as of December 31 of the current year. The term "long-term" is intended to exclude bonds and CDs with maturity or repurchase dates one year or less from the date acquired and cash equivalents with maturities of three months or less. Bonds that are not long term are reported in other schedules. Bonds with maturities of one year or less are reported in Schedule DA. CDs with maturities of one year or less are reported in Schedule E, Part 1. Cash equivalents are reported in Schedule E, Part 2. Schedules DA and E are discussed in subsequent sections of this chapter.

The source of the balance sheet figure for bonds is the total in column 11 (Book/Adjusted Carrying Value) of Schedule D, Part 1.

In Part 1, bonds are separated into the following categories:

- U.S. governments
- All other governments
- U.S. states, territories and possessions (direct and guaranteed)
- U.S. political subdivisions of states, territories and possessions (direct and guaranteed)
- U.S. special revenue and special assessment obligations and all non-guaranteed obligations of agencies and authorities of governments and their political subdivisions
- Industrial and miscellaneous (unaffiliated)
- Hybrid securities
- Parent, subsidiaries and affiliates

Within each of the aforementioned categories, there are issuer obligations, residential mortgage-backed securities (MBS), commercial MBS, and other loan-back and structured securities, with subtotals for each.

In addition to book/adjusted carrying value, the columns within Part 1 enable the user to obtain an understanding of fluctuations in value over the past year and time to maturity of each bond. As noted, users of the Annual Statement consider time to maturity, and therefore liquidity, relative to liability duration.

Part 2

Part 2 provides a detailed listing of the stocks *owned* by the insurance company as of December 31 of the current year. Preferred stocks are in Section 1 of Schedule D, Part 2, and Common stocks are in Section 2.

Schedule D, Part 2 is the source of the information provided within line 2 of the asset side of the balance sheet titled "Stocks (Schedule D)."

The source of the balance sheet figure for preferred stocks is the total in column 8, Book/Adjusted Carrying Value, of Schedule D, Part 2, Section 1, whereas the source for common stocks is the total in column 6, Book/Adjusted Carrying Value, of Schedule D, Part 2, Section 2.

In Part 2, Section 1 of Schedule D, preferred stocks are separated into the following categories:

- Industrial and miscellaneous (unaffiliated)
- Parent, subsidiaries and affiliates

Part 2, Section 2 has the additional categories for common stocks of:

- Mutual funds
- Money market mutual funds

Parts 3 through 6

Part 3 provides a detailed listing of long-term bonds and stocks *acquired during the current year* and still owned by the company as of December 31 of the current year. Those acquired and disposed of during the current year are only provided in subtotal in Part 3, with the details reported in Part 5.

Part 4 provides a detailed listing of long-term bonds and stocks that were *owned as of the beginning of the current year* and disposed of during the year through sale, redemption or other means. Those acquired and sold during the current year are provided in detail in Part 5, with only subtotals in Part 4.

Part 6 provides a detailed listing of preferred and common stocks in affiliated companies. This is particularly relevant in the calculation of the R_0 charge in the RBC calculation, as we will see in Chapter 19. *Risk-Based Capital*.

SCHEDULE DA

Schedule DA provides information on short-term investments owned by the insurance company. According to the 2018 National Association of Insurance Commissioners (NAIC) *Annual Statement Instructions Property/Casualty*, this schedule is to "include all investments whose maturities (or repurchase dates under repurchase agreement) at the time of acquisition were one year or less except those defined as cash or cash equivalents in accordance with Statement of Statutory Accounting Principles No. 2R, Cash, Cash Equivalents, Drafts, and Short-term Investments."[42]

Schedule DA, Part 1 provides a detailed listing of short-term investments by the company as of December 31 of the current year. This is the source of the information provided within line 5 of the asset side of the balance sheet.

[42] *2018 NAIC Annual Statement Instructions Property/Casualty*, page 367.

Short-term investments can include the following asset classes:

- Bonds
- Mortgage loans and other short-term invested assets for parent, subsidiaries and affiliates
- Mortgage loans
- Exempt money market mutual funds
- Class one money market mutual funds
- Other short-term invested assets

Fictitious had less than 1% of its assets invested in short-term investments in 2018.

SCHEDULE DB

Schedule DB provides information on derivative instruments owned by the insurance company. It is broken into four parts, A through D. Part A provides the company's positions in options, caps, floors, collars, swaps and forwards. Part B provides the company's positions in futures contracts. Part C provides the company's positions in replication (synthetic asset) transactions. And in Part D, the company reports counterparty exposure for derivative instruments open December 31 of the current year. Counterparty exposure is the exposure to credit risk.

Parts A and B are further broken into two sections. Section 1 provides open positions during the year, and Section 2 provides positions terminated during the year.

Schedule DB, Parts A and B are the source of the information provided within line 7 of the asset side of the balance sheet, Derivatives (Schedule DB).

While property/casualty insurance companies do not invest much in the derivatives market, derivatives are used to hedge the mismatch between the timing and payment of assets and liabilities. A company investing in a greater proportion of risky assets than the industry (say a higher proportion in common stocks than bonds), could be expected by its stakeholders to have a hedging strategy in place to mitigate those risks.

As displayed on line 7 of the asset side of its balance sheet, Fictitious did not use derivatives in its investment strategy in 2018.

SCHEDULE DL

Schedule DL provides information on securities lending collateral assets. Schedule DL is a fairly new schedule in the Annual Statement, added in 2010 as a result of the financial crisis in 2008.[43]

[43] NAIC and The Center for Insurance Policy and Research, Capital Markets Special Report, *Securities Lending in the Insurance Industry,* http://www.naic.org/capital_markets_archive/110708.htm, (July 11, 2011)

Securities lending received a lot of publicity during the financial crisis of September 2008. Securities lending involves a company lending securities that it does not actively trade to another party for a fee. The borrower will generally sell the borrowed security, in anticipation of repurchasing it at a lower price before returning it to the lender. The difference between the sale price and repurchase price is profit to the borrower.

The borrower is required to post collateral with the lender. This collateral may in turn be invested by the lender; however, the lender needs to have the collateral available for return when the borrower decides to return the borrowed security. These arrangements tend to be for less than a year, and the borrower generally can return the security on relatively short notice. Therefore, a prudent investment strategy would call for investment of the collateral by the lender in short-term, low-risk, liquid markets. Investment in long-term, riskier securities is one of the causes of the financial crisis in 2008.

According to an article by the NAIC and The Center for Insurance Policy and Research,[44] American International Group (AIG) was involved in securities lending whereby securities owned were loaned in exchange for fee and cash collateral. During the period 2005 through 2007, investments of the collateral were made in long-term subprime residential MBS, which subsequently experienced significant declines in market value. When the borrowers came back to AIG to exchange the borrowed securities for the cash collateral they had provided, AIG was experiencing liquidity constraints. The demand for cash from securities lending counterparties put further constraints on AIG, resulting in regulators and the U.S. government stepping in to help alleviate the liquidity issue and reduce strains on AIG's capital.

While securities lending was not the main cause of the financial crisis in 2008, one of the many lessons learned was the lack of transparency in the securities lending market. Schedule DL was created to provide further transparency by providing detailed information on the collateral assets that are reinvested by the insurance company, including the fair value and book value and the date the agreements mature. As the length of the agreement term increases, so does the risk to the insurance company. If borrowers in the company's securities lending program were to return the borrowed securities and request their collateral back with short notice, the company may have difficulty meeting the cash (collateral) demand.[45]

Schedule DL, Part 1 contains those collateral assets that are not included in other investment schedules within the Annual Statement (e.g., Schedule A, B, BA, D, DA and E). Part 2 contains those that are reported in the other asset schedules. Therefore, Part 1 is the source of the information provided in line 10 of the asset side of the balance sheet.

The total in column 6, Book/Adjusted Carrying Value, of Schedule DL, Part 1, is the source of line 10 of the asset side of the balance sheet.

[44] Ibid.

[45] Regulators became aware of this strategy as a result of the financial examination process, which occurs only once every three to five years.

As displayed in Table 18, Fictitious had an immaterial securities lending program relative to total assets and policyholders' surplus at year-end 2018. As a result, sudden demand to return collateral to a borrower would not have had a significant impact on Fictitious' balance sheet.

TABLE 18

Current-Year Assets, 2018 Annual Statement Page 2, Column 1 (USD)	
10. Securities lending reinvested collateral assets (Schedule DL)	79,000
28. Total assets	101,454,000
Percentage reinvested collateral assets (Row 10 / Row 28)	0.08%
Total PHS	31,024,000
Percentage reinvested collateral assets	0.25%

SCHEDULE E

Schedule E provides information on the insurance company's cash and cash equivalents.

Schedule E, Part 1 provides:

- A detailed listing of cash on deposit with banks, trust companies, and savings and loan and building and loan associations
- Totals for cash held in the company's offices
- CDs maturing one year or less (long-term CDs are reporting in Schedule D)

Part 2 provides a detailed listing of investments in what are referred to as cash equivalents and are therefore maturing within three months or less.

Part 3 provides a detailed listing of special deposits, which include assets reported in the various asset schedules within the Annual Statement but are segregated for a special purpose, such as bail bonds, workers' compensation, property and casualty insurance, collateral and escrow.

Column 6, Balance, of Schedule E, Part 1, is the source of the cash amount included in line 5 of the asset side of the balance sheet. Column 6, book/adjusted carrying value of Schedule E, Part 2, is the source of the amount of cash equivalents, which are also included in line 5.

Table 19 shows that Fictitious had less than 1% of its assets in cash and cash equivalents at year-end 2018.

TABLE 19

Current-Year Assets, 2018 Annual Statement Page 2, Column 1 (USD)	
5. Cash ($153,000, Sch. E-Part 1), cash equivalents ($0, Sch. E-Part2) and short-term investments ($829,000, Sch. DA)	983,000

28. Total assets	101,454,000
Percentage of total assets (Row 5 / Row 28)	1.0%

SCHEDULE T

Schedule T has two parts:

1. Exhibit of Premiums Written
2. Interstate Compact — Exhibit of Premiums Written

Each part is arranged showing its content by U.S. state (50); the District of Columbia; five U.S. territories (American Samoa, Guam, Puerto Rico, U.S. Virgin Islands and Northern Mariana Islands); Canada; and a line for aggregate other alien territories.[46]

The following provides a general description of the content of each part and their use(s).

Exhibit of Premiums Written

The purpose of this schedule is to apportion premiums, losses and other items amongst the states or territories in which the company writes business.

The first column shows the "active status" of the company for each state/territory. Active status is denoted by:

L: Licensed insurance carrier or domiciled Risk Retention Group (RRG)
R: Registered — non-domiciled RRGs
Q: Qualified or accredited reinsurer
E: Eligible — reporting entities eligible or approved to write surplus lines in the state
N: None of the above — not allowed to write business in the state

The total line of this column shows the number of states/territories that the company is licensed in.

Direct losses, premiums and other information are required to be allocated by state/territory regardless of the active status reported. The information requested includes:

- Written premiums
- Earned premiums
- Policyholder dividends
- Paid losses
- Incurred Losses

[46] According to the glossary in the textbook *Property-Casualty Insurance Accounting* issued by Insurance Accounting & Systems Association, Inc., Eighth Edition (2003), First Addendum (2006), an alien insurance company is defined as "An insurer or reinsurer domiciled outside the U.S. but conducting an insurance or reinsurance business in the U.S."

- Unpaid losses
- Finance and service charges
- Direct premiums written for federal purchasing groups

The complicated part of completing this schedule is figuring out how to allocate the foregoing items by state/territory. The NAIC *Annual Statement Instructions Property/Casualty* looks for the premiums to be reported "based on the physical location of the insured risk (except individual and group health insurance)."[47] Losses are to be reported to the states where the associated premium is allocated.

For example, an insurer writes workers' compensation insurance for an organization that has employees located across the country. The foregoing items need to be allocated to each state/territory based on primary workplace of each employee. Table 20 shows additional examples of the basis for allocating premiums and losses by state/territory, according to the NAIC instructions.

TABLE 20

Line of Business	**Basis for Allocation by State**
Property lines, such as fire, homeowners, boiler and machinery	Location of property
Marine coverages, where property is in transit	Beginning state location
Automobile lines	Location of principal garage of each automobile
Liability lines (other than auto) where premium determined per location	Location of principal office of operation

Companies are required to describe the basis for the allocation in the footnote of Schedule T.

Schedule T is useful to actuaries in several instances, such as the following:

- Actuaries use this schedule to learn where the company writes its business to further research and consider the insurance laws of those states. This is particularly important for workers' compensation insurers where estimates of unpaid claims depend on each state's laws.

- Actuaries also look to this schedule over a series of historical Annual Statements to see if the company has changed geographic concentration or is growing in a particular state. In addition to regulatory differences by state, changes in geographic mix have an impact on the exposures. For example, for a company writing in California or among fault lines, consideration should be made of the company's exposure to earthquakes.

[47] *2018 NAIC Annual Statement Instructions Property/Casualty*, page 241.

- For a company where industry loss development factors are used in reserving, actuaries may look to this schedule for a distribution of losses by state to determine weights to apply to industry factors by state.

In addition, as we shall see in Chapter 18. *Insurance Expense Exhibit*, the totals in Schedule T are used as a means of reconciling items contained in the Insurance Expense Exhibit.

Interstate Compact — Exhibit of Premiums Written

There is another part to Schedule T that is less well-known to property/casualty actuaries: Interstate Compact — Exhibit of Premiums Written and Allocated by States and Territories. Part 2 only pertains to property/casualty insurers that also write life insurance, annuities, disability income and long-term care insurance products. The purpose of Part 2 is for regulators to monitor writings in these products for consumer protection purposes.

SCHEDULE Y

Schedule Y, Information Concerning Activities of Insurer Members of a Holding Company Group, has two parts:

1. Organizational chart
2. Summary of insurer's transactions with any affiliates

The following provides a brief description of the content and purpose of each.

Part 1 — Organizational Chart

Part 1 is required for those companies that file a registration statement under the Insurance Holding Company System Regulatory Act of the company's domiciliary state.[48]

This part provides exactly what its name says, an organizational chart. In simplest terms, it is similar to a family tree, showing a pictorial representation of where the company lies within an organization and its relationship to the other members of the organization.

We often hear the phrases "sister company," "parent company" and "holding company," but until you see the schematic, it can be difficult to understand where a company fits within an organization. Knowing this and the company's purpose relative to its affiliates is important. For example, the company may have an affiliated managing general agent or other agency that produces its business, or it may have an affiliated claims administrative organization. Consideration of the affiliate's underwriting philosophy and/or claims handling practices is significant in estimating unpaid claims and establishing reserves for the company's liabilities, including those for adjusting expenses.

[48] Ibid., page 247.

Sometimes this part is provided in list form as opposed to an actual chart due to the number of companies involved.

Part 1A — Detail of Insurance Holding Company System

This part must be completed by members of a holding company system. The purpose is to provide information about the relationship between the reporting entity and any parent, subsidiary(ies) and/or affiliate(s). The relationship is identified in Part 1A as either:

- Upstream direct parent (UDP)
- Upstream indirect parent (UIP)
- Downstream subsidiary (DS)
- Insurance affiliate (IA)
- Non-insurance affiliate (NIA)
- Other, which requires an explanation of the relationship in the footnotes to this part (OTH)

Additionally, the controlling entity in the relationship is provided, along with the type of control that the entity has over the other:

- Control through ownership
- Control at the board of directors level
- Control through management
- Control by acting as the attorney-in-fact
- Controlling influence
- Other

If the reporting entity is a member of a holding company system, the reporting entity must include the above items for each parent, subsidiary or affiliate of the reporting entity whose names are listed in column 8 of Schedule Y.

According to the NAIC 2018 *Annual Statement Instructions Property/Casualty*, which references the Insurance Holding Company System Regulatory Act, "Control shall be presumed to exist if any person, directly or indirectly, owns, controls, holds with the power to vote, or holds proxies representing, ten percent (10%) or more of the voting securities by another person."[49]

As we shall see in Chapter 19. *Risk-Based Capital*, this information is particularly useful in determining the RBC R_0 charge for investments in insurance affiliates.

[49] Ibid., page 249.

Part 2 — Summary of Insurer's Transactions With Any Affiliates

Schedule Y, Part 2, provides a listing of transactions among members of the holding company system where an insurance affiliate was a party to the transaction. Examples include:

- Shareholder dividends
- Capital infusions
- Purchases/sales of loans or real estate
- Management agreements and service contracts
- Income (disbursements) incurred under reinsurance contracts and reinsurance recoverable (only those transactions that took place during the reporting period are included)

The purpose of this part of Schedule Y is to assist regulators in monitoring monetary flows in and out of insurance company affiliates. This schedule is the same for all members of an insurance holding company system. Therefore, the totals all balance to zero, as an outflow from one company is offset by the inflow to another.

CHAPTER 14. SCHEDULE F

OVERVIEW

As noted in the previous Chapter 13. *Overview of Schedules and Their Purpose*, Schedule F and Schedule P are two of the Annual Statement schedules that property/casualty actuaries tend to use most. In this chapter we will focus on the content of Schedule F; Chapter 15 focuses on the content of Schedule P.

Schedule F provides details underlying an insurance company's reinsurance transactions on prospective contracts[50] that meet the conditions for reinsurance accounting as defined in SSAP No. 62R. It includes the names of the counterparties to the transactions and the premium, loss and expense amounts that emanate from those transactions as of December 31 of the reporting year. This information is important to actuaries for several reasons:

- Loss and loss adjustment expense (LAE) reserves recorded by an insurance company include business assumed by the company. Knowledge of the source and amount of assumed reinsurance provides valuable information to an actuary in assessing the reasonableness of the gross and net loss and LAE reserve balances. Schedule F, Part 1 provides a listing of assumed premiums and losses by ceding company.

- Loss and LAE reserves recorded on an insurance company's statutory balance sheet are net of reinsurance. Considerable focus is placed on the collectability of that reinsurance by users of the Annual Statement, particularly regulators. In fact, the NAIC Instructions to the Statement of Actuarial Opinion require the Appointed Actuary to provide relevant comment paragraphs to address reinsurance. According to the NAIC Instructions, "Before commenting on reinsurance collectability, the actuary should solicit information from management on any actual collectability problems, review ratings given to reinsurers by a recognized rating service, and examine Schedule F for the current year for indications of regulatory action or reinsurance recoverable on paid losses over 90 days past due."[51]

  Schedule F, Part 3 provides the name of each of the company's reinsurers, a listing of liability amounts ceded to each reinsurer and the amount of collateral held by the insurance company in support of those liabilities. Using this information, research can be done on the financial ratings of the reinsurers to evidence the credit quality of the reinsurer and assess the risk that the ceding company would not able to collect the balances due from that reinsurer.

[50] According to paragraph 22 of SSAP No. 62R, Property and Casualty Reinsurance, "Prospective reinsurance is defined as reinsurance in which a reinsurer agrees to reimburse a ceding entity for losses that may be incurred as a result of future insurable events covered under contracts subject to the reinsurance."
[51] *2018 NAIC Annual Statement Instructions Property/Casualty*, page 13.

Schedule F, Part 3 also provides the aging of ceded reinsurance. An assessment can be made of the company's exposure to collectability issues in light of the reinsurer's payment history and the amount of collateral the company holds in support of its reinsured balances.

- The Statement of Actuarial Opinion also requires the Appointed Actuary to comment on and disclose the amount of net reserves for the insurance company's participation in underwriting pools and associations. Schedule F, Part 1 provides a source for this information. In fact, regulators expect there to be a reconciliation of the amount disclosed in the Statement of Actuarial Opinion to Schedule F.[52]

Schedule F also provides the derivation of the provision for reinsurance, which is included as a liability on the statutory balance sheet (page 3, line 16 of the 2018 Annual Statement). While Statutory Accounting Principles (SAP) requires insurance companies to record loss and LAE reserves net of reinsurance, SAP also presumes that a portion of that reinsurance is not collectible. The provision for reinsurance provides "a minimum reserve for uncollectible reinsurance with an additional reserve required if an entity's experience indicates that a higher amount should be provided. The minimum reserve Provision for Reinsurance is recorded as a liability, and the change between years is recorded as a gain or loss directly to unassigned funds (surplus). Any reserve over the minimum amount shall be recorded on the statement of income by reversing the accounts previously utilized to establish the reinsurance recoverable."[53]

This minimum reserve is computed in Schedule F, Part 3. It reflects the conservative nature of statutory accounting since the entire provision may ultimately be collected.

Schedule F – Part 3 also provides the data used in the calculation of the credit risk charge for reinsurance recoverables required by the NAIC Risk-Based Capital (RBC) formula.

Finally, Schedule F also provides a view of the reporting entity's balance sheet on a gross of reinsurance basis. Ceded reinsurance is a valuable means for insurance companies to mitigate insurance risk. Schedule F, Part 6 enables the user to observe the amount of protection afforded to the company's balance sheet through the use of reinsurance.

Note that retroactive reinsurance does not flow through Schedule F.[54] Ceding companies record loss and LAE reserves gross of retroactive reinsurance and assuming companies exclude the retroactive

[52] American Academy of Actuaries Committee on Property and Liability Financial Reporting, "Statements of Actuarial Opinion on Property and casualty Loss Reserves 2012," Appendix 9a, "Regulatory Guidance On Property and Casualty Statutory Statements of Actuarial Opinion for the Year 2012 Prepared by the NAIC's Casualty Actuarial and Statistical (C) Task Force," page 99.

[53] SSAP No. 62R, paragraph 64.

[54] According to paragraph 22 of SSAP No. 62R, "Retroactive reinsurance is defined as reinsurance in which a reinsurer agrees to reimburse a ceding entity for liabilities incurred as a result of past insurable events covered under contracts subject to the reinsurance." Note that there are exceptions for property/casualty run-off agreements whereby the entire risk for a line of business or segment (e.g., asbestos liabilities) is retroactively

reinsurance from loss and LAE reserves. The same is true for Schedule P[55]; retroactive reinsurance does not flow through Schedule P.

STRUCTURAL ORGANIZATION OF SCHEDULE F

Schedule F is arranged in the following six parts:

Part 1 Assumed Reinsurance as of December 31, Current Year ($000 Omitted)

Part 2 Premium Portfolio Reinsurance Effected or (Canceled) during Current Year

Part 3 Ceded Reinsurance as of December 31, Current Year ($000 Omitted)

Part 4 Issuing or Confirming Banks for Letters of Credit from Schedule F, Part 3 ($000 Omitted)

Part 5 Interrogatories for Schedule F, Part 3 ($000 Omitted)

Part 6 Restatement of Balance Sheet to Identify Net Credit for Reinsurance

Parts 1 and 3 provide details underlying the reinsurance items on a company's balance sheet. One asset item and four liability items on an insurance company's balance sheet come directly from Schedule F.

The asset item is "amounts recoverable from reinsurers" (Assets, page 2, line 16.1). It includes amounts the insurance company has already paid in loss and LAE to its claimants that are recoverable from its reinsurers. The first of the liability items provide this balance from the reinsurer's (i.e., the company in this case, as an assumed reinsurer) perspective (Liabilities, Surplus and Other Funds, page 3, line 2).

The other three liability items that come directly from Schedule F include ceded reinsurance premiums payable, net of ceding commissions, (Liabilities, Surplus and Other Funds, page 3, line 12), funds held by the company under reinsurance treaties (Liabilities, Surplus and Other Funds, page 3, line 13), and the provision for reinsurance (Liabilities, Surplus and Other Funds, page 3, line 16). In addition, the parenthetical reference to unearned premiums for ceded reinsurance in line 9 of page 3 also comes from Schedule F, Part 3 (column 13, total).

Schedule F, Part 3 is used to derive the provision for reinsurance. Effective with the 2018 Annual Statement, numerous individual parts used to derive the provision for reinsurance were consolidated into a single new Part 3 within Schedule F. This "eliminates duplication, promotes consistency of the reported ceded transactions, provides for greater automation, and reduces filing errors."[56]

transferred by a ceding company to a reinsurer. We will not get into the specifics in this publication, but note that the accounting for this type of contract can be found in paragraphs 81-84 of SSAP No. 62R.

[55] SSAP No. 62R, paragraph 29.

[56] NAIC Banks (E) Working Group, Agenda Item # 2016-35BWG MOD, https://www.naic.org/documents/cmte_e_app_blanks_related_adopted_mods_2016-35BWG_Modified.pdf, page 57.

The following illustrates how the amounts in the balance sheet map to those in Schedule F using the 2018 Annual Statement for Fictitious Insurance Company[57]:

TABLE 21

Company:	**Fictitious Insurance Company**						
Annual Statement for the year:	**2018**						
Assets, page 2			**Schedule F Source**				
Line	**Item**	**Current Year**	**Part**	**Column**	**Item**	**Row**	**Amount**
16.1	Amounts recoverable from reinsurers	426,000	3	7 + 8 (and 43)	Reinsurance recoverable on paid losses and paid LAE	Totals	426
Liabilities, Surplus and Other Funds, page 3			**Schedule F Source**				
Line	**Item**	**Current Year**	**Part**	**Column**	**Item**	**Row**	**Amount**
2.	Reinsurance payable on paid losses and loss adjustment expenses	—	1	6	Reinsurance on paid losses and loss adjustment expenses	Totals	—
9.	Unearned premiums for ceded reinsurance (parenthetical amount)	920,000	3	13	Reinsurance recoverable on unearned premium	Totals	920
12.	Ceded reinsurance premiums payable (net of ceding commissions)	440,000	3	17	Ceded reinsurance balances payable	Totals	440
13.	Funds held by company under reinsurance treaties	170,000	3	20	Funds held by Company under reinsurance treaties	Totals	170
16.	Provision for reinsurance	283,000	3	78	Provision for reinsurance	Totals	283,000

While relevant, Parts 2 and 4 through 6 tend to get less attention by actuaries. As the name suggests, Schedule F, Part 2 provides the user with a detailed listing of all portfolio reinsurance transactions entered into or canceled during the current year.

Schedule F, Part 4 provides a listing of issuing or conforming banks for letters of credit as collateral reported in Schedule F, Part 3, column 22.

Schedule F, Part 5 provides interrogatories for Schedule F, Part 3. The interrogatories include two tables with more detailed information. The first identifies the five largest commission rates included in the cedant's reinsurance treaties for those contracts where ceded premium is in excess of $50,000[58]. The second table identifies the five largest reinsurance recoverables reported in column 15 and associated

[57] In gaining an understanding of the interplay between the Financial Statements and various Schedules within the Annual Statement, it is important to remember that the amounts in Schedule F, Parts 1 and 3 are displayed in thousands of U.S. dollars, whereas amounts on the balance sheet, as well as in Schedule F, Part 6, are in whole dollars.

[58] According to the NAIC Annual Statement Instructions, the five largest should exclude mandatory pools and joint underwriting associations.

ceded premiums, as well as an indicator as to whether the reinsurer is affiliated with the reporting entity.

Schedule F, Part 6 provides a summarized form of the balance sheet with adjustments to restate it on a gross of ceded reinsurance basis. The assets are adjusted to remove any expected recoverables from the company's reinsurer, while the liabilities are restated to remove any anticipated recoveries or payables.

Given the limited level of focus on Parts 2 and 4 through 6 by property/casualty actuaries, we will provide only a brief description of their contents and use. We will devote the majority of this chapter on the contents of the other parts of Schedule F, including the calculation of the provision for reinsurance in Part 3.

SCHEDULE F — PART 1: ASSUMED REINSURANCE AS OF DECEMBER 31, CURRENT YEAR ($000 OMITTED)

Overview

Part 1 provides the total amount of the insurance company's assumed reinsurance balances by reinsured. It enables the user to obtain an additional understanding of the amounts at stake and risks associated with an insurance company's assumed reinsurance transactions as of the current year.

With Part 1, each reinsured is separated into the following groups or categories, with subtotals at the end of each category and group:

- Affiliated Insurers:
    - U.S. Intercompany Pooling
    - U.S. Non-Pool - Captive
    - U.S. Non-Pool - Other
    - Other (Non-U.S.) – Captive
    - Other (Non-U.S.) – Other
- Other U.S. Unaffiliated Insurers
- Pools and Associations:
    - Mandatory Pools, Associations or Other Similar Facilities
    - Voluntary Pools, Associations or Other Similar Facilities
- Other Non-U.S. Insurers

Knowledge of the group or category the reinsured is in, as well as the name of the reinsured, provides the user of the Annual Statement with further insight as to the risk associated with the assumed transaction.[59] For example, the reporting entity may have less control over and knowledge of the risks assumed from an unaffiliated non-U.S. insurer than it would of risks assumed from a U.S. affiliate.

[59] Reinsurance assumed from pools and associations is generally reported by the name of the pool or association. As a result, it is difficult to gain insight about the underlying risks of the pool(s) and/or association(s) that the insurer participates in from Schedule F alone.

In terms of its structure, the first four columns of Part 1 provide the ID number, NAIC company code, name of the reinsured and the reinsured's domiciliary jurisdiction. The ID number is one of the following, as appropriate:

- Federal Employer Identification Number (FEIN)
- Alien Insurer Identification Number (AIIN)
- Certified Reinsurer Identification Number (CRIN)
- Pool/Association Identification Number

The remaining 11 columns provide the dollar amounts pertaining to the assumed reinsurance transactions, including premiums, loss and LAE liabilities, contingent commissions, and the type of collateral required by the ceding company to secure balances owed to it by the reporting entity.

Premiums

The amount of written premium assumed by the insurance company from the reinsurer during the year is shown in column 5. The totals in column 5 ($000 omitted) will reconcile to the sum of the totals in columns 2 (reinsurance assumed from affiliates) and 3 (reinsurance assumed from non-affiliates) in Part 1B of the Underwriting and Investment Exhibit (shown in whole dollars).

Assumed premiums receivable, less commissions payable, are shown in column 10. The amount of commissions payable does not include contingent commissions, which are shown in column 9 and discussed below. The amount considered in column 10 is for fixed commissions. For example, if the reporting entity wrote a reinsurance contract for premium of $500,000 with a fixed ceding commission of 25%, all of which was unpaid at the end of the year, the figure in column 10 would be the $500,000 of assumed premium receivable less $125,000 of commissions payable, for a total of $375,000.

The total in column 10 ($000 omitted) is included as a part of agent's balances in line 15 (premiums and considerations) of page 2. As we will see later, this is considered in the profit calculation in the IEE.

Unearned premium on assumed business is provided in column 11. This is a liability to the insurance company and is included within line 9 of page 3, entitled unearned premiums, as well as the unearned premium reserves contained in Parts 1 and 1A of the Underwriting and Investment Exhibit. The unearned premium reserves on page 3 and in the Underwriting and Investment Exhibit are net of reinsurance. As such, the assumed unearned premium reserves listed in column 11 of Schedule F, Part 1 make up only one piece of these net amounts.

The amount in column 11 ($000 omitted) should reconcile directly to item (1) within the *"Reinsurance"* note of the "Notes to Financial Statements" titled *"Reinsurance Assumed and Ceded"* (shown in whole dollars; Notes 23C of Fictitious' 2018 Annual Statement).

Loss and LAE liabilities

Known liabilities owed by the reporting entity (i.e., the insurance company) to the reinsured (i.e., ceding company) as of December 31 of the current year are displayed in columns 6 and 7, with column 8 being the sum of the two.

- Column 6 (reinsurance recoverable on paid losses and LAE) represents losses and LAE that the ceding company has already paid but for which the insurance company has yet to pay to the reinsured.
- Column 7 (reinsurance recoverable on known case losses and LAE) represents the amount of losses and LAE reported by the ceding company as case reserves for which the reporting entity has included in its direct plus assumed case reserves stated on Schedule P, Part 1 and its net loss and LAE reserves stated on page 3 of the balance sheet.[60]

The above information is valuable to the actuary in assessing the reasonableness of unpaid claims. The actuary can reconcile the case reserves relied upon in the actuarial analysis to Schedule F, Part 3 and determine where the ceded loss reserves are coming from. However, Part 1 does not provide assumed IBNR. While a ceding company may report IBNR figures to its reinsurer, the reinsurer is responsible for estimating and recording assumed IBNR.

As shown in Table 21, the total in column 6 (reinsurance recoverable on paid losses and LAE; $000 omitted) reconciles to the amount on page 3, line 2 (reinsurance payable on paid losses and LAE, displayed in whole dollars). However, the total in column 7 ($000 omitted) does not reconcile directly to any exhibits or schedules within the Annual Statement. Known case reserves for losses are a part of the reported losses included in column 2 of the Underwriting and Investment Exhibit, Part 2A; however, LAE would need to be added to this balance to reconcile to the amount in Schedule F, Part 1, column 7.

Contingent commissions

Column 9 provides a listing of contingent commissions payable. Reinsurers pay ceding companies a commission for the premium income generated under the reinsurance contract. Contingent commissions payable represent profit commissions generated from assumed reinsurance contracts that have yet to be paid as they are "contingent" on the profitability of the underlying reinsurance arrangement. The total amount listed in column 9 ($000 omitted) is included within the amount on page 3, line 4, entitled *Commissions payable, contingent commissions and other similar charges*. The amount in column 9 ($000 omitted) should reconcile to item (2) within the "Reinsurance" note of the "Notes to Financial Statements" titled "Reinsurance Assumed and Ceded" (Note 23C of the 2018 Annual Statement), which provides the amount of additional or return commission contingent upon loss experience or other forms of profit-sharing arrangement as a result of existing contracts (shown in whole dollars).

[60] This is only true for those companies that do not participate in intercompany pooling. A discussion of the treatment of intercompany pooling in Schedule P is provided in Chapter 15. *Schedule P* of this publication.

Let's go back to the example we used in our explanation of column 10 (assumed premiums receivable), but this time, let's assume that the 25% ceding commission is on a one-to-one sliding scale basis instead of being fixed. The 25% ceding commission assumes a 75% loss ratio. If the loss ratio is worse than expected and ends up being 80%, then the ceding commission drops to 20%. If the loss ratio turns out to be better than expected and is 65%, for example, then the ceding commission increases by 10 points to 35%.

The amount of assumed premium receivable in column 10 would be $500,000, and the contingent commissions payable in column 9 would be $125,000, which is the amount of expected commission at the onset of the contract. Let's fast-forward to the end of the following year and assume that the $500,000 in premium was paid by the ceding company (reinsured) to the reporting entity (reinsurer), and the $125,000 in ceding commission was paid by the reporting entity to the ceding company. However, based on actual loss experience to date, the reporting entity now knows that the loss ratio is 65% as opposed to the 75% originally expected. This means that the reporting entity will owe the ceding company 10 more points of commission, or $50,000. The $50,000 would be shown in column 9 as a positive number and is a liability to the reporting entity. Of course, since the $500,000 in premium has already been received by the reporting entity, the amount shown in column 10 would be $0.

Security

The remaining columns of Schedule F, Part 1 (columns 12 through 15) provide forms of security that ceding companies often require of their reinsurers to avoid credit risk or an insolvency problem with the reinsurer.

Funds held

Funds held by or deposited with reinsured companies (column 12) represent an asset to the reinsurance company and a liability to the ceding company. It represents a provision within a reinsurance contract under which a portion of the premium due to the reinsurer is withheld by the ceding company to pay claims. There is usually a limit to the funds-held balance; however, it is replenished as (or when) it is absorbed.

Not only do the funds held reduce credit risk, but they also serve to reduce the administrative burden of the reinsured having to go to the reinsurance company to collect each time it makes a loss payment. This provision is often beneficial to the reinsurer as the funds withheld are credited for interest, the rate of which is determined in the contract. Given the benefit, this is one provision that is considered in the evaluation of whether a reinsurance contract transfers underwriting risk.

Letters of credit

The dollar amount underlying any letters of credit that the reporting entity is required to post to benefit the reinsured is shown in column 13. Letters of credit are issued by a bank in favor of the reinsured in the event that the reinsurer is unable to meet its obligations. Reinsureds tend to favor this form of credit because it is not part of the estate of an insolvent reinsurer and therefore not tied up or subject to

degradation in bankruptcy or liquidation proceedings. However, letters of credit can be very costly to the reinsurer. First, banks charge the reinsurer a fee, and this fee can be very high in uncertain economic times, as experienced during 2008 and several years thereafter. Second, letters of credit serve as a reduction to the reinsurer's line of credit with a bank and therefore reduce the amount of collateralization available on its debt obligations.

Amount of assets pledged or collateral held in trust

Broadly speaking, these are amounts not otherwise included within the funds-held provision. Unlike the other two types of security (funds held and letters of credit), these assets or collateral amounts are under the control of the reinsurer.

As we will see in Schedule F, Part 3, the funds-held provision and letters of credit serve to reduce a ceding company's provision for reinsurance.

Schedule F — Part 1 for Fictitious Insurance Company

Because Fictitious Insurance Company does not have any assumed reinsurance, these balances are $0 within Fictitious' 2018 Annual Statement. However, a reconciliation of these balances could be made within the Annual Statement for another company on the Exam 6 U.S. Syllabus.

SCHEDULE F — PART 2: PREMIUM PORTFOLIO REINSURANCE EFFECTED OR (CANCELED) DURING CURRENT YEAR

Overview

Part 2 provides a detailed listing of portfolio reinsurance transactions effected or canceled during the current year. Portfolio reinsurance is the transfer of policies in force or liabilities remaining on a block of the insurance company's business. Companies tend to enter into these arrangements when they:

- Want to discontinue writing a certain business
- Would like to get the risk or uncertainty associated with the liabilities off of their books
- Need surplus relief, which can come in the form of the discounted premium

However, these transactions come at a price, as the reinsurer will require a risk premium; the benefit of these contracts must be weighed with the cost.

Schedule F – Part 2 for Fictitious Insurance Company

Fictitious Insurance Company neither effected nor canceled any portfolio reinsurance during 2018.

SCHEDULE F — PART 3: CEDED REINSURANCE AS OF DECEMBER 31, CURRENT YEAR ($000 OMITTED)

Overview

Part 3 is one of the most referenced parts within Schedule F. Part 3 provides a comprehensive listing of the company's ceded reinsurance balances by reinsurer. It shows the dollar amounts relating to ceded reinsurance contracts, which enable the user to identify amounts recoverable from each of the company's reinsurers and assess credit risk.

Each reinsurer in Part 3 is separated into the same groups and categories as Part 1, with the addition of protected cells.[61] However, these groups and categories are provided separately for authorized reinsurers, unauthorized reinsurers and certified reinsurers,[62] with subtotals for each. As we shall see, the categorization of authorized, unauthorized and certified is used in the calculation of the provision for reinsurance, which culminates in column 78.

Schedule F, Part 3, is separated into 5 "sections":

[61] A protected cell company is one that is organized for the creation of separate cells, each having its own assets and liabilities, but also having access to a part of the company's overall capital. The liability to each cell is limited such that creditors to one cell cannot look to another cell or the company as a whole for assets. Only certain jurisdictions currently have insurance legislation pertaining to protected cell companies.

[62] An authorized reinsurer is one that is licensed or approved to transact insurance business in a jurisdiction; an unauthorized reinsurer is not. A certified reinsurer is an assuming insurer that has been certified as a reinsurer in the domiciliary state of the ceding insurer and secures its obligations in accordance with the requirements of Appendix A-785, *Credit for Reinsurance*, of the NAIC *Accounting Practices and Procedures Manual*.

- The first 20 columns detail the ceded reinsurance balances
- Columns 21 through 36 calculate credit risk on ceded reinsurance
- Columns 37 through 53 provide the aging of ceded reinsurance
- Columns 54 through 69 provide the calculation of the Provision for Reinsurance for Certified Reinsurance
- Columns 70 through 78 provide the Total Provision for Reinsurance (authorized, unauthorized and total)

Ceded Reinsurance Balances (the first 20 columns of Part 3)

Similar to Part 1, Part 3 starts off with a listing of the ID Number, NAIC Company Code, name of each of the Company's reinsurers (reinsured in Part 1), and the domiciliary jurisdiction of each reinsurer (reinsured in Part 1).

Special Code

Column 5 of Schedule F, Part 3, is used to identify reinsurance relationships of heightened importance to regulators or those where special considerations are made in the calculation of the provision for unauthorized reinsurance. A specifically defined number code is indicated in the applicable row for situations outlined below.

Special Code "2" - Cessions of 75% or more of subject premium

By definition, an insurance company is a risk-bearing entity. When an insurance company decides to cede most, if not all, of the risk under a contract, regulators need to understand why an insurer writes business and then cedes a large portion of it to another insurer. Column 5 identifies, through an indicator of the number 2 in the relevant row, each individual reinsurance contract whereby 75% or more of the subject direct written premiums are ceded. The purpose of column 5 is to identify situations where the reporting entity may be acting as a fronting carrier for another company (the reinsurer) in a particular state where the reinsurer is not licensed to transact business. Regulatory concern is that the reinsurer is using the fronting company to avoid regulatory oversight.

We often see this in the case of workers' compensation insurance due to the strict licensing requirements. For example, Insurer A may wish to write workers' compensation for a retail organization with locations along the west coast of the U.S. However, Insurer A may not be licensed to write workers' compensation insurance in California. Insurer A may turn to Insurer B, which is licensed in California, to write the policy on Insurer A's behalf. In turn, Insurer B would cede 100% of the exposure to Insurer A. Insurer B would require a fronting fee to provide this service to Insurer A.

Certain reinsurance transactions are exempt from this requirement, as they are not fronting arrangements and their purpose is not to avoid regulatory oversight. These transactions include:

- Intercompany cessions with affiliates, as these are used to share risks across related companies
- Cessions to a group, association, pool or organization of insurers that underwrite jointly and are subject to examination by any state regulatory authority or that operate pursuant to any state or federal statutory or administrative authorization, such as a workers' compensation or auto assigned risk pool
- Those where the gross annual premium ceded is less than 5% of policyholder surplus, as these transactions are deemed immaterial and may represent situations where an insurance company is exiting a line of business as opposed to a fronting arrangement
- Cessions to captive insurance companies, which are regulated in their domiciliary state (captive insurance companies are used by parent companies (non-insurance) to keep commercial insurance costs down)

Special Code "3" – Counterparty Reporting Exception for Asbestos and Pollution Contracts under SSAP No. 62R – Property Casualty Reinsurance

Special Code "3" identifies those reinsurers that have been aggregated into one line in Schedule F in accordance with the counterparty reporting exception for asbestos and pollution contracts under SSAP No. 62R paragraphs 66 through 68. This exception allows the Provision for Reinsurance to be reduced by reflecting that amounts have been recovered by the reporting entity under duplicate coverage provided by the retroactive contract, and that inuring balances from the original contract(s) are payable by the retroactive counterparty, if applicable. In order for this exception to be employed, the agreement must comply with paragraphs 66.a. through 66.e. and the reporting entity must obtain prior approval by its domiciliary regulator.

If this exception is employed, the reporting entity must complete the *Supplemental Schedule for Reinsurance Counterparty Reporting Exception – Asbestos and Pollution Contracts*.

Note that this exception only applies to the calculation of the Provision for Reinsurance and how these contracts are presented in Schedule F. It does not change the treatment of retroactive reinsurance accounting.

Special Code "4" – Incurred but not Reported Losses on Contracts in Force Prior to July 1, 1984 that are Exempt from the Statutory Provision for Unauthorized Reinsurance

IBNR losses on contracts in force prior to July 1, 1984 and not subsequently renewed are exempt from the statutory provision for unauthorized reinsurance. These contracts are identified by a 4 in this column with details of amounts provided in Part 2, Question 17, of the General Interrogatories to enable the reader to assess significance.

Many of the columns in the first section (the first 20 columns) of Schedule F, Part 3, are mirror images (albeit with different column numbers) to the corresponding contents of Part 1 for assumed reinsurance and pertain to premiums ceded, reinsurance recoverable, reinsurance payable and funds held by the

reporting entity. In our discussion of the remaining columns of Part 3, we provide parenthetical references to amounts in Schedule F of Fictitious Insurance Company's 2018 Annual Statement where applicable.

Premiums ceded

The amount of written premium that is ceded to each of the company's reinsurers during the year is shown in column 6. The total amount in column 6 ($1,882; $000 omitted) should reconcile to the total of columns 4 plus 5 in Part 1B of the Underwriting and Investment Exhibit (shown in whole dollars).

Reinsurance recoverable

Columns 7 and 8 provide recoverables on paid losses and LAE ($426; $000 omitted). These are booked as an asset on the insurance company's balance sheet ($426,000 on page 2, line 16.1) because the company is awaiting receipt of a recovery from its reinsurer on payments that the insurance company already made to the claimant.

Columns 9 through 12 provide recoverable on unpaid loss and LAE. The totals of column 9 ($5,343; $000 omitted) will reconcile to the Underwriting and Investment, Part 2A, column 3 (shown in whole dollars). The totals of column 11 ($4,038; $000 omitted) will reconcile to the Underwriting and Investment, Part 2A, column 7 (shown in whole dollars).

For companies that do not participate in intercompany pooling, Schedule F, Part 3, columns 9 through 12 are equal to the amount of ceded reserves that are netted against the gross loss and LAE reserves, which result in the net loss and loss adjustment expense reserves shown on page 3 of the balance sheet in rows 1 plus 3. Columns 9 through 12 should also reconcile to the sum of the totals in columns 14, 16, 18, 20 and 22 of Schedule P, Part 1 – Summary as follows:

- The totals in Schedule F, Part 3, columns 9 and 11 ($5,343 and $4,038) should reconcile directly to the total amounts in Schedule P, Part 1, columns 14 and 16 ($5,343 and $4,038), respectively.[63]

- Similarly, Schedule F, Part 3, column 10 ($258) should reconcile to Schedule P – Part 1, column 18 ($258), since the NAIC Annual Statement Instructions require column 10 of Schedule F, Part 3 to exclude Adjusting and Other expenses.

- The total in Schedule F, Part 3, column 12 ($503) should reconcile to the sum of the totals in columns 20 and 22 of Schedule P, Part 1 ($503) .[64]

Even if the company does participate in intercompany pooling, the recoverables on known case and IBNR loss reserves should match columns 3 (reported losses recoverable from authorized, unauthorized

[63] Any differences are due to rounding within the Annual Statement for Fictitious Insurance Company.
[64] ibid.

and certified reinsurers) and 7 (IBNR losses on reinsurance ceded) of the Underwriting and investment Exhibit Part 2A.

Note that Part 3 provides IBNR reserves, as these are amounts determined and recorded by the reporting entity. Recall that Part 1 does not provide IBNR. Part 1 provides case reserve amounts reported by the assuming company from the ceding company. While the ceding company may report IBNR to the assuming company, it is the assuming company's responsibility to book what it believes to be its best estimate.

Column 13 represents the amount of unearned premium that will be ceded to an insurance company's reinsurers ($920; $000 omitted). This should equal to the parenthetical amount on page 3, line 9 of the balance sheet ($920,000), which provides the reduction to gross unearned premium for the amount ceded. This is a contra liability to the ceding company. It should also reconcile directly to the amount in item (1) within the "Reinsurance" note of the Notes to Financial Statements titled "Reinsurance Assumed and Ceded" (shown in whole dollars; Note 23C of the 2018 Annual Statement).

Column 14 is similar to Schedule F, Part 1, column 9 (contingent commissions payable), but column 14 is from the view point of the reporting entity as a ceding company (reinsured) as opposed to the reporting entity as the reinsurer. Schedule F, Part 3, column 14 represents the amount of contingent commissions receivable from the reporting entity's reinsurers. The amount in column 14 ($11; $000 omitted) should reconcile to item (2) within the "Reinsurance" note of the Notes to Financial Statements titled "Reinsurance Assumed and Ceded" (shown in whole dollars; Note 23C of the 2018 Annual Statement), which provides the amount of additional or return commission contingent upon loss experience or other forms of profit-sharing arrangement under the reporting entity's existing reinsurance contracts. In the case of Fictitious, this amount is positive, which means that Fictitious expects to receive additional commission from the companies it cedes business to (specifically Good Reinsurer and Slightly Overdue Reinsurer) as a result of favorable loss experience. However, the amount can also be negative, which would mean that the reinsurer's experience has been worse than anticipated under the contract and the reporting entity is expected to return some of the commission already received.

Column 15 provides a sum of reinsurance recoverables, whether on paid (an asset) or unpaid losses (a reduction to liabilities), a reduction to unearned premiums, or contingent commissions receivable. Column 16 identifies amounts in dispute that are included in column 15. Amounts in dispute are those for which the reinsurer has disputed amounts due through formal written notification, arbitration or litigation.

Reinsurance payable

Columns 17 and 18 provide other amounts payable by the insurance company to the reinsurer. All other commissions receivable that are not included in column 14 are netted with ceded balances payable in column 17. Column 17 ($440; $000 omitted) should reconcile to page 3, line 12, "Ceded reinsurance premiums payable (net of ceding commissions) ($440,000). Amounts in column 18 ($0) represent

miscellaneous liabilities owed to the reinsurer under the ceded contracts, excluding funds held by the company under the terms of the contracts with its reinsurers. Funds held are provided for separately in column 20.

Column 19 ($11,061; $000 omitted) represents the net amount recoverable from reinsurers and is equal to column 15 reduced by columns 17 and 18.

Funds held

Column 20 provides the liability for funds held by company under reinsurance treaties ($170; $000 omitted) and reconciles to page 3, line 13 ($170,000). This provision is the mirror image of that reported by the reinsurer in a transaction, as described in Part 1. It is used by the reporting entity to protect balances due from the reinsurer under the terms of the reinsurance contract. As we will see in the remainder of Schedule F, Part 3, the liability for funds held enables the insurance company to mitigate its liability for unauthorized, certified and overdue authorized reinsurance.

Credit Risk on Ceded Reinsurance (columns 21 through 36)

This section of Part 3 is new in 2018. The information reported in this section is not only used in the calculation of the provision for reinsurance, but it is also used in the calculation of the credit risk charge for reinsurance recoverables for RBC purposes. The calculation is performed on reinsurance balances receivable on reinsurance ceded to non-affiliated companies. Cessions to state mandated residual market mechanisms, the National Council on Compensation Insurance, Federal Insurance Programs (e.g., National Flood Insurance Program), and U.S. parents, subsidiaries and affiliates are exempt from this charge and therefore excluded from the calculation.

The amount of the credit risk charge is dependent upon whether the reinsurance recoverables are collateralized or not and the financial strength of the reinsurers. Therefore, the credit risk charge is calculated separately for collateralized and uncollateralized recoverables in columns 35 and 36, respectively.

The financial strength of the reinsurers is determined based on the current rating received from an approved rating agency as outlined in the table below taken from the 2018 NAIC Annual Statement Instructions.

TABLE 22

	Reinsurer Designation Equivalent Category						
Code	1	2	3	4	5	6	7
Description	Secure 1	Secure 2	Secure 3	Secure 4	Secure 5	Vulnerable 6 or Unrated Unauthorized Reinsurers	Unrated Authorized Reinsurers
Best	A++	A+	A	A-	B++, B+	B, B-, C++, C+, C, C-, D, E, F	.....
S&P	AAA	AA+, AA, AA-	A+, A	A-	BBB+, BBB, BBB-	BB+, BB, BB-, B+, B, B-, CCC, CC, C, D, R	.....
Moody's	Aaa	Aa1, Aa2, Aa3	A1, A2	A3	Baa1, Baa2, Baa3	Ba1, Ba2, Ba3, B1, B2, B3, Caa, Ca, C	.....
Fitch	AAA	AA+, AA, AA-	A+, A	A-	BBB+, BBB, BBB-	BB+, BB, BB-, B+, B, B-, CCC, CC, C, D, R	.....

Table 22 provides a mapping of the current financial strength rating to an equivalent designation category used for purposes of applying the applicable credit risk-based capital charge for collateralized and uncollateralized recoverables as provided in Tables 23 and 24 below from the 2018 Annual Statement Instructions. The equivalent designation category is provided in column 34 of Part 3 (Reinsurance Designation Equivalent).

TABLE 23

Credit Risk Charge on Collateralized Recoverables

Code	1	2	3	4	5	6	7
Factor	3.6%	4.1%	4.8%	5.0%	5.0%	5.0%	5.0%

TABLE 24

Credit Risk Charge on Uncollateralized Recoverables

Code	1	2	3	4	5	6	7
Factor	3.6%	4.1%	4.8%	5.3%	7.1%	14.0%	10.0%

The calculation of credit risk for RBC purposes is offset by the liability that has been established for purposes of the reinsurance penalty (Provision for Reinsurance) in the Annual Statement (Page 3, Line 16). Therefore, before application of the credit risk charge, the reinsurance recoverables in column 15 are reduced by the Schedule F penalty provided in column 27 (equal to the Provision for Reinsurance in column 78) to produce column 28, the total amount recoverable from reinsurers less any applicable

reinsurance penalty. Column 28 is multiplied by 120% to stress the recoverable in column 29. The total of reinsurance payable and funds held (total of columns 17 plus 18 plus 20, but not in excess of the stressed recoverable in column 29) are applied as offsets to arrive at the stressed net recoverable in column 31. Based on the Reinsurer Designation Equivalent in column 34, the credit risk charge on uncollateralized recoverables (provided in Table 24) is applied to the stressed net recoverable net of collateral offsets provided in column 33 to arrive at the credit risk on uncollateralized recoverables in column 36. Credit risk on collateralized recoverables in column 35 is determined by applying the credit risk charge on collateralized recoverables (provided in Table 23) to total collateral in column 32 (columns 21 plus 22 plus 24, not in excess of the stressed net recoverable in column 31).

Note for purposes of calculating the reinsurance credit risk charge, reinsurance recoverables are reduced by IBNR for reinsurers with Special Code "4" indicated in column 5. Recall, Special Code "4" designates those reinsurers with IBNR loses on contracts in force prior to July 1, 1984 that are exempt from the Provision for Reinsurance.

Aging of Ceded Reinsurance (columns 37 through 53)

Columns 37 through 53 of Part 3 comprise the section on the "Aging of Ceded Reinsurance" This section provides a breakdown by age of the paid loss and LAE amounts recoverable from the insurance company's reinsurers that are shown in columns 7 (reinsurance recoverable on paid loss) and 8 (reinsurance recoverable on paid LAE) of Schedule F, Part 3.

Paid loss and LAE recoverables are provided in the following age categories:

- Current (column 37)
- 1 to 29 days (column 38)
- 30 to 90 days (column 39)
- 91 to 120 days (column 40)
- Over 120 days (column 41)

The total amount of paid loss and LAE recoverable that is overdue (columns 38 through 41) is provided in column 42. The total amount of paid loss and LAE recoverable that is due (current in column 37 plus overdue in column 42) is provided in column 43. The amount in column 43 ($426 in total; $000 omitted) reconciles to the amount in column 7 (recoverable on paid loss) plus column 8 (recoverable on paid LAE) in Schedule F, Part 3 ($426 + $0 = $426 in total; $000 omitted) and Page 2, line 16.1 (amounts recoverable from reinsurers; $426,000) of the Annual Statement. As stated previously, paid loss and LAE recoverables are assets of the reporting entity.

According to the NAIC Annual Statement Instructions, the age of the recoverable is based on the following:

- The terms of the reinsurance contract as to when claims are to be paid by the reinsurer, if specified

- The terms of the reinsurance contract as to when claims are to be reported by the insurance company to the reinsurer, if specified
  Or
- The date when the amount recoverable exceeds $50,000 for a particular reinsurer and is entered in the insurance company's financial accounts as a paid recoverable

If the amount recoverable is less than $50,000, and the aforementioned paid/reported dates are not specified in the contract, then the recoverable is reported in column 37 as currently due.

Note that recoverables from mandatory pools and associations are reported in column 37 as currently due.

Columns 49 through 50 provide percentages of the overdue balances to total amounts due. Column 49 provides the percentage overdue relative to the total due (column 42 divided by column 43), column 50 provides the percentage overdue greater than 90 days and not in dispute (column 47 divided by columns 46 plus 48), and column 51 provides the percentage overdue greater than 120 days to the total due (column 41 divided by column 43). These percentages are used in the calculation of the provision for reinsurance.

Provision for Reinsurance for Certified Reinsurance (columns 54 through 69)

In 2012, the NAIC added a third facet to the "authorized" and "unauthorized" categorization of reinsurers in Schedule F, called "certified." This resulted in the addition of a new Part 6 to Schedule F, shifting the former Parts 6 through 8 to Parts 7 through 9, respectively. In 2018, numerous individual parts used to derive the provision for reinsurance were consolidated into a single new Part 3 within Schedule F, with columns 54 through 69 being specific to certified reinsurers.

Certified reinsurers are non-U.S. reinsurers domiciled in a jurisdiction designated by the NAIC as a Qualified Jurisdiction (i.e., Bermuda, France, Germany, Ireland, Japan, Switzerland and the United Kingdom) that would have been categorized as unauthorized prior to 2012, but have applied for and attained certification from the reporting entity's domiciliary state as a certified reinsurer. A non-U.S. reinsurer that is not certified is required to post 100% collateral for its U.S. claims. Once a reinsurer is certified, it is allowed to provide a reduce amount of collateral for its U.S. claims. In attaining certification, consideration is made for the reinsurer's jurisdiction, financial position, amount of capital and surplus, regulatory history, financial strength rating(s) from[65] recognized rating agency(ies), among other factors. Once certified, the reinsurer is given a rating that ranges from 1 to 6, called the Certified Reinsurer Rating. A reinsurer with a rating of 1 is considered most secure from a financial strength perspective; a reinsurer with a rating of 6 is considered vulnerable.

[65] The list can be found at this link: https://content.naic.org/sites/default/files/inline-files/committees_e_reinsurance_qualified_jurisdictions_list_1.pdf, and the designation was initially effective on January 1, 2015

The rating defines the amount of collateral that the reinsurer is required to post with the reporting entity. The more secure the certified reinsurer, the less collateral required. For example, a reinsurer with a rating of 1 is not required to post any collateral; a reinsurer with a rating of 6 is required to post 100% of total recoverable due to the reporting entity in collateral.[66] The rating and collateral are used in the calculation of the provision for reinsurance in column 77 of Schedule F, Part 3.

The obvious benefits of this new "certified" category are twofold: (1) the reporting entity does not get "penalized" as much as an unauthorized reinsurer in the provision for reinsurance, and (2) the reinsurer does not have to post as much security with the ceding company.

The provision for certified reinsurance comprises two parts, one coming from column 64 and the other from column 69. Column 64 provides the provision for reinsurance ceded to certified reinsurers due to collateral deficiency. This provision is equal to total recoverables from certified reinsurers offset by any corresponding payables (from Schedule F, Part 3, column 19) in excess of the amount of credit permitted for recoverables based on the Certified Reinsurer Rating (column 63). The amount of credit permitted is based on the amount of collateral actually posted by the reinsurer relative to the amount of collateral required based on its Certified Reinsurer Rating. For example, if a certified reinsurer has a rating of 6, then the reinsurer is required to post 100% of the recoverable in collateral. However, if the reinsurer only posts 75% of the total collateral required, then the reporting entity would record a provision for reinsurance in Section 1 equal to 25% of the recoverable. The 25% represents the deficiency in collateral; 75% represents the amount of credit permitted.

Column 69 of Part 3 provides the provision for overdue reinsurance ceded to certified reinsurers. As with authorized and unauthorized reinsurers, overdue reinsurance ceded is defined as recoverable on paid losses and LAE more than 90 days overdue per columns 40 and 41.

As we will see, the provision for overdue certified reinsurers is calculated similarly to the provision for authorized reinsurance, in that the provision is greater for slow payers (i.e., those certified reinsurers where the percent of recoverables on paid losses and LAE more than 90 days overdue is 20% or more), than non-slow payers. In the case of slow payers, instead of 20% of the recoverables on paid losses and LAE, the maximum amount of the recoverables on paid losses and LAE and the net unsecured recoverable for which credit is allowed is considered. In either case, the provision is not to excess the amount of credit allowed for net recoverables per column 63.

Total Provision for Reinsurance (columns 70 through 78)

As explained in the "Overview" section of this chapter, the provision for reinsurance is a minimum reserve that is calculated under SAP to reflect an estimate of recoveries under the reporting entity's reinsurance contract(s) that it will not be able to collect. The provision is provided in column 78 and is the sum of the following three main elements:

[66] A rating of Secure-2 requires 10%; Secure-3 requires 20%; Secure-4 requires 50%; and Secure-5 requires 75%.

1. Provision for authorized reinsurance in column 75, which emanates from overdue balances.
2. Provision for unauthorized reinsurance in column 76, which comprises two components, the sum of columns 71 and 72:
    - Column 71 provides the provision due to collateral deficiency.
    - Column 72 provides the provision due to overdue balances.
3. Provision for certified reinsurers in column 77, which similarly comprises two components, the sum of columns 64 and 69:
    - Column 64 provides the provision due to collateral deficiency.
    - Column 69 provides the provision due to overdue balances.

For Fictitious, the components of the provision for reinsurance are as follows:

TABLE 25

Column	Provision for Reinsurance (USD in 000)	Total
75	1. Provision for Authorized Reinsurance	46
76	2. Provision for Unauthorized Reinsurance	224
77	3. Provision for Certified Reinsurance	13
78	Total Provision for Reinsurance	283

Details underlying the computation of each of these three elements is provided below.

1. Provision for Amounts Ceded to Authorized Reinsurers in column 75

An authorized reinsurer is one that is either licensed or accredited in the ceding insurance company's state of domicile or domiciled in a state that employs standards regarding credit for reinsurance substantially similar to those of the ceding insurance company's state of domicile and is therefore regulated in the U.S. and subject to minimum capital and surplus requirements. As a result, there is less concern about the reinsurer's ability to pay unless the reinsurer is late in making payments or has disputed the ceded balance. Therefore, for authorized reinsurers, the provision for reinsurance emanates from overdue balances, including amounts in dispute.

For purposes of calculating the provision for overdue authorized reinsurance, "overdue" reinsurance is defined as the amount of paid loss and LAE recoverable over 90 days past due for reasons other than dispute between the insurance company and the reinsurer.

The provision for authorized reinsurance is equal to the sum of column 73 and 74. The provision that emanates from column 73 comprises overdue authorized reinsurance that represents *less than 20%* of the total recoverable on paid loss and LAE (plus amounts received by the insurance company from that reinsurer in the prior 90 days). For these reinsurers, most of the payments are less than three months late. This of course is not as great of a concern from a collectability standpoint as is the situation where the majority of the amount overdue from a reinsurer is greater than 90 days (i.e., the provision for "slow payers" derived in column 74); the likelihood of the reinsurer reimbursing the insurance company is less as time goes on.

The provision for overdue authorized reinsurance in column 73 is calculated as (1) 20% of the amount of reinsurance recoverable on paid losses and LAE more than 90 days overdue, plus (2) 20% of amounts in dispute excluded from the recoverable on paid losses and LAE more than 90 days overdue for those authorized reinsurers where the amount overdue represents less than 20% of the total. This is equal to 20% of the amount reported in column 47 plus 20% of the amount reported in column 45.

For Fictitious Insurance Company, "Good Reinsurer" and "Slightly Overdue Reinsurer" are the only authorized reinsurers for which loss and LAE payments are overdue in 2018 *and* for which the overdue amount represents *less than 20%* the total recoverable on paid, as indicated by a "YES" in column 52.

Column 74 provides the provision for what Sholom Feldblum refers to as "slow-paying" [67] authorized reinsurers (i.e., authorized reinsurers where the amount of paid loss and LAE recoverable more than 90 days overdue represents *greater than or equal to 20%* of the total recoverable on paid losses and LAE). Column 74 is calculated as 20% of the maximum of (1) reinsurance recoverable on all items less funds held and collateral in column 26 and (2) the amount recoverable on paid losses and LAE greater than 90 days past due in columns 40 and 41.

Similar to column 73, the provision for overdue authorized reinsurers in column 74 considers reinsurance recoverables on paid loss and LAE greater than 90 days overdue. However, column 74 also considers all recoverables from the reinsurer, less allowable offsets. We note that the reinsurance recoverables would include amounts in dispute. In column 74, the greater of all items recoverable less offsets, and paid recoverables more than 90 days due, is used in the calculation of the provision. In other words, slow payers are penalized in the calculation of the provision for authorized reinsurance.

As indicated in column 52 by a "NO", Fictitious has two slow-paying reinsurers: "Overdue Reinsurer" and "Foreign Authorized."

The following table details the first step in the calculation of the provision of authorized reinsurance for Fictitious Insurance Company, the determination of whether amounts overdue are less than 20% of total recoverables on paid losses and LAE in column 52.

[67] Feldblum, S., "Reinsurance Accounting: Schedule F," CAS Exam Study Note, April 2003, 8th Edition, page 22.

TABLE 26

Authorized Reinsurance (USD in 000)							
Do overdue amounts represent less than 20% of total recoverables on paid losses and LAE?							
Column		**Good Reinsurer**	**Overdue Reinsurer**	**Slightly Overdue Reinsurer**	**Pooling Company**	**Foreign Authorized**	**Source**
52	Do overdue amounts represent less than 20% of total recoverables on paid losses and LAE (plus amounts received in prior 90 days)?	YES	NO	YES	YES	NO	If Column 50 is less Than 20%, then "Yes" and go to Column 73, else "No" and go to Column 74
50	Percentage of Amounts More Than 90 Days Overdue Not in Dispute	0.0%	100.0%	8.3%	0.0%	23.5%	Column 47 / [Column 46 + 48]
46	Total Recoverable on Paid Losses & LAE Amounts Not in Dispute	258	10	60	-	34	Columns 43 - Column 44
47	Recoverable on Paid Losses & LAE Over 90 Days Past Due Amounts Not in Dispute	-	10	5	-	8	Columns 40 + 41 - 45
48	Amounts Received Prior 90 Days	-	-	-	-	-	Input by Company
Reinsurance Recoverable on Paid Losses and Paid Loss Adjustment Expenses							
37	Current	248	-	54	-	26	Input by Company
38	1 - 29 days past due	10	-	-	-	-	Input by Company
39	30 - 90 days past due	-	-	5	-	-	Input by Company
40	91 - 120 days past due	-	-	5	-	8	Input by Company
41	Over 120 days past due	-	10	-	-	-	Input by Company
42	Total Overdue	10	10	10	-	8	Columns 38 + 39 + 40 + 41
43	Total Due	258	10	64	-	34	Columns 37 + 42; equals Schedule F, Part 3, Columns 7 + 8
44	Total Recoverable on Paid Losses & LAE Amounts in Dispute Included in Column 43	-	-	4	-	-	Input by Company
45	Recoverable on Paid Losses & LAE Over 90 Days Past Due Amounts in Dispute Included in Columns 40 & 41	-	-	-	-	-	Input by Company

Once column 52 is determined, the calculation of the provision for reinsurance for authorized reinsurance is separately determined for those overdue authorized reinsurers for which column 52 is a "yes" and those for which column 52 is a "no", as displayed below for Fictitious.

Provision for Authorized Reinsurance (USD in 000)							
Column		Good Reinsurer	Overdue Reinsurer	Slightly Overdue Reinsurer	Pooling Company	Foreign Authorized	Source
75	Provision for Authorized Reinsurance	-	43	1	-	2	Columns 73 + 74; if less than 0, enter 0
Provision for Overdue Balances and Amounts in Dispute							
73	Provision for overdue authorized representing less than 20%of total recoverables on paids (plus amounts received in prior 90 days)	-	-	1	-	-	If Column 52 = "YES", 20%of Column 47 + 20%of Column 45; otherwise = 0
74	Provision for "slow payers" (overdue authorized representing greater than or equal to 20%of total recoverables on paids (plus amounts received in prior 90 days))	-	43	-	-	2	If Column 52 = "No", Greater of 20%of Column 26 and 20% of [Columns 40 + 41]; otherwise = 0
26	Net Recoverable Net of Funds Held & Collateral	4,137	217	2,779	617	-	Column 15 - Column 25, unless Column 5 = Special Code 4, then reduce Column 15 by Columns 11 + 12 in this calculation
15	Reinsurance Recoverable on paid, known case and IBNR loss and LAE, unearned premiums and contingent commissions	4,137	745	2,873	628	2,411	Coumns 7 through 14 Totals
25	Total Funds Held, Payables & Collateral	-	528	94	11	2,411	Minimum of [Column 15 and sum of Columns 17 + 18 + 20 + 21 + 22 + 24], unless Column 5 = Special Code 4, then reduce Column 15 by Columns 11 + 12 in this calculation
Reinsurance Payable							
17	Ceded Balances Payable	-	13	94	11	255	Input by Company
18	Other Amounts Due to Reinsurers	-	-	-	-	-	Input by Company
Funds Held							
20	Funds Held by Company Under Reinsurance Treaties	-	-	-	-	-	Input by Company
Collateral							
21	Multiple Beneficiary Trusts	-	-	-	-	-	Input by Company
22	Letters of Credit	-	515	-	-	2,500	Input by Company
24	Single Beneficiary Trusts & Other Allowable Collateral	-	-	-	-	-	Input by Company

2. Provision for unauthorized reinsurance in column 76

The provision for unauthorized reinsurance requires that the insurance company establish a liability to protect against the inability to collect on amounts due from a reinsurer not authorized or certified by the domiciliary state of the insurance company. The liability emanates from two sources:

- Collateral deficiency (column 26), which is defined as the total amount of reinsurance recoverables, including amounts in dispute, offset by funds held, payables and collateral (i.e., the unsecured recoverable in column 26); and

- Overdue balances (i.e., 20% of column 47) and amounts in dispute (20% of column 16)

To put it another way, the liability is equal to total recoverable from unauthorized reinsurers, reduced for allowable offsets only to the extent that there are no amounts in dispute or more than 90 days due (and not in dispute). Otherwise, the allowable offsets are reduced by 20% of amounts due from late payers and 20% of amounts recoverable that are in dispute. Late payers and those that dispute coverage are more likely not to pay than those unauthorized reinsurers that have a history of paying on time and where no amounts are currently in dispute. For each reinsurer, the liability is capped at the total amount of reinsurance recoverable from that reinsurer.

The Appointed Actuary comments on the collectability of reinsurance in the Statement of Actuarial Opinion. However, a large provision for reinsurance would not always mean there is a collectability issue. Just because a reinsurer is not authorized (or certified) to transact business in the company's domiciliary state doesn't mean that the reinsurer is not viable and will not pay claims owed under the terms of the reinsurance contract.

The following provides the calculation of the Provision for Unauthorized Reinsurers included in Schedule F, Part 3, column 76 of the 2018 Annual Statement for Fictitious Insurance Company.

TABLE 27

Provision for Unauthorized Reinsurance (USD in 000)							
		Reinsurer					
Column		A	B	C	D	E	Source
76	Provision for Unauthorized Reinsurance	22	75	126	-	1	Minimum of [Column 15 and sum of Columns 71 + 72]; if less than 0, enter 0
71	Provision for Reinsurance Due to Collateral Deficiency	21	75	116	-	1	Column 26
72	Provision for Reinsurance Due to Overdue Balances and Amounts in Dispute	1	0	10	-	-	Column 70 + 20% of Column 16
71	Provision for Reinsurance Due to Collateral Deficiency	21	75	116	-	1	Column 26
26	Net Recoverable Net of Funds Held & Collateral	21	75	116	-	1	Column 15 - Column 25, unless Column 5 = Special Code 4, then reduce Column 15 by Columns 11 + 12 in this calculation
5	Special Code				4		Input by Company
11	IBNR Loss Reserves	16	80	58	16	80	
12	IBNR LAE Reserves	4	22	22	4	22	
15	Reinsurance Recoverable on paid, known case and IBNR loss and LAE, unearned premiums and contingent commissions	42	171	149	35	171	Columns 7 through 14 Totals
25	Total Funds Held, Payables & Collateral	21	96	33	15	170	Minimum of [Column 15 and sum of Columns 17 + 18 + 20 + 21 + 22 + 24], unless Column 5 = Special Code 4, then reduce Column 15 by Columns 11 + 12 in this calculation
Reinsurance Payable							
17	Ceded Balances Payable	1	3	3	1	2	Input by Company
18	Other Amounts Due to Reinsurers	-	-	-	-	-	Input by Company
Funds Held							
20	Funds Held by Company Under Reinsurance Treaties	20	-	20	30	100	Input by Company

Collateral							
21	Multiple Beneficiary Trusts	-	-	10	-	-	Input by Company
22	Letters of Credit	-	93	-	-	68	Input by Company
24	Single Beneficiary Trusts & Other Allowable Collateral	-	-	-	-	-	Input by Company
72	Provision for Reinsurance Due to Overdue Balances and Amounts in Dispute	1	0	10	-	-	Column 70 + 20% of Column 16
70	20% of Recoverable on Paid Losses & LAE Over 90 Days Past Due Amounts Not in Dispute	1	0	-	-	-	20% of Column 47
47	Recoverable on Paid Losses & LAE Over 90 Days Past Due Amounts Not in Dispute	5	1	-	-	-	Columns 40 + 41 - 45
Reinsurance Recoverable on Paid Losses and Paid Loss Adjustment Expenses							
40	91 - 120 days past due	5	1	-	-	-	Input by Company
41	Over 120 days past due	-	-	-	-	-	Input by Company
45	Recoverable on Paid Losses & LAE Over 90 Days Past Due Amounts in Dispute Included in Columns 40 & 41	-	-	-	-	-	Input by Company
16	Amount in Dispute Included in Column 15	-	-	50	-	-	Input by Company

3. Provision for certified reinsurers in column 77

As discussed earlier in this chapter, the provision for certified reinsurance is calculated in a separate, dedicated section of Part 3, in columns 54 through 69, and emanates from two sources:

- Collateral deficiency (column 64), which is defined as the total amount of reinsurance recoverables, including amounts in dispute, net of reinsurance payables and the amount of credit allowed (column 19 minus column 63); and
- Overdue balances (column 69) which is calculated as the greater of 20% of recoverables on paid losses and LAE, including amounts in dispute (i.e., 20% of column 47 and 20% of column 45). For "slow payers", the provision is modified to be at least equal to 20% of the net unsecured recoverable for which credit is allowed (column 68 = 20% * column 67 = 20% * (column 63 minus column 66)). In either case, the provision should not exceed the amount of credit allowed for net recoverables in column 63.

The following provides the calculation of the Provision for Certified Reinsurers included in Schedule F, Part 3, column 77 of the 2018 Annual Statement for Fictitious Insurance Company.

TABLE 28

Provision for Certified Reinsurance (USD in 000)					
Column		ABC Reins LTD	DEF Reins LTD	GHI Reins LTD	Source
77	Provision for Certified Reinsurance	9	4	-	Columns 64 + 69; if less than 0, enter 0
64	Provision for Reinsurance Due to Collateral Deficiency	9	-	-	Greater of Column 19 - Column 63 and 0
69	Provision for Reinsurance Due to Overdue Balances and Amounts in Dispute	-	4	-	Greater of Columns 62 + 65 and Column 68, not to exceed Column 63
64	Provision for Reinsurance Due to Collateral Deficiency	9	-	-	Greater of Column 19 - Column 63 and 0
19	Net Amount Recoverable From Reinsurers	84	41	(6)	Columns 15 - (17 + 18)
15	Reinsurance Recoverable on paid, known case and IBNR loss and LAE, unearned premiums and contingent commissions	121	52	3	Columns 7 through 14 Totals
Reinsurance Payable					
17	Ceded Balances Payable	37	11	9	Input by Company
18	Other Amounts Due to Reinsurers	-	-	-	Input by Company
63	Amount of Credit Allowed for Net Recoverables	75	41	-	Column 57 + [Column 58 * Column 61]
57	Catastrophe Recoverables Qualifying for Collateral Deferral	-	-	-	Input by Company
58	Net Recoverables Subject to Collateral Requirements for Full Credit	84	41	(6)	Column 19 - Column 57
61	Percent Credit Allowed on Net Recoverables Subject to Collateral Requirements	89	100	-	Column 60 / Column 56, not to exceed 100%
60	Percent of Collateral Provided for Net Recoverables Subject to Collateral Requirements	17.9	151.2	-	[Columns 20 + 21 + 22 + 24] / Column 58
56	Percent Collateral Required for Full Credit (0% through 100%)	20.0	10.0	10.0	
Funds Held					
20	Funds Held by Company Under Reinsurance Treaties	-	-	-	Input by Company

Collateral					
21	Multiple Beneficiary Trusts	-	40	-	Input by Company
22	Letters of Credit	15	22	-	Input by Company
24	Single Beneficiary Trusts & Other Allowable Collateral	-	-	-	Input by Company
72	Provision for Reinsurance Due to Overdue Balances and Amounts in Dispute	-	4	-	Greater of Columns 62 + 65 and Column 68, not to exceed Column 63
62	20% of Recoverable on Paid Losses & LAE Over 90 Days Past Due Amounts in Dispute	-	-	-	20% of Column 45
65	20% of Recoverable on Paid Losses & LAE Over 90 Days Past Due Amounts Not in Dispute	-	4	-	20% of Column 47
68	20% of Amount in Column 67 (for "slow payers")	-	-	-	20% of Column 67
45	Recoverable on Paid Losses & LAE Over 90 Days Past Due Amounts in Dispute Included in Cols. 40 & 41	-	-	-	Input by Company
47	Recoverable on Paid Losses & LAE Over 90 Days Past Due Amounts Not in Dispute	-	20	-	Columns 40 + 41 - 45
67	Net Unsecured Recoverable for Which Credit is Allowed (for "slow payers")	-	-	-	Column 63 - Column 66, if Column 52 = "No"
66	Total Collateral Provided (for "slow payers")	-	41	-	Columns 20 + 21 + 22 + 24; not to exceed Column 63; if Column 52 = "No"
Reinsurance Recoverable on Paid Losses and Paid Loss Adjustment Expenses					
40	91 - 120 days past due	-	20	-	Input by Company
41	Over 120 days past due	-	-	-	Input by Company
45	Recoverable on Paid Losses & LAE Over 90 Days Past Due Amounts in Dispute Included in Columns 40 & 41	-	-	-	Input by Company

The final provision for reinsurance in column 78 of Schedule F, Part 3, which is equal to the amount recorded in Liabilities, Surplus and Other Funds on Page 3, line 16 ($283,000) of the Annual Statement, is equal to the sum of the following three items:

TABLE 29 (same as TABLE 25)

Column	Provision for Reinsurance (USD in 000)	Total
75	1. Provision for Authorized Reinsurance	46
76	2. Provision for Unauthorized Reinsurance	224
77	3. Provision for Certified Reinsurance	13
78	Total Provision for Reinsurance	283

SCHEDULE F — PART 4: ISSUING OR CONFIRMING BANKS FOR LETTERS OF CREDIT FROM SCHEDULE F, PART 3 ($000 OMITTED)

Schedule F, Part 4 is for information purposes. It provides a listing of the issuing or confirming banks for letters of credit as collateral reported in Schedule F, Part 3, column 22. Confirming banks are those that provide a guarantee on a letter of credit such that the confirming bank will pay if the original bank issuing the letter of credit bank does not.

There are 5 columns in Part 4:

Column (1): provides the issuing or confirming bank reference number.

Column (2): identifies by a "1", "2" or "3" whether single, syndicated or multiple letters of credit, respectively, are provided as collateral. Syndicated letters of credit are those where one bank acts as an agent for a group of banks issuing the letter of credit.

Column (3): provides the American Bankers Association (ABA) Routing Number for the letter of credit issuing or confirming bank.

Column (4): provides the name of the issuing or confirming bank.

Column (5): provides the amount of the letter of credit, the sum of which should equal the total of Schedule F, Part 3, column 22.

SCHEDULE F — PART 5: INTERROGATORIES FOR SCHEDULE F, PART 3 ($000 OMITTED)

Schedule F, Part 5 provides interrogatories for Schedule F, Part 3. The interrogatories include two tables with more detailed information. These two tables are particularly relevant from a regulatory perspective.

The first table identifies the five largest commission rates included in the cedant's reinsurance treaties for those contracts where ceded premium is in excess of $50,000.[68] The top five provisional commission rates are considered in conjunction with column 14 (contingent commissions receivable) and the

[68] According to the NAIC Annual Statement Instructions, the five largest should exclude mandatory pools and joint underwriting associations.

aforementioned Note to the Financial Statements on reinsurance assumed and ceded. The purpose is to identify companies that may be using reinsurance as a means to conceal high operating leverage. As we shall see in Appendix I of this publication, one purpose of the NAIC's Insurance Regulatory Information System (IRIS) ratios is to identify companies that may be taking on more business and more risk than they can handle relative to their surplus. Specifically, IRIS Ratio 2 provides the ratio of net written premium to policyholders' surplus. Unusual values triggering regulatory attention are those in excess of 300% on a net basis. The 300% ratio on a net basis corresponds to the age-old generally accepted benchmark that insurers remain within the 3-to-1 range in terms of writings relative to surplus.

Companies growing rapidly may use reinsurance as a means to reduce pressure on its surplus. This is known as "surplus relief." All else being equal, an increase in the amount of ceded premiums will reduce the amount of net premiums and reduce the premium to surplus ratio (IRIS Ratio 2). This is perfectly legitimate; the purpose of reinsurance is to spread and manage insurance risk.

For example, consider a company that has $150 million of direct written premium and surplus of $25 million. The premium-to-surplus ratio is 600%, well above the 300% benchmark. Let's say this company decides to purchase a 30% quota share reinsurance contract with a fixed ceding commission of 35%. The company's net written premium would be:

Direct written premium * (1 – ceding percentage)
= $150 million * (1 – 0.30)
= $105 million.

At the onset of the contract, the company's surplus would grow by the amount of ceding commission:

Direct written premium * ceding percentage * ceding commission
= $150 million * 30% * 35%
= $15.75 million

The resulting surplus would be $40.75 million ($25 million current surplus plus $15.75 million in ceding commission). The purchase of this contract would reduce the company's premium-to-surplus ratio below the 300% "usual" value benchmark, from 600% to 258%.

However, consider the situation where the commission is instead offered on sliding scale basis such that a one-point increase in loss ratio from 65% would result in a one-point decrease in the 35% commission rate. The premium-to-surplus ratio at the onset of this contract would be the same as that under the situation where the commission rate is fixed (258%). However, if the actual loss ratio turns out to be 80%, then the company will have to return $6.75 million of the original $15.75 million in ceding commission. Instead of receiving 35% of ceded premium in commission, the company (reinsured) will end up getting only 20%. If a 20% fixed commission rate was considered at the onset, the premium-to-surplus ratio would have been 309%, triggering an unusual value for IRIS Ratio 2.

Schedule F, Part 5 and the reinsurance Note to the Financial Statements identify reinsurance contracts with high provisional commission rates so that the regulator may investigate these contracts and determine if they are being used to mask high operating leverage.

We note that IRIS Ratio 4 (surplus aid to policyholders surplus) is another statistic that can identify companies that rely heavily on reinsurance for surplus relief. As explained in Appendix I of this publication, IRIS Ratio 4 provides the ratio of surplus aid to policyholders surplus. Surplus aid is the amount of surplus enhancement in the current year attributed to ceding commission (both fixed and contingent) that has been taken into income on ceded unearned premium. Ratios of surplus aid to policyholders surplus in excess of 15% are considered unusual and trigger regulatory scrutiny.

In either of our examples (with the 35% ceding commission being either fixed or provisional), IRIS Ratio 4 would be computed as 39% at the onset of the contract, well in excess of the 15% benchmark.[69] This further illustrates the company's heavy use of reinsurance as surplus relief, masking considerable growth and uncertainty in results.

The second table in Part 5 identifies the five largest reinsurance recoverables reported in column 15 and associated ceded premiums, as well as an indicator as to whether the reinsurer is affiliated with the reporting entity. This table enables the regulator to assess concentration of reinsurance credit risk.

SCHEDULE F — PART 6: RESTATEMENT OF BALANCE SHEET TO IDENTIFY NET CREDIT FOR REINSURANCE

Part 6 of Schedule F provides a summarized form of the balance sheet with adjustments to restate it on a gross of ceded reinsurance basis. That is, Part 6 provides a snapshot of the balance sheet as if the company had no reinsurance protection.

Part 6 is one page and displays the assets followed by the liabilities. Both the assets and liabilities are in a condensed format for ease of presentation and computation. There are three columns, providing balances for each of the following asset and liability line items:

Column 1: As Reported (Net of Ceded)
This provides the amounts included on page 2 of the Annual Statement, which are net of reinsurance.

Column 2: Restatement Adjustments
This provides the adjustments necessary to put the net amounts in column 1 on a gross of reinsurance basis in column 3.

Column 3: Restated (Gross of Ceded)
This is equal to the sum of columns 1 and 2 and shows the corresponding asset and liability figures on a gross of reinsurance basis.

[69] IRIS Ratio 4 is computed as the unearned premium reserve of $45 million multiplied by the 35% ceding commission and divided by policyholders surplus of $40.75 million.

Adjustments to assets

The asset side of the balance sheet is generally easier to adjust because there are fewer items that require adjustment. This is because certain items relate to direct or assumed business only, and/or certain items are not impacted by the amounts associated with a company's ceded reinsurance transactions. In general, no adjustment is made to the following asset items within Part 9:

- Cash and invested assets (line 1 of Schedule F, Part 6; line 12 of page 2), as these represent balances that the company has on hand or invested, regardless of its ceded reinsurance
- Premiums and considerations (line 2 of Schedule F, Part 6; line 15 of page 2), as these represent uncollected or deferred balances relating to direct written premiums
- Funds held by or deposited with reinsured companies (line 4 of Schedule F, Part 9; line 16.2 of page 2), as these represent balances for business assumed by the company, not ceded
- Other assets (line 5 of Schedule F, Part 6; representing the balance of page 2 not separately identified), as these represent balances that would not change regardless of ceded reinsurance balances, such as title plants, furniture and electronic data equipment
- Protected cell assets (line 7 of Schedule F, Part 6; line 27 of page 2), as these are not related to ceded reinsurance

The only two lines that are affected by the reinsurance adjustments are line 3, reinsurance recoverable on loss and loss adjustment expense payment, and line 6, net amount recoverable from reinsurers. The adjustment in line 3 is simply a reversal of the amount of reinsurance recoverable on loss and LAE such that the balance gross of reinsurance ceded is $0 for this asset. The adjustment for line 6 is a balancing item such that the total adjustments on the liabilities side of the balance sheet equal those on the asset side.

Adjustments to liabilities

With respect to the Liability side of the balance sheet, no adjustment is typically made to the following line items in Part 6:

- Taxes, expense, and other obligations (line 10 of Schedule F, Part 9; lines 4 through 8 of page 3), as these are generally applied to direct writings
- Advance premium (line 12 of Schedule F, Part 6; line 10 of page 3), as this represents balances that the company has received in advance on its direct writings
- Dividends declared and unpaid (line 13 of Schedule F, Part 6; line 11.1 and 11.2 of page 3), as dividends are not affected by the ceded reinsurance balances

- Amounts withheld or retained by company for account of others (line 16 of Schedule F, Part 6; line 14 of page 3), as these balances are not related to ceded reinsurance
- Other liabilities (line 18 of Schedule F, Part 6; representing the balance of the liabilities on page 3 not separately identified), as these are unrelated to ceded reinsurance

Adjustments are made for the following lines:

Line 9: Losses and LAE (lines 1 through 3 of page 3)
These balances are stated net on a company's statutory balance sheet. The adjustment puts the balances on a gross of reinsurance basis. For companies that are not involved in intercompany pooling arrangements, the adjustment equals the ceded case and IBNR figures from Schedule P, Part 1, Summary, total, columns 14, 16, 18, 20 and 22.

Line 11: Unearned premiums (line 9 of page 3)
These balances are stated net on a company's statutory balance sheet. The adjustment puts the balances on a gross of reinsurance basis. The source of the ceded unearned premium reserve is Schedule F, Part 3, column 13, multiplied by 1,000. The ceded balance is also provided within the parenthetical reference on the Liabilities, Surplus and Other Funds page of the Annual Statement (page 3) on line 9.

Line 14: Ceded reinsurance premiums payable (line 12 of page 3)
If ceded reinsurance is ignored, as is the purpose of Part 6, then the company will not have any ceded reinsurance premiums payable. The adjustment reverses the amount in column 1.

Line 15: Funds held by company under reinsurance treaties (line 13 of page 3)
Similarly, if there are no ceded reinsurance treaties, then the company won't have any funds held related to these treaties. The adjustment reverses the amount in column 1.

Line 17: Provision for reinsurance (line 16 of page 3)
This is the Schedule F "penalty," as computed in Schedule F, Part 3. If the company is assumed to have no reinsurance protection in Part 6, then there will be no provision for reinsurance. The adjustment reverses the amount in column 1.

Surplus

Surplus remains unadjusted in Part 6, as such, the adjustment amount is shown as "XXX" in column 2 and the amount in column 3 equals that in column 1.

Totals

The totals shown in column 1, line 22 of Part 6, balance to the totals shown on line 38 of page 3 of the Annual Statement. The total is equal to the difference between the total assets and total liabilities of the

company. This calculation follows through to column 3, with the new total being on gross of reinsurance basis.

The following provides Schedule F, Part 6 for Fictitious Insurance Company.

TABLE 30

Schedule F — Part 6
Annual Statement for the year 2018 of the Fictitious Insurance Company
Restatement of Balance Sheet to Identify Net Credit for Reinsurance

		1 As Reported (Net of Ceded)	2 Restatement Adjustments	3 Restated (Gross of Ceded)
Assets (page 2, Col. 3)				
1.	Cash and invested assets (Line 12)	87,825,000	0	87,825,000
2.	Premiums and considerations (Line 15)	7,990,000	0	7,990,000
3.	Reinsurance recoverable on loss and loss adjustment expense payments (Line 16.1)	426,000	(426,000)	0
4.	Funds held by or deposited with reinsured companies (Line 16.2)	0	0	0
5.	Other assets	3,759,000	0	3,759,000
6.	Net amount recoverable from reinsurers	0	10,595,000	10,595,000
7.	Protected cell assets (Line 27)	0	0	0
8.	Totals (Line 28)	100,000,000	10,169,000	110,169,000
Liabilities (page 3)				
9.	Losses and loss adjustment expenses (Lines 1 through 3)	51,557,000	10,142,000	61,699,000
10.	Taxes, expenses, and other obligations (Lines 4 through 8)	1,932,000	0	1,932,000
11.	Unearned premiums (Line 9)	11,895,000	920,000	12,815,000
12.	Advance premiums (Line 10)	0	0	0
13.	Dividends declared and unpaid (Lines 11.1 through 11.2)	1,562,000	0	1,562,000
14.	Ceded reinsurance premiums payable (net of ceding commissions) (Line 12)	440,000	(440,000)	0
15.	Funds held by company under reinsurance treaties (Line 13)	170,000	(170,000)	0
16.	Amounts withheld or retained by company for account of others (Line 14)	308,000	0	308,000
17.	Provision for reinsurance (Line 16)	283,000	(283,000)	0
18.	Other liabilities	829,000	0	829,000
19.	Total liabilities excluding protected cell business (Line 26)	68,976,000	10,169,000	79,145,000
20.	Protected cell liabilities (Line 27)	0	0	0
21.	Surplus as regards policyholders (Line 37)	31,024,000	0	31,024,000
22.	Totals (Line 38)	100,000,000	10,169,000	110,169,000

As displayed above, the asset items are adjusted in column 2 for:

- Reinsurance recoverable on loss and LAE payments in line 3, totaling $426,000
- The net amount recoverable from reinsurers in line 6, totaling $10,595,000

The amount in line 6, column 2, is simply a reversal of the balance shown in column 1, and therefore the asset side of the balance sheet. The amount in line 6 is computed as the "plug," such that the total adjustment to the assets in line 8 equals the total adjustment to the liabilities in line 19.

The liability items are adjusted in column 2 for:

- Loss and LAE in line 9, totaling $10,142,000
- Unearned premiums in line 11, totaling $920,000
- Ceded reinsurance premiums payable in line 14, totaling $440,000
- Funds held by company under reinsurance treaties in line 15, totaling $170,000
- Provision for reinsurance in line 17, totaling $283,000

The amount in line 9, column 2, is equal to the amount of ceded loss and LAE reserves per Schedule P, Part 1, Summary, of Fictitious' 2018 Annual Statement (sum of the totals in columns 14, 16, 18, 20 and 22).[70]

For companies that do not participate in intercompany pooling, line 9 is equal to the ceded reserve loss and LAE reserve balance in Schedule P, Part 1, Summary. However, for those that operate in an intercompany pooling arrangement, we note that Schedule P is prepared net of pooling on both a gross and net of external reinsurance basis, whereas Schedule F considers all assumed and ceded reinsurance, including intercompany pooling. As such, it makes it difficult to have full visibility into the loss and LAE reserve balances shown in column 2 of Schedule F, Part 6 for companies participating in intercompany pooling.

The amount in line 11, column 2 is equal to the amount of gross unearned premium reserves that are ceded, as displayed in the total line of Schedule F, Part 3, column 13, multiplied by 1,000.

The amounts in column 2 for lines 14, 15, and 17 represent a reversal of the amount in column 1.

As displayed above, there is no adjustment to surplus; therefore, the amount in column 1 equals that in column 3 ($31,024,000).

SUMMARY

As we have seen, Schedule F is not only important to actuaries in assessing net loss and LAE reserves, but it is also an important tool to the many users of the Annual Statement in solvency monitoring because it:

[70] Schedule P is prepared net of intercompany pooling on both a gross and net of external reinsurance basis, whereas Schedule F considers all assumed and ceded reinsurance, including intercompany pooling. As such, it makes it difficult to have full visibility into the loss and LAE reserve balances shown in column 2 of Schedule F, Part 6 for companies participating in intercompany pooling arrangements.

- Identifies the amount of gross losses that emanate from the reporting entity's assumed reinsurance transactions;
- Provides an estimate of the significance of the reporting entity's assumed and ceded reinsurance transactions to its surplus;
- Enables further inquiry into the financial strength of the reporting entity's reinsureds and reinsurers;
- Quantifies "credit risk" related to reinsurance recoverables for purposes of the NAIC's RBC formula; and
- Identifies the reporting entity's reinsurers that may require further scrutiny because they are either slow at paying claims or are not regulated.

Yet, Schedule F is only one of many tools used to monitor solvency by regulators. As we have stressed throughout this publication, no one tool can be used blindly.

Further, while Schedule F is valuable, it has received some criticism as to how well it meets the regulatory objectives of monitoring solvency for the protection of policyholders. The following are a few of those criticisms:[71]

- The provision for reinsurance is strictly formulaic, potentially masking the true estimate of uncollectible reinsurance that would be determined by company management based on their knowledge of the reinsurers and terms of each contract.
- There is no statistical, historical or actuarial basis for the formula, and its application may not adequately represent an insurer's exposure to collectability risk.
- Unauthorized reinsurance may provide more and/or higher-quality reinsurance at a lower price than a competing authorized reinsurer.
- Slow payers who are financially strong eventually pay, whereas a reinsurer that is current in its payments may not be able to withstand a stress scenario to its financials.
- The numerous calculations and detail involved in determining the provision for reinsurance can lead to a false level of precision such that the true issue of collectability risk is overlooked.
- The costs associated with collateral requirements may be passed down to the primary policy, thereby costing the policyholder more for insurance.
- The provisions within Schedule F can limit competition to the U.S. market as a result of the penalty that the European reinsurers bring given that they are unauthorized.
- Schedule F does not directly tell us anything about the reinsurer's solvency, which is really the source of collectability risk.

[71] Feldblum, S., "Reinsurance Accounting: Schedule F," April 2003, pages 40-47.

CHAPTER 15. SCHEDULE P

OVERVIEW

Schedule P is probably the most important schedule within the Annual Statement to property/casualty actuaries. Schedule P provides details underlying the recorded loss and loss adjustment expense (LAE) reserves on the reporting entity's statutory balance sheet, including 10 years of the company's historical loss and defense and cost containment (DCC) experience (i.e., net paid, case outstanding and incurred loss and DCC triangles). Because the Annual Statement is a public document, Schedule P tends to be a means for outside parties to evaluate the adequacy of recorded reserves, absent loss and LAE data provided directly by the company. And even when detailed data is provided by the company, oftentimes outside parties look to Schedule P for purposes of providing a check on the reasonableness of the recorded balances. However, there are cautions to using this information, and we have presented several within this chapter.

Schedule P has numerous other uses in addition to providing support for the recorded loss and LAE reserves. For example, Schedule P:

- Supports and provides necessary disclosures for the Statement of Actuarial Opinion, including:
    - Direct plus assumed and net loss and expense reserves
    - The amount of anticipated salvage and subrogation (S&S) that the reporting entity takes credit for in its reserves
    - The amount of tabular and non-tabular discount that the reporting entity takes credit for in its reserves
- Shows how loss reserves have developed over time and enables the reader to decipher whether development is attributed to a specific year or line of business
-
- Shows the split between a company's reserves for known claims and those actuarially determined (i.e., IBNR reserves)
- Provides historical claim count data to facilitate review of trends in claim frequency and severity, as well as changes in claims handling and reserving
- Provides information necessary to compute the loss sensitive discount in the RBC calculation

We will discuss some of these additional uses within this chapter.

ORGANIZATIONAL STRUCTURE

There are seven parts to Schedule P plus interrogatories, as described below.

Part 1 summarizes a company's loss and LAE experience as of December 31 of the current year. It displays a company's loss and LAE reserves, after adjustment for tabular discount if applicable, and then separately shows the reserves net of all discounts (both tabular and non-tabular). These are the loss and

LAE reserves that are recorded on a company's statutory balance sheet (page 3 of the Annual Statement).

For those companies that participate in intercompany pooling, Part 1 displays the pooling percentage.

Part 2 provides a historical display of a company's net ultimate loss and DCC estimates. This enables the user to see how the company's ultimate loss and DCC estimates have developed over time. In a perfect world, the company's ultimate estimate of the cost of incurred claims would remain the same at each evaluation point. However, these are estimates, and therefore have the potential to develop upward or downward as the claims mature. The information provided in Part 2 feeds into the one-year development test in the Five-Year Data Exhibit and is also used in computing the NAIC Insurance Regulatory Information System (IRIS) ratios 11, 12 and 13.

Part 3 shows a historical array of the company's net paid loss and DCC experience as of each of the past 10 years. Actuaries can use this information to project unpaid claims using methods such as the paid loss development technique.

The difference between Part 2 (ultimates) and Part 3 (paids) provides a historical array of the company's net loss and DCC reserves as of each of the past 10 years. These amounts are provided *before* tabular discount.

Part 4 displays a company's recorded net IBNR for loss and DCC *before* tabular discount. The difference between Parts 2 and 4 provides a historical array of the company's net reported loss and DCC experience as of each of the past 10 years. This information can be used by actuaries to project unpaid claims using methods such as the case incurred loss development technique.

Part 5 provides a historical array of claim counts as of each of the past 10 years, including claims closed with payment, open claims and reported claims.

Part 6 displays the earning of premium over time, separately on a direct plus assumed and ceded basis. Like the information provided in Parts 2 through 4, the earned premium data is provided in a triangular format enabling the monitoring of premium adjustments over time.

Part 7 provides loss and premium data on loss sensitive contracts, separately for primary and reinsurance contracts, for those lines of business where such contracts are written.

All dollar amounts presented in Schedule P are in thousands (i.e., 000 omitted).

Within the remaining sections of this chapter, we will provide an overview of each part of Schedule P, focusing on those of most relevance to the property/casualty actuary. We will then get into details of those parts, providing relevant examples from the 2018 Schedule P for Fictitious Insurance Company.

SCHEDULE P — PART 1

Part 1 is shown in summary format for all lines of business combined, followed by separate schedules (Parts 1A through 1T) in the same format as Part 1 – Summary, but by Schedule P line of business. The data in Part 1 is provided on a direct plus assumed (gross) and ceded basis and includes premiums

earned, paid loss and LAE, case outstanding loss and DCC reserves, and IBNR for loss and LAE. Additionally, incurred loss and LAE ratios are displayed on a gross, ceded and net of reinsurance basis.

One item that is not included in Schedule P is the segregation of gross data into its direct and assumed components. Oftentimes actuaries look for this information separately in performing analyses of unpaid claims; however, it is not provided in Schedule P. As noted in Chapter 14. *Schedule F*, certain of this information can be provided in Schedule F, Part 1, including assumed case reserves.

Line of Business Segmentation in Part 1

Parts 1A through 1T provide the same information as in Part 1 – Summary, except separately by line of business. The line of business segmentations are as follows:

A – Homeowners/Farmowners
B – Private Passenger Auto Liability/Medical
C – Commercial Auto Liability/Medical
D – Workers' Compensation
E – Commercial Multiple Peril
F – Section 1 – Medical Professional Liability – Occurrence
F – Section 2 – Medical Professional Liability – Claims-Made
G – Special Liability (Ocean Marine, Aircraft (All Perils), Boiler & Machinery)
H – Section 1 – Other Liability – Occurrence[72]
H – Section 2 – Other Liability – Claims-Made
I – Special Property (Fire, Allied Lines, Inland Marine, Earthquake, Burglary & Theft)
J – Auto Physical Damage
K – Fidelity/Surety
L – Other (Including Credit, Accident and Health)
M – International
N – Reinsurance – Nonproportional Assumed Property[73]
O – Reinsurance – Nonproportional Assumed Liability[74]
P – Reinsurance – Nonproportional Assumed Financial Lines[75]
R – Section 1 – Products Liability – Occurrence[76]
R – Section 2 – Products Liability – Claims-Made
S – Financial Guaranty/Mortgage Guaranty

[72] Business reported as an aggregate write-in for other lines of business in the State Page is included here (either as occurrence or claims-made, depending on the coverage written).
[73] Property includes fire, allied, ocean marine, inland marine, earthquake, group, credit and other A&H, auto physical damage, boiler and machinery, burglary and theft and international property.
[74] Liability includes farmowners, homeowners and commercial multiperil; medical professional liability workers' compensation; other liability; products liability; auto liability; aircraft (all peril); and international liability.
[75] Financial includes financial guaranty, fidelity, surety, credit, and international financial.
[76] There is no Part Q.

T – Warranty

The definitions of these lines correspond to those on the Exhibit of Premiums and Losses (Statutory Page 14), with the exception of the three nonproportional reinsurance assumed lines (Parts N, O and P), which are not included in Statutory Page 14, as it provides information on a direct basis only. Nonproportional reinsurance assumed is generally excess of loss reinsurance, whereas proportional is generally a form of quota share reinsurance. Proportional reinsurance is included within its respective line(s) of business segments. For example, premiums and losses associated with assumed commercial property reinsurance under a quota share contract would be included within Schedule P, Part 1I, whereas the same risk assumed on an excess of loss basis would be included within Schedule P, Part 1N.

Only two accident years and a "prior years" row are shown for the following lines due to the limited amount of loss development beyond two years:

I – Special Property (Fire, Allied Lines, Inland Marine, Earthquake, Burglary & Theft)
J – Auto Physical Damage
K – Fidelity/Surety
L – Other (Including Credit, Accident and Health)
S – Financial Guaranty/Mortgage Guaranty
T – Warranty

That is, claims for the aforementioned lines of business are expected to be reported and paid within a relatively short period of time after the occurrence of a claim. Consider the Special Property line of business. If a commercial property is damaged due to fire, the insured will report the claim rather quickly to get the building repaired or rebuilt in order to continue operations. Payments may continue to the insured while the commercial property is being repaired due to business interruption; however, the insured will generally be back in business within the year in which the loss occurred. As a result, losses will develop for 12 to 24 months after the beginning of the accident year (January 1) in which the loss occurred, but typically the claim will be closed by the end of 24 months.

To illustrate the "bucketing" of claims, consider a complete fire loss to a paper mill on December 19, 2018. Assume the building is rebuilt and the insured is back in business on September 4, 2019. This claim would be recorded as an accident year 2018 claim, with loss payments extending into the second year of development (24-month period) until the claim is closed on September 4.

Despite only two years being shown in the Schedule P line of business parts, all 10 years are included in Schedule P – Part 1 – Summary. Therefore, the insurer is required to retain data for these lines in a similar 10-year format as all other lines of business in Schedule P.

Many have argued that the two-year reporting convention is not necessarily appropriate for the aforementioned lines of business due to the tail on lines such as Fidelity/Surety. These opponents would

vote for including all 10 years, as is shown for the other Schedule P lines, arguing further that all 10 years are already produced for purposes of forming the summaries in Schedule P.

Yearly Reporting Convention

Part 1 provides information related to earned premiums and cumulative loss and LAE data at the current evaluation date (i.e., December 31 of the current year) for the last 10 years in which premiums are earned and losses incurred. Earned premiums are shown by calendar year, and once they are entered in Schedule P, they do not change for retrospective premium adjustments or other adjustments. Losses are shown by:

- Accident year for occurrence policies
- Report year for claims-made policies
- Policy year for tail policies
- Discovery year for fidelity and surety policies

Accident year is defined as the calendar year in which accidents occur and/or losses are incurred. For example, a claim with a date of loss of November 13, 2018, would be a 2018 accident year claim. This reporting convention is used for occurrence-basis policies, where the trigger of coverage is the occurrence of a loss. With occurrence policies, a claim can be reported at any time after the loss occurs, subject to statutes of limitation, as long as the loss occurs during the policy term. For example, an injury that occurred 15 years ago can be reported to the insurer today, and any coverage for that injury would be provided by the terms and conditions of the policy that was in effect 15 years ago.

Report year represents the calendar year in which losses are reported. This is typically used for claims-made policies, as the trigger of coverage is the reporting of a claim or incident to the insurance carrier. In their most basic format, claims-made policies cover claims that are first made during the policy term. As a result, if a claim occurs during the policy period but is not reported by the insured during the policy term, the claim is not covered by the insurance company under the terms and conditions of the policy that was in force at the time the claim occurred. This significantly reduces the uncertainty for the insurance carrier, both for pricing and reserving, since the policy that is in effect at the time the claim is made will be the policy providing the coverage for the claim, regardless of how long ago the incident took place (provided there is no retroactive date on the policy).

A claims-made policy may have a retroactive date that is before the effective date of the policy, the same as the effective date of the policy or it may have no retroactive date. The retroactive date is the date on or after which the incident must occur in order for it to be covered under the claims-made policy. An incident that occurs before the retroactive date will not be covered by the claims-made policy even if it is first reported during the policy period.

These types of policies are generally issued for medical malpractice, other liability, or products liability coverages because claims covered by these types of policies tend to have a long latency period. It becomes very difficult for insurance companies to project the claim frequency as well as the severity of

claims and therefore difficult to price and reserve for an occurrence that will result in the reporting of a claim many years in the future.

To illustrate the concept of claims-made coverage and the concept of report year, assume a young surgeon purchases a medical malpractice policy on a claims-made basis for the term beginning July 1, 2018, and expiring on June 30, 2019. Assume that the surgeon performs a procedure on his patient on October 21, 2018, and complications arise during the surgery. If the surgeon reports the incident to his insurance carrier before June 30, 2019, and subsequently the surgeon is sued and a claim materializes, he will be covered under his policy in effect from July 1, 2018, through June 30, 2019. This would be a 2018 report year claim for Schedule P reporting purposes. If the surgeon does not report the incident because the patient did not become aware of the complications until a year later, and the claimant decides to sue the physician on August 22, 2019, the surgeon reports this claim to his carrier on August 23, 2019. He would not be covered by the policy in effect from July 1, 2018, through June 30, 2019, as the claim was not reported during the policy term. If the surgeon renewed the claims made policy, the renewal policy that is in effect from July 1, 2019, through June 30, 2020, would be the policy that covers the claim.

In general, the people or companies that purchase claims-made policies do not like to leave themselves exposed to the risk of being uninsured, despite the cost savings of a claims-made policy as compared to an occurrence policy. As a result, they generally purchase something called an extended reporting period or “tail coverage.” Tail coverage extends the reporting period of a claims-made policy for an additional period of time, which may be one to five years or an unlimited period of time past the expiration of the claims-made policy. A claims-made policy plus an unlimited extended reporting period essentially turns the claims-made policy into an occurrence policy. To illustrate using our previous example, let’s assume that the surgeon does not renew his claims-made policy and therefore purchases unlimited tail coverage on July 1, 2019, when the policy expires. This means that any accident or loss that occurred as a result of error by the surgeon during the period July 1, 2018, through June 30, 2019, would be a covered claim by the insurance company that issued the claims-made policy regardless of when in the future the surgeon first reports the claim. Without the tail coverage, the surgeon would have no coverage for claims that he learns about on or after July 1, 2019.

Premiums and losses associated with tail policies are included in Schedule P with their associated line on an occurrence basis.

Discovery year is generally used for fidelity and surety policies, as it is difficult to determine the actual date the “loss” occurs. As the name suggests, discovery year represents the calendar year in which a loss or damage is discovered.

For simplicity, and because it is most common, we will use the term accident year in the remainder of our discussion of Schedule P, unless explicitly stated otherwise.

Note that there is also a prior years row in Schedule P, which accumulates loss and expense information into one row within each of the schedules. The prior years row shows paid (received) activity *during* the current year (i.e., calendar year activity) and ending reserves *as of* the evaluation date of the Statement. Within this chapter we provide examples of how to calculate the prior years row; it is a bit trickier than this brief explanation suggests.

Loss Adjustment Expenses

Losses are provided separately from LAE, which is separated into two components: DCC expenses and Adjusting and Other (A&O) expenses. DCC generally includes defense, litigation and medical cost containment expenses, whether internal or external, and A&O includes all expenses associated with adjusting and recording policy claims, other than those included with DCC.[77] The following table summarizes the types of expenses by category.

[77] Per the Official NAIC Annual Statement Instructions for 2018, DCC are defined as "those that are correlated with the loss amounts," and A&O are defined as "those expenses that are correlated with claim counts or general loss adjusting expenses."

TABLE 31

DCC	A&O
Surveillance expenses	Fees and expenses of adjusters and settling agents
Fixed amounts for medical cost containment	
Litigation management expenses (e.g., audit of bills)	
LAE for participation in voluntary and involuntary pools if reported by accident year	LAE for participation in voluntary and involuntary pools if reported by calendar year
Fees or salaries for: • Appraisers • Private investigators • Hearing representatives • Reinspectors • Fraud investigators (If working in defense of a claim)	Fees and salaries for: • Appraisers • Private investigators • Hearing representatives • Reinspectors • Fraud investigators (If working in the capacity of an adjuster)
Fees or salaries for rehabilitation nurses, if not included with losses	
Attorney fees incurred owing duty to defend, even when other coverage does not exist	Attorney fees incurred in determination of coverage, including litigation between the reporting entity and the policyholder
Cost of engaging experts	Adjustment expenses arising from claims related lawsuits, such as extra contractual obligations and bad faith lawsuits

The NAIC Instructions to the Annual Statement indicate that DCC should be assigned to accident year in accordance with the associated losses, while for A&O, *"in any justifiable way, … [t]he preferred way is to apportion these expenses in proportion to the number of claims reported, closed, or outstanding each year."*[78] The following table illustrates this using Fictitious' commercial automobile liability line of business as an example. Fictitious allocates its unpaid A&O for commercial automobile liability by applying the distribution of outstanding claim counts by accident year to total unpaid A&O.

[78] *2018 NAIC Annual Statement Instructions Property/Casualty*, page 226.

TABLE 32

	Years in Which Premiums Were Earned and Losses Were Incurred	Number of Claims Outstanding Direct and Assumed	Distribution of Outstanding Claims	Direct and Assumed Adjusting & Other Unpaid
1.	Prior	1	1%	2
2.	2009	1	1%	2
3.	2010	1	1%	2
4.	2011	1	1%	2
5.	2012	1	1%	2
6.	2013	1	1%	2
7.	2014	2	3%	4
8.	2015	4	5%	8
9.	2016	7	9%	15
10.	2017	13	18%	27
11.	2018	42	57%	89
	Totals	74	100%	156

Disclosure of the methodology used to allocate A&O by year is required in the interrogatories to Schedule P.

LAE wasn't always segregated between DCC and A&O. Prior to 1988, LAE were stated as either allocated LAE (ALAE) and unallocated LAE (ULAE) in the Annual Statement. ALAE is defined as claim expenses that can be specifically assigned to a particular claim, and ULAE as those that cannot. ULAE is generally associated with the cost of administering claims. The terms ALAE and ULAE are still used in practice. In fact, for reserving purposes many companies perform actuarial analyses on an ALAE/ULAE basis.

Salvage and Subrogation

Most insurance policies require the insured to transfer the right to S&S recovery upon payment of a covered claim to an insured. Salvage is typically received by insurance companies in the case of automobile claims, when the vehicle incurs physical damage that is beyond repair. Here the insurance company can sell usable parts of the vehicle, such as tires, hubcaps and engine parts, to companies that salvage damaged vehicles.

Subrogation is typically received in the case of liability policies. For example, an insurance carrier paying a claimant for liability associated with a product manufactured by an insured, may in turn attempt to recover part or all of the amount paid to the claimant from the company that made a part used in manufacturing the product.

The paid loss figures provided in columns 4 (direct and assumed loss payments) and 5 (ceded loss payments) are net of S&S received, and the unpaid losses provided in columns 13 through 16 are net of anticipated S&S, if the company reduces its reserves for anticipated S&S. We typically find that when companies take credit for anticipated S&S, they do so in the "bulk and IBNR"[79] amounts as opposed to the "case basis" reserves. It is difficult enough to estimate reserves for known claims, let alone the amount that will be recovered for salvage and/or subrogation on those claims.

For statutory reporting purposes, insurance companies can take credit for S&S received, as well as that anticipated in its loss reserves. This means that companies can reduce their reserves by estimates of recoveries that they expect to receive in the future.

The S&S figures displayed in columns 10 (received) and 23 (anticipated) are for informational purposes only. As displayed in the formula for total net paid loss and LAE in column 11, S&S received in column 10 is not subtracted from the paid loss and LAE amounts in columns 4 through 9, as they are already reduced by the S&S received. The following illustrates the calculation on total net paid loss and LAE using data from the total line from Schedule P, Part 1 – Summary of the 2018 Annual Statement for Fictitious Insurance Company.

TABLE 33

Data from 2018 Schedule P — Part 1 — Summary for Fictitious Insurance Company (000 omitted)

Column	Item	Amount	Notes
4	Direct and assumed loss payments	116,277	
5	Ceded loss payments	16,875	
	Net loss payments	99,402	= Column 4 — Column 5
6	Direct and assumed DCC payments	10,266	
7	Ceded DCC payments	1,067	
	Net DCC payments	9,199	= Column 6 — Column 7
8	Direct and assumed A&O payments	10,830	
9	Ceded A&O payments	417	
	Net A&O payments	10,413	= Column 8 — Column 9
11	Total net paid	119,014	= (Columns 4 + 6 + 8) — (Columns 5 + 7 + 9)

The S&S received figure in column 10 of Schedule P, Part 1 – Summary ($5,283 in total; 000 omitted) does not enter the above calculation, as the loss payments shown in columns 4 and 5 have already been reduced by this amount. The amount shown in column 11 is net of the S&S received amount shown in column 10.

The same goes for the total net loss and LAE unpaid in column 24; anticipated S&S in column 23 is not subtracted from the case and IBNR figures in columns 13 through 22, as it is already displayed net of

[79] Hereafter we will refer to "bulk and IBNR" simply as "IBNR."

anticipated S&S (if the company anticipates S&S in its recorded reserves). The following provides a similar illustration using total unpaid amounts from Fictitious' 2018 Schedule P, Part 1 – Summary.

TABLE 34

Data from 2018 Schedule P — Part 1 — Summary for Fictitious Insurance Company (000 omitted)

Column	Item	Amount	Notes
13	Direct and assumed case basis losses	24,945	
14	Ceded case basis losses	5,343	
	Net case basis losses	19,602	= Column 13 — Column 14
15	Direct and assumed IBNR losses	26,330	
16	Ceded IBNR losses	4,038	
	Net IBNR losses	22,292	= Column 15 — Column 16
17	Direct and assumed case basis DCC	2,424	
18	Ceded case basis DCC	258	
	Net case basis DCC	2,166	= Column 17 — Column 18
19	Direct and assumed IBNR DCC	5,401	
20	Ceded IBNR DCC	499	
	Net IBNR DCC	4,902	= Column 19 — Column 20
21	Direct and assumed A&O unpaid	2,599	
22	Ceded A&O unpaid	4	
	Net A&O unpaid	2,595	= Column 21 — Column 22
24	Total net losses and expenses unpaid	51,557	= (Columns 13 + 15 + 17 + 19 + 21) — (Columns 14 + 16 + 18 + 20 + 22)

Column 23, which provides anticipated S&S ($1,363 in total; 000 omitted), is not included in the above calculation as the amounts in loss columns are provided on a net basis.

Composition of Loss and LAE Reserve Figures Provided in Schedule P, Part 1

The case and IBNR reserves provided in Part 1 are net of tabular[80] discounting and gross of non-tabular discounting, up until columns 32 and 33. The amount of non-tabular discount is shown separately for loss and LAE in columns 32 and 33, respectively. For Fictitious, the amounts shown in columns 32 and 33 are zero because the Company does not discount non-tabular reserves. This is confirmed in part B of the Note to Financial Statements titled "Discounting of Liabilities for Unpaid Losses or Unpaid Loss Adjustment Expenses" (Note 32B in the 2018 Annual Statement).

The reserves shown on the Balance Sheet are provided in columns 35 and 36 for loss and LAE, respectively. These figures are on a net of reinsurance basis, and net of all discounting, if applicable. The

[80] Tabular reserves are defined on page 159 of the 2018 NAIC Annual Statement Instructions to Note 32 of the Financial Statements as "indemnity reserves that are calculated using discounts determined with reference to actuarial tables that incorporate interest and contingencies such as mortality, remarriage, inflation, or recovery from disability applied to a reasonably determinable payment stream. This definition shall not include medical loss reserves or any loss adjustment expense reserves."

sum of columns 35 and 36 will reconcile to the amount shown in column 24 reduced by the amount of discount shown in columns 32 and 33.

TABLE 35a

Data from 2018 Schedule P - Part 1 - Summary for Fictitious Insurance Company (000 omitted)

Column	Item	Amount	Notes
	Total net losses unpaid	41,894	Columns (13 + 15) - Columns (14 + 16)
	Total net expenses unpaid	9,663	Columns (17 + 19 + 21) - Columns (18 + 20 + 22)
24	Total net losses and expenses unpaid	51,557	
32	Nontabular discount on losses	XXX	
33	Nontabular discount on loss expense	XXX	
	Total nontabular discount	XXX	= Column 32 + Column 33
35	Net balance sheet loss reserves after discount	41,894	Columns (13 + 15) - Columns (14 + 16 + 32)
36	Net balance sheet loss expense reserves after discount	9,663	Columns (17 + 19 + 21) - Columns (18 + 20 + 22 + 33)
	Total net losses and expenses unpaid after discount	51,557	= Column 35 + Column 36

As we shall see in Part IV. *Statutory Filings to Accompany the Annual Statement* of this publication, Schedule P, Part 1 – Summary provides the source of the recorded reserve amounts that the Appointed Actuary opines upon in the Statement of Actuarial Opinion on behalf of the insurance company. The Appointed Actuary opines on the loss and LAE reserve amounts provided in columns 35 and 36, respectively, on a net of reinsurance basis, and columns 13 plus 15 and columns 17 plus 19 plus 21, respectively, on a gross of reinsurance basis. For Fictitious Insurance Company, the amounts shown in Exhibit A to the 2018 Statement of Actuarial Opinion, on which the Appointed Actuary has provided his opinion, are as follows.

TABLE 35b

Fictitious Insurance Company 2018 Statement of Actuarial Opinion Loss and LAE Reserve Amounts Per Exhibit A		
Loss and LAE Reserves:		Amount
1.	Reserve for Unpaid Losses (Liabilities, Surplus and Other Funds page, Col 1, Line 1)	$41,894,000
2.	Reserve for Unpaid LAE (Liabilities, Surplus and Other Funds page, Col 1, Line 3)	$9,663,000
3.	Reserve for Unpaid Losses – Direct and Assumed (Should equal Schedule P, Part 1, Summary, Totals from Cols. 13 and 15, Line 12 * 1,000)	$51,275,000
4.	Reserve for Unpaid LAE – Direct and Assumed (Should equal Schedule P, Part 1 — Summary, Totals from Cols. 17, 19 and 21, Line 12 * 1,000)	$10,424,000

The figures shown in Schedule P are net of intercompany pooling. As suggested by the "XXX" in column 34, Fictitious does not participate in any intercompany pooling arrangements. This can be confirmed by a reading of the Notes to the Financial Statements titled *"Intercompany Pooling Arrangements"* (Note 26 in the 2018 Annual Statement) for an insurance company. We will discuss the effect of intercompany pooling on Schedule P reporting in a separate section at the end of this chapter.

Incurred loss and LAE

The other items of interest in Schedule P, Part 1 are the total losses and loss expense incurred columns (26 through 28) and resulting loss and LAE ratios columns (29 through 31). The loss ratio columns are useful in assessing historical performance of the business separately on a direct and assumed, ceded and net basis. For companies with non-proportional reinsurance, the loss ratios will differ on a direct and net basis, and one can get a sense if the company is paying relatively more for the reinsurance than the direct risk. Using Fictitious as an example, we see that its incurred loss and LAE ratios differ on a direct plus assumed, ceded and net of reinsurance basis.

TABLE 36

Years in Which Premiums Were Earned and Losses Were Incurred		Loss and Loss Expense Percentage (Incurred/Premiums Earned)		
		29	30	31
		Direct and Assumed	Ceded	Net
1	Prior			
2	2009	66.9	71.9	65.6
3	2010	57.7	44.3	61.3
4	2011	52.9	52.6	53.0
5	2012	61.8	106.5	54.3
6	2013	52.1	53.4	51.9
7	2014	54.9	52.2	55.2
8	2015	66.5	65.0	66.6
9	2016	62.8	62.3	62.8
10	2017	68.2	52.5	69.5
11	2018	78.9	72.6	79.4

Since 2014, the Company's ceded loss and expense ratios have been lower than its direct plus assumed ratios, thereby resulting in higher net loss ratios.

We should note that the amounts shown as "incurred" in columns 26 through 31 are on an "ultimate incurred" basis. This is an important definitional distinction from "case incurred," and people often get the two confused, so we will walk through the definitions here.

The following equations are different ways of presenting ultimate incurreds:

Ultimate incurred loss

= Paid loss + case outstanding loss + IBNR loss
= Reported loss + IBNR loss
= Paid loss + unpaid loss

Paid losses represent those amounts paid by the insurance carrier. Case outstanding losses represent the reserve for known claims, which is generally established by the company's claims administrators/adjusters. IBNR represents the reserve for claims Incurred But Not Reported. IBNR includes a provision for:

- Development on known claims ("case development")
- Pure IBNR, or those claims that are incurred but not yet reported to the insurance carriers
- Reopened claims

Case development is intended to cover upward and downward movements in the reserves established by the adjusters as additional information becomes available about the claim. For example, an adjuster

may establish an initial reserve for a workers' compensation claim based on the initial injury reports from the employer or claimant's doctor. However, subsequent medical examinations may uncover that the injury is worse than originally expected, resulting in additional cost and the need for an increase in the case reserve estimate to reserve the claim to its ultimate value.

Reported loss is equal to the amount of paid plus case outstanding; it represents the dollar value of loss known to the insurance company. The term "case incurred" is synonymous with "reported" and represents the reported value of known cases.

Unpaid loss (or loss reserve) equals the amount of case outstanding plus IBNR reserves. It represents the remaining amount expected to be paid on claims incurred by the insurance company.

Actuaries often derive an ultimate loss estimate using triangular projection methods. The amount unpaid (or loss reserve) can be derived using the above formulas by subtracting paid losses from the ultimate estimate. Similarly, IBNR can be determined by subtracting reported losses from the ultimate estimate.

Data used in actuarial projections can be derived from the information contained in Parts 2 through 4 of Schedule P, as will be discussed later in this chapter under the heading "Actuarial Projections" within the section "SCHEDULE P – PARTS 2 THROUGH 4."

Claim Count Information in Part 1

Certain line of business subparts of Part 1 also provide claim count information that is not included in Part 1 – Summary because such information is not captured for all lines. Column 12 provides the number of claims reported, direct plus assumed. However, this column only applies to certain lines and may be left blank for others, including the Summary. The applicable lines are:

- Homeowners/Farmowners
- Private Passenger Auto Liability/Medical
- Commercial Auto Liability/Medical
- Workers' Compensation
- Commercial Multiple Peril
- Medical Professional Liability
- Other Liability
- Auto Physical Damage
- Products Liability
- Warranty

Further, column 25 provides the number of claims outstanding, direct plus assumed. This column is completed for all lines except the nonproportional reinsurance assumed lines (Parts N, O and P) and therefore the Summary.

For those lines, including the Summary, where claim count information is not included, the corresponding columns are filled in with "XXX."

Claim count data can be used to explore changes in ultimate loss and LAE or reserve levels or to identify changes in claims settlement or reserving philosophy. We will provide more details in our discussion of Schedule P, Part 5; however, for now we will show the meaningful relationships that can be derived from Schedule P, Part 1 for Fictitious' Homeowners/Farmowners lines of business (Part 1A).

First, it is generally assumed that net claim counts are equal to direct and assumed counts, unless 100% of the business is ceded. The theory is that a direct claim results in a net claim, even if the value of the net claim is $0. Therefore, all ratios that we show below, both on a gross and net of reinsurance basis, are in relation to direct plus assumed counts.

Data from Schedule P, Part 1 can be used to calculate reported claim frequency, which is the relationship of reported claim counts as of December 31, 2018, to earned premium.

TABLE 37

Data From Schedule P — Part 1 — Homeowners & Farmowners
(000 omitted)
Average Reported Claim Frequency

	Years in Which Premiums Were Earned and Losses Were Incurred	Earned Premium		Number of Claims Reported Direct and Assumed (Col. 12)	Average Reported Claim Frequency	
		Direct and Assumed (Col. 1)	Net (Col. 3)		Direct and Assumed Counts/Earned Premium	Direct and Assumed Counts/Net Earned Premium
1	Prior	XXX	XXX	XXX	XXX	XXX
2	2009	1,931	1,763	242	0.125	0.137
3	2010	2,251	2,084	253	0.113	0.122
4	2011	2,721	2,612	219	0.081	0.084
5	2012	3,123	3,000	217	0.069	0.072
6	2013	3,307	3,231	216	0.065	0.067
7	2014	3,609	3,507	194	0.054	0.055
8	2015	3,816	3,713	300	0.079	0.081
9	2016	4,003	3,895	296	0.074	0.076
10	2017	4,294	4,178	325	0.076	0.078
11	2018	4,550	4,445	427	0.094	0.096
12	Totals	XXX	XXX	XXX	XXX	XXX

Table 37 can help us identify trends in claim frequency over the accident years. It is not a complete picture because claim counts are on a reported basis, as opposed to ultimate. However, for a short-tailed line of business such as homeowners, where losses are generally reported within the year in which they are incurred (i.e., accident year), it is not a bad approximation. Reported claim frequency appears to have increased in 2018 relative to both gross and net earned premiums (e.g., frequency in 2018 of 0.094 per $000 of gross earned premium versus 2017 of 0.076). This is most likely due to the high frequency of weather-related and catastrophe claims incurred by the Company during 2018.

We note that the interpretation of frequency trends using earned premium can be misleading due to the effect of rate changes. In our example, the increasing trend in Fictitious' claim frequency relative to earned premium may be partly attributed to soft market conditions in addition to the number of catastrophe claims. Viewing claim frequency in terms of exposures (e.g., house years for homeowners) would provide a clearer comparison and enhance the ability to understand observed trends. Regardless, when investigating trends in claim frequency, consideration should be made for changes over time in a company's mix of business (e.g., by types of exposures, geography), policy limits, reinsurance attachment points and limits, as well as the way the company counts its claims.

We can also compute the average value of reported claims by year, with each year evaluated as of December 31, 2018, using Schedule P, Part 1 data, as shown below.

TABLE 38

Data From Schedule P — Part 1 — Homeowners & Farmowners
(000 omitted)

Average Reported Loss and DCC Severity

		Reported Loss and DCC			Average Reported Loss & DCC		Trend in Average Reported $	
Years in Which Premiums Were Earned and Losses Were Incurred		Direct and Assumed (Cols. 4 + 6 + 13 + 17)	Net (Direct - Ceded per Cols. 5 + 7 + 14 + 18)	Number of Claims Reported Direct and Assumed (Col. 12)	Direct and Assumed Reported $/Counts *1000	Net Reported $/Direct and Assumed Counts *1000	Direct and Assumed Severity in Accident Year 20XX+1 divided by 20xx	Net Severity in Accident Year 20XX+1 divided by 20xx
1	Prior	6	6	XXX	XXX	XXX	XXX	XXX
2	2009	1,021	942	242	4,219	3,893		
3	2010	1,170	1,107	253	4,625	4,375	10%	12%
4	2011	1,450	1,381	219	6,621	6,306	43%	44%
5	2012	1,644	1,368	217	7,576	6,304	14%	0%
6	2013	1,350	1,349	216	6,250	6,245	-18%	-1%
7	2014	1,407	1,405	194	7,253	7,242	16%	16%
8	2015	2,186	2,185	300	7,287	7,283	0%	1%
9	2016	2,214	2,208	296	7,480	7,459	3%	2%
10	2017	2,421	2,419	325	7,449	7,443	0%	0%
11	2018	3,372	3,369	427	7,897	7,890	6%	6%
12	Totals	18,241	17,739	XXX	XXX	XXX	XXX	XXX

We see that there hasn't been much of a trend in the average cost per reported claim since 2015, until we get to 2018. The relatively flat trend from 2015 through 2017 is most likely due to economic factors during the time period and general flattening of costs associated with the repair and rebuilding of damaged properties. Similar to the increase in frequency in 2018, the increase in claim costs is primarily attributed to an increase in the size of claims due to the catastrophic events of 2018.

Here again, the comparison does not provide a complete picture because we are comparing accident year data at different levels of maturity rather than evaluating the reported loss and claims counts at their ultimate values. As we shall see, comparisons at the ultimate level can be made by developing loss and DCC data provided in Parts 2 through 4 and claim count data provided in Part 5.

Finally, we can also show the average cost of open claims as of December 31, 2018, using Part 1 data, as provided in the Table 39:

TABLE 39

Data From Schedule P — Part 1 — Homeowners & Farmowners
(000 omitted)
Average Case Outstanding Loss and DCC Severity

	Years in Which Premiums Were Earned and Losses Were Incurred	Case Basis Loss and DCC: Direct and Assumed (Cols. 13 + 17)	Case Basis Loss and DCC: Net (Direct – Ceded per Cols. (14 + 18))	Number of Claims Outstanding Direct and Assumed (Col. 25)	Average Case O/S Loss & DCC: Direct and Assumed Case Basis $/Counts *1,000	Average Case O/S Loss & DCC: Net Case Basis $/Direct and Assumed Counts *1,000
1	Prior	4	4	1	4,000	4,000
2	2009	0	0	1	0	0
3	2010	1	1	1	1,000	1,000
4	2011	2	2	1	2,000	2,000
5	2012	3	0	1	3,000	0
6	2013	8	8	1	8,000	8,000
7	2014	18	18	1	18,000	18,000
8	2015	40	40	1	40,000	40,000
9	2016	61	61	1	61,000	61,000
10	2017	124	124	3	41,333	41,333
11	2018	366	366	21	17,429	17,429
12	Totals	627	624	33	19,000	18,909

What we see in Table 39 is that the case outstanding reserve values and number of open claims generally decrease with maturity (ignoring the prior years row, which is a compilation of all prior years into one line). This makes sense, as eventually all claims will be closed and the outstanding reserves will be $0.[81] We also see that the average case reserves increase in maturity to a certain point, at which they decrease (ignoring the prior years row). This suggests that the claims that remain open after 24 months (accident year 2017 in this case) tend to be the larger dollar-valued claims. Put another way, the claims that cost the least tend to be the easiest to administer and close, while the more costly claims take longer to settle and pay out. This makes sense and is generally the case with property/casualty lines of business. As time goes on, the average case reserve for homeowners claims tends to decrease as the payments decline to closure.

The average case reserve values are lower on accident year 2018 relative to the immediately prior periods. There are still small to midsized claims, in addition to the large dollar-value claims, that remain open on the current accident year. These low-value claims suppress the average.

[81] Sometimes we will see a very high severity in a mature accident year, relative to the surrounding years and the general decreasing trend with maturity. This will happen when there's one or a small number of large dollar-valued claims outstanding.

SCHEDULE P — PARTS 2 THROUGH 4

Parts 2 through 4 provide a historical array of incurred, paid and IBNR loss and DCC, respectively. The data is provided on a net of reinsurance and net of S&S (as applicable) basis.

Similar to Part 1 – Summary, the information in the Summary of Parts 2 through 4 is provided for each of the past 10 years in which losses were incurred using the aforementioned definitions depending on the type of policies (e.g., occurrence, claims-made, tail, or fidelity and surety). The data is evaluated as of December 31 for each of the last 10 years.

Details are provided by line of business in the same breakdowns as in Part 1, with 10 accident years shown for all lines except for those lines previously mentioned (e.g., Special Property, Auto Physical Damage).

Discounting

Parts 2 through 4 of Schedule P are gross of all discounting. Therefore, the reserve amounts shown in Parts 2 through 4 will not reconcile to those provided in Part 1 for companies that discount nontabular reserves. The amount of discount is reported in the Notes to Financial Statements, which enables reconciliation between Part 1 and Parts 2 through 4.

We can illustrate this using Schedule P, Parts 1, 2 and 3, Summary for Fictitious. As displayed in Table 40b, the difference between the total net loss and DCC reserve reported in Schedule P, Part 1 and the amount indicated by subtracting the figures in column 10 of Parts 2 and 3 provides the $1.365 million of reduction for tabular discount taken in Schedule P, Part 1.

TABLE 40a

Data from 2018 Annual Statement for Fictitious Insurance Company			
Years in Which Losses Were Incurred	Net Loss and DCC at Year End per Schedule P (000 omitted)		
	Net Incurred Part 2 Summary	Net Paid Part 3 Summary	Net Unpaid Part 2 — Part 3 Summary
Prior	46,022	30,210	15,812
2009	13,387	12,202	1,185
2010	13,540	12,238	1,302
2011	12,099	10,933	1,166
2012	12,321	10,919	1,402
2013	11,679	9,804	1,875
2014	12,895	10,503	2,392
2015	15,635	12,130	3,505
2016	14,745	10,332	4,413
2017	16,345	9,774	6,571
2018	19,364	8,660	10,704
Total	188,032	137,705	50,327

TABLE 40b

Net Unpaid Loss and DCC Reserves Per Schedule P — Part 1 — Summary (000 omitted)	
Column 24, Total Net Losses and Expenses Unpaid, Line 12, Totals:	51,557
Column 21, Direct and Assumed A&O Unpaid, Line 12, Totals:	2,599
Column 22, Ceded A&O Unpaid, Line 12, Totals:	4
Column 24 — (Column 21 — Column 22), Total Net Losses and DCC Unpaid:	48,962
Difference, Schedule P — Part 2 minus Part 3 and Schedule P — Part 1:	**1,365**
Note to Financial Statement on Discounting (in whole dollars)	
Workers' Compensation Cases:	495,000
Workers' Compensation IBNR:	664,000
Other Liability Cases:	21,000
Other Liability IBNR:	15,000
Other Liability — Structured Payments IBNR:	170,000
Total Amount of Tabular Discount per Notes to Financial Statements:	1,365,000
Total Amount of Tabular Discount per Notes to Financial Statements, divided by 1,000:	**1,365**

The amount of tabular discount included in Schedule P, Part 1 should reconcile to the amount disclosed in the Note titled *"Discounting of Liabilities for Unpaid Losses or Unpaid Loss Adjustment Expenses"* (Note 32 of the 2018 Annual Statement).

Actuarial Projections

The format of Parts 2 through 4 is conducive for loss development projection methods used by actuaries to assess a company's reserve adequacy. However, actuaries tend to view the data in a slightly different format than that presented in Parts 2 through 4. Shifting all of the cells to the left so that each accident year starts with figures in column 1 transforms the data into standard triangular format used in the loss development (or "chain ladder") method. The paid loss triangle comes directly from Schedule P, Part 3, and the case incurred loss triangle can be derived by subtracting the IBNR in Part 4 from the incurreds in Part 2. The following provides the calculation of the net case incurred (reported) triangle for Fictitious Insurance Company.

TABLE 41a

Data from 2018 Annual Statement for Fictitious Insurance Company,
Schedule P — Part 2 — Summary

Incurred Net Losses and Defense and Cost Containment Expenses Reported at Year-End
(000 omitted)

Years in Which Losses Were Incurred	12 Months	24 Months	36 Months	48 Months	60 Months	72 Months	84 Months	96 Months	108 Months	120 Months	120 Months
Prior	XXX	35,994	38,360	41,784	43,601	44,861	45,378	45,947	45,884	45,845	46,022
2009	14,249	13,109	13,545	13,763	13,842	13,778	13,722	13,657	13,408	13,387	
2010	14,434	13,651	14,040	13,994	14,032	14,042	13,748	13,617	13,540		
2011	15,733	14,265	13,630	13,209	12,726	12,485	12,288	12,099			
2012	15,982	14,733	14,195	13,210	12,768	12,445	12,321				
2013	13,501	13,051	12,370	12,056	11,837	11,679					
2014	13,938	13,629	13,303	13,265	12,895						
2015	15,980	16,106	16,015	15,635							
2016	14,917	14,851	14,745								
2017	15,972	16,345									
2018	19,364										
		2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Ending		50,243	65,903	84,713	101,651	114,561	127,581	141,626	154,924	169,543	188,032
	Check:	—	—	—	—	—	—	—	—	—	—

TABLE 41b

Data from 2018 Annual Statement for Fictitious Insurance Company,
Schedule P — Part 4 — Summary
Bulk and IBNR Net Losses and Defense and Cost Containment Expenses Reported at Year-End
(000 omitted)

Years in Which Losses Were Incurred	12 Months	24 Months	36 Months	48 Months	60 Months	72 Months	84 Months	96 Months	108 Months	120 Months	120 Months
Prior	XXX	17,126	14,330	13,764	12,807	12,285	11,632	10,529	9,752	8,907	8,088
2009	7,093	3,349	2,393	1,821	1,445	1,249	1,121	1,010	728	677	
2010	7,149	3,583	2,544	1,799	1,479	1,370	1,016	814	713		
2011	8,512	4,667	3,068	2,149	1,505	1,122	864	651			
2012	7,337	4,644	3,505	2,131	1,522	1,030	876				
2013	6,333	4,175	2,757	1,959	1,440	1,114					
2014	6,022	3,756	2,640	2,018	1,459						
2015	6,400	3,932	2,810	1,850							
2016	6,008	3,544	2,511								
2017	5,817	3,682									
2018	6,422										
		2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Ending		24,219	24,828	28,252	29,176	29,574	30,211	29,569	28,961	27,972	28,043
	Check:	—	—	—	—	—	—	—	—	—	—

TABLE 41c

Difference between Schedule P — Part 2 — Summary and Part 4 — Summary

Case Incurred (Reported) Net Losses and Defense and Cost Containment Expenses Reported at Year-End (000 omitted)

Years in Which Losses Were Incurred	12 Months	24 Months	36 Months	48 Months	60 Months	72 Months	84 Months	96 Months	108 Months	120 Months	120 Months
Prior	XXX	18,868	24,030	28,020	30,794	32,576	33,746	35,418	36,132	36,938	37,934
2009	7,156	9,760	11,152	11,942	12,397	12,529	12,601	12,647	12,680	12,710	
2010	7,285	10,068	11,496	12,195	12,553	12,672	12,732	12,803	12,827		
2011	7,221	9,598	10,562	11,060	11,221	11,363	11,424	11,448			
2012	8,645	10,089	10,690	11,079	11,246	11,415	11,445				
2013	7,168	8,876	9,613	10,097	10,397	10,565					
2014	7,916	9,873	10,663	11,247	11,436						
2015	9,580	12,174	13,205	13,785							
2016	8,909	11,307	12,234								
2017	10,155	12,663									
2018	12,942										
		2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Ending		26,024	41,075	56,461	72,475	84,987	97,370	112,057	125,963	141,571	159,989
	Check:	—	—	—	—	—	—	—	—	—	—

The “ending” rows simply provide the sum of each of the diagonals of data, thereby showing the ending balances as of December 31 of the respective years.

The following provides the net paid loss and DCC triangle for Fictitious in the same triangular format as shown above for reported loss and DCC.

TABLE 42

Data from 2018 Annual Statement for Fictitious Insurance Company,
Schedule P — Part 3 — Summary

Cumulative Paid Net Losses and Defense and Cost Containment Expenses Reported at Year-End (000 omitted)

Years in Which Losses Were Incurred	12 Months	24 Months	36 Months	48 Months	60 Months	72 Months	84 Months	96 Months	108 Months	120 Months	120 Months
Prior	XXX	000	9,061	13,830	18,110	21,281	23,728	26,341	27,752	29,108	30,210
2009	3,881	6,637	8,297	9,620	10,627	11,289	11,686	11,961	12,108	12,202	
2010	4,121	7,109	9,011	10,142	11,035	11,552	11,847	12,070	12,238		
2011	4,061	6,981	8,385	9,439	10,067	10,485	10,772	10,933			
2012	4,376	7,649	8,904	9,766	10,329	10,724	10,919				
2013	4,208	6,630	7,898	8,803	9,481	9,804					
2014	4,591	7,325	8,821	9,846	10,503						
2015	6,026	9,265	10,971	12,130							
2016	5,626	8,740	10,332								
2017	6,278	9,774									
2018	8,660										
		2009	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**
Ending		3,881	19,819	33,297	48,098	62,292	75,616	90,661	104,889	120,098	137,705
	Check:	—	—	—	—	—	—	—	—	—	—

Cautions When Using Schedule P to Assess Reserve Adequacy

Age-to-age loss development factors can be computed from the above triangles and projections of ultimate loss and DCC made. However, we note several issues that we have observed in practice with blindly using Schedule P data to assess the adequacy of an insurance company's reserves:

- While there are Instructions to the Annual Statement and third-party companies provide software to assist insurers in preparing their Schedule P, certain allocations and presentations are left up to interpretation of the person completing Schedule P.
- Internal pooling or reinsurance agreements may have an impact on the data set, and that impact may not be readily apparent from Schedule P. For example, we have seen pooling and reinsurance arrangements on a calendar year basis, as opposed to accident or policy year, which distorts Schedule P since it is on a net (or after pool) basis.
- Schedule P contains experience from a company's participation in voluntary and involuntary pools and/or associations. Many underwriting pools report IBNR reserves as case reserves, thereby distorting analytics and projections that use case base reserves. Further, a company's level of participation in the pool may have changed over time.

- Schedule P only contains data for the last 10 accident years. Most casualty lines have experienced loss development significantly longer than 10 years. Tail development factors have to be estimated using other (external) sources, thereby increasing the uncertainty of the projections.

- Commutations of reinsurance agreements can also distort an analysis of loss development using Schedule P. Commutations represent an agreement between a reinsurer and the reinsured to release all obligations under a reinsurance contract. Typically, the reinsurer will pay a lump sum to the reinsured to extinguish all future liabilities. The reinsurer's case and IBNR reserves for the assumed contract will drop to $0 upon paying the lump sum, while the ceding company's net reserves should increase since the ceding company can no longer take credit for the reinsurance and "reassumes" the liability.

- The data triangles in Parts 2 through 4 include DCC expenses, potentially masking trends in the loss or DCC components that may impact reserve needs.

- Analytics of the data, including a review of loss ratios, claim closure rates from Part 5 data, and average severities from data contained in Parts 2 through 5 can provide observations regarding trends. However, the underlying cause for these trends, and determination of their impact on future claim payments, can only be obtained through discussion with company management, including interviews with management in the pricing, underwriting and claims departments of the insurance company. Care should be taken in the interpretation of these trends absent these discussions.

This list is not intended to be all-inclusive, but rather illustrate that care should be taken when drawing conclusions about a company's recorded reserves using Schedule P data alone.

As with any unpaid claim analysis, consideration should be made for changes in the company's business, including but not limited to retentions, claims settlement and reserving, business mix, and underlying exposures. One of the Schedule P Interrogatories helps to address this. Interrogatory 7 asks for further explanation regarding *"any especially significant events, coverage, retention or accounting changes that have occurred that must be considered"* in using Schedule P data to assess reserve adequacy.

Hindsight Tests from Part 2

Part 2 represents ultimate incurred loss and DCC by accident year, recorded by the company at the end of each of the last 10 years. Part 2 is particularly useful as it shows how the company's estimates of ultimate loss and DCC have fared over the past year and past two years, as displayed in columns 11 and 12, respectively. The figures in column 11 provide the change in ultimates over the past year (column 10 minus column 9) for all accident years prior to the current accident year. Column 12 provides the change in ultimates over the past two years (column 10 minus column 8) for all but the most recent two accident years.

The totals of the figures in columns 11 and 12 of Part 2 – Summary reconcile directly to the current calendar year figures in column 1, lines 73 and 75 respectively, of the Five-Year Historical Data exhibit within the Annual Statement. This is illustrated below for Fictitious Insurance Company using the 2018 Annual Statement:

TABLE 43a

Data from 2018 Annual Statement for Fictitious Insurance Company
Schedule P — Part 2 — Summary (000 omitted)
Incurred Net Losses and Defense and Cost Containment Expenses Reported at Year-end

Years in Which Losses Were Incurred	Development	
	One Year	Two Year
Prior	177	138
2009	(21)	(270)
2010	(77)	(208)
2011	(189)	(386)
2012	(124)	(447)
2013	(158)	(377)
2014	(370)	(408)
2015	(380)	(471)
2016	(106)	(172)
2017	73	XXX
2018	XXX	XXX
Total	(875)	(2,601)

TABLE 43b

Five-Year Historical Data (000 omitted)	
	2018
73. Development in estimated losses and loss expenses incurred prior to current year (Schedule P, Part 2 — Summary, Line 12, Col. 11)	(875)
75. Development in estimated losses and loss expenses incurred 2 years before the current year and prior year (Schedule P, Part 2—- Summary, Line 12, Col. 12)	(2,602)

While the absolute dollar amount of development is useful, it is valuable to view loss development in relation to prior year reserves from which the development has emerged, as well as on prior year surplus. For Fictitious, the $0.875 million of favorable development represents less than 1.8% of prior year reserves totaling $49.445 million.[82] This means that, with perfect hindsight, company management would have established reserves at $48.570 million ($49.445 million minus $0.875 million).

In Part IV, *Statutory Fillings to Accompany the Annual Statement* of this publication, we discuss loss development as a ratio to surplus in further detail. This is a measure used by the NAIC IRIS. For now, we will simply state that the $0.875 million of favorable development represents less than 2.8% of policyholders' surplus as of December 31, 2017, totaling $31.608 million per column 2, line 37 of page 3 of the company's 2018 Annual Statement.

A benefit of Part 2 is that it provides further insight into the observed development. The development across all accident years may be negligible in aggregate; however, there may be large increases or decreases in certain accident years or lines of business that warrant further investigation.

As displayed above, Fictitious Insurance Company experienced favorable development in 2018, totaling $0.875 million on prior accident years. We see that the favorable development on accident years 2009 through 2016 was somewhat offset by adverse development on the prior accident years and the current accident year. This is where the actuary becomes a detective to uncover the cause of the development.

- First, when we see adverse development in the prior accident years, we might first look to the longer-tailed casualty lines as the culprit. Schedule P, Parts 2A through 2T provide net incurred loss and DCC development for each of the Schedule P lines of business.
- Second, when we see adverse development on the "all prior" years, and then a consistent trend of favorable development, we question the difference between the exposures in the prior

[82] The net loss and DCC reserve of $49.4 million as of December 31, 2017, was computed by subtracting column 9 in Schedule P, Part 2 – Summary from column 9 in Schedule P, Part 3 – Summary (i.e., ultimate incurred minus paid = unpaid). This was done to put the reserve amount on the same basis as the development amount, both of which are undiscounted.

accident years versus those in the subsequent accident years. Generally speaking, if the exposures underlying the prior years were consistent with those in subsequent accident years, we would expect the adverse development to flow through to the current years as well.

Once we identify the line of business, we could look to other areas of the Annual Statement for guidance. For example, we can turn to the Notes to the Financial Statements, in particular "Changes in Incurred Losses and Loss Adjustment Expenses" (Note 25 of the 2018 Annual Statement) for further details. This Note provides management's explanation for development during the year. This may lead to review of additional notes, such as the note titled "Asbestos/Environmental Reserves." Oftentimes when we see adverse development isolated to the prior years row, we look to see if it stems from asbestos and environmental (A&E) claims activity.[83]

While the line of business details in Parts 2A through 2T and Notes to the Financials provide further insight into the source of loss development, they do not substitute the value of a conversation with management of the insurance company. Management can provide further color around the causes of development that pure numbers and notes cannot.

Prior Years Row

The calculation of the prior years row in Schedule P, Parts 2 through 4 can be a bit cumbersome and confusing. The easiest way to explain the calculation is to start backwards, providing the source of the prior years row for Schedule P, Part 4, and then work our way to the details underlying the computation of Part 3, and then Part 2.

Prior Years Row – Part 4

The prior row in Part 4 is the most straightforward. It is simply the amount recorded by the company for bulk and IBNR reserves for all accident years prior to the most recent 10. This amount is determined by the company's management and recorded in Part 4, as are the amounts for all subsequent accident years.

One can reconcile the prior year balances at each evaluation date (i.e., across the columns) to Schedule P, Part 1 of the current and prior year Annual Statements. Specifically, the amount in column 15 (direct and assumed bulk + IBNR loss) minus 16 (ceded bulk + IBNR loss) plus 19 (direct and assumed bulk + IBNR DCC) minus 20 (ceded bulk + IBNR DCC) of Schedule P, Part 1, should equal the last number in column 10 of the prior row in Part 4 after adjusting for any tabular discount. The following provides the calculation for Fictitious for 2018.

[83] There is considerable uncertainty around the reserving for these types of claims due to the length of time between exposure to manifestation of disease that gives rise to a claim. As such, the industry has experienced considerable adverse development on reserves established for these claims over the years.

TABLE 44a[84]

Prior years row	Sch P Part 1 Column	Amount $000s
Direct plus assumed bulk + IBNR loss	15	7,719
minus Ceded bulk + IBNR loss	16	1,416
plus direct plus assumed bulk + IBNR DCC	19	1,545
minus Ceded bulk + IBNR DCC	20	138
Net bulk + IBNR loss & DCC (net of tabular discount)		7,710
plus tabular discount		378
Net bulk + IBNR per Schedule P, Part 4	2018	8,088

The entire prior years row for Part 4 is provided below.

TABLE 44b

Bulk and IBNR Reserves on Net Losses and Defense Cost Containment Expenses Reported at Year End (000 omitted)

	Years in Which Losses Were Incurred	1 2009	2 2010	3 2011	4 2012	5 2013	6 2014	7 2015	8 2016	9 2017	10 2018
1.	Prior	17,126	14,330	13,764	12,807	12,285	11,632	10,529	9,752	8,907	8,088

Prior Years Row – Part 3

As discussed previously, Part 3 provides cumulative paid loss and DCC for the latest 10 accident years, evaluated as of the end of each of those years. The prior row for Part 3 also provides cumulative paid data; however, it does not start with the cumulative payments from the first year that the company wrote business. Rather, it shows the payments that have occurred on loss and DCC reserves as of the earliest evaluation date in the table, for all prior accident years. Only payments made subsequent to the establishment of reserves as of the earliest evaluation date in the table are shown. The 2018 Annual Statement for Fictitious shows the prior row for Part 3 as the following.

[84] The amount of tabular discount shown in the table is derived from the data in Fictitious' Schedule P by taking the bulk and IBNR in the prior years row from Part 4 minus the corresponding amount in Part 1.

TABLE 45

Data from 2018 Annual Statement for Fictitious Insurance Company,
Schedule P — Part 3 — Summary

Cumulative Paid Net Losses and Defense and Cost Containment Expenses Reported at Year-End (000 omitted)

	Years in Which Losses Were Incurred	1 2009	2 2010	3 2011	4 2012	5 2013	6 2014	7 2015	8 2016	9 2017	10 2018
1.	Prior	000	9,061	13,830	18,110	21,281	23,728	26,341	27,752	29,108	30,210

The amount of $9,061 in column 2 represents net amounts paid in 2010 on net loss and DCC reserves established by the Company as of December 31, 2009. The amount shown in column 3 of $13,830 represents net amounts paid *since* year-end 2009 on net loss and LAE reserves as of December 31, 2009, for all prior accident years. This continues all the way until 2018, where the amount of $30,210 represents net amounts paid since year-end 2002 (through year-end 2018) on net loss and DCC reserves as of December 31, 2009, for all prior accident years.

Only loss and DCC payments on reserves evaluated as of the earliest evaluation date (December 31, 2009, in our example) are shown in the prior row. As a result, the balance in the first column is always zero.

The calculation of the prior row in Part 3 is done by computing the incremental payments subsequent to the earliest evaluation date (2009 in our example) for both the prior and first subsequent accident year from the previous year's Schedule P, Part 3 (2017 in our example). The following provides this calculation using Part 3 from the 2017 Schedule P for Fictitious.

TABLE 46

Data from 2017 Annual Statement for Fictitious Insurance Company,
Schedule P — Part 3 — Summary
Cumulative Paid Net Losses and Defense and Cost Containment Expenses Reported at Year-End (000 omitted)

Years in Which Losses Were Incurred	1 2008	2 2009	3 2010	4 2011	5 2012	6 2013	7 2014	8 2015	9 2016	10 2017
Prior	000	8,238	14,960	18,129	21,279	23,817	25,840	28,163	29,380	30,519
2008	4,680	8,297	10,637	12,236	13,367	13,999	14,424	14,714	14,908	15,124

Calculation to Transition 2017 Part 3 Prior Row to 2011 Schedule P, Part 3
Current Column minus 2002 Column (Column 2) in 2010 Part 3

Years in Which Losses Were Incurred	1 2008	2 2009	3 2010	4 2011	5 2012	6 2013	7 2014	8 2015	9 2016	10 2017
Prior		—	6,722	9,891	13,041	15,579	17,602	19,924	21,142	22,281
2008		—	2,340	3,939	5,070	5,702	6,127	6,417	6,611	6,828
Sum		—	9,062	13,830	18,110	21,282	23,729	26,342	27,753	29,108

Data from 2018 Annual Statement for Fictitious Insurance Company,
Schedule P — Part 3 — Summary
Cumulative Paid Net Losses and Defense and Cost Containment Expenses Reported at Year-End (000 omitted)

Years in Which Losses Were Incurred	1 2009	2 2010	3 2011	4 2012	5 2013	6 2014	7 2015	8 2016	9 2017	10 2018
Prior	000	9,061	13,830	18,110	21,281	23,728	26,341	27,752	29,108	30,210

As displayed above, the starting point for the calculation is the first two rows (prior and 2008) of Part 3 of the Fictitious 2017 Annual Statement. To calculate the prior years row for Part 3 of Fictitious' 2018 Annual Statement, the difference between amounts in each column and the amounts in column 2 (2009) is computed. The prior and subsequent accident year (2008) payments are then added together to produce the new prior row for Part 3 of the Company's 2018 Schedule P.

For example, cumulative net paid loss and DCC for column 2 (2010) are calculated as:

$$14{,}960 - 8{,}238 + 10{,}637 - 8{,}297 = 6{,}722 + 2{,}340 = 9{,}061$$ [85]

As another example, the cumulative net paid loss and DCC for column 10 (2017) are calculated as:

[85] Minor differences due to rounding.

30,519 - 8,238 + 15,124 - 8,297 = 22,281 + 6,827 = 29,108[86]

Prior Years Row – Part 2

As discussed previously, Part 2 provides cumulative ultimate incurred loss and DCC for the latest 10 accident years, evaluated as of the end of each of those years. The prior row for Part 2 also provides cumulative incurred data; however, it does not start with the cumulative incurreds from the first year that the company wrote business. Rather, it starts with the net loss and DCC reserves recorded by the Company as of the earliest evaluation date in the table and includes this amount in column 1 of Schedule P, Part 2. For example, using Schedule P, Parts 2 through 4, Summary, of the 2017 and 2018 Annual Statements for Fictitious Insurance Company, we see that column 1 of the prior row in the 2011 Schedule P, Part 2, is equal to the sum of the following amounts in column 2 (labeled "2009") from the 2017 Annual Statement (USD in 000s).

TABLE 47

Data from 2017 Annual Statement	**2009**	**Source**
		Schedule P, Part 2 — Summary minus Part 3 — Summary minus Part 4 — Summary
Case outstanding:		
Prior Years row	15,123	*Line 1*
2008 row	3,745	*Line 2*
Sum	18,868	
Bulk and IBNR:		*Schedule P, Part 4 — Summary*
Prior Years row	13,241	*Line 1*
2008 row	3,886	*Line 2*
Sum	17,127	
Total Unpaid:		
Prior Years row	28,365	*Sum of above (case outstanding plus bulk and IBNR)*
2008 row	7,630	*Sum of above (case outstanding plus bulk and IBNR)*
Sum	**35,995**	*Sum of above (case outstanding plus bulk and IBNR)*
	↓	
2018 Annual Statement	**2009**	**Source**
Schedule P — Part 2 — Summary, Prior Years row	**35,994**	*Line 1*

As displayed above, the amount in column 1 of the prior row in 2018 Schedule P, Part 2, Summary is $35,994[87].

Then, amounts in columns 2 and subsequent are equal to the ending reserves (case plus bulk plus IBNR reserves) as of each corresponding year-end, plus the paids from the corresponding prior row in Schedule P, Part 3. This is shown below for Fictitious:

[86] Minor differences due to rounding.
[87] Minor differences due to rounding.

TABLE 48

Data from 2018 Annual Statement for Fictitious Insurance Company,
Schedule P — Parts 2 through 4 — Summary
Prior Years Row, Net Loss & DCC

Years in Which Losses Were Incurred	1 2009	2 2010	3 2011	4 2012	5 2013	6 2014	7 2015	8 2016	9 2017	10 2018
Prior Paid from Part 3	000	9,061	13,830	18,110	21,281	23,728	26,341	27,752	29,108	30,210
Prior Case Outstanding from Part 2 — Part 3 — Part 4	XXX	14,969	14,190	12,684	11,295	10,018	9,077	8,380	7,830	7,724
Prior Bulk + IBNR from Part 4	17,126	14,330	13,764	12,807	12,285	11,632	10,529	9,752	8,907	8,088
Total Prior Unpaid (Case + Bulk + IBNR)		29,299	27,954	25,491	23,580	21,650	19,606	18,132	16,737	15,812
Prior Incurred Loss = Paid + Unpaid	35,994	38,360	41,784	43,601	44,861	45,378	45,947	45,884	45,845	46,022

Data from 2018 Annual Statement for Fictitious Insurance Company,
Schedule P — Part 2 — Summary
Incurred Net Losses and Defense and Cost Containment Expenses Reported at Year-End
(000 omitted)

Years in Which Losses Were Incurred	1 2009	2 2010	3 2011	4 2012	5 2013	6 2014	7 2015	8 2016	9 2017	10 2018
Prior	35,994	38,360	41,784	43,601	44,861	45,378	45,947	45,884	45,845	46,022

As displayed above, the case outstanding plus bulk plus IBNR reserves in the prior rows, derived from Parts 2 through 4, are summed and then added to the corresponding cumulative paids since 2010. This produces the "incurreds" on all prior accident years, as shown in Schedule P, Part 2.

All the examples above are provided for the Summary of Schedule P, Parts 2 through 4, with the calculation being the same for all of the lines of business in Parts 2A through 2T.

Prior Years Row – Fictitious 2017 Annual Statement

For completion, and so that a reconciliation can be made of the amounts shown in Table 48 for 2017, the following provides the prior years and 2008 rows from Schedule P, Parts 2 and 4 from Fictitious' 2017 Annual Statement.

TABLE 49

Data from 2017 Annual Statement for Fictitious Insurance Company,
Schedule P — Part 2 — Summary

Incurred Net Losses and Defense and Cost Containment Expenses Reported at Year-End
(000 omitted)

Years in Which Losses Were Incurred	1 2008	2 2009	3 2010	4 2011	5 2012	6 2013	7 2014	8 2015	9 2016	10 2017
Prior	31,760	36,602	38,321	41,474	43,475	44,539	45,113	45,607	45,605	45,706
2008	15,976	15,927	16,574	16,844	16,661	16,856	16,799	16,875	16,814	16,673

Data from 2017 Annual Statement for Fictitious Insurance Company,
Schedule P — Part 4 — Summary

Bulk and IBNR Net Losses and Defense and Cost Containment Expenses Reported at Year-End
(000 omitted)

Years in Which Losses Were Incurred	1 2008	2 2009	3 2010	4 2011	5 2012	6 2013	7 2014	8 2015	9 2016	10 2017
Prior	14,550	13,241	11,605	11,986	11,610	11,089	10,606	9,506	8,852	8,191
2008	7,241	3,885	2,725	1,778	1,197	1,196	1,026	1,023	900	716

As a reminder, Part 3 from Fictitious' 2017 Annual Statement is shown in Table 46.

Claim Counts

Part 3 also provides the number of claims closed with and without loss payment in columns 11 and 12, respectively. These figures are provided only for those lines where this information is provided in Part 5 (see below); these figures are not shown in the Summary.

SCHEDULE P — PART 5

Part 5 is provided in the following three sections, which are provided by accident year as of the last 10 year-end evaluations on a direct plus assumed basis:

Section 1: Cumulative number of claims closed with loss payment
Section 2: Number of claims outstanding
Section 3: Cumulative number of claims reported

Part 5 is provided for the following lines of business:

A - Homeowners/Farmowners
B - Private Passenger Auto Liability/Medical
C - Commercial Auto Liability/Medical

D - Workers' Compensation
E – Commercial Multiple Peril
F – Section A[88] – Medical Professional Liability – Occurrence
F – Section B – Medical Professional Liability – Claims-Made
H – Section A – Other Liability – Occurrence[89]
H – Section B – Other Liability – Claims-Made
R – Section A – Products Liability – Occurrence
R – Section B – Products Liability – Claims-Made
T – Warranty

No summary is provided for Part 5.

As noted, claim counts can assist the user in identifying trends or changes in the way claims are settled and reserved. However, caution should be made in relying solely on the analytics without discussion with company management, ideally management within the claims department of the insurance company. There is inconsistency in the way that companies record and report claim counts, and sole reliance on the data without confirmation with management can be misleading. One known inconsistency is that some companies record claims on a per-claim basis and others on a per-claimant basis. As we shall see later in this chapter, the Interrogatories of Schedule P require that companies disclose the method for recording claim counts.

Actuaries can derive many statistics from the data contained in Part 5. In the following paragraphs we discuss the most common claim count statistics used by actuaries, as well as other uses of Part 5.

Claim Closure Rates

These represent the ratio of closed claims to total reported claims. The ratio can be computed as all closed claims, or only those claims closed with payment, divided by reported claims. This relationship, in particular when viewed in the current accident year in comparison to prior accident years during the first 12 months of a development, helps to identify any changes in the rate at which claims are settled (closed).

We often hear claims adjusters say, "The best claim is a closed claim," the reason being that the longer a claim stays open, the greater the likelihood it will develop adversely and cost the insurer more money. A closed claim significantly reduces that potential, in most cases to zero.[90] Closed claims also benefit the insured by allowing the insured to receive medical treatment, repair damaged property and recover

[88] The line of business section headings change from 1 and 2 to A and B in Part 5, due to the naming of Sections 1 through 3 herein.
[89] Business reported as an aggregate write-in for other lines of business in the State Page is included here (either as occurrence or claims-made, depending on the coverage written).
[90] There is always the chance that a claim could reopen.

from the loss. Claims departments look for ways to increase claim settlement rates to achieve this mutual benefit.

Despite the benefits of such improvements, they can have an adverse effect on the projection of unpaid claims if not explicitly taken into consideration. Take for example the situation where a company has implemented a new strategy to increase claim settlement rates in the current year. This will result in higher than average claim payments being made in the current year and will cause the paid loss development factors at the latest evaluation date (i.e., last diagonal) to be higher than in prior evaluation dates along the diagonals. Giving weight to this higher factor in the application of loss development factors to paid losses (that are themselves higher than normal) will result in the over-projecting of ultimate losses and therefore the overestimate of unpaids.

Similarly, a claims department may also experience a reduction in claim settlement rates for numerous reasons, such as reductions in staffing levels, growth in a book without a commensurate increase in claim staff, or influx of claims resulting from the occurrence of a catastrophe, among others. A reduction in claim settlement rates could result in underestimating unpaid claims because the last diagonal of loss development factors and current evaluation of paid losses are suppressed relative to prior years.

A review of claim closure rates will help to identify these trends, thereby enabling the actuary to consider the impact on the analysis of unpaid claims.

Table 50 shows the triangle of claim closure rates for Fictitious' homeowners line of business.

TABLE 50

Data from 2018 Annual Statement for Fictitious Insurance Company,
Data from Schedule P — Part 5A — Homeowners/Farmowners

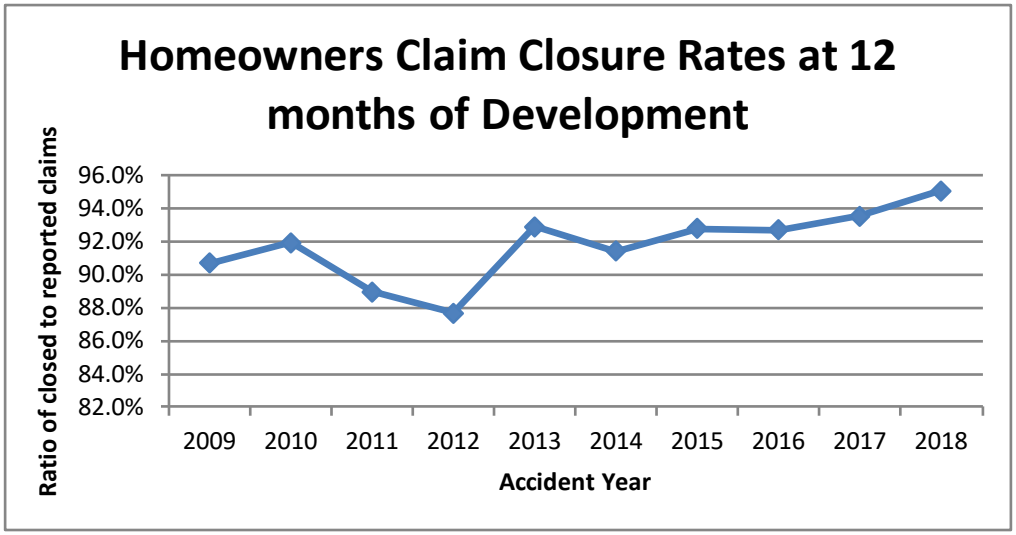
Calculation of Claim Closure Rate (Total Claims Closed from Section 3 minus Section 2, divided by Total Reported Claim Counts from Section 3)

Years in Which Losses Were Incurred	12 Months	24 Months	36 Months	48 Months	60 Months	72 Months	84 Months	96 Months	108 Months	120 Months
2009	90.7%	97.9%	98.8%	98.8%	99.2%	99.6%	99.6%	99.6%	99.6%	99.6%
2010	91.9%	98.4%	99.2%	99.6%	99.6%	99.6%	99.6%	99.6%	99.6%	
2011	88.9%	97.7%	99.1%	99.5%	99.5%	99.5%	99.5%	99.5%		
2012	87.7%	98.1%	98.6%	99.5%	99.5%	99.5%	99.5%			
2013	92.9%	98.6%	99.5%	99.5%	99.5%	99.5%				
2014	91.4%	98.4%	99.0%	99.5%	99.5%					
2015	92.8%	98.7%	99.3%	99.7%						
2016	92.7%	99.0%	99.7%							
2017	93.6%	99.1%								
2018	95.1%									

The above was computed by taking total reported counts in Section 3 of Part 5A and subtracting the open counts in Section 2 to compute a triangle of closed counts. We then took the resulting closed count triangle and divided by the reported count triangle in Section 3.

Depending on the line of business, generally, only the first two to three columns are relevant to the actuary, as claim adjusters tend to have the biggest impact on claim settlement in the first couple of years of development. After that, it is often difficult to have a widespread effect on the open claims. For a short-tailed line of business such as homeowners, actuaries will tend to focus on the first 12 months in the above triangle. The following provides a graphic depiction of the first 12 months of settlement rates.

TABLE 51



From the chart we see a slight uptick in the claim settlement rates since 2016. While the change is relatively benign, it would be important to talk to Fictitious' management to see if there are any internal or external changes than might impact the rate at which homeowners claims are being settled. Additionally, it would be interesting to inquire as to the changes that occurred in 2011 and 2012, as there appears to have been a large drop in the rate at which claims were being closed. If, for example, there was an uptick in weather-related claims during 2012, it may be that Fictitious' claims department had some difficulties keeping pace with the large number of claims reported during 2012.

Closed With Pay (CWP) Ratios

These represent the ratio of CWP claims to total closed claims. Companies may experience changes in the rate that claims are closed without payment. It is important for the actuary to understand the implications of changes in CWP rates on the unpaid claim analysis. While an increasing trend in CWP rates is generally a good sign, it may result in increases in reopened claims in the future or have other effects that are not easily discernible in the loss data.

Table 52 provides the ratio of claims closed without payment to total closed claims for Fictitious. While we can show the ratio of CWPs as well, which is simply one minus the ratios shown within Table 52, we thought the ratios of closed without pay more clearly highlights some changes in the Company's experience.

TABLE 52

Data from 2018 Annual Statement for Fictitious Insurance Company,
Data from Schedule P — Part 5A — Homeowners/Farmowners
Ratio of Claims Closed Without Payment to Total Closed Claims

Years in Which Losses Were Incurred	12 Months	24 Months	36 Months	48 Months	60 Months	72 Months	84 Months	96 Months	108 Months	120 Months	120 Months
2009	1%	16%	15%	15%	15%	15%	16%	16%	16%	16%	
2010	14%	14%	14%	14%	14%	13%	13%	13%	13%		
2011	16%	16%	16%	16%	16%	16%	16%	16%			
2012	13%	13%	13%	13%	13%	13%	12%				
2013	9%	9%	9%	9%	9%	9%					
2014	8%	9%	8%	8%	8%						
2015	8%	8%	8%	8%							
2016	9%	9%	9%								
2017	8%	8%									
2018	6%										

As displayed above, there appears to have been a drop in claims closed without pay between the 2011 and 2013 accident years from around the 15% level at 12 months of development to about the 8% level for accident years 2013 through 2017 at 12 months. There seems to be a further decline in accident year 2018, although to a much lesser degree. Inquiries would have to be made of company management to understand the cause for these trends and ascertain the impact on future loss and LAE development.

Claim Frequency

The rate of claim frequency can be determined using Schedule P data by dividing claim counts in Part 5 by earned premiums in Part 1. This can be useful in identifying changes in the rate claims are closed and reported relative to the exposure. However, we note that the exposure here is influenced by rate changes. Therefore, similar to loss ratios, these rates can go up or down depending on pricing changes. Schedule P does not provide the raw exposure base (e.g., home years for homeowners, car years for auto, payroll or employee count for workers' compensation). As a result, one cannot identify pure loss cost trends using this data without making manual adjustments for changes in rate.

Average Claim Severities

In addition to providing statistics based solely on counts, the actuary can also analyze severities using the loss data from Parts 2 through 4 and the count data in Part 5. The actuary can analyze the following:

- Average closed claim severities, which are computed as the ratio of net paid loss and DCC to direct plus assumed claims closed with payment (or total closed claim counts). The numerator in

the equation comes from Schedule P, Part 3, and the denominator comes from Schedule P, Part 5, Section 1 (or Section 3 minus Section 2 for total closed claim counts).

- Average case outstanding severities, which are computed as the ratio of net case outstanding loss and DCC to direct plus assumed open counts. The numerator in the equation comes from Schedule P, Part 2 minus Part 3 minus Part 4, and the denominator comes from Schedule P, Part 5, Section 2.

- Average reported claim severities, which are computed as the ratio of net reported loss and DCC to direct plus assumed reported counts. The numerator in the equation comes from Schedule P, Part 2 minus Part 4, and the denominator comes from Schedule P, Part 5, Section 3.

The above enables the actuary to identify trends in the cost of insurance claims. Such trends may be inflationary, a result of law changes, attributed to one-time catastrophic claims, due to changes in deductibles or retentions, or caused by internal factors, among others.

As with claim counts, actuaries generally look for changes in the first few years of development, as these changes tend to have the biggest impact on reserve levels.

A review of average case reserves is particularly useful to the reserving actuary. Changes in case reserve levels may be a sign that the company has strengthened or weakened its case reserves. For example, if we were to compute a triangle of average case outstanding severities and observe a decrease along the last diagonal relative to the prior diagonal, then that may be a sign that the company has weakened its case reserves.[91] Of course, this observation would warrant discussion with the company's claims department. However, assuming there was a weakening in case reserves, use of the reported loss development method to project unpaid loss, without adjustment to reflect the weakening, may understate the reserve need.

To be more specific, loss development methods assume that the past is predictive of the future. When a company weakens reserves, the reported losses are at a lower level than they had been at the past. Therefore, application of prior average loss development factors to current, lower loss amounts, will tend to understate the ultimate loss estimate and therefore the reserve need. The effect is similar to what happens to development methods using paid loss data when there has been a change in the rate claims are being closed. A decrease in claim settlement rates (i.e., "slowdown") along the last diagonal will result in an understatement of the reserve need absent adjustment to the paid loss triangle or paid loss development methods. The opposite can happen when there has been a strengthening in case reserves or a speed-up in claim settlement. While not the topic of this publication, there are loss

[91] The last diagonal represents average case outstanding reserves corresponding to the accident years in the left most column, as of the current evaluation date, which is December 31, 2018 for Fictitious. The prior diagonal is one year prior to the current evaluation (i.e., December 31, 2017 for Fictitious).

reserving methods that explicitly adjust for changes in case reserve adequacy and claim closure rates, such as those described in the Berquist-Sherman paper.[92]

Table 53 provides the average case outstanding reserves for Fictitious' homeowners line of business:

TABLE 53

Data from 2018 Annual Statement for Fictitious Insurance Company,
Data from Schedule P — Parts 2 through 5 — Homeowners/Farmowners

Average Net Case Outstanding Loss and DCC Severities
(Net Case Outstanding Loss and DCC / Open Claim Counts)

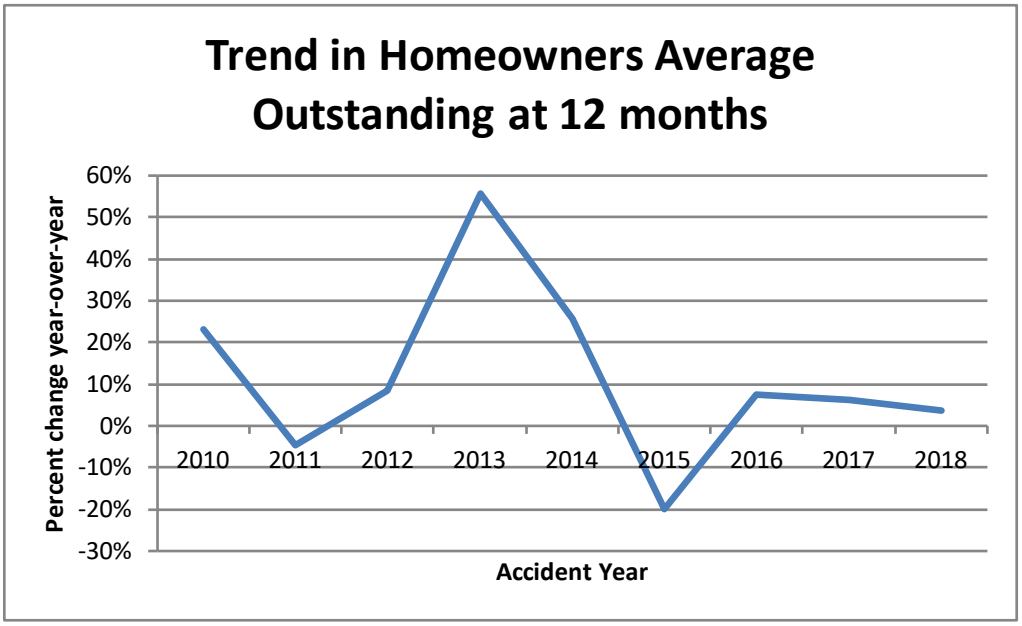
Years in Which Losses Were Incurred	12 Months	24 Months	36 Months	48 Months	60 Months	72 Months	84 Months	96 Months	108 Months	120 Months	120 Months
2009	7,350	10,800	10,677	6,000	5,000	7,000	5,000	2,000	1,000	—	
2010	9,053	16,750	19,000	21,000	12,000	7,000	5,000	2,000	1,000		
2011	8,636	18,600	23,500	25,000	14,000	9,000	5,000	2,000			
2012	9,360	13,750	8,667	9,000	11,000	12,000	—				
2013	14,571	30,333	45,000	26,000	15,000	8,000					
2014	18,333	37,000	30,500	34,000	18,000						
2015	14,684	32,250	37,500	40,000							
2016	15,789	42,000	61,000								
2017	16,789	41,333									
2018	17,429										
		2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Ending			10,966	10,844	11,243	14,833	17,920	17,071	17,774	19,194	18,909
Annual Trend				-1%	4%	32%	21%	-5%	4%	8%	-1%

The bottom row shows the trend across all accident years combined, over each evaluation year. We see that in 2016 and 2017, average reserve levels increased by about 4% and 8%, respectively. However, in 2018, reserve levels decreased by 1%. As a result of this decline, the actuary may see ultimate loss and DCC estimates based on reported methods coming in lower than the ultimate loss and DCC estimates based on paid methods.

Looking down the column at the first 12 months, we see a significant increase in case reserve between 2012 and 2013. This is a bit more obvious graphically. The following provides the change in average case reserves, from one accident year to the next, going down the 12-month development column.

TABLE 54

[92] Berquist, J.R.; and Sherman, R.E., "Loss Reserve Adequacy Testing: A Comprehensive, Systematic Approach," Proceedings of the Casualty Actuarial Society (PCAS) LXIV, 1977, pp.123-184.



A large spike is seen in 2013. The approximate 56% increase was computed by taking the average case outstanding severity for accident year 2013 of $14,571 and dividing by the average for accident year 2012 of $9,360 to obtain the year-over-year change of 1.56 (+56%).

Despite the large increase in 2013 and subsequent sharp decline in 2015, the year-over-year trend rates in the first 12 months of development appear to have been on a slight decline from 8% to 4% between 2016 and 2018.

As previously mentioned, the value of these analytics is to identify trends and generate discussion with management so that the actuary can appropriately consider them in the analysis of unpaid claims.

Reasonableness Tests

In addition to the raw trends, actuaries also use Part 5 data to provide checks on the reasonableness of unpaid claim estimates. For example, actuaries can compute the following statistics and compare the results to see if the trends across the accident years are in alignment with what they expect:

- Average claim frequency — the ratio of the ultimate claim count estimate by accident year to the corresponding earned premium
- Average ultimate severity — the ratio of the ultimate loss and DCC estimate by accident year to the corresponding estimate of ultimate claim counts
- Average unpaid claim severity — the ratio of the unpaid loss and DCC estimate by accident year to the corresponding estimate of unpaid claims

The above can be computed using direct plus assumed loss and DCC estimates in addition to the net estimates.

Uses of Part 5 in Estimating Unpaid Claims

Before turning to Part 6, we should add that actuaries also use Part 5 for purposes of projecting ultimate loss and DCC estimates. These methods are referred to as "counts and averages" methods. Projections are made by developing average paid and reported loss severities to ultimate and applying them to estimates of ultimate claim counts using closed and reported claims count development methods. These methods can be valuable when adjusting for observed trends in each of their specific components.

SCHEDULE P — PART 6

Part 6 provides cumulative premiums earned as of December 31 for each of the last 10 calendar years. The first year of report includes premiums earned in the calendar year. Moving left to right, subsequent years show premiums earned after positive or negative adjustments from premium audits, retrospectively rated policies, lags in reporting or accounting for premiums, among others. Part 6 provides the information needed to develop earned premium to its ultimate amount using methods similar to those used to develop ultimate loss and DCC (i.e., using traditional, triangular development methods). Part 6 is provided for the following lines of business, as these lines tend to be the ones subject to the aforementioned adjustments:

C – Commercial Auto Liability/Medical
D – Workers' Compensation
E – Commercial Multiple Peril
H – Section A – Other Liability – Occurrence[93]
H – Section B – Other Liability – Claims-Made
M - International
N – Reinsurance – Nonproportional Assumed Property[94]
O – Reinsurance – Nonproportional Assumed Liability[95]
P – Reinsurance – Nonproportional Assumed Financial Lines[96]
R – Section A – Products Liability – Occurrence
R – Section B – Products Liability – Claims-Made

[93] Business reported as an aggregate write-in for other lines of business in the State Page is included here (either as occurrence or claims-made, depending on the coverage written).
[94] Property includes fire, allied, ocean marine, inland marine, earthquake, group, credit and other A&H, auto physical damage, boiler and machinery, burglary and theft and international property.
[95] Liability includes farmowners, homeowners and commercial multiperil; medical professional liability workers' compensation; other liability; products liability; auto liability; aircraft (all peril); and international liability.
[96] Financial includes financial guaranty, fidelity, surety, credit and international financial.

The premium displayed in Part 1 of Schedule P is that which is earned during each specified calendar year; it is not updated for subsequent adjustments to the specified exposure year premium. It is equal to the left-most diagonal in Part 6 plus adjustments that come through during the specified calendar year to premiums on prior exposure years. Adjustments made after the first year of report are included in the appropriate column of Part 6.

Workers' compensation provides a good example of a line that is subject to premium adjustment. At inception, the premium charged for a workers' compensation policy is determined by applying a rate to an estimate of the payroll (exposure) for the policy term. At the end of the year, or shortly thereafter, the actual payroll is known. The insurance carrier, however, has determined its premium earnings on the basis of the estimated premium. As a result, the premium figure will change from its initial amount, and this change is recorded in Part 6.

Additionally, the exposure base used to determine the premium can be subject to audit by the insurance carrier. For example, an insurance company can verify that payroll amounts used in determining an insured's workers compensation premium, or revenue figures used in computing an insured's general liability premium, are accurate and complete. Differences uncovered through these audits will emerge as premium development in Part 6.

The one area where we tend to see the most development on earned premium is retrospectively rated insurance policies. Under these policies, the insured is charged a base premium that is adjusted over time based on the insured's loss experience based on a formula. The formula incorporates tax multipliers and expense factors and typically imposes a minimum and maximum premium amount.

Insurance companies record the claim experience associated with retrospectively rated insurance policies within Schedule P, and the loss reserve estimates typically include a provision for these claims. Without adjustment for the additional premium income expected under these policies, a company's surplus would be understated. This adjustment comes in as an asset on line 15.3 of page 2 of the Annual Statement titled "Accrued Retrospective premium."

Estimates of future premium can be determined by developing the earned premiums in Part 6 using development methods. However, as with reliance on the rest of Schedule P for projection purposes, exclusive reliance on Part 6 should not be made without having a good understanding of its contents.

SCHEDULE P — PART 7

Part 7 is optional and completed only by those companies using the loss sensitive adjustment in the RBC calculation. It provides premium and loss information on loss sensitive contracts. It is broken into two parts: A for Primary Contracts (i.e., direct written business) and B for Reinsurance Contracts (i.e., assumed business). Parts A and B each have the same five sections:

- Section 1 provides net loss and LAE unpaid and net written premium on loss sensitive contracts, relative to all contracts written by the company, for each Schedule P line of business in total.

- Section 2 provides incurred loss and DCC reported at year-end on loss sensitive contracts in the same format as Schedule P, Part 2.
- Section 3 provides loss and DCC IBNR at year-end on loss sensitive contracts in the same format as Schedule P, Part 4.
- Section 4 provides net earned premiums reported at year-end on loss sensitive contracts in the same format as Schedule P, Part 6.
- Section 5 provides net reserves for premium adjustments and accrued retrospective premiums for each of the last 10 years in which the policies were issued, evaluated at each of the last 10 years.

The information provided in Part 7 is on a policy year basis.

As noted, the primary use of this exhibit is for RBC purposes. The Reserve RBC and Written Premium RBC are adjusted to reflect the fact that loss experience under loss sensitive contracts is shared in whole or in part with the insured. As such, the risk of adverse loss development is also shared with the insured. The insurance company receives a discount to its RBC reserve charge to reflect this reduction in risk. This discount is computed separately by line of business. Columns 3 and 6 of Schedules A and B provide the percentage of loss and LAE reserves and written premiums by line of business for loss sensitive contracts. Column 3 provides the distribution of reserves, and column 6 provides the distribution of net written premium.

Examples of how this information is used in computing RBC are contained in Part IV. *Statutory Filings to Accompany the Annual Statement* of this publication.

SCHEDULE P INTERROGATORIES

The Schedule P Interrogatories are a series of seven questions that the insurance company is required to answer to provide further insight into the information reported in Schedule P. We will briefly discuss those interrogatories that are most widely referred to by property/casualty actuaries.

Question 1 pertains to extended reporting endorsements (EREs) arising from death, disability or retirement (DDR). EREs essentially turn a medical professional liability claims-made policy into an occurrence policy upon the policyholder's death, disability or retirement. In the 1990s, DDR endorsements were issued for free and known as "free tail coverage" as a marketing effort by medical insurers to attract physicians. Many such DDR extended reporting period endorsements are still offered for free.

Question 1 has six parts, the first of which pertains to whether the company issues such endorsements for free or at a reduced rate. The remaining five parts serve to identify where and how the company reports the DDR reserve: as unearned premium or loss reserve, claims-made or occurrence, etc. The main point is to make sure these policies have been reserved for somewhere in the company's financial statements, either as losses or unearned premium.

Question 2 asks whether LAE are reported as DCC and A&O as per the definitional change effective January 1, 1998. This is relevant to the actuary or other user who may be relying on Schedule P data to perform reserve adequacy tests.

Question 4 requires disclosure on whether the company's recorded loss and LAE reserves are net of non-tabular discount and reminds the preparer of the Annual Statement that:

- Disclosure of non-tabular discount must be included in the Notes to Financial Statements.
- Discounting is only allowed if the company has permission from its state insurance regulator.
- Schedule P must be prepared gross of non-tabular discounts, with the amount of discount reported in Schedule P – Part 1, Columns 32 and 33.
- Support for the amount of discount must be available for regulatory review upon request.

In question 6, the company is required to indicate whether the company reports claim counts on a per-claim or per-claimant basis in Schedule P. This, along with whether the reporting convention has changed over time, is relevant in interpreting trends in claim frequency and severity. It is also relevant when assessing reserve adequacy using counts and averages (frequency and severity) methods.

Question 7 is the most important and aligns most directly with the use of Schedule P. It asks if there are any changes or if there is anything special that the user should be aware of if the user decides to rely on the data provided in Schedule P to assess the adequacy of the recorded loss and LAE reserves. If the answer is yes, disclosure of such is required.

INTERCOMPANY POOLING AND SCHEDULE P

It is important to know that intercompany pooling differs from intercompany reinsurance.

According to SSAP No. 63, "Intercompany pooling arrangements involve establishment of a conventional quota share reinsurance agreement under which all of the pooled business is ceded to the lead entity and then retroceded back to the pool participants in accordance with their stipulated shares."[97] Under intercompany pooling, business underwritten by affiliated insurance companies is consolidated by the "lead" company and the premiums, losses and related expenses are shared based on a fixed and predetermined percentage per the agreement.

Intercompany reinsurance refers to a transaction whereby one company (the reinsurer) agrees to indemnify the other (the ceding company) against all or part of the loss that the latter may sustain under the policies that it has issued. Intercompany reinsurance is accounted for in the same way as third-party reinsurance, subject of course to statutory accounting rules. Very broadly, cessions to affiliated reinsurers under straight reinsurance agreements serve to reduce gross premiums, losses and related expenses.

[97] NAIC *Accounting Practices and Procedures Manual*, March 2019, SSAP No. 63, Underwriting Pools, page 63-3, paragraph 7.

The treatment of intercompany pooling in Schedule P is different from that of a typical reinsurance agreement. Gross losses are combined or "pooled" and then shared based on the pooling percentage of each member company, regardless of the policy issuing entity. Net losses are treated in the same manner in that they are first pooled and then shared based on each company's pooling percentage. Very simply, assume Companies A, B and C participate in intercompany pooling, with 60%, 20% and 20% participation, respectively. If each company has $100 of loss reserves on a direct basis and cedes $30 to outside reinsurers, the recorded reserves in Schedule P of Companies A, B and C would be $180, $60 and $60 on a gross of reinsurance basis and $126, $42 and $42 on a net of reinsurance basis, respectively. That is, the pooled gross ($300) and net amounts ($210) are shared based on each company's participation rates. This is summarized in Table 55.

TABLE 55

Reporting in Schedule P				
	Company A (Lead)	**Company B (Non-Lead)**	**Company C (Non-Lead)**	**Total**
Total Gross	180	60	60	300
Total Net	126	42	42	210

While Schedule P for companies that operate under an intercompany pooling arrangement is prepared on a pooled basis, as exemplified above, other schedules and exhibits within the Annual Statement treat intercompany pooling as if it is a typical reinsurance arrangement. Therefore, using the above example, if Company A were the lead in the intercompany pool, then Company A would have $100 in direct loss reserves, plus $70 assumed from each of Companies B and C, for a total of $240 in gross reserves. The $70 in assumed loss reserves from each non-lead company is after cessions to outside reinsurance.

For each non-lead company, the amount of gross loss reserves is $100 in direct reserves plus the amount assumed after the lead company cedes through the intercompany reinsurance relationship. The amount of business in the intercompany pool is $300 of direct loss reserves minus $90 (=$30*3) of ceded business, for a total of $210 net reserves. The $210 pooled net loss reserve is shared 60%, 20%, 20%, so each non-lead gets $42. Thus, the total gross loss reserves for each non-lead is $100 in direct plus $42 of intercompany pooled loss reserves for a total of $142. These amounts are summarized in Table 56.

TABLE 56

Reporting in Annual Statement Exhibits and Schedules other than P				
	Company A (Lead)	**Company B (Non-Lead)**	**Company C (Non-Lead)**	**Total**
Total Gross	240	142	142	524
Total Net	126	42	42	210

Notice that on a net basis, the amounts are the same in all of the exhibits and schedules within the Annual Statement. However, on a gross basis, exhibits and schedules other than Schedule P essentially double count the cessions to intercompany pooling, whereas Schedule P nets them out.

The fact that Schedule F does not show IBNR on an assumed basis, the double counting effect of pooling, as well as the fact that some companies have other intercompany reinsurance relationships outside the intercompany pooling relationship, complicates the reconciliation between Schedules within the Annual Statement to Schedule P. This is the main reason we have not used Fictitious in our examples.

We used loss reserves in our example. However, it is important to note that pooling percentages apply to the premium, loss, expense and claim count data within Schedule P. Therefore, all figures provided in Part 1 and the triangles provided in Parts 2 through 7 are provided after intercompany pooling. If one wanted to determine total premium, loss, expense and/or claim count data for the pool in aggregate, all one would need to do is divide the figures in Schedule P for a pool member by its intercompany pooling percentage in Schedule P, Part 1, column 34.

Intercompany pooling percentages can change over time, based on a particular group's business strategy. Schedule P is generally restated retroactively when there is a change in intercompany pooling.

Ignoring differences in underwriting expense structure, underwriting income for members of an intercompany pool is shared based on their respective pooling percentage. Each company will likely have its own underwriting expense structure, as well as structure for investment and other income, therefore policyholders' surplus will differ by company and may not align with the companies' particular pooling percentages. However, pooling percentages are generally determined with consideration of the level of policyholders' surplus at the legal entity level; in general, the larger the surplus, the greater the share.

As with reinsurance, companies use intercompany pooling for surplus relief. Under intercompany reinsurance, an individual company provides the relief. Under intercompany pooling, the members of the pool utilize the capital and surplus of all the companies, rather than each individual company.

Actuaries often think of intercompany pooling as advantageous over intercompany reinsurance, given that the unpaid claim analysis for both gross and net reserves can be calculated on pooled (combined) basis, as opposed to having to perform separate analyses of gross reserves for each entity. However, many companies use intercompany reinsurance as opposed to intercompany pooling.

In general, intercompany pooling should be easier to administer than having to maintain separate intercompany reinsurance agreements between affiliates. Over time, one table of pooling percentages can be updated as things change, therefore intercompany pooling can be more flexible. Intercompany pooling also makes it easier for a rating agency to review the financial condition of a group and assign a single rating. The group can then market its rating across all member underwriting companies. We expect that intercompany pooling would also facilitate regulatory review at a group level versus each individual company.

PART IV. STATUTORY FILINGS TO ACCOMPANY THE ANNUAL STATEMENT

INTRODUCTION TO PART IV

Insurance companies are required to file numerous documents with state insurance regulators each year, either included within or supplemental to the Property/Casualty Annual Statement. These annual filings include those listed in the Official NAIC *Annual Statement Instructions Property/Casualty,*[98] such as the Statement of Actuarial Opinion (SAO), Actuarial Opinion Summary Supplement (AOS), Supplemental Compensation Exhibit, Insurance Expense Exhibit (IEE), Supplemental Investment Risks Interrogatories, Financial Guaranty Insurance Exhibit and others such as the National Association of Insurance Commissioners (NAIC) Insurance Regulatory Information System (IRIS) ratio and Risk-Based Capital (RBC) calculation. Many of these filings serve as a means for regulators to obtain a relatively quick view of an insurance company's financial health, thereby enabling regulators to prioritize those insurance companies requiring immediate attention.

This section addresses the filings that tend to be used the most by property/casualty actuaries, namely:

- SAO
- AOS
- IEE
- RBC
- IRIS

We will discuss the purpose and important aspects of each filing. Many of these filings are addressed in considerable detail in other publications, and the NAIC has issued instructions, manuals and/or software applications that provide the preparer of these filings with authoritative guidance. This section is not intended to replace those readings or provide instructions on how to prepare those filings. Rather, we will limit our discussion to the purpose of each and a general overview of how they are prepared.

[98] *2018 NAIC Annual Statement Instructions Property/Casualty,* pages i-v.

CHAPTER 16. STATEMENT OF ACTUARIAL OPINION

OVERVIEW

The Statement of Actuarial Opinion (SAO) provides the opinion of a qualified actuary on the reasonableness of the loss and loss adjustment expense (LAE) reserves recorded by a property/casualty insurance company as of December 31 each year. It is filed with the Annual Statement, either included or attached to page 1 of the Annual Statement. The SAO must be prepared by a qualified actuary, as defined by the National Association of Insurance Commissioners (NAIC),[99] who is appointed by the company's board and then referred to as the appointed actuary.[100]

Certain companies may qualify for an exemption from the SAO requirement. Possible exemptions include the following:

- Size of the insurer (less than $1 million of total gross written premiums during a calendar year and less than $1 million of total gross loss and LAE reserves at year-end)
- Insurers under supervision or conservatorship
- Nature of business written
- Insurers under financial hardship (if the cost of the SAO is greater than either 1% of surplus or 3% of gross written premiums during the calendar year within which the exemption is requested)

Simply meeting one of the above criteria does not provide automatic exemption. To qualify, the insurer has to file for exemption with its domiciliary commissioner. It is at the discretion of the domiciliary commissioner to decide whether to exempt a company from the SAO requirement.

The main purposes of the SAO are the following:

- Provide the appointed actuary's opinion on the reserves specified within the scope of the SAO.
- Inform the reader, in particular regulators, of significant risk factors and/or uncertainties with respect to those reserves.

[99] A qualified actuary is defined by the NAIC as "a person who meets the basic education, experience and continuing education requirements of the Specific Qualification Standard for Statements of Actuarial Opinion, NAIC Property and Casualty Annual Statement, as set forth in the *Qualification Standards for Actuaries Issuing Statements of Actuarial Opinion in the United States,* promulgated by the American Academy of Actuaries, and is either: (i) A member in good standing of the Casualty Actuarial Society, or (ii) A member in good standing of the American Academy of Actuaries who has been approved as qualified for signing casualty loss reserve opinions by the Casualty Practice Council of the American Academy of Actuaries" *2011 NAIC Annual Statement Instructions Property/Casualty*, page 9.

[100] The *2011 NAIC Annual Statement Instructions Property/Casualty* go on further by saying that the requirements of the company's domiciliary state may permit individuals to issue the SAO despite not meeting the definition of qualified actuary per the NAIC. In these instances, a letter from the state must be attached to the SAO indicating that the individual meets the state's requirement to issue SAOs. Throughout this text we will use the terms "qualified actuary" and "appointed actuary" to encompass these individuals.

- Advise whether those risks and uncertainties are reasonably expected to lead to material adverse deviation in the reserves.

There is considerable guidance for the actuary in issuing the SAO. Every appointed actuary should read and be familiar with the most current versions of the following:

- Qualification Standards, as set forth by the American Academy of Actuaries (AAA)
- NAIC Instructions for the SAO
- AAA Committee on Property and Liability Financial Reporting (COPLFR) *Practice Note on Statements of Actuarial Opinion on Property and Casualty Loss Reserves* (COPLFR P/C Practice Note)
- NAIC *Regulatory Guidance On Property and Casualty Statutory Statements of Actuarial Opinion* Prepared by the NAIC's Casualty Actuarial and Statistical (C) Task Force[101]
- Actuarial Standards of Practice (ASOP), including but not limited to:
    - ASOP No. 20. *Discounting of Property/Casualty Unpaid Claim Estimates* (September 2011)
    - ASOP No. 23. *Data Quality*
    - ASOP No. 36. *Statement of Actuarial Opinion Regarding Property/Casualty Loss and LAE Reserves*
    - ASOP No. 41. *Actuarial Communications*
    - ASOP No. 43. *Property/Casualty Unpaid Claim Estimates*
- Applicable state laws, in particular with respect to reserve requirements, SAO requirements, discounting, etc. (the Property/Casualty Loss Reserve Law Manual published annually by the AAA provides a compilation of this material) [102]
- SSAP No. 55, *Unpaid Claims, Losses and Loss Adjustment Expenses*
- SSAP No. 62R, *Property and Casualty Reinsurance*
- SSAP No. 65, *Property and Casualty Contracts*

The SAO is organized into four required sections:

1. Identification
2. Scope
3. Opinion
4. Relevant comments

Each section must be included and clearly identified within the SAO.

The SAO also contains two exhibits, A and B. Exhibit A provides the recorded amounts associated with the items identified in the scope section, generally on a direct plus assumed and net basis. Exhibit B provides relevant disclosure items with respect to the *net* reserves identified in the scope section, as

[101] This is updated annually and typically included as an appendix to COPLFR P/C Practice Note.
[102] Applicable laws and regulations supersede any applicable ASOPs.

identified in the relevant comments section. For example, loss and LAE reserves for asbestos are disclosed in Exhibit B on a net of reinsurance basis. There is no separate exhibit within the SAO showing asbestos reserves on a gross of reinsurance basis. Differences between the net and gross (direct plus assumed) amounts reported in Exhibit B may be discussed in the relevant comments section.

While there are other publications on the CAS Exam 6 U.S. Syllabus of Basic Education that cover the SAO, there is not a "real" SAO on the Syllabus to bring the instructions to life for the student. As a result, we have created a SAO for Fictitious Insurance Company to illustrate the application of the SAO instructions in practice. Fictitious' SAO was issued by an imaginary actuary named Mr. William H. Smith, who is a consulting actuary with the make-believe firm, WS Actuarial Consulting. Smith's opinion is included in of this publication and should be read side-by-side with this chapter.

The Fictitious SAO is the author's interpretation of the NAIC instructions as they might apply to Fictitious. It should not be taken as authoritative guidance on format or content of the SAO.

The following provides a summarized view of each of the four sections of the SAO and how Fictitious' appointed actuary responded to each required section in his 2018 SAO for the company.

IDENTIFICATION

The identification section of the SAO provides the actuary's name and credentials, the actuary's qualifications for issuing the SAO, the actuary's relationship to the company, and the date the actuary was appointed by the company's board of directors (or its equivalent) to issue the opinion. This section typically includes a statement identifying the intended purposes and users of the opinion, consistent with ASOP 36 requirements.

For Fictitious, the 2018 SAO was issued by Mr. William H. Smith, who is a Fellow of the Casualty Actuarial Society and Member, American Academy of Actuaries, and is associated with the firm of WS Actuarial Consulting. He was appointed by the company's board of directors on September 7, 2018. At the time of issuance of his opinion (February 24, 2019), Smith met the qualification standards to issue SAOs.

The intended purpose of Smith's opinion was to satisfy the requirements of the NAIC. The intended users were the company's management, the directors of its board and state regulatory officials.

SCOPE

The scope section identifies the reserve items upon which the actuary is giving an opinion as well as the accounting basis for those reserves. The reserve items include:

- Loss and LAE reserves
- Retroactive reinsurance assumed reserves

- Unearned premium reserves for Property and Casualty ("P&C") Long-Duration Contracts[103]
- Unearned premium reserves for extended reporting endorsements, such as those included in Schedule P Interrogatory No. 1 of the company's Annual Statement
- Other reserve items for which the actuary is providing an opinion

The scope also identifies the "review date," which is defined in ASOP 36 as "the date (subsequent to the valuation date) through which material information known to the actuary is included in forming the reserve opinion."[104] If no such date is explicitly disclosed, it is likely to be assumed by the reader of the opinion that the review date is the date the opinion is signed.

It also contains a statement regarding who provided the data relied upon by the actuary in forming the opinion and that either the actuary performed a reconciliation of that data, or reviewed a reconciliation prepared by the company, to Schedule P of the company's Annual Statement.

If the company participates in intercompany pooling, the actuary *may wish* to disclose this and the basis for reconciling data used in the actuary's analysis to Schedule P.

Further, regulatory guidance suggests that the scope section for each pooled company provide information about the pooling arrangement, including the intercompany pooling percentage for the company.

There are special requirements for opinions on non-lead companies operating under an intercompany pooling arrangement in which the lead company retains 100% of the pooled reserves. We refer the reader to the NAIC opinion instructions and COPLFR Practice Note for further guidance.

The reserve items on which Smith opined for Fictitious are presented in Exhibit A of his 2018 SAO. As displayed on Exhibit A, Smith opined on net loss and LAE reserves in lines 1 and 2, totaling $51,557,000 as of December 31, 2018. The amounts in lines 1 and 2 of Exhibit A reconcile to lines 1 and 3, respectively, of the Liabilities, Surplus and Other Funds page of the 2018 Annual Statements.

Smith also opined on total direct plus assumed (or gross) loss and LAE reserves of $61,699,000, as shown in lines 3 and 4. The amounts in lines 3 and 4 reconcile to Schedule P, Part 1, Summary, columns 13 plus 15, and columns 17, 19 and 21, respectively.

[103] P&C Long Duration Contracts are defined on page 10 of the NAIC SAO Instructions as "contracts (excluding financial guaranty contracts, mortgage guaranty contracts and surety contracts) that fulfill both of the following conditions: (1) the contract term is greater than or equal to 13 months; and (2) the insurer can neither cancel the contract not increase the premium during the contract term. These contracts are subject to the three tests of *SSAP No. 65-Property and Casualty Contracts* of the NAIC *Accounting Practices and Procedures Manual*."

[104] Actuarial Standards Board of the American Academy of Actuaries, "Actuarial Standard of Practice No. 36, Statements of Actuarial Opinion Regarding Property/Casualty Loss and Loss Adjustment Expense Reserves," December 2010, page 3.

As disclosed in the Notes to Financial Statements (see Chapter 10. *Notes to Financial Statements*) and displayed in Exhibit A of the SAO, Fictitious did not have any retroactive reinsurance assumed as of December 31, 2018. Nor were there any other loss reserve items on which Smith expressed an opinion.

Smith disclosed his "review date" as January 28, 2019. This means that information received through January 28, 2019, was relevant to his analysis of unpaid claims and his opinion on the company's loss and LAE reserves. Information after that date, to the time he signed the opinion on February 24, 2019 (see the signature line of the opinion), was not relied on by Smith in forming his opinion.

The scope section also provides a statement from Smith that he reconciled the data that he relied upon for purposes of forming his opinion to Schedule P, Part 1, of Fictitious' 2018 Annual Statement.

OPINION

The opinion section provides exactly what the name says, the actuary's opinion with respect to the reserves identified in the scope section. The actuary has five options in terms of the type of opinion, as outlined in ASOP 36. These are:

1. Reasonable: if the recorded reserve lies within the actuary's range of reasonable unpaid claim estimates
2. Inadequate or deficient: if the recorded reserves are below what the actuary deems to be reasonable
3. Excessive or redundant: if the recorded reserves are above what the actuary deems to be reasonable[105]
4. Qualified: if the actuary is unable to issue an opinion on certain items and those items are believed to be material
5. No opinion: if the actuary is unable to conclude on the reasonableness of the recorded reserves

Note that in accordance with ASOP 36, the actuary should disclose the minimum amount that he or she deems reasonable when issuing an inadequate or deficient opinion.[106] Similarly, the actuary should disclose the maximum amount deemed to be reasonable when issuing an excessive or redundant opinion.

The actuary is also required to state whether the recorded reserves identified in the scope section meet the requirements of the insurance laws of the state the company is domiciled in and are computed in accordance with actuarial standards.

Additionally, if use was made of the work of another actuary, such as for pools and associations, for a subsidiary, or for special lines of business, in forming the SAO, the other actuary must be identified by name and affiliation within the opinion section. The appointed actuary cannot simply rely on another

[105] Ibid., page 9.
[106] Ibid., page 10.

actuary's opinion. The appointed actuary needs to perform enough analysis on the other actuary's work to issue an unqualified opinion on the total reserve amounts listed in Exhibit A. A situation where the actuary may make use of another's work is for reserves assumed by the company for its participation in underwriting pools and associations. ASOP No. 36 provides the relevant guidance, and the COPLFR P/C Practice Note provides good examples of how to handle this situation in practice.[107]

The 2018 SAO for Fictitious states the following:

"In my opinion, the amounts carried in Exhibit A on account of the items identified:

- Make a reasonable provision for all unpaid losses and loss adjustment expenses, gross and net as to reinsurance ceded, under the terms of the Company's contracts and agreements
- Are computed in accordance with accepted standards and principles
- Meet the requirements of the insurance laws of Florida"[108]

Note that Smith opined on the loss and LAE reserves in Exhibit A, items 1 through 6. These reserves include "Retroactive Reinsurance Reserve Assumed," which in the case of Fictitious totaled $0.

Unless otherwise disclosed, the Appointed Actuary will generally opine on the loss and LAE reserves including the amount of retroactive reinsurance assumed, despite the fact that the amount of retroactive reinsurance is not accounted for within lines 1 and 3 of page 3 of the Annual Statement under SAP. This treatment is in accordance with the NAIC instructions. Retroactive reinsurance assumed is a liability, and regulators look for assurance that this balance is reasonable.

The reserves for retroactive reinsurance ceded are not separately listed on Exhibit A and are therefore not explicitly opined on by the actuary. The absence of this reserve from Exhibit A is not because regulators don't care about the reasonableness of the balance. Rather, the reserve for retroactive reinsurance ceded is already included as a component of the gross loss and LAE reserves, which are opined on by the actuary.[109] An overstatement or understatement of retroactive reinsurance ceded would impact gross and ceded reserves equally and have no impact on the net reserve balance.

RELEVANT COMMENTS

The relevant comments section provides commentary and disclosures relative to the reserves opined on to assist the reader in understanding the context and composition of those reserves. Commentary is required on the following items:

[107] Committee on Property and Liability Financial Reporting, American Academy of Actuaries, "Property and Casualty Practice Note, Statements of Actuarial Opinion on P&C Loss Reserves as of December 31, 2018," page 55.
[108] See Appendix I of this publication for the Statement of Actuarial Opinion for Fictitious Insurance Company.
[109] Recall from Chapter 10. *Notes to Financial Statements*, a company's gross reserves are not reduced for retroactive reinsurance ceded. Rather, retroactive reinsurance ceded is recorded separately as a write-in item on the balance sheet.

- The actuary's materiality standard for purposes of addressing the risk of material adverse deviation
- Significant risks and uncertainties that could result in material adverse deviation
- The significance of items listed in Exhibit B, including:
    - Anticipated net salvage and subrogation
    - Nontabular discounting
    - Tabular discounting
    - Net reserves for the company's share of voluntary and involuntary pools and associations
    - Net reserves for asbestos and environmental liabilities
    - Claims-made extended loss and LAE reserve reported as unearned premium and as loss reserves
- Retroactive or financial reinsurance
- Uncollectible reinsurance
- The results of IRIS ratios 11, 12 and 13 and explanation for exceptional values
- Changes in methods and assumptions from those employed in the most recent prior opinion that are deemed to have a material effect on the recorded reserve or actuary's unpaid claim estimate
- Unearned premium reserves for P&C Long Duration Contracts
- Net reserves for Accident and Health ("A&H") Long Duration Contracts that the company carries on the Liabilities, Surplus and Other Funds page as Losses, Loss Adjustment Expenses, Unearned Premium or other Write-In items (e.g., Premium Deficiency Reserves, Contract Reserves, or AG 51 Reserves)[110]

With respect to the risk of material adverse deviation, the NAIC Instructions require the appointed actuary to make an explicit statement as to whether or not he/she believes there are significant risks and/or uncertainties that could result in material adverse deviation.

Smith addresses the above items within the 2018 SAO for Fictitious, as applicable. We will not discuss each item but rather provide further details on some to assist in reading this section of the opinion.

MATERIALITY STANDARD

[110] "A&H Long Duration Contracts are defined on page 10 of the NAIC SAO Instructions as "contracts in which the contract term is greater than or equal to 13 months and contract reserves are required. See Schedule H instructions for a description of categories of contract reserves, as well as policy features that give rise to contract reserves. Two specific examples of contracts that typically require contract reserves are long-term care and disability income insurance." According to page 15 of the NAIC SAO Instructions, "*Actuarial Guideline LI—The Application of Asset Adequacy Testing to Long-Term Care Insurance Reserves* (AG 51) in the NAIC *Accounting Practices and Procedures Manual* requires a company to perform a stand-alone asset adequacy analysis for its in force long-term care (LTC) contracts with more than 10,000 in force lives as of the valuation date. The Actuarial Report and workpapers summarizing the results, assumptions and testing procedures for the asset adequacy testing of LTC business must be in compliance with AG 51 requirements."

There are numerous ways an actuary can establish his or her materiality standards, and examples are provided in the COPLFR Practice Note. Common methods are based on a percentage of reserves, surplus and movements in Risk-Based Capital (RBC) levels, among others. Materiality standards such as 10% of loss and LAE reserves or anywhere from 10% to 20% of surplus are commonly used. However, some actuaries establish materiality standards using a set dollar amount based on the actuary's particular knowledge of the company's operations. As an extreme example, for a company operating with limited surplus and/or under regulatory intervention, a deviation in loss and LAE reserves greater than $0 might be considered material.

Regardless, there is no "one size fits all" in terms of formulaic materiality standards. The standard is based on the actuary's personal opinion as to what he or she considers material in relation to the company's reserves and surplus.

Smith considered a deviation in net loss and LAE reserves of more than:

1. 10% of net loss and LAE reserves, which he calculated as:

   10% of $51.557 million = $5.156 million

2. 20% of policyholders' surplus, which he calculated as:

   20% of $31.024 million = $6.205 million

   Or

3. The reduction in surplus that would result in additional action per the NAIC RBC formula, which he calculated as the difference between the following:

   - The company's total adjusted capital of $31.024 million,[111] which produces an RBC ratio of 555% based on authorized control level (ACL) RBC of $5.588 million per the Five-Year Historical Data exhibit
   - Adjusted capital at the next RBC level of $11.176 million, which is equal to two times ACL

   The difference between $31.024 million and $11.176 million is $19.848 million.

For purposes of establishing his materiality standard, Smith selects the smallest of the three balances, which in this case happens to be 10% of net loss and LAE reserves ($5.156 million).

MAJOR RISK FACTORS

Once materiality is defined, the actuary determines whether there are significant risks or uncertainties that could result in material adverse deviation in the company's loss and LAE reserve. According to the

[111] Differences from above due to immaterial rounding errors that may occur in the Annual Statement.

NAIC instructions to the SAO, "If such risk exists, the actuary should include an explanatory paragraph to describe the major factors, combination of factors, or particular conditions underlying the risks and uncertainties that the actuary reasonably believes could result in material adverse deviation."[112] Examples of risk factors are provided in the COPLFR Practice Note.

Note that the actuary is not expected to list all risks that the company is exposed. Rather, only those major risk factors that could result in the reserves developing adversely by an amount that is material relative to the actuary's materiality standard. To illustrate, Smith identifies and provides details about major risk factors that materially affect the variability of the reserves held by Fictitious Insurance Company. The major risk factors identified are mass tort claims; so-called "Chinese drywall" claims; cumulative injury losses; claims from large deductible workers' compensation policies; and claims related to catastrophic weather events, including wildfires, tornadoes and hurricanes. The uncertainty associated with these types of claims adds to the variability in the company's recorded reserves.

RISK OF MATERIAL ADVERSE DEVIATION

The actuary is required to make a clear statement within the SAO as to whether or not there are significant risks or uncertainties that could result in material adverse deviation. That determination is based on the major risk factors identified by the actuary, the actuary's professional opinion of the variability inherent in the unpaid claim estimates and the actuary's materiality standard.

In the case of Fictitious, Smith concludes that there are significant risks that could result in the net reserve amount deviating adversely from that recorded by the company by a material amount. This conclusion was determined in part quantitatively, by comparing the distance between the company's net recorded loss and LAE reserve and the high end of Smith's range to his materiality standard.

As shown in the Smith's Actuarial Opinion Summary for the company, he has developed a range of reasonable unpaid loss and LAE claim estimates on a net of reinsurance basis of $43 million to $57 million with a point estimate of $50 million. The distance between the company's recorded reserve of $51.556 million and the high end of Smith's range is $5.443 million. Smith's materiality standard is $5.156 million, which is less than the distance between the high end of his range and the recorded reserve. This means that a deviation of $5.156 million is reasonably expected by Smith, as it lies within his range relative to the recorded balance. The compilation of these figures is shown in Table 57.

TABLE 57

	WS Actuarial Consulting				Carried +
				Fictitious	Materiality
	Low	Point	High	Carried	Standard
Reserve estimates	43,000	50,000	57,000	51,557	56,713

[112] *2018 NAIC Annual Statement Instructions Property/Casualty,* page 13.

Stated differently, Smith reasonably expects that the company's carried reserve could deviate by an amount equal to the materiality standard since the carried reserve plus the materiality standard lies within his range of reasonable unpaid claim estimates. The results of his quantitative analysis, coupled with his knowledge of the significant risks and uncertainties inherent in the company's reserves, lead Smith to conclude that there are significant risks and uncertainties that could result in material adverse deviation in the recorded reserves.

It is important to note that there is no requirement for an actuary to provide a range. Even when a range is provided, the actuary may believe there are significant risks and uncertainties that could result in material adverse deviation despite the results of the calculation described above. In other words, there may be qualitative reasons for concluding there are significant risks that could result in material adverse deviation absent quantitative reasons. For example, a company might have a significant portion of its gross loss and LAE reserves ceded to a reinsurer of relatively weak financial strength. In this case, the carried net reserve plus materiality standard might exceed the high end of the actuary's range (assuming all reinsurance was considered valid and collectible in determining the range). However, the risk that the company may not be able to recover a portion of its gross reserves due to the financial strength of one of its reinsurers may be considered significant by the actuary, and lead him/her to conclude the carried net reserves could deviate adversely by a material amount. Therefore, both qualitative and quantitative considerations should be considered in determining whether there are significant risks that could result in material adverse deviation.

REMAINING RELEVANT COMMENTS

The remaining relevant comments in Smith's opinion speak to the disclosure items in Exhibit B, addressing the fact that the company anticipates salvage and subrogation in its reserves totaling $1.363 million and discounts its reserves for certain workers' compensation and other liability claims on a tabular basis, the amount of which totals $1.365 million.

According to Smith, the company does not have claims-made extended reporting endorsement loss and expense reserves, participate in any underwriting pools or associations or write either P&C or A&H Long Duration Contracts.

As noted, retroactive and financial reinsurance is addressed in the relevant comments section. The liability for the one retroactive reinsurance assumed contract that the company has been deemed immaterial by Smith.

Finally, Smith has disclosed in his opinion that IRIS ratios 11, 12 and 13 did not produce unusual values for the company. We have confirmed this statement in our recalculation of Fictitious' IRIS ratios in Appendix I of this publication.

SIGNATURE OF THE APPOINTED ACTUARY

The SAO closes with an affirmative statement that an actuarial report supporting the SAO will be provided to the company and retained for a period of seven years at its administrative offices and will be made available for regulatory examination, if requested.

The SAO is signed and dated by the actuary for delivery along with the Annual Statement by March 1 of the year following the Annual Statement date (December 31). Note that some states require an original signature on each signed opinion, as opposed to a photocopy. The signature line includes the actuary's address (both postal and email).

Smith signed the opinion on February 24, 2019.

NOTEWORTHY CHANGES TO THE NAIC SAO INSTRUCTIONS IN 2019

While this text contemplates the NAIC SAO Instructions for 2018, there were significant changes to the NAIC SAO Instructions for 2019 pertaining to the requirements for an actuary to be qualified to sign property/casualty SAOs. In particular, the NAIC set the definition of a "Qualified Actuary" as "a person who:

(i) Meets the basic education, experience and continuing education requirements of Specific Qualifications Standard for Statements of Actuarial Opinion, NAIC Property and Casualty Annual Statement, as set forth in the Qualification Standards for Actuaries Issuing Statements of Actuarial Opinion in the United States (U.S. Qualification Standards), promulgated by the American Academy of Actuaries (Academy), and
(ii) has obtained and maintains an Accepted Actuarial Designation; and
(iii) is a member of a professional actuarial association that requires adherence to the same Code of Professional Conduct promulgated by the Academy, requires adherence to the U.S. Qualification Standards, and participates in the Actuarial Board for Counseling and Discipline when its members are practicing in the U.S.

An exception to parts (i) and (ii) of this definition would be an actuary evaluated by the Academy's Casualty Practice Council and determined to be a Qualified Actuary for particular lines of business and business activities."[113]

The NAIC has defined the term "Accepted Actuarial Designation as "an actuarial designation accepted as meeting or exceeding the NAIC's Minimum Property/Casualty (P/C) Actuarial Educational Standards for a P/C Appointed Actuary (published on the NAIC website). The following actuarial designations, with any noted conditions, are accepted as meeting or exceeding basic education minimum standards:

(i) Fellow of the CAS (FCAS) – Condition: basic education must include Exam 6 – Regulation and Financial Reporting (United States);

[113] *2019 NAIC Annual Statement Instructions Property/Casualty,* page 10.

(ii) Associate of the CAS (ACAS) – Conditions: basic education must include Exam 6 – Regulation and Financial Reporting (United States) and Exam 7 – Estimation of Policy Liabilities, Insurance Company Valuation, and Enterprise Risk Management;

(iii) Fellow of the SOA (FSA) – Conditions: basic education must include completion of the general insurance track, including the following optional exams: the United States' version of the Financial and Regulatory Environment Exam and the Advanced Topics in General Insurance Exam."[114]

The 2019 NAIC SAO Instructions include a table of allowable exam substitutions for (i), (ii) and (iii) in the definition of "Accepted Actuarial Designation" given that exams have changed over time.

In accordance with these changes, Exhibit B, Item 3 of the SAO (the Appointed Actuary's designation) has been modified to provide the Appointed Actuary's Accepted Actuarial Designation and the NAIC now requires the Appointed Actuary to provide qualification documentation to company's Board of Directors, including a description of how the Appointed Actuary meets the definition of Qualified Actuary and his or her experience relevant to the subject of the SAO.

We refer the reader to the 2019 NAIC SAO Instructions, AOWG Regulatory Guidance and COPLFR Practice Note for further details on these changes and new requirements for the Appointed Actuary.

[114] Ibid.

CHAPTER 17. ACTUARIAL OPINION SUMMARY SUPPLEMENT

OVERVIEW

The Actuarial Opinion Summary Supplement (AOS) is required to be filed by the company with its domiciliary state by March 15 of the year following the Annual Statement date (December 31). This is a confidential document containing the appointed actuary's range of unpaid claim estimates and/or point estimate, as calculated by the actuary, in comparison to the company's recorded reserves on a net and gross of reinsurance basis. Due to its confidential nature, it is filed separately from the public Annual Statement document, which is due on March 1.

Non-domiciliary states that provide evidence of the ability to preserve the confidential nature of the document may request a copy.

The AOS also provides a statement regarding whether the company has experienced one-year adverse development in excess of 5% of surplus in three or more of the past five years. The amount of adverse development is computed in Schedule P, Part 2, Summary, and is also provided in the one-year development line of the Five-Year Historical Data exhibit within the Annual Statement. If the company has experienced adverse development in excess of 5% of surplus in three or more of the past five years, an explanatory paragraph is required so that the regulator can determine what additional review, if any, is required.

Prior to 2011, the actuary had the choice of providing his or her range, point estimate, or both, regardless of whether the actuary calculated both. In 2011, the instructions changed, requiring the actuary to include the point estimate and range, if both are calculated. If only one is calculated, the actuary would need only to provide one.

Because the AOS document is confidential, it is not available for public review, unlike the Statement of Actuarial Opinion (SAO). As a result, the student will not be able to find the AOS for the companies listed on the Casualty Actuarial Society *Syllabus of Basic Education*. However, we created an AOS for Fictitious Insurance Company, which is provided in Appendix I of this publication and should be read side by side with this chapter of the publication.

Like the SAO, the AOS is signed and dated by the actuary. In the case of Fictitious, this is Mr. William H. Smith. As we see in items A and B, Smith has produced a range and point estimate in his independent analysis of unpaid claims supporting the SAO. Items A and B include his range and point estimate on a net and gross of reinsurance basis, as displayed in Table 58.

TABLE 58

	Net Reserves (USD in 000s)			Gross Reserves (USD in 000s)		
	Low	Point	High	Low	Point	High
A. Actuary's range of reserve estimates	43,000		57,000	52,000		68,000
B. Actuary's point estimate		50,000			60,000	

Item C provides the company's carried loss and loss adjustment expense (LAE) reserves on which the actuary has based his opinion. Item D highlights the company's position within the actuary's range by showing the difference between the carried loss and LAE reserves and the actuary's range and point estimate. In Table 59 we see that Fictitious' recorded reserves lie above Smith's point estimate.

TABLE 59

	Net Reserves (USD in 000s)			Gross Reserves (USD in 000s)		
	Low	Point	High	Low	Point	High
C. Company carried reserves		51,557			61,699	
D. Difference between Company carried and Actuary's estimate (C. - A. and C. – B., if applicable)	8,557	1,557	(5,443)	9,699	1,699	(6,301)

It is not surprising that Fictitious' recorded reserves lie within the high end of the actuary's range given that the Fictitious' recorded loss and LAE reserves have developed favorably over time. This favorable development is seen in the one-year development line of the Five-Year Historical Data exhibit within Fictitious' 2018 Annual Statement. At the risk of being repetitious (see Table 13), we show the one-year development line again in Table 60.

TABLE 60

Data from Fictitious Insurance Company 2018 Five-Year Historical Data						
		2018	2017	2016	2015	2014
73.	Development in estimated losses and loss expenses incurred prior to current year (Schedule P, Part 2 — Summary, Line 12, Column 11); *USD in 000s*	(875)	(1,354)	(1,618)	(1,935)	(1,918)
74.	Percent of development of losses and loss expenses incurred to policyholders' surplus of prior year end (Line 73 divided by Page 4, Line 21, Column 1 x 100)	(2.8)	(3.8)	(5.0)	(5.6)	(2.6)

While the AOS only displays the company's current position within the actuary's range, the AOS Instructions require that the actuary state whether the company has experienced one-year adverse

development in excess of 5% of surplus in three or more of the past five years. This and an explanation are provided in Item E of the AOS. The information contained in Item E enables the regulator to obtain an understanding of why the company's recorded reserves continue to show adverse development over time. The concern, of course, is whether the company is consistently understating reserves and therefore overstating surplus. Depending on the result, the information provided in Item E could trigger additional regulatory review in assessing the company's financial health. As shown in Table 60, Fictitious' loss and LAE reserves have developed favorably in each of the past five years. As a result, Smith has responded with the following in Item E of his AOS:

> E. The Company has not had 1-year adverse development in excess of 5% of surplus in at least three of the last five calendar years, as measured by Schedule P, Part 2 Summary, and disclosed in the Five-Year Historical Data, on line 74, of the Company's December 31, 2018 statutory-basis Annual Statement.

In those cases where there has been adverse development in excess of 5% of surplus in three or more of the last five years, we have seen explanations in Item E vary from providing vague detail to very specific reasons for the changes. The more detail that can be provided as to the root cause, the easier time the regulator will have in his or her review.

To illustrate we have provided sample wording in the 2018 AOS of a fictional company that experienced one-year development in excess of 5% of surplus during 2015 through 2017:

> The company had one-year adverse development in excess of 5% of statutory surplus in three of the past five years. The exceptional values occurred in years 2015 through 2017. The exceptional values resulted from a strengthening in loss reserves made by management to reflect unexpected trends in asbestos and environmental claims on excess liability policies written by the company from 1968 to 1986.
>
> These trends include increased likelihood of exposure to higher-layer policies as a result of greater than expected emergence of reported claims on underlying policies, and efforts by insureds to expand coverage periods and expose additional policies.
>
> It should be noted that in 2018 the company entered into a retroactive reinsurance agreement whereby 100% of this run-off business is ceded to an unaffiliated reinsurance company. Going forward, this reinsurance agreement will mitigate the impact of adverse development of loss reserves on the company's statutory surplus.

The regulator reading the above will determine whether additional steps are necessary to understand the cause of the adverse development and impact on the company's financial health. While the regulator may gain comfort that the company's balance sheet is protected against future adverse development because of the new reinsurance agreement, we expect that the regulator would want to understand the potential impact of such development on the financial health of the company's unaffiliated reinsurer.

CHAPTER 18. INSURANCE EXPENSE EXHIBIT

OVERVIEW

As discussed in Chapter 4. *Primary Financial Statements*, the Statement of Income within the Annual Statement provides a view of an insurance company's profitability over the past year on a net of reinsurance basis, but only on an aggregate level for all lines of business combined. The Insurance Expense Exhibit (IEE) enables a deeper review of an insurance company's profitability by showing the components of statutory profit (loss) by line of business on a direct and net of reinsurance basis.

The IEE is required to be filed by April 1 of the year following the Annual Statement date (December 31). It contains three parts plus interrogatories. Part I provides an allocation of the other underwriting expense category within Part 3, Expenses, of the Underwriting and Investment Exhibit (U&IE) of the Annual Statement. Parts II and III allocate pretax profit by line of business, on a net and direct written basis, respectively. All dollars are shown in thousands within the IEE, either by rounding or truncating.

The uses of the IEE are numerous. The following provides some examples:

- Regulators use the IEE as a means for monitoring financial health. Changes or historical trends in an insurance company's profitability at the line of business level may put a strain on the company's surplus in total, thereby threatening solvency.
- Regulators also use the IEE as a means to monitor rate adequacy. Inadequate rates also threaten an insurance company's financial health. Conversely, excessive rates are also a concern to the regulator as they are unfair to the consumer.
- Stakeholders in general use the IEE as a means to identify those lines of business that have performed profitably and those that have not in order to make informed business decisions, such as where to deploy capital and/or where the company should grow.
- An investor might look at the IEE in light of the company's future growth plans to make decisions as to how much to invest in the company. Growth into unprofitable lines might lead the investor to reduce his or her level of investment in the company.
- Actuaries use the IEE as a publicly available source of premium, loss and expense data for benchmarking company performance by line of business.

As we shall see, there are cautions to using the IEE as described above, and we have presented several within this chapter.

Throughout our discussion of the IEE, we will continue to use Fictitious Insurance Company in our examples.

PART I — ALLOCATION TO EXPENSE GROUPS

Part IV. Statutory Filings to Accompany the Annual Statement

The National Association of Insurance Commissioners (NAIC) instructions to the Property/Casualty Annual Statement provide directions for classifying expenses to the 22 operating expense categories provided in Part 3, Expenses, of the U&IE within the Annual Statement. The instructions provide uniformity in classification of expenses among property/casualty insurance companies.

The 22 operating expense categories are as follows, by line number per the U&IE, Part 3, Expenses:

1. Claims adjustment services
2. Commission and brokerage
3. Allowances to managers and agents
4. Advertising
5. Boards, bureaus and associations
6. Surveys and underwriting reports
7. Audit of assureds' records
8. Salary and related items
9. Employee relations and welfare
10. Insurance
11. Directors' fees
12. Travel and travel items
13. Rent and rent items
14. Equipment
15. Cost or depreciation of Electronic Data Processing (EDP) equipment and software
16. Printing and stationery
17. Postage, telephone and telegraph, exchange and expenses
18. Legal and auditing
20. Taxes, licenses and fees
21. Real estate expenses
22. Real estate taxes
24. Miscellaneous

Amounts for the above operating expenses are each allocated into the following three categories (column headings) within the U&IE:

1. Loss Adjustment Expenses
2. Other Underwriting Expenses
3. Investment Expenses

Part 1 of the IEE further allocates other underwriting expenses into the following three components (column headings):

1. Acquisition, Field Supervision and Collection Expenses
2. General Expenses

3. Taxes, Licenses and Fees

The allocation of other underwriting expenses from the U&IE, Part 3, Expenses, into Part I of the IEE is as follows:

- All commission and brokerage expenses from line 2 of U&IE, Part 3 should be allocated to acquisition, field supervision and collection expenses in column 2 of Part I of the IEE.
- All taxes, licenses and fees from line 20 of U&IE, Part 3 should be allocated to taxes, licenses and fees in column 4 of Part I of the IEE.
- The remaining operating expenses from lines 3 through 18 of the IEE can be allocated to acquisition, field supervision and collection expenses in column 2 or general expenses in column 3 of Part I of the IEE, as applicable.

Part 1 of the IEE looks like Part 3, Expenses, of the U&IE within the Annual Statement, except:

1. There are three columns under the other underwriting expenses heading, rather than one in total.
2. The operating expense classification line items end with line 25, total expenses incurred, and therefore do not include amounts unpaid, amounts relating to uninsured plans or total expenses paid (lines 26 through 30 of U&IE, Part 3).
3. Amounts are reported in thousands of dollars in the IEE rather than in whole dollars as in the U&IE.

The totals in column 4 of the U&IE, Part 3, line 25 should equal the totals in column 6 of Part I of the IEE multiplied by 1,000.

Table 61 provides the other underwriting expenses column from Part3, Expenses, of the U&IE from Fictitious' 2018 Annual Statement, with the allocation to acquisition, field supervision and collection expenses, general expenses, and taxes licenses and fees, as in Part I of the company's 2018 IEE.

TABLE 61

	Annual Statement	Insurance Expense Exhibit		
	Underwriting and Investment Exhibit	Other Underwriting Expenses (USD in 000s)		
	Part 3 - Expenses	Part 1 - Allocation to Expense Groups		
	Column 2	Column 2	Column 3	Column 4
Operating Expense Classifications	**Other Underwriting Expenses**	**Acquisition, Field Supervision and Collection Expenses**	**General Expenses**	**Taxes, Licenses and Fees**
2. Commission and brokerage				
2.1 Direct excluding contingent	4,759,000	4,759		
2.2 Reinsurance assumed, excluding contingent	–	–		
2.3 Reinsurance ceded, excluding contingent	816,000	816		
2.4 Contingent - direct	121,000	121		
2.5 Contingent - reinsurance assumed	–	–		
2.6 Contingent - reinsurance ceded	9,000	9		
2.7 Policy and membership fees	–	–		
2.8 Net commission and brokerage (2.1 + 2.2 - 2.3 + 2.4 + 2.5 - 2.6 + 2.7)	4,055,000	4,055	–	–
3. Allowances to manager and agents	4,000	1	3	
4. Advertising	208,000	75	133	
5. Boards, bureaus and associations	106,000	38	68	
6. Surveys and underwriting reports	99,000	36	63	
7. Audit of assureds' records	–	–	–	
8. Salary and related items:		–	–	
8.1 Salaries	1,845,000	664	1,181	
8.2 Payroll taxes	115,000	41	74	
9. Employee relations and welfare	293,000	105	188	
10. Insurance	23,000	8	15	
11. Directors' fees	–	–	–	
12. Travel and travel items	95,000	34	61	
13. Rent and rent items	133,000	48	85	
14. Equipment	42,000	15	27	
15. Cost or depreciation of EDP equipment and software	330,000	119	211	
16. Printing and stationery	19,000	7	12	
17. Postage, telephone and telegraph, exchange and express	112,000	40	72	
18. Legal and auditing	14,000	5	9	
19. Totals (Lines 3 to 18)	3,438,000	1,236	2,202	–
20. Taxes, licenses and fees:				
20.1 State and local insurance taxes deducting guaranty association credits of $1,103	791,000			791
20.2 Insurance department licenses and fees	53,000			53
20.3 Gross guaranty association assessments	(2,000)			(2)
20.4 All other (excluding federal and foreign income and real estate)	18,000			18
20.5 Total taxes, licenses and fees (20.1 + 20.2 + 20.3 + 20.4)	860,000	–	–	860
21. Real estate expenses	–			
22. Real estate taxes	–			
23. Reimbursements by uninsured plans	–			
24. Aggregate write-ins for miscellaneous expenses	130,000	47	83	
25. Total expenses incurred	8,483,000	5,338	2,285	860

PART II — ALLOCATION TO LINES OF BUSINESS NET OF REINSURANCE

Part II provides the components of total profit (loss) on a pretax basis, net of reinsurance, and additional information needed to calculate net profit (loss) for the line of business segments used in the U&IE of the Annual Statement. The line of business segments differ slightly from the U&IE in the following ways:

- Allied lines are broken down into further components in the IEE as:
    - 2.1 Allied lines
    - 2.2 Multiple peril crop
    - 2.3 Federal flood
- Commercial multiple peril is broken down into further components in the IEE as:
    - 5.1 Commercial multiple peril (non-liability portion)
    - 5.2 Commercial multiple peril (liability portion)
- Medical professional liability occurrence and claims-made lines are combined in the IEE into line 11, as are the corresponding product liability lines into line 18.
- Auto physical damage is broken down into further segments in the IEE as:
    - 21.1 Private passenger auto physical damage
    - 21.2 Commercial auto physical damage
- Reinsurance lines 31 through 33 are summed in the IEE.

Line 35 of the IEE provides the totals for all lines of business in lines 1 through 34.

Similar to the U&IE, the line of business segments are displayed in the first column of the IEE, with the components of profit (loss) and additional items in the remaining columns, providing the amounts (or percentages) for each line of business. These components and additional items are as follows:

- Net premiums written
- Net premiums earned
- Dividends to policyholders
- Incurred:
    - Loss
    - Defense and cost containment (DCC)
    - Adjusting and other (A&O) expenses
- Unpaid:
    - Loss
    - DCC
    - A&O expenses
- Unearned premium reserves
- Agents' balances

- Other underwriting expenses:
  - Commission and brokerage expenses incurred
  - Taxes, licenses and fees incurred
  - Other acquisitions, field supervision and collection expenses incurred
  - General expenses incurred
- Other income less other expenses
- Pre-tax profit or loss excluding all investment gain
- Investment gain on funds attributable to insurance transactions
- Profit or loss excluding investment gain attributable to capital and surplus
- Investment gain attributable to capital and surplus

The above items are organized in two columns: the first containing the dollar amount and the second providing the ratio of the dollar amount to premiums earned. There are 42 columns: 21 provide dollar amounts (odd-numbered columns) and 21 provide percentages to earned premium (even-numbered columns).

Total profit (loss) is calculated using the same components as in the Statement of Income, with the exception that the IEE is on a pretax basis. *Most* of the aforementioned components used to compute pretax profit (loss) either reconcile directly to exhibits within the Annual Statement, or are reasonably straightforward for companies to compute.[115] However, the calculation of investment gain is not straightforward, as the allocation of investment gain by line of business is not intuitive.

We will discuss the computation of each component (odd-numbered columns), reconciling to Annual Statement exhibits, and provide example(s) as to how to calculate investment gain. We will not address the even-numbered columns, other than to say that they represent the ratio of the dollar amount to net earned premium, on a line-by-line basis.

There are numerous ways to estimate profit by line of business; the approach used by the NAIC for the IEE is only one of them. The NAIC approach is a retrospective one. It allocates total profit that has emerged rather than providing an estimate of future profit, as is used in pricing insurance policies.

Further, the allocation of surplus by line of business does not consider how much surplus is needed to support the line, as is the intention in pricing insurance policies and capital modeling. Rather, as we shall see, the entire amount of surplus is allocated by line based on the level of the company's reserves (loss and unearned premium) and earned premium, which do not necessarily measure the inherent risk of a particular line of business. Good examples are catastrophe-exposed short-tailed lines, such as

[115] According to page 419 of the *2018 NAIC Annual Statement Instructions Property/Casualty*, "In instances where the reporting entity cannot allocate amounts to lines of business by direct and accurate allocation, the methods of allocation stated in the Uniform Classification of Expenses found in the Appendix of the *NAIC Annual Statement Instructions* must be used. Where the instructions do not define means of allocation, a reasonable method of allocation must be applied and disclosed in Interrogatory 4."

homeowners. In non-catastrophe years, the reserves for these lines may be relatively small because claims are reported and paid out relatively quickly when compared to longer-tailed casualty lines. However, as the property/casualty insurance industry observed in 2018, this short-tailed line of business is exposed to considerable risk. We shall see this in our examples for Fictitious. Therefore, caution should be made when reviewing and placing reliance on the results of the IEE calculations of surplus and profit by line of business for pricing or capital allocation purposes.

Columns 1 through 32

The following components or items within Part II reconcile directly to the U&IE within the Annual Statement by line of business as follows:

TABLE 62

IEE Part II		Reconciles to	U&IE		
Column Number	Heading		Part	Heading	Column Number
1	Premiums Written	-------->	1B	Net Premiums Written	6
3	Premiums Earned	-------->	1	Premiums Earned During Year	4
7	Incurred Loss	-------->	2	Losses Incurred Current Year	7
13	Unpaid Losses	-------->	2A	Net Losses Unpaid	8
19	Unearned Premium Reserves	-------->	1A	Total Reserve for Unearned premiums	5

Dividends to policyholders in column 5 reconcile in total to the amount in the Statement of Income of the Annual Statement, line 17. The allocation by line of business is based on the policies eligible and receiving dividends or on a company's formulaic determination if the line of business per the policy does not correspond directly to a line of business in the Annual Statement.[116]

Loss adjustment expense (LAE), provided separately for DCC and A&O expenses incurred and unpaid, in columns 9, 11, 15 and 17 of the IEE, cannot be found within the Annual Statement for the line of business breakdowns required in the IEE. However, insurance companies track expenses by line of business and therefore know which expenses are allocated to which lines. In total, the LAE incurred amounts in columns 9 plus 11 reconcile to the Statement of Income, line 3, column 1 (current year) and Part 3 of the U&IE, line 25, column 1. The LAE unpaid amounts reconcile to page 3 of the Annual Statement, line 3, column 1 (current year) and Part 2A of the U&IE, line 35, column 9.

Like policyholder dividends, insurance companies know which lines agents' balances stem from and therefore can allocate the amounts directly in column 21. The amounts should agree to balances included within lines 15.1 plus 15.2, column 3 of the Assets page of the Annual Statement.

[116] Feldblum, S., "The Insurance Expense Exhibit and the Allocation of Investment Income" (Fifth Edition), CAS Study Note, May 1997, page 32.

Other underwriting expenses in columns 23, 25, 27 and 29 reconcile directly to Part I of the IEE.

Other income less other expenses in column 31 of the IEE reconciles in total to line 15 minus line 5 of the Statement of Income. Line 15 of the Statement of Income provides total other income incurred, and line 5 provides aggregate write-ins for underwriting deductions. The allocation by line is performed directly by accumulating the sources of other income and underwriting deductions on specific policies and mapping the income/deductions by policy to the Annual Statement lines of business.

Calculation of Pretax Profit or Loss Excluding All Investment Gain (Column 33)

Column 33 provides pretax profit (loss) excluding all investment gains and is calculated from the information contained in the previous columns of Part II of the IEE as follows:

Pretax profit (loss) excluding all investment gains =

Premiums earned (column 3)
- Dividends to policyholders (column 5)
- Incurred loss (column 7)
- DCC expenses incurred (column 9)
- A&O expenses incurred (column 11)
- Commission and brokerage expenses incurred (column 23)
- Taxes, licenses and fees incurred (column 25)
- Other acquisitions, field supervision and collection expenses incurred (column 27)
- General expenses incurred (column 29)
+ Other income less other expenses (column 31).

Simply put, pretax profit equals inflows of earned revenue minus outflows of incurred expenses.

The total amount in column 33 reconciles to line 18 (net income after dividends to policyholders, after capital gains tax and before all other federal and foreign income taxes) *minus* line 11 (net investment gain (loss)) of the Statement of Income.

Table 63 demonstrates the calculation of column 33 of Part II of the IEE *in total* and shows the reconciliation to the Statement of Income within the Annual Statement for Fictitious in 2018. Recall that figures in the IEE are provided in thousands; any differences from the Statement of Income are due to rounding errors.

TABLE 63

Data from Fictitious Insurance Company 2018 IEE (USD in 000s) for All Lines of Business			
Column Number	**IEE Part II Column Heading**	**Total Line 35**	**Statement of Income Reference**
3	Premiums Earned	26,512	Line 1
5	Dividends to Policyholders	46	Line 17
7	Incurred Loss	16,907	Line 2
9	Defense and Cost Containment Expenses Incurred	1,671	

11	Adjusting and Other Expenses Incurred	1,585	
	Subtotal Loss Adjustment Expenses Incurred	3,256	Line 3
23	Commissions and Brokerage Expenses Incurred	4,055	
25	Taxes, Licenses and Fees Incurred	860	
27	Other Acquisitions, Field Supervision and Collection Expenses Incurred	1,283	
29	General Expenses Incurred	2,285	
	Subtotal Other Underwriting Expenses Incurred	8,483	Line 4
31	Other Income Less Other Expenses	33	Line 15 minus Line 5
33	Pre-Tax Profit or Loss Excluding All Investment Gain	(2,147)	= Line 1 - Lines 17, 2, 3, 4 + Line 15

As displayed in Table 63, Fictitious operated at a pretax loss (before any gains or losses from investments) of $2.1 million in 2018, most of which was due to underwriting (underwriting loss totaled $2.1 million as per line 8 of the Statement of Income). Net incurred loss and LAE during 2018 was $4.4 million higher than that incurred in 2017, with less than $1 million more in net earned premium. As previously explained, this was due to the high frequency of catastrophe losses incurred by Fictitious in 2018, compared to a relatively benign catastrophe year for Fictitious in 2017.

Of the $2.1 million pretax loss (before investment gain), $1.2 million stems from the homeowners of business. Homeowners is the largest line of business written by the company in terms of net written premium volume ($4.6 million per column 1 of the IEE, Part II). Further, the homeowners line was hit hardest by the catastrophe losses in 2018. Given its significance to the 2018 results, we will use homeowners as the line of business example for computing total profit or loss for Fictitious.

The remaining columns, columns 35 through 41, are determined formulaically and are the crux of Part II of the IEE.

Overview of the Calculation of Total Profit or Loss (Column 41)

Column 41 provides total profit (loss) on a pretax basis to an insurance company for each line of business. It is computed by taking pretax profit (loss) *before* any investment gain and adding investment gains.

Column 41 of the IEE is equal to net income as calculated in the Statement of Income within the Annual Statement, except all amounts in the IEE are gross of taxes. Column 41 reconciles to line 18 (net income after dividends to policyholders, after capital gains tax and before all other federal and foreign income taxes) *plus* the amount of capital gains tax provided in line 10 (Net realized capital gains (losses) less capital gains tax) of the Statement of Income. Capital gains taxes are added back to the calculation simply because total profit is shown on a pretax basis.

Table 64 demonstrates the calculation of column 41 of Part II of the IEE *in total* and shows the reconciliation to the Statement of Income within the Annual Statement for Fictitious in 2018.

TABLE 64

Data from Fictitious Insurance Company 2018 IEE (USD in 000s) for All Lines of Business

Column Number	IEE Part II Column Heading	Total Line 35	Statement of Income Reference
33	Pre-tax Profit or Loss Excluding All Investment Gain	(2,147)	= Line 1 - Lines 17, 2, 3, 4 + Line 15
35	Investment Gain on Funds Attributable to Insurance Transactions	2,663	
39	Investment Gain Attributable to Capital and Surplus	1,741	
	Subtotal Net Investment Gain (Loss) *Before* Capital Gains Tax	4,404	Line 11 + Capital Gains Tax of $99 per Line 10
41	Total Profit or Loss	2,257	Line 18 + Capital Gains Tax of $99 per Line 10

As displayed in Table 64, net investment gain (loss) ($4.4 million) more than offset the Fictitious' underwriting loss in 2018.

The same formula is used to calculate total profit or loss (column 41) for each line of business. The tricky part, of course, is how to allocate the net investment gain (loss) by line of business and between funds attributable to insurance transactions versus those attributable to capital and surplus. The following provides an overview of the allocation procedure, with details in the subsequent sections.

The first step of the calculation is to determine the ratio of net investment gain (loss) to total investable assets then apply that ratio to investable assets by line of business. This calculation provides net investment gain (loss) by line. The ratio of net investment gain (loss) to total investable assets is called the net investment gain ratio.

The second step is to apply the net investment gain ratio to funds attributable to insurance transactions by line of business. This calculation provides investment gain on funds attributable to insurance transactions in column 35.

Investment gain attributable to capital and surplus in column 39 is computed as the difference between net investment gain (loss) and investment gain on funds attributable to insurance transactions in column 35. Formulaically, for each line of business,

Investment gain attributable to capital and surplus (column 39) =

Net investment gain (loss)[117]
- Investment gain on funds attributable to insurance transactions (column 35).

As indicated, both of the inputs in the calculation of investment gain attributable to capital and surplus (column 39) are determined by applying the ratio of net investment gain (loss) to total investable assets for all lines of business to the applicable investable funds (either in total or attributable to insurance transactions) associated with the particular line of business.

Net Investment Gain Ratio

[117] The calculation of net investment gain (loss) is provided in subsequent paragraphs below.

The net investment gain ratio is the ratio of net investment gain (loss) to total investable assets. Total investable assets equal the sum of net loss and LAE reserves, net unearned premium reserves, ceded reinsurance payable and policyholders' surplus, minus agents' balances. These amounts are intended to be a proxy for investable assets as they are amounts that are available for investment by the insurance company.[118] Agents' balances are subtracted in the formula because they are not investable assets.

In the calculation of total investable assets, the mean of the aforementioned amounts are used (i.e., average of the prior year and current year) because investment income during the year is earned on reserves and surplus throughout the year, rather than a fixed point in time.

Formulaically, the net investment gain ratio is calculated as follows, for all lines of business in total:

Net investment gain ratio =

$$\frac{\text{Net investment gain (loss)}}{\text{Total investable assets}}$$

where,

Total investable assets =

Mean net loss and LAE reserves
+ Mean net unearned premium reserves
+ Mean ceded reinsurance premiums payable
+ Mean policyholders' surplus
- Mean agents' balances.

Table 65 demonstrates the calculation of the net investment gain ratio based on 2018 Annual Statement data for Fictitious.

TABLE 65

Data from Fictitious Insurance Company 2018 IEE and Annual Statement (USD in 000s)

	All Lines of Business	2018 Current Year	2017 Prior Year	Mean	2018 IEE Part II Total, Line 35	Annual Statement
(1)	**Net Investment Gain Ratio**	**5.0%**				= (2) current year divided by (3) mean
(2)	**Net Investment Gain (loss) *before* Capital Gains Tax**	**4,404**				Statement of Income Page 4, Line 11 plus Capital Gains Tax of $99 per Line 10

[118] Going back to basics, admitted assets minus liabilities equals surplus. Or equivalently, admitted assets equals liabilities plus surplus. Reserves and ceded reinsurance payables are liabilities that the insurance carrier must hold. As with surplus, the company can invest the assets backing these liabilities. They are therefore used in the calculation to represent investable assets.

(3)	**Investable Assets**	87,540	87,080	**87,310**		= (4) + (5) + (6) + (7) + (8) - (9)
(4)	**Net Loss Reserve**	41,894	40,933	41,414	Column (13)	U&IE, Part 2A, Total line, Column 8, divided by 1,000
(5)	**Net Loss Adjustment Expense Reserve**	9,663	9,664	9,664	Column (15) + (17)	U&IE, Part 2A, Total line, Column 9, divided by 1,000
(6)	**Net Unearned Premium Reserve**	11,691	11,451	11,571	Column (19)	U&IE, Part 1A, Total line 35, Column 4, divided by 1,000
(7)	**Policyholders' Surplus**	31,024	31,608	31,316		Liabilities, Surplus and Other Funds, Page 3, Line 37, divided by 1,000
(8)	**Ceded Reinsurance Premiums Payable**	440	608	524		Liabilities, Surplus and Other Funds, Page 3, Line 12, divided by 1,000
(9)	**Agents' Balances**	7,172	7,184	7,178	Column (21)	Equals the portion of Assets Line 15.1 plus 15.2, divided by 1,000, for Agents' Balances

As displayed above, the 2018 investment gain ratio for Fictitious was 5%. This means the company earned 5% on its "investable assets" during 2018.

Net Investment Gain (Loss) by Line of Business

Net investment gain (loss) by line of business is determined as the investment gain ratio multiplied by total investable assets for that line of business.

Net investment gain (loss) for a particular line of business =

Net investment gain ratio (for all lines)
* Total investable assets for the line of business

where,

Total investable assets for the line of business =

Mean net loss and LAE reserves for the line of business
\+ Mean net unearned premium reserves for the line of business
\+ Mean ceded reinsurance premiums payable for the line of business
\+ Mean policyholders' surplus for the line of business
\- Mean agents' balances for the line of business.

Table 66 demonstrates the calculation of the net investment gain for the homeowners line of business based on 2018 Annual Statement and IEE data for Fictitious.

TABLE 66

Data from Fictitious Insurance Company 2018 IEE and Annual Statement (USD in 000s)

Line of Business: Homeowners Multiple Peril		2018 Current Year	2017 Prior Year	Mean	2018 IEE Part II Total, Line 35	Annual Statement (AS)
(1)	Investment Gain for Line of Business	232			Column (35)	= (3) Current Year * (3) Mean
(2)	Net Investment Gain Ratio (all lines of business)	**5.0%**				Calculated in Table 65
(3)	Investable Funds for Line of Business			4,603		= (4) + (5) + (6) + (7) - (8) + (9)
(4)	Net Loss Reserve for Line of Business	1,311	1,161	**1,236**	Column (13)	U&IE, Part 2, Line 4, Columns 5 and 6, divided by 1,000
(5)	Net Loss Adjustment Expense Reserve for Line of Business	144	170	**157**	Column (15) + (17)	U&IE, Part 2A, Line 4, Column 9, divided by 1,000; and prior year AS
(6)	Net Unearned Premium Reserve for Line of Business	2,401	2,290	**2,346**	Column (19)	U&IE, Part 1A, Line 4, Column 5, divided by 1,000; and prior year AS
(7)	Ceded Reinsurance Premiums Payable for Line of Business	21	3	**12**		Calculated in Table 67
(8)	Agents' Balances for Line of Business	1,901	2,134	**2,018**	Column (21)	IEE, Column 21, line 4 provided in each of the 2018 and 2017 AS
(9)	Surplus Allocable to Line of Business			**2,869**		Calculated in Table 69

As displayed in Table 66, $232,000 of the company's total $4.4 million in net investment gain during 2018 was allocated to the homeowners line using the NAIC's approach.

The net loss and LAE reserves, unearned premium reserves and agents' balances by line of business used in the above calculation come from columns 13, 15, 17, 19 and 21 of the IEE, current year and prior year,

respectively. Ceded reinsurance premiums payable by line and policyholders' surplus by line, are calculated separately.

Ceded Reinsurance Premiums Payable by Line of Business

Ceded reinsurance premiums payable are allocated to line of business based on the distribution of ceded written premiums by line. Formulaically, the calculation is as follows:

Ceded reinsurance premiums payable for the line of business =

$$\frac{\text{Ceded written premiums for the line of business}}{\text{Total ceded written premiums}} * \text{Total ceded reinsurance premiums payable.}$$

Table 67 demonstrates the calculation of Fictitious' ceded reinsurance premiums payable for homeowners.

TABLE 67

Data from Fictitious Insurance Company 2017 and 2018 Annual Statement (USD in 000s)

	Line of Business: Homeowners Multiple Peril	2018 Current Year	2017 Prior Year	Mean	2018 IEE Part II Total, Line 35	Annual Statement (AS)
(1)	Ceded Reinsurance Premiums Payable for Line of Business	21	3	12	N/A	= (4) * (5)
(2)	Ceded Premiums Written for Line of Business	91	12		N/A	U&IE, Part 1B, Line 4, Columns 4 + 5, divided by 1,000; and prior year AS
(3)	Ceded Premiums Written, Total	1,882	2,149		N/A	U&IE, Part 1B, Totals, Columns 4 + 5, divided by 1,000; and prior year AS
(4)	Ratio of Ceded Premiums Written for Line of Business to Total	4.8%	0.6%		N/A	= (2) / (3)
(5)	Ceded Reinsurance Premiums Payable, Total	440	608		N/A	Liabilities, Surplus and Other Funds, Page 3, Line 12, divided by 1,000

The mean ceded reinsurance payable for homeowners that was used in the calculation of Fictitious' total investable assets for homeowners was $12 (dollars in thousands).

Policyholders' Surplus by Line of Business

The NAIC allocates surplus to line of business in proportion to the sum of net loss and LAE reserves, net unearned premium reserves and net earned premium. The mean values are used in the calculation of the balance sheet figures (reserves), while the current-year value is used for the income statement figure (net earned premium).

The first step in the calculation is to compute the ratio of mean policyholders' surplus to the sum of mean net loss and LAE reserves, mean net unearned premium reserves and current year net earned premiums, in total for all lines combined. This ratio is called the *surplus ratio*.

Surplus ratio =

Mean policyholders' surplus in total *divided by*
[Mean net loss and LAE reserves in total
+ Mean net unearned premium reserves in total
+ Current year net earned premium in total].

Table 68 demonstrates the calculation of the 2018 surplus ratio for Fictitious.

TABLE 68

Data from Fictitious Insurance Company 2018 IEE and 2017 and 2018 Annual Statement (USD in 000s)

All Lines of Business		2018 Current Year	2017 Prior Year	Mean	2018 IEE Part II Total, Line 35	Annual Statement (AS)
(1)	Surplus Ratio	35.1%				= (2) / [Sum of means of (3) through (5) plus (6) for current year]
(2)	Policyholders' Surplus	31,024	31,608	31,316		Liabilities, Surplus and Other Funds, Page 3, Line 37, Columns 1 and 2, respectively, divided by 1,000
(3)	Net Loss Reserve	41,894	40,933	41,414	Column (13)	U&IE, Part 2A, Total line, Column 8, divided by 1,000; and prior year AS
(4)	Net Loss Adjustment Expense Reserve	9,663	9,664	9,664	Column (15) + (17)	U&IE, Part 2A, Total line, Column 9, divided by 1,000; and prior year AS
(5)	Net Unearned Premium Reserve	11,691	11,451	11,571	Column (19)	U&IE, Part 1A, Total line 35, Column 4, divided by 1,000; and prior year AS
(6)	Net Earned Premium	26,512			Column (3)	U&IE, Part 1, Total line 35, Column 4, divided by 1,000

The surplus ratio for Fictitious was 35.1% in 2018.

The surplus ratio is then applied to the applicable mean balance sheet amounts and the income statement amount (earned premium) for the current year for the particular line of business to determine the amount of surplus allocated to that line.

Surplus allocated to line of business =

Mean surplus ratio (for all lines) *multiplied by*
[Mean net loss and LAE reserves for the line of business
+ Mean net unearned premium reserves for the line of business

+ Current year net earned premium for the line of business].

Table 69 shows the application of the surplus ratio in determining the amount of surplus allocated to Fictitious' homeowners line of business.

TABLE 69

Data from Fictitious Insurance Company 2018 IEE and 2017 and 2018 Annual Statement (USD in 000s)

Line of Business: Homeowners Multiple Peril		2018 Current Year	2017 Prior Year	Mean	2018 IEE Part II Total, Line 35	Annual Statement (AS)
(1)	Surplus Allocable to Line of Business			2,872		= (2) * [Sum of means of (3) through (5) plus (6) for current year]
(2)	Surplus Ratio	35.1%				Calculated in Table 68
(3)	Net Loss Reserve for Line of Business	1,311	1,161	1,236		U&IE, Part 2, Line 4, Columns 5 and 6, divided by 1,000
(4)	Net Loss Adjustment Expense Reserve for Line of Business	144	170	157		U&IE, Part 2A, Line 4, Column 9, divided by 1,000; and prior year AS
(5)	Net Unearned Premium Reserve for Line of Business	2,401	2,290	2,346		U&IE, Part 1A, Line 4, Column 5, divided by 1,000; and prior year AS
(6)	Net Earned Premium for Line of Business	4,445			Column (3)	U&IE, Part 1, Line 4, Column 4, divided by 1,000

As displayed in Table 69, $2.9 million of the Fictitious' total $31 million in policyholders' surplus at year-end 2018 was allocated to the homeowners line using the NAIC's allocation approach. Stated differently, less than 10% of the company's policyholders' surplus was allocated to homeowners using the IEE allocation. This exemplifies the caution noted earlier in relying on this method for prospective pricing or even retrospective evaluation of profitability. Given the catastrophe risk inherent in this line of business, which is quite evident based on 2018 experience, one might expect more than 10% of the surplus to be allocated to this line. To provide some perspective, in 2018 we saw that homeowners contributed more than 50% of the company's underwriting loss. If the IEE allocation is used in pricing for Fictitious, the rates will be inadequate and could eventually result in the insolvency of Fictitious.

Investment Gain by Line of Business Attributable to Insurance Transactions

Investment gain attributable to insurance transactions is allocated to line of business by applying the net investment gain ratio to funds attributable to insurance transactions for the particular line. Funds attributable to insurance transactions for a particular line are equal to the sum of mean net loss and LAE reserves, mean net unearned premium reserves and mean ceded reinsurance premiums payable for that line, reduced by agents' balances and the portion of prepaid expenses in the unearned premium reserves.

Funds attributable to insurance transactions for the line of business =

Mean net loss and LAE reserves for the line of business
+ Mean net unearned premium reserves for the line of business
+ Mean ceded reinsurance premiums payable for the line of business
- Mean agents' balances for the line of business
- Prepaid expenses in the unearned premium reserves.

The elements that go into the calculation of funds attributable to insurance transactions differ from total investable funds in two ways. First, mean policyholders' surplus is not included in the calculation of funds attributable to insurance transactions. This is because here the focus is on funds attributed to insurance transactions and not to capital and surplus. Second, prepaid expenses in the unearned premium reserves are not included in the calculation because they are not an investable asset; they have already been expensed. These expenses were not explicitly removed in the calculation of total investable funds because they are already out of policyholders' surplus, which is a component of the calculation.

Table 70 provides the calculation of investment gain attributable to insurance transactions for Fictitious' homeowners line.

TABLE 70

Data from Fictitious Insurance Company 2018 IEE and 2017 and 2018 Annual Statement (USD in 000s)

	Line of Business: Homeowners Multiple Peril	2018 Current Year	2017 Prior Year	Mean	2018 IEE Part II Total, Line 35	Annual Statement (AS)
(1)	Investment Gain on Funds Attributable to Insurance Transactions for Line of Business	53			Column (35)	= (2) Current Year * (3) Mean
(2)	Net Investment Gain Ratio (all lines of business)	5.0%				Calculated in Table 65
(3)	Funds Attributable to Insurance Transactions for Line of Business	1,283	829	1,056		= (4) + (5) + (6) + (7) - (9) - [(6) * (8)]
(4)	Net Loss Reserve for Line of Business	1,311	1,161	1,236	Column (13)	U&IE, Part 2, Line 4, Columns 5 and 6, divided by 1,000
(5)	Net Loss Adjustment Expense Reserve for Line of Business	144	170	157	Column (15) + (17)	U&IE, Part 2A, Line 4, Column 9, divided by 1,000; and prior year AS
(6)	Net Unearned Premium Reserve for Line of Business	2,401	2,290	2,346	Column (19)	U&IE, Part 1A, Line 4, Column 5, divided by 1,000; and prior year AS
(7)	Ceded Reinsurance Premiums Payable for Line of Business	21	3	12		Calculated in Table 67
(8)	Prepaid Expense Ratio	29%				Calculated in Table 71
(9)	Agents' Balances for Line of Business	1,901	2,134	2,018	Column (21)	

As displayed in Table 70, $53,000 of the company's total $232,000 in net investment gain on the homeowners line was attributed to gains on insurance transactions using the NAIC approach.

Prepaid Expense Ratio

The ratio that is used to determine the amount of unearned premium reserves representing prepaid expenses is calculated for each line of business separately. It is the ratio of net acquisition expenses to net written premiums (column 1). Net acquisition expenses are calculated as the sum of commissions and brokerage expenses incurred (column 23); taxes, licenses and fees incurred (column 25); other acquisition, field supervisions and collection expenses incurred (column 27); and half of the general expenses incurred (50% of column 29).

The prepaid expense ratio for homeowners is calculated for Fictitious in Table 71.

TABLE 71

Data from Fictitious Insurance Company 2018 IEE and 2017 and 2018 Annual Statement (USD in 000s)

Line of Business: Homeowners Multiple Peril		2018 Current Year	2017 Prior Year	Mean	2018 IEE Part II Total, Line 4	Annual Statement
(1)	Prepaid Expense Ratio	29%				= (2) / (7)
(2)	Net Acquisition Expenses for Line of Business	1,315				= (3) + (4) + (5) + 50% of (6)
(3)	Commissions and Brokerage Expenses Incurred for Line of Business	867			Column (23)	
(4)	Taxes, Licenses and Fees Incurred for Line of Business	130			Column (25)	
(5)	Other Acquisitions, Field Supervision and Collection Expenses Incurred for Line of Business	169			Column (27)	
(6)	General Expenses Incurred for Lines of Business	298			Column (29)	
(7)	Net Written Premium for Line of Business	4,555			Column (1)	

The prepaid expense ratio for Fictitious was 29% in 2018.

Investment Gain by Line of Business Attributable to Capital and Surplus

The difference between net investment gain (loss) and the amount of investment gain attributed to insurance transactions is the amount of investment gain attributable to capital and surplus. Table 72 provides this calculation for Fictitious.

TABLE 72

Data from Fictitious Insurance Company 2018 IEE (USD in 000s)

Line of Business: Homeowners Multiple Peril		2018 Current Year	2017 Prior Year	Mean	2018 IEE Part II Total, Line 35	Annual Statement
(1)	Investment Gain Attributable to Capital and Surplus for Line of Business	179			Column (39)	= (2) - (3)
(2)	Investment Gain for Line of Business	232				Calculated in a Table 66
(3)	Investment Gain on Funds Attributable to Insurance Transactions for Line of Business	53			Column (35)	Calculated in Table 70

As displayed in Table 72, the amount of investment gain attributable to capital and surplus for homeowners was $179,000.

Total profit or loss

Finally, column 41 provides total profit (loss) by line of business. Table 73 demonstrates the calculation of total profit in 2018 for Fictitious' homeowners line. First, we will provide the calculation of pretax profit excluding all investment gain for homeowners, as shown in column 33. Then we will add the components of net investment gain in columns 35 and 39 to compute total profit in column 41.

Pretax profit excluding all investment gain is first computed for Fictitious' homeowners line of business as follows in Table 73.

TABLE 73

Data from Fictitious Insurance Company 2018 IEE (USD in 000s) for Homeowners Multiple Peril

Column Number	IEE Part II Column Heading	Total Line 4	Notes
3	Premiums Earned	4,445	
5	Dividends to Policyholders	-	
7	Incurred Loss	3,789	
9	Defense and Cost Containment Expenses Incurred	74	
11	Adjusting and Other Expenses Incurred	360	
23	Commissions and Brokerage Expenses Incurred	867	
25	Taxes, Licenses and Fees Incurred	130	
27	Other Acquisitions, Field Supervision and Collection Expenses Incurred	169	
29	General Expenses Incurred	298	
31	Other Income Less Other Expenses	1	
33	Pre-Tax Profit of Loss Excluding All Investment Gain	(1,241)	= Column 3 minus Columns 5, 7, 9, 11, 23,25, 27, 29 plus Column 31

As displayed in Table 73, the NAIC allocation formula shows that Fictitious experienced a pretax loss of $1.2 million on its homeowners book in 2018, nearly all of which came from underwriting (since other income is $1).

The calculation of column 41 of Part II of the IEE shows that investment gains only offset $232,000 of the $1.2 million underwriting loss, such that homeowners showed an overall loss, after investment gain, of $1.0 million.

TABLE 74

Data from Fictitious Insurance Company 2018 IEE (USD in 000s) for Homeowners Multiple Peril			
Column Number	IEE Part II Column Heading	Total Line 35	Statement of Income Reference
33	Pre-Tax Profit or Loss Excluding All Investment Gain	(1,241)	
35	Investment Gain on Funds Attributable to Insurance Transactions	53	
39	Investment Gain Attributable to Capital and Surplus	179	
	Subtotal Net Investment Gain (loss) *before* Capital Gains Tax	232	
41	Total Profit or Loss	(1,009)	
42	%	22.7%	= Column 41 divided by Column 3

Out of the total $2.3 million in pretax profit for all lines earned by Fictitious in 2018, $(1.0) million was allocated to homeowners based on the NAIC calculation. This represents -23% of net earned premium in 2018. A review of column 41 of IEE shows that Fictitious also experienced pretax losses in the other liability, automobile physical damage and fidelity lines. Profits were earned in other lines to absorb the losses in these lines of business, the largest of which was achieved in workers' compensation ($3.3 million). This is why companies diversify insurance risks across property/casualty lines of business; the intent is that any losses would be offset by gains.

PART III — ALLOCATION TO LINES OF BUSINESS DIRECT

Part III provides the components of direct profit (loss) on a pretax basis, excluding investment gain. Investment gain is not considered because investment income is earned on the actual assets held by the company, which are net of reinsurance.

Different from Part II, the components used to compute profit (loss) in Part III are not readily available from the Annual Statement as presented. Unless assigned with the task of completing the IEE for their employer, most students will not use the information contained in Part III of the IEE. This publication is not intended to be an instruction manual for completing the IEE. As a result, we will only provide a brief discussion of the computation of each component, reconciling to Annual Statement exhibits when possible.

Columns 1 through 32

As with Part II, the even columns of Part III of the IEE provide the percent of the corresponding amounts in the odd-numbered columns to earned premium, in this case on a direct basis.

Direct premiums written in column 1 reconcile to Part 1B, Premiums Written, column 1, of the U&IE. Direct premiums written also reconcile to column 1 of the Exhibit of Premiums and Losses (Statutory Page 14 Data) by line and in total to Schedule T, column 2, line 59.

Direct premiums earned in column 3 reconcile to column 2 of the Exhibit of Premiums and Losses (Statutory Page 14 Data) by line, for all states plus any alien business, and in total to Schedule T, column 3, line 59.

Dividends to policyholders in column 5 should agree to line 17 of the Statement of Income, excluding dividends associated with business assumed and ceded.

Incurred loss in column 7 reconciles to column 6 of the Exhibit of Premiums and Losses (Statutory Page 14 Data) by line, for all states plus any alien business, and in total to Schedule T, column 6, line 59.

DCC expenses incurred and unpaid in columns 9 and 15, respectively, reconcile to columns 9 and 10, of the Exhibit of Premiums and Losses (Statutory Page 14 Data) by line, for all states plus any alien business. Incurred expenses also reconcile in total to the U&IE, Part 3, Expenses, line 1.1 of column 1.

A&O expenses incurred and unpaid in columns 11 and 17, respectively, cannot be tied directly to amounts presented in the Annual Statement. The NAIC instructions state, "IEE Part III, columns 9, 11, 15 and 17 must agree with IEE Part II, columns 9, 11, 15 and 17, respectively, excluding expenses relating to reinsurance assumed and ceded."[119] An insurance company knows which expenses are allocated to which lines and can therefore complete these columns.

Unpaid losses in column 13 reconcile to column 7 of the Exhibit of Premiums and Losses (Statutory Page 14 Data) by line, for all states plus any alien business, and in total to Schedule T, column 7, line 59.

Unearned premium reserves in column 19 reconcile to column 4 of the Exhibit of Premiums and Losses (Statutory Page 14 Data) by line, for all states plus any alien business.

Agents' balances in column 21 stem from policies written; therefore, companies know the applicable line of business. The amounts should agree to balances included within lines 15.1 plus 15.2, column 3 of the Assets page, excluding balances relating to reinsurance.

Other underwriting expenses in columns 23, 25, 27 and 29 cannot be found in the line of business breakdown of Part III. However, they should reconcile in total to the corresponding amounts in Part I of the IEE excluding amounts relating to reinsurance assumed or ceded. In fact, commissions and brokerage incurred on a direct basis in column 23 should reconcile in total to the sum of the amounts in line 2.1 plus 2.4 of IEE Part I, column 2.

Other income less other expense in column 31 also does not reconcile directly to amounts in the Annual Statement. However, the NAIC instructions note that it should agree in total to amounts in line 15 minus line 5 of the Statement of Income that apply to direct business only (i.e., "excluding expenses related to reinsurance assumed or ceded").[120]

[119] *2018 NAIC Annual Statement Instructions Property/Casualty*, page 422.
[120] Ibid., page 422.

Calculation of Pretax Profit or Loss Excluding All Investment Gain (Column 33)

Column 33 provides pretax profit (loss) excluding all investment gains and is calculated from the information contained in the previous columns of Part III of the IEE, using the same formulaic approach as in Part II. Specifically,

Pretax profit or loss excluding all investment gains =

Premiums earned (column 3)
- Dividends to policyholders (column 5)
- Incurred loss (column 7)
- DCC expenses incurred (column 9)
- A&O expenses incurred (column 11)
- Commission and brokerage expenses incurred (column 23)
- Taxes, licenses and fees incurred (column 25)
- Other acquisitions, field supervision and collection expenses incurred (column 27)
- General expenses incurred (column 29)
+ Other income less other expenses (column 31).

INTERROGATORIES

The interrogatories to the IEE are actually shown before the Parts I through III. The interrogatories provide explanatory notes on the information contained in Parts I through III, the most important of which is Interrogatory 4, which provides information on the process by which the allocations of expenses and profit are made. Specifically, question 4 asks:

4. The information provided in the Insurance Expense Exhibit will be used by many persons to estimate the allocation of expenses and profit to the various lines of business.
   - 4.1 Are there any items requiring special comment or explanation?
   - 4.2 Are items allocated to line of business in Parts II and III using methods not defined in the instructions?
   - 4.3 If yes, explain.[121]

Questions 4.1 and 4.2 each require “yes” or “no” responses. If the company answers “yes” to either question, the company is required to provide an explanation, so the user can consider differences in the company’s process relative to what is stated in the instructions.

[121] 2018 IEE.

CHAPTER 19. RISK-BASED CAPITAL

OVERVIEW

The Risk-Based Capital (RBC) system was developed by the National Association of Insurance Commissioners (NAIC) and has been used since 1994 to provide a means for the early detection of insurance company insolvency. It was implemented for property/casualty companies in part in response to reports issued by the federal government in the late 1980s and early 1990s questioning the ability of state governments to regulate insurance companies.[122] These reports emerged in the wake of four of the largest property/casualty insurance company insolvencies in the history of the U.S. insurance industry: Mission Insurance Company, Transit Casualty Company, Integrity Insurance Company and Anglo-American Insurance Company.

The implementation of the RBC system was a significant advancement in solvency monitoring by state governments and has also served as the foundation for many other capital models that followed, including those currently used by rating agencies.

There are two main components to the RBC system:

1. RBC formula: The RBC formula results in a minimum level of required capital determined (the authorized control level benchmark, or ACL) formulaically using an approach that is standard to all insurance companies in a particular industry group (e.g., property/casualty, life and health). The minimum level of required capital is intended to reflect the capital needed to support the risks faced by insurance companies. The company's actual recorded capital and surplus is compared to the minimum required capital to produce the RBC ratio.[123] The RBC ratio is compared to a range of values that define the levels of company and regulatory action.
2. RBC for Insurers Model Act:[124] The RBC Model Act, as adopted in the laws and regulations of each state, provides the state insurance regulator with authority to take specific action when a company's RBC ratio falls below certain thresholds.

The RBC system is applied to property/casualty, life and health insurance companies. Certain entities are exempt from the RBC system, including title insurance companies, monoline financial guaranty insurance companies and monoline mortgage guaranty insurance companies[125]. Other exemptions may apply based on individual state laws and regulations.

[122] The most widely known of these reports was written by the U.S. House of Representatives Subcommittee on Oversight and Investigations of the Committee on Energy and Commerce titled, "Failed Promises – Insurance Company Insolvencies" (see U.S. House of Representatives Subcommittee on Oversight and Investigations of the Committee on Energy and Commerce. "Failed Promises-Insurance Company Insolvencies." 101 Cong., 2nd sess., February 1990. Washington, D.C.: GPO, 1993).
[123] The company's actual recorded capital and surplus is adjusted to reflect certain items that will be introduced later in this chapter.
[124] NAIC RBC for Insurers Model Act (Model #312).
[125] It should be noted that the NAIC is currently in the process of testing and implementing a proposed risk-based mortgage guaranty capital model, see: http://www.naic.org/cmte_e_mortgage_guaranty_insurance_wg.htm

This publication will focus on the RBC system as it applies to property/casualty insurance companies. The formulas differ for property/casualty, life and health insurance companies, reflecting differing risk factors for each.

Insurance companies are required to file their RBC report with the NAIC by March 1 based on information evaluated as of the prior year-end (December 31). An insurance company's RBC report provides its RBC formula calculations and management discussion and analysis of the RBC results. The RBC report is confidential; therefore, details of the calculation are not available to the public. However, the summarized results of the RBC formula calculations are shown in the Five-Year Historical Data exhibit of the Annual Statement, which is in the public domain. The disclosure shows the overall result of the authorized control level risk-based capital calculation together with the company's total adjusted capital, which can be compared to determine the RBC ratio.

RBC FORMULA

Overview

The RBC formula is computed by applying a set of factors to asset, reserve, recoverable and premium items reported in an insurance company's Annual Statement. The size of the factor depends on the level of risk associated with each item; the greater the risk, the greater the factor. The application of the factors to the associated Annual Statement items results in what are commonly referred to as "risk charges."

The formula is not a comprehensive measure of every risk for an insurance company; rather it only considers those risks that are material to an insurance company. Further, risks associated with a company's business plans and strategy, management, internal controls, systems, reserve adequacy and ability to access capital are not considered as these risks are difficult to quantify.

The general structure of the RBC formula has remained intact since it was first implemented in 1994, although the risk charges have been subject to periodic revisions since that time. In recent years, additional risk categories have been introduced to the formula to reflect evolving practices around the management and quantification of risk in the insurance industry. The RBC formula was developed based on its predecessor, the life RBC formula, which the NAIC implemented a year earlier in 1993.[126]

Risk Categories

The current property/casualty RBC formula includes eight risk categories, with most denoted by the letter "R" with an indicator subscript to identify the particular risk:

- R_0 Subsidiary Insurance Companies and Miscellaneous Other Amounts
- R_1 Asset Risk – Fixed Income
- R_2 Asset Risk – Equity

[126] RBC for stand-alone health insurers was not implemented until 1998.

R_3 Asset Risk – Credit
R_4 Underwriting Risk – Reserves
R_5 Underwriting Risk – Net Written Premium
R_{cat} Catastrophe Risk
- Operational Risk[127]

Broadly speaking, the major categories of risk captured by the property/casualty RBC formula are similar to those within the life and health formulas, focusing mainly on the risks associated with the company's investments and other recoverable-based assets ("asset risk"), as well as risks associated with the issuance of insurance policies ("underwriting risk"). Visually, the formulas differ by the use of the letter "R" denoting the risks for property-casualty, while the letter "C" is used for the life formula and "H" for the health formula.

Asset risk is a much smaller portion of the property/casualty total risk charge compared to the life industry. This is because life insurance policies tend to be purchased as investment vehicles, whereas property/casualty products are purchased to protect the consumer from financial loss. As a result, property/casualty companies tend to invest in short-term, liquid investments (which are generally considered to be lower risk) due to the relatively shorter duration of liabilities.

As of December 31, 2018, the life insurance industry held more than 17 times the amount of recorded surplus in admitted assets whereas property/casualty insurers held less than three times the amount of surplus in admitted assets[128].

Subsidiary Insurance Companies and Miscellaneous Other Amounts

The R_0 charge considers the risks associated with investments in affiliated entities as well as miscellaneous off-balance sheet and other items.

Affiliated investments fall into two broad categories: insurance affiliates that are subject to RBC and affiliates that are not subject to RBC. The latter group includes insurance affiliates that are not subject to RBC, such as title insurers, monoline financial guaranty insurers, and monoline mortgage guaranty insurers, all of which are currently exempt from the RBC system.

[127] Operational Risk is added as a final step in the calculation, after applying the covariance adjustment between other risk types, and does not have a corresponding "R" indicator.

[128] S&P Global Market Intelligence, based on YE2018 Annual Statement data.

R_0 contains the risk charges associated with affiliated insurers subject to RBC (whether property/casualty, life or health), along with alien insurance affiliates.[129] All other affiliates are subject to R_2 charges.

The miscellaneous off-balance sheet and other items component includes non-controlled assets, guarantees for affiliates, contingent liabilities and deferred tax assets admitted under statutory-basis accounting.

Asset Risk

Within the property/casualty RBC formula, there are three categories of asset risk:

- R_1 Asset risk — Fixed income
- R_2 Asset risk — Equity
- R_3 Asset risk — Credit

R_1 and R_2 are risks associated with admitted invested assets (other than those already captured in R_0), which are shown on lines 1 through 11, column 3, on the asset side of the statutory balance sheet on page 2 of the Annual Statement. The R_1 charge considers changes in interest rates and potential default of fixed income investments (e.g., cash, bonds, mortgage loans). The R_2 charge considers changes in asset valuations for non-fixed income investments (e.g., stocks, real estate).

As of December 31, 2018, bonds represented approximately 51% of the admitted assets of the property/casualty insurance industry, with the next largest investment category dropping to 20%, represented by holdings of common (19%) and preferred (<1%) stocks, and 5% in cash.[130]

R_3 considers the credit risk associated with receivables on the balance sheet, which include items listed on lines 14 and subsequent on the asset side of the statutory balance sheet, as well as risk associated with reinsurance recoverables. Additionally, if a company has written 5% or more of its premiums in accident & health lines in the last three years, it is also subject to a Health Credit Risk charge.

Underwriting Risk

There are two categories of underwriting risk in the property/casualty RBC formula:

- R_4 Underwriting risk — Reserves
- R_5 Underwriting risk — Net written premium

The reserve risk charge (R_4) is concerned with past business while the premium risk charge (R_5) is concerned with future business. Reserve risk is the risk that the company's recorded loss and loss

[129] According to the Glossary of Terms in the textbook *Property-Casualty Insurance Accounting* issued by Insurance Accounting & Systems Association, Inc., 8th ed. (2003), First Addendum (2006), an alien insurance company is defined as "An insurer or reinsurer domiciled outside the U.S. but conducting an insurance or reinsurance business in the U.S."

[130] S&P Global Market Intelligence, based on YE2018 Annual Statement data

adjustment expense (LAE) reserves will develop adversely, under the assumption that the current reserve balance is adequate. Written premium risk considers the risk that the company's business in the following year will be unprofitable.

According to the NAIC RBC instructions, "Underwriting risk is the largest portion of the risk-based capital charge for most property/casualty insurance companies and makes up approximately 55 percent of the aggregate industry risk-based capital prior to the covariance adjustment."[131] This contrasts with life insurance companies, where the predominant portion of the RBC charge is asset risk.

Property/casualty insurance companies tend to concentrate in short-term, relatively fixed and liquid investment categories given the short duration of most property/casualty insurance products sold and the need to have funds readily available to pay claims. The smaller volume and relatively short-term nature of the assets for property/casualty insurance companies significantly limits the asset risk relative to the size of underwriting risk, as compared to life insurance companies.

Catastrophe Risk

The catastrophe risk charge (R_{cat}) was added to the RBC formula in 2017 after more than a decade of development.[132] It covers risks associated with earthquake and hurricane events and considers modeled losses at the worst year in 100. Projected losses can be calculated using one of the approved commercially available catastrophe models (e.g., AIR, RMS, EQECAT). Beginning in 2019, companies will also be able to use their own internally developed catastrophe model, upon obtaining written permission by their domestic (where model output is used for a single entity) or lead state (where model output is used for the whole group) insurance regulator.

The catastrophe risk charge applies on a net of reinsurance basis, with a corresponding contingent credit risk charge for certain categories of reinsurers.

Covariance Adjustment

Risk charges R_0 through R_{cat} are aggregated in the RBC formula to calculate the overall RBC requirement, before the consideration of operational risk, as follows[133]:

$$R_0 + \sqrt{R_1^2 + R_2^2 + R_3^2 + R_4^2 + R_5^2 + R_{cat}^2}$$

$$= \text{Total RBC After Covariance Before Basic Operational Risk}$$

[131] NAIC, *RBC Property & Casualty 2018 Forecasting & Instructions,* page 20.

[132] Catastrophe Risk was included as part of RBC filings on an informational only basis only from 2013-16 as part of the development phase.

[133] Note that under certain circumstances, discussed later, half of the reinsurance component of R_3 is moved in to R_4 for the purpose of the covariance adjustment calculation

The square root calculation within the RBC formula is commonly referred to as the "covariance adjustment." Rather than summing up the individual risk charges (R_1 through R_{cat}), it is assumed that the individual risk charge categories are independent of one another. That is, the formula reflects diversification among these risk categories, thereby assuming that the aggregate risk is less than the sum of risk of the independent components. For example, the formula assumes that the risk of default on an insurance company's invested assets (e.g., bonds, stocks) is independent of the performance of its loss reserves. Taking the square root of the sum of the squares for R_1 through R_{cat} increases the dependency of the larger risks in the calculation and decreases the significance of the smaller risk categories in the overall aggregate RBC requirement.

R_0 is kept outside of the covariance adjustment because the risk for investments in insurance company subsidiaries is believed to be directly correlated with the combination of the risks specific to the reporting entity (i.e., the other risk charges R_1 through R_{cat}). Therefore, the risk for investments in insurance company subsidiaries is additive to the aggregate of the investment and underwriting risks of the reporting entity for which RBC is being calculated. In other words, RBC should not depend on the organizational structure of the insurance company and investments in insurance company subsidiaries that are subject to RBC do not provide a diversification benefit.

The covariance calculation is applied similarly in the life and health RBC formulas, keeping C_0 and H_0 outside of the square root like R_0.

Basic Operational Risk

Introduced in 2018,[134] the basic operational risk charge considers the risk of financial loss resulting from operational events, such as the inadequacy or failure of internal systems, personnel, procedures or controls, as well as external events. This includes legal risk but excludes reputational risk arising from strategic decisions. The risk charge accounts for operational risks that are not deemed to be already reflected in the existing risk categories.

The basic operational risk charge uses a percentage of RBC or "add-on" approach that applies a risk factor to the Total RBC After Covariance Before Basic Operational Risk amount described above. The operational risk charge will be reduced by the sum of offset amounts reported by direct Life RBC filing insurance subsidiaries adjusted for the percentage of ownership in the direct life insurance subsidiaries (but not to produce a charge that is less than zero).

Components of the Charges

Within subsequent sections of this chapter, we will walk through the components of each charge that goes into the RBC formula, deliberately leaving out certain information that would be necessary to fully prepare and issue the RBC report for a company. We will reference the requirements of the RBC formula

[134] The operational risk charge was formally introduced in 2017, but applied a 0% risk charge that year

as it stands for year-end 2018 submissions, noting in a few places modifications that are expected in the 2019 version of the RBC formula.

The NAIC issues instructions on how to prepare the RBC calculation, including an instructional forecasting spreadsheet containing an example of the necessary formulas. Additionally, RBC software is available from Annual Statement software vendors and is used by insurance companies for filing with state regulatory authorities. This publication is only intended to provide an overview of the RBC formula and is not intended to supplant the NAIC RBC instructions or electronic filing requirements.

Before we delve into the details, let us provide some perspective on the relevance of each risk category to the overall formula. Table 75 provides a summarization of figures provided by the NAIC in its presentation of 2018 RBC results for the property/casualty insurance industry:[135]

[135] NAIC, *Summary: Aggregate P/C RBC Results By Year*, 2018, http://www.naic.org/documents/research_stats_rbc_results_pc.pdf

TABLE 75

Aggregate for 2,465 Property/Casualty Companies RBC by Category USD in $million	
2018 Risk Category	**Totals**
R_0 — Subsidiary Insurance Companies and Misc. Other Amounts	58,786
R_1 — Asset Risk — Fixed Income	8,046
R_2 — Asset Risk — Equity	119,069
R_3 — Asset Risk — Credit	9,301
R_4 — Underwriting Risk — Reserves	114,979
R_5 — Underwriting Risk — Net Written Premium	75,532
R_{cat} — Catastrophe Risk	52,510

Asset Risk – Equity (R_2) and Underwriting Risk – Reserves (R_4) represented the largest risk charges within the RBC formula for the property/casualty insurance industry in 2018, with $119 billion and $115 billion respectively.

Despite representing approximately half of the invested assets of the property/casualty insurance industry in 2018 (see Table 2), the asset risk charge for fixed income investments is the smallest component of the RBC charge for the industry. This is because property/casualty insurers tend to invest in relatively safe, high-credit quality bonds.

On the other hand, the asset risk charge for equity brings the highest charge, reflecting the increased risk associated with these investments over fixed income. The NAIC's report on 2018 RBC results shows that the equity risk component has been growing in significance relative to other risk charges over the past decade, becoming the largest risk component for the first time in 2017. This reflects a period where common stocks have increased from 12% of property/casualty insurers' total admitted assets in 2008 to 19% in 2018.

Table 76 shows the impact of the Covariance Adjustment. Applying the sum-of-squares approach to the R_1 through R_{cat} charges reduces the combined total of these risk charges by approximately 50%, reflecting independence between each of the risk types.

TABLE 76

Aggregate for 2,465 Property/Casualty Companies
RBC by Category
USD in $million

2018 Risk Charges for R_1 through R_{cat}	Totals	Distribution	Squared Totals	Distribution
R_1 — Asset Risk — Fixed Income	8,046	2%	64,738,615	0%
R_2 — Asset Risk — Equity	119,069	31%	14,177,508,681	39%
R_3 — Asset Risk — Credit	9,301	2%	86,512,359	0%
R_4 — Underwriting Risk — Reserves	114,979	30%	13,220,264,494	37%
R_5 — Underwriting Risk —Net Written Premium	75,532	20%	5,705,129,401	16%
R_{cat} — Catastrophe Risk	52,510	14%	2,757,330,871	8%
Sum of $R_1 - R_{cat}$	379,438	100%	36,011,484,420	100%
Total RBC (excl R_0) After Covariance Before Basic Operational Risk	189,767	*= square root of the sum of Squared Totals above*		
Covariance Adjustment	*- 189,672*			

Recall that the covariance adjustment increases the dependency of the larger risks and decreases the significance of the smaller risk categories in the overall aggregate RBC requirement. As displayed in the Table 76, squaring each of charges R_1 through R_{cat} and summing the results shows the increased significance of the two largest risk categories (R_2 and R_4), which now contribute 76% to the total on a squared basis, up from 61% based on a simple sum. The other risk categories have similarly seen their contribution shrink.

THE RBC CHARGE FOR SUBSIDIARY INSURANCE COMPANIES AND MISCELLANEOUS OTHER AMOUNTS (R_0)

The R_0 charge considers the risks associated with investments in subsidiary insurance companies as well as miscellaneous off-balance sheet and other items.

Subsidiary and affiliated insurance companies are only considered within R_0 if they are U.S. domiciled entities subject to RBC, or if they are alien insurers (i.e., foreign to the U.S.). Recall that certain insurance companies are not subject to RBC, such as title insurers, monoline mortgage guaranty insurers and monoline financial guaranty insurers. All other affiliated entities, including U.S. insurance subsidiaries not subject to RBC, are considered within the Asset Risk – Equity (R_2) module.

Selected definitions

Term definitions will become important as we walk through the risk charges for affiliated entities. Statutory Accounting Principles (SAP), specifically Statement of Statutory Accounting Principles (SSAP) No. 97, *Investments in Subsidiary, Controlled and Affiliated Entities*, define the following terms:

Parent	"An entity that directly or indirectly owns and controls the reporting entity."[136]
Subsidiary	"An entity that is, directly or indirectly, owned and controlled by the reporting entity."[137]
Affiliate	"An entity that is within the holding company system or a party that, directly or indirectly, through one or more intermediaries, controls, is controlled by, or is under common control with the reporting entity. An affiliate includes a parent or subsidiary and may also include partnerships, joint ventures, and limited liability companies."[138]
Control	"The possession, directly or indirectly, of the power to direct or cause the direction of the management and policies of the investee, whether through the (a) ownership of voting securities, (b) by contract other than a commercial contract for goods or non-management services, (c) by common management, or (d) otherwise. Control shall be presumed to exist if a reporting entity and its affiliates directly or indirectly, own, control, hold with the power to vote, or hold proxies representing 10% or more of the voting interests of the entity."[139] SSAP No. 97 further states that control is measured at the holding company level. For example, the 10% benchmark would apply to a group consisting of two affiliates where one affiliate owns 7% of a company and the other affiliate owns 4% of that same company. Each member of the group has control over the company as the sum of their ownership percentages exceeds 10%.
Investments in SCA entities	An insurance company's investment in subsidiaries, controlled and affiliated entities (SCAs), are admitted assets to the extent they conform to the requirements of SSAP No. 97.

Insurance Affiliates Subject to RBC

For U.S. insurers subject to RBC, including those subject to the life or health RBC requirements, the total R_0 charge for a particular subsidiary is limited to the RBC of the subsidiary, across all common stocks and

[136] SSAP No. 97, Investments in Subsidiary, Controlled and Affiliated Entities, "Definitions" section.
[137] Ibid.
[138] Ibid.
[139] Ibid.

preferred stocks, adjusted by the reporting entity's ownership (pro rata) share in the subsidiary. The theory is that, through ownership, the reporting entity is subject to the same risks as its subsidiary.

According to the NAIC's 2018 written instructions for RBC,[140] the relevant RBC measure from the subsidiary or affiliate is defined as:

- For a P/C and Health subsidiary RBC filings:
    - Total RBC After Covariance Before Basic Operational Risk

- For a Life subsidiary RBC filing, the sum of:
    - Total RBC After Covariance Before Basic Operational Risk
    - Primary Security shortfalls for all cessions covered by Actuarial Guideline XLVIII, multiplied by two

Ownership of Common Stock

The RBC charge for investments of an insurance company subsidiary depends on the accounting method used by the reporting entity to report the investment.[141]

For investments in insurance affiliates recorded on the equity method, and for which unamortized admitted goodwill is zero or non-existent (i.e., no adjustment to the book/carrying value of the investment), the R_0 charge for ownership of common stock in the insurance affiliate subject to RBC is equal to the *minimum* of the following:

- The total RBC of the affiliate multiplied by the percentage of ownership in the common stock
- The book/adjusted carrying value of the common stock (greater than 0) as recorded by the reporting entity

For all other insurance affiliates, the R_0 charge for ownership of common stock in these affiliates is made up of two components:

1. An R_0 component, which is equal to the *minimum* of the following:
    a. The total RBC of the affiliate multiplied by the percentage of ownership in the common stock; or
    b. The statutory surplus of the affiliate multiplied by the percentage of ownership of the total common stock.

[140] NAIC *RBC Property & Casualty 2018 Forecasting & Instructions,* page 1.

[141] According to SAP (SSAP No. 97), admitted investments in insurance company SCAs are recorded on the reporting entity's balance sheet using one of two methods: the market valuation approach or equity method. Under the market valuation approach, investments in insurance company SCAs are based on the market value of the SCA, adjusted for the reporting entity's ownership percentage. Market value is equivalent to fair value. Under the equity method, investments in insurance company SCAs are recorded based on the reporting entity's proportionate share of audited statutory equity of the SCA's balance sheet, adjusted for any unamortized goodwill. Under this method, the reporting entity records the initial investment at cost then essentially adjusts the value over time based on the reporting entity's share in the company's income (loss). At any point in time, the recorded amount is called the "carrying value."

2. An R_2 component, which is equal to one of the following (limited to a minimum of zero):
    a. The amount of the book/carrying value that exceeds the value from the R_0 component (above), when the total RBC of the affiliate multiplied by the percentage of ownership in the common stock is greater than the book/carrying value; otherwise
    b. The *maximum* of the following:
        i. The excess of the book/adjusted carrying value over the pro rata statutory surplus value for the affiliate multiplied by 22.5%; or
        ii. The amount that RBC of the affiliate multiplied by the percentage of ownership in the common stock exceeds the value obtained in the R_0 component (above).

Recall that RBC calculations are not in the public domain. Attempts to recalculate an insurance company's RBC often make a simplifying assumption that the R_0 charge for ownership in common stock of an SCA is equal to the SCA's RBC (adjusted for ownership).

Ownership of Preferred Stock

The reporting entity's R_0 charge for investments in preferred stock of insurance subsidiaries depends on whether the subsidiary has excess RBC. Excess RBC is defined as the amount of RBC of the affiliate that exceeds the total value of the outstanding common stock. If the excess RBC is greater than zero, the RBC charge for ownership in preferred stock is the *minimum* of the following:

- The pro rata share of the excess RBC
- The book/adjusted carrying value of the preferred stock (greater than zero) as recorded by the reporting entity

The pro rata share is equal to the percentage of the affiliate's total outstanding preferred stock value that is owned by the company. To determine the value of total outstanding common stock or total outstanding preferred stock, divide the book/adjusted carrying value of the investment by the percentage of ownership.

If the excess RBC is less than or equal to zero, then the RBC charge for the company's ownership in the preferred stock of its affiliate is zero.

Occasionally, a company might own preferred stock in an affiliate subject to RBC but no common stock. When this occurs, the company must determine if there is any excess by calculating the notional value of the total outstanding value of the affiliate's common stock and/or preferred stock using one of the accepted methods from the *Purposes and Procedures Manual of the NAIC Investment Analysis Office*.

Alien Insurance Affiliates

Alien insurance companies are entities that are incorporated under the laws of a country outside the U.S., therefore these entities are not themselves subject to RBC. The reporting entity's RBC charge for investments in directly owned alien affiliates is equal to the Annual Statement carrying value of the

company's interest in the affiliate multiplied by a factor of 0.500. For indirectly owned alien affiliates, this amount is further adjusted to reflect the reporting entity's ownership on the holding company.

Off-balance Sheet and Other Items

Off-balance sheet and other items include amounts that are either restricted or not recorded by the insurance company in its statutory financial statements yet still represent assets and/or potential liabilities of the insurance company and therefore expose the company to risk. Off-balance sheet and other items are disclosed in the Notes to Financial Statements and General Interrogatories of the Annual Statement. The following represents the categories of such items included in the R_0 charge:

1. *Non-controlled assets:* This category of assets includes the following:
    - Collateral loaned to others from securities lending programs
    - Assets that are reported on the company's balance sheet but for which the company does not have exclusive control over, thereby exposing the company to increased investment risk
    - Assets sold or transferred that are subject to a put option, thereby enabling the purchaser to sell the assets back to the insurance company
2. *Guarantees for the benefit of affiliates:* These are guarantees that may expose the company's assets to contingent liability exposure. An example would be a guarantee made by a company to pay an outstanding loan held by an affiliate with a third party in the event that the affiliate was unable to meet its obligation to that third party.
3. *Contingent liabilities:* This includes amounts for which the insurance company may be held responsible but for which the amount cannot be determined and therefore is not entered on the balance sheet. An example includes structured settlements for which the insurance company purchases an annuity from a life insurance company to make structured payments to claimants in order to close out a claim. The insurance carrier would close the claim since it paid the life insurer to make the claim payments on its behalf. However, if the life insurance company fails to pay, the insurance company would still be ultimately responsible for settling the liability. This is a contingent liability to the insurance company.
4. *Deferred tax assets:* This comprises admitted adjusted gross deferred tax assets (DTAs) as described in SSAP No. 101, paragraphs 11a and 11b. The source for the DTA amounts to use in the calculation is found in the Annual Statement, Notes to the Financial Statements, Note 9, Part A, Section 2.

For almost all of the items listed above, a 1.0% factor is applied to all off-balance sheet amounts for purposes of inclusion in the R_0 charge. The one exception is for conforming securities lending programs,

which are those programs that have specified elements that lower the associated risk,[142] where a reduced charge of 0.2% is applied.

Additionally, the charge associated with deferred tax assets can be reduced to 0.5% when the insurance company either filed its own separate Federal income tax return or was included in a consolidated Federal income tax of which the common parent is an insurance company.

THE RBC CHARGE FOR ASSET RISK ASSOCIATED WITH FIXED INCOME INVESTMENTS (R_1)

R_1 includes the charge for interest rate and default risk associated with fixed income investments in the following categories:

1. Bonds
2. Off-balance sheet collateral and Schedule DL, Part 1, Assets
3. Other long term assets, including mortgage loans, low income housing tax credits and working capital finance investments
4. Miscellaneous assets, including cash, cash equivalents, other short-term investments and non-admitted collateral loans
5. Replication (synthetic asset) transactions and mandatorily convertible securities

Typically, the charge relating to bonds overwhelmingly dominates this risk category for property/casualty insurers. In general, the charge for each of these investment types is based on a factor determined by the NAIC multiplied by the book/adjusted carrying value of the investment.

In addition to the charge for the aforementioned types of fixed income investment categories, there are two charges reflecting the level of diversification in the entity's fixed income portfolio. The first is the bond size factor, and the second is the asset concentration factor. The fewer the bond holdings and greater the concentration in individual issuers or borrowers, the greater the associated charge.

A brief discussion of each charge is provided below, with examples to illustrate their calculation as deemed appropriate.

Bonds and the Bond Size Factor

[142] According to the NAIC *RBC Property & Casualty 2018 Forecasting & Instructions*, page 16, conforming securities lending programs are those comprising all of the following: (1) a written plan approved by the company's board of directors describing the company's securities lending program and ways it can invest collateral; (2) written procedures that the company must follow to monitor and control the risks of the program; (3) a binding agreement between the insurance company and the borrowers of the insurer's securities; and (4) collateral in the form of investments that are allowable by the company's domiciliary state (e.g., cash, cash equivalents, federally guaranteed investments).[143] NAIC, *RBC Property & Casualty 2018 Forecasting & Instructions,* page 7.

The RBC charge for unaffiliated bond investments is equal to the book/adjusted carrying value of the bond multiplied by a factor, where the factors vary based on the bond class. The factors are as shown in Table 77.

TABLE 77

NAIC bond class	RBC factor
Class 01 — Highest credit quality	
- U.S. government, guaranteed by U.S. government	0.000
- U.S. government, not backed by full faith and credit of U.S. government	0.003
- All other	0.003
Class 02 — High credit quality	0.010
Class 03 — Medium credit quality	0.020
Class 04 — Low credit quality	0.045
Class 05 — Lowest credit quality	0.100
Class 06 — In or near default	0.300

As displayed in Table 77, the RBC factors increase with the amount of perceived credit risk, starting with 0.000 for U.S. government bonds that are backed by the full faith and credit of the government and therefore have almost no default risk, all the way to a factor of 0.300 for bonds issued by companies that are in or near default. According to the NAIC RBC instructions, the bond factors are determined "based on cash flow modeling using historically adjusted default rates for each bond category." The instructions further explain: "For each of 2,000 trials, annual economic conditions were generated for the 10-year modeling period. Each bond of a 400-bond portfolio was annually tested for default (based on a "roll of the dice") where the default probability varies by NAIC designation category and that year's economic environment."[143]

In addition to the charge for each class of bond, there is a separate charge to reflect the level of diversification called the bond size factor. According to the NAIC RBC instructions, "The size factor reflects additional modeling for different size portfolios that shows the risk increases as the number of bond issuers decreases. Because most insurers' bond portfolios are considerably smaller than the portfolio used to develop the model bond risk, the basic bond factors understate the true default risk of these assets. The bond size factor adjusts the computed RBC for those bonds that are subject to the size factor to more accurately reflect the risk."[144]

The bond size factor, which measures the degree of diversification in the investment portfolio, is computed as the weighted average number of issuers in a portfolio subject to the adjustment, with the weights prescribed by the NAIC depending on the number of issuers. Table 78 displays the formula, including the NAIC weights.

TABLE 78

[143] NAIC, *RBC Property & Casualty 2018 Forecasting & Instructions,* page 7.
[144] Ibid.

Bond Size Factor			
	# of bond issuers (1)	Weights (2)	Weighted # Issuers (3) = (1) * (2)
First 50	XXXX	2.5	
Next 50	XXXX	1.3	
Next 300	XXXX	1.0	
More than 400	XXXX	0.9	
Total	XXXX		

The bond size factor is equal to the total in column 3 divided by the total in column 1 in Table 79, minus 1. For example, if a reporting entity invests in 500 bonds, the bond size factor would be 0.2. The calculation of this factor is provided in Table 79 as the sum of the weighted number of issuers in column 3 of 580 divided by the total number of issuers in column 1 of 500, minus 1.

TABLE 79

Example of Bond Size Factor			
# of bond issuers	(1)	Weights (2)	Weighted # Issuers (3) = (1) * (2)
First 50	50	2.5	125
Next 50	50	1.3	65
Next 300	300	1.0	300
More than 400	100	0.9	90
Total	500	1.2	580

The bond size factor is applied to the RBC calculated for bonds subject to adjustment. As displayed in Table 79, the weights decrease with the number of issuers. Therefore, the more issuers, the lower the factor applied in the RBC calculation and the lower the additional RBC amount required. For a reporting entity investing in fewer than 50 bonds, the factor is 1.5 times the RBC required for the bonds (=2.5 – 1); for an entity investing in 1,000 bonds, the factor is 0.03.[145]

The bond size factor is calibrated such that the break-even point where the factor equals 1.0 is set at 1,300 bonds. Portfolios containing 1,300 or more bonds will receive a discount to their RBC charge for bonds.

Bonds that are subject to the bond size factor include unaffiliated bonds in classes 02 through 06, plus non-U.S. government bonds in class 01.

[145] 0.03 = [[(50*2.5) + (50*1.3) + (300*1.0) + (600*0.9)] / (1,000)] – 1.0

Off-balance Sheet Collateral and Schedule DL, Part 1, Assets

The RBC charge for off-balance sheet collateral and Schedule DL assets considers the risk associated with securities lending programs. Recall the discussion of securities lending programs in Chapter 13. *Overview of Schedules and Their Purpose*. The risk associated with these programs is that the reporting entity will lose money on the reinvestment of collateral posted by the borrower. Collateral held by the reporting entity in conjunction with securities lending programs is reported one of three ways in the Annual Statement:

1. In investment schedules that correspond to the invested collateral (e.g., Schedule A, B, BA, D, DA and E), which roll up into the balance sheet
2. In Schedule DL, Part 1, of the Annual Statement, which rolls into line 10 of the asset side of the balance sheet
3. Off-balance sheet, due to not being recorded in the financial statements

The R_1 charge considered herein includes a provision for these assets as included in items 2 and 3 above. The charge is equal to the book/adjusted carrying value multiplied by a factor, where the factor is equal to that for the particular asset class. For example, the same factors by class applicable to bonds are also used in this calculation.

Other long term assets – Mortgage loans

The RBC charge for mortgage loans for property/casualty insurers is computed as the book/adjusted carrying value of the loans multiplied by a factor of 0.050. This is based upon the factors developed by the Life RBC formula, which ranged from 3% to 20%.

Other long term assets – Working Capital Finance Investments

The booked/adjusted carrying value of working capital finance investments can be found in the Notes to Financial Statements, lines 5M(01a) and 5M(01b) in column 3, of the Annual Statement. Those in line 5M(01a) – NAIC Designation 1 – get a risk charge of 0.0038, while those in 5M(01b) – NAIC Designation 2 – have a factor of 0.0125.

Low Income Housing Tax Credits (LIHTC)

There are five categories of LIHTC investments listed below, which must be reported in accordance with Statement of Statutory Accounting Principles (SSAP) No. 93, *Low Income Housing Tax Credit Property Investments*:

- Federal guaranteed
- Federal non-guaranteed
- State guaranteed
- State non-guaranteed

- All other

The associated NAIC factor used to calculate the RBC charge varies by category.

In order to be classified as a federal guaranteed LIHTC investment, it must have an all-inclusive guarantee from an ARO[146]-rated entity which guarantees the yield on the investment. The RBC charge for a federal guaranteed LIHTC investment is equal to the book/adjusted carrying value times 0.0014.

To be classified as a federal non-guaranteed LIHTC investment, it must include the following risk mitigation factors:

a) A level of leverage below 50%. For an LIHTC fund, the level of leverage is measured at the fund level; and
b) A tax credit guarantee agreement from a general partner or managing member, requiring the general partner or managing member to reimburse investors for any shortfalls in tax credits due to errors of compliance. For an LIHTC fund, a tax credit guarantee is required from the developers of the lower-tier LIHTC properties to the upper-tier partnership.

The RBC charge for a federal non-guaranteed LIHTC investment is equal to the book/adjusted carrying value times 0.0260.

To be classified as a state guaranteed LIHTC investment, it must minimally meet the federal requirements for guaranteed LIHTC investments. The RBC charge for a state guaranteed LIHTC investment is equal to the book/adjusted carrying value times 0.0014.

To be classified as a state non-guaranteed LIHTC investment, it must minimally meet the federal requirements for non-guaranteed LIHTC investments. The RBC charge for a state non-guaranteed LIHTC investment is equal to the book/adjusted carrying value times 0.0260.

All other federal and state LIHTC investments that do not meet the requirements of the above categories will be classified in the All Other LIHTC investments category. The RBC charge for all other LIHTC investments is equal to the book/adjusted carrying value times 0.1500.

Miscellaneous Assets

The RBC charge for miscellaneous assets is computed as a factor times the book/adjusted carrying value for those assets that are in excess of amounts considered elsewhere in the RBC formula, if any. The RBC charges for each investment are as follows (not less than zero):

- 0.003 times the book value of cash, net cash equivalents and other short-term investments

[146] NAIC's Acceptable Rating Organizations

  - The NAIC recognize that there is a small risk related to the possible insolvency of the bank where cash deposits are held. The 0.3% factor, equivalent to an unaffiliated NAIC 01 bond, reflects the short-term nature of this risk.

- 0.050 times admitted collateral loans and write-ins
  - These are generally a small proportion of total portfolio value. A factor of 5.0% is consistent with other RBC formulas studied by the NAIC working group.

Replication (Synthetic Asset) Transactions and Mandatory Convertible Securities

Assets included within this category are defined in the NAIC RBC instructions as follows:

"A replication (synthetic asset) transaction is a derivative transaction entered into in conjunction with other investments in order to reproduce the investment characteristics of otherwise permissible investments…

A mandatory convertible security is defined as a type of convertible bond that has a required conversion or redemption feature. Either on or before a contractual conversion date, the holder must convert the mandatory convertible security into the underlying common stock. Mandatory convertible securities are subject to special reporting instructions and are therefore not assigned NAIC designations or Unit Prices by the SVO. The balance sheet amount for mandatory convertible securities shall be reported at the lower of amortized cost or fair value during the period prior to conversion… Upon conversion, these securities will be subject to the accounting guidance of the SSAP that reflects their revised characteristics." [147]

To expand upon the discussion about derivatives in Chapter 8. *The Statutory Income Statement: Income and Changes to Surplus* and Chapter 13. *Overview of Schedules and their Purpose*, insurance companies use derivative transactions for one of three reasons:

1. Hedge or mitigate risk
2. Generate income
3. Replicate an asset that cannot be purchased in the cash market because it is either too expensive or unavailable[148]

As stated previously, derivative holdings by property/casualty insurers are small relative to those held by life insurance companies. This somewhat explains the low-risk charge for this category.

[147] NAIC, *RBC Property & Casualty 2018 Forecasting & Instructions,* page 10.
[148] Memorandum to NAIC Investment Risk Based Capital (RBC) Working Group from Walter Givler – Northwestern Mutual Life, Mark Anderson – Met Life and other members of the ACLI Derivative Risk Management Team, dated March 29, 2013, Re: Life Insurer RBC for Derivatives.
http://www.naic.org/documents/committees_e_capad_investment_rbc_wg_exposures_derivatives.pdf.

Replication (synthetic asset) transactions are commonly referred to as "RSATs" and are reported in Schedule DB of the Annual Statement. An RSAT is a package of a derivative(s) and a cash instrument(s). The cash instrument is generally a bond.

The RBC charge for RSATs is equal to the RBC factor applicable for the asset the RSAT is replicating, multiplied by the statement value of the transaction from Schedule DB. Credit is given for the RBC charge already applied to the cash instrument. For example, if the cash instrument is a bond, then the cash component of the RSAT is recorded as a bond on the company's balance sheet and has already received a risk charge based on its bond characterization. The RBC for RSATs is adjusted to remove the RBC previously calculated for the subject bond.

A mandatory convertible security is reported in the Annual Statement schedule that corresponds to the security pre-conversion. For example, assume an insurer holds a bond that is mandatorily convertible into a fixed number of shares of common stock within three years. The bond will be reported in the company's balance sheet and will therefore receive an RBC charge based on its NAIC bond class. However, the insurer is not only exposed to risks associated with the bond, but also the risk associated with the common stock that it will convert to sometime over the next three years, since the bond's principal will be used to purchase the shares. The RBC charge for mandatory convertible securities adjusts the RBC charge upward if the security that results from conversion is more risky. Since unaffiliated common stocks have a RBC charge of 0.15, and bonds have a charge between 0.00 and 0.30, depending on class, the RBC charge will be adjusted upward by the maximum of the difference between the RBC charge for the stock and bond, and zero. This is similar to the application of the RBC charge for RSATs; the RBC charge for mandatory convertible securities is equal to the RBC charge for the converted security, reduced by the RBC charge for the original security.

Half of the charge for RSATs and mandatory convertible securities is applied to R_1, with the remaining half applied to R_2. This assumes that half of the securities in the calculation are fixed income and half are equity.

Asset Concentration Factor

The asset concentration factor doubles the RBC charge for the 10 largest issuers that the insurance company is exposed to. The purpose of this charge is to reflect the increased risk associated with large concentrations in single issuers.

The 10 largest issuers are determined by first summing the insurer's total investment (book/adjusted carrying value) across all investments (fixed income plus equity) for each issuer. The total amounts for each issuer are then sorted from largest to smallest to determine the top 10. The RBC charge for each fixed income and equity asset is computed for the 10 largest issuers. The resulting RBC charge for fixed income is included as the asset concentration RBC charge within R_1; the resulting RBC charge for equity

is included as the asset concentration RBC charge within R_2.[149] The RBC charge is limited to a maximum of 0.300 for each fixed income and/or equity investment.

However, not all assets are subject to the asset concentration factor, as certain assets are deemed to be of low risk or have already received the maximum charge of 0.300. The assets excluded from the additional charge are also excluded in determining the 10 largest issuers.

Fixed income assets that are subject to the asset concentration factor include the following:

- Bonds in classes 02 through 05[150]
- Collateral loans
- Mortgage loans
- Working Capital Finance Investments – NAIC 02
- Low Income Housing Tax Credits

R_2 assets that are subject to the asset concentration factor include the following:

- Unaffiliated preferred stocks and hybrid securities in classes 02 through 05
- Hybrid securities in classes 02 through 05
- Unaffiliated common stock
- Investment in real estate
- Encumbrances on invested real estate
- Schedule BA assets (excluding collateral loans)
- Receivable for securities
- Aggregate write-ins for invested assets
- Derivatives

The following provides a simplified example to illustrate the calculation of the asset concentration factor.

Assume that the fixed income and equity investments made by an insurance company that are subject to the asset concentration factor are limited to 15 issuers and investments in these issuers are limited to the assets listed in the Table 80 below. The following provides the total adjusted book/carrying value of these investments sorted from highest to lowest value by issuer[151].

TABLE 80

Example

[149] The asset concentration *factor* can be computed as the weighted average of the total asset concentration RBC charge with the total subject assets.

[150] Unaffiliated bonds in class 01 are excluded because they are deemed to be of low risk; unaffiliated bonds in class 06 are excluded because they already receive the maximum charge of 0.300.

[151] Note, for simplicity, only certain assets were included in the example.

Adjusted Book/Carrying Value for Assets Subject to Asset Concentration USD in 000s

		Fixed Income Assets		Equity Assets			
Issuer	Name	Unaffiliated Bonds Class 2 - 5	Collateral Loans	Unaffiliated Preferred Stocks Class 2 - 5	Unaffiliated Common Stock	Investment Real Estate	Total Assets Subject to Asset Concentration
1	Asppill Drug				1,200		1,200
2	Deal Mart		1,000				1,000
3	U.S. Express	1,000					1,000
4	MacroHard Inc.	900					900
5	Dill Computing			900			900
6	Tropical Beverage Co.	820					820
7	Popsi Co.			800			800
8	Texas Oil Inc.	550					550
9	Westwood Resorts		200			35	235
10	Dakota Energy	220					220
11	Bear Pharmaceuticals				200		200
12	Mediapro	200					200
13	Pear Computer				100		100
14	Jane Moose	80					80
15	KO Media				25	50	75
Total		3,770	1,200	1,700	1,525	85	8,280

Only the first ten of these issuers (Asppill Drug through Dakota Energy) are considered in the calculation of the asset concentration factor. The asset concentration charge is computed by multiplying the RBC charge for each asset class by the associated RBC factor for that class. For simplicity, assume that each of the bond investments is class 02 and each of the preferred stock investments is class 03. Table 81 provides the calculation of the asset concentration RBC charge within R_1 and R_2.

TABLE 81

Example
Calculation of Asset Concentration RBC

Fixed Income Assets	Book/Adjusted Carrying Value	Factor	Additional RBC
Class 2 Unaffiliated Bonds	3,490	0.010	35
Class 3 Unaffiliated Bonds	-	0.020	-
Class 4 Unaffiliated Bonds	-	0.045	-
Class 5 Unaffiliated Bonds	-	0.100	-
Collateral Loans	1,200	0.050	60
Mortgage Loans	-	0.050	-
Subtotal Fixed Income	4,690	0.020	95
Equity Assets	**Book/Adjusted Carrying Value**	**Factor**	**Additional RBC**

Class 2 Unaffiliated Preferred Stock	-	0.010	-
Class 3 Unaffiliated Preferred Stock	1,700	0.020	34
Class 4 Unaffiliated Preferred Stock	-	0.045	-
Class 5 Unaffiliated Preferred Stock	-	0.100	-
Class 2 Unaffiliated Hybrid Securities	-	0.010	-
Class 3 Unaffiliated Hybrid Securities	-	0.020	-
Class 4 Unaffiliated Hybrid Securities	-	0.045	-
Class 5 Unaffiliated Hybrid Securities	-	0.100	-
Unaffiliated Common Stock	1,200	0.150	180
Investment Real Estate	35	0.100	4
Encumbrance on Investment Real Estate	-	0.100	-
Schedule BA Assets	-	0.050	-
Aggregate Write-Ins for Invested Assets	-	0.050	-
Derivatives	-	0.050	-
Receivable for Securities	-	0.025	-
Subtotal Equity	2,935	0.074	218
Grand Total Asset Concentration			312

The asset concentration RBC charge for fixed income investments within R_1 is $94,900 and the asset concentration RBC charge for equity within R_2 is $217,500, resulting in a total asset concentration RBC charge of $312,400.

R_1 for Fictitious

To further illustrate the RBC charges, we used the Annual Statement for Fictitious Insurance Company to build a full example of the NAIC RBC calculations.[152] Because Schedule D is not included in the Annual Statement for Fictitious, we had to make assumptions in preparing the calculation, such as the distribution of fixed assets by RBC class. Table 82 provides the R_1 portion of the RBC calculation for Fictitious.

TABLE 82

R_1 Charge for Fictitious Insurance Company
***NAIC Risk-Based Capital* 2018**

R_1 Calculation — Fixed Income Assets	**Amount Held**	**Charge Factor**	**RBC Charge**
Cash and Cash Equivalents	154,000	0.0030	462
Total Other Short-Term Investments	829,000	0.0030	2,487
Mortgage Bonds	245,000	0.0500	12,250
Net Admitted Collateral Loans	0	0.0500	0
Bonds			
U.S. Government	6,395,684	0.0000	0
Class 01 U.S. Government Agency Bonds	0	0.0030	0
Class 01 Unaffiliated Bonds	46,060,660	0.0030	138,182
Class 02 Unaffiliated Bonds	4,987,460	0.0100	49,875
Class 03 Unaffiliated Bonds	704,112	0.0200	14,082
Class 04 Unaffiliated Bonds	352,056	0.0450	15,843
Class 05 Unaffiliated Bonds	117,352	0.1000	11,735
Class 06 Unaffiliated Bonds	58,676	0.3000	17,603
Subtotal — Bonds subject to bond size factor	58,676,000		247,319
Estimated number of bonds	120		
	Count	**Multiplier**	**Weighting**
0 to 50	50	2.50	125
50 to 100	50	1.30	65
100 to 400	20	1.00	20
More than 400	0	0.900	0
Sum (weighted average)	120	1.750	210
Bond size factor RBC	247,319	0.750	185,490
Asset concentration RBC	87,825,000	0.0012	105,390
Total R_1 Charge — Fixed Income Assets Risk			**553,398**

[152] Note that Fictitious Insurance Company does not have any affiliated entities or miscellaneous off-balance sheet amounts. Therefore, the R_0 charge is zero for Fictitious.

THE RBC CHARGE FOR ASSET RISK ASSOCIATED WITH EQUITY INVESTMENTS (R_2)

R_2 includes the charge for risk associated with equity investments in the following:

1. Affiliated investments
2. Unaffiliated stocks
3. Real estate
4. Schedule BA assets
5. Miscellaneous assets, including receivables for securities, aggregate write-ins for invested assets and derivatives
6. Replication (synthetic asset) transactions and mandatory convertible securities

Typically, investments in unaffiliated stocks and Schedule BA assets, as well as the asset concentration RBC charge, represent most of the risk charge within R_2 for property/casualty insurers.

As discussed for R_0, there is an RBC charge for the ownership of common stock in insurance affiliates which includes an R_2 component – this gets rolled up with the unaffiliated stocks component of the RBC formula. Additionally, for R_1, half of the RBC charge for replication transactions and mandatorily convertible securities listed above as item 6 is applied to R_2.

Similarly, there is the additional charge for asset concentration in the 10 largest issuers for each type of equity investment. The calculation is performed as described within the previous section of this chapter covering the Asset Risk – Fixed Income (R_1) component.

We will continue by providing a brief discussion of the charges for the different types of equity investments (items 1 through 6).

Affiliated investments

The following list includes the different categories of affiliated investments included in R_2, which can be described generally as affiliated entities not subject to RBC (other than alien affiliates):

- Investment affiliates
- Holding companies
- Upstream affiliates (parent)
- Property & Casualty insurance affiliates not subject to RBC
- Life insurance affiliates not subject to RBC
- Health insurance affiliates not subject to RBC
- Other affiliates

The R_2 charge for investments in insurance affiliates not subject to RBC is calculated by multiplying a factor by the book/adjusted carrying value of the common and preferred stock of those affiliates.

Investment Affiliates

According to the NAIC RBC Instructions, "An investment affiliate is an affiliate that exists only to invest the funds of the parent company. The term investment affiliate is strictly defined in the annual statement instructions as any affiliate, other than a holding company, engaged or organized primarily to engage in the ownership and management of investments for the insurer, not including any broker-dealer or a money management fund managing funds other than those of the parent company."[153]

In other words, the RBC charge for an investment affiliate is essentially the same as it would be if the reporting entity held the assets directly. For example, if the reporting entity owned a subsidiary that managed $1 billion of its investments in common stock, then the RBC charge for that entity would be computed based on the $1 billion common stock portfolio. If the charge for these investments would have been $10 million if the reporting entity owned the stock directly, then the charge for the investment affiliate would also be $10 million. If the entity only owned 60% of the investment affiliate, then the RBC charge would be $6 million (= 0.6 * $10 million).

The RBC charge for an investment in an investment affiliate is 0.225 times the carrying value of the common and preferred stock.

Holding Companies

For investment in a holding company, the RBC charge is 0.225 times the holding company value in excess of the carrying value (i.e., holding company value minus carrying value) for indirectly owned insurance affiliates.

Let's use an example to illustrate this calculation. In this example, we will use another fictional company named Reporting Entity Insurance Company (REIC).

Assume REIC purchased 100% of the shares in a holding company called HC Company in 2018. Also assume that HC Company has the following assets on its December 31, 2018, balance sheet, as illustrated in Table 83.

[153] NAIC, *RBC Property & Casualty 2018 Forecasting & Instructions,* page 5.

TABLE 83

Total assets held by HC Company as of December 31, 2018		
Type of asset	Assets 12/31/2018	Distribution by asset type
U.S. Sub Life Insurance Company	5,000,000	10%
U.S. Sub Property/Casualty Insurance Company	15,000,000	30%
UK Sub Property/Casualty Insurance Company	10,000,000	20%
Common Stock	8,000,000	16%
Preferred Stock	12,000,000	24%
Total assets	50,000,000	100%

U.S. Sub Life Insurance Company, U.S. Sub Property/Casualty Insurance Company and UK Sub Property/Casualty Insurance Company are directly owned by HC Company and indirectly owned by REIC as a result of REIC's ownership of HC.

Recall that book/adjusted carrying value is used in computing the R_0 charge. The carrying value of an indirectly owned insurance subsidiary will depend on the carrying value of the holding company and percentage of the holding company carrying value that the subsidiary represents. Let's continue our example to illustrate.

Assume that REIC carried HC Company on its Annual Statement at year-end 2018 at a value of $55 million, which is equal to the market value of the shares. Of this amount, 10%, or $5.5 million, would represent the carrying value of U.S. Sub Life Insurance Company for purposes of determining the R_0 charge in REIC's RBC calculation. Similarly, $16.5 million (= 0.3 * $55 million) would be the carrying value for U.S. Sub Property/Casualty Insurance Company, and $11 million is the value for the alien insurer, UK Sub Property/Casualty Insurance Company.

If REIC had only purchased, for example, 66% of the shares of HC Company, each carrying value would be adjusted by REIC's ownership interest of 66%. The corresponding values would be $3.63 million, $10.89 million and $7.26 million for the three subsidiaries of HC Company, respectively.

Now back to our discussion of the R_2 charge for investments in holding companies. The RBC charge is 0.225 times the holding company value in excess of the carrying value of indirectly owned insurance affiliates calculated in R_0. In our example, this would be 0.225 times $22 million, where $22 million is derived as in Table 84.

TABLE 84

Reporting Entity Insurance Company (REIC)	**Carrying value**
HC Company	55,000,000
U.S. Sub Life Insurance Company	5,500,000
U.S. Sub Property/Casualty Insurance Company	16,500,000
UK Sub Property/Casualty Insurance Company	11,000,000
Subtotal, indirectly owned insurance subsidiaries	33,000,000
Holding company minus indirectly owned subs	22,000,000

Upstream Affiliates (i.e., Parent Company)

For bond investments in a parent company, the RBC charge is 0.225 times the carrying value of the common and preferred stock of the parent, regardless of whether the parent is subject to RBC.

Property & Casualty Insurance Affiliates

For P/C insurance affiliates that are not subject to RBC, including title insurers, monoline financial guaranty insurers, and monoline mortgage guaranty insurers, the RBC charge is 0.225 times the book/adjusted carrying value of the common and preferred stock.

Life Insurance Affiliates

For Life insurance affiliates that are not subject to RBC, the RBC charge is 0.225 times the book/adjusted carrying value of the common stock and preferred stock.

Health Insurance Affiliates

For Health insurance affiliates that are not subject to RBC, the RBC charge is 0.225 times the book/adjusted carrying value of the common stock and preferred stock.

Other Affiliates

Non-insurance and insurance affiliates not included elsewhere in this chapter are classified as Other Affiliates. The RBC charge for investments in Other Affiliate is 0.225 times the carrying value of the common and preferred stock.

Unaffiliated Stocks

The RBC charge for unaffiliated preferred stocks and hybrid investments is equal to the book/adjusted carrying value of the asset multiplied by a factor, where the factors vary based on the NAIC class. The classes for preferred stocks and hybrid securities are the same as those for bonds, as are the RBC factors, with the exception that there are no federal government guaranteed preferred stocks:

TABLE 85

NAIC class for preferred stocks and hybrid securities	RBC factor
Class 01 — Highest credit quality	0.003
Class 02 — High credit quality	0.010
Class 03 — Medium credit quality	0.020
Class 04 — Low credit quality	0.045
Class 05 — Lowest credit quality	0.100
Class 06 — In or near default	0.300

The RBC charge for unaffiliated common stocks is computed separately for non-government money market funds and other admitted unaffiliated common stocks. The computation applies a specific factor to the book/adjusted carrying value. The RBC factor for non-government money market funds of 0.003 is equal to that for cash because these investments are considered to be of the same risk level. The factor applied to other common stocks is 0.150.

Real Estate, Schedule BA and Miscellaneous Assets

In general, the RBC charge for real estate investments, other long-term invested assets (as per Schedule BA) and miscellaneous assets are computed as a factor times the book/adjusted carrying value for those assets. The RBC charges for each investment are as follows:

- 0.100 times the book value of real estate (Annual Statement Schedule A assets)
    - According to the NAIC RBC Instructions, encumbrances have been included in the real estate base since the value of the property subject to loss would include encumbrances[154]
- 0.200 times the book value for other long-term invested assets (Annual Statement Schedule BA assets) other than collateral loans
- 0.050 times the book value for aggregate write-ins for invested assets and derivatives
- 0.025 times the book value for receivables for securities

R_2 for Fictitious

Table 86 shows the calculation of R_2 for Fictitious Insurance Company. As with the calculation of R_1 for Fictitious, we had to make several assumptions because only excerpts of Fictitious' Annual Statement are included with this publication. One such assumption that is relevant to the calculation of R_2 is the distribution of stock by RBC class.

[154] NAIC, *RBC Property & Casualty 2018 Forecasting & Instructions,* page 8.

TABLE 86[155]

R_2 Charge for Fictitious Insurance Company **NAIC Risk-Based Capital 2018**			
Total R_O Charge — Subsidiary Insurance Companies and Misc. Other Amounts			0
Total R_1 Charge — Fixed Income Asset Risk			553,398
R_2 Calculation — Equity Asset Risk	**Amount Held**	**Charge Factor**	**RBC Charge**
Affiliated Investments			
Non-Insurance Affiliated Common Stock	0	0.2250	0
Unaffiliated Preferred Stock			
Class 01 Unaffiliated Preferred Stock	10,880	0.0030	33
Class 02 Unaffiliated Preferred Stock	0	0.0100	0
Class 03 Unaffiliated Preferred Stock	0	0.0200	0
Class 04 Unaffiliated Preferred Stock	23,120	0.0450	1,040
Class 05 Unaffiliated Preferred Stock	0	0.1000	0
Class 06 Unaffiliated Preferred Stock	0	0.3000	0
Unaffiliated Common Stock			
Non-government money market funds	0	0.0030	0
Other admitted unaffiliated common stock	19,340,000	0.1500	2,901,000
Other Long-Term Assets			
Real Estate	3,845,000	0.1000	384,500
Schedule BA Assets Excluding Collateral Loans	4,628,000	0.2000	925,600
Miscellaneous Assets			
Aggregate W/I for Invested Assets	(5,000)	0.0500	0
All Other Invested Assets	79,000	0.0500	3,950
Receivables for Securities	0	0.0250	0
Asset concentration RBC	87,825,000	0.0010	87,825
Total R_2 Charge — Equity Assets Risk			**4,303,948**

THE RBC CHARGE FOR CREDIT RISK (R_3)

Credit risk reflects counterparty (the entity owing the insurance company money) credit exposure for receivables, including those relating to reinsurance. It contemplates the risk that the counterparty will default (or not pay in whole or in part) and the risk associated with estimating the amounts recorded for counterparty receivables.

R_3 is the charge for credit risk associated with the following:

1. Reinsurance recoverable (reinsurance RBC)

[155] Note the RBC charge is greater than or equal to 0 as in the case of Aggregate Write-ins (W/I) for Invested Assets in Table 86.

2. Non-invested assets
3. Health credit risk

The largest component of R_3 in the industry is the risk associated with uncollectible reinsurance (due both to reinsurers being unable and unwilling to pay). While there is a charge for health credit risk, it is historically zero for most property/casualty companies across the industry.

Reinsurance recoverables

The R_3 charge for reinsurance recoverables reflects the risk that reinsurers cannot or will not pay amounts the reporting entity expects to receive under the terms of its reinsurance contracts.

Over the years there has been considerable focus in the property/casualty industry on reinsurance. For one, uncollectible reinsurance was deemed partly to blame for the failure of Mission Insurance Company and Transit Casualty Company,[156] which helped set RBC in motion for the property/casualty industry. Furthermore, throughout the years, reinsurance has been used in certain situations inappropriately to enhance a company's financial position or hide poor financial results.[157]

From its inception, the RBC formula applied a simple 10% loading to all eligible reinsurance recoverables. Despite the relatively low impact that R_3 has on the industry as a whole, the charge has been subject to criticism from insurance carriers, who have argued that the charge does not differentiate between high and low rated reinsurers, or give credit for those recoverables that are backed by collateral.

From 2018,[158] a new formula was introduced to address these concerns. This new formula is performed at the transaction level and those results are then summed to determine the charge. It applies differentiated risk charges to each reinsurer counterparty based on their credit quality, as indicated by a rating from an approved rating agency, as well as whether or not the recoverables are collateralized.

The charge is calculated within columns 28 through 36 of Schedule F, Part 3, of the Annual Statement. Details of this part of the calculation are described in Chapter 14 covering Schedule F (section titled *"Credit Risk on Ceded Reinsurance (columns 21 through 36)"*). The RBC formula uses the total row of the results shown in columns 35 and 36 as inputs to the R_3 risk charge.

[156] U.S. House of Representatives Subcommittee on Oversight and Investigations of the Committee on Energy and Commerce, Failed Promises-Insurance Company Insolvencies, 101 Cong., 2rid sess., February 1990. Washington, D.C.: GPO, 1993.
[157] Feldblum, S., "NAIC Property/Casualty Insurance Company Risk-Based Capital Requirements," PCAS LXXXIII, 1996, pages 317-319.
[158] Earlier versions of the new formula for the reinsurance recoverables component of R_3 were included for informational purposes only in the RBC filings in 2016 and 2017 while it was under development.

Overall, the implementation of this new formula has reduced the level of RBC for reinsurance recoverables by almost a half across the industry.[159]

The RBC charge for reinsurance recoverable is split 50%/50% between R_3 and R_4 in circumstances where the reserve RBC charge (see discussion below) exceeds the sum of the credit risk RBC charge for non-invested assets plus one-half of the RBC charge for reinsurance recoverables. Otherwise, the full amount of the reinsurance recoverable RBC charge is included in R_3. The concept of moving half of the reinsurance recoverable RBC amount to R_4 is to recognize there is some dependency between deterioration in reserves and an increase in exposure to reinsurance credit risk. The limitation on splitting the charge based on the size of the reserve RBC charge is put in place so the insurance company cannot diversify away a portion of its credit risk in situations where the company has limited net reserves.

Non-invested assets

R_3 includes the charge for risk associated with credit exposure resulting from the following non-invested assets listed on the balance sheet:

1. Investment income due and accrued
2. Guaranty funds receivable or on deposit
3. Recoverable from parent, subsidiaries and affiliates
4. Amounts receivable relating to uninsured Accident and Health plans
5. Aggregate write-in for other than invested assets

The RBC charge for these assets is the net admitted value included in column 3 of the asset side of the balance sheet (page 2 of the Annual Statement), each multiplied by a factor of 0.050, with the exception of investment income due and accrued, which receives a factor of 0.010. The factor for investment income due and accrued is equal to the RBC factor applied to unaffiliated class 02 bonds because most of the investment income due and accrued comes from bonds, which are typically the largest holding for a property/casualty insurance company. The receivable assets are generally short-term balances generated in the normal course of doing business. The capital charges for these assets are lower than other long-term recoverables.

Health credit risk

Finally, R_3 also includes a charge for health credit risk for those reporting entities writing 5% or more in accident and health premiums in any of the last three years. This charge considers the risk associated with transferring health risks (morbidity and mortality) to health care organizations through fixed prepaid amounts (i.e., capitated payments).[160] There is a risk of non-payment in these situations (similar to traditional reinsurance recoverables). Therefore, a charge is applied to reflect the credit risk

[159] NAIC, *Summary: Aggregate P/C RBC Results By Year*, 2018, http://www.naic.org/documents/research_stats_rbc_results_pc.pdf

[160] Health care organizations include health maintenance organizations or managed care organizations.

associated with the portion of capitated payments over and above the security held by the reporting entity for these organizations.

Given that this charge is generally zero for most companies in the property/casualty industry, we will not go into details of the calculation of this charge.

R_3 for Fictitious

Table 87 illustrates the calculation of R_3 for Fictitious.

TABLE 87

R_3 Charge for Fictitious Insurance Company NAIC Risk-Based Capital 2018			
Total R_0 Charge — Subsidiary Insurance Companies and Misc. Other Amounts			0
Total R_1 Charge — Fixed Income Asset Risk			553,398
Total R_2 Charge — Equity Asset Risk			4,303,948
R_3 Calculation — Credit-Related Assets	**Amount Held**	**Charge Factor**	**RBC Charge**
Total RBC Requirement for Collateralized RI Recoverables *(Sch F, Part 3, Col 35)*			132,000
Total RBC Requirement for Uncollateralized RI Recoverables *(Sch F, Part 3, Col 36)*			415,000
Investment Income Due & Accrued	726,000	0.010	7,260
Guaranty Funds Receivable or on Deposit	0	0.050	0
Recoverable from Parent, Subs and Affils	0	0.050	0
Amts Receivable relating to Uninsured A&H Plans	0	0.050	0
Agg. Write-ins for other than Inv. Assets	586,000	0.050	29,300
Health Credit Risk			0
Total			**583,560**
Half of Reinsurance Recoverables Moved to R_4			273,500
Total R_3 Charge — Credit-Related Asset Risk			**310,060**

THE RBC CHARGE FOR RESERVE RISK (R_4)

R_4 is very often the largest of the RBC charges for property/casualty insurers. Reserve risk contemplates the risk that a reporting entity's loss and LAE reserves will develop adversely. This charge is calculated separately by line of business using Schedule P data for the last 10 years.

R_4 is the charge for reserve risk associated with the following:

1. Unpaid loss and LAE (reserve RBC)
2. Excessive premium growth
3. Reinsurance recoverable (reinsurance RBC)
4. Accident and Health (A&H) claim reserves (health RBC)

Within the following sections we provide a discussion of each of these categories, with considerable focus on the reserve RBC since this represents the dominant component of the R_4 charge.

Reserve RBC

Reserve RBC is determined by applying a set of factors (called company RBC percent) to the company's net loss and LAE reserves before non-tabular discount. Nominal (undiscounted) reserves are used because consideration for investment income is made by applying the same set of discount factors to all property/casualty insurance companies (called the adjustment for investment income). The use of a common method for considering investment income puts all property/casualty companies on an equivalent basis rather than having differences due to discount rates and payout patterns.

The calculation is performed separately by line of business using the same lines of business as used in Schedule P of the Annual Statement, with the exception that certain lines of business are combined. The occurrence and claims-made categories are combined for other liability and product liability, and reinsurance property and financial lines are combined.

Once the calculation of the base loss and LAE reserve RBC is performed for each line of business, two adjustments are made: one for loss sensitive (e.g., retrospectively rated) contracts and the other for loss concentration. Similar to the asset concentration factor in R_1 and R_2, the loss concentration factor considers diversification in the RBC calculation. Both adjustments result in reductions to the reserve RBC.

We will discuss each component of the calculation, providing examples where applicable.

<u>Base loss and LAE reserve RBC by line of business</u>

The base loss and LAE reserve RBC by line of business is computed as follows:

Equation 1: Base Loss and LAE Reserve RBC

= [[[Company RBC % + 1] * Adjustment for investment income] – 1]
* [Net loss and LAE reserve + Other discounts not in the reserves]

The net loss and LAE reserves used in this calculation are provided in Schedule P, Part 1, column 24, for each line of business. As previously noted, these are gross of non-tabular discount, but net of tabular discount.

Company RBC percentage

The company RBC percentage is the crux of the reserve risk charge. According to the NAIC RBC instructions, "These factors are designed to provide a surplus cushion against adverse reserve development."[161]

For each line of business, the company RBC percentage is determined based on a 50% weighting applied to the straight industry reserve RBC percent and 50% applied to the industry reserve RBC percent adjusted for the company's own experience.

- *Industry reserve RBC percent*

  The industry reserve RBC percent is a set of factors provided by the NAIC and is the same for all property/casualty insurance companies. There is one factor for each Schedule P line of business. According to the NAIC RBC instructions, these percentages "are based on detailed analysis of historical reserve development patterns found in Parts 2 and 3 of Schedule P for each major line of business."[162] They have been determined in the past by computing the ratio of net incurred loss and defense and cost containment (DCC) development during a particular period from Schedule P, Part 2, to the net loss and DCC reserves as of the earlier period (calculated by subtracting the figures in Schedule P, Part 3 from those in Part 2). The industry percent factor is selected based on the average for all companies within the property/casualty insurance industry, by line of business.

  The industry RBC percent factors are not always updated annually, but rather on an as-needed basis. In fact, the factors in the original RBC model remained for well over 10 years. The only interim change was made to reflect the change in the format of Schedule P, such as when medical malpractice was split into its claims made and occurrence components.

  The NAIC developed the original factors in 1993 based on an actuarial analysis using data evaluated as of 1991 and prior.[163] This analysis computed the aforementioned ratios of incurred loss and DCC to prior period reserves over each evaluation period provided in Schedule P, Parts 2 and 3 of the 1991 Annual Statement. Nine ratios were computed, the first of which provided development on accident years 1982 and prior over the period December 31, 1982 through December 31, 1991, as a ratio to loss and DCC reserves as of December 31, 1982. The remaining eight ratios were computed measuring development to December 31, 1991, for periods beginning December 31, 1983 through December 31, 1990. The nine ratios were calculated for each line of business by company. An average was computed over all companies for each evaluation period. The industry RBC percent factor for each line of business was set equal to the

[161] NAIC, *RBC Property & Casualty 2018 Forecasting & Instructions,* page 21.
[162] Ibid.
[163] American Academy of Actuaries, "An Update to P/C Risk-Based Capital Underwriting Factors: September 2007 Report to the National Association of Insurance Commissioners P/C Risk-Based Capital Working Group," page 3.

largest ratio over all of the evaluation dates. This is commonly referred to as the "worst-case year" ratio. The belief is that development of this magnitude could occur in the future because it occurred in the past.[164]

The original factors remained until 2008, when the NAIC adopted changes recommended by the American Academy of Actuaries P/C Risk-Based Capital Committee (Committee) in a report titled *An Update to P/C Risk-Based Capital Underwriting Factors: September 2007 Report to the National Association of Insurance Commissioners P/C Risk-Based Capital Working Group*. In this study, the Committee recognized that the insurance industry had been through many changes since the original factors were developed, namely changes in the underwriting cycle resulting in shifts in reserve redundancies/deficiencies. Furthermore, despite the formulaic approach of the worst-case year, the Committee found that the original factors could not be easily replicated and varied considerably relative to expectations as to the level of adverse development inherent in a particular line of business. The Committee therefore recommended developing a revised approach that would meet the following criteria:

1. Simple to apply and understand;
2. Responsive to actual history and underlying risk;
3. Easily reproducible by future practitioners;
4. Statistically relevant;
5. Resulting in indications that could be adopted without disruptive swings in required capital for regulated companies."[165]

The revised approach differed from the original approach in four significant ways:

1. The historical data was filtered and screened to remove companies with insufficient or unusual data points. Examples include companies with less than 10 years of experience and/or companies with negative paid, reserve and/or incurred loss and DCC in any one accident year.
2. Rather than selecting the ratio from the worst-case year over the average of all companies, the 87.5 percentile of all data points was used. "The 87.5 percentile was selected because it represents a conservative view of the risk in each line but is also broadly consistent with the existing factors."[166]
3. A floor was set such that the indicated industry reserve RBC percent factor resulted in a minimum charge of 5% after adjustment for investment income.

[164] Feldblum, S., "NAIC Property/Casualty Insurance Company Risk-Based Capital Requirements," PCAS LXXXIII, 1996, pages 327-329.
[165] American Academy of Actuaries, *An Update to P/C Risk-Based Capital Underwriting Factors: September 2007 Report to the National Association of Insurance Commissioners P/C Risk-Based Capital Working Group*, pages 2 and 3.
[166] Ibid, page 6.

4. The indicated industry reserve RBC percent factors were capped to limit the change in the base loss and LAE reserve RBC. The Committee recommended a cap of 35%.[167]

For example, the indicated industry reserve RBC factor for private passenger automobile liability that was produced using the revised methodology before capping was 0.128, and the change in the investment income adjustment factor was 0.927. Using Equation 1 (assuming a net loss and LAE reserve balance of $1.00), the implied base loss and LAE reserve RBC is 0.046. As displayed below, this represented a change of -70.5% from the original industry reserve RBC factor of 0.254 with adjustment for investment income of 0.921:

Indicated base loss and LAE reserve RBC based on 2007 methodology before capping:

= [[[0.128 + 1] * 0.927] – 1] *$1.00
= 0.046

Original base loss and LAE reserve RBC:

= [[[0.254 + 1] * 0.921] – 1] *$1.00
= 0.155

Change in base loss and LAE reserve RBC from original to revised (2007) methodology:

= 0.046 / 0.155 - 1
= -70.5%

Capped at 35%, the revised methodology produced an industry reserve RBC percent factor of 0.187, which was calculated as follows:

= [[[(-0.350 +1) * 0.155] +1] / 0.927] - 1
= 0.187

To summarize, the industry RBC reserve factor indicated from the revised 2007 methodology was 0.128 before capping and 0.187 after the 35% cap. The 35% cap reduced the impact of the change in methodology from the original factor of 0.254.[168]

The NAIC adopted the factors in 2008 using the revised methodology and indications of the September 2007 report, however with a cap at 15% instead of 35%. The revised factors were applied to RBC calculations for the 2008 reporting year. To continue with the previous example, capping at 15% resulted in an industry RBC reserve percent factor of 0.221, which was calculated as follows:

= [[[(-0.150 +1) * 0.155] +1] / 0.927] - 1

[167] Ibid, pages 6 and 7.
[168] Ibid, Appendix II, Exhibit I – III.

= 0.221[169]

Subsequent changes to the industry reserve RBC percent factors were also made and adopted in 2009 and 2010. The 2009 update applied a 15% cap to the factors adopted in 2008. That is, 2008 factors were substituted in for the "original" factors in the previous calculations, for purposes of capping the impact from the effects of the 2007 revised methodology. This revision was adopted in 2009 and applied to the 2009 reporting year.[170]

Two changes were made in 2010. First, in March 2010, the American Academy of Actuaries P/C Risk-Based Capital Working Group updated the 2007 methodology but with 2008 data. As with the 2007 study, the factors were capped to cause no more than a 15% change to the current factors (2009 updated factors), and the minimum charge was set at 5%.[171] Second, in June 2010, the March 2010 study was updated using a 5% cap instead of 15%.[172] The 2010 study capped at 5% was adopted and applied to the 2010 reporting year.

The 2017 RBC formula had a further update to the industry RBC reserve factors, the first since 2010. This update was based on changes recommended by the American Academy of Actuaries P/C Risk-Based Capital Committee in a report titled *2016 Update to Property and Casualty Risk-Based Capital Underwriting Factors.*[173] This report proposed a new calibration based on data from Annual Statements 1997-2014 and calculates the 87.5 percentile subject to the following filtering:

- **Survivorship** – Include data points where, for a particular company and line of business there is no net earned premium in the latest accident year(s).
- **Line of business size** – Exclude data points where, for a particular line of business, net earned premiums are less than the 15th percentile for that accident year or reserve year.
- **Pooling** – Combine data points from intercompany pool participants into a single pool-wide data point.
- **Minor Lines** – Exclude data points where the net earned premium for the line of business represents a small portion of the company's total net earned premium.

[169] American Academy of Actuaries, *Update to P/C Risk-Based Capital Underwriting Factors Presented to National Association of Insurance Commissioners P/C Risk-Based Capital Working Group*, March 2008.
[170] American Academy of Actuaries, *2009 Update to P/C Risk-Based Capital Underwriting Factors Presented to National Association of Insurance Commissioners' P/C Risk-Based Capital Working Group*, December 2008.
[171] American Academy of Actuaries, *2010 Update to P/C Risk-Based Capital Underwriting Factors Presented to the National Association of Insurance Commissioners' Property Risk-Based Capital Working Group*, March 2010.
[172] Letter from the American Academy of Actuaries P/C Risk-Based Capital Working Group to the National Association of Insurance Commissioners Capital Adequacy (E) Task Force *Re: Risk-Based Capital Underwriting Factors – 2010 Update – Addendum Using 5 Percent Cap*, dated June 22, 2010.
[173] https://www.actuary.org/sites/default/files/files/publications/PC_RBC_UWFactors_10282016.pdf

- **Years of line of business with net earned premium >0** – Exclude data points where, for a particular company and line of business, there is less than five years of net earned premium
- **Maturity** – Remove the least mature data points.
- **Anomalous values** – Exclude data points with anomalous values, i.e., negative loss ratios, negative initial reserves and reserve runoff ratios over/under 500%/-500%.

In 2017, the NAIC's Property and Casualty Risk-Based Capital (E) Working Group updated the industry RBC reserve factors in the 2017 RBC formula to the 10% capped level, representing scenario #1 in the report. The factors were due to be re-evaluated again and expected to reach the fully proposed values in the following four years.

In 2018, the NAIC's Property and Casualty Risk-Based Capital (E) Working Group further revised the factors to be included in the 2019 RBC formula by adopting the 35% capped factors (scenario #3) for commercial insurance, medical professional liability and all other lines, while adopting the uncapped factors (scenario #4) for personal and reinsurance lines.

- *Company "development factor"*

The reporting entity's own loss experience is considered by adjusting the industry reserve RBC percent by the company "development factor" by line of business. This development factor is calculated as the ratio of the sum of incurred loss and DCC from nine prior accident years evaluated as of the current year to the sum of the initial evaluations of those incurred amounts. The current incurred loss and DCC values come from Schedule P, Part 2, column 10, with the initial values coming from the first incurred value shown for each accident year. The initial values lie along the diagonal. This development factor measures how the initial estimates of ultimate loss and DCC have developed based on what the company currently knows. The factor is capped at 400% to limit the impact of anomalous, one-time results.

The reporting entity may not rely on its own experience in determining the company RBC percentage if:

1. Either the initial or current values shown in Schedule P, Part 2, are negative for any year.
2. The current value is zero for any year.
3. The sum of the initial values is zero across all years.

<u>Adjustment for investment income</u>

With the exception of workers' compensation tabular reserves, and instances where a company has explicitly requested and received permission from state regulatory authorities to discount non-tabular reserves, insurance companies are required to record loss and LAE reserves on an undiscounted basis

under statutory accounting. This creates an inherent margin in surplus. For purposes of determining required capital under the RBC calculation, the reserves are adjusted to remove this margin.[174]

Similar to the industry reserve RBC percent, the investment income factors are provided by the NAIC. According to the NAIC RBC instructions, "This discount factor assumes a 5 percent interest rate. For lines of business other than workers' compensation and the excess reinsurance lines, the payment pattern is determined using an IRS type methodology applied to industry-wide Schedule P data by line of business; otherwise, a curve has been fit to the data to estimate the average payout over time. The discount factor for workers' compensation is adjusted to reflect the tabular portion of the reserves that is already discounted."[175] Tabular discounting is typically permitted only on the indemnity portion of workers' compensation reserves and not to the medical component due to the relatively fast payment of medical expenses.

Similar to the industry reserve RBC percent, the investment income adjustment factors were updated in September 2007 from their original values. An approach similar to the original methodology was followed but applied to updated data through 2005.[176]

Other discounts not included in the reserves

The adjustment for investment income is applied to reflect non-tabular discount. It is applied to loss and LAE reserves on a net of reinsurance basis, net of tabular discount, but before any non-tabular discount, as provided in column 24 of Schedule P, Part 1. If for some reason the amounts included in column 24 are net of non-tabular discount, the amount of the non-tabular discount would need to be added back to the reserves before applying the adjustment for investment income.

These amounts are generally equal to zero; the amount of non-tabular discount is included in columns 32 and 33 of Schedule P, Part 1.

Adjustment for loss-sensitive business

Prior to summing the reserve risk charge over all lines of business written by the reporting company, an adjustment is made to reflect loss-sensitive business.

The loss sensitive adjustment provides a discount for business that is written by the insurance company on contracts for which the premium is determined based on the insured's loss experience (i.e., retrospectively rated contracts). The loss experience is shared in whole or in part with the insured. Therefore, the risk of adverse loss development is also shared with the insured. The insurer needs less surplus to survive this risk of adverse loss development than it does if none of the policies were written

[174] Feldblum, S., "NAIC Property/Casualty Insurance Company Risk-Based Capital Requirements," PCAS LXXXIII, 1996, page 354.
[175] NAIC, *RBC Property & Casualty 2018 Forecasting & Instructions,* page 21.
[176] American Academy of Actuaries, *An Update to P/C Risk-Based Capital Underwriting Factors: September 2007 Report to the National Association of Insurance Commissioners P/C Risk-Based Capital Working Group*, page 5.

on a loss sensitive basis, thereby resulting in a discount to the company's RBC reserve charge to reflect this reduction in risk. This discount is computed separately by line of business.

The following provides the application of the loss-sensitive adjustment:

Equation 2: Loss and LAE RBC after discount
= Equation1 — Loss-sensitive discount
= Base Loss and LAE Reserve RBC — Loss-sensitive discount

Where the loss-sensitive discount
= Loss-sensitive discount factor
* Base loss and LAE RBC (from Equation 1).

The loss-sensitive discount factor is 30% for net loss and expense reserves associated with direct loss-sensitive contracts and 15% for net loss and expense reserves associated with assumed loss-sensitive contracts. The difference stems from the potential offset associated with reinsurance contracts for commissions that are loss sensitive as well. Oftentimes such business is written with sliding scale commissions whereby the commission the ceding company receives from the reinsurer is dependent upon the loss ratio on the business; the lower the loss ratio, the higher the commission paid by the reinsurer to the ceding company, subject of course to specified limits. For example, the reinsurer may receive additional premium from the reinsured as losses emerge but in turn have to pay additional commission due to a reduction in loss ratio. As with direct loss-sensitive contracts, the risk of adverse loss development on assumed contracts is reduced; however, it is not reduced by as much due to the potential offset from ceding commissions.

The portion of net loss and expense reserves attributed to direct and assumed loss-sensitive contracts is found in column 3 of Schedule P, Parts 7A and 7B, respectively.

Adjustment for loss concentration

The loss concentration adjustment is applied to the sum of the RBC reserve charges for all lines of business and reflects diversification across the lines. The theory underlying this discount is that the reserves for each line of business written by an insurance company would not be expected to develop adversely or favorably at the same time, assuming such development is random.

The final net loss and LAE RBC charge is computed as follows:

Equation 3: Net loss and LAE RBC
= Total loss and LAE RBC after discount for all RBC lines * 1,000
* Loss concentration factor

Where the loss concentration factor

$$= \frac{\text{Net loss and LAE for the largest line} * 0.300}{\text{Net loss and LAE for all lines combined}} + 0.700$$

The loss concentration factor is determined by taking the percentage of total net loss and LAE reserves for the largest line of business to the total net loss and LAE for all RBC lines combined, multiplying this percentage by 0.300 and then adding the result to 0.700.[177]

Because all adverse loss development may not always be a random fluctuation in losses, such as when the company increases loss reserves to improve its earnings position, adverse development across lines may not be totally independent. This formula recognizes that there may be some interdependence between lines of business.

A monoline writer would not receive any discount, as the calculation would be 1.000 * 0.300 + 0.700, which produces a loss concentration factor of 1.000. However, a company writing 60% of its business in its largest line would receive a discount to its reserve risk charge of 12%, or a loss concentration factor of 0.880 (= 0.600 * 0.300 + 0.700).

Illustration of reserve RBC calculation

The following provides an illustration of the reserve RBC calculation for REIC. Assume REIC writes only four lines of business: homeowners/farmowners (HO/FO), private passenger automobile liability (PPAL), workers' compensation (WC) and other liability (OL). The source of the company's own data is Schedule P, which is provided in thousands of U.S. dollars.

[177] For clarity, largest line is determined based on the Schedule P line of business having the highest amount of net loss and LAE reserves as of the filing date. Note, despite being separate lines of business within Schedule P, claims-made and occurrence business are combined for purposes of this calculation for other liability and product liability.

TABLE 88

Reporting Entity Insurance Company (REIC)							
Given the following data:		**HO/FO**	**PPAL**	**WC**	**OL**	**Total All Lines**	***Source***
(1)	Industry Average Loss & LAE Development Ratio	0.989	1.022	0.952	0.966		*Provided by NAIC*
(2)	Company Average Loss & LAE Dvpt Ratio for prior 9 years	1.070	1.100	1.125	1.150		*Company Schedule P, Part 2*
(3)	Industry Loss & LAE RBC %	0.213	0.181	0.336	0.531		*Provided by NAIC*
(4)	Adjustment for Investment Income	0.938	0.928	0.830	0.852		*Provided by NAIC*
(5)	Company Net Loss & LAE Unpaid, gross of non-tabular discount	10,000	8,000	17,000	12,000	47,000	*Company Schedule P, Part 1*
(6)	Other Discount Amount Not Included in Unpaid Loss & LAE	–	–	–	–	–	*Company data*
(7)	Portion of Reserves on Retro-Rated Plans:						
	(a) % Direct Loss Sensitive	0.0%	0.0%	20.0%	0.0%		*Company Schedule P, Part 7A, Col 3*
	(b) % Assumed Loss Sensitive	0.0%	0.0%	0.0%	0.0%		*Company Schedule P, Part 7B, Col 3*
Calculation of Reserve RBC		**HO/FO**	**PPAL**	**WC**	**OL**	**Total All Lines**	
Step 1: Base Loss & LAE Reserve RBC							
(8)	Ratio of Company Average Development Ratio to Industry	1.082	1.076	1.182	1.190		*= (2) / (1)*
(9)	Company Loss & LAE RBC %	0.222	0.188	0.367	0.582		*= 50% of (3) + 50% of (8)*(3)*
(10)	Base Loss & LAE Reserve RBC Charge	1,460	819	2,282	4,170		*={ [((9)+1) * (4)] - 1 } * { (5) + (6) }*
Step 2: Loss & LAE RBC After Discount							
(11)	Loss-sensitive Factor	–	–	0.060	–		*= 30% of (7a) + 15% of (7b)*
(12)	Loss-sensitive Discount	–	–	137	–		*= (11) * (10)*
(13)	Loss & LAE RBC After Discount	1,460	819	2,145	4,170	8,594	*= (10) - (12)*
Step 3: Net Loss & LAE RBC * 1,000							
(14)	Distribution of Loss & LAE Reserves by Line	21%	17%	36%	26%		*= (5) by line / (5) total*
(15)	Loss Concentration Factor					0.809	*= 0.300 * Max of (14) + 0.700*
(16)	**Net Loss & LAE RBC * 1,000**					**6,948,010**	*= (13) * (15) * 1,000*

As displayed in Table 88, the reserve RBC included in the R_4 charge for REIC is $6,948,010. The main driver of the reserve RBC is the company RBC percentage for loss and LAE reserve risk. This percentage is higher than the industry RBC percent in line 3 because REIC's ultimate estimates tend to develop adversely, as evidenced by the ratios of company development to industry development in excess of 1.000 in line 8 above.

Table 89 provides another example of the detailed R_4 calculation for the commercial automobile liability (CAL) line of business for Fictitious Insurance Company. This calculation uses the financial statements and Schedule P line detail found in other examples within this publication.

TABLE 89

R_4 Charge for Commercial Automobile Liability (CAL) *Fictitious Insurance Company* *NAIC Risk-Based Capital 2018*	
R_4 — Reserve Risk	**CAL**
Industry Average Development	1.060
Company Average Development	0.901
Company Average Development / Industry Average Development	0.850
Industry Loss & LAE RBC %	0.243
Company RBC %	0.225
Loss & LAE Unpaid	3,450,000
Adjustment for Investment Income	0.911
Loss & LAE Reserve RBC Before Discounts	399,565
Percent Loss-sensitive Direct Loss and Expense Reserves	0.011
Loss-sensitive Direct Loss and Expense Reserve Discount Factor	0.300
Loss-sensitive Discount for Loss and Expense Reserves	1,319
Loss and LAE Reserve RBC	398,247

Excessive premium growth

The estimation of unpaid loss and LAE reserves is subject to greater uncertainty for companies that are growing rapidly. The reasons are twofold. First, an insurance company does not have as much insight into new business as it does into risks that are currently on the books. Second, the estimation of unpaid claims is more difficult for a growing company rather than a company in a steady state. Consider a company that decides to grow its writings by 20% over the course of a year. As a company grows throughout the year, the average writings are more heavily skewed toward the second half of the policy year. Without explicit consideration for this shift, traditional actuarial projection techniques will not adequately capture the lag in loss emergence and therefore will understate the reserve need. However, the difficulty is in determining how exactly to consider this shift.

In the RBC calculation, excessive growth is defined as a three-year average growth rate in gross written premiums that is in excess of 10%. A growth rate of 10% is deemed to be a normal annual increase in premium volume. The growth rate for any single year is capped at 40%. The excess percentage (excess of 10%) is called the RBC average growth rate factor.

Average growth rate factor
= Maximum (average gross premium growth over three years, 0.10) – 0.10

For purposes of this calculation, gross written premiums are equal to direct written premiums from line 35 of column 1 of the Underwriting and Investment Exhibit (U&IE), plus assumed premiums from non-affiliates in column 3. To perform this calculation, Part 1 of the U&IE is required for each of the past four years. The calculation is performed using as many years as possible, but no more than four; if the company only has one year of experience, only one year is used. However, if the company is a start-up, a growth rate of 40% is used. If a company has no gross written premium in the current year, it is assumed not to be growing, and a growth rate of zero is used.

This calculation is performed on a group basis, for those companies that are part of a group. Therefore, each member of the group will have the same RBC average growth rate factor. The group basis is used to neither punish nor reward individual legal entities that might be growing due to a realignment of business from one company within the group to another. In this case, the growth is not attributed to new business but rather a transfer or risks from one company to the other.

In addition, business acquired or divested as a "shell" is included in the calculation of the growth rate only to the extent that the liabilities are retained by the reporting entity. Servicing carriers for assigned risk pools can also exclude the written premiums associated with the involuntary pool, as the insurer has little or no control over the assignment of such risk.

The RBC average growth rate factor is multiplied by 0.450 of the net loss and LAE reserves as per the total line in Schedule P, Part 1, Summary, column 24.

Excessive premium growth charge for loss and LAE reserves =

RBC average growth rate factor * 0.450 * net loss and LAE reserves

The 0.450 has remained unchanged since the original RBC formula for property/casualty insurers was implemented. It was determined by a member of the American Academy of Actuaries RBC Task Force (Mr. Allan Kaufman) after studying the average development in net loss and LAE reserves experienced by companies that experienced growth in excess of 10%, relative to development observed by the remainder of the industry.[178] The 0.450 is already adjusted for discount using a factor of 0.900, which was what Kaufman approximated to be the average discount factor for all lines of business.[179]

Reinsurance RBC

Recall from our discussion of the R_3 charge that reinsurance RBC represents the minimum amount of capital included in the RBC formula that would be needed to survive the risk of reinsurer default.

The reinsurance RBC within R_4 is equal to the other half of the reinsurance recoverable amount computed in R_3 unless the reserve RBC is less than the RBC for non-invested assets plus one-half of the RBC for reinsurance recoverables. If this is the case, the entire reinsurance RBC charge is included in R_3 and the reinsurance RBC within R_4 is zero. The reserve RBC limitation was put in place so the insurance company cannot diversify away a portion of its credit risk in situations where the company has limited net reserves.

Health RBC

[178] Feldblum, S., "NAIC Property/Casualty Insurance Company Risk-Based Capital Requirements," PCAS LXXXIII, 1996, page 354.
[179] Ibid.

In addition to the charge for property/casualty lines of business, a separate health RBC calculation is required for those property/casualty insurers that have written 5% or more in accident and health premiums in any of the past three years. We will not go into the details of this formula but note that the health RBC calculation is based on the RBC formula for life insurance.

R_4 for Fictitious

Table 90 provides the R_4 calculation for Fictitious.

TABLE 90

R_4 Charge for Fictitious Insurance Company
NAIC Risk-Based Capital 2018

Total R_0 Charge — Subsidiary Insurance Companies and Misc. Other Amounts					0
Total R_1 Charge — Fixed Income Asset Risk					553,398
Total R_2 Charge — Equity Asset Risk					4,303,948
Total R_3 Charge — Credit-Related Asset Risk					310,060
R_4 Calculation — Underwriting Risk — Reserves	**Amount Held**	**Charge Factor**	**Initial RBC Charge**	**Loss-sensitive Discount[180]**	**Final RBC Charge**
Property/Casualty business					
Loss and LAE reserves — HO/FO	1,455,000	0.1237	179,984	0	179,984
Loss and LAE reserves — PPAL	2,482,000	0.1136	281,955	0	281,955
Loss and LAE reserves — CAL	3,450,000	0.1158	399,565	1,319	398,247
Loss and LAE reserves — WC	15,946,000	0.1122	1,789,141	66,019	1,723,122
Loss and LAE reserves — CMP	4,782,000	0.3087	1,476,203	0	1,476,203
Loss and LAE reserves — Med Mal Occurrence	0	0.0000	0	0	0
Loss and LAE reserves — Med Mal CM	0	0.0000	0	0	0
Loss and LAE reserves — Spec Liab	0	0.0000	0	0	0
Loss and LAE reserves — OL	20,691,000	0.3095	6,403,865	9,607	6,394,258
Loss and LAE reserves — Spec Prop	1,624,000	0.1740	282,576	0	282,576
Loss and LAE reserves — APD	310,000	0.0873	27,063	0	27,063
Loss and LAE reserves — F&S	817,000	0.2530	206,701	0	206,701
Loss and LAE reserves — Other	0	0.0000	0	0	0
Loss and LAE reserves — Products Liability	0	0.0000	0	0	0
Loss and LAE reserves — All Other					
Total	51,557,000		11,047,053	76,945	10,970,109
Company loss concentration factor		0.8204			
Loss reserve RBC after loss concentration					8,999,842
Current year growth		0.0195			
1st prior year growth		-0.0486			
2nd prior year growth		-0.0550			
Selected Average Growth		0.0000			
RBC average growth rate		0.0000			
Excessive growth charge on loss and LAE reserves	51,557,000	0.0000			0
Half of Reinsurance RBC					273,500
Total R_4 Charge — Underwriting Risk — Reserves					**9,273,342**

[180] We have assumed that the percentage of Fictitious' net loss and expense reserves that emanates from loss-sensitive contracts written on a direct basis is: 1.10% for commercial automobile liability, 12.3% for workers' compensation, 0.5% for other liability, and 0% for all other lines and for loss-sensitive contracts written on an assumed basis.

THE RBC CHARGE FOR WRITTEN PREMIUM RISK (R_5)

The R_5 charge considers underwriting risk associated with the following:

1. Net written premium (written premium RBC)
2. Excessive premium growth
3. Health premium (health premium RBC)
4. Health stabilization

For a typical company, almost all of the R_5 charge will come from the written premium RBC component.

The following provides a brief discussion of each of the first two categories of the R_5 risk charge. As previously noted in the discussion on R_4, we will not go into details for health insurance categories because the charges for health premium RBC and health stabilization are generally immaterial to the property/casualty industry.

Written premium RBC

Written premium risk contemplates the risk that future business written by the company will be unprofitable. Ideally, the charge for this risk should be based on business written in the following year, but since that is an unknown quantity, business written during the current year is used as a proxy. Similar to the reserve RBC, the written premium RBC is computed by applying a set of factors, varying by line of business, to the net of reinsurance premiums written by the company during the current year. The calculation is done on the same lines of business as the reserve RBC with a different set of factors used in the calculation.

As with the reserve RBC, once the calculation of the base net written premium RBC is calculated for each line of business, two reductions are made: one for loss-sensitive business and the other for premium concentration (as opposed to loss concentration in R_4). Premium concentration reflects diversification in writing business across different lines of business.

Because the mechanics generally follow those used in the reserve RBC charge, we will only discuss differences in the calculation for written premium RBC.

<u>Base net written premium RBC by line of business</u>

The base net written premium RBC by line of business is computed as follows:

Equation 4: Base net written premium RBC

= Net written premium for the current calendar year

* [[Company RBC loss and LAE ratio * Adjustment for investment income] + Underwriting expense ratio - 1.000]

The net written premiums for each line of business are provided in column 6 of Part 1B of the U&IE within the Annual Statement. Aggregate write-ins for other lines of business are included within the other liability line of business.

Company RBC loss and LAE ratio

Similar to how the company RBC percentage is the key driver in the reserve RBC calculation, the company RBC loss and LAE ratio forms the crux of the written premium risk charge. For each line of business, the company RBC loss and LAE ratio is determined based on a 50% weighting applied to the straight industry RBC loss and LAE ratio and 50% applied to the industry RBC loss and LAE ratio adjusted for the company's own experience. The industry RBC loss and LAE ratio is given by the NAIC and is the same for all property/casualty insurance companies.

As with the industry reserve RBC percent, the industry RBC loss and LAE ratios did not change from their original value until 2008, when the NAIC adopted changes that were recommended by the American Academy of Actuaries P/C Risk-Based Capital Committee.[181] The original industry RBC loss and LAE ratios were based on the "worst-case" accident year ratio by line of business that resulted from taking a simple average over all companies. Company loss and LAE ratios by accident year were taken from what is currently column 31 of Schedule P, Part 1. The revised methodology recommended by the Committee instead uses the 87.5 percentile of all data points. Consistent with the industry reserve RBC percent factor, a floor was set such that the indicated industry RBC loss and LAE ratio resulted in a minimum charge of 5% after adjustment for investment income. In addition, the indicated industry RBC loss and LAE ratios were capped to limit the change in the base loss and LAE reserve RBC. The data was also filtered and screened to remove anomalous values (e.g., companies having less than an average of $500,000 in earned premium or a loss ratio of 0% for any one year). Further, loss ratios were capped at 300%.[182]

As discussed in the reserve RBC section above, the 2017 RBC formula saw another update to the industry RBC loss and LAE ratio factors, the first since 2010. This update was based on changes recommended by the American Academy of Actuaries P/C Risk-Based Capital Committee in a report titled *2016 update to Property and Casualty Risk-Based Capital Underwriting Factors.*[183] The recommendations from this study are the same for written premium RBC as those discussed above for reserve RBC. As with the industry RBC reserve factors, the NAIC adopted the industry RBC loss and LAE ratio factors capped at 10% in the 2017 formula, with further revisions to the 2019 formula to use the

[181] Note, however, changes were made to reflect structural changes to Schedule P over the time period, such as the separation of medical malpractice into its occurrence and claims-made components.
[182] American Academy of Actuaries, *An Update to P/C Risk-Based Capital Underwriting Factors: September 2007 Report to the National Association of Insurance Commissioners P/C Risk-Based Capital Working Group*, pages 2 and 5.
[183] https://www.actuary.org/sites/default/files/files/publications/PC_RBC_UWFactors_10282016.pdf

factors capped at 35% for all lines of business other than personal and reinsurance lines which are uncapped.

The reporting entity's own experience is considered by adjusting the industry loss and LAE ratios by the ratio of the company average loss and LAE ratio to the industry average loss and LAE ratio. The company average loss and LAE ratio is a straight average over the past 10 accident years of the net loss and LAE ratios provided in Schedule P, Part 1, column 31. Loss and LAE ratios for any accident year in excess of 300% are capped at that value in consideration of anomalous, one-time results.

Note that the reporting entity may not rely on its own experience in determining the company RBC loss and LAE ratio if:

1. The loss and LAE ratio for any accident year is zero or negative.
2. The net earned premium for any accident year is zero or negative.
3. More than two years' net earned premiums are less than 20% of the average over all years for each line (otherwise the company must exclude the one or two specific years that fail and take a straight average from the remaining years).

Adjustment for investment income

The investment income factors are provided by the NAIC and calculated using the same assumptions as in the reserve RBC, with the exception that discounted years differ because written premium is discounted as opposed to reserves.

Underwriting expense ratio

This is the company's own underwriting expense ratio for the current year capped at 400%, with a floor of zero. It is equal to the ratio of other underwriting expenses incurred in the current year per line 4 of the income statement, divided by total net written premium for the current year from Part 1B, column 6 of the U&IE.

Underwriting expense ratio =
Other underwriting expenses /
Net written premium

Adjustment for loss-sensitive business

Prior to summing the written premium RBC over all lines of business written by the reporting company, an adjustment is made to reflect loss-sensitive business. The following provides the application of the loss-sensitive adjustment:

Equation 5: Net written premium RBC after discount
= Equation 4
- Loss-sensitive discount

= Base net written premium RBC
- Loss-sensitive discount.

Similar to the reserve RBC, a 30% discount is applied to the portion of the net written premium RBC charge that is attributed to direct loss-sensitive contracts, and a 15% discount is applied to the base net written premium RBC charge for assumed contracts. The portion of net written premium attributed to direct and assumed loss sensitive contracts is found in column 6 of Schedule P, Parts 7A and 7B, respectively.

Adjustment for premium concentration

The final written premium RBC charge is computed as follows:

Equation 6: Net written premium RBC charge
= Equation 5
* Premium concentration factor
= Total net written premium RBC after discount
* Premium concentration factor

The premium concentration factor is determined by taking the percentage of total net written premiums that the largest line of business represents, multiplying this percentage by 0.300 and then adding the result to 0.700. As with the loss concentration factor, a monoline writer would not receive any discount, as the calculation would be 1.000 * 0.300 + 0.700, which produces a premium concentration factor of 1.000. However, a company writing 60% of its business in its largest line would receive a discount to its net written premium RBC charge of 12%, or a premium concentration factor of 0.880 (= 0.600 * 0.300 + 0.700).

Illustration of written premium RBC calculation

Table 91 shows the written premium RBC calculation for REIC used in our illustration of Reserve RBC. The source of the company's net written premium data is Part 1B of the U&IE, which is provided in U.S. dollars.

TABLE 91

Reporting Entity Insurance Company (REIC)							
Given the following data:		**HO/FO**	**PPAL**	**WC**	**OL**	**Total All Lines**	**Source**
(1)	Industry Average Loss & LAE Ratio	0.687	0.806	0.744	0.633		*Provided by NAIC*
(2)	Company Average Loss & LAE Ratio for past 10 years	0.634	0.724	0.811	0.975		*Company Schedule P, Part 1*
(3)	Industry Loss & LAE Ratio	0.927	0.969	1.044	1.027		*Provided by NAIC*
(4)	Adjustment for Investment Income	0.954	0.925	0.839	0.816		*Provided by NAIC*
(5)	Company Current Year Net Written Premium	8,500,000	7,000,000	6,200,000	5,300,000	27,000,000	*Company U/W & Inv Ex, Part 1B, Col 6*
(6)	Company Underwriting Expense Ratio	0.271	0.271	0.271	0.271		*Company Inc Stmt Line 4 divided by*
(7)	Portion of WP on Retro-Rated Plans:						*U/W & Inv Ex, Part 1B, Col 6*
	(a) % Direct Loss Sensitive	0.0%	0.0%	13.0%	0.0%		*Company Schedule P, Part 7A, Col 6*
	(b) % Assumed Loss Sensitive	0.0%	0.0%	0.0%	0.0%		*Company Schedule P, Part 7B, Col 6*
Calculation of Written Premium RBC:		**HO/FO**	**PPAL**	**WC**	**OL**	**Total All Lines**	
Step 1: Base Written Premium RBC							
(8)	Ratio of Company Average Loss & LAE Ratio to Industry	0.923	0.898	1.090	1.540		*= (2) / (1)*
(9)	Company Loss & LAE Ratio	0.891	0.920	1.091	1.304		*= 50% of (3) + 50% of (8)*(3)*
(10)	Base Loss & LAE WP RBC Charge	1,030,584	852,112	1,155,406	1,777,725		*= (5) * { [(9) * (4)] + (6) - 1 }*
Step 2: Net Written Premium RBC After Discount							
(11)	Loss-sensitive Factor	–	–	0.039	–		*= 30% of (7a) + 15% of (7b)*
(12)	Loss-sensitive Discount	–	–	45,061	–		*= (11) * (10)*
(13)	Net Written Premium RBC After Discount	1,030,584	852,112	1,110,345	1,777,725	4,770,766	*= (10) - (12)*
Step 3: Net Written Premium RBC							
(14)	Distribution of WP by Line	31%	26%	23%	20%		*= (5) by line / (5) total*
(15)	Premium Concentration Factor					0.794	*= 0.300 * Max of (14) +0.700*
(16)	**Net Written Premium RBC**					**3,790,109**	*= (13) * (15)*

As displayed in Table 91, the written premium RBC that is included in the R_5 charge for REIC is $3,790,109. The company average loss and LAE ratio for the past 10 years (line 2) is better than the industry average loss and LAE ratio (line 1) for the personal lines (HO/FO and PPAL) and worse for the commercial lines (WC and OL). Thus, the company loss and LAE ratio in line 9 is lower than the industry ratio in line 3 for the personal lines and higher for the commercial lines. In fact, the ratio is substantially

higher for OL given the poor average loss ratio over the past 10 years, which is causing a higher overall written premium RBC for OL than the other three lines of business, despite the fact that the premium writings are the lowest for OL.

Table 92 provides another example of the R_5 calculation for CAL for Fictitious.

TABLE 92

R_5 Charge for Commercial Automobile Liability (CAL) Fictitious Insurance Company NAIC Risk-Based Capital 2018	
R_5 — Written Premium Risk	
Industry Average Loss and Loss Expense Ratio	0.724
Company Average Loss and Loss Expense Ratio	0.618
Company Average Loss Ratio/Industry Loss Ratio	0.854
Industry Loss & LAE Ratio	1.005
Company RBC Loss & LAE Ratio	0.931
Company Underwriting Expense Ratio	0.317
Net Written Premium	2,250,000
Adjustment for Investment Income	0.890
Net Written Premium RBC Before Discounts	328,438
Percent Loss-sensitive Direct NPW	0.008
Loss-sensitive Direct NPW Discount Factor	0.300
Loss-sensitive Discount for Direct NPW	788
Total NPW RBC	327,649

Excessive premium growth

The RBC average growth rate factor is calculated the same as that for reserve risk. However, the factor differs in its application. In the case of R_5, the excessive premium growth charge is applied to net written premium rather than reserves and multiplied by 0.225, rather than 0.450. The net written premium is obtained from the total line in Part 1B, column 6, of the U&IE. The factor of 0.225 was determined by Kaufman based on a study of the loss ratio for companies experiencing growth in excess of 10% versus all companies in the industry. As with the 0.450 factor, the factor applied to net written premium of 0.225 has been adjusted for discounting by 0.900.

R_5 for Fictitious

Table 93 provides the R_5 portion of the calculation for Fictitious.

TABLE 93

R_5 Charge for Fictitious Insurance Company

NAIC Risk-Based Capital 2018

Fictitious Insurance Company

Total R_0 Charge — Subsidiary Insurance Companies and Misc. Other Amounts	0
Total R_1 Charge — Fixed Income Asset Risk	553,398
Total R_2 Charge — Equity Asset Risk	4,303,948
Total R_3 Charge — Credit-Related Asset Risk	310,060
Total R_4 Charge — Underwriting Risk--Reserves	9,273,342

R_5 Calculation — Underwriting Risk — Net Written Premium	**Amount Written**	**Charge Factor**	**Initial RBC Charge**	**Loss-sensitive Discount[184]**	**Final RBC Charge**
Property/Casualty business					
Net Written Premium — HO / FO	4,555,000	0.1441	656,376	0	656,376
Net Written Premium — PPAL	2,804,000	0.2115	593,046	0	593,046
Net Written Premium — CAL	2,250,000	0.1460	328,438	788	327,649
Net Written Premium — WC	4,022,000	0.2030	816,466	13,471	802,995
Net Written Premium — CMP	4,677,000	0.1709	799,299	0	799,299
Net Written Premium — Med Mal Occurrence	0	0.0000	0	0	0
Net Written Premium — Med Mal CM	0	0.0000	0	0	0
Net Written Premium — Spec Liab	0	0.0000	0	0	0
Net Written Premium — OL	3,502,000	0.1999	700,050	630	699,420
Net Written Premium — Spec Prop	2,484,000	0.1805	448,362	0	448,362
Net Written Premium — APD	2,312,000	0.1715	396,508	0	396,508
Net Written Premium — F&S	146,000	0.1830	26,718	0	26,718
Net Written Premium — Other	0	0.0000	0	0	0
Net Written Premium — Products Liability	0	0.0000	0	0	0
Net Written Premium — All Other	0	0.0000	0	0	0
Total	26,752,000		4,765,262	14,889	4,750,373
Company premium concentration factor		0.7524			
Written Premium RBC after premium concentration					3,574,411
Excessive growth charge on net written premium	26,752,000	0.0000			0
Total R_5 Charge — Underwriting Risk — Net Written Premium					**3,574,411**

THE RBC CHARGE FOR CATASTROPHE RISK (R_{cat})

The R_{cat} risk charge considers catastrophe risk associated with earthquakes and hurricanes. This risk applies on a net of reinsurance basis with a corresponding contingent credit risk charge for certain categories of reinsurers.

The insurance company may use the modeled losses from any one of the NAIC-approved commercially available third party vendor catastrophe models, or any combination of losses from two or more of the models, using the insurer's own insured property exposure information as inputs to the model. For the 2018 RBC formula, approved vendor models are available from AIR, EQECAT, RMS, ARA HurLoss Model (hurricane only) and the Florida Public Model (hurricane only). For the 2019 RBC formula, companies will

[184] We have assumed that the percentage of Fictitious' net written premium that emanates from loss-sensitive contracts written on a direct basis is: 0.8% for commercial automobile liability, 5.5% for workers' compensation, 0.3% for other liability, and 0% for all other lines and for loss-sensitive contracts written on an assumed basis.

also be able to use their own internally developed catastrophe model or those that are the result of adjustments made by the insurer to vendor models to represent their own view of catastrophe risk, upon applying for and obtaining written permission by their domestic (where model output is used for a single entity) or lead state (where model output is used for the whole group) insurance regulator.

The company must provide modeled loss scenarios for the worst year in 50, 100, 250 and 500; however, only the worst year in 100 will be used in calculating the catastrophe risk charge. Insurers are expected to use the same exposure data, modeling, and assumptions that they use in their own internal catastrophe risk management process, rather than a prescribed set of modeling assumptions. While it is preferred that the projected modeled losses are reported on an Aggregate Exceedance Probability (AEP) basis, companies are permitted to report on an Occurrence Exceedance Probability (OEP) basis if that is consistent with the company's internal risk management process.

For both earthquakes and hurricanes, a risk charge factor of 1.000 is applied to the net of reinsurance losses (excluding any loss adjustment expenses) at the worst year in 100 level. Additionally, a factor of 0.048 is applied to the modeled losses ceded under any reinsurance contract associated with this level of net loss to capture the contingent credit risk associated with the potential default of reinsurers in this scenario. Recoveries from certain categories of reinsurers are exempt from this charge, namely U.S. affiliates and mandatory pools (whether authorized, unauthorized or certified).

The total R_{cat} catastrophe risk charge is calculated using the "sum of squares" approach, which assumes the two risks are independent, using the following formula:

$$R_{cat} = \sqrt{(Total\ earthquake\ risk)^2 + (Total\ hurricane\ risk)^2}$$

Exemption Interrogatory

Insurers may qualify for an exemption from filing either or both of the components of the catastrophe risk charge if they meet certain criteria, upon completion of an interrogatory.

For both earthquake and hurricane exemptions, the company must indicate under which criteria below it is claiming an exemption:

1. The company has not entered into a reinsurance agreement covering earthquake / hurricane exposure with a non-affiliate or a non-U.S. affiliate, and either
    a. The company participates in an inter-company pooling arrangement with 0% participation, leaving no net exposure for earthquake / hurricane risks; or
    b. The company cedes 100% of its earthquake / hurricane exposures to its U.S. affiliate(s), leaving no net exposure for earthquake / hurricane risks
2. The company's ratio of Insured Value – Property to surplus as regards policyholders is less than 50%

3. The company has written Insured Value – Property that includes earthquake / hurricane coverage in the Catastrophe-Prone Areas representing less than 10% of its surplus as regards policyholders

The NAIC RBC Instructions include the following definitions related to the catastrophe risk exemptions[185]:

Insured-Value Property	Includes aggregate policy limits for structures and contents for policies written and assumed in the following annual statements lines – Fire, Allied Lines, Earthquake, Farmowners, Homeowners, and Commercial Multi-Peril.
Catastrophe-Prone Areas in the U.S.:	
- Earthquake risks	Includes any of the following states or commonwealths: Alaska, Hawaii, Washington, Oregon, California, Idaho, Nevada, Utah, Arizona, Montana, Wyoming, Colorado, New Mexico, Puerto Rico, and geographic areas in the following states that are in the New Madrid Seismic Zone – Missouri, Arkansas, Mississippi, Tennessee, Illinois, and Kentucky.
- Hurricane risks	Includes Hawaii, District of Columbia, and states and commonwealths bordering on the Atlantic Ocean, and/or Gulf of Mexico including Puerto Rico.

For the earthquake exemption, if a company qualifies for exemption under criteria 3, the company must provide details about how the "geographic areas in the New Madrid Seismic Zone" were determined, with the following additional questions:

a. What resource was used to define the New Madrid Seismic Zone?
b. Was exposure determined based on zip codes or countries in the zone, was it based on all of the earthquake exposure in the identified states, or was another methodology used? Describe any other methodology used.

R_{cat} for Fictitious

Table 94 provides the R_{cat} – Earthquake Catastrophe Risk portion of the calculation for Fictitious.

TABLE 94

R_{cat} Earthquake Charge for Fictitious Insurance Company NAIC Risk-Based Capital 2018	
R_{cat} - Earthquake Catastrophe Risk	**Modeled Losses (USD in 000s)**

[185] NAIC, *RBC Property & Casualty 2018 Forecasting & Instructions, page 43*.

Earthquake	Direct & Assumed	Net	Ceded Amounts Recoverable	Ceded Amounts Recoverable with zero Credit Risk Charge
Worst Year in 50	70,000	50,000	20,000	-
Worst Year in 100	105,000	75,000	30,000	-
Worst Year in 250	120,000	80,000	40,000	-
Worst Year in 500	135,000	80,000	55,000	-
Has the company reported above, its modeled earthquake losses using an Occurrence Exceedance Probability (OEP) basis?				Yes

	Amount	Factor	RBC Requirement
Net Earthquake Risk	75,000	1.000	75,000
Contingent Credit Risk for Earthquake Risk	30,000	0.048	1,440
Total Earthquake Catastrophe Risk (AEP basis)	0	1.000	0
Total Earthquake Catastrophe Risk (OEP basis)	76,440	1.000	76,440
Total Earthquake Catastrophe Risk			**76,440**

Table 95 provides the R_{cat} – Hurricane Catastrophe Risk portion of the calculation for Fictitious.

TABLE 95

R_{cat} Hurricane Charge for Fictitious Insurance Company
NAIC Risk-Based Capital 2018

R_{cat} - Hurricane Catastrophe Risk

	Modeled Losses (USD in 000s)			
Hurricane	**Direct & Assumed**	**Net**	**Ceded Amounts Recoverable**	**Ceded Amounts Recoverable with zero Credit Risk Charge**
Worst Year in 50	105,000	90,000	15,000	-
Worst Year in 100	125,000	105,000	20,000	-
Worst Year in 250	160,000	115,000	45,000	-
Worst Year in 500	210,000	135,000	75,000	-

Has the company reported above, its modeled Hurricane losses using an occurrence exceedance probability (OEP) basis? Yes

	Amount	Factor	RBC Requirement
Net Hurricane Risk	105,000	1.000	105,000
Contingent Credit Risk for Hurricane Risk	20,000	0.048	960
Total Hurricane Catastrophe Risk (AEP basis)	0	1.000	0
Total Hurricane Catastrophe Risk (OEP basis)	105,960	1.000	105,960
Total Hurricane Catastrophe Risk			**105,960**

Table 96 illustrates the calculation of the total R_{cat} risk charge for Fictitious.

TABLE 96

R_{cat} Charge for Fictitious Insurance Company
NAIC Risk-Based Capital 2018

Fictitious Insurance Company	
Total R_O Charge — Subsidiary Insurance Companies and Misc. Other Amounts	-
Total R_1 Charge — Fixed Income Asset Risk	553,398
Total R_2 Charge — Equity Asset Risk	4,303,948
Total R_3 Charge — Credit-Related Asset Risk	310,060
Total R_4 Charge — Underwriting Risk--Reserves	9,273,342
Total R_5 Charge — Underwriting Risk--Net Written Premium	3,574,411
R_{cat} Calculation – Catastrophe Risk	
Total Earthquake Catastrophe Risk	76,440
Total Hurricane Catastrophe Risk	105,960
Total R_{cat} Charge – Catastrophe Risk	**130,654**

THE RBC CHARGE FOR BASIC OPERATIONAL RISK

The basic operational risk charge considers the risk of financial loss resulting from operational events that have not already been reflected in existing risk charges. This includes the inadequacy or failure of internal systems, personnel, procedures, or controls, and external events. Additionally, this accounts for legal risk, excluding reputational risk from strategic decisions.

The operational risk charge uses a percentage or "add-on" charge of 3.00%, applied to the Total RBC After Covariance Before Basic Operational Risk. The operational risk charge is further reduced by the sum of offset amounts reported by directly owned life insurance company subsidiaries that prepare and file the Life RBC calculation, adjusted for the percentage of ownership in the directly owned life insurance company subsidiaries (but not to produce a charge that is less than zero).

Table 97 illustrates the final calculation of NAIC RBC, including basic operational risk, for Fictitious.

TABLE 97

NAIC Risk-Based Capital 2018 Fictitious Insurance Company	
Total R_0 Charge — Subsidiary Insurance Companies and Misc. Other Amounts	0
Total R_1 Charge — Asset Risk - Fixed Income	553,398
Total R_2 Charge — Asset Risk - Equity	4,303,948
Total R_3 Charge — Asset Risk - Credit	310,060
Total R_4 Charge — Underwriting Risk--Reserves	9,561,305
Total R_5 Charge — Underwriting Risk--Net Written Premiums	3,574,411
Total R_{cat} Charge – Catastrophe Risk	130,654
Total RBC After Covariance Before Basic Operational Risk	10,849,641
Basic Operational Risk	325,489
Total RBC After Covariance including Basic Operational Risk	11,175,131

RBC MODEL ACT

Each state's statutes define a minimum amount of capital that a company must have to obtain a license in that state. These amounts vary by state and by lines of business but are usually relatively low, from $1 million to $5 million. These minimum capital amounts do not account for the characteristics and risk level of individual insurance companies.

The purpose of RBC is to help regulators identify insurers that are in financial trouble and that need regulatory attention. Therefore, the RBC requirements attempt to individualize the minimum capital requirement for each insurer. RBC is not a target-level of capital that insurers should hold; rather, it computes a minimum level of capital adequacy that a company must have to operate.

The RBC requirement is a dollar amount calculated from the NAIC RBC formula. The RBC that results from the formula (Total RBC After Covariance including Basic Operational Risk) is compared to a company's Total Adjusted Capital. Total Adjusted Capital is equal to the company's policyholders' surplus from page 3 of the Annual Statement that is reduced by:

1. The amount of non-tabular discount from Schedule P, Part 1, Summary, columns 32 and 33.
2. Tabular discount on medical reserves included in Schedule P, Part 1, Summary, column 24.

Additionally, a property/casualty insurer that owns a life insurance company subsidiary adjusts its surplus for the same amounts as the life subsidiary does for RBC purposes, namely by adding back the asset valuation reserve and 50% of the dividend liability to surplus. All such affiliate amounts are adjusted by the company's percentage of ownership.

The "RBC ratio" is the name used in the insurance industry to describe the ratio of Total Adjusted Capital to Authorized Control Level (ACL). While discretionary, ACL is the point at which the insurance commissioner is authorized to take control over the company under the RBC Model Act. ACL is equal to 50% of the Total RBC After Covariance including Basic Operational Risk.

RBC ratio
= Total Adjusted Capital / ACL
= Total Adjusted Capital / (Total RBC After Covariance including Basic Operational Risk * 0.500)

Regulatory action is permitted when total adjusted capital is within 50 percentage points of the ACL (i.e., when the RBC ratio is 150% or less). This is called the regulatory action level.

Table 98 summarizes the level of regulatory control relative to the percentage of total adjusted capital to both the RBC and ACL benchmarks:

TABLE 98

Action Level	Total Adjusted capital as a % of ACL Benchmark	Action Required if Inside Range	
		By State Insurance Department	By Company
1. Company Action Level	150% to 200%	None initially	Must submit a plan of action within 45 days to the insurance commissioner of the domiciliary state explaining how the Company intends to obtain the needed capital or to reduce its operations or risks to meet the RBC standards.
2. Regulatory Action Level	100% to 150%	Commissioner has the right to issue an order specifying corrective actions (Corrective Order) to be taken by the insurance company, such as by restricting new business. However, all action by the state insurance department is discretionary; nothing is mandated.	Must submit a plan of action within 45 days to the insurance commissioner of the domiciliary state explaining how the Company intends to obtain the needed capital or to reduce its operations or risks to meet the RBC standards.
3. Authorized Control Level	70% to 100%	Regulatory action still discretionary, but the insurance commissioner is authorized to take control of the company.	None initially
4. Mandatory Control Level	Below 70%	Insurance commissioner of the domiciliary state must rehabilitate or liquidate the company.	None initially

As noted earlier, the detailed calculations of a company's risk charges are not available to the public. However, two metrics of RBC are disclosed in the Five-Year Historical Data exhibit of the Annual Statement: Total Adjusted Capital and the ACL. A company's RBC ratio can be calculated by dividing the Total Adjusted Capital by the ACL from the company's Five-Year Historical Data. Table 99 provides the RBC ratios for Fictitious from its 2018 Five-Year Historical Data exhibit.

TABLE 99

Data from Fictitious Insurance Company 2018 Five-Year Historical Data (USD)					
RBC Analysis	**2018**	**2017**	**2016**	**2015**	**2014**
28. Total adjusted capital	31,024,000	31,608,000	35,793,000	32,572,000	34,567,000
29. Authorized control level risk-based capital	5,588,000	6,097,300	5,854,000	5,685,000	6,517,000
Total adjusted capital as a percent of ACL (= line 28 / line 29)	555%	518%	611%	573%	530%

As displayed in Table 99, the company's RBC ratios have been well over 300 points above the Company Action Level, the first action level within the RBC framework, which ranges from 150% to 200% of ACL. Note how the 2018 ACL amount of $5,588,000 is 50% of the Total RBC After Covariance including Basic Operational Risk shown in Table 97.[186]

As shown in the Actuarial Opinion Summary in the Appendix of this publication, Fictitious Insurance Company's range of reasonable reserve estimates is $43 million to $57 million with an actuarial central estimate of $50 million and carried reserves of $51.557 million. If the high end of the range was to materialize, total adjusted capital would decrease by $5.443 million ($57 million - $51.557 million). At $25.581 million, the total adjusted capital would still be well above the company action level of $11.450 million (by $14.131 million). Some Appointed Actuaries look to the impact on capital resulting from a movement in reserves relative to the high end of the actuarial range for purposes of selecting a materiality standard (see Chapter 16. *Statement of Actuarial Opinion*) in their Statement of Actuarial Opinion.

According to the NAIC 2018 RBC instructions, 98.5% of property/casualty insurance companies usually fall within RBC levels that require no regulatory action (i.e., having Total Adjusted Capital in excess of 200% of ACL).[187] However, just because a company's RBC results do not require regulatory attention, it does not necessarily mean that the company is strong financially. RBC is intended to be one of a number of tools used by regulators to evaluate financial solvency and therefore should not be used in isolation.

TREND TEST

Companies with RBC ratios exceeding 200% are not necessarily free from regulatory attention. Companies with an RBC ratio of between 200% and 300% are subject to the trend test. The trend test serves as an early warning to state insurance regulators of companies that may be on a path to reporting an RBC ratio below 200%, thereby triggering the company action level. The trend test looks to see whether companies with an RBC ratio of between 200% and 300% also have a current year combined

[186] Note that the Authorized Control Level RBC of $5,587,565 is rounded to $5,588,000 in Table 12 and Table 99 for simplicity.
[187] NAIC, *RBC Property & Casualty 2018 Forecasting & Instructions,* page 48.

ratio that exceeds 120%. Companies meeting the trend test criteria are required to comply with the company action level requirements despite having an RBC ratio in excess of 200%.

The combined ratio is calculated as the sum of:

(1) Loss and LAE ratio
(2) Dividend ratio
(3) Expense ratio

The loss and LAE ratio is calculated as calendar year net incurred loss and LAE divided by net earned premium from the Statement of Income. The dividend ratio is equal to policyholders' dividends divided by net earned premium from the Statement of Income. The expense ratio is equal to other underwriting expenses incurred plus aggregate write-ins for underwriting deductions from the Statement of Income divided by net written premiums from the Underwriting & Investment Exhibit.

THE FUTURE OF RBC

Since its inception, the RBC model has continued to evolve and this chapter has captured the details of the calculation at a point in time. In particular, over the past decade the RBC formula has had substantial development as a consequence of the comprehensive review of the solvency framework in the U.S. performed as part of the NAIC's Solvency Modernization Initiative. Such changes included the addition of new catastrophe risk and operational risk charges as well as enhancements made to various existing risk categories, such as investments in affiliates and reinsurance credit risk.

In the future the principles behind the RBC calculation are unlikely to change substantially, although we are likely to see continued enhancements to the calculation to reflect evolving practices in the measurement and management of risk.

One initiative currently undertaken by the NAIC is the development of a Group Capital Calculation that will provide regulators with another regulatory tool to understand the level of risk across an entire insurance group, i.e., aggregating across all of its operations, to complement the RBC requirements that are applicable at the legal entity level.

The RBC calculation is likely to also remain a key component of an insurance company's annual Own Risk and Solvency Assessment ("ORSA"). First introduced in 2015, the ORSA is an internal process undertaken by an insurer to assess the adequacy of its risk management and current and prospective solvency positions under normal and severe stress scenarios.

CHAPTER 20. IRIS RATIOS

OVERVIEW

National Association of Insurance Commissioners (NAIC) Insurance Regulatory Information System (IRIS) has been used since 1972 to help insurance regulators evaluate the financial condition of insurance companies. More than 5,000 companies file their financial statements with the NAIC each year.[188] IRIS is applied to property/casualty, life/accident and health, and fraternal insurance organizations.

IRIS is known by practicing property/casualty actuaries as being a series of 13 tests of financial ratios relative to benchmarks (i.e., ranges of "unusual values"). These are called IRIS ratios. However, the IRIS ratios are only one component of IRIS. IRIS includes other tools and databases of financial information that are used by state insurance regulators to monitor the financial health of insurance companies.

The instructions for computing IRIS ratios are currently included as part of the CAS Exam 6 U.S. Syllabus of Basic Education. As a result, we will not go into details of the calculations here but rather will provide a brief overview of the IRIS ratios. In Appendix I of this publication, we walk through the calculation and purpose of each of the 13 IRIS ratios, provide possible explanations for unusual values, and show the results of the IRIS ratio calculations for Fictitious Insurance Company using data from the 2018 Annual Statement.

IRIS RATIOS

The IRIS ratios are grouped into four categories:

- Overall ratios
- Profitability ratios
- Liquidity ratios
- Reserve ratios

Many of the ratios are computed in terms of policyholder surplus, with the intent of providing an early warning of companies in financial distress. The results of each of these ratios are not reviewed in isolation. When reviewing the results of ratios and investigating unusual values, mitigating or augmenting circumstances brought to light through other ratios and information are considered.

The reserve ratios are probably the most important ratios to the property/casualty actuary and where the actuary places most attention, as these ratios are specifically commented on by the appointed actuary in the Statement of Actuarial Opinion (SAO).

There are three reserve ratios:

[188] Per the description of the publication *Ratio Results for the IRIS* on the NAIC and The Center for Insurance Policy and Research, NAIC Store, Financial Regulation Publication on IRIS, http://www.naic.org/store_pub_fin_receivership.htm#iris_results.

IRIS ratio 11: One-year reserve development to policyholders' surplus
IRIS ratio 12: Two-year reserve development to policyholders' surplus
IRIS ratio 13: Estimated current reserve deficiency to policyholders' surplus

These three ratios focus on the development of an insurance company's net loss and LAE reserves for purposes of understanding reserve adequacy. IRIS ratio 11 is the same one-year development test as provided in the Five-Year Historical Data exhibit within the Annual Statement. It measures development in the company's net loss and LAE reserves over the past year, whether adverse or favorable, relative to prior year surplus. Essentially, this test looks to see how much surplus would have been absorbed or enhanced in the prior year as a result of adverse or favorable development in the corresponding net loss and LAE reserves. Adverse development is shown as an increase to reserves and therefore a positive number. Results of IRIS ratio 11 equal to or greater than 20% are considered unusual.

IRIS ratio 12 is the same two-year development test as provided in the Five-Year Historical Data exhibit within the Annual Statement. It measures development in the company's net loss and LAE reserves over the past two years, relative to surplus at the end of the second prior year. Like ratio 11, results of IRIS ratio 12 equal to or greater than 20% are considered unusual.

IRIS ratio 13 is a hindsight test. It looks at a company's net outstanding loss and LAE reserves at the immediate prior two years relative to calendar year earned premium for those years and adds to the reserves development that has emerged over that period (one-year development for the immediate prior year; two-year development for the year prior to that). The test then applies the average of the resulting two "adjusted" loss ratios to earned premium for the recent year to determine what the outstanding loss reserve should be. A calculated deficiency in recorded loss and LAE reserves of 25% or more is deemed to be unusual.

The purpose of this test is to identify companies that may not have gotten their reserves "right" in the past. The expectation inherent in this test is if companies have had adverse development in the past, they will probably have adverse development in the future. Regulators want to see if companies who have had such adverse development have corrected for it in their current estimates.

INTERPRETING THE RESULTS OF THE SYSTEM

The IRIS results are used to prioritize insurers requiring further analysis through examination by the state insurance regulatory system. An unusual value does not necessarily mean that the insurer is financially impaired. The NAIC *IRIS Ratios Manual* states, "No state can rely on the tools' results as the state's only form of surveillance."[189]

[189] Ibid., page 2.

PART V. FINANCIAL HEALTH OF PROPERTY/CASUALTY INSURANCE COMPANIES IN THE U.S.

INTRODUCTION TO PART V

In Part IV. *Statutory Filings to Accompany the Annual Statement* we presented details underlying several filings either included within or supplemental to the statutory Annual Statement. These and other tools, including on-site financial examinations and Financial Analysis Solvency Tools (FAST, of which the IRIS System is a part), provide a means for the regulator to monitor the financial health of an insurance company. Many of these tools are confidential. However, certain results can be derived from publicly available information, such as the result of RBC, which is included within the Five-Year Historical Data exhibit in the Annual Statement.

The monitoring performed by regulators is risk-focused and intended to identify financially troubled companies well before they are impaired. Regulators use the tools collectively to evaluate financial health and prioritize those insurers requiring additional scrutiny and analysis.

While policyholders and investors place heavy reliance on state insurance regulators in monitoring the health of property/casualty insurance companies, they themselves have access to the publicly available tools, such as quarterly and Annual Statement filings, the Statement of Actuarial Opinion, and Securities and Exchange Commission filings (for publicly traded companies). Also, to assess financial health, they rely on ratings and analyses performed by credit rating agencies, such as A.M. Best, Moody's, Standard & Poor's and Fitch. Each of these rating agencies uses internally developed capital adequacy models to perform qualitative and quantitative financial strength assessments and establish a company's rating.

In this section we provide a summary of the tools used by regulators and stakeholders in monitoring an insurance company's financial health and briefly explain how these tools are used in practice.

CHAPTER 21. MEASUREMENT TOOLS

Before we discuss what the tools mentioned in the introduction do, it is important to disclose what they don't do.

First, each measurement tool provides one piece of evidence and should not be taken as the only evidence of a healthy or troubled insurance company. For example, an insurance company may have "usual" values for each of its Insurance Regulatory Information System (IRIS) ratios, but something about the company's exposures or a pending regulatory decision may result in a risk of material adverse deviation in the company's reserves, and such risk could be material to the company surplus. The risk of material adverse deviation would be discussed in the Statement of Actuarial Opinion (SAO) by the appointed actuary, and in reading that disclosure, the regulator would determine the necessary steps for further investigation. In this example, neither the results of the IRIS ratios nor the SAO should be considered alone; other information should be incorporated into an evaluation of an insurance company's health.

Second, these tools don't supplant the audit of an insurance company. In fact, the audited financial statements are themselves a tool used by the stakeholders and regulators of an insurance company. Further, these tools will not ensure that the data used as input into the tools is accurate and complete, nor will they provide any insight as to whether the company's management has good internal management, systems and controls in place. However, weaknesses in company management, systems and/or controls eventually leach into the output from the tools.

Finally, these tools will not identify fraud, which can be difficult to uncover.

WAYS IN WHICH THESE TOOLS ARE USED TO MEASURE FINANCIAL HEALTH

When viewed together, these tools can provide valuable insight into the financial health of a property/casualty insurance company. The information gathered from one tool may not in itself be an indicator but may prompt additional investigation, either through the evaluation of other tools or inquiry of company management.

Further, the results from a single year may not immediately suggest financial impairment; however, a review of these results over several years may identify a trend in that direction. When reviewed together and across multiple years, these tools can be used to provide an early warning of companies that are of higher risk for financial impairment.

Annual and quarterly financial statements and schedules

Insurance companies are required to file financial statements every quarter. To summarize what we learned in preceding chapters, substantial detail is contained in the annual filing (i.e., as of December 31), including qualitative information in the form of detailed notes to financial statements and interrogatories. These statements are filed under Statutory Accounting Principles. As discussed, statutory accounting focuses on protecting the policyholder and therefore is known as maintaining more of a conservative stance relative to Generally Accepted Accounting Principles. Assets and liabilities tend to be measured on a basis that includes some cushion in the event of financial impairment.

There are two perspectives of financial health measured by the statutory financial statement: balance sheet strength and earnings potential. In terms of balance sheet strength, regulators are concerned with an insurance company's claim-paying ability and therefore focus on areas that could impair solvency. Two such areas are loss and loss adjustment expense (LAE) reserve and unearned premium reserve adequacy. Loss and LAE reserves make up the largest item on the liability side of an insurance company's balance sheet, representing one-third of total Liabilities, Surplus and Other Funds at year-end 2018 for the U.S. property/casualty insurance industry. Coupled with unearned premium reserves, these liabilities represent nearly half of the total 2018 Liabilities, Surplus and Other Funds for all U.S. property/casualty insurers in aggregate.

The Five-Year Historical Data exhibit provides a historical view of how an insurance company's losses have developed over time. Additionally, the Notes to Financial Statements provide management discussion of changes in incurred loss and LAE. Data from Schedule P, Parts 2 through 4 can also be used to perform independent tests of a company's reserve adequacy.

Because loss reserves are stated on a net of reinsurance basis on the balance sheet, reinsurance collectability is also an area of risk relative to the statutory financial statements. The provision for reinsurance is established on the liability side of the balance sheet to offset some of this risk by excluding a portion of reinsurance recoverables from unauthorized and overdue authorized reinsurers. Despite the establishment of the provision for reinsurance, reserve credit risk still exists. The Notes to Financial Statements are a means to identify reinsurance that is unsecured, uncollectible or in dispute. And Schedule F, Part 3 can be used to identify the company's reinsurers so that additional review of the reinsurers' financial strength can be performed. For example, the credit rating of each reinsurer can be determined from recognized rating agencies, such as those mentioned later in this chapter.

Accident-year loss and LAE ratios from Schedule P, Part 1 provide insight into the adequacy of claim reserves and unearned premium reserves. For example, property/casualty actuaries look at current accident year incurred loss and LAE ratios by line of business relative to prior year ratios adjusted for rate change and trend. Deviations from anticipated trends are typically investigated to assess adequacy of loss and LAE ratios on the current accident years. To illustrate, for a line of business experiencing loss trend of +5% and rate change of -3% on premiums earned in 2019 over 2018, one might initially expect the accident year 2019 loss and LAE ratio to be approximately 8% higher (= 1.05 / 0.97 - 1) than that for

2018. That is, if the accident year 2018 loss and LAE ratio was 60%, one would expect the accident year 2019 ratio to be 65% (60% * 1.08). If the loss and LAE recorded in Schedule P, Part 1, for accident year 2019 was 55%, one might question the rationale behind an improvement in loss ratio, when deterioration was expected.

Additionally, deficiencies in loss and LAE reserves or current accident-year loss and LAE ratios in excess of 100% lead to further investigation of whether the unearned premium is adequate to cover losses that will emerge as premium is earned. In performing such an investigation, consideration is often made for investment income.

In terms of the asset side of the balance sheet, property/casualty insurance companies tend to invest in short-duration, relatively liquid fixed-income investments. Nearly 50% of the assets held by U.S. property/casualty insurers at year-end 2018 were in bonds. However, the financial crisis in 2008 taught us that even conservative investment strategies can pose a risk to insurance companies. Changes in asset values and yields on invested assets are monitored to assess this risk.

Further, investment in asset classes where the level of risk exceeds industry norms stimulates investigation of the hedging strategies a company has in place to mitigate risk.

While a company's balance sheet may appear financially solid, future earnings can be impaired by a company's underwriting, pricing and investment strategy. Although the Annual Statement schedules and exhibits may not be able to uncover a weakening in earning strength on their surface, trends in financial ratios and other analysis of year-over-year changes in income statement line items can provide an early warning. Examples of such trends include:

- Rapid and substantial growth in written premium and the timing of such growth relative to the underwriting cycle: In soft markets it is difficult to achieve significant growth without concessions on price or commission levels. The Five-Year Historical Data provides historical premium volume on a gross and net basis to assist in measurement of a company's growth.

- Increases in underwriting (or other) expense ratios: This may also be a sign that an insurer is conceding commission to grow or maintain business. Increases in commissions or other expenses mean that there is less premium available to pay losses. The income statement and Part 3 of the Underwriting and Investment Exhibit (U&IE) and the Insurance Expense Exhibit (IEE) are sources of this data.

- Deteriorating loss ratios: Historical loss ratios can be observed on a calendar-year basis in the Five-Year Historical Data or by accident year and line of business in Schedule P. Deterioration in loss ratios implies that pricing is not keeping pace with the underlying risk being underwritten. Further investigation into a company's price monitoring practices relative to peer benchmarks and ability to increase rates would be warranted.

- Increased exposure to catastrophic or large events: A review of writings by state in Schedule T and writings by line of business per the U&IE can help to identify catastrophe exposure. A company with premium concentration in Florida homeowners business suggests that the company may have increased exposure to hurricane risk. Further, a review of Part 2 of the general interrogatories provides information regarding a company's probable maximum loss and provisions in place to protect the company against such loss, such as a catastrophic reinsurance program.

- Losses on investments, change in mix of invested assets by class and/or declining yields on investment assets: Such trends may suggest a change in a company's investment strategy or lack of control in the strategy.

- Increases in the provision for reinsurance: Changes in the provision for reinsurance, as displayed in the capital and surplus account of the income statement, can be a sign of increased credit risk.

Quarterly statements provide more limited information than what is included in the annual filing. However, the primary financial statements remain in the same general format (i.e., Assets page; Liabilities, Surplus and Other Funds; Statement of Income; Cash Flow; and Notes to Financial Statements), as do many of the schedules. The evaluation date is the quarter-end and comparisons are made to the prior year-end. From the perspective of a property/casualty actuary, the biggest difference is that quarterly statement does not include Schedule P. Schedule P is replaced with a schedule titled "Part 3," which shows loss and LAE reserve development during the quarter for the latest three accident years and all years prior, for all lines of business in the aggregate. While this schedule provides a gauge of retrospective reserve strength during the current year, it does not provide all of the line of business detail that is provided annually in Schedule P.

There is a wealth of information contained in the annual and quarterly statements. But because more than 5,000 companies file their statements, state regulators of insurance companies may not have the resources available to analyze these filings in detail for every company domiciled or licensed to write business in their state. Rather, regulators rely on the other tools coupled with the financial statements and schedules to prioritize those companies of greatest risk of financial impairment.

IRIS

As discussed in Chapter 20. *IRIS Ratios*, IRIS is one tool used by regulators. The IRIS ratios focus on balance sheet strength and the earnings quality through measures that assess growth, profitability, liquidity, and reserve development/adequacy.

Although the IRIS ratio results are not widely available to the public, they can be calculated directly from an insurance company's Annual Statement. We have done so for Fictitious in Appendix I of this publication.

While there is no direct link to regulatory intervention based on the results of these ratios, the results of the IRIS values are considered by regulators in conjunction with other solvency monitoring tools, such as Risk-Based Capital (RBC), to prioritize those insurance companies requiring immediate regulatory attention.

RBC

RBC is another tool that considers balance sheet strength and future earnings. Balance sheet risk is considered in the asset risk charges (R_0 through R_3), while profitability of future writings is contemplated through the underwriting risk charges (R_4 and R_5) and the catastrophe risk charge (R_{CAT}).

The calculations underlying an insurance company's RBC are confidential and cumbersome to perform without using the spreadsheet provided with the NAIC instructions. However, the results of the RBC formula are provided in the Five-Year Historical Data exhibit within the Annual Statement. Stakeholders are able to review overall results and monitor changes over time.

RBC considers the risks and relative size of an insurance company in computing a required level of capital, whereas under IRIS, no adjustments are made to reflect what would be "usual" for an individual insurance company. Unlike IRIS, there is a direct link to regulatory intervention based on a comparison of the RBC level of required capital to the company's total adjusted capital. The NAIC RBC Model Act provides regulators with the authority to take control of a property/casualty insurance company if the company's RBC ratio falls below 100% of the ACL.

RBC isn't a fail-safe test for financial impairment. While certain of the RBC factors consider a company's own experience, the majority of the factors used to determine the level of required capital are based on industry-wide factors developed by the NAIC. As a result, while a company's RBC ratios may not require any specific action by the company management or regulatory authorities, this doesn't mean that the company is safe from future impairment.

The trend test is one way that the RBC results are used to identify companies that may become financially impaired. The purpose of the trend test is to identify companies likely to fall in the company action level RBC in the coming year and require those companies to take action before that happens.

The trigger for application of company action within the trend test is having an RBC ratio within 100 points of the company action level RBC, coupled with a current-year combined ratio of more than 120%.

SAO

The SAO provides assurance of a qualified actuary that the company's loss and LAE reserves are reasonable on a gross and net of reinsurance basis. It is not an opinion on the solvency of an insurance company but an opinion on the adequacy of what is typically the largest item on an insurance company's balance sheet. Significant deviations in this balance may have a material impact on a company's solvency. Therefore, the actuary will provide commentary of any significant uncertainties or risks that could result in a material adverse deviation in the company's recorded reserves.

A determination by the appointed actuary that the reserves are anything other than "reasonable" and relevant comments that indicate there is are significant risks and/or uncertainties that could result in material adverse deviation are two triggers of additional scrutiny by regulatory authorities.

One thing the SAO does not tell the reader is the company's reserve position within the appointed actuary's range, if the appointed actuary calculates a range. A company that is exposed to significant risks and uncertainties, with reserves lying at the lower bound of the actuary's range, would be subject to greater concern than a company exposed to the same level of risk with reserves in the high end of the appointed actuary's range. There is no document available for public review, which includes rating agencies, that contains the appointed actuary's range. The appointed actuary's range is contained in the Actuarial Opinion Summary (AOS), SAO documentation report, and usually found in the work papers of the company's external auditors.

As noted previously, the AOS is a confidential document, for regulators only. The actuarial report contains the range; however, these reports contain restrictions on distribution and use, due to their confidential nature, and therefore are not widely distributed. Similarly, while audit work papers may be subpoenaed for cause, they are not publicly available.

AOS

The AOS is valuable in providing the regulator with context as to the company's reserve adequacy by providing the company's position relative to the appointed actuary's point estimate or range, if calculated, on a net and gross of reinsurance basis. It also provides details that explain to the regulator the cause for adverse development in the company's reserves over the past five years, where such development has exceeded 5% of surplus in three of those years. The AOS is also a confidential document that is only shared with the insurance company's state regulator.

Credit Rating Agencies

Stakeholders also rely on financial strength ratings (FSRs) issued by credit rating agencies (CRAs) in the evaluation of financial health. FSRs represent a CRA's evaluation of an insurance company's ability to

meet ongoing obligations to its policyholders. This is in contrast to debt/issuer credit ratings, which are also provided by CRAs. Debt/issuer ratings represent the CRA's evaluation of a company's ability to meet debt obligations. Debt/issuer credit ratings are provided on the creditworthiness of the entity as a whole or on individual debt instruments.

Of the CRAs that rate insurance companies, A.M. Best is the only one that focuses exclusively on the insurance industry, providing FSRs and debt/issuer ratings. A.M. Best rates thousands of insurance entities across the globe. Other CRAs, such as Standard & Poor's (S&P), Moody's and Fitch serve a wide range of industries (ranging from aerospace to utilities, financial institutions and the public sector) and are prevalent in the area of debt/issuer ratings.

Ratings are based on qualitative and quantitative analysis of a company's financial statements and organization. Each CRA uses its own criteria. Qualitative factors can include corporate governance, product development, composition of capital structure, asset quality, investment strategy, reserve adequacy, claims management, contingent assets and liabilities, and the level of reinsurance dependency. Quantitative analysis includes running a company's financial data through capital adequacy models. Each CRA has its own internally developed model that computes required capital levels. Similar to RBC, the required capital levels are computed and compared to an insurer's capital to produce a ratio that translates to letter ratings. Examples of CRA models include Best's Capital Adequacy Ratio and S&P's Capital Adequacy Ratio.

The higher the rating, the greater the ability the company is deemed to have to meet its ongoing insurance obligations. The ability to meet ongoing insurance obligations generally diminishes as ratings decrease. For example, A.M. Best's FSR scale includes 7 rating symbols from A+ (superior) to D (poor), with rating notches applicable to symbols A+ through C (weak) to reflect a gradation of financial strength denoted by an additional "+" or "-". With the rating notches there are a total of 13 FSR designations. There are also 4 non-rating designations of E (in conservation or rehabilitation), F (in liquidation), S (rating suspended) and NR (not rated).[190] Regardless, the CRAs provide no guarantee that the insurance company will be able to meet its obligations.

FSR ratings are generally established annually, with ongoing monitoring performed by the CRA analyst throughout the year to evaluate the impact of developments on a company's rating. Ongoing monitoring includes review of the following:

- Statutory financial statement filings
- Interim management reports and other information provided by the insurer to the rating agency
- Significant public announcements, including earnings releases/calls, made by the entity

[190] A.M. Best, Ratings & Criteria Center, *Best's Financial Strength Rating,* http://www.ambest.com/ratings/guide.pdf, 2019.

A rating action or review can be considered at any time that A.M. Best becomes aware of significant development in the insurer's operations.

The following provides examples of the uses of FSRs by stakeholders of insurance companies:

- Individual and corporate policyholders want to make sure the insurance company will be there when needed to pay claims. They therefore look to the FSR as an indicator in their insurance buying decisions, weighing the company's rating against the cost of insurance.
- Many boards of directors of corporate policyholders require that their organization's insurance purchases are made with highly rated insurance companies. After the financial crisis, many large corporations required insurance companies to include cancellation endorsements to allow the insured to cancel without penalty if the carrier was downgraded below a certain level(s) by recognized CRAs.
- Insurance companies will also look at FSRs of reinsurers in making reinsurance buying decisions.
- Investors look at FSRs in their decision to invest in an insurance company, weighing risk relative to the company's rating with expected return.

HOW THESE TOOLS HAVE FARED — INDICATORS OF INSURANCE COMPANY INSOLVENCIES OVER THE PAST 40 YEARS

The measurement tools discussed in this publication are designed to assist in predicting or preventing all insurance company failures, but it is impossible for a tool to work in all circumstances. The intent, however, is that they identify the vast majority before it's too late.

Over the years, studies have been performed to detect the cause of insurance company failure and therefore sharpen the tools that are available to monitor solvency. The American Academy of Actuaries (AAA) has issued three such studies that, collectively, have examined property/casualty insurance company insolvencies over a 40-year period, from 1969 through 2009. The following contains the results of these studies and common themes observed in insolvent companies prior to their demise.

The AAA Property/Casualty Financial Soundness/Risk Management Committee (the FSRM) published a report in September 2010 titled *Property/Casualty Insurance Company Insolvencies*. This report revisited the issue of insurance company solvencies, which was examined in two previous studies in the 1990s by AAA, one based on property/casualty insurance company insolvencies over the period 1969 to 1987 and the other from 1988 to 1990. The AAA's research included submitting a questionnaire to insurance regulators on the causes of the insurance company failures over that time period. In each period, "under-reserving" and "mismanagement" were the first and second most frequently cited cause of insurance company insolvencies.

Given that the adequacy of loss reserves was historically cited as the primary cause of insolvency in the prior two studies, the 2010 report focused on the performance and characteristics of companies having the largest reserve deficiencies. Additionally, the FSRM studied five years' worth of historical financial

data for 36 property/casualty insurance companies that became insolvent over the period 2005 to 2009 for commonalities. The 2010 report concluded the following:

- Insolvency is caused by a combination of factors. "Under-reserving" is a factor in the insolvency of property/casualty insurance companies but "is not the leading cause of insolvency." [191]
- Size, experience and diversification matters. "The majority of the companies was small, relatively new, and/or was concentrated in one line of business and/or state."[192]
- Good management and governance is essential. "The review of financial data for many of the companies showed evidence of poor management and decision-making, including little or no reinsurance, inadequate reinsurance for the amount of risk, very rapid premium growth, significant adverse development, inadequate pricing, and potentially serious data problems."[193]

The report also studied the SAO as an indicator of financial impairment over the immediate five years prior to insolvency. The FSRM concluded that the SAO alone is not a backstop for insurance company insolvencies, but it "can help identify those companies and/or categories of companies that could be in trouble."[194] Where opinions were available, the FSRM observed the following:

- Only one SAO was qualified, and the remaining were "reasonable" reserve opinions.
- Nearly 50% of the SAOs concluded that a risk of material adverse deviation existed in the company's loss and LAE reserves, 37% concluded that such a risk did not exist, and the remainder of the SAOs either did not comment on the risk of material adverse deviation or it wasn't clear if the appointed actuary deemed a risk of material adverse deviation existed.
- When stated, materiality standards were generally based on a percentage of surplus (between 5% and 20%).

We note that the NAIC *Actuarial Opinion Instructions* and Actuarial Standards of Practice issued by the Actuarial Standards Board have continued to include enhancements on disclosure requirements within the SAO since the period studied.

The commonalities identified in the above studies provide us with areas of focus when evaluating the tools used to measure financial health. The key message is that financial impairment is caused by a variety of factors, and the measurement tools discussed in this publication, when considered in unison, can help detect companies at risk for financial impairment.

[191] American Academy of Actuaries Property/Casualty Financial Soundness/Risk Management Committee. *Property/Casualty Insurance Company Insolvencies,* September 2010, page 5.
[192] Ibid., page 16.
[193] Ibid.
[194] Ibid., page 18.

PART VI. DIFFERENCES FROM STATUTORY TO OTHER FINANCIAL/REGULATORY REPORTING FRAMEWORKS IN THE U.S.

INTRODUCTION TO PART VI

As discussed in Part III. *SAP in the U.S.: Fundamental Aspects of the Annual Statement*, U.S. Statutory Accounting Principles (SAP) focuses on the solvency of insurance companies. However, other frameworks exist for solvency, general purpose financial reporting, and taxation. In this section we will examine these other frameworks, beginning with general purpose financial reporting.

The framework in the U.S. for general purpose financial reporting is U.S. Generally Accepted Accounting Principles (GAAP). We will focus on the key differences between U.S. SAP and U.S. GAAP. We will also study the importance of accounting for business combinations and consider calculations that involve actuaries in fair valuing the balance sheet in accordance with the requirements of U.S. GAAP. We will provide an overview of the emergence of International Financial Reporting Standards as a general purpose financial reporting framework. We will also provide a brief overview of the European regulatory framework known as Solvency II. Finally, we will discuss financial reporting for tax purposes.

CHAPTER 22. U.S. GAAP[195], INCLUDING ADDITIONAL SEC REPORTING[196]

OVERVIEW

U.S. Generally Accepted Accounting Principles (GAAP)for public companies is, by statute, determined by the Securities and Exchange Commission (SEC). The SEC has effectively delegated this responsibility since its inception to the private sector. Currently, the SEC looks to the Financial Accounting Standards Board (FASB) as the organization for establishing standards of financial accounting. In 2009, the FASB codified U.S. GAAP by publishing its Accounting Standards Codification (ASC). The ASC replaced several sources of authoritative U.S. GAAP literature from various standard setters. These sources included:

1. FASB
    a. Statements (FAS)
    b. Interpretations (FIN)
    c. Technical Bulletins (FTB)
    d. Staff Positions (FSP)
    e. Staff Implementation Guides (Q&A)
    f. Statement No. 138 Examples.
2. Emerging Issues Task Force (EITF)
    a. Abstracts
    b. Topic D.
3. Derivative Implementation Group (DIG) Issues
4. Accounting Principles Board (APB) Opinions
5. Accounting Research Bulletins (ARB)
6. Accounting Interpretations (AIN)
7. American Institute of Certified Public Accountants (AICPA)
    a. Statements of Position (SOP)
    b. Audit and Accounting Guides (AAG) — only for incremental accounting guidance
    c. Practice Bulletins (PB)
    d. Technical Inquiry Service (TIS) — only for Software Revenue Recognition

References to the newly codified standards usually start with the letters ASC followed by a series of numbers. Insurance specific guidance can be found in Section 944. For example, the definition of the measurement approach to unpaid claims estimates under U.S. GAAP can be found at ASC-944-40-30-1. It states: “The liability for unpaid claims shall be based on the estimated ultimate cost of settling the claims (including the effects of inflation and other societal and economic factors), using past experience

[195] Aligns with IASA Chapter 14.
[196] Aligns with IASA Chapter 15.

adjusted for current trends, and any other factors that would modify past experience." A free basic version of the ASC is available, after registering, at https://asc.fasb.org/.[197]

Historically, U.S. GAAP formed the foundation of U.S. Statutory Accounting Principles (SAP). From this foundation, U.S. SAP evolved over time (on a state by state basis), incorporating many modifications and exceptions to U.S. GAAP in the interest of establishing a more conservative accounting framework with a focus on solvency. In the 1990s, the National Association of Insurance Commissioners (NAIC) undertook a project (Codification) to consolidate the myriad state-based rules and exceptions to U.S. GAAP into a cohesive set of accounting principles. included in the NAIC *Accounting Practices and Procedures Manual*. SAP still remains the prerogative of each individual state; however, Codification provides a consistent and comprehensive framework of accounting and reporting guidance for each state insurance department to consider. As new pronouncements are made under U.S. GAAP, they are reviewed by the NAIC's Statutory Accounting Principles Working Group, which decides whether to adopt, reject or modify it for NAIC SAP. In turn, each state may accept what the NAIC has produced or adopt deviations or develop exceptions to the guidance that would apply to insurance entities domiciled in that state.

The fundamental difference between U.S. SAP and U.S. GAAP is driven by the intended user. U.S. SAP is intended for use by state insurance regulators and is thus focused on an insurance company's ability to pay claims, emphasizing the adequacy of surplus in the balance sheet. This is generally viewed as conservative-leaning philosophy to provide an element of margin if the regulator would need one day to step in to settle all current liabilities while not writing any new business. U.S. GAAP is primarily intended for use by investors and creditors and has historically been focused on the measurement of earnings emergence, through the income statement, over a specified reporting period. Given the objective of U.S. SAP, it is not surprising that it is viewed as a conservative basis of accounting in comparison to U.S. GAAP.

There are many differences between U.S. GAAP and U.S. SAP, but we will focus on those that actuaries need to be familiar with:

- Deferred acquisition costs (DAC)
- Premium deficiency reserves (PDR)
- Nonadmitted assets
- Deferred tax assets (DTAs)
- Invested assets
- Balance sheet presentation of reinsurance
- Ceded reinsurance — prospective and retroactive
- Structured settlements
- Anticipated subrogation and salvage
- Discounting of loss reserves

[197] FASB, *Accounting Standards Codification,* https://asc.fasb.org/, 2012.

- Goodwill under purchase accounting

DEFERRED ACQUISITION COSTS

DAC is an asset that is established under GAAP to defer the recognition of acquisition expenses to match the recognition of earned premium. Beginning in 2012, the deferral of acquisition costs is limited to those direct costs (i.e., those which would not have been incurred if the contract had not been entered into) related to the successful acquisition or renewal of a contract. In addition, certain direct marketing advertising costs can be deferred under very limited circumstances. All other expenses, either direct or indirect, must be expensed as incurred.

Certain companies are permitted to limit the capitalization (deferred expenditure) of DAC to those expenses they had been capitalizing prior to 2012 if they previously had not been capitalizing all expenses that met the definition of direct expenses related to the successful acquisition or renewal of insurance contracts. Capitalization of acquisition costs, through the establishment of a DAC asset, is not permitted under SAP. Therefore, all acquisition costs are expensed to current operations as incurred. This is keeping with the conservative philosophy of SAP.

Under SAP, if the ceding commission under a reinsurance agreement exceeds the anticipated acquisition cost of the business ceded, the ceding entity shall establish a liability, equal to the difference between the anticipated acquisition cost and the reinsurance commissions received, to be amortized over the effective period of the reinsurance agreement in proportion to the amount of coverage provided under the reinsurance contract. For example, when the commission rate of a company's direct business is 10% and the ceding commission rate charged for the business ceded is 20%, it is likely that after considering all other anticipated direct acquisition costs, the ceded commission is still higher than the direct acquisition cost of the business being ceded. While the recognition of a DAC asset is not permitted, and the corresponding direct acquisition costs should be expensed to current operations, in this example, a net liability must be recognized by the ceding entity, reported as a write-in liability item on the balance sheet rather than a gain to the current operations. This effectively defers the gain until such time as the premium is earned.

PREMIUM DEFICIENCY RESERVES

Under both GAAP and SAP, a PDR must be recognized with a charge to current operations when the unearned premium reserve (UPR) is insufficient to cover the anticipated losses, loss adjustment expenses, commissions and other acquisition costs, and maintenance costs associated with the unexpired exposure. When a company performs the premium deficiency analysis, insurance contracts should be grouped in a manner consistent with how policies are marketed, serviced and measured. A liability should be recognized for each policy grouping where a premium deficiency is indicated. Premium deficiency from one policy grouping cannot be offset by expected profits from any other grouping.

Under both GAAP and SAP, a company is allowed to include anticipated investment income in the premium deficiency analysis.

The major difference in the calculation of premium deficiency liability between GAAP and SAP is that under SAP, commissions and other acquisition costs should not be included to the extent that the related amounts have previously been expensed rather than established as an asset.

The table below, using three numerical examples, illustrates the difference in the calculation of premium deficiency liability between GAAP and SAP:

TABLE 100

Policy Grouping	UPR	Present Value of Total Expected Loss	Anticipated Investment Income	DAC	GAAP-basis Expected Profit	GAAP-basis Premium Deficiency Calculated	SAP-basis Expected Profit	SAP-basis Premium Deficiency Calculated
	(1)	(2)	(3)	(4)	(5) = (1) – (2) + (3) – (4)	(6)	(7) = (1) – (2) + (3)	(8)
A	$10,000	$8,000	$500	$2,000	$500	$0	$2,500	$ -
B	$10,000	$9,000	$500	$2,000	$(500)	$500	$1,500	$ -
C	$10,000	$12,000	$500	$2,000	$(3,500)	$3,500	$(1,500)	$ 1,500

Balance Sheet Presentation of Deferred Acquisition Costs and Premium Deficiency Reserves

Under GAAP, DAC is established as an asset and is presented net of ceded DAC. If a PDR is calculated, it first lowers the recorded DAC asset; once the DAC asset is exhausted, a separate PDR liability should be established.

Under SAP, any premium deficiency is either included in the UPR balance or reported as a write-in liability item.

The table below illustrates the difference in the presentation of DAC and PDR between GAAP and SAP.

TABLE 101

Policy Grouping	Original DAC	GAAP-basis Premium Deficiency Calculated	GAAP-basis DAC Asset	GAAP-basis PDR Liability	SAP-basis Premium Deficiency Calculated	SAP-basis DAC Asset	SAP-basis PDR Liability
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
1	$2,000	$ -	$2,000	$ -	$ -	$ -	$ -
2	$2,000	$500	$1,500	$ -	$ -	$ -	$ -
3	$2,000	$3,500	$ -	$1,500	$1,500	$ -	$1,500

NONADMITTED ASSETS

As discussed in Part III. *SAP in the U.S.: Fundamental Aspects of the Annual Statement*, SAP is focused on the ability of an insurance company to pay claims. To reflect that certain assets are not readily liquid, they are considered nonadmitted for purposes of determining the company's statutory surplus. One such example is furniture, fixtures and equipment.

For other asset categories, matters are more complicated as they may be partly admitted and partly nonadmitted. One such asset category is DTAs.

DEFERRED TAX ASSETS

Under GAAP and SAP, deferred taxes are established for temporary differences in the accounting and tax treatment of all assets and liabilities. For example, discounting of loss reserves for tax purposes but not for accounting purposes leads to a deferred tax asset. This is because you pay tax based on income (revenue minus expenses) under the tax accounting basis. If liabilities incurred are discounted for tax purposes, this leads to higher income, which produces more tax for the taxing authorities. But the discount on incurred losses will unwind over time and create an expense that will reduce future taxable income. Some or all of this reduction to future taxable income is what is recorded as a DTA.

The primary difference between GAAP and SAP is in the treatment of DTAs. For GAAP, DTAs are fully recognized, and a valuation allowance is established if, based on the weight of evidence, it is more likely than not that the DTAs will not be realized. GAAP establishes a hierarchy of evidence to be considered. This is a subjective determination requiring management to use significant judgment. Under SAP, there is a strict admissibility test for all DTAs in addition to the establishment of a valuation allowance. This can lead to recognition of less DTAs in SAP basis financial statements. Since January 1, 2012, the admitted portion is calculated as the sum of the following three components:[198]

1. Federal income taxes paid in prior years that can be recovered through loss carrybacks for existing temporary differences that reverse during a timeframe corresponding with IRS tax loss

[198] This recent change is not reflected in the 2007 Feldblum taxation CAS Study Note.

carryback provisions[199] (not to exceed three years), including the amount established for tax loss contingencies related to those periods.

2. The amount of DTA expected to reverse during the forthcoming period (up to a maximum of three years), limited to a percentage of surplus. The period and percentage of surplus is determined based on the company's ratio of total authorized capital (with some adjustments) to authorized control level (ACL) Risk-Based Capital (RBC). For example, the December 31 ratio is calculated based on the Authorized Control Level RBC for the current reporting period, which is in process of being filed with the company's state of domicile. Different rules apply for non-RBC reporting entities such as mortgage guarantee insurers.
3. The amount of DTA after application of the first and second components that can be offset against existing DTLs. The character (i.e., ordinary vs capital) of the DTAs and DTLs must be taken into consideration. Ordinary DTAs can be admitted by offset with ordinary DTLs and/or capital DTLs; however, capital DTAs can only be admitted by offset with capital DTLs.

INVESTED ASSETS

Under SAP, investment-grade bonds and higher quality redeemable preferred stocks are held at cost or amortized cost while below-investment-grade bonds and lower quality redeemable preferred stocks are held at the lower of cost, amortized cost or fair value. All common stock and higher quality perpetual (i.e., non-redeemable) preferred stock are recorded at fair value. Lower quality non-redeemable preferred stock are held at the lower of cost or fair value. Changes in the carrying value of investments attributed to changes in fair value are recorded directly to surplus.

The accounting treatment of investment-grade bonds appears to be inconsistent with the conservative philosophy of SAP. In the case of increasing interest rates, the market value of older investment-grade bonds issued at a lower interest rate will decrease. Yet SAP allows for the asset to be carried at the higher amortized cost value. One possible explanation for this is that the difference is only temporary if the bond is held until maturity, as is typically done by most property/casualty insurers.

Effective December 31, 2017, SAP adopted a revised definition of bonds that identifies certain non-bond types of non-bond investments as SVO-identified investments that receive special statutory accounting treatment under the new guidance. These specifically identified investments shall be treated in the same way as those included in the revised definition of bonds. The new guidance also introduces the concept of systematic value for SVO-identified investments and allows a company to elect the use of a documented systematic approach to value its higher quality SVO-identified investments if certain conditions are met. SVO-identified investments for which the company has not made this election, or do not qualify for the use of systematic value, should be measured and reported at fair value. Net asset value (NAV) is allowed to be used as a practical expedient to fair value for these investments.

[199] Under the Federal Internal Revenue Code, for nonlife insurance entities, ordinary losses can be carried back two years, while capital losses can be carried back three years.

The table below summarizes the accounting treatment under SAP for investments in bonds, common stocks, preferred stocks and SVO-identified investments[200]:

TABLE 102

Investment Type	NAIC Designation	Book Value
Bonds (both long-term and short-term)	1-2	Amortized cost
Bonds (both long-term and short-term)	3-6	Lower of amortized cost or fair value
Common Stocks	N/A	Fair value
Redeemable Preferred Stocks	1-2	Cost or amortized cost
Nonredeemable Preferred Stocks	1-2	Fair value
Redeemable Preferred Stocks	3-6	Lower of cost, amortized cost or fair value
Nonredeemable Preferred Stocks	3-6	Lower of cost or fair value
SVO-Identified Investments	1-2	Fair value unless systematic value is elected
SVO-Identified Investments	3-6	Fair value

Under U.S. GAAP, financial instruments such as bonds and stocks are classified as Available-For-Sale (AFS), Held-To-Maturity (HTM) or trading securities. The acquiring entity classifies the financial instrument at the time of acquisition, and the appropriateness of the classification is reassessed at each reporting date. If a security is acquired with the intent of selling it within hours or days, the security is classified as trading. However, at acquisition an entity is not precluded from classifying a security as trading if it plans to hold it for a longer period. Trading securities include both debt and marketable equity securities. Trading securities are recorded at fair value with changes in fair value recorded in the income statement. Investments in debt securities are classified as HTM only if the reporting entity has the positive intent and ability to hold those securities to maturity. Equity securities cannot be classified as HTM because they do not have a stated maturity date. HTM debt securities are recorded at amortized cost. Investments in debt securities and equity securities that have readily determinable fair values not classified as either trading securities or HTM securities are classified as AFS securities. The AFS category is the default or residual security classification. AFS securities are recorded at fair value with changes in fair value reported in other comprehensive income (OCI), resulting in a direct change to the value of U.S. GAAP equity, rather than changes in their fair value flowing through the income statement. Most property/casualty companies' financial instruments are classified and measured as AFS.

BALANCE SHEET PRESENTATION OF CEDED REINSURANCE

U.S. GAAP requires, due to limited rights to offset assets and liabilities, that liabilities be presented gross on the balance sheet with a separate asset for anticipated ceded reinsurance recoveries. SAP

[200] Per SSAP No. 26R, SVO-identified investments refer to certain Exchange Traded Funds and Bond Mutual Funds that shall be treated as if they were bonds under the new guidance. For these investments, net asset value (NAV) is allowed as a practical expedient to fair value. The use of a systematic value is an irrevocable election. SSAP No.26R is effective December 31, 2017, but these investments shall be reported at their systematic value, if elected, starting on January 1, 2018.

requires the balance sheet presentation of liabilities on page 3 of the Annual Statement to be presented net of ceded reinsurance. Schedule P provides additional detail on the gross liabilities.

Using the Fictitious Insurance Company as our example, we have created the table below illustrating how the balance sheet presentation differs between GAAP and SAP for the line items associated with ceded reinsurance. The table shows how the SAP-basis balances illustrated correspond to the specific line items on the annual statement of the Fictitious Insurance Company (see Appendix I).

TABLE 103

GAAP basis		
Assets:		
Reinsurance Recoverables		
On Paid Losses	$ 426,000	
On Unpaid Losses	$ 10,142,000	
Prepaid Reinsurance Premiums	$ 920,000	
Liabilities:		
Reserve for Losses and Loss Adjustment Expenses	$ 61,699,000	
Ceded Reinsurance Premium Payable (Net of Ceded Commission)	$ 440,000	
Unearned Premium Reserve	$ 12,815,000	
SAP basis		
		AS Line
Assets:		Page 2
Reinsurance Recoverables		
On Paid Losses	$ 426,000	16.1
Liabilities:		Page 3
Reserve for Losses and Loss Adjustment Expenses	$ 51,557,000	1+3
Ceded Reinsurance Premium Payable (Net of Ceded Commission)	$ 440,000	12
Unearned Premium Reserve	$ 11,895,000	9
Provision for Reinsurance	$ 283,000	16

CEDED REINSURANCE — PROSPECTIVE AND RETROACTIVE

The accounting for reinsurance depends on whether the reinsurance contract covers future or past insured events. The latter is called retroactive reinsurance and the former prospective reinsurance. The difference between SAP and U.S. GAAP for prospective reinsurance is limited to balance sheet presentation. illustrated in Table 103 above.

Retroactive reinsurance, however, has a different measurement approach for SAP compared to U.S. GAAP. SAP requires that undiscounted ceded reserves be recorded as a negative write-in liability. This leaves Schedule P unchanged, i.e., gross of the retroactive reinsurance. Any gain to the ceding company (excess of the negative write-in liability over the consideration paid for the reinsurance) is treated as write-in gain in other income and restricted as special surplus until the actual paid reinsurance recovery is in excess of the consideration paid.

U.S. GAAP requires ceded reserves to be recorded as a reinsurance asset. Any gain is deferred, thereby resulting in no immediate income or surplus benefit. The deferred gain is amortized using the interest method if the timing of the payments under the reinsurance treaty are reasonably estimable. Otherwise the proportion of actual recoveries to total estimated recoveries (the recovery method) determines the amount of amortization.

STRUCTURED SETTLEMENTS

To settle certain liability claims, an insurance company may purchase an annuity from a life insurance company with the beneficiary being the original claimant. For the case where a full release is signed by the claimant upon agreement to settle for the future annuity payments, the GAAP and SAP treatments are the same. The purchase price of the annuity is recorded as a paid loss and the claim is closed.

In the situation where a full release is not provided to the insurance company by the claimant, the insurance company is still contingently liable. In this situation, U.S. GAAP treats the structured settlement like a reinsurance contract, thus retaining the loss reserve and establishing an equivalent reinsurance recoverable. The accounting under SAP is the same as for structured settlements where a release is obtained, but it requires that the insurance company disclose the amount of these contingent liabilities in the Notes to Financial Statements.

ANTICIPATED SALVAGE AND SUBROGATION

In Schedule P reserves can be stated either gross or net of anticipated salvage and subrogation. If the reserves are stated net, column 23 in Schedule P discloses the amount of anticipated salvage and subrogation. This election appears to be a residual effect of pre-codification standards where certain states required reserves to be stated gross of anticipated salvage and subrogation.

Under U.S. GAAP, estimated realizable salvage and subrogation is subtracted from the unpaid loss estimates.

DISCOUNTING OF LOSS RESERVES

Statement of Statutory Accounting Principles (SSAP) 65 indicates that except for certain workers compensation and long-term disability claims with fixed and reasonably determinable payments, property/casualty loss reserves cannot be discounted. For those reserves that are tabular based, SSAP 65 is silent on the permitted discount rate. Most state regulations are also silent, but typically 3.5% per annum is used. For non-tabular reserves SSAP 65 recommends that the discount rate should be determined in accordance with Actuarial Standard of Practice 20, but capped at the lesser of:

1. If the company's statutory invested assets are at least equal to the total of all policyholder reserves, the company's net rate of return on statutory invested assets minus 1.5%; otherwise, the company's average net portfolio yield rate minus 1.5%

2. The current yield to maturity on a U.S. Treasury debt instrument with a duration that is consistent to the payment of the claims

For U.S. GAAP, ASC 944-40-S30-1 refers to an SEC staff bulletin that indicates it is permissible to apply the same discount calculated under SAP for U.S. GAAP purposes. It also indicates that an alternative discount rate could be used as long as the alternative rate "is reasonable on the facts and circumstances applicable to the registrant at the time the claims are settled." This SEC staff bulletin was prepared in response to an inquiry from a registrant asking if it was permissible to discount for U.S. GAAP purposes based on the company's historical investment yield.

GOODWILL UNDER PURCHASE ACCOUNTING

Under SAP, a business combination is accounted for as either a statutory purchase or a statutory merger. Business combinations that create parent-subsidiary relationships are accounted for as a statutory purchase. Alternatively, transactions are accounted for as a statutory merger if equity of one entity is issued in exchange for equity of the second entity, with the equity in the second entity then canceled. Prospectively, only one entity exists. Under statutory purchase accounting, the assets and liabilities of the acquired entity are recorded at their historical carrying (i.e., book) values. Goodwill is calculated as the difference between the purchase price and the net book value of the acquired entity. Goodwill is limited in the aggregate to 10% of the acquiring entity's capital and surplus (adjusted to exclude any net positive goodwill, electronic data processing equipment and operating system software, and net DTAs) for its most recently filed Annual Statement. Goodwill is amortized to unrealized capital gains and losses over the period in which the acquiring entity benefits economically, not to exceed 10 years.

Under U.S. GAAP, all business combinations are accounted for using purchase accounting, which requires all assets and liabilities of the acquired entity to be recorded at fair value (including all identifiable intangible assets). Goodwill represents the difference between the purchase price and the fair value of the net assets of the acquired entity. Goodwill is not amortized but is evaluated for possible impairment on a regular basis.

For example, Company XYZ acquired Company ABC (an insurance entity) on January 1, 2018. We assumed that the purchase price of Company ABC was $3 million, the fair value of Company ABC's net assets was $2 million, and the statutory surplus amount of Company ABC was $1.5 million. On January 1, 2018, we calculated that under SAP the goodwill recorded should be $1.5 million, the difference between the purchase price and the statutory surplus of Company ABC, and that under GAAP the goodwill recorded should be $1 million, the difference between the purchase price and the fair value of the net assets. On December 31, 2018, we calculated that under SAP the goodwill recorded should be reduced to $1.35 million after amortization (assuming the goodwill should be amortized over 10 years) and that under GAAP the goodwill recorded should remain at $1 million as no impairment was identified.

In the case of a negative goodwill, under SAP, it should be recorded as a contra-asset and be amortized to unrealized capital gains and losses over a period not to exceed 10 years; under GAAP, the negative goodwill should first offset the book value of the acquired non-current assets (plant, property, equipment, intangibles, and other non-current and non-monetary assets) and the residual negative goodwill recorded as a bargain purchase gain through the income statement.

Due to these different approaches in calculating goodwill, the initial amounts of goodwill under SAP and GAAP can be significantly different. Chapter 23. *Fair Value Under Purchase GAAP* will discuss further the concept of fair value in business combinations.

SEC REPORTING

Companies with publicly traded securities are required to file quarterly (Form 10-Q) and annual (Form 10-K) financial reports with the SEC. In addition, companies are required to file a Form 8-K on an ad hoc basis for material events as they occur. The triggering events requiring the filing of an 8-K include a change in the principal officers or directors of the company, a change in the company's certified accountant, and entering or terminating a material definitive agreement.

These filings provide investors with quantitative and qualitative information about a company's business and operations, allowing investors to make informed and timely decisions. The key contents by section of a 10-K include:

- Part I — Business description, risks factors, unresolved comments from SEC staff, properties, and legal proceedings
- Part II — Financial statements and supplementary data, selected financial data, management's discussion and analysis of financial condition and results of operations, and controls and procedures
- Part III — Directors and executive officers of the company, executive compensation, securities ownership by certain beneficial owners and management, certain relationships and related transactions, and the fees of the principal accountant
- Part IV — Reports, exhibits and schedules from 8-Ks filed during the reporting period.

The 10-Q is an abbreviated form of the 10-K.

SEC reporting requirements for all registrants are mainly outlined in two regulations.

1. Regulation S-X — Form and Content of Financial Statements
2. Regulation S-K — Integrated Disclosure Rules

Regulation S-X contains general instructions to all companies around the composition and presentation of financial statements. Specifically, article seven provides detailed rules around the form and content of financial statement data and schedules of insurance companies. Many of these requirements are also

required under GAAP. In particular, article seven requires the insurance company to state in the Notes to Financial Statements the:

- Basis of assumptions, including interest rates, for determining discounted liabilities
- Deferred acquisition costs amortized in the period
- Statutory stockholders equity and net income or loss

In addition, Regulation S-X requires certain schedules to be included in each registrant's 10-K form (their annual filing). These schedules include:

- Schedule III — Supplementary insurance information for each reporting segment, of which the following is required to be reported:
    - Deferred policy acquisition costs
    - Unpaid loss and loss expenses
    - Unearned premiums
    - Other policy claims payable
    - Premium revenue
    - Net investment income
    - Losses and loss expenses
    - Amortization of deferred policy acquisition costs
    - Other operating expenses
    - Premiums written
- Schedule IV — Reinsurance including amounts ceded and assumed
- Schedule VI — Supplemental information concerning property/casualty insurance operations that includes the same information as Schedule III in total across fiscal years for the current fiscal year and the two years prior

Following are examples of Schedules III (Table 104), IV (Table 105) and VI (Table 106) from a 2018 10-K filing for a company we are calling "Fictional Insurance Company".

TABLE 104

10-K Schedule III
Fictional Insurance Company
Supplementary Insurance Information
2016—2018
($ in millions)

Segment	Deferred Acquisition Costs	Claims and Claim Adjustment Expense Reserves	Unearned Premiums	Earned Premiums	Net Investment Income (1)	Claims and Claim Adjustment Expenses	Amortization of Deferred Acquisition Costs	Other Operating Expenses (2)	Net Written Premiums
2018									
Business Insurance	430	21,132	2,887	5,965	1,075	448	956	1,024	5,972
Financial, Professional and International Insurance	175	3,611	1,076	1,671	218	783	318	341	1,633
Personal Insurance	336	2,300	1,884	3,996	223	3,340	768	478	4,078
Total – Reportable Segments	940	27,042	5,846	11,632	1,516	8,571	2,041	1,843	11,684
Other	–	35	–	–	–	–	–	233	–
Consolidated	940	27,077	5,846	11,632	1,516	8,571	2,041	2,076	11,684
2017									
Business Insurance	424	21,231	2,825	5,669	1,135	3,425	921	1,003	5,717
Financial, Professional and International Insurance	185	3,686	1,126	1,747	231	895	322	320	1,691
Personal Insurance	329	2,222	1,800	3,870	244	2,636	759	457	3,985
Total – Reportable Segments	938	27,139	5,751	11,286	1,611	6,956	2,002	1,779	11,393
Other	–	36	–	–	–	–	–	219	–
Consolidated	938	27,175	5,751	11,286	1,611	6,956	2,002	1,998	11,393
2016									
Business Insurance	417	22,171	2,833	5,776	1,002	3,179	935	1,035	5,741
Financial, Professional and International Insurance	194	3,790	1,199	1,755	238	920	328	305	1,730
Personal Insurance	315	2,227	1,688	3,748	222	2,435	746	413	3,765
Total – Reportable Segments	926	28,188	5,719	11,279	1,462	6,534	2,008	1,753	11,235
Other	–	38	–	–	–	–	–	221	–
Consolidated	926	28,226	5,719	11,279	1,462	6,534	2,008	1,974	11,235

(1) See note 2 to the consolidated financial statements for discussion of the method used to allocate net investment income and invested assets to the identified segments.

(2) Expense allocations are determined in accordance with prescribed statutory accounting practices. These practices make a reasonable allocation of all expenses to those product lines with which they are associated.

TABLE 105

10-K Schedule IV
Fictional Insurance Company
Valuation and Qualifying Accounts
(USD in millions)

	Balance beginning of period	Charged to costs and expenses	Charged to other accounts (1)	Deductions (2)	Balance at end of period
2018					
Reinsurance recoverables	191	–	–	9	182
Allowance for uncollectible:					
Premiums receivable from underwriting activities	61	12	–	29	44
Deductions	19	3	–	2	21
2017					
Reinsurance recoverables	275	–	–	84	191
Allowance for uncollectible:					
Premiums receivable from underwriting activities	68	24	(1)	31	61
Deductions	26	(4)	–	2	19
2016					
Reinsurance recoverables	325	–	–	50	275
Allowance for uncollectible:					
premiums receivable from underwriting activities	68	32	1	33	68
Deductions	35	(2)	–	7	26

(1) Charged to claims and claim adjustment expenses in the consolidated statement of income.
(2) Credited to the related asset account.

TABLE 106

10-K Schedule VI
Fictional Insurance Company
Supplementary Information Concerning Property-Casualty Insurance Operations (1)
2016–2018
(USD in millions)

Affiliation with Registrant (2)	Deferred Acquisition Costs	Claims and Claim Adjustment Expense Reserves	Discount From Reserves for Unpaid Claims (3)	Unearned Premiums	Earned Premiums	Net Investment Income	Claims and Claim Adjustment Expenses Incurred Related to:		Amortization of Deferred Acquisition Costs	Paid Claims and Claims and Adjustment Expenses	Net Written Premiums
							Current Year	Prior Year			
2018	940	27,042	629	5,846	11,632	1,516	8,919	(443)	2,041	8,112	11,684
2017	938	27,139	626	5,751	11,286	1,611	7,610	(746)	2,002	7,213	11,393
2016	926	28,188	612	5,719	11,279	1,462	7,204	(763)	2,008	6,803	11,235

(1) Excludes accident and health insurance business.
(2) Consolidated property/casualty insurance operations.
(3) For a discussion of types of reserves discounted and discount rates used, see Item 1, Business, Discounting.

Regulation S-K contains the requirements for the nonfinancial statement portions of the 10-K filing. In conjunction with the Securities Act Industry Guides, Guide 6: Disclosures Concerning Unpaid Claims and Claim Adjustment Expenses of Property-Casualty Insurance Underwriters, the following items are required to be disclosed:

- A tabular analysis of changes in aggregate reserves for unpaid claims and claim adjustment expenses for each of the latest three one-year periods
- Method for estimating the effects of inflation, implicitly or explicitly
- A reconciliation between statutory and GAAP reserves for unpaid claims and claim adjustment expenses, including an explanation of the key differences
- The amount of discount embedded in the GAAP reserves for unpaid claims, including the pre-tax income effect of discount accrued and of discount amortized

The following in an example of the tabular analysis of changes in aggregate reserves.

TABLE 107

10-K Notes to Consolidated Financial Statements
Fictional Insurance Company
Insurance Claim Reserves
Reconciliation of beginning and ending property casualty reserve balances for claims and claim adjustment expenses
(USD in millions)

At and for the year ending December 31	2018	2017	2016
Claims and claim adjustment expense reserves at beginning of year	27,139	28,188	29,026
Less reinsurance recoverables on unpaid losses	5,941	6,629	7,272
Net reserves at beginning of year	21,198	21,559	21,755
Estimated claims and claim adjustment expenses for claims arising in the current year	8,919	7,610	7,204
Estimated decrease in claims and claim adjustment expenses for claims arising in prior years	(443)	(746)	(763)
Total increases	8,476	6,864	6,441
Claims and claim adjustment expense payments for claims arising in:			
Current year	4,082	3,133	2,843
Prior years	4,030	4,080	3,959
Total payments	8,112	7,213	6,803
Unrealized foreign exchange (gain) loss	(14)	(13)	166
Net reserves at end of year	21,548	21,198	21,559
Plus reinsurance recoverables on unpaid losses	5,494	5,941	6,629
Claims and claim adjustment expense reserves at end of year	27,042	27,139	28,188

Table 107 shows for each of the last three years the beginning reserve from the prior year-end, the provision for reserve development in the calendar year (ultimate incurred losses from accidents occurring in the current year plus change in ultimate incurred losses on accidents from prior fiscal periods), paid losses and the ending reserve. The beginning reserve plus the provision for reserve development minus paid losses equals the ending reserve. If the company makes an acquisition, this would be reflected in the beginning reserve balance.

Accounting Standards Update (ASU) 2015-09

In the early 2010s, the FASB explored a joint project with the International Accounting Standards Board (IASB) to update insurance accounting. Due to a lack of agreement between the Boards, the FASB decided instead to make targeted improvements to the current accounting under U.S. GAAP. Meanwhile the IASB went on to developing IFRS 17 (See Chapter 24).

The FASB initially proposed that short duration contract liabilities be discounted, to allow investors the ability to understand the present value of the liabilities, but with no adjustment for risk. Insurance companies and the analyst community provided feedback indicating that any

discount would immediately be unwound by analysts, to be replaced with what they believe is the appropriate amount of discount. Instead the analysts requested additional disclosures be developed to allow them more insight to develop their own discount and to judge management's ability to establish the appropriate reserve estimates over time.

The resulting guidance that was issued in ASU 2015-09 added several new disclosures to U.S. GAAP financial statements for short duration insurance contracts. The key elements of ASU 2015-09 are as follows:

- The reserve roll-forward table required annually by the SEC (see Table 107) was codified into U.S. GAAP and required quarterly for all U.S. GAAP financial statements rather than just annually for SEC public filers.
- Accident year triangles of paid and ultimate loss and ALAE for up to 10 years on a net of reinsurance basis. These triangles were required to be reconciled in another schedule to the carried reserves.
- Current reported claim frequencies and current net loss and ALAE IBNR by accident year on the same level of aggregation as the triangles.
- A description of the methodologies used to estimate the loss and ALAE IBNR.
- The average annual payout of ultimate incurred claims based on the paid triangles and current ultimate incurred loss and ALAE.
- In the aggregate, a description of any significant changes in the methodology used to estimate the IBNR or the reported claim frequencies.

These additional disclosures were required to be presented at a level such that "useful information is not obscured by either the inclusion of a large amount of insignificant detail or the aggregation of items that have significantly different characteristics." The exceptions to this requirement were the quarterly roll-forwards and the description of significant changes in methodology, both of which are only required in the aggregate.

While there are similarities to the triangles in Schedule P for some of these disclosures, there are also important differences. Some of these differences include:

- These U.S. GAAP triangles require ALAE, not DCC. For example, this can drive significant differences if claims are handled by external adjustors, whose costs would fall under ALAE for U.S. GAAP as long as they can be allocated to a specific claim, but A&O expense for SAP.
- The level of disclosure for the U.S. GAAP triangles is principle based, while SAP has defined lines of business.
- Schedule P, even when presented for a group, only contains business written through U.S. entities for an insurance group. The U.S. GAAP disclosures may require business written globally, which can lead to significant foreign currency exchange issues.

- Under U.S. GAAP, the IBNR and reported claim frequency are as of the financial reporting date, and not in triangle form. The former limits the ability for a user of the financial statements to obtain and use case incurred data. The latter, while meant to help the user understand the severities in the underlying business, ignores that incurred amounts for reported claims tend to develop after being reported and claims reported later tend to have higher severities. Therefore, care must be taken by users in interpreting these disclosures.

The American Academy of Actuaries published a white paper on the considerations in implementing ASU 2015-09 in December 2016. In developing the white paper, the authors consulted with the AICPA's insurance expert panel and the SEC. Therefore, the reader is urged to read the white paper for further information.

https://www.actuary.org/sites/default/files/files/publications/FASB_SDC_Disclosures_White_Paper_120916.pdf

CHAPTER 23. FAIR VALUE UNDER PURCHASE GAAP

When an entity agrees to buy another entity, under U.S. Generally Accepted Accounting Principles (GAAP) the purchaser is required to state at fair value the assets and liabilities of the purchased entity. This accounting for business combinations is often referred to as Purchase GAAP (P-GAAP). As part of the P-GAAP process, certain intangible assets are included that would not typically be recognized and measured under U.S. GAAP. After the fair value of the assets and liabilities is determined, the implied capital (fair value assets minus fair value liabilities) is compared to the purchase price. If the implied capital is less than the purchase price of the purchased entity, the difference is defined to be goodwill and an asset equivalent to that amount is established. If the implied capital is greater than the purchase price of the purchased entity, the difference is immediately recognized as an operating gain into income.

As actuaries we may become involved in the estimation of certain balance sheet items on a fair value basis. In particular we may be asked to estimate the fair value of loss and LAE reserves and to estimate the value of business in-force (VBIF).

FAIR VALUE OF LOSS AND LAE RESERVES

Fair value under U.S. GAAP is defined in Accounting Standards Codification (ASC) 820-10-05 as “the price at which an orderly transaction to sell the asset or to transfer the liability would take place between market participants at the measurement date under current market conditions.” Such a value could be obtained by a market quote if there were a deep and liquid market for insurance liabilities. As there is no such market, the approach is “mark-to-model,” which entails determining the market value through an estimation process rather than using an observable market price. Recent actuarial literature supports an approach to estimating fair value of insurance liabilities based on three components. These components are:

1. The expected value of the nominal future cash flows related to liabilities incurred, for loss and LAE, as of the date of the transaction.
2. The reduction in those cash flows for the time value of money at a risk-free rate plus an element for the illiquid nature of the liabilities. This discount rate is meant to reflect the characteristics of the underlying liabilities.
3. A risk adjustment to compensate an investor for bearing the risk associated with the liabilities. This is meant to reflect the expected net present value of profit that an investor would demand in return for the risk inherent within the liabilities.

We will separately consider each in our example below, basing the expected value of the cash flows on what we deem to be a reasonable estimate of unpaid claims as of the sale date and the associated future payout pattern (first component), and the current risk-free rate matched to the duration of those liabilities plus an adjustment for illiquidity (second component). For the third component of fair value, the risk adjustment, we use what is commonly referred to as the “cost of capital approach.” This approach estimates the amount of capital required to support the reserves at each future evaluation

date. The required return on a pretax basis in excess of the risk-free rate plus illiquidity adjustment is applied to this amount to calculate the value of the excess return expected by the investor in that future period. These values are in turn discounted to present value. The sum of the present value of excess returns from each future period is considered the risk margin.

The first component, expected nominal cash flows, can be derived from the current recorded reserve if management's best estimate is indeed an expected value that has no obvious inherent bias. There are two common ways to establish the cash flows by line of business from the nominal reserves. The first is to use the payout pattern based on the loss reserve development that the actuary would have selected in the course of his or her review of the reasonableness of management's recorded reserve. The second approach is to utilize the implied pattern based on the ratios of paid loss to ultimate loss by accident year. This latter approach may require more smoothing depending on the methods used in selecting ultimate losses and the stability, yet decreasing values, of incurred but not reported (IBNR) to case reserve ratios.

The second component is the amount of discount. Once the cash flows are estimated, the discounting calculation is fairly straightforward provided the rate is given. Given the third component is an explicit risk margin, the interest rate should reflect only the characteristics of the liability not related to the underlying risk in the outcomes for the purchasing entity. This is effectively the risk-free rate plus an element for the illiquidity of the liability, typically less than 100 basis points.

The risk-free rates are typically observed by referencing the U.S. Treasury Daily Yield Curve for the evaluation date of study, for liabilities settled in U.S. dollars. The liquidity/illiquidity premium (the terms "liquidity" and "illiquidity" are used interchangeably) is not readily available or typically understood. The need for an illiquidity premium is much easier to initially comprehend when considered from an asset perspective. Two assets with identical expected cash flows and no difference in the risk associated with those cash flows would be expected to be valued the same. But what if one was publicly listed and readily tradable, while the other is privately held? In this situation the ability to readily trade the asset would result in a lower discount rate being applied to the tradable asset's future cash flows than that of the privately held asset. The difference in the discount rates is the illiquidity premium for the privately held asset.

From a liability perspective, many find it hard to fathom why a liability that is less liquid should be lower in value than a liability that is liquid. It is easier to understand by considering the asset transferred to support the liability by the seller. The less liquid the liability is, the greater the opportunity for the purchaser of the liability to utilize the asset for their own gain until the liability comes due. This opportunity cost results in a greater discount for the seller of the liability, i.e., a higher discount rate. How to derive the illiquidity premium is an active debate at the time of writing and beyond the scope of this study material.

The third and final component of the fair value of the loss reserves is the risk adjustment. The most logical approach to calculating a risk adjustment for an estimate that is meant to represent a market-

based valuation is a cost of capital. The cost of capital approach is simply the present value of the future returns on capital that an investor would require for bearing the risk in the expected cash flows. The basic formula for the risk adjustment is:

$$\text{Risk adjustment} = (R - i)\sum_{t=0}^{\infty}\frac{C_{t\,to\,t+1}}{(1+i)^{t+1}}$$

Where:

- R = pretax required return on capital by the capital provider
- i = risk-free rate of return plus an illiquidity premium
- t = time
- $C_{t\,to\ t+1}$ = average capital carried over time t and t+1 to support the liability

The pretax required return can be approximated from the post-tax weighted average cost of capital that is typically produced by valuation experts performing the P-GAAP work on other intangible assets. The capital at any time t could be derived from using a suitable benchmark of the required capital for a hypothetical market participant based on Risk-Based Capital, S&P's capital model or Best's Capital Adequacy Ratio model.

As an example, we shall calculate the fair value of the loss and loss adjustment expense (LAE) reserves for the homeowners/farmowners line of business from Fictitious' Annual Statement. In performing the calculation, we have assumed the following:

- The recorded reserve of $1.457 million is a mean estimate of the expected future cash flows, i.e., no margin is present in management's best estimate.
- The appropriate payout pattern of the loss reserves, with some slight smoothing, can be derived from the ultimates in each accident year divided by the paid losses in each accident year[201].
- The discount rates are the U.S. Treasury yield curve as of the valuation date plus an adjustment of 35 basis points for the illiquidity premium.
- The payments are made halfway through each future period.
- The required capital ratio is 20.1% of the unpaid claim estimates in each future period and is applied to the average amount outstanding over the period to estimate the required capital.
- The cost of capital is 10%, which is reduced by the discount rate associated with the average duration of capital to derive the risk cost of capital of 9.7%, (R-i) in the above formula.
- The return on capital is paid at the end of each future period.

[201] Note the term "payout pattern" is used interchangeably by actuaries as either the ratio of paid losses to ultimate loss ("percent paid") or the ratio of ultimate loss to paid loss (which is equivalent to a paid age-to-ultimate factor).

TABLE 108

Fictitious Insurance Company
Homeowners/Farmowners
Fair Value of Loss and LAE Reserves — Net
As of December 31, 2018
(U.S.D in 000s)

			Anticipated Loss Payments By Payment Period									
		Total	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Payments in Period	(1)	1,457	879	261	104	112	38	27	7	8	9	11
Payment Duration	(2)		0.5	1.5	2.5	3.5	4.5	5.5	6.5	7.5	8.5	9.5
Discount Rate	(3)		0.095%	0.210%	0.336%	0.481%	0.711%	0.973%	1.231%	1.463%	1.633%	1.822%
PV of Payment	(4)	1,446	878	260	104	110	37	25	7	7	8	10
Undiscounted Future Payments	(5)		1,457	578	317	213	101	62	36	29	21	11
Required Capital Ratio	(6)		0.201	0.201	0.201	0.201	0.201	0.201	0.201	0.201	0.201	0.201
Average Required Capital	(7)		205	90	53	32	16	10	7	5	3	1
Risk Cost of Capital	(8)		0.097	0.097	0.097	0.097	0.097	0.097	0.097	0.097	0.097	0.097
Cost of Capital in Period	(9)		20	9	5	3	2	1	1	0	0	0
Duration	(10)		1	2	3	4	5	6	7	8	9	10
Discount Rate	(11)		0.155%	0.285%	0.395%	0.585%	0.865%	1.095%	1.385%	1.546%	1.725%	1.925%
Associated Risk Margin	(12)	40	20	9	5	3	2	1	1	0	0	0
Total Fair Value Reserve	(13)	1,486										

(1) Determined from reserve and payout pattern
(2) Payments assumed to occur on average halfway through the period
(3) From yield curve
(4) = (1) / [1 + (3)] ^ (2)
(5) Sum of remaining amounts from (1)
(6) Selected
(7) = Average of (5) from t and t+1 x (6)
(8) Selected
(9) = (7) x (8)
(10) Capital is assumed to be held until the end of the period
(11) From yield curve
(12) = (9) / [1 + (11)] ^ (10)
(13) = Total (4) + Total (12)

The resulting fair value for this line of business differs only slightly from the recorded reserve and is likely within the bounds of the level of accuracy for determining a reasonable reserve estimate. However, this is due to several factors, some of which are offsetting. The discount is minimal in this case due to the relatively short payout pattern of the line of business and the low level of interest rates on U.S. treasuries as of December 31, 2018.

The shorter payout pattern also affects how long you need to hold the capital. The less time the capital is held, the lower the future capital charges that can accumulate. In addition, in this case the line of business is not one that is associated with a large degree of reserve variability. Therefore, the required capital ratio is fairly small, which decreases the absolute return that a third party would demand to acquire the liability. Finally, working in the opposite direction, there is the effect of discount rates on the risk margin. The low discount rates effectively increase the risk margin as the present value of the future returns on capital is higher.

In this example, you can see that the fair value of a liability can be affected by many moving pieces that can require an actuary to dig into the calculation to be able to explain differences between lines of business or between evaluation dates.

Not all believe that cost of capital is the right approach to producing a risk adjustment. Australian Prudential Regulation Authority requires reserves to be recorded at or about the 75th percentile of the discounted distribution of outcomes. In Canada, property/casualty actuaries judgmentally select the risk adjustment for loss reserves as a percentage value up to 20%. In addition, one could use a tail value at risk (T-VaR) approach. While the cost of capital can be calibrated to the pre-tax return investors require and the amounts of capital typically held for a risk, these other methods lack any calibration to the market. This makes it difficult to assert that the assumption of a certain confidence level, T-VaR or percentage load is required by a market participant in an arm's-length transaction.

VALUE OF IN-FORCE

Under P-GAAP, the fair value of deferred acquisition costs (DAC) is zero, given its lack of ability to generate future cashflows. In its place an asset is established based on the VBIF. This is not, as some companies assume, equivalent to the DAC asset. The VBIF is affected by the relationship of discount to risk adjustment on the liabilities expected to be incurred in connection with the unearned premium reserves, the amount of acquisition costs that were covered by the premium but previously expensed, and the estimated profitability of the unearned premium reserves. A shortcut technique to calculating the VBIF is to state at fair value the liabilities expected to be incurred in connection with the unearned premium reserves and subtract them from the unearned premium to obtain the implied VBIF. The steps to obtain a fair value of these liabilities are identical to those in obtaining the fair value of the loss reserves but with some additional steps. The expected and unbiased loss ratio is required to estimate the nominal expected liabilities from the unearned premium, and the cash flows in the first year should include an amount for policy maintenance costs. Consideration should also be given to the additional risk, event risk, present during the coverage period which can be reflected with a higher capital charge during that period if using a cost of capital approach to estimate a risk adjustment.

CHAPTER 24. INTERNATIONAL FINANCIAL REPORTING STANDARDS

International Financial Reporting Standards (IFRS) is a single set of global financial reporting standards issued by the International Accounting Standards Board (IASB). It was developed in the public interest as a high-quality set of general purpose standards that will provide users across borders and industries with transparent and comparable information. That is, they provide the world's integrated capital markets with a common language for financial reporting.

Most of the world's major economies permit or require the use of IFRS. The European Union, Canada, Hong Kong, and Australia are among the economies that use IFRS. At the time of writing, the Securities and Exchange Commission (SEC) in the U.S. does not allow domestic issuers of financial statements the ability to file using IFRS rather than U.S. Generally Accepted Accounting Principles (GAAP), but it currently permits foreign issuers to do so without reconciliation to U.S. GAAP.

In 2005, the IASB realized it was unable to issue a new standard for insurance contracts before IFRS was due to be implemented in the European Union. Consequently, under time constraints, the IASB issued an interim standard known as IFRS 4. IFRS 4 allowed entities to use a wide variety of accounting practices for insurance contracts, reflecting national accounting requirements and variations within the respective requirements. For instance, companies were allowed to continue to use their local GAAP but with minimum rules around that practice. However, the standard did not adequately reflect the true underlying financial position or performance of the insurance contracts as the contracts:

- Are accounted for differently across jurisdictions as national accounting requirements were allowed to be adopted;
- Often cover difficult-to-measure long term and complex risks, with uncertain outcomes;
- Are not typically traded in the market;
- May include a significant investment or deposit component – the amount that the insurer is liable to pay the policyholder regardless of whether the insured event occurs.

To address the issues above, in May 2017, the IASB issued IFRS 17 which was initially set to be effective on or after January 1, 2021, superseding IFRS 4. However, in 2018, the IASB voted to defer its effective date to January 1, 2022.

IFRS 17 establishes principles for the recognition, measurement, presentation and disclosure of insurance contracts. The objective is to:

a) Improve comparability between insurers
    - Harmonization of insurance practices across jurisdictions
    - New accounting framework to replace the various accounting treatments
b) Improve quality of financial information
    - Inclusion of useful information in the financial statements
    - Increase transparency on insurers' profitability.

SCOPE

IFRS 17 applies to contracts that are insurance contracts issued, reinsurance contracts held, and investment contracts with discretionary participation features. Similar to IFRS 4, it does not apply to insurance contracts in which the company is the policyholder, with the exception that the contracts are reinsurance contracts.

> The new standard retains the IFRS 4 definition of an insurance and reinsurance contract, which is "a contract under which one party (the insurer) accepts significant insurance risk from another party (the policyholder) by agreeing to compensate the policyholder if a specified uncertain future event (the insured event) adversely affects the policyholder."

LEVEL OF AGGREGATION

IFRS 17 provides a consistent framework for accounting for all insurance contracts issued. A company applies the requirements of IFRS 17 to a group of insurance contracts rather than on a contract-by-contract basis. In grouping insurance contracts, a company is required to identify portfolios of contracts and divide each portfolio into:

a) A group of contracts that are onerous at initial recognition;

b) A group of contracts, at initial recognition, that have no significant possibility of becoming onerous subsequently; and

c) A group of remaining contracts

Contracts issued more than one year apart can't be grouped into the same group.

MEASUREMENT MODEL

The standard introduced a new measurement model referred to as the General Model with the measurement objective of fulfillment value for insurance contracts. Two variants of the General Model were also defined by the standard, the Premium Allocation Approach ("PAA") and the Variable Fee Approach ("VFA").

General Model

The General Model is the default model in IFRS 17. Under this model, insurance contracts are to be reported on the balance sheet as the total of:

a) Fulfillment cash flows – the current estimate of amounts that the insurer expects to collect from premiums and pay out for claims, benefits and expenses, including an adjustment for the timing and risk of those cash flows; and

b) Contractual service margin ("CSM") – the expected profit for providing future insurance coverage (i.e., unearned profit).

The fulfillment cash flows consist of the present value of future cash flows and a provision for risk adjustment. The risk adjustment component represents compensation that an insurer requires for bearing the uncertainty about the amount and timing of the cash flows that arise as it fulfills the insurance contract.

Upon initial recognition, the CSM is defined as the net difference between the fulfillment cash inflows and outflows, floored by zero. The CSM cannot be negative. If it is negative upon inception, the expected losses are to be recognized in the income statement immediately. The purpose of recognizing a positive initial CSM is to report expected profitability arising from the contract over time, reflecting the service to be provided.

The standard requires companies to update the fulfillment cash flows at each reporting date, using current estimates that are consistent with relevant market information. For instance, companies are to use current discount rates to measure insurance contracts. Using current discount rates, as opposed to historical rates (i.e., discount rates during contract inception) or a mix of rates, will reflect the characteristics of the cash flows arising from the insurance contract liabilities in a consistent manner across all companies. As such, changes in insurance obligations due to economic factors, i.e., interest rates, will be reflected in the financial statements in a timely way.

Premium allocation approach

The PAA is a simplification of the General Model. It is an option that insurers can elect to implement if the model is expected to produce results that would not differ materially from the General Model and if it doesn't contain any complex features. There is a safe harbor for contracts that have a coverage period of twelve months or less. Other contracts can be tested to allow them to use the PAA over the General Model.

The PAA splits the measurement of groups of insurance contracts into two pieces where needed, the liability for remaining coverage and the liability for incurred claims. The liability for remaining coverage is approximately equal to the unearned premium less any premium receivable and deferred acquisition costs.

The liability for incurred claims is measured using the fulfilment cashflows from the General Model. No CSM is required for this portion of the liability as the coverage from the contract has expired for this portion of the liability.

Variable Fee Approach

The VFA is based on the General Model but with additional features to account for contracts with direct participating features.

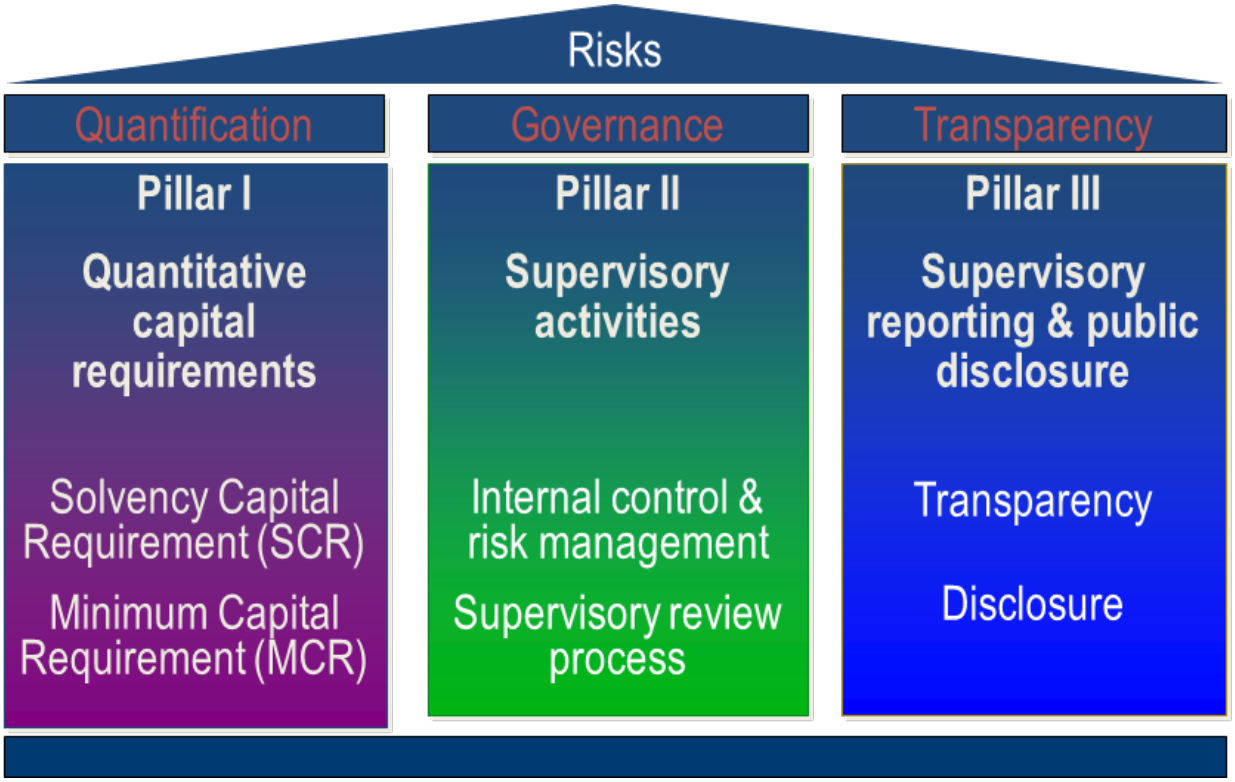
Overall, IFRS 17 and its basis for conclusions published by the IASB total 240 pages. It covers in-depth topics such as what is considered an insurance contract and therefore needs to be accounted for under the standard, the boundaries of such contracts, more specifics around the building blocks (fulfilment cashflows and CSM), the option to lock-in discount rates to avoid income statement volatility from mismatched accounting of assets, recognition of revenue, and required disclosures.

At the time of writing of this text, significant amounts of accounting and actuarial literature have been published on how to implement this complex standard. No doubt much more will be written in the coming years as the implementation date is reached. Those interested in reading more should first look to International Actuarial Note 100 that will be published by the International Actuarial Association during 2020.

CHAPTER 25. SOLVENCY II

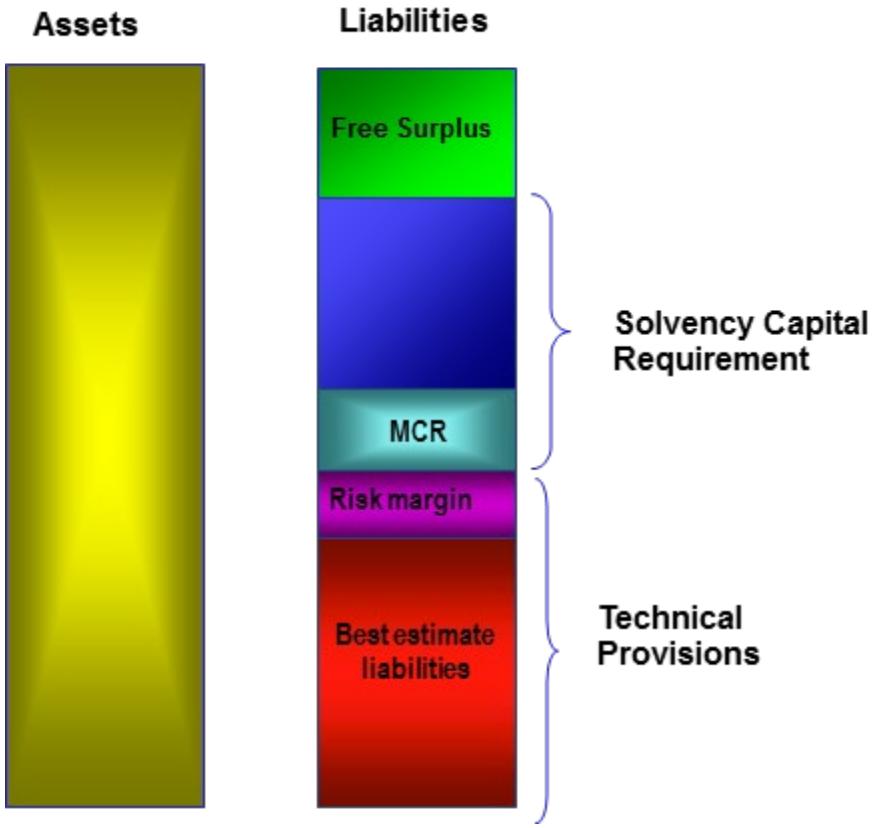
Solvency II is a principle-based insurance regulatory system governing how insurance companies are funded in the European Union. It links the required capital of insurance companies to their risk profile.

Solvency II came into effect on January 1, 2016. The new system is based on three pillars similar to those of Basel II. Those pillars are quantification, governance, and transparency.



PILLAR I — QUANTITATIVE CAPITAL REQUIREMENTS

Pillar I is focused on the quantitative aspect of Solvency II to obtain the solvency capital requirement (SCR) and minimum capital requirement (MCR). It also harmonized standards for the valuation of assets and liabilities. The measurement approach is summarized in the following diagram and is often referred to as the total balance sheet approach.



On the asset side of the balance sheet, non-insurance assets are recorded using the measurement approach under International Financial Reporting Standards (IFRS). Reinsurance assets are measured in the same way as insurance liabilities. On the liability side of the balance sheet, the technical provisions consist of the discounted best estimate of the liabilities and their associated risk margin. These are meant to represent the fair market value of the insurance liabilities, and although principles based, the approach to calculating them is fairly prescriptive. The best estimate of the liabilities is the expected value of the cash flows discounted using a risk-free rate; adjustments such as matching adjustment for illiquidity are available for long term liabilities. The risk-free discount rates are published by the European regulator on a monthly basis. The risk margin is calculated using a cost of capital method with the cost of capital above the risk-free rate (R-i from Chapter 23) equal to 6%.

Under Pillar 1 there are two capital requirements defined which are the Solvency Capital Requirement (SCR) and the Minimum Capital Requirement (MCR). The SCR and MCR are capital requirements that must be held in addition to the best estimate liabilities. SCR is the capital that should be held to ensure that the insurance company can meet its obligations to policyholders and beneficiaries with certain probability and should be set to a confidence level of 99.5% over a 12-month period i.e., a one-year 99.5% Value at Risk (VaR). A company whose capital falls below the SCR will be subject to regulatory intervention. If it falls even further below the MCR, the company will lose its license and will not be permitted to operate. Critics have noted that the one-year 99.5% VaR is not an adequate measure for bearing the risk to ultimate settlement. Solvency II requires consideration of recapitalization based on

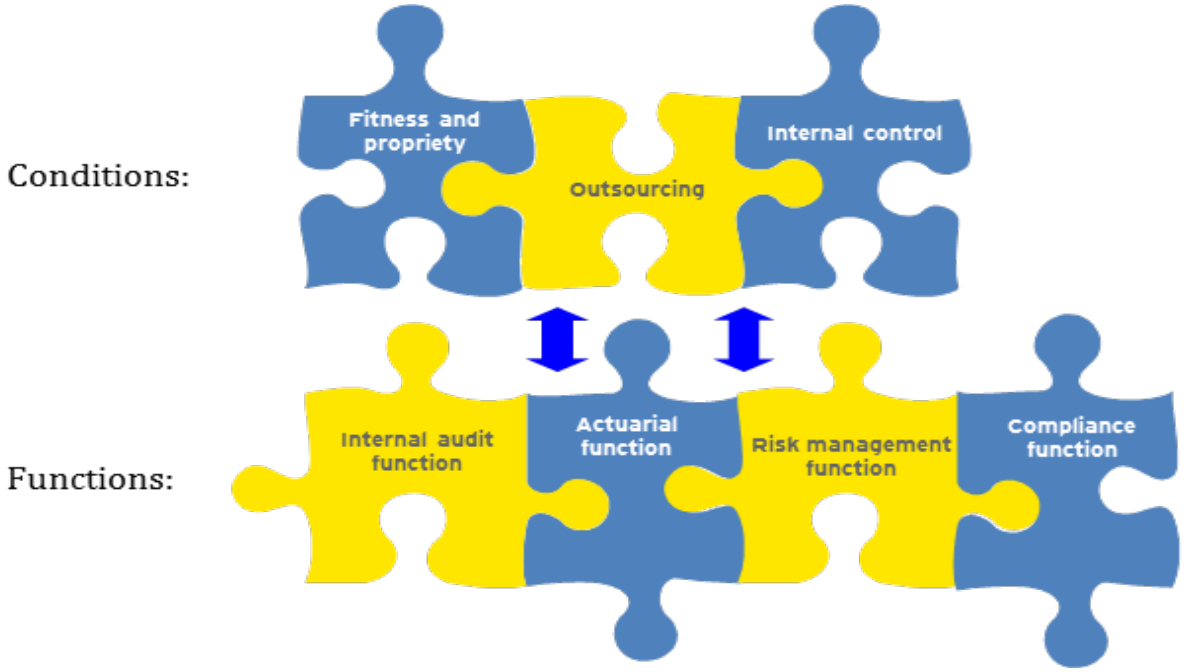
adverse development in each future annual period, yet doesn't assume you need to hold sufficient capital from inception to settlement without raising capital. Therefore, critics of Solvency II believe using one-year 99.5% VaR as the capital standard in the risk margin calculation does not provide a true fair market value.

The SCR can be calculated using the standard model, an approved internal model or a mix of both. To obtain approval for an internal model, the company has to demonstrate that the model is used in running the business, has been validated by an independent third party and is documented appropriately. The benefits of using an internal model are a model which is more appropriately tailored to the risk profile of the insurance company and the likely outcome of a lower SCR.

Any remaining amount between the assets minus the technical provisions and SCR is considered free surplus.

PILLAR II — SUPERVISORY ACTIVITIES

Pillar II provides insurance supervisors with the tools required to identify high-risk companies and the power to intervene. First, this pillar requires companies to have the governance structure in place to address the following key areas:



The functional areas, while each satisfying the conditions, should be allocated responsibility in a manner that avoids duplication. Each one is viewed as essential for an insurance business to operate effectively. Key responsibilities of each function include:

- Internal audit: Produce a report at least annually to the board of directors on any deficiencies of the internal controls and any shortcomings in compliance with internal policies and procedures. This function should have unrestricted access to information and staff.
- Actuarial: Ensure the reasonability of methods and assumptions used in calculating the technical provisions and providing a look-back analysis of best estimates against experience. Also, provide opinions on the overall underwriting policy and adequacy of reinsurance arrangements.
- Risk management: Monitoring the risk management function and maintaining an aggregated view. Ensure the integration of any internal model with the risk management function.
- Compliance: Ensure the internal control system is effective to comply with all applicable laws and regulation, promptly reporting any major compliance issues to the board of directors.

Pillar II also requires that companies complete an own risk self-assessment (ORSA). The ORSA has been defined by the European Insurance and Occupational Pensions Authority (EIOPA) as: "The entirety of the processes and procedures employed to identify, assess, monitor, manage, and report the short- and long-term risks a (re) insurance undertaking faces or may face and to determine the own funds necessary to ensure that the undertaking's overall solvency needs are met at all times."

An ORSA should contain at a minimum the following:

- The overall solvency needs, taking into account the specific risk profile, approved risk tolerance limits and the business strategy of the undertaking
- The compliance with the capital requirements and the requirements regarding technical provisions
- The extent to which the risk profile of the undertaking deviates significantly from the assumptions underlying the SCR, calculated with the standard formula or with its partial or full internal model

The ORSA results will periodically be reported to the supervisor who will use the results as input for their risk-based supervision and actions. The ORSA will also be the basis for the dialogue between the insurer and the supervisor regarding important decisions made by the insurer.

In the case of significant deviations from the risk profile, the ORSA will be the starting point of the supervisor's process that could lead to a capital add-on (i.e., an increase in the SCR).

PILLAR III — TRANSPARENCY

Pillar III represents the disclosure and reporting of information about a company's capital and regulatory position collected from Pillars I and II to the supervisors and the financial markets. Some items will be reported quarterly and others annually. The purpose of public disclosure of a company's financial and solvency position is to increase market discipline because companies are aware that their risk-based decisions will be in the public and supervisory domains.

COMPARISON TO THE U.S. SOLVENCY REGIME

Solvency II was developed as a group wide solvency regime. The U.S. regime, being state-based, is focused on the regulation of individual statutory entities with capital "walled" off from other entities in the group. However, pressure stemming from the financial crisis in 2008 combined with closer coordination between international insurance regulators led to the NAIC's Solvency Modernization Initiative ("SMI").

The SMI developed a "Windows and Walls" approach, giving windows for state insurance regulators to look into group wide operations and the effect those operations might have on a statutory entity, while maintaining the walls at the statutory legal entity level. Those windows that developed out of the SMI were:

1.Communication between regulators – enhanced communications between the state insurance regulators within the group

2. Supervisory Colleges – formally incorporate supervisory colleges of international regulators into the NAIC review procedures

3. Access to and collection of information – enhanced access to upstream entities within a group structure including regulated and non-regulated entities

4. Enforcement measures – tools to protect policyholders if violations occur

5. Group capital assessments –group supervision requires a panoramic view of capital needs of the group to be effective

6. Accreditation – state insurance regulators involved in group supervision should be accredited through the NAIC

The regulatory tool developed to implement several of these windows was the U.S. Own Risk and Solvency Assessment ("ORSA") requirement. The NAIC defines the ORSA as *"an internal assessment … conducted by [the] insurer of the material and relevant risks identified by the insurer associated with an insurer's current business plan and the sufficiency of capital resources to support those risks."*

The NAIC has stipulated two primary goals for the ORSA:

1. To foster an effective level of Enterprise Risk Management (ERM) at all insurance companies through which each insurance company identifies, assesses, monitors, prioritizes and reports on its material and relevant risks, using techniques that are appropriate to the nature, scale and complexity of the insurer's risks, in a manner that is adequate to support risk and capital decisions

2. To provide a group-level perspective on risk and capital, as a supplement to the existing legal entity view

In order to meet these goals, an insurer that is a member of an insurance holding company system (as defined by state insurance law) and meets certain benchmarks for direct written and unaffiliated

assumed premium is required to complete the ORSA process at least annually and create an ORSA Summary Report to be provided to its lead state commissioner and, upon request, to its domiciliary state commissioner. Additionally, the insurer must retain documentation and supporting risk management material to evidence the efficacy of its ORSA process, as these may be requested for review by the insurer's state commissioner(s).

The ORSA process is intended to be just one element of an insurer's overall ERM framework, in which the insurer assesses and summarizes the other elements of the framework, as well as linking these to the insurer's overall organizational structure, business strategy and capital management/planning process. Accordingly, the NAIC expects that the depth and detail of the ORSA and the ORSA Summary Report should reflect the nature of the size and complexity of insurer and its ERM framework. To assist state commissioners in gaining a high-level understanding of an insurer's ORSA, the NAIC has established three key areas that the ORSA Summary Report should cover:

Section 1: Description of the Insurer's Risk Management Framework

This section provides a summary of the insurer's ERM framework, covering how the insurer has integrated the following key principles into the organization: risk culture and governance; risk identification and prioritization process; risk appetite and tolerances/limits; risk management and controls; and risk reporting and communication. In summary, it brings together how the insurer identifies and categorizes its material risks and how it assesses, monitors and manages those risks against its established risk tolerances as it executes its business strategy.

Section 2: Insurer's Assessment of Risk Exposure

This section provides a high-level summary of the current quantitative and/or qualitative assessments of the insurer's risk exposure in both normal and stressed environments for each material risk category identified in Section 1. In addition to providing detailed descriptions and explanations of the risks identified by the insurer, the insurer describes the assessment methodology used and key assumptions made to evaluate the current risk level and how this compares to the relevant risk tolerances/limits for the risk under both normal and stressed conditions. For P&C insurers, relevant material risk categories typically include insurance risk (often divided into underwriting/premium risk, reserve risk and catastrophe risk), market risk, credit risk, liquidity risk, operational risk, and strategic risk.

Section 3: Group Assessment of Risk Capital and Prospective Solvency Assessment

This section provides a summary of the insurer's process for assessing capital adequacy in relation to its risk profile and how this process is integrated into the insurer's management and decision-making culture. For the Group Assessment of Risk Capital, the insurer describes its approach for assessing its group capital adequacy, including the basis of its definition of solvency, accounting/valuation basis, and the key methodologies, assumptions and considerations used in calculating available capital and risk capital required. For the Prospective Solvency Assessment, the

insurer projects its future financial position, including its projected economic and regulatory capital to assess its ability to meet its internally defined risk appetite and its regulatory capital requirements based on the insurer's multi-year (typically three to five years) business plan. The Prospective Solvency Assessment is also completed under both normal and stressed environments.

Further detail on the requirements for completing an ORSA process and the details that are expected to be covered within each section of an insurer's ORSA Summary Report can be found in the NAIC's *Own Risk and Solvency Assessment (ORSA) Guidance Manual*[202].

Depending on their role within an insurer, actuaries may become involved in the ORSA process in several ways.

Due to the significant role they play in establishing and executing the insurer's ERM framework and policies, identifying and monitoring its key risks, and assisting senior leadership in overall risk and capital management, an actuary that serves as the insurer's Chief Risk Officer and actuaries that are members of its ERM function typically have ownership of the overall drafting of the ORSA Summary Report, particularly where these elements are covered within Section 1. Additionally, actuaries within the ERM function are frequently involved with the estimation and monitoring of the insurer's risk exposure in relation to its risk tolerances for the material risks identified in Section 2, as well as the modelling of the group's risk capital adequacy and prospective solvency assessment detailed in Section 3.

Actuaries working within an insurer's pricing or reserving functions assist the ERM team in the risk identification and assessment/estimation process for the insurer's material insurance risks and may contribute to drafting sections of the ORSA Summary Report related to their risk area.

The models utilized by the insurer to estimate its material risk exposures, group risk capital and prospective solvency position are typically validated by another qualified actuary that was not involved in their development, which sometimes results in the involvement of a third-party party actuarial consulting firm.

Finally, actuaries assisting in the regulatory examination and financial analysis review of an insurance company may review the ORSA Summary Report to better understand the material risks the insurer is facing, its current and projected capital adequacy, and the strength of the insurer's risk management program.

[202] https://www.naic.org/documents/prod_serv_fin_recievership_ORSA-2014.pdf

CHAPTER 26. TAXATION IN THE U.S.

Beyond the solvency and general-purpose financial reporting frameworks, taxation is another framework applicable to insurance companies. Taxation has many forms, including the direct taxation of the income of corporations. Generally, tax is imposed on net profits from business, net gains, and other income. The income subject to taxation is determined under accounting principles that are modified or replaced by tax law principles where a different basis is determined as necessary by the relevant taxing authorities. In the U.S., an insurance company is taxed based on its statutory income, but with adjustments provided by the Internal Revenue Code ("IRC") that will be described herein.

Understanding the impact of federal taxation is important for insurance contract pricing, insurance company valuation, capital models construction, and tax returns preparation. Additionally, when there are changes to the tax law, it is important to understand the changes that occurred and the potential impact. In 2017, the Tax Cuts and Jobs Act of 2017 ("TCJA"), which became effective beginning tax year 2018, changed key federal tax rules. The changes most significant to property/casualty insurance carriers were related to the corporate tax rate, the discounting rules, and the international tax system.

In this chapter, we will present a summary of how taxable income is derived for property/casualty insurance companies from their statutory accounts, including a review of the adjustment of loss reserves for discounting. We will also review the process for determining taxable income attributable to statutory underwriting income and to investment income. Statutory underwriting income consists of premium revenue (i.e., earned premiums) minus losses and expenses incurred.

TAX BASIS EARNED PREMIUMS

On a tax basis, earned premiums are adjusted for "revenue offset". The need for the revenue offset stems from a lack of a deferred acquisition cost asset under statutory accounting. Assume that today a company wrote a policy effective January 1 of the following year for $100 but incurred $20 in acquisition costs. Under statutory accounting, the company would incur a $20 loss from establishing an unearned premium reserve of $100 and payment of $20 in acquisition costs. Rather than allowing property/casualty insurance companies to claim a tax credit on that "loss" under statutory accounting, the IRC has established a revenue offset convention, often referred to as the "20% haircut" The revenue offset convention assumes that acquisition costs are 20% of net written premiums for all lines of property/casualty business and all types of insurers and requires that 20% of unearned premiums be currently included in earned premiums. In our example, the unearned premium reserve would be reduced by $20, resulting in the income effect from writing this contract as $0.

Statutory earned premium is calculated as net written premium minus the change in the unearned premium reserve. Under the revenue offset convention, tax basis earned premiums are net written premium minus 80% of the change in unearned premium reserves.

Tax Basis Earned Premium
= Net Written Premium – (0.8 x (Change in Unearned Premium Reserve))

This formula can be rearranged to provide:

Tax Basis Earned Premium
= Statutory Earned Premium
+ (0.2 x (Change in Unearned Premium Reserve)).

Where the change in Unearned Premium Reserve
= Unearned Premium Reserve at end of period – Unearned Premium Reserve at beginning of period.

TAX BASIS INCURRED LOSSES AND LOSS ADJUSTMENT EXPENSES

Statutory calendar-year incurred losses are paid losses plus the change in full value loss reserves:

Incurred losses = Paid losses + Change in full value loss reserves
= Paid losses + (Full value loss reserves at end of period – Full value loss reserves at beginning of period).

For long-tailed lines of business, without the time value of money considerations that are considered in the pricing of policies, the result may be an underwriting loss under this statutory definition of incurred losses. As we previously discussed, the IRC does not provide an insurance company with a tax credit for what appears to be a temporary loss when investment income can be made on the reserves held before the claims are paid. To avoid this, tax basis accounting is more aligned with economic reality by requiring the discounting of loss reserves, albeit with defined rules and the lack of a risk margin/adjustment.

Our next section will discuss the process of discounting for taxes in more detail. For now, it is sufficient to understand that:

Tax Basis Incurred Losses = Paid Losses + Change in Discounted Reserves
= Statutory Incurred Losses – Change in Reserve Discount.

Loss adjustment expenses are treated in the IRC in the same manner as losses (i.e., estimated loss adjustment expense is subject to discounting). Other kinds of expense liabilities are addressed in a different paragraph in the IRC and may be subject to a different timing requirement.

INVESTMENT INCOME

Taxable investment income consists of income from bonds, mortgages, real estate and venture capital holdings, and realized capital gains. In addition, there are two key adjustments: proration of tax-exempt municipal bond interest and proration of dividends received deduction for stockholder dividends.

Tax-exempt municipal bonds produce tax-free income for most taxpayers. Similarly, the dividends received deduction (DRD) allows most corporate taxpayers to reduce taxable income by a portion of dividends received from other corporate taxpayers. Generally, earnings credited to the cash values of life insurance policies owned by corporate taxpayers are not recognized as current income. Insurance companies, however, are required under the IRC to include a portion of such tax-favored income and earnings in taxable income under a rule known as "proration". For a property/casualty insurer, proration increases taxable income by reducing the deduction for losses incurred by a percentage of such tax favored income.

Previously, the proration rules required a property/casualty insurance company to reduce its losses incurred deduction by an amount equal to 15% of the sum of its tax-exempt income, DRD and any earnings credited to life insurance products owned.

The TCJA amended the proration rules in a manner that retains the prior law's financial effect (i.e., a 15% reduction in the deduction from income taxed at a top marginal rate of 35%) while reflecting the reduction of the top corporate marginal rate from 35% to 21%. It does so by replacing the reduction percentage of 15% under previous law with a reduction percentage computed by dividing 5.25% (the "applicable percentage" referred to in the statute) by the top corporate tax rate of 21%, which results in a reduction percentage of 25%. Should the top corporate tax rate change in future years, the proration rate will also change.

BASE EROSION AND ANTI-ABUSE TAX (BEAT)

Now that we have determined taxable income, we can establish the regular tax liability, which is 21% of taxable income, a decrease from 35% under the previous tax law. Yet that is not necessarily the end of the calculations; if a U.S. insurance company makes a payment to a related foreign company, it might be subject to the BEAT.

In general, the BEAT calculations may apply when a domestic taxpayer, such as an insurance company that is domiciled in the U.S., obtains a "base erosion tax benefit" as a result of making a "base erosion payment" to a related foreign party. BEAT applies when the insurance company is part of a U.S. group of companies that has average gross receipts in the past three years equal to or in excess of $500M and if base erosion payments constitute 3% or more of the total deductions taken by the U.S. group on its current tax return.

The BEAT operates as a type of "minimum tax" that is added to the regular tax liability. It operates by ascertaining the "modified taxable income" of a U.S. taxpayer that has paid or incurred amounts to a foreign related party that provide deductions from regular taxable income or, in the case of reinsurance premiums to a foreign reinsurer, reduce gross income included in regular taxable income. Generally, modified taxable income is determined by adding back to regular taxable income the base erosion tax benefit caused by a base erosion payment. This minimum tax is equal to the excess of:

i. BEAT rate x modified taxable income over
ii. Regular tax liability

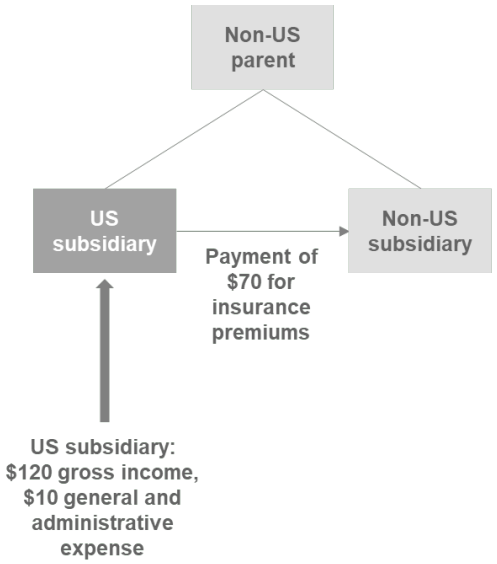
The BEAT rate in the 2018 tax year was 5%, moving to 10% in tax years 2019 through 2025, and then subsequently to 12.5%. The modified taxable income includes the income subject to the regular tax rate plus all deductible or excludible payments made to a foreign affiliate (base erosion payments) for the year.

Accordingly, to determine the BEAT charge a corporation should perform the following steps:

1. Determine if subject to the BEAT
2. Determine taxable income and compute regular tax of its U.S. companies
3. Compute modified taxable income
4. Apply the BEAT tax rate to modified taxable income
5. Compare regular tax liability with the BEAT

As an example, assume there is a domestic insurance company that is part of a U.S. group that meets the minimum requirements for being subject to the BEAT. In the 2019 tax year, this U.S. subsidiary has $120 of gross written premium for coverage effective January 1 (and so no unearned premiums), $0 investment income, $0 losses incurred and $10 of general and administrative expenses. Additionally, the U.S. subsidiary paid reinsurance premiums of $70 to a related foreign insurance company.

TABLE 109



	Ordinary	BEAT
US subsidiary taxable income	$40	$40
Add back base erosion payments, deductible payments made to foreign affiliates		$70
Modified taxable income		$110
Ordinary US tax at 21%	**$8.40**	
BEAT at 10%		**$11.00**
Additional tax due for BEAT	**$2.60**	

Note: The 10% BEAT rate is for illustrative purposes and will vary depending on tax year.

The U.S. subsidiary regular tax must first be determined:

- Taxable income = $120 gross written premium reduced by $70 of reinsurance premiums reduced by expenses of $10 = $40
- Regular tax = $40 * 21% = $8.40

Then the BEAT tax must be determined:

- Modified taxable income = $40 + $70 = $110
- BEAT tax = $110 * 10% = $11

As such, the additional tax due under the BEAT is $2.60 ($11 - $8.40).

It is noted, however, that payments to a foreign company that has elected to be taxed as a U.S. taxpayer under Section 953(d) are not subject to the BEAT.

DISCOUNTING LOSS RESERVES FOR TAXES

In the section within Chapter 22 titled “Deferred Tax Assets”, we discussed the reasons why statutory loss reserves are discounted in calculating taxable income. We shall now look in more detail at the method prescribed under the IRC for determining the discount required. The discounted loss reserves are calculated using three components:

1. The undiscounted loss reserves
2. The discount rate promulgated by the U.S. Treasury for that accident year
3. The payment pattern

The first component is obtained from Schedule P, Part 1. Reserves in Schedule P, Part 1 are net of tabular discount but gross of non-tabular discount. Therefore, any tabular discount will need to be eliminated to gross-up the loss reserves from Schedule P, Part 1 to an undiscounted basis.

The discount rate will be determined by the U.S. Treasury for each accident year and is to be based on the corporate bond yield curve., effective for taxable years beginning after December 31, 2017. This, this is a change from the previous tax law, where the discount rate was determined for each accident year based on the 60-month average of the Federal midterm rates.

The payment pattern for each line of business is determined every five years by the IRS based on the paid loss development from industry aggregate Schedule P, Part 1 data. Under the TCJA, insurance companies can no longer elect to use their own payment patterns.

Additionally, during the transition from the previous tax law to the TCJA in tax year 2018, unpaid losses and loss adjustment expenses for all accident years were discounted using the interest rate and loss payment patterns applicable to accident year 2018. The recognition of the adjustment (differences in taxable reserve estimates between the prior methodology and the new methodology at the same point in time) from the interest rate and payment pattern changes are evenly spread across eight tax years so that Companies are not burdened with the full change in the first year in taxable income from a change in the tax reserve. Below is an example of an implied eight year spread:

TABLE 110

Tax Year	Statutory Reserve	Tax Discount Factor*	Beginning of Year 2018 Net Change in Taxable Reserve**	8 Year Spread of Net Change***
2017	51,557	0.9		
2018		0.8	(5,156)	(644)
2019				(644)
2020				(644)
2021				(644)
2022				(644)
2023				(644)
2024				(644)
2025				(644)

* For example purposes, assume that 0.9 is the company implied tax discount factor under the prior law and 0.8 is the implied company tax discount factor under the current law

** -$5,156 = $51,557 * (0.8 - 0.9)

*** -$644 = -$5,156/8

TCJA IMPACT

As discussed above, the TCJA had the following key changes affecting insurance companies:

- Decrease in the corporate tax rate
- Repeal in the election for use of company-specific payment patterns
- Change in the determination of the interest rate
- Addition of the Base Erosion and Anti-Abuse Tax (BEAT)

These changes will have varying impacts, with the biggest drivers being the primary exposures that are written, what payment patterns were used in the past, and whether or not the company utilizes an affiliated foreign entity for certain transactions (e.g., reinsurance).

PART VII. CANADIAN-SPECIFIC REPORTING

INTRODUCTION TO PART VII

This part provides an overview of insurance financial reporting in Canada and a description of the main participants who influence the reporting framework in Canada. The Canadian regulatory Annual Statement and certain key elements of particular importance to Canadian actuaries are discussed.

CHAPTER 27. OVERVIEW OF FINANCIAL REPORTING IN CANADA

OVERVIEW

Insurance regulators, the accounting profession, and the actuarial profession play a role in setting the framework for insurance financial reporting in Canada.

Insurance is regulated in Canada at the federal and provincial levels. As a result, insurance companies can choose to be registered federally (across Canada) or separately in each province where they conduct business. The majority of insurers are regulated federally under the jurisdiction of the Office of the Superintendent of Financial Institutions (OSFI).[203] Registered[204] insurers are required annually to file detailed financial statements with supporting exhibits and quarterly updates. In addition, since 1992 registered insurers have been required to appoint an actuary ("Appointed Actuary") to value their policyholders' liabilities and to report at least annually on the current and future financial condition of the insurer. Each province regulates its own policy forms and monitors market conduct; hence, an insurer must also be licensed by each province in which it writes business regardless of where it is registered.

OFFICE OF THE SUPERINTENDENT OF FINANCIAL INSTITUTIONS

OSFI is a federal agency established in 1987 under the Office of the Superintendent of Financial Institutions Act. OSFI's mandate is to supervise all federally regulated financial institutions, monitor federally regulated pension plans and provide actuarial advice to the Government of Canada.

OSFI's activities are structured to protect the rights and interests of depositors, policyholders, pension plan members, and creditors of financial institutions and in so doing to contribute to the public confidence in a safe and sound financial system. This is accomplished through supervision under a principles-based regulatory framework which is designed[205] to identify key risks in certain institutions and intervene as appropriate and through regulation to enhance the financial system's safety and soundness.

OSFI differs from the National Association of Insurance Commissioners (NAIC) in that OSFI covers all federally regulated financial institutions and not just insurance companies. OSFI has authority over the entities it regulates, whereas the NAIC is a coordinating body that works with state insurance regulators to provide support and coordination to the regulation of multistate insurers across the various states.

INTERNATIONAL FINANCIAL REPORTING STANDARDS (IFRS)

[203] Office of the Superintendent of Financial Institutions Canada, http://www.osfi-bsif.gc.ca/, May 20, 2017.

[204] A registered insurer in Canada is an insurer that is licensed to distribute insurance policies by either the federal regulator or a provincial regulator in Canada.

[205] OSFI's web site provides a table of guidelines such as the Minimum Capital Test which comprise the principles-based regulatory framework by which OSFI regulates insurers in Canada.

On January 1, 2013, the Chartered Professional Accountants of Canada (CPA Canada) was established by both the Canadian Institute of Chartered Accountants (CICA) and the Society of Management Accountants of Canada (CMA Canada) to support the Canadian provincial accounting bodies unifying under the CPA banner. Certified General Accountant (CGA-Canada) integrated with CPA Canada on October 1, 2014, completing the unification of Canada's accounting profession at the national level.

In 2011, the Canadian Institute of Chartered Accountants (CICA) adopted all changes to IFRS standards issued by the International Accounting Standards Board (IASB) as part of the reporting framework for publicly accountable entities (PAE).[206] Regulated insurance companies meet the definition of PAEs and therefore were required to adopt IFRS as of January 1, 2011 (with comparative information for 2010). Today, this still holds with the merge to CPA Canada.

IFRS 4 is the current standard that deals with accounting for insurance contracts. It allows for the continuation of valuation practices in existence at the adoption of IFRS that Canadian Generally Accepted Accounting Principles (CGAAP) provided for insurance contracts. Under CGAAP the policy liabilities can be recorded in accordance with accepted actuarial practice (AAP) in Canada, which means the recorded liabilities are discounted to reflect the time value of money and include a provision for adverse deviation. The accounting for foreign branches and domestic insurers is substantially the same, and their financial statements are prepared in accordance with IFRS. However, there are two key differences for foreign branches:

1. The assets of foreign branches are required to be under the control of either the Minister of Finance of Canada or the branches' Chief Agent in Canada. The amount of assets under the control of the Minister of Finance is determined by risk based minimum capital requirements, further described in Chapter 29. Assets that are under the control of the Minister of Finance are to be placed in a trust.

2. There is no share capital account, as the entity is operating as a branch of its parent; therefore, there is a head office account instead.

[206] Publicly accountable enterprises, https://www.canada.ca/en/revenue-agency/services/tax/businesses/topics/international-financial-reporting-standards-ifrs/publicly-accountable-enterprises-paes.html, 2019

[5] Chartered Professional Accountants of Canada, https://www.cpacanada.ca , 2018.

CANADIAN INSTITUTE OF ACTUARIES

The Canadian Institute of Actuaries (CIA) is the national organization of the Canadian actuarial profession.[207] The CIA serves the public through the provision, by the profession, of actuarial services and advice of the highest quality.

AAP is the manner of performing work in Canada in accordance with the rules and the Standards of Practice (SOP) of the CIA. SOP is the responsibility of the Canadian Actuarial Standards Board,[208] and approval of standards and changes to standards are made through a process that involves consultation with the actuarial profession and other interested parties. If AAP conflicts with the law, an actuary should comply with the law but report the conflict and, if practical, useful and appropriate under the terms of the engagement, report the result of applying AAP.

The SOP published by the CIA are binding on fellows, associates, and affiliates of the CIA for work in Canada and for members of bilateral organizations, as defined in the bylaws, when those members are practicing in Canada. The standards consist of recommendations and explanatory text. A recommendation is the highest order of guidance in the SOP. Unless there is evidence to the contrary, there is a presumption that a deviation from a recommendation is a deviation from AAP. Explanatory text, which consists of definitions, explanations, examples, and useful practices, support and expand upon the recommendations.

The SOP consist of general standards and practice-specific standards. The general standards apply to all areas of actuarial practice. Usually, the intent of the practice-specific standards is to narrow the range of practice considered acceptable under the general standards.

Actuaries practicing in Canada should be familiar with relevant educational notes and other designated educational material affecting their practice. Educational notes are not binding on an actuary; however, educational notes and other designated educational material describe but do not recommend practice in illustrative situations. A practice that the educational notes describe for a situation is not necessarily the only accepted practice for that situation and is not necessarily AAP for a different situation.

DIFFERENCES BETWEEN STATUTORY AND OTHER FINANCIAL/REGULATORY REPORTING FRAMEWORKS IN CANADA

Canadian insurers are required to prepare their financial statements in accordance with IFRS, as issued by the IASB, since 2011. The Canadian Annual Returns were also modified to include the impacts of changes to IFRS. Upon the introduction of IFRS, the insurance contracts standard (IFRS 4) permitted insurers to apply CGAAP for their insurance contracts. With IFRS 4, there was little impact on the

[6] Canadian Institute of Actuaries, http://www.cia-ica.ca/, 2018.

[7] Actuarial Standards Board, "*About the ASB – Terms of Reference,*" http://www.asb-cna.ca/, September 27, 2017.

financial statements of Canadian property/casualty insurers, and as in the past, the statutory Annual Return was prepared on the same basis as the company's financial statements.

In May 2017, the IASB issued a new insurance contracts standard, IFRS 17, which is effective for annual accounting periods beginning on 1 January 2023. As companies were allowed to use a wide variety of accounting practices for insurance contracts under IFRS 4, it was difficult for investors and analysts to understand and compare results of insurers, especially from an international perspective. IFRS 17 is expected to improve the comparability of financial performance of insurance contracts between different entities. The standard applies to both life and property and casualty insurers and it requires insurers to divide insurance contracts into groups, and recognize groups of contracts as risk-adjusted present value of future cash flows, plus an amount representing the unearned profit in the group of contracts (named contractual service margin under IFRS 17). There is a simplified approach (premium allocation approach) that will apply to certain types of contracts, which is somewhat consistent with current Canadian practice, and it is expected that this simplified approach will be widely adopted by property and casualty insurers in Canada. The standard may have a significant effect on many insurers as their existing accounting policies are likely to differ from those required by the IFRS 17. Therefore, the costs involved in implementing IFRS 17 are expected to be substantial because of the need for significant systems development in order to capture the required information.

Statutory Accounting Principles (SAP) is the accounting framework under which all U.S. insurance companies are required to report for state regulatory purposes. There are many differences between SAP and IFRS, including the valuation of invested assets and the valuation of policy liabilities. These differences arise because in Canada there is a desire to achieve consistency with published financial statements and in the U.S. there is a focus on insurer solvency.

CHAPTER 28. CANADIAN ANNUAL RETURN

OVERVIEW

All insurers are required to file an Annual Return (or Canadian Annual Statement) based on International Financial Reporting Standards (IFRS) in each province where they are licensed and with the Office of the Superintendent of Financial Institutions (OSFI) if they are federally regulated. The Annual Returns are prescribed forms that are annually reviewed by the Canadian Council of Insurance Regulators. The full Annual Return is to be completed and filed annually within 60 days of year-end. In addition, there is a requirement to file interim returns on a quarterly basis within 45 days of the end of each quarter.

PREPARATION OF KEY SCHEDULES

The Canadian Annual Return is logically divided into a number of sections as follows:

- General information: This section contains information about the company, its officers, and directors and a summary of selected financial data for five years.
- Consolidated financial statements: This section shows the company's balance sheet (assets, liabilities, and equity), statement of income; statement of retained earnings and reserves; statement of comprehensive income and accumulated comprehensive income; statement of cash flows; statement of changes in equity; and notes.
- Statutory compliance: This is the Minimum Capital Test (MCT) for domestic insurers or the Branch Adequacy of Assets Test (BAAT) for foreign insurers, including supporting exhibits, related to capital adequacy.
- Investments: This includes detailed information relating to the company's invested assets.
- Miscellaneous assets and liabilities: This includes items such as other receivables and interests in joint ventures.
- Premiums, claims, and adjustment expenses: This section contains detailed information relating to unearned premiums, incurred losses, claims liabilities, and runoff of claims and adjustment expenses.
- Provincial and territorial summaries: This provides geographical premium and claims information.
- Reinsurance ceded: This includes information related to premiums and claims ceded.
- Commissions and expenses: This includes details relating to commissions and operating expenses.
- Out of Canada exhibits: This section provides detail relating to operations outside of Canada.
- Non-consolidated financial statements and exhibits: Financial statements and many of the exhibits are also provided on a non-consolidated basis.

The report of the appointed actuary must be submitted with the Annual Return. It is expected that the values reported in the financial statements for the items included in the opinion of the appointed actuary not differ materially from the values opined on by the appointed actuary.

BALANCE SHEET

Appendix II of this publication shows separately the assets and liabilities and equity elements of the balance sheet for the total of all Canadian property/casualty insurance companies as reported by the OSFI as at December 31, 2017. The Appointed Actuary should be familiar with all aspects of the Annual Return; however, the Appointed Actuary is opining on the policy liabilities and is thus expected to demonstrate a significant understanding of all elements of the policy liabilities (claims and policy liabilities in connection with unearned premiums).

The claims and premium liabilities are typically the largest liabilities on the balance sheet of an insurer and are reported through the following:

1. Claims liabilities:
    a. Direct unpaid claims and adjustment expenses
    b. Assumed unpaid claims and adjustment expenses
    c. Ceded unpaid claims and adjustment expenses
    d. Other amounts to recover
2. Premium liabilities:
    a. Gross unearned premiums
    b. Net unearned premiums
    c. Premium deficiency reserves
    d. Other net liabilities
    e. Deferred policy acquisition expenses
    f. Unearned commissions

Table 111 summarizes the balance sheet provided in Appendix II of this publication into key items from the perspective of the Appointed Actuary.

TABLE 111

Balance sheet summary — Canadian property/casualty companies at December 2018			
Assets		**Liabilities and Equity**	
Total Investments	69,100,568	Unpaid Claims and Adjustment Expenses	58,646,287
Unpaid Claims Recoverable from Reinsurers	17,103,237	Unearned Premiums	25,688,427
Unearned Premium Recoverable from Reinsurers	4,101,116	Unearned Commission	787,090
Deferred Policy Acquisition Expenses	4,509,415	Other Liabilities	8,782,174
Other Assets	30,208,179	Equity	31,118,537

As illustrated, the unpaid claims and loss adjustment expense (LAE) and unearned premium liabilities are the most significant liabilities on the balance sheet. In Canada, the claims and premium liabilities are reported on the balance sheet on a gross basis. That is, the liabilities are reported gross of reinsurance, and an asset is recorded to reflect the amount of the liabilities expected to be recoverable from reinsurers, which, as illustrated above, is a significant asset on the balance sheet.

The liabilities in Canada are recorded in accordance with AAP, which requires that the liabilities be equal to the value discounted to reflect the time value of money plus a provision for adverse deviation (PfAD). A discount rate has to be selected to determine the present value of the liabilities. This discount rate is defined by the Canadian Institute of Actuaries as follows:

> "The expected investment return rate for calculation of the present value of cash flow is that to be earned on the assets, taking into account reinsurance recoverables, that support the insurance contract liabilities. It depends on
>
> > the assets owned at the calculation date,
> > the allocation of those assets and related investment income among lines of business,
> > the method of valuing assets and reporting investment income,
> > the yield on assets acquired after the calculation date,
> > the capital gains and losses on assets sold after the calculation date
> > investment expenses, and
> > losses from asset depreciation.
>
> The actuary need not verify the existence and ownership of the assets at the calculation date, but would consider their quality." [209]

[209]CIA ASB, Actuarial Standards of Practice – Practice-Specific Standards for Insurance (2000), *Present Values*, page 2022. http://www.cia-ica.ca. *(Effective April 15, 2017; Revised February 1, 2018.)*

This definition requires the Appointed Actuary to also understand the assets on the balance sheet, how they are valued and the insurer's investment policy. Typically, a large proportion of invested assets are used to support insurance contract liabilities. Therefore, the Appointed Actuary should be able to estimate the expected investment return on those assets. The following chart, Table 112, illustrates a simple calculation of the market yield of a bond portfolio. The market yield and modified duration are calculated using readily available spreadsheet functions and the overall yield is calculated using the product of modified duration and market value as weights.

TABLE 112

XYZ Insurance Company
CDN$
Evaluation Date: December 31, 2018

Description	Interest Rate	Maturity Date	Par Value	Market Value	Market Yield	Effective Market Yield	Modified Duration
BOND A	5.38%	18-11-50	320,000.00	371,314.76	4.45%	4.50%	16.47
BOND B	4.87%	18-06-42	8,844,000.00	10,420,050.06	3.75%	3.79%	15.07
BOND C	4.46%	08-11-41	235,000.00	252,477.15	3.98%	4.02%	14.87
BOND D	6.95%	24-10-41	805,000.00	874,269.61	6.25%	6.35%	11.91
BOND E	5.15%	15-11-40	75,000.00	85,366.32	4.20%	4.25%	13.93
BOND F	3.10%	18-06-40	2,055,000.00	2,638,690.57	1.59%	1.60%	17.02
BOND G	4.56%	26-03-40	1,080,000.00	1,321,528.41	3.15%	3.18%	14.67
BOND H	4.99%	30-10-37	200,000.00	247,497.12	3.34%	3.37%	13.28
BOND I	5.04%	21-09-29	200,000.00	275,976.38	1.50%	1.50%	9.30
BOND J	4.30%	08-09-29	355,000.00	531,274.16	0.04%	0.04%	9.73
BOND K	3.25%	18-12-23	25,000.00	25,948.14	2.56%	2.58%	5.41
BOND L	8.50%	22-11-23	200,000.00	224,468.00	6.00%	6.09%	4.65
BOND M	8.00%	27-03-22	6,134,000.00	6,360,609.90	6.97%	7.10%	3.50
BOND N	4.25%	30-05-21	3,270,000.00	2,893,628.26	8.18%	8.34%	3.06
BOND O	4.95%	10-03-20	4,800,000.00	4,947,188.78	3.48%	3.51%	2.04
BOND P	4.80%	18-06-20	378,000.00	405,969.44	1.72%	1.73%	2.34
BOND Q	5.56%	30-10-19	1,375,000.00	1,449,829.32	2.50%	2.51%	1.73
BOND R	4.95%	23-08-19	2,600,000.00	2,712,868.67	2.25%	2.26%	1.56
BOND S	4.54%	08-04-19	5,000,000.00	5,225,046.55	0.97%	0.98%	1.23
Total			**37,951,000.00**	**41,264,001.60**			
			Market value duration weighted average yield			3.72%	
			Estimated investment expense ratio			0.25%	
			Indicated discount rate net of expenses			3.47%	

There are also other more complex methods employed for estimating the investment yield, such as using a discounted cash flow model where the discount rate is the rate at which the present value of claims cash flows equals the market value of the assets or where the discount rate is the internal rate of return for a group of assets whose cash flow matches claims payout.

INCOME STATEMENT

Appendix II of this publication shows the income statement for the total of all Canadian property/casualty insurance companies as reported by OSFI as at December 31,2018. The income statement measures the financial performance of the insurer over the accounting period. The net income for the period is equal to revenues less expenses and income taxes. For an insurance company, revenues and expenses are separately identified for insurance underwriting operations, investment operations, and other operations (mainly from subsidiaries, or affiliated or ancillary operations).

In the Canadian Annual Return, insurance revenue consists of net premiums written, which is equal to direct written premiums plus assumed written premiums, less written premiums ceded to reinsurers.

The change (opening unearned premiums less ending unearned premiums) in net unearned premiums is added to net written premiums resulting in net premiums earned. The net premiums earned item is the net underwriting revenue that is attributable to the accounting period under consideration. Other underwriting-related revenues are added, such as service charges, to generate total underwriting revenue.

Premium deficiency adjustments are required if the Appointed Actuary determines that the net policy liabilities in connection with the net unearned premium are larger than the total of the net unearned premium plus unearned commission liabilities less the deferred policy acquisition expense asset as recorded by the company. Incurred claims, claims adjustment expenses, acquisition expenses, general expenses, and any premium deficiency adjustments must be deducted from total underwriting revenue to derive the underwriting income or loss for the period under consideration.

Gross incurred claims and adjustment expenses are equal to gross claims and adjustment expenses paid during the period plus the change in gross unpaid claims (ending unpaid claims minus opening unpaid claims) and adjustment expenses calculated in accordance with AAP over the period. The reinsurers' share of claims and adjustment expenses is deducted from gross incurred claims and adjustment expenses to derive net claims and adjustment expenses. This calculation of net incurred claims and adjustment expenses is consistent with the same exposure period(s) as revenue, as defined above.

The categories of acquisition expenses shown in the income statement in the Canadian Annual Return are gross commissions, ceded commissions, taxes, and other acquisition expenses. For an insurer that distributes its products through the independent broker network, commissions are typically the largest cost of acquiring the business. For those companies that have captive agents or that distribute their products directly to the consumer, the other acquisition expenses will be larger. The net commission expense is the gross (direct plus assumed) commission expense less any commission income received from ceding reinsurance — typically ceding commissions received on proportional reinsurance. The tax expense item is for taxes, other than income taxes, such as premium taxes, associated with writing insurance in Canada.

General expenses are items that do not relate directly to the acquisition of the business. This includes salaries, management fees, professional fees, occupancy costs, and information technology costs, among other items not directly related to the acquisition of the business.

Net investment income consists of investment income earned plus realized gains (losses), less investment expenses.

Underwriting income, net investment income, and other revenues and expenses are added to derive net income before income taxes and extraordinary items. Income taxes are separated into current income taxes and deferred income taxes.

Extraordinary items, net of income tax, are added to arrive at the net income or loss for the accounting period under consideration.

STATEMENT OF RETAINED EARNINGS

The statement of retained earnings illustrates the calculation of the retained earnings for the insurance company at the end of the reporting period. The retained earnings at the end of the reporting period are equal to the retained earnings at the beginning of the period plus the net income earned during the period less dividends and changes in reserves required plus any prior period adjustments.

RESERVES

This statement provides detail as to the reserves shown under the Equity section of the balance sheet. These reserves are appropriations of surplus for items such as earthquakes or nuclear events. These reserves have specific purposes and are required by OSFI in Canada.

STATEMENT OF COMPREHENSIVE INCOME AND ACCUMULATED COMPREHENSIVE INCOME

Total comprehensive income for the reporting period is equal to net income as reported on the statement of income (above) plus other comprehensive income (OCI). OCI comes from changes in unrealized gains (losses) on available-for-sale assets such as loans, bonds, and debentures and equities; derivatives designated as cash flow hedges; foreign currency translation; and share of OCI of subsidiaries, associates, and joint ventures. Items that are reclassified to earnings of gains (losses) are also included in OCI.

Accumulated other comprehensive income (AOCI) is the cumulative value of OCI or the total of unrealized gains on the above noted items that is included in the equity on the balance sheet.

STATEMENT OF CASH FLOWS

The statement of cash flows derives the value of cash and cash equivalents that are included as the cash item on the balance sheet at the end of the reporting period. Cash flow is derived from or used in operating activities, investing activities and financing activities. The cash flow during the year from these activities is added to the opening cash to derive the cash balance at the end of the year.

Operating activities relate to the operation of the business and include such items as:

- The net income generated during the year
- Changes in receivables
- Changes in unearned premiums and unpaid claims liabilities
- Recognized gains/losses in investments

The cash flow from investing activities is basically the net cash flow from the purchase of new investments and the proceeds from the sale of investments plus the amortization of premiums on investments.

The cash flow from financing activities is the net cash flow from increasing/repayment of borrowing plus the increase/redemption of shares less dividends to shareholders.

STATEMENT OF CHANGES IN EQUITY

This exhibit illustrates the change in equity across various classes of equity (e.g., share capital, retained earnings, accumulated other comprehensive income ("AOCI")) resulting from various transactions or events such as issue of share capital, total comprehensive income for the year, and dividends.

NOTES TO FINANCIAL STATEMENTS

The notes to financial statements are an integral part of the financial statements. The notes provide significant detail on such important items as the basis of presentation, the basis of measurement, significant accounting policies and detailed explanations relating to some of the key financial statement items.

IMPACT OF REINSURANCE, INCLUDING COMMUTATIONS

Insurance companies may purchase reinsurance to limit their risk to loss from certain events. There are many different forms of reinsurance contracts that insurers can enter into, allowing each insurer to manage risk and capital in accordance with its own objectives. These reinsurance contracts can be used to protect against multi-claim, catastrophic events, individual large losses, and poor experience across a line of business, among other uses, and thereby act to reduce volatility in insurance results.

In the event that a registered insurer cedes business to a non-registered insurer, the registered insurer is required to secure adequate collateral from the non-registered insurer to receive full capital credit for the cession of this business. The collateral must be secured through a Reinsurance Security Agreement providing the adequate level of creditor protection to the ceding insurer. This aspect is further discussed in Chapter 29.

Treaty reinsurance is a contract that applies to all or a portion of an insurance company's contracts covered under the term of the agreement, typically for a calendar year. These contracts generally are placed on an excess basis or on a proportional (quota-share) basis. In an excess treaty, the reinsurer

responds to all claims during the treaty period excess of a specified threshold to a specified limit, e.g., automobile claims for $5 million excess of $5 million. In a proportional treaty, the reinsurer receives a set proportion of all premiums subject to the treaty, net of ceding commission, and in return pays the same proportion of all claims subject to the treaty. The ceding commission is paid by the reinsurer to the insurer in a proportional treaty to reimburse the insurer for policy acquisition expenses.

Facultative reinsurance differs from treaty reinsurance in that it relates to reinsurance against risks from certain policies written by an insurer. For example, an insurance company writes a very large commercial property exposure and wishes to limit its losses from this specific policy and hence purchases facultative reinsurance excess of its retained risk.

Reinsurance contracts impact the income statement and balance sheet of an insurance company. When an insurer purchases reinsurance, it pays a ceding premium, which reduces its earned premiums during the financial reporting period. It will also reduce its gross claims and adjustment expenses incurred by the reinsurer's share of claims and adjusting expenses and reduce its commission expense for any ceding commissions received. All of these items are reflected on the income statement.

Similarly, on the balance sheet of the Canadian Annual Return, there are two main reinsurance assets: unpaid claims and adjustment expenses recoverable from reinsurers, and unearned premiums recoverable from reinsurers. These assets reflect the share of the corresponding liabilities recorded by the insurer, which are recoverable from reinsurers.[210]

Table 113 charts a sample income statement and balance sheet for an insurance company prior to the application of reinsurance.

[210] This differs from the U.S. Annual Statement, where liabilities are shown net of reinsurance.

TABLE 113

No Reinsurance

Statement of Income			**Balance Sheet**		
			ASSETs		
Premium Written			**Cash**	$	18,000
Direct	$	340,000	**Investments**		
Assumed	$	—	Bonds and Debentures	$	650,000
Ceded	$	—	Common Shares	$	120,000
Net Premiums Written	$	340,000	**Receivables**		
Decrease (increase) in Net Unearned Premiums	$	7,000	Other Insurers	$	20,000
Net Premiums Earned	$	347,000	Other	$	5,000
Gross Claims and Adjustment Expenses	$	225,000	**Recoverable from Reinsurers**		
Ceded Claims and Adjustment Expenses	$	—	Unearned Premiums	$	—
Net Claims and Adjustment Expenses	$	225,000	Unpaid Claims and Adjustment Expenses	$	—
Gross Commissions	$	50,000	**Other Assets**	$	5,000
Ceded Commissions	$	—			
Other Expenses	$	42,500	**TOTAL ASSETS**	$	818,000
Total Claims and Expenses	$	317,500			
			LIABILITIES AND EQUITY		
Underwriting Income (Loss)	$	29,500			
Net Investment Income	$	40,000	**LIABILITIES**		
Net Income (Loss) before Income Taxes	$	69,500			
Income Taxes	$	24,325	**Payables**		
NET INCOME	$	45,175	Other Insurers	$	3,000
			Other	$	2,000
			Unearned Premiums	$	10,000
			Unpaid Claims and Adjustment Expenses	$	500,000
			Other Liabilities	$	3,000
			TOTAL LIABILITIES	$	518,000
			EQUITY		
			Retained Earnings	$	300,000
			TOTAL LIABILITIES AND EQUITY	$	818,000

Table 114 shows the impact of reinsurance on a company's financial statements resulting from two simple reinsurance treaties: an excess of loss treaty and a proportional treaty. To simplify the example, we will ignore all impacts on investment income and income taxes, and, further, we will assume that the treaties run from January 1 to December 31.

For the excess of loss treaty example, it is assumed that the company will cede $20,000 in premiums and that it will recover $13,000 of losses from the reinsurer, of which $10,000 will be unpaid at the end of the year. The following chart illustrates the impact on the foregoing financial statements of such a treaty.

TABLE 114

Excess of Loss Treaty Reinsurance

Statement of Income			**Balance Sheet**		
			ASSETS		
Premium Written			**Cash**	$	1,000
Direct	$	340,000	**Investments**		
Assumed	$	—	Bonds and Debentures	$	650,000
Ceded	$	20,000	Common Shares	$	120,000
Net Premiums Written	$	320,000	**Receivables**		
Decrease (increase) in Net Unearned Premiums	$	7,000	Other Insurers	$	20,000
Net Premiums Earned	$	327,000	Other	$	5,000
Gross Claims and Adjustment Expenses	$	225,000	**Recoverable from Reinsurers**		
Ceded Claims and Adjustment Expenses	$	13,000	Unearned Premiums	$	—
Net Claims and Adjustment Expenses	$	212,000	Unpaid Claims and Adjustment Expenses	$	10,000
Gross Commissions	$	50,000	**Other Assets**	$	5,000
Ceded Commissions	$	—			
Other Expenses	$	42,500	**TOTAL ASSETS**	$	811,000
Total Claims and Expenses	$	304,500			
			LIABILITIES AND EQUITY		
Underwriting Income (Loss)	$	22,500			
Net Investment Income	$	40,000	**LIABILITIES**		
Net Income (Loss) before Income Taxes	$	62,500			
Income Taxes	$	24,325	**Payables**		
NET INCOME	$	38,175	Other Insurers	$	3,000
			Other	$	2,000
			Unearned Premiums	$	10,000
			Unpaid Claims and Adjustment Expenses	$	500,000
			Other Liabilities	$	3,000
			TOTAL LIABILITIES	$	518,000
			EQUITY		
			Retained Earnings	$	293,000
			TOTAL LIABILITIES AND EQUITY	$	811,000

In the example above, the accounts impacted are highlighted, and it is assumed that ceded premiums and claims have flowed through cash.

In the proportional example, it is assumed that 15% of premiums and claims are ceded and that a ceding commission of 25% is paid to the insurer. It is also assumed that due to the large ceded premium that invested assets (bonds) would be reduced and that 100% of the claims are unpaid at the end of the year. Table 115 charts the impact on the foregoing financial statements of such a treaty.

TABLE 115

Proportional Reinsurance

Statement of Income			**Balance Sheet**		
			ASSETS		
Premium Written			**Cash**	$	30,750
Direct	$	340,000	**Investments**		
Assumed	$	—	Bonds and Debentures	$	599,000
Ceded	$	51,000	Common Shares	$	120,000
Net Premiums Written	$	289,000	**Receivables**		
Decrease (increase) in Net Unearned Premiums	$	7,000	Other Insurers	$	20,000
Net Premiums Earned	$	296,000	Other	$	5,000
Gross Claims and Adjustment Expenses	$	225,000	**Recoverable from Reinsurers**		
Ceded Claims and Adjustment Expenses	$	33,750	Unearned Premiums	$	—
Net Claims and Adjustment Expenses	$	191,250	Unpaid Claims and Adjustment Expenses	$	33,750
Gross Commissions	$	50,000	**Other Assets**	$	5,000
Ceded Commissions	$	(12,750)			
Other Expenses	$	42,500	**TOTAL ASSETS**	$	813,500
Total Claims and Expenses	$	271,000			
			LIABILITIES AND EQUITY		
Underwriting Income (Loss)	$	25,000			
Net Investment Income	$	40,000	**LIABILITIES**		
Net Income (Loss) before Income Taxes	$	65,000			
Income Taxes	$	24,325	**Payables**		
NET INCOME	$	40,675	Other Insurers	$	3,000
			Other	$	2,000
			Unearned Premiums	$	10,000
			Unpaid Claims and Adjustment Expenses	$	500,000
			Other Liabilities	$	3,000
			TOTAL LIABILITIES	$	518,000
			EQUITY		
			Retained Earnings	$	295,500
			TOTAL LIABILITIES AND EQUITY	$	813,500

Again, accounts impacted are highlighted.

COMMUTATION OF CLAIMS

Commuting a claim is a process in which one party is relieved of its obligations in respect of the claim in exchange for a cash payment. This can happen between insurers and individual claimants, with insurers under financial stress or between insurers and reinsurers. This section addresses the commutation of claims between insurers and reinsurers.

Reinsurance contracts may contain a commutation clause, which requires the insurer to relieve the reinsurer of its obligations in exchange for a cash payment. These clauses are typically more common in contracts that cover long-tail liabilities, and the purpose is generally to allow the reinsurer to settle its obligations within a finite period.

The primary motivation for a reinsurer to commute is to bring certainty to its results; however, there are other benefits to the reinsurer associated with commutation, including capital relief and savings in claims adjusting and administrative costs. From an insurer's point of view, there can be a benefit from commutation if there is a concern in respect of the creditworthiness of the reinsurer — the receipt of cash extinguishes this risk. Insurers also will save administrative costs. Insurers, however, once they receive the cash payment will be subject to the risk of any future adverse loss experience in respect of the commuted liability and will have to hold capital for this risk.

Claims subject to commutation typically have expected cash flows that extend into the future. Therefore, the settlement of these claims requires that financial and non-financial considerations associated with the future cash flows be contemplated. Financial considerations can include items such as the amount and timing of cash flows, the discount rate to be used, cost inflation, the potential for volatility in cash flows and income tax. Non-financial considerations can include such items as regulatory involvement or legal court decisions of the claimant(s), current and future entitlements of the claimant(s), and unfavorable court decisions.

The commutation of a block of claims under a reinsurance agreement typically will involve the actuary for the insurer and the actuary for the reinsurer. Each actuary will be charged with estimating the present value of the future obligations. In estimating the present value of these obligations, the actuary must consider the following:

- The nominal or undiscounted value of future loss and LAE on reported and unreported claims
- The expected timing of the payout of the undiscounted loss and LAE
- Expected investment income on assets supporting these cash flows
- Income tax
- An appropriate risk load to provide for volatility

An example calculation of a commuted value of a portfolio is illustrated below.

TABLE 116

Estimate of Commuted Value of Claims
December 31, 2018

	Total	2019	2020	2021	2022	2023	2024	2025	2026
Estimated Payments in Period	$1,000,000	$350,000	$150,000	$125,000	$100,000	$100,000	$75,000	$50,000	$50,000
Payment Timing		0.5	1.5	2.5	3.5	4.5	5.5	6.5	7.5
Duration Matched Risk Free Rate		2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%
Present Value Claims Cash Flow	$ 950,223	$346,552	$145,610	$118,962	$93,304	$91,474	$67,261	$43,961	$43,099
Undiscounted Future Payments remaining		$1,000,000	$650,000	$500,000	$375,000	$275,000	$175,000	$100,000	$50,000
Required Margin		10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%	10.00%
Target Capital Level at 200%		$200,000	$130,000	$100,000	$75,000	$55,000	$35,000	$20,000	$10,000
Risk Cost of Capital		9.00%	9.00%	9.00%	9.00%	9.00%	9.00%	9.00%	9.00%
Cost of Capital in Period		$18,000	$11,700	$9,000	$6,750	$4,950	$3,150	$1,800	$900
Timing		1	2	3	4	5	6	7	8
Discount Rate		2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%
Risk Margin	$ 53,225	$17,647	$11,246	$8,481	$6,236	$4,483	$2,797	$1,567	$768
Commuted Value	$ 1,003,448								

The starting point in estimating the commuted value is to estimate the undiscounted value of the liabilities to be commuted and the expected payout of the liabilities. This can be completed using various actuarial approaches. In Table 116, these liabilities are discounted at a risk-free rate corresponding to the average duration of each expected payment to obtain an estimate of discounted liabilities.

The risk margin is estimated based on the cost of holding capital for claims liabilities. In this case, it is assumed that required capital is based on a regulatory approach. For purposes of this example, it is assumed that a margin of 10% of the claim liabilities is required and that the company must hold target capital equal to 200% of required capital.

The cost of holding capital is equal to the risk cost of capital multiplied by the regulatory capital. The risk cost of capital can be calculated in various ways, such as by calculating a weighted average cost of capital less the risk-free rate. The total risk margin is the present value of the annual cost of capital amounts discounted at the risk-free rate. The commuted value is calculated as the sum of the discounted value of the liabilities plus the risk margin.

PREMIUM LIABILITIES

The policy liabilities of a property/casualty insurance company at a particular valuation date consist of claims liabilities and premium liabilities. Claims liabilities provide for events that have happened prior to the valuation date, whether reported or not. Premium liabilities provide for events that will occur after the valuation date on policies in force on the valuation date, i.e., premium liabilities are the liabilities associated with the unexpired portion of an insurance or reinsurance contract.

Net premium liabilities are not separately identified on an insurer's balance sheet as a single item but rather are derived by considering the following items:

1. Net unearned premiums
2. Net loss and LAE costs (external and internal) after the valuation date on in-force policies
3. Expected excess of loss reinsurance costs after the valuation date on in-force policies
4. Costs of servicing the in-force policies
5. Provision for premium adjustments
6. Contingent commissions adjustments
7. Unearned reinsurance commissions
8. Deferred policy acquisition expenses (DPAE)
9. Premium deficiency

A property/casualty insurer typically records items 1, 6, 7, and 9 as liabilities on its balance sheet, item 8 is recorded as an asset on the balance sheet, and item 5 can be an asset or a liability. Items 2, 3, and 4 are not recorded on the insurer's financial statements but are used by the Appointed Actuary in testing the adequacy of the recorded premium liabilities.

In testing the adequacy of premium liabilities, the Appointed Actuary is comparing an estimate of ultimate costs associated with the unexpired portion of the policy against premium liabilities recorded by the company. The elements of this calculation are discussed below (on a net of reinsurance basis as the gross basis is identical with the exception of the items relating to reinsurance ceded):

A. Unearned premiums: These are the company's unearned premiums net of proportional reinsurance.

B. Excess of loss reinsurance costs: This is the expected costs of excess of loss reinsurance associated with unexpired policies. It is typically calculated by applying the subsequent year's excess of loss reinsurance rates to the unearned premium.

C. Expected losses and external LAE: This is the expected losses (net of all reinsurance) for the unexpired portion of the policy. In Canada this is calculated on an AAP basis, i.e., discounted plus a PfAD. There are different ways to calculate this, such as reviewing historical loss and LAE ratios on an AAP basis and selecting an expected AAP loss ratio or by forecasting expected loss and LAE cash flows and then discounting these and adding a PfAD.

D. Expected internal LAE: This provides for the internal costs associated with settling these claims. This is typically calculated by reviewing historical ratios of paid internal LAE to paid losses.

E. Expected maintenance expenses: This is the cost of servicing these in-force policies, other than internal claims handling. This would provide for policy changes, customer inquiries, etc.

F. Contingent commissions: Many insurers have contingent commission arrangements with brokers, which pay additional commissions if certain volume and/or profit targets are met, and this provides for the anticipated cost of these.

G. Policy Liabilities in Connection with Unearned Premium: The total of items B to F in Table 117 below are all expenses associated with the unearned premium. The net liability recorded by the company would be the unearned premium plus unearned commissions less the deferred premium acquisition expense (DPAE) asset.

H. Equity in Unearned Premium Reserve: This is the amount by which the unearned premiums exceed the policy liabilities in connection with unearned premium.

I. Unearned commissions: These are ceding commissions from proportional reinsurance that are not yet earned by the company.

J. Maximum net DPAE: This is the maximum DPAE asset that the company may record given the expected costs and the liability already recorded. If the company, on a provisional basis, has a higher amount recorded, it must be adjusted downward to a level at or below the amount flowing from this calculation.

K. In the event that this amount is negative, the company must record a premium deficiency reserve, which is an additional liability to ensure that all future costs are provided for.

These elements are illustrated below in Table 117 on both gross and net of reinsurance bases.

TABLE 117

ABC Insurance Company **Illustration of Test of Adequacy of Premium Liabilities ($000's)**	
Gross of Reinsurance Basis	**Net of Reinsurance Basis**

A.	Unearned Premiums	$ 100,000	A.	Unearned Premiums	$ 80,000
B.	Expected Losses and External L.A.E.	$ 75,000	B.	Excess of Loss Reinsurance Costs	$ 3,000
C.	Expected Internal L.A.E.	$ 4,500	C.	Expected Losses and External L.A.E.	$ 61,600
D.	Expected Maintenance Expenses	$ 2,000	D.	Expected Internal L.A.E.	$ 4,500
E.	Contingent Commissions	$ 50	E.	Expected Maintenance Expenses	$ 2,000
F.	Policy Liabilities in Connection with Unearned Premium (B+C+D+E)	$ 81,550	F.	Contingent Commissions	$ 50
G.	Equity in Unearned Premium Reserve (A-F)	$ 18,450	G.	Policy Liabilities in Connection with Unearned Premium (B+C+D+E+F)	$ 71,150
			H.	Equity in Unearned Premium Reserve (A-F)	$ 8,850
			I.	Unearned Commissions	$ 150
			J.	Maximum Net Deferred Acquisition Expense (MAX(A-G+I,0))	$ 9,000

A number of items above are included in the premium liability component of the actuarial opinion required by OSFI, as part of the Annual Return, as illustrated in Table 118. It is assumed in this case that the company booked $6.5 million as a DPAE asset, which is less than the $9 million calculated by the Appointed Actuary. Since the booked DPAE is less than the maximum DPAE calculated by the appointed actuary there is no need for a premium deficiency reserve.

TABLE 118

Premium Liabilities (CDN in 000s)	Carried in Annual Return (Column 1)	Actuary's Estimate (Column 2)
(1) Gross policy liabilities in connection with unearned premiums		81,550
(2) Net policy liabilities in connection with unearned premiums		71,150
(3) Gross unearned premiums	100,000	
(4) Net unearned premiums	80,000	
(5) Premium deficiency	—	—
(6) Other net liabilities	—	—
(7) Deferred policy acquisition expenses	6,500	
(8) Maximum policy acquisition expenses deferrable $[(4)+(5)+(9)]_{Col.\ 1} - (2)_{Col.\ 2}$		9,000
(9) Unearned commissions	150	

CHAPTER 29. FINANCIAL HEALTH OF PROPERTY/CASUALTY INSURANCE COMPANIES IN CANADA

RISK-BASED CAPITAL ADEQUACY FRAMEWORK

The Minimum Capital Test (MCT) for federally regulated property/casualty insurance companies and the Branch Adequacy of Asset Test (BAAT) for foreign property/casualty companies operating in Canada on a branch basis (foreign branch) were introduced in 2003 by the Office of the Superintendent of Financial Institutions (OSFI). To simplify their use, effective January 1, 2012, the MCT/BAAT guidelines were consolidated into one document, the MCT guideline. Under this guideline the MCT/BAAT ratios are also subject to an independent audit.

The minimum and supervisory target capital standards set out in the MCT guideline published by OSFI provide the framework within which the Superintendent assesses whether a property/casualty company, or a foreign branch, maintains adequate capital. Property/casualty companies are required, at a minimum, to maintain an MCT ratio of 100% (minimum capital ratio). OSFI has also set a "supervisory target capital ratio" of 150% to trigger early intervention and provide time for a company to take action to improve its MCT ratio, if it falls below the supervisory target.

OSFI expects companies to establish their own "internal target capital ratio" to reflect their own risk appetite and profile. An adequate internal target capital ratio provides the company with capacity to withstand unexpected losses beyond those covered by the minimum capital ratio. Notwithstanding that a property/casualty company or a foreign branch may meet these standards, the Superintendent has the authority to direct the property/casualty company to increase its capital or the foreign branch to increase the margin of assets over liabilities in Canada.

Typically, the Appointed Actuary is involved with company management in setting its internal target capital ratio. In setting it, the Appointed Actuary should consider the following, among other items:

- Nature of the company: A stock company has the ability to raise capital and thus may wish to hold enough capital to ensure that it stays above the supervisory target capital ratio (150%) but not so much that it cannot generate its required return on capital. A mutual company cannot raise capital and thus will typically wish to operate at a higher ratio.

- Size of the company: A smaller company or monoline company may have more volatile results and thus wish to hold more capital to ensure that it stays above the supervisory target capital ratio under most circumstances.

- Company's reinsurance program: Reinsurance is a form of capital support in that it can act to reduce the volatility in loss experience. In addition, when reinsurance reduces the net claims liability, the capital required will also be reduced.

- Investment philosophy: Certain investment approaches will require greater capital. That is, if a company does not match assets and liabilities or if a company holds a greater proportion of its investments in equities, more capital may be required.

- Competitive forces: If competing companies can raise capital quickly, by issuing stocks for example, their internal target can be relatively lower as it would be easy to raise funds in an event that drains the capital.

In simple terms, the Minimum Capital Test ("MCT") compares capital available to capital required. Detailed guidelines are issued by and available from OSFI.

CAPITAL AVAILABLE

Capital available generally represents the company's total equity adjusted for certain items. It is restricted to the following, subject to qualification requirements by OSFI:

- Category A: common equity including common shares, surplus, retained earnings, earthquake, nuclear and general reserves and Accumulated other comprehensive income (AOCI);
- Category B & C: instruments issued by the institution that meet certain criteria for the respective category.

Certain items are deducted from/adjusted within the total of capital available, such as:

- Interests in non-consolidated subsidiaries and associates, and joint ventures with more than a 10% ownership interest
- Loans to non-consolidated subsidiaries, associates, and joint ventures with more than a 10% ownership interest considered as capital
- Amounts due to/from unregistered reinsurers to the extent they are not covered by deposits or letters of credit held as security
- Self-insured retentions where no collateral has been received
- The earthquake premium reserve (EPR) not used as part of financial resources to cover earthquake risk exposure
- Deferred policy acquisition expenses associates with accident and sickness (A&S) business, other than those arising from commissions and premium taxes
- Accumulated other comprehensive income on cash flow hedges
- Accumulated impact of shadow accounting
- Goodwill and other intangible assets
- Deferred tax assets that are not eligible for the 10% capital factor
- Cumulative gains and losses due to changes in own credit risk on fair values financial liabilities
- Defined benefit pension fund assets and liabilities
- Investments in treasury stock
- Reciprocal cross holdings in the common shares of insurance, banking, and financial entities
- Adjustment to owner-occupied property valuations

- Accumulated net after-tax revaluation losses in excess of gains accounted for using the revaluation model
- Other assets, as defined by OSFI, in excess of 1% of total assets

No capital factor is applied to items that are deducted from capital available.

CAPITAL REQUIRED

The total capital required is determined as the sum of capital required for insurance risk, market risk, credit risk, and operational risk, less diversification credit (divided by 1.5). See below for calculations of the capital requirements and the target level for each of these risk components. Further details on each component of capital required follow.

INSURANCE RISK

MARGINS FOR UNPAID CLAIM AND PREMIUM LIABILITY

Insurance risk is the risk arising from the potential for claims or payouts to be made to policyholders or beneficiaries. This risk arises from the present value of losses being higher than the amounts originally estimated. Factors are applied to net unpaid claims (less PfAD) and net premium liabilities (less PfAD). The factors for unpaid claims vary by class of insurance and reflect the potential for variability in the estimates of these amounts, e.g., a 15% factor is applied to personal property claims, and a 25% factor is applied to liability claims. The risk factors for premium liabilities also vary by class of insurance, e.g., property claims have a 20% factor, and Auto – Liability claims have a 15% factor. However, the accident and sickness line of insurance has margins for unearned premiums and unpaid claims to take into account possible abnormal negative variations in actual requirements.

RISK MITIGATION and RISK TRANSFER - REINSURANCE

The factor to be applied to unpaid claims and unearned premiums recoverable from registered non-associated reinsurers is treated as a combined weight under the MCT and is set at 2.5%. The factor to be applied to unearned premiums and unpaid claims ceded to unregistered reinsurers is 20%. The resulting margin can be reduced to zero by letters of credit and non-owned deposits held as security.

SELF RETENTION

Self-Insured Retention represents the portion of a loss that is retained by the policyholder. Credit maybe taken with acceptable collateral such as letters of credit which are also subject to risk factors depending on the credit rating of the issuing organization.

CATASTROPHES

In Canada there is specific guidance on the amount of capital required for earthquake exposure and nuclear risk (if written). Components of capital are required for Earthquake Premium risk and Earthquake Reserves. These maybe reduced based on specific financial resources. The financial resources may take the form of capital & surplus, earthquake premium reserve, reinsurance coverage and prior approved capital financing.

MARKET RISKINTEREST RATE RISK

Interest rate risk is the risk of loss from changes in interest rates impacting interest-rate-sensitive assets and liabilities. Interest rate risk arises due to the volatility and uncertainty of future interest rates. Assets and liabilities whose value depends on interest rates are impacted; generally, this includes fixed income assets and discounted policy liabilities. The interest rate risk margin is the difference between the change in the value of interest-rate-sensitive assets and the change in the value of interest-rate-sensitive liabilities arising from a change in interest rates plus the change in the value of allowable interest rate derivatives (only simple derivatives such as interest rate futures, forwards, and swaps may be included).

Interest-rate-sensitive assets include the following:

- Term deposits and other short-term securities (excluding cash)
- Bonds and debentures
- Commercial paper
- Loans
- Mortgages
- Mortgage-backed securities and asset-backed securities
- Preferred shares
- Interest rate derivatives held for other than hedging purposes

Assets held in mutual funds and segregated funds that are interest-rate sensitive are to be included in interest-rate-sensitive assets. All interest-rate-sensitive assets that are held by the insurer are to be included, not just those backing liabilities.

Net unpaid claims and adjustment expenses and net premium liabilities (as determined in accordance with AAP) are considered to be the interest-rate-sensitive liabilities.

The interest rate risk margin is calculated as A – B + C where:

A. Estimated change in the value of the interest-sensitive asset portfolio for an interest rate change of X%
B. Estimated change in the value of the interest-sensitive liabilities for an interest rate change X%
C. Estimated change in the value of the allowable interest rate derivatives for an interest rate change X%

The same calculation is completed for an interest rate change of –X%. The interest rate risk margin is the greater of that resulting from a change of X% or –X%.

The change in the value of the interest-rate-sensitive assets and liabilities depends on the duration of the relevant assets and liabilities. Modified duration or effective duration may be used to calculate duration; however, the selected method must be used for all interest-rate-sensitive assets and liabilities and must be used consistently from year to year. The portfolio duration is calculated as a weighted average of the duration of the individual assets or liabilities comprising the portfolio. The dollar duration is the change in the asset or liability dollar value for a given change in interest rates.

The estimated change in the value of the interest rate assets is therefore calculated as duration of the asset portfolio multiplied by fair value of the asset portfolio multiplied by X%. The estimated change in the value of the interest rate liabilities is therefore calculated as duration of the liabilities multiplied by fair value of the liabilities multiplied by X%. A simple example (ignoring the impact of interest rate derivatives) follows:

Asset duration = 6 years
Fair value of asset portfolio = $500 million
X = 1.25%

Liability duration = 3 years
Fair value of liabilities = $350 million

Capital required = 6 * $500 million *.0125 – 3 * $350 million * .0125 = $24.375 million

FOREIGN EXCHANGE RISK

The foreign exchange risk margin is 10% of the greater of either the aggregate net long positions or the aggregate net short positions in each currency, adjusted by any effective allowable foreign exchange rate hedges.

The net open positions for each currency is the sum of:

- The net spot position (all asset items less all liabilities denominated in the currency under consideration, including accrued interest and accrued expenses if they are subject to exchange rate fluctuations);
- The net forward position, valued at current spot market exchange rates or discounted using current interest rates and translated at current spot rates;
- Guarantees that will be called and are irrecoverable;
- Any fully hedged net future income/expenses not yet accrued;
- Other items representing a profit or loss in foreign currencies.

To reduce the amount of net exposure, a carve-out may be used by P&C insurer with a net open long position in a given currency. This carve-out is equal to a short position of up to 25% of the liabilities denominated in the corresponding currency, to a maximum of zero.

A simple example for calculating the foreign exchange risk is as follows:

If a P&C insurer has $200 of U.S. assets and $100 of U.S. liabilities,
Net spot position = 200 – 100 = $100
Carve-out = 25% * $100 = 25
Foreign exchange risk margin = 10% * MAX ((net spot position – carve-out), 0)
= 10% * MAX ((100 – 25), 0)
= 10% * 75
= 7.5

EQUITY, REAL ESTATE, AND OTHER MARKET RISK EXPOSURES

Equity risk is the risk of economic loss due to fluctuations in the value of equity securities. A 30% risk factor is applied to investments in common shares and joint ventures in which a company holds less than or equal to 10% ownership interest, and to the market value of equity futures, forwards, and swaps.

Real estate risk is the risk of loss due to changes in the value of a property or in real estate investment cash flows. The risk factor for owner-occupied properties is 10%, and a 20% factor is applied to real estate held for investment purposes.

Other market risk exposures include those assets comprised in the "other assets" category, where a 10% risk factor applies.

CREDIT RISK

The risk of loss resulting from a counterparty's potential inability to fully meet contractual obligations due to an insurer is defined as credit risk. This risk occurs anytime funds are extended, committed, or invested through actual or implied contractual agreements. Risk factors are as follows:

- Long-term obligations (term deposits, bonds, debentures, and loans) that are not eligible for a 0% risk factor have a risk factor between 0.25% and 18% depending on the rating and remaining term to maturity of the investment
- Short-term obligations (term to maturity less than 1 year) that are not eligible for a 0% risk factor have risk factors between 0.25% and 8% depending on the rating of the investment
- Risk factors for preferred shares are between 3% and 30% depending on the rating of the investment

STRUCTURED SETTLEMENTS, LETTERS OF CREDIT, DERIVATIVES, AND OTHER EXPOSURES

Capital required for structured settlements, letters of credit, derivatives, and other exposures are for counterparty risk not covered by the capital required for balance sheet assets. The capital required for these instruments is calculated as follows:

Capital required =
The credit equivalent amount of the instrument less collateral or guarantees
* Credit conversion factor (reflects the nature and maturity of the instrument)
* Capital factor (to reflect counterparty default risk).

The credit equivalent amount varies according to the type of instrument. The credit equivalent of a structured settlement is the current replacement cost of the settlement. For derivatives, it is the positive replacement cost plus an amount for potential future credit exposure.

OPERATIONAL RISK

Operational risk is the risk of loss arising from inadequate or failed internal processes, people and systems from external events. There are two risk drivers to determine the operational risk margin: capital required and premium volume. For the total capital required (before the operational risk margin and diversification credit), an 8.5% risk factor is applied. The following risk factors apply to insurance premiums:

- 2.50% for all direct premiums and ceded premiums written arising from third party reinsurance
- 1.75% for assumed premiums written arising from third party reinsurance

- 0.75% for assumed and ceded premiums written arising from intra-group pooling arrangements

To account for the additional pressures on people and systems due to rapid growth, additional capital is required. Thus, a 2.50% risk factor is applied to the total amount of gross premiums written in the past 12 months above a 20% growth threshold compared to the gross premiums written for the same period in the previous year. Finally, to lessen the effect of the operational risk margin for companies that have high-volume/low-complexity business, a 30% cap is applied. This is calculated in relation to the total capital required before the operational risk margin and diversification credit.

DIVERSIFICATION CREDIT

A company is not likely to incur the maximum possible loss from each type of risk simultaneously since the losses arising across risk categories are not perfectly correlated. Therefore, a diversification credit can be applied so that the total capital for the credit, market, and insurance risk requirements is lower than the sum of the individual requirements for these risks.

The formula used to calculate the diversification credit is:

$$Diversification\ credit = A + I - \sqrt{A^2 + I^2 + 2 \times R \times A \times I}$$

A = asset risk margin = capital required for credit risk + capital required for market risk (e.g., interest rate, foreign exchange, equity, real estate, and other market risks)
I = insurance risk margin
R = correlation factor between A and I = 50%

MINIMUM CAPITAL TEST

MCT = Capital Available / Capital Required, where Capital Required =

[Insurance risk margin + Market risk margin + Credit risk margin + Operational risk margin – Diversification credit] / 1.5

FOREIGN COMPANIES

Foreign companies operating in Canada on a branch basis are required to maintain an adequate margin of assets over liabilities in respect of their business in Canada. The BAAT provides a framework, similar to the MCT, by which the regulator assesses the adequacy of assets of the branch.

The BAAT is similar to the MCT in that it compares net assets available to margin required. The net assets available are equal to the excess of assets vested in Canada less total net liabilities. The margin required is the sum of amounts required for the same items as in the MCT, e.g., assets, policy liabilities, catastrophes, etc., less the diversification credit (as in the MCT), divided by 1.5.

DYNAMIC CAPITAL ADEQUACY TESTING

Under federal regulation, the Appointed Actuary must investigate the insurer's financial condition. This is completed by way of Dynamic Capital Adequacy Testing (DCAT).

DCAT is a process of analyzing and projecting the trends of a company's financial condition, given its current financial and operating circumstances, its recent past, and its intended business plan under a variety of future scenarios. It allows the Appointed Actuary to inform company management of the likely implications of the business plan on capital and to provide guidance on the significant risks to which the company is exposed.

The principal goal of this process is to help measure capital adequacy by arming the company with the best information on courses of events that may lead to capital depletion and the relative effectiveness of alternative corrective actions. Furthermore, knowing the sources of threat, the company can strengthen the monitoring systems where it is most vulnerable and thus provide information on a continuous and timely basis.

In accordance with AAP, the DCAT process must include a base scenario and several plausible adverse scenarios. The CIA provides guidance as to the risk categories that must be examined for possible threats to capital adequacy. For property and casualty insurers, some of these risk categories include claim frequency and severity, inflation, premium increases and decreases, investment, reinsurance, and policy liabilities. However, the risk categories enumerated by the CIA are not necessarily the only ones to be examined because the circumstances of the insurer may result in the need to examine other risk categories.

The DCAT process generally consists of the following:

1. Development of a base scenario, which is typically derived from the company's business plan
2. Examination of the risk categories (mandatory or otherwise) to determine those that are relevant to the company circumstances
3. Stress-testing of the risk category in question for each relevant risk category
4. Selection of those scenarios requiring further analysis
5. Reporting on the results of the analysis

In the most general sense, solvency is the ability of an entity to honor its financial obligations. From the accounting viewpoint, solvency requires that assets equal or exceed liabilities and therefore that the total equity is non-negative. This is ascertained as of a specified date. Even though a balance sheet may show a corporate entity to be technically insolvent by this definition, legal insolvency is only determined through court or regulatory action to terminate the operations of that company. In contrast, the concept of capital adequacy envisioned by DCAT extends beyond the balance sheet at a specific date to the continued vitality of the organization.

Accordingly, in considering the solvency of insurance operations, the amount of and expected trends in surplus and other forms of available capital over the near future are of vital importance, especially in terms of risk profile of the company. It is necessary to consider the purposes of and needs for capital in relation to anticipated and possible events occurring after the statement date.

DCAT utilizes the regulatory formula for the capital adequacy standard. For insurers regulated under the Federal Insurance Companies Act or the Ontario Insurance Act, the minimum regulatory capital requirement for the purposes of the DCAT standard is based upon the MCT for a Canadian property/casualty insurer and the BAAT for a Canadian branch of a foreign property/casualty insurer. Should an insurer be subject to minimum capital requirements under other jurisdictions, the most restrictive requirement is used.

The company's financial condition is deemed satisfactory if, throughout the forecast period, it is able to meet all its future obligations under the base and all plausible adverse scenarios. In addition, under the base scenario, it must meet the target regulatory capital requirement. Otherwise the company's financial condition is deemed unsatisfactory.

DCAT analysis provides the Appointed Actuary with significant information about the financial condition of a company. The base scenario is in essence the business plan of the company throughout the forecast period. A review of the business plan should allow the Appointed Actuary to learn much about the company, including the following:

- Whether the company is growing or contracting through the forecast period and, if relevant, the level at which it is growing
- Whether the company is profitable throughout the period and whether the profits are sufficient to grow the capital base to support the growth of the company
- Planned changes in mix of business written by the company through the forecast period
- Planned changes to reinsurance programs, investment philosophies, expenses, etc.

Further, the adverse scenarios can reveal information about the risk management strategy employed by the company. For example, if a scenario that tests the impact of a change in interest rates has very little impact on the company, it is likely that the company has employed an asset/liability matching strategy to minimize the impact of this event. Adverse scenarios can also identify risks to which the company's financial condition is particularly sensitive, and the Appointed Actuary can work with management in developing mitigation strategies to manage these risks.

FINANCIAL CONDITION TESTING

Under federal regulation, the Appointed Actuary must investigate the insurer's financial condition. The financial condition of an entity refers to its prospective ability to meet its future obligations and is sometimes termed "future financial condition". The investigation is completed by way of Financial Condition Testing (FCT). The Appointed Actuary can supplement FCT with the use of other means, such as the own risk solvency assessment (ORSA).

Financial condition testing examines the effect of selected adverse scenarios on the insurer's forecasted capital adequacy. FCT is a process of analyzing and projecting the trends of a company's financial condition, given its current financial and operating circumstances, its recent past, and its intended business plan under a variety of future scenarios. It allows the Appointed Actuary to inform company management of the likely implications of the business plan on capital and to provide guidance on the significant risks to which the company is exposed.

The purpose FCT is to identify plausible threats to satisfactory financial condition, actions that would lessen the likelihood of those threats, and actions that would mitigate a threat if it materialized. FCT is one of several stress-testing processes that would fit within the insurer's overall risk management process. The FCT process allows management to understand implications the business plan has on capital and provides awareness of the significant risks to which the insurer is exposed

The FCT process generally consists of the following:

1. Development of a base scenario, which is typically derived from the company's business plan. The forecast period would be sufficiently long to be aligned with the risk emergence and the recognition of impacts and to capture the effect of management actions.
2. Development and analysis of the impact of adverse scenarios to determine those that are relevant to the company circumstances.
   The adverse scenarios may be single-risk or an integration thereof. Possible adverse scenarios include but not limited to risks associated with claims frequency and severity, policy liabilities, investment and reinsurance. They are categorized as solvency or going-concern. A solvency scenario is a plausible adverse scenario if it is credible and has a non-trivial chance of occurring whereas a going-concern scenario is more likely to occur and less severe.
   The approach used to determine adverse scenarios may be stochastic (based on statistical models), deterministic (based on judgement), or a combination of the two.
3. Identification and analysis of the effectiveness of corrective management actions to mitigate risks. Possible management actions include repricing products, reducing planned dividends and strengthening capital.
4. Reporting on the results of the analysis
5. An opinion by the Appointed Actuary. The financial condition is deemed satisfactory if throughout the forecast period, the following are met:
   - Under the solvency scenarios, the statement value of the insurer's assets is greater than the statement value of its liabilities;
   - Under going concern scenarios, the insurer meets the regulatory minimum capital ratio; and
   - Under the base scenario, the insurer meets its internal target capital ratio as determined by the ORSA.

DCAT utilizes the regulatory formula for the capital adequacy standard. The report need not include any explanation on the development and/or validity of the regulatory capital formula used. In most cases it will suffice to disclose the following:

- The applicable federal and/or provincial regulatory formula(s);

- For insurers subject to target capital requirements under multiple jurisdictions, the rationale for using the selected formula; and
- The target requirement used in the projections and the rationale.

FCT analysis provides the Appointed Actuary with significant information about the financial condition of a company. The base scenario is in essence the business plan of the company throughout the forecast period. A review of the business plan should allow the Appointed Actuary to learn much about the company, including the following:

- Whether the company is growing or contracting through the forecast period and, if relevant, the level at which it is growing;
- Whether the company is profitable throughout the period and whether the profits are sufficient to grow the capital base to support the growth of the company;
- Planned changes in mix of business written by the company through the forecast period;
- Planned changes to reinsurance programs, investment philosophies, expenses, etc.

Further, the adverse scenarios can reveal information about the risk management strategy employed by the company. For example, if a scenario that tests the impact of a change in interest rates has very little impact on the company, it is likely that the company has employed an asset/liability matching strategy to minimize the impact of this event. Adverse scenarios can also identify risks to which the company's financial condition is particularly sensitive, and the Appointed Actuary can work with management in developing mitigation strategies to manage these risks.

INDUSTRY RESEARCH

Market-Security Analysis and Research, Inc.

Market-Security Analysis and Research, Inc. (MSA) is a Canadian analytical research firm that is focused on the Canadian insurance industry.[211] While MSA is not a rating agency, it publishes many reports and also offers a software tool that allows for comprehensive analysis of company and industry results in significant detail over a number of years. Canadian insurers are also monitored by major rating agencies such as A.M. Best, Standard & Poor's, and Moody's.

Individual company reports are presented by way of a number of exhibits. The first exhibit (Exhibit 1) is titled "Key Company Information." It presents key information about the company's type of license, ownership, and distribution category; identification of the appointed actuary and external auditor; and the name of the CEO or chief agent. There is additional information included in this exhibit for companies with publicly traded parents.

[211] MSA Research Inc. http://www.msaresearch.com/.

Key financial indicators are included in Exhibit 2. A number of regulatory tests and early warning indicators are included, such as:

- The MCT/BAAT ratio
- Profitability measures such as return on equity, return on revenue, return on assets after tax, and insurance return on net premium earned
- Liabilities as a percentage of liquid assets
- Net loss reserves to equity
- One-year loss development to equity
- Overall net leverage

The above measures are used by OSFI and other regulatory bodies as early warning solvency indicators. In its reports, MSA flags results that fall outside of OSFI's acceptable range. The MCT/BAAT ratios are OSFI's Risk-Based Capital adequacy assessment and are important measures of a company's financial position. If a company fails this test, it will likely be the subject of regulatory intervention. Often companies fail certain other ratios without being in distress; thus, the Appointed Actuary should consider results across all of the tests as a whole when making judgments about a company's financial position.

There are also supplementary ratios calculated to provide more summary-level information about the company, including:

- Investment yield (including realized capital gains)
- Change in net premium written
- Change in gross premium written
- Change in equity
- AOCI to equity
- Reinsurance recoverable to equity
- Net underwriting leverage ratio (ratio of net premiums written to equity)
- Two-year combined ratio
- Overall diversification score

PART VIII. THE FUTURE OF SAP

INTRODUCTION TO PART VIII

Regulation and financial reporting of insurance companies has evolved over time. The original FASB accounting standard for insurance entities (FAS 60) was discussed and developed in the 1970s and adopted in June 1982. The NAIC codified its statutory accounting principles, effective January 1, 2001. Today we see the implications of the work performed by the FASB and the IASB on insurance contracts accounting and the NAIC's Solvency Modernization Initiative (SMI). So, what is driving change today and where are we heading?

CHAPTER 30. THE FUTURE OF FINANCIAL REPORTING AND SOLVENCY MONITORING OF INSURANCE COMPANIES

THE NAIC AND THE FINANCIAL SECTOR ASSESSMENT PROGRAM

In Part VI. *Differences from Statutory to other Financial/Regulatory Reporting Frameworks in the U.S.,* we discussed the reasons behind the development of new accounting standards for insurance contracts by the Financial Accounting Standards Board (FASB) and the International Accounting Standards Board (IASB), . The National Association of Insurance Commissioners' (NAIC) Solvency Modernization Initiative was started in part because of pressure to conform to new and evolving international standards. In November 2008 at a G20 summit, during the global financial crisis, the G20 members agreed to undergo periodic peer reviews of their financial services regulatory regimes. This peer review process was developed by the International Monetary Fund and World Bank in response to the financial crisis in the late 1990s but had mainly been applied to developing countries. This peer review process is called the Financial Sector Assessment Program (FSAP).

The NAIC participated in the FSAP process during 2010 for the first time, and again in 2015. The assessment process benchmarked the U.S. insurance regulatory regime against the Insurance Core Principles (ICPs) developed and published by the International Association of Insurance Supervisors (IAIS). The results of the 2010 assessment were generally favorable but were based on the ICPs published in 2003. In October 2011, the IAIS published a revised set of ICPs, with amendments to certain of the ICPs published through November 2018. This revised set of ICPs were used to perform the 2015 FSAP review.

The 2015 FSAP concluded that while there were improvements since 2010, there remained difficulties in assessing the health of the U.S. insurance sector. In particular:

"Capital adequacy at legal entity level, measured by the regulators' risk-based capital (RBC) requirements, has increased since the crisis, and the number of companies breaching regulatory levels has declined. However, capital adequacy ratios are hard to interpret due to valuation rules, regulatory arbitrage via captives, and lack of regulatory capital adequacy measures at group level."

The report also noted that one area that still poses a challenge is ICP 14, Valuation. ICP 14 states the following:

"The context and purpose of the valuation of assets or liabilities of an insurer are key factors in determining the values that should be placed on them. This ICP considers the valuation requirements that should be met for the purpose of the solvency assessment of insurers within the context of IAIS risk-based solvency requirements that reflect a total balance sheet approach on an economic basis and address all reasonably foreseeable and relevant risks."

ICP 14 also states that "an economic value should reflect the prospective valuation of the future cash flows of the asset or liability allowing for the riskiness of those cash flows and the time value of money."

Some may argue the current statutory valuation of property/casualty liabilities does not comply with this statement as it doesn't reflect the time value of money, except in limited circumstance, nor the underlying risk. The 2015 FSAP found that the U.S. insurance regulatory regime only partially observed this ICP. It recommended:

"Allowing for conservatism explicitly in a margin over current estimate would increase transparency. The explicit decomposition of reserves into a current estimate and a margin over current estimate allows assessment of the overall conservatism for different lines of products. This would allow a recalibration of the valuation standard for products where reserves are overly conservative or not sufficient."

COMFRAME, SOLVENCY II AND THE FEDERAL INSURANCE OFFICE

In addition to the revised set of ICPs, the IAIS has been developing a Common Framework for the Supervision of Internationally Active Insurance Groups, commonly referred to as ComFrame. The final framework was published in November 2019.

U.S. regulators have expressed concerns about the valuation approach under ComFrame which requires a margin over the current estimate for valuation purposes, also known as a GAAP plus valuation approach. U.S. regulator have instead proposed allowing an aggregation approach based on current local requirements in determining the required amount of group capital. As a compromise there will be a five year monitoring period to assess GAAP plus valuation and its effect on the prescribed capital requirement versus the aggregated approach proposed by U.S. regulators.

The Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010 created the Federal Insurance Office (FIO), which has several functions. The relevant functions are:

- To coordinate federal efforts and develop federal policy on prudential aspects of international insurance matters, including representing the U.S., as appropriate, in the IAIS and assisting the Treasury Secretary in negotiating covered agreements (bilateral or multilateral agreements entered into by the U.S. regarding prudential measures with respect to the business of insurance or reinsurance)
- To determine whether state insurance measures are preempted by covered agreements
- To consult with the states (including state insurance regulators) regarding insurance matters of national importance and prudential insurance matters of international importance

Effectively, this gives the FIO the power to act like a national regulator for purposes of negotiating the contents of ComFrame and its group capital requirement as it can preempt state law if the director of the FIO determines that the measure “results in less favorable treatment of a non-U.S. insurer domiciled in a foreign jurisdiction that is subject to a covered agreement than a U.S. insurer domiciled, licensed, or otherwise admitted in that State,” and state law “is inconsistent with a covered agreement.”

In addition to the FIO, Dodd-Frank gave the Federal government powers to regulate systemically important financial institutions (SIFI). What financial institutions are systemically important is determined by the Financial Stability Oversight Council, a body set up by Dodd-Frank to reduce the risk of any one company being “too big to fail.”

THE FUTURE

All the above activities by the NAIC, FASB, IASB, IAIS, and the FIO leave us with a very muddy picture of how insurance liabilities will be evaluated in the future. The common theme, though, is change, as each proposed framework differs from the current valuation of insurance liabilities today. Several scenarios could play out that would leave us with several different frameworks in place. Yet, any of these changes individually would have one common result: a greater need for actuaries to perform the additional calculations and explain the drivers of the results.

Glossary of Terms

Accepted Actuarial Practice (AAP)

The manner of performing work in accordance with rules and standards of practice as promulgated by the relevant actuarial body, e.g., American Academy of Actuaries in the U.S. or the Canadian Institute of Actuaries in Canada.

Accident year

The calendar year in which the accident occurs and/or the loss is incurred.

Accumulated other comprehensive income (AOCI)

The cumulative value of other comprehensive income or the total of unrealized gains and losses on (i) available-for-sale assets such as loans, bonds and debentures and equities; (ii) derivatives designated as cash flow hedges; (iii) foreign currency translation; and (iv) share of other comprehensive income of subsidiaries, associates, and joint ventures. AOCI is included on the balance sheet of a Canadian insurance company in equity.

Actuarial Opinion Summary (AOS)

A confidential document containing the appointed actuary's range of unpaid claim estimates and/or point estimate, as calculated by the appointed actuary, in comparison to the company's recorded reserves on both a net and gross of reinsurance basis.

Actuarial Standards Board (ASB)

"The Actuarial Standards Board (ASB) establishes and improves standards of actuarial practice. These Actuarial Standards of Practice (ASOPs) identify what the actuary should consider, document, and disclose when performing an actuarial assignment. The ASB's goal is to set standards for appropriate practice for the U.S."[212]

Actuarial Standards of Practice (ASOP)

"ASOPs are intended to provide actuaries with a framework for performing professional assignments and to offer guidance on relevant issues, recommended practices, documentation, and disclosure."[213]

Adjusting and other (A&O) expenses

One of the two components of loss adjustment expense, with defense and cost containment being the other. A&O generally include all expenses associated with the adjusting and recording of insurance claims, other than those included with defense and cost containment expenses.

[212] Actuarial Standards Board. *"About the ASB."* http://www.actuarialstandardsboard.org/aboutasb.asp , 2019.
[213] Actuarial Standards Board, *Introduction to the Actuarial Standards of Practice*, http://www.actuarialstandardsboard.org/pdf/asops/Introduction_113.pdf , October 2008.

According to the 2011 National Association of Insurance Commissioners *Annual Statement Instructions Property/Casualty*, A&O expenses are "those expenses that are correlated with claim counts or general loss adjusting expenses."[214]

Alien insurance company

A company doing business in the U.S. that is incorporated under the laws of a country outside the U.S.

Allocated loss adjustment expenses (ALAE)

Expenses that can be readily assigned to a specific claim, such as attorney fees.

A.M. Best Company

A global credit rating agency that serves the financial and health care service industries. In the insurance area, Best's Credit Ratings cover property/casualty, life, annuity, reinsurance, captive, title and health insurance companies as well as health maintenance organizations. A.M. Best covers thousands of insurance entities across the globe.

American Academy of Actuaries Committee on Property and Liability Financial Reporting (COPLFR)

"This committee monitors activities regarding financial reporting related to property and liability risks, reviews proposals made by various organizations affecting the actuarial aspects of financial reporting and auditing issues related to property and liability risks, and evaluates property and liability insurance and self-insurance accounting issues."[215]

Amortized cost

"The cost of bonds less the amortization of premium, or plus the accumulated accrual of discount, from the date of purchase to the date of valuation."[216]

Annual Statement

A filing made annually by an insurance company to each state insurance department in which it writes business. The filing is prepared under Statutory Accounting Principles and includes the company's financial statements and various supporting schedules and exhibits.

Appointed actuary

"A qualified actuary appointed the Board of Directors, or its equivalent, or by a committee of the Board to render a statement of actuarial opinion. 'Qualified Actuary' is a person who is either:

i. A member in good standing of the Casualty Actuarial Society, or

[214] *2018 NAIC Annual Statement Instructions Property/Casualty*, page 225.
[215] American Academy of Actuaries, "Committee on Property and Liability Financial Reporting," http://www.actuary.org/committees/dynamic/COPLFR, 2019.
[216] Insurance Accounting & Systems Association, *Property Casualty Insurance Accounting*, 2006.

ii. A member in good standing of the American Academy of Actuaries who has been approved as qualified for signing casualty loss reserve opinions by the Casualty Practice Council of the American Academy of Actuaries."[217]

Assets

Resources obtained or controlled by a company as a result of past events that have a probable future economic benefit to the company.

Authorized control level (ACL)

The level of Risk-Based Capital within which the state regulatory authority is authorized, but not required, to take control of an insurance company. This level is triggered when a company's total adjusted capital is between 70% and 100% of the ACL benchmark.

Authorized reinsurer

A reinsurer that is licensed or approved to transact insurance business in a jurisdiction; an unauthorized reinsurer is not.

Balance sheet

The financial statement that presents all of a company's assets and liabilities as of a specific point in time.

Branch Adequacy of Asset Test (BAAT)

Guideline for federally regulated property/casualty insurance companies published by the Office of the Superintendent of Financial Institutions that provides the framework within which the Superintendent assesses whether a property/casualty company, or a foreign branch, maintains adequate capital.

Canadian Institute of Actuaries (CIA)

The national organization of the Canadian actuarial profession.

[217] *2018 NAIC Annual Statement Instructions Property/Casualty*, page 10.

Chartered Professional Accountants Canada (CPA Canada)

"Chartered Professional Accountants of Canada (CPA Canada) is one of the largest national accounting organizations in the world and is a respected voice in the business, government, education and non-profit sectors.

CPA Canada is a progressive and forward-thinking organization whose members bring a convergence of shared values, diverse business skills and exceptional talents to the accounting field. Domestically, CPA Canada works cooperatively with the provincial and territorial CPA bodies who are charged with regulating the profession. Globally, it works together with the International Federation of Accountants and the Global Accounting Alliance to build a stronger accounting profession worldwide. As one of the world's largest national accounting bodies, CPA Canada carries a strong influential voice and acts in the public interest."[218]

Cap

"An agreement obligating the seller to make payments to the buyer, each payment under which is based on the amount, if any, that a reference price, level, performance or value of one or more Underlying Interests exceed a predetermined number, sometimes called the strike/cap rate or price."[219]

Carryforward of net operating losses

An accounting practice used when an insurance company has net operating losses in one financial year and expects those losses to offset gains in the future, thereby reducing future tax liability.

Carrying value

An initial cost of an investment adjusted over time based on the reporting entity's share in the company's income.

Case development

Increases or decreases in the reserves for known claims as additional information becomes available.

Case incurred loss

The reported value of a known claim equal to the sum of paid losses plus case outstanding losses.

[218] Chartered Professional Accountants Canada, "About Chartered Professional Accountants of Canada (CPA Canada)," https://www.cpacanada.ca/en/the-cpa-profession/about-cpa-canada, 2019.
[219] *2018 NAIC Annual Statement Instructions Property/Casualty*, page 373.

Case outstanding loss

The reserve for a known claim, or case reserve, generally established by the company's claims administrator(s)/handler(s) based either on the facts of the particular claim or based on formula.

Case reserves

See definition for *case outstanding loss*

Cash flow statement

A statement that presents a company's operations strictly from a cash perspective.

Ceded reinsurance premiums payable

Premiums that are owed to reinsurers relating to ceded reinsurance.

Ceding commission

A fee paid by the reinsurer to the insurance company (ceding company) for the reinsurance transaction. The fee is generally expected to reimburse the insurer for policy acquisition expenses.

Certified public accountant (CPA)

"Professional accountant who has passed the uniform CPA examination administered by the American Institute Of Certified Public Accountants, and has fulfilled the educational and work related experience requirements for certification."[220]

Claim frequency

The rate of claim occurrence, typically calculated as the ratio of claim counts to exposures.

Claim severity

The average cost of a claim, typically calculated as the ratio of losses to claim counts.

Claims-made policy

An insurance policy covering claims that arise on or after the policy retroactive date and are reported during the term of the policy. The retroactive date may be a date many years before the purchase of the policy. Therefore, a claims-made policy may cover claims made today that result from actions that occurred any time after the retroactive date.

Collar

[220] BusinessDictionary.com, *Definitions,* http://www.businessdictionary.com/definition/certified-public-accountant-CPA.html, 2019.

"An agreement to receive payments as the buyer of an Option, Cap or Floor and to make payments as the seller of a different Option, Cap or Floor."[221]

Common capital stock

A surplus account that is equal to the par value of common stocks that were issued.

Common stock

A type of stock holding that confers voting privileges and may pay a dividend, though the dividend is not guaranteed.

Commutation of ceded reinsurance

The agreement to fully settle all current and future liabilities associated with a reinsurance agreement for a set payment from the reinsurer.

Commuting a claim

A process in which one party is relieved of its obligations in respect of the claim in exchange for a cash payment.

Contingent commissions

Additional commissions paid by an insurance company to its broker if certain volume and/or profit targets are met.

Contingent liabilities

Amounts for which the insurance company may be held responsible but for which the balance is not currently determinable.

Credit risk

A risk that the counterparty will default (or not pay in whole or in part) and the estimation risk associated with amounts recorded for those receivables.

Defense and cost containment (DCC)

One of the two components of loss adjustment expense, with adjustment and other expense being the second. DCC generally includes defense, litigation and medical cost containment expenses, whether internal or external. According to the 2011 NAIC *Annual Statement Instructions Property/Casualty*, DCC expenses are "those that are correlated with the loss amounts."[222]

[221] *2018 NAIC Annual Statement Instructions Property/Casualty*, page 373.
[222] Ibid., page 225.

Deferred acquisition costs (DAC)

An asset that is established under U.S. Generally Accepted Accounting Principles to defer the recognition of acquisition expenses to match the recognition of revenue of insurance companies.

Deferred tax assets (DTAs)

Expected future tax benefits related to amounts previously recorded in the statutory financial statements and not expected to be reflected in the tax return as of the reporting date.

Derivatives

Financial contracts between two parties for which the value is dependent upon the performance of other assets or variables. Examples include options, warrants, caps, floors, collars, swaps, forwards and futures.

Discount rate

The term commonly used when referring to the rate at which the present value of cash flows are calculated.

Discovery year

A calendar year in which a loss or damage is discovered.

Dividends received deduction (DRD)

In the case of corporate stockholders, DRDs are certain allowances that are made to reduce tax on dividends to avoid triple taxation when the Company in turn dividends earnings to their investors.

Dynamic Capital Adequacy Testing (DCAT)

A process of analyzing and projecting the trends of a company's financial condition given its current financial and operating circumstances, its recent past, and its intended business plan under a variety of future scenarios.

Earned but unbilled premiums

Estimated adjustments that will occur to the premium on policies where the actual amount of premium depends on an exposure measure (such as payroll) that is unknown until the end of the policy period.

Encumbrance

An impediment or claim on an asset made by a party that restricts the value of asset from complete use by the owner until the owner clears its obligation to the other party. An example is a lien on a property.

Equity method

A method under which investments in insurance company subsidiary, controlled and affiliated entities (SCAs) are recorded based on the reporting entity's proportionate share of audited statutory equity of the SCA's balance sheet, adjusted for any unamortized goodwill.

Excess treaty reinsurance

A contract under which the reinsurer responds to claims during the treaty period excess of a specified threshold to a specified limit.

Exhibit of Capital Gains (Losses)

An Annual Statement exhibit that shows the split of the gains (losses) between those gains (losses) that were realized on the sale or maturity of an asset and those due to impairments.

Exhibit of Net Investment Income

An Annual Statement exhibit that differentiates between the amount of income collected and the amount of income earned in the year and describes the deductions for investment expenses and other costs.

Facultative reinsurance

A reinsurance contract that is negotiated separately for each insurance policy that is reinsured. Facultative reinsurance is purchased for individual risks that are not covered, or not adequately covered, by the insurer's treaty reinsurance.

Fair value

The value at which an asset or liability could be bought or sold for in the open market.

Financial Accounting Standards Board (FASB)

A private organization providing authoritative accounting guidance for non-governmental entities. It has the responsibility of developing and establishing U.S. Generally Accepted Accounting Principles, with the Securities and Exchange Commission operating in an overall monitoring role over the application of the accounting standards by public companies.

Floor

"An agreement obligating the seller to make payments to the buyer, each payment under which is based on the amount, if any, that a predetermined number, sometimes called the strike/floor rate or price exceeds a reference price, level, performance or value of one or more Underlying Interests."[223]

[223] *2018 NAIC Annual Statement Instructions Property/Casualty*, page 373.

Forward

"An agreement (other than a Future) to make or take delivery of, or effect a cash settlement based on, the actual or expected price, level, performance or value of one or more Underlying Interests."[224]

Future

"An agreement traded on an exchange, Board or Trade or contract market to make or take delivery of, or effect a cash settlement based on, the actual or expected price, level, performance or value of one or more Underlying Interests."[225]

General expenses

Insurance company operating and administrative expenses other than those that relate directly to the acquisition of the business or ongoing policy maintenance costs incurred by an insurance company.

General Interrogatories

A series of questions that the insurance company is required to respond to within its Annual Statement.

Generally Accepted Accounting Principles (GAAP)

An accounting framework that provides a consistent set of rules under which publicly traded and privately held companies report their financial transactions.

Goodwill

An intangible asset that results from the excess of the price paid for an acquired entity and its book value (for U.S. SAP) or fair value (for U.S. GAAP). It represents the value perceived by the buyer in the company for things like customer relationships or trade name, which are not physical or material assets but can be bought or sold due to their relevance to the company's future profitability.

Governmental Accounting Standards Board (GASB)

"…the independent private-sector organization…, that establishes accounting and financial reporting standards for U.S. state and local governments that follow generally accepted accounting principles (GAAP)."[226]

Income statement

[224] Ibid., page 373.
[225] Ibid., page 374.
[226] GASB, "About the GASB" https://www.gasb.org/jsp/GASB/Page/GASBSectionPage&cid=1176168081485, 2019.

A statement that describes a company's gain or loss in net income during a specific time period.

Incurred but not reported (IBNR)

The reserve for claims that have been incurred but not yet reported to the insurance company. IBNR includes a provision for development on known claims ("case development"), a provision purely for those claims that are incurred but not yet reported to the insurance carriers ("pure IBNR"), and reopened claims.

Insurance Expense Exhibit (IEE)

An Annual Statement exhibit that enables regulators to dive deeper into an insurance company's profitability by examining profitability by line of business on a direct and net of reinsurance basis.

Insurance Regulatory Information System (IRIS)

A collection of analytical solvency tools and databases designed to provide state insurance departments with an integrated approach to screening and analyzing the financial condition of insurers. IRIS is used to assist each state in prioritizing which companies need additional regulatory attention.

Insurance contract

A contract under which one party (the insurer) accepts significant insurance risk from another party (the policyholder) by agreeing to compensate the policyholder if a specified uncertain future event (the insured event) adversely affects the policyholder.

Insurance or underwriting risk

The risk of an insurance company associated with issuing insurance policies.

Intercompany pooling

A common arrangement among companies in a group in which each participant fully cedes all of its business to the lead insurance company of the pool, and then each participant assumes back a specific percentage of the total.

Interest rate risk

The risk of loss from changes in interest rates impacting interest-rate-sensitive assets and liabilities.

Internal Revenue Service (IRS)

The U.S. government agency that is responsible for establishing tax laws and collecting taxes.

Internal Target Capital Ratio

The ratio determined by an insurance company intended to provide capacity to withstand unexpected losses beyond those covered by the minimum capital ratio. Canadian property and casualty companies are asked by the Office of the Superintendent of Financial Institutions to establish their own internal target capital ratio.

International Accounting Standards Board (IASB)

"The Board is an independent group of experts with an appropriate mix of recent practical experience in setting accounting standards, in preparing, auditing, or using financial reports, and in accounting education…Board members are responsible for the development and publication of IFRS Standards including the *IFRS for* SMEs Standard. The Board is also responsible for approving interpretations of IFRS Standards as developed by the IFRS Interpretations Committee (formerly IFRIC)."[227]

International Financial Reporting Standards (IFRS)

The accounting standards promulgated by the International Accounting Standards Board typically used for financial reporting by companies licensed in countries outside of the U.S.

Investment affiliate

An affiliate, other than a holding company, engaged or organized primarily to engage in the ownership and management of investments for the insurer. Investment affiliates exclude entities that manage funds of organizations other than the parent.

Letters of credit

Issued by a bank to guarantee that payment will be made by a borrower to the lender. In the case of reinsurance transactions, a letter of credit guarantees that the reinsurer will be able to meet its obligations to the reinsured. The bank typically charges for this guarantee as a percent of its value. The percentage rate generally rises during periods of uncertain economic times.

Liability

An obligation that the company must fulfill based on past events or transactions that will require the use of monetary resources.

Liquidity/Illiquidity premium

[227] IFRS Foundation, "About the International Accounting Standards Board (Board)," https://www.ifrs.org/groups/international-accounting-standards-board/, 2019.

In a situation when the ability to readily trade the asset results in a lower discount rate being applied to the tradable asset's future cash flows than that of the privately held asset, the difference in the discount rates is the liquidity/illiquidity premium for the privately held asset.

Loss adjustment expense (LAE)

Expenses associated with the handling of a claim from the time it is reported to the insurance company until the time it is closed. LAE includes allocated loss adjustment expenses (ALAE) and unallocated loss adjustment expenses (ULAE). The National Association of Insurance Commissioners currently uses the defense and cost containment (DCC) and adjusting and other (A&O) expenses to comprise the two forms of LAE. While LAE in total is equivalent under either the ALAE/ULAE or DCC/A&O definitions, it is the segregation of expenses between the two that differs. DCC generally includes defense, litigation and medical cost containment expenses, whether internal or external, and A&O includes all expenses associated with adjusting and recording policy claims, other than those included with DCC.

Mandatorily convertible security

A security that is required to be exchanged for another type of security at a specified price that differs from the market price at the time of conversion.

Market-Security Analysis & Research (MSA)

A Canadian analytical research firm that is focused on the Canadian insurance industry.

Market valuation approach

A valuation approach in which an investment by an insurance company in subsidiary, controlled and affiliated entities (SCAs) is based on the market value of the SCA, adjusted for the reporting entity's ownership percentage.

Maximum net deferred policy acquisition expense (DPAE)

A ceiling to the amount of the DPAE asset that a property/casualty insurance company may record on its financial statements in Canada.

Minimum capital ratio

Minimum Capital Test (MCT) ratio of 100%.

Minimum capital requirement (MCR)

The smallest level of capital at which a company would be permitted to operate in Canada per the Office of the Superintendent of Financial Institutions.

Minimum capital test (MCT)

Guideline for Federally Regulated Property and Casualty Insurance Companies published by the Office of the Superintendent of Financial Institutions that provides the framework within which the Superintendent assesses whether a property/casualty company, or a foreign branch, maintains adequate capital. MCT compares capital available to capital required.

Mortgage-backed security (MBS)

"Debt instrument secured by a mortgage or a pool of mortgages (but not conveying a right of ownership to the underlying mortgage). Unlike unsecured securities, they are considered 'investment grade,' and are paid out of the income generated by principle and interest payments on the underlying mortgage. It is a type of mortgage derivative."[228] We note that there can be MBS securities designated by the NAIC at 3 through 6, which would be equivalent to a below investment grade designation for bonds.

National Association of Insurance Commissioners (NAIC)

Serves as an organization of state regulators that facilitates and coordinates governance of insurance companies across the U.S.

NAIC Model Investment Law

Allows for two alternative types of investment guidelines:

1. The defined limit system of investment guidelines follows a rule-based approach and prescribes specific quantitative limits for the invested assets that a company may hold.
2. The prudent person system of investment guidelines follows a principles-based approach and requires an insurance company to develop its own investment guidelines.

NAIC's Securities Valuation Office (SVO)

"The National Association of Insurance Commissioners' Securities Valuations Office (SVO), one of three groups within the Capital Markets & Investment Analysis Office, is responsible for the day-to-day credit quality assessment of securities owned by state regulated insurance companies. Insurance companies report ownership of securities to the Capital Markets and Investment Analysis Office when such securities are eligible for filing on Schedule D, DA or BA of the NAIC Financial Statement Blank."[229]

[228] BusinessDictionary.com, *Definitions,* http://www.businessdictionary.com/definition/mortgage-backed-security.html, 2019.

[229] Per the description of the Securities Valuation Office on the NAIC and The Center for Insurance Policy and Research website, http://www.naic.org/svo.htm, 2019.

Net income/Net loss

The difference between the amount of the revenues and expenses during the period. It is referred to as net income if it is positive and net loss if it is negative.

Net investment income earned

Interest and dividends received on investment assets held over the course of the year, net of investment expenses including any associated taxes.

Net realized capital gain (loss)

Income received related to changes in the value of investment assets that are held under U.S. SAP, net of any associated taxes.

Nonadmitted assets

Assets that are not recognized by state insurance departments in evaluating the solvency of an insurance company for statutory accounting purposes.

Notes to Financial Statements

Qualitative and quantitative disclosures made by a company to further explain the balances shown in its financial statements.

Off-balance sheet and other items

Amounts that are not recorded by the insurance company in its statutory financial statements yet still represent assets and/or potential liabilities of the insurance company and therefore expose the company to risk.

Office of the Superintendent of Financial Institutions (OSFI)

The organization that supervises all federally regulated financial institutions, monitors federally regulated pension plans and provides actuarial advice to the Government of Canada.

Option

"An agreement giving the buyer the right to buy or receive, sell or deliver, enter into, extend or terminate, or effect a cash settlement based on the actual or expected price, level, performance or value of one or more Underlying Interests."[230]

Other comprehensive income (OCI)

Changes in unrealized gains and losses on (i) available for sale assets such as loans, bonds and debentures and equities; (ii) derivatives designated as cash flow hedges; (iii) foreign currency translation; and (iv) share of OCI of subsidiaries, associates and joint ventures. OCI is required by U.S. GAAP and International Financial Reporting Standards.

[230] *2018 NAIC Annual Statement Instructions Property/Casualty*, page 373.

Overdue authorized reinsurance

Reinsurance for which the amount of paid loss and loss adjustment expense recoverable is more than 90 days past due for reasons other than dispute between the insurance company and the reinsurer.

Own risk self-assessment (ORSA)

The entirety of the processes and procedures employed to identify, assess, monitor, manage and report the short- and long-term risks a (re) insurance undertaking faces or may face and to determine the own funds necessary to ensure that the undertaking's overall solvency needs are met at all times.

Paid losses

Amounts paid by the insurance carrier for insured claims.

Par value

An amount set by the issuer of a stock when the stock is initially offered, which serves as a minimum value for which the stock can be sold in that initial offering.

Policyholder dividend

A return to the policyholder of a portion of the premium that was originally paid by the policyholder. There are typically state requirements that must be met for a company to pay dividends.

Preferred stock

A stock holding that does not confer voting privileges but usually provides a guarantee on dividends to be paid and usually has preference to common stock in the event of liquidation.

Premium deficiency reserve

A reserve that must be recorded when the unearned premium of in-force business is not sufficient to cover the losses, loss adjustment expense and other expenses that will arise when that premium is earned.

Proportional treaty

A contract under which the reinsurer receives a set proportion of all premiums subject to the treaty, net of ceding commission, and in return pays the same proportion of all claims subject to the treaty.

Protected cell company

A company that comprises individual cells, each with its own assets, liabilities and equity, but that also has access to a part of the company's overall capital. The liability to each cell is limited such that creditors to one cell cannot look to another cell or the company as a whole for assets.

Provision for adverse deviation (PfAD)

A provision required in Canada for adverse deviation in a company's loss reserves determined by increasing the value of variables used in the reserve estimation process.

Provision for reinsurance

A penalty for reinsurance recoverables that may not be collectible. The amount of this provision is a reduction to surplus. This penalty applies to unauthorized reinsurers that do not provided full collateral, that are slow to pay or that have disputed amounts owed to the ceding company, as well as the authorized reinsurers that are slow to pay or that have disputed amounts that are owed to the ceding company.

Regulation S-X

The Securities and Exchange Commission's regulation that contains general instructions to all companies around the composition and presentation of financial statements

Reinsurance contract

Oftentimes considered insurance for insurance companies, a contract under which one party (the insurer or reinsured) transfers risk to another party (the reinsurer) to protect the insurer (reinsured) from financial loss.

Replication (synthetic asset) transaction

A derivative transaction entered into in conjunction with other investments to reproduce the investment characteristics of otherwise permissible investments.

Report year

A calendar year in which losses are reported.

Reported loss

Amount of paid plus case outstanding losses incurred by an insurance company. It represents the dollar value of loss known to the insurance company. Reported loss is synonymous with the term case incurred loss.

Reserve risk

The risk that a reporting entity's loss and loss adjustment expense reserves will develop adversely.

Retroactive date

The date specified in a claims-made insurance policy that defines the first day on which incurred losses are covered under the policy.

Retroactive reinsurance

Reinsurance that is purchased for liabilities that occurred in the past (i.e., prior to the effective date of the reinsurance policy).

Revenue offset

A reduction in earned premium to account for a lack of deferred acquisition costs.

Review date

The valuation date through which material information known to the actuary is included in forming the reserve opinion.

Risk-Based Capital (RBC)

A solvency framework developed by the National Association of Insurance Commissioners from which an amount of capital is determined formulaically based on the application of specified factors to an insurance company's admitted assets and liabilities recorded as of year-end. The calculated amount, or RBC, is compared to the total adjusted capital for the insurance company at year-end to determine the level, if any, of company or regulatory action required from a solvency perspective.

Risk-Based Capital ratio (RBC ratio)

The ratio of total adjusted capital to the authorized control level benchmark computed under the National Association of Insurance Commissioners RBC framework.

Schedule A

A schedule within an Annual Statement that provides information on real estate directly owned by the insurance company.

Schedule B

A schedule within an Annual Statement that provides information on mortgage loans owned by the insurance company that are backed by real estate.

Schedule BA

A schedule within an Annual Statement that provides information on other long-term invested assets owned by the insurance company. These are assets not included in any of the other invested asset schedules, such as real estate that is not owned directly by the insurance company and therefore excluded from Schedule A.

Schedule D

A schedule within an Annual Statement that provides information on bonds and stocks owned by the insurance company.

Schedule DA

A schedule within an Annual Statement that provides information on short-term investments owned by the insurance company. The schedule includes all investments whose maturities (or repurchase dates under repurchase agreement) at the time of acquisition were one year or less except those defined as cash or cash equivalents in accordance with SSAP No. 2R, *Cash, Cash Equivalents, Drafts and Short-term Investments*.

Schedule DB

A schedule within an Annual Statement that provides the number of contracts for each derivative and the notional amount, which represents the number of units of the underlying asset that are involved.

Schedule DL

A schedule within an Annual Statement that provides information on securities lending reinvested assets.

Schedule E

A schedule within an Annual Statement that provides information on the insurance company's cash and cash equivalents.

Schedule F

A schedule within an Annual Statement that provides information on an insurance company's assumed and ceded reinsurance transactions.

Schedule P

A schedule within an Annual Statement that provides loss and loss expenses reserves gross and net and also breaks down the total reserves by line of business and accident year.

Schedule P interrogatories

A series of questions that the insurance company is required to answer to provide further insight into the information reported in Schedule P.

Schedule T

A schedule within an Annual Statement that provides an allocation of its contents by U.S. state (50) and the District of Columbia, as well as five U.S. territories (American Samoa, Guam, Puerto Rico, U.S. Virgin Islands and Northern Mariana Islands), Canada, and "aggregate other alien" territories.

Securities and Exchange Commission (SEC)

The authoritative body for establishing accounting and reporting standards for publicly traded companies in the U.S.

Solvency capital requirement (SCR)

An amount of capital required to limit the probability of ruin over the forthcoming year to 0.5%.

Statement of Actuarial Opinion (SAO)

The opinion of a qualified actuary on the reasonableness of the loss and loss adjustment expense reserves recorded by a property/casualty insurance company as of December 31 each year.

Statement of cash flows

A statement that shows cash inflows and outflows from a company's operations, investments, financing and other sources, the net value of which is included as the value of cash and cash equivalents (and short-term investments under U.S. SAP) that is shown on the on the balance sheet at the end of the reporting period.

Statement of Changes in Equity exhibit

A statement included within the financials of a Canadian insurance company Illustrating the change in equity across the various classes of equity (e.g., share capital, retained earnings, available for sale financial assets) resulting from various transactions or events such as issue of share capital, total comprehensive income for the year, dividends, etc.

Statement of retained earnings

A statement included within the financials of a Canadian insurance company that provides the calculation of the retained earnings for the insurance company at the end of the reporting period.

Statutory Accounting Principles (SAP)

The accounting framework that all U.S. insurance companies are required to report under for state regulatory purposes: "accounting principles or practices prescribed or permitted by an insurer's domiciliary state"[231]

Structured settlements

A situation where an insurance company settles a claim by purchasing an annuity on behalf of a claimant.

Surplus (policyholders' surplus)

The difference between assets and liabilities is generally referred to as net worth, and, in the specific case of an insurance company under statutory accounting, it is referred to as surplus.

Surplus aid

An amount of enhancement to surplus in the current period as a result of ceding commission that has been taken into income on its ceded unearned premium.

Surplus ratio

A ratio of mean policyholders' surplus to the sum of mean net loss and loss adjustment reserves, mean net unearned premium reserves and current year net earned premiums, in total for all lines combined.

Swap

"An agreement to exchange or net payments at one or more times based on the actual or expected price, level, performance or value of one or more Underlying Interests or upon the probability occurrence of a specified credit or other event."[232]

Tabular reserves

Indemnity reserves that are calculated using discounts determined with reference to actuarial tables that incorporate interest and contingencies such as mortality, remarriage, inflation or recovery from disability applied to a reasonably determinable payment stream. This definition does not include medical loss reserves or any LAE reserves.

Tail coverage

[231] NAIC, *Accounting Practices and Procedures Manual*, Volume I, March 2019, page P-2.
[232] *2018 NAIC Annual Statement Instructions Property/Casualty*, page 373.

Coverage issued as an endorsement to a claims-made policy that covers claims incurred after the retroactive date but reported to the insurer subsequent to the claims-made policy expiration date.

Tax-basis earned premium

Earned premium adjusted for a revenue offset.

Tax-basis incurred losses and expenses

Statutory calendar-year incurred paid losses plus the change in discounted loss reserves.

Total comprehensive income

Net income as reported by Canadian insurance companies on the Statement of Income plus other comprehensive income.

Treaty reinsurance

A reinsurance contract that applies to all or a portion of an insurance company's policies written during the term of the reinsurance agreement, typically a calendar year.

Unallocated loss adjustment expenses (ULAE)

Expenses associated with the handling of claims that are not generally assigned to a particular claim, such as salaries for adjustors and utility costs.

Underwriting income

Earned premium minus loss and LAE incurred and other underwriting expenses incurred.

Unearned commissions

Ceding commissions from reinsurance that are not yet earned by the insurance company.

Unearned premiums

The premium that corresponds to the time period remaining on an insurance policy prior to expiration.

Unpaid loss (or loss reserve)

Amount of case outstanding plus incurred but not reported reserves. It represents the remaining amount expected to be paid on claims incurred by the insurance company.

Value at risk

"Largest loss likely to be suffered on a portfolio position over a holding period (usually 1 to 10 days) with a given probability (confidence level). VAR is a measure of market risk, and is equal to one standard deviation of the distribution of possible returns on a portfolio of positions. "[233]

Warrant

"An agreement that gives the holder the right to purchase an underlying financial instrument at a given price and time or at a series of prices and times according to a schedule or warrant agreement."[234]

Written premium risk

A risk that future business written by the company will be unprofitable.

Yield curve

"Graph used typically to show yields for different bond maturities and used for determining the best value in bonds and as an economic indicator. Positive (upward sloping) curve indicates an expanding economy whereas a flat or negative (downward sloping) curve indicates a slowing or contracting economy."[235]

[233] BusinessDictionary.com, *Definitions,* http://www.businessdictionary.com/definition/value-at-risk-VAR.html, 2019.
[234] *2018 NAIC Annual Statement Instructions Property/Casualty*, page 373.
[235] BusinessDictionary.com, *Definitions,* http://www.businessdictionary.com/definition/yield-curve.html, 2019.

APPENDICES

APPENDIX I. FICTITIOUS INSURANCE COMPANY

EXCERPTS FROM THE 2018 ANNUAL STATEMENT FOR FICTITIOUS INSURANCE COMPANY

EXCERPTS FROM THE 2018 INSURANCE EXPENSE EXHIBIT FOR FICTITIOUS INSURANCE COMPANY

2018 STATEMENT OF ACTUARIAL OPINION FOR FICTITIOUS INSURANCE COMPANY

STATEMENT OF ACTUARIAL OPINION

Fictitious Insurance Company

IDENTIFICATION

I, William H. Smith, am a Fellow of the Casualty Actuarial Society, member of the American Academy of Actuaries, and am associated with the firm of WS Actuarial Consulting. I meet the qualification standards of the American Academy of Actuaries for Statements of Actuarial Opinion for the Property and Casualty ("P&C") Annual Statement.

I was appointed by the Board of Directors of Fictitious Insurance Company ("the Company") on September 7, 2018, to provide this opinion for purposes of satisfying the requirements of the NAIC *Annual Statement Instructions Property/Casualty*. The intended users of this opinion are Company management, its Board of Directors and state insurance department regulators.

SCOPE

I have reviewed the December 31, 2018, loss and loss adjustment expense reserves recorded under U.S. Statutory Accounting Principles, listed in Exhibit A and included in the 2018 Statutory Annual Statement of the Company as filed with the respective state insurance departments. Those loss and loss adjustment expense reserves are the responsibility of the Company's management; my responsibility is to express an opinion on those loss and loss adjustment expense reserves based on my review.

My review of the Company's reserves included the use of such actuarial assumptions and methods and such tests of the actuarial calculations as I considered necessary in the circumstances and was conducted in accordance with standards and principles established by the Actuarial Standards Board. My review considered information provided to me through January 28, 2019.

The reserves listed in Exhibit A, where applicable, include provisions for disclosure items (disclosures 8 through 13) in Exhibit B.

In my review, I have relied on data and other relevant information, prepared by John J. Hoffman, Vice President and Controller of the Company. I evaluated that data for reasonableness and consistency. I also reconciled that data to Schedule P, Part 1 of the Company's 2018 Annual Statement.

I have not reviewed the Company's unearned premium reserves, nor have I performed any analysis to determine whether a premium deficiency reserve is needed to supplement the unearned premium reserves reported by the Company.

I have not reviewed any of the Company's assets, nor have I formed any opinion as to their validity or value; the following opinion is based on the assumption that the Company's December 31, 2018,

statutory-basis reserves identified herein are funded by valid assets that have suitably scheduled maturities and/or adequate liquidity to meet cash flow requirements.

OPINION

In my opinion, the amounts carried in Exhibit A on account of the items identified:

- Make a reasonable provision for all unpaid losses and loss adjustment expenses, gross and net as to reinsurance ceded, under the terms of the Company's contracts and agreements.
- Are computed in accordance with accepted standards and principles.
- Meet the requirements of the insurance laws of Florida.

RELEVANT COMMENTS

Materiality standard

In order to establish my materiality standard, for purposes of addressing the risk of material adverse deviation of the Company's reserves for unpaid losses and loss adjustment expenses, I have considered the following amounts:

1.	10% of the Company's net loss + loss adjustment expense reserves (10% of Exhibit A, Item 1. + Item 2.) at December 31, 2018	$5,155,700
2.	20% of the Company's surplus at December 31, 2018	$6,204,800
3.	The difference between the Company's surplus at December 31, 2018, and the company action level based on the NAIC's Risk-Based Capital formula	$19,848,000

My materiality standard, for purposes of preparing the analysis in support of this Statement of Actuarial Opinion, was established at $5,155,700, which is the smallest of the foregoing amounts.

Risk of material adverse deviation

I have identified the major risk factors for this company as: mass tort claims; construction defect claims; so-called "Chinese drywall" claims; cumulative injury losses; claims from large deductible workers' compensation policies; and claims related to catastrophic weather events.

In my analysis I have considered these risk factors and the implications of uncertainty in estimates of unpaid losses and loss adjustment expenses in determining my range of reasonable estimates. I also observed that the difference between the Company's carried reserves for losses and loss adjustment

expenses and the higher end of my range of reasonable unpaid claim estimates is greater than my materiality standard.

In light of the materiality considerations within this analysis, and after considering the potential risks and uncertainties that could bear on the Company's reserve development, I concluded that there are significant risks and uncertainties that could result in material adverse deviation of the Company's carried reserves for unpaid losses and loss adjustment expenses as of December 31, 2018.

These risk factors are described in more detail in the following paragraphs and in the report supporting this opinion.

Mass Torts

The Company has exposure to mass tort claims such as those involving asbestos and environmental impairment liability. The Company's management has indicated that case-basis loss and allocated loss adjustment expense reserves for such claims are established as claims are reported. Additional reserves for such claims are established by the Company's management to include the potential for future development of those claims and the reporting of latent claims. Estimation of ultimate liabilities for those types of claims is unusually difficult due to such outstanding issues as whether coverage exists, definition of an occurrence, determination of ultimate damages, and allocation of such damages to financially responsible parties. The Company's net reserves for these mass tort claims totaling $3,739,000, which are included in the amounts listed in Exhibit A, are subject to greater inherent uncertainty than are estimates of the remainder of the Company's loss and loss adjustment expense liabilities.

Other losses and/or risk factors subject to greater inherent uncertainty

Additionally, at December 31, 2018, the Company has characterized construction defect claims; so-called "Chinese drywall" claims; cumulative injury losses; claims from large deductible workers' compensation policies; and claims related to catastrophic weather events, including wildfires tornadoes and hurricanes, as types of losses subject to greater inherent uncertainty than are estimates for the remainder of the Company's loss and loss adjustment expense liabilities due to pending legal interpretation, coverage disputes, length of the expected settlement pattern and high excess attachment levels. The absence of other types of losses and risk factors from this paragraph does not imply that additional factors will not be identified in the future as having contributed to significant uncertainty in the Company's estimates of unpaid losses and loss adjustment expenses.

Anticipated salvage and subrogation

The Company's management has informed me that the reserves listed in Exhibit A provide for anticipated salvage and subrogation.

Discounting

Except for tabular discount for workers' compensation and other liability, the Company's management has informed me that it does not discount its reserves for unpaid losses and loss adjustment expenses.

Pools and associations

The company does not participate in any voluntary and involuntary underwriting pools or associations.

Retroactive or financial reinsurance

I have been informed by the Company's management that it is not aware of any reinsurance contract that either has been or should have been accounted for as retroactive reinsurance or financial reinsurance.

Uncollectible reinsurance

I have been informed by the Company's management that it is not aware of any significant uncollectible reinsurance. In my review, I have requested information from management on uncollectible reinsurance, reviewed the latest available financial ratings of reinsurers by a recognized rating service and reviewed Schedule F for indications of regulatory actions or reinsurance recoverables on paid losses over 90 days past due. The majority of the Company's ceded loss reserves are with reinsurance companies rated A or better by A.M. Best Company. Past uncollectability levels and current amounts in dispute have been reviewed and found to be immaterial relative to surplus. Therefore, reinsurance collectability does not appear to be an issue. I express no opinion on the financial condition of the Company's reinsurers.

IRIS Ratios

I have reviewed the Company's calculations of the National Association of Insurance Commissioners' Insurance Regulatory Information System (IRIS) tests that relate to the Company's December 31, 2018, loss and loss adjustment expense reserves (Test 11, One-Year Reserve Development to Surplus; Test 12, Two-Year Reserve Development to Surplus; and Test 13, Estimated Current Reserve Deficiency to Surplus). No exceptional values were noted with respect to the Company's December 31, 2018, loss and loss adjustment expense reserve tests.

Extended reporting endorsements

According to management, the Company has no exposure to medical professional liability extended reporting endorsements, such as those relating to death, disability or retirement.

P&C Long Duration Contracts

Excluding financial guaranty contracts, mortgage guaranty policies and surety contracts, the Company's management has informed me that the Company does not write policies with coverage periods of 13 months or greater that are non-cancelable and not subject to premium increase.

Accident & Health ("A&H") Long Duration Contracts

The Company's management has informed me that the Company does not write A&H policies with contract terms of thirteen months and for which contract reserves are required.

* * *

An actuarial report supporting this actuarial opinion is to be provided to the Company to be retained for a period of seven years at its administrative offices and to be available for regulatory examination.

(Signature of William H. Smith)

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February 24, 2019

Exhibit A: SCOPE

Loss and Loss Adjustment Expense Reserves:		Amount
1.	Reserve for Unpaid Losses (Liabilities, Surplus and Other Funds page, Col 1, Line 1)	$41,894,000
2.	Reserve for Unpaid Loss Adjustment Expenses (Liabilities, Surplus and Other Funds page, Col 1, Line 3)	$9,663,000
3.	Reserve for Unpaid Losses – Direct and Assumed (Should equal Schedule P, Part 1, Summary, Totals from Cols. 13 and 15, Line 12 * 1000)	$51,275,000
4.	Reserve for Unpaid Loss Adjustment Expenses – Direct and Assumed (Should equal Schedule P, Part 1, Summary, Totals from Cols. 17, 19 and 21, Line 12 * 1000)	$10,424,000
5.	The Page 3 write-in item reserve, "Retroactive Reinsurance Reserve Assumed"	$0
6.	Other Loss Reserve items on which the Appointed Actuary is expressing an Opinion (list separately)	$0
Premium Reserves:		
7.	Reserve for Direct and Assumed Unearned Premiums for P&C Long Duration Contracts	$0
8.	Reserve for Net Unearned Premiums for P&C Long Duration Contracts	$0
9.	Other Premium Reserve items on which the Appointed Actuary is expressing an Opinion (list separately)	$0

Exhibit B: DISCLOSURES

			Last	First	Mid
1.	Name of the Appointed Actuary		Smith	William	H
2.	The Appointed Actuary's Relationship to the Company. Enter E or C based upon the following: E if an Employee of the Company or Group C if a Consultant			C	
3.	The Appointed Actuary has the following designation (indicated by the letter code): F if a Fellow of the Casualty Actuarial Society (FCAS) A if an Associate of the Casualty Actuarial Society (ACAS) M if not a member of the Casualty Actuarial Society, but a Member of the American Academy of Actuaries (MAAA) approved by the Casualty Practice Council, as documented with the attached approval letter. O for Other			F	
4.	Type of Opinion, as identified in the OPINION paragraph. Enter R, I, E, Q, or N based upon the following: R if Reasonable I if Inadequate or Deficient Provision E if Excessive or Redundant Provision Q if Qualified. Use Q when part of the OPINION is Qualified N if No Opinion			R	
5.	Materiality Standard expressed in U.S. dollars (Used to Answer Question #6)	$5,155,700			
6.	Are there significant risks that could result in Material Adverse Deviation?		Yes [X]	No [ ]	Not Applicable [ ]
7.	Statutory Surplus (Liabilities, Col 1, Line 37)	$31,024,000			
8.	Anticipated net salvage and subrogation included as a reduction to loss reserves as reported in Schedule P (should equal Part 1 Summary, Col 23, Line 12 * 1000)	$1,363,000			
9.	Discount included as a reduction to loss reserves and loss expense reserves as reported in Schedule P				
	9.1 Nontabular Discount [Notes, Line 32B23, (Amounts 1, 2, 3 & 4)], Electronic Filing Cols 1, 2, 3 & 4	$0			
	9.2 Tabular Discount [Notes, Line 32A23 (Amounts 1 & 2)], Electronic Filing Col 1 & 2.	$1,365,000			

Appendix I. Fictitious Insurance Company

10.	The net reserves for losses and expenses for the Company's share of voluntary and involuntary underwriting pools' and associations' unpaid losses and expenses that are included in reserves shown on the Liabilities, Surplus and Other Funds page, Losses and Loss Adjustment Expenses lines.	$0
11.	The net reserves for losses and loss adjustment expenses that the Company carries for the following liabilities included on the Liabilities, Surplus and Other Funds page, Losses and Loss Adjustment Expenses lines.*	
	11.1 Asbestos, as disclosed in the Notes to Financial Statements (Notes, Line 33A03D, ending net asbestos reserves for current year), Electronic Filing Col 6	$3,280,000
	11.2 Environmental, as disclosed in the Notes to Financial Statements (Notes, Line 33D03D, ending net environmental reserves for current year), Electronic Filing Col 6	$459,000
12.	The total claims made extended loss and expense reserve (Greater than or equal to Schedule P Interrogatories).	
	12.1 Amount reported as loss reserves	$0
	12.2 Amount reported as unearned premium reserves	$0
13.	The net reserves for the A&H Long Duration Contracts that the Company carries on the following lines on the Liabilities, Surplus and Other Funds page:	
	13.1 Losses	$0
	13.2 Loss Adjustment Expenses	$0
	13.3 Unearned Premium	$0
	13.4 Write-In (list separately, adding additional lines as needed, and identify (e.g., "Premium Deficiency Reserves", "Contract Reserves other than Premium Deficiency Reserves" or "AG 51 Reserves"))	$0
14.	Other items on which the Appointed Actuary is providing Relevant Comment (list separately)	$0

* The reserves disclosed in item 11 above, should exclude amounts relating to contracts specifically written to cover asbestos and environmental exposures. Contracts specifically written to cover these exposures include Environmental Impairment Liability (post 1986), Asbestos Abatement, Pollution Legal Liability, Contractor's Pollution Liability, Consultant's Environmental Liability, and Pollution and Remediation Legal Liability.

2018 ACTUARIAL OPINION SUMMARY FOR FICTITIOUS INSURANCE COMPANY

ACTUARIAL OPINION SUMMARY

Fictitious Insurance Company

December 31, 2018

This Actuarial Opinion Summary has been prepared in conjunction with my role as Appointed Actuary for Fictitious Insurance Company ("the Company"), and in accordance with the NAIC's Annual Statement Supplemental Filing Instructions. The information provided in this Actuarial Opinion Summary will be included in the actuarial report in support of my Statement of Actuarial Opinion, dated February 24, 2019, on the Company's statutory-basis loss and loss adjustment expense reserves at December 31, 2018. That actuarial report is to be provided to the Company to be retained for a period of seven years at its administrative offices and to be available for regulatory examination.

		Net Reserves (USD in 000s)			Gross Reserves (USD in 000s)		
		Low	Point	High	Low	Point	High
A.	Actuary's range of reserve estimates	43,000		57,000	52,000		68,000
B.	Actuary's point estimate		50,000			60,000	
C.	Company carried reserves		51,557			61,699	
D.	Difference between Company carried and Actuary's estimate (C. - A. and C. – B., if applicable)	8,557	1,557	(5,443)	9,699	1,699	(6,301)

E. The Company has not had one-year adverse development in excess of 5% of surplus in at least three of the last five calendar years, as measured by Schedule P, Part 2, Summary, and disclosed in the Five-Year Historical Data, on line 74, of the Company's December 31, 2018 statutory-basis Annual Statement.

* * *

This Actuarial Opinion Summary was prepared solely for the Company for the purpose of filing with regulatory agencies and is not intended for any other purpose. Furthermore, it is my understanding that, consistent with the Annual Statement Supplemental Filing Instructions, the information provided in this Actuarial Opinion Summary will be held confidential by those regulatory agencies and will not be made available for public inspection.

(Signature of William H. Smith)

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March 1, 2019

RESULTS OF IRIS RATIO TESTS FOR FICTITIOUS INSURANCE COMPANY

OVERVIEW

Within this section of the Appendix, we will walk through the calculation and purpose of the 13 IRIS Ratios, provide possible explanations for unusual values, and show the results of the IRIS Ratio calculations for Fictitious Insurance Company using the 2018 Annual Statement.

IRIS Ratios are grouped into four categories:

- Overall ratios
- Profitability ratios
- Liquidity ratios
- Reserve ratios

We will present the material separately by category.

It is important to note that the calculations provided herein are based on the 2017 edition of the National Association of Insurance Commissioners' (NAIC) *Insurance Regulatory Information System (IRIS) Ratios Manual*. Further, the ranges of "unusual values" are as provided in the 2017 IRIS manual. The NAIC re-evaluates the reasonableness of the ranges periodically, in light of the current environment. For example, years ago the range of "usual" values for IRIS Ratio 6, *Investment Yield*, was between 5% and 10%. Compare that to the range in 2017 of 3% to 6.5%, which reflects the current economic environment. The current version of the IRIS manual needs to be followed when analyzing data.

OVERALL RATIOS

The overall ratios focus on the insurance company's leverage, in terms of premium volume relative to surplus. There are four overall ratios:

IRIS Ratio 1: Gross premiums written to policyholders' surplus
IRIS Ratio 2: Net premiums written to policyholders' surplus
IRIS Ratio 3: Change in net premiums written
IRIS Ratio 4: Surplus aid to policyholders' surplus

IRIS Ratios 1 and 2 provide written premium-to-surplus ratios on a gross and net of reinsurance basis, respectively. The denominator is the same in each of these ratios, with the numerator differing by the amount of ceded reinsurance premium written. The source of this data can be readily found in an insurance company's Annual Statement, from either Part 1B of the Underwriting and Investment Exhibit (U&IE) *and* the balance sheet (page 3), or Five-Year Historical Data.

The purpose of IRIS Ratios 1 and 2 is to identify companies that may be taking on more business and more risk than they can handle relative to their surplus. Unusual values are greater than or equal to 900% on a gross basis and 300% on a net basis. The 300% ratio on a net basis corresponds to the age-old

generally accepted benchmark that insurers remain within the 3-to-1 range in terms of writings relative to surplus. This ratio is higher on a gross basis in consideration of reinsurance.

The following are examples of considerations that should be made when reviewing the results of these ratios:

- The difference between the gross and net IRIS Ratio results:
    - Wide disparity could signal heavy reliance on reinsurance or involvement in fronting arrangements. Further investigation on the quality, rating and collectability of the reinsurance should be made, as well as the level of collateral held, if any. This can be accomplished through a review of the note titled, "Reinsurance" (number 23 within the Notes to Financial Statement of the 2018 Annual Statement), Schedule F, and research on the financial ratings of the company's reinsurers listed in Schedule F by a recognized rating service, such as A.M. Best.
    - This does not mean that a narrow difference between the gross and net IRIS Ratio results should not be investigated, as it could signal inadequate levels of reinsurance protection, in particular if the company is exposed to catastrophe risk. Part 2 of the General Interrogatories provides information on a company's protection against excessive or catastrophic loss, although further inquiry would have to be made of the company for specific details.
- The amount of the gross premiums that stem from assumed business versus business directly written by the company:
    - Companies tend to have less control over business assumed from third parties. Those companies having a large portion of assumed business and IRIS Ratio 1 results nearing the unusual value benchmark should be subject to further investigation. This would include an understanding of the type of business assumed, attachment points, layers and limits of coverage, as well as the underwriting and price monitoring controls in place on the assumed book.
- The results relative to lines of business written:
    - Lower ratio results are preferred for companies writing long-tailed lines of business due to the uncertainty inherent in the ultimate payout of associated claims.

As displayed below, IRIS Ratios 1 and 2 can be calculated for Fictitious using data from the Five-Year Historical Data exhibit.

Data from Fictitious Insurance Company 2018 Five-Year Historical Data (USD)					
	2018	**2017**	**2016**	**2015**	**2014**

Appendix I. Fictitious Insurance Company

6. Gross premiums written (GPW)	28,634,000	28,085,000	29,519,000	31,238,000	31,670,000
12. Net premiums written (NPW)	26,752,000	25,936,000	25,521,000	25,583,000	25,363,000
26. Surplus as regards policyholders (PHS)	31,024,000	31,608,000	35,793,000	32,572,000	34,567,000
Results of IRIS Ratios 1 and 2					
IRIS Ratio 1 (= Line 6 / Line 26)	92%	89%	82%	96%	92%
IRIS Ratio 2 (= Line 12 / Line 26)	86%	82%	71%	79%	73%

As displayed in the above table, the results of IRIS Ratio 1 for Fictitious, ranging from 82% to 96% over the period 2014 to 2018, were well within the benchmark imposed for unusual values (900%). Similarly, the results of IRIS Ratio 2, ranging from 71% to 86% over same period, were well within the 300% benchmark on a net basis.

IRIS Ratio 3 provides the change in net written premiums, current year over prior year, as a percentage of prior year net written premium. The source of this data can be readily found in an insurance company's Annual Statement, from either Part 1B of the current year and prior year U&IEs, or Five-Year Historical Data.

The purpose of IRIS Ratio 3 is to identify companies that are growing or declining rapidly so that further investigation can be made as to the cause. Unusual values are outside of the -33% to +33% range.

The following are examples of considerations that should be made when reviewing the results of IRIS Ratio 3:

- Consistent or large increases in results:
    - Growth brings uncertainty in the types of risks written and the frequency and ultimate cost of claims. In certain markets, it is difficult to expand without conceding on pricing and underwriting standards. Further investigation as to the source of the company's expansion and whether the company has been able to maintain adequate pricing and terms and conditions is warranted. In addition, a review of the results of other IRIS Ratios can serve to mitigate or augment the uncertainty. For example, a mitigating factor would be a low result for IRIS Ratios 1 and 2.
- Consistent or large decreases in results:
    - A decrease in writings also requires attention. A sharp reduction in writings may be a sign of financial stress.
- Unstable results year over year:

- This may be a sign that the company does not have good controls on its underwriting or a solid business plan and therefore raises uncertainty with respect to the viability of the company in the long-term.

We can also calculate IRIS Ratio 3 from Fictitious' Five-Year Historical Data exhibit.

Data from Fictitious Insurance Company 2018 Five-Year Historical Data (USD)					
	2018	**2017**	**2016**	**2015**	**2014**
12. Net premiums written (NPW)	26,752,000	25,936,000	25,521,000	25,583,000	25,363,000
Results of IRIS Ratio 3					
IRIS Ratio 3 (= Line 12 current less prior year) /Line 12 prior year)	3%	2%	0%	1%	

As displayed in the above table, the results of IRIS Ratio 3 for Fictitious, ranging from 0% to 3% over the period 2014 through 2018, were well within the benchmark imposed for unusual values (outside the range -33% to +33%).

IRIS Ratio 4 provides the ratio of surplus aid to policyholder surplus. It is meant to identify companies that rely heavily on reinsurance as a means to enhance surplus. Insurance companies typically receive a ceding commission from their reinsurers for placing business with those reinsurers. Under statutory accounting, the treatment of ceding commissions is similar to the way that an insurance company treats policy acquisition costs, the "signs" are just different. While acquisition expenses are a direct charge to income and surplus as they are incurred, ceding commissions are recognized as a credit to income and surplus when they are incurred. Surplus aid represents the amount of enhancement to surplus in the current period as a result of ceding commission that has been taken into income on its ceded unearned premium. Formulaically,

Surplus aid =

Estimated reinsurance commission rate
* Unearned premium on reinsurance ceded to non-affiliates

where,

Estimated reinsurance commission rate =

Ceding commissions from reinsurance, including contingent commissions
÷ Total written premiums ceded to reinsurers (affiliates and non-affiliates)

Ceding commissions from reinsurance for the current year are found in Part 3, Expenses of the U&IE of the Annual Statement, column 2 (other underwriting expenses), line 2.3 (reinsurance ceded, excluding contingent) plus line 2.6 (contingent — reinsurance ceded).

Total written premiums ceded to reinsurers is found in Part 1B, Premiums Written of the U&IE of the Annual Statement, column 4 (reinsurance ceded to affiliates) plus column 5 (reinsurance ceded to non-affiliates) totals.

Unearned premium on reinsurance ceded to non-affiliates is found in Schedule F, Part 3, reinsurance ceded of the Annual Statement, column 13 totals for the following three categories of unaffiliated reinsurers:

1. Authorized, unauthorized and certified other U.S. unaffiliated insurers
2. Authorized, unauthorized and certified mandatory and voluntary pools
3. Authorized, unauthorized and certified other non-U.S. insurers

IRIS Ratio 4 is the ratio of surplus aid, as calculated above, to policyholders' surplus.

Unusual values are greater than or equal to 15%, and may be a sign that policyholders' surplus is inadequate. Therefore, when IRIS Ratio 4 produces values greater than 15%, certain other IRIS Ratio tests dependent upon policyholders' surplus are recalculated to remove surplus aid. These are:

IRIS Ratio 1: Gross premiums written to policyholders' surplus
IRIS Ratio 2: Net premiums written to policyholders' surplus
IRIS Ratio 7: Gross change in policyholders' surplus
IRIS Ratio 10: Gross agents' balances (in collection) to policyholders' surplus
IRIS Ratio 13: Estimated current reserve deficiency to policyholders' surplus

Further, when IRIS Ratio 4 produced unusual values, the company's reinsurance treaties should be evaluated to assess the impact that cancellation could have on solvency.

The following provides the calculation of IRIS Ratio 4 for Fictitious.

Appendix I. Fictitious Insurance Company

Data from Fictitious Insurance Company 2018 Annual Statement (USD)			
		2018	**Source**
(1)	Surplus Aid	403,172	= (2) * (9) * 1000
(2)	Estimated reinsurance commission rate	44%	= (3) / (6)
(3)	Total ceding commissions from reinsurance	825,000	= (4) + (5)
(4)	Reinsurance ceded, excluding contingent	816,000	Underwriting & Investment Exhibit, Part 3, Column 2, Line 2, 3
(5)	Ceding Commission from reinsurance	9,000	Underwriting & Investment Exhibit, Part 3, Column 2, Line 2, 6
(6)	Total written premiums ceded to reinsurers	1,882,000	= (7) + (8); = Five Year Historical Data GPW minus NPW
(7)	Reinsurance ceded to affiliates	0	Underwriting & Investment Exhibit, Part 1B, Column 4, Total
(8)	Reinsurance ceded to non-affiliates	1,882,000	Underwriting & Investment Exhibit, Part 1B, Column 5, Total
(9)	Unearned premium on reinsurance ceded to non-affiliates	920	= Sum of (10) through (21)
(10)	Authorized Other U.S. Unaffiliated Insurers	532	Schedule F, Part 3, Column 13, Total (000 omitted)
(11)	Authorized Mandatory Pools		Schedule F, Part 3, Column 13, Total (000 omitted)
(12)	Authorized Voluntary Pools	50	Schedule F, Part 3, Column 13, Total (000 omitted)
(13)	Authorized Other Non-U.S. Insurers	201	Schedule F, Part 3, Column 13, Total (000 omitted)
(14)	Unauthorized Other U.S. Unaffiliated Insurers	29	Schedule F, Part 3, Column 13, Total (000 omitted)
(15)	Unauthorized Mandatory Pools		Schedule F, Part 3, Column 13, Total (000 omitted)
(16)	Unauthorized Voluntary Pools		Schedule F, Part 3, Column 13, Total (000 omitted)
(17)	Unauthorized Other Non-U.S. Insurers	16	Schedule F, Part 3, Column 13, Total (000 omitted)
(18)	Certified Other U.S. Unaffiliated Insurers		Schedule F, Part 3, Column 13, Total (000 omitted)
(19)	Certified Mandatory Pools		Schedule F, Part 3, Column 13, Total (000 omitted)
(20)	Certified Voluntary Pools		Schedule F, Part 3, Column 13, Total (000 omitted)
(21)	Certified Other Non-U.S. Insurers	92	Schedule F, Part 3, Column 13, Total (000 omitted)
(22)	Surplus as regards policyholders (PHS)	31,024,000	Page 3, Line 37, Column 1
Results of IRIS Ratio 4			
IRIS Ratio 4		1.30%	= (1) / (22)

As displayed in the above table, the result of IRIS Ratio 4 of 1.30% for Fictitious was well within the benchmark imposed for unusual values (greater than or equal to 15%).

PROFITABILITY RATIOS

The profitability ratios focus on the insurance company's profitability from an operations, investment and surplus perspective. There are four profitability ratios:

IRIS Ratio 5: Two-year overall operating ratio
IRIS Ratio 6: Investment yield
IRIS Ratio 7: Gross change in policyholders' surplus
IRIS Ratio 8: Change in adjusted policyholders' surplus

IRIS Ratio 5 essentially provides a company's combined ratio over a two-year period, offset for investment income earned over that period. In IRIS Ratio 5, the combined ratio is calculated as loss and loss adjustment expense (LAE) incurred plus policyholder dividends incurred, divided by earned premium, plus other underwriting expenses less other income, divided by written premium. The investment income ratio is calculated as the ratio of investment income earned divided by earned premium.

Two-year operating ratio =

Two-year combined ratio – Two-year investment income ratio

where,

Combined ratio =

$$\frac{\text{Net loss and LAE + Dividends to policyholders incurred}}{\text{Net earned premium}} + \frac{\text{Other underwriting expenses – Other income incurred}}{\text{Net written premium}}$$

Investment income ratio =

$$\frac{\text{Investment income earned}}{\text{Net earned premium}}$$

The source of this data can be readily found in an insurance company's Annual Statement, from the Statement of Income and Part 1B of the U&IE.

The purpose of IRIS Ratio 5 is to identify companies that are operating unprofitably. A two-year period is used in the calculation to smooth unusual fluctuations due to a "bad" loss or investment year. Unusual values are greater than or equal to 100%, meaning that the company is operating at an underwriting loss, even after consideration of investment income.

When reviewing the result of this ratio, consideration should be made for the cause by looking at each of the components of the calculation. During the financial crisis, companies experienced a significant decline in investment income and therefore did not achieve as much of a benefit in the offset afforded in the calculation. Further, adverse development on prior accident years will have an impact on the combined ratio, but such development may not be reflective of profitability on the company's current operations or current reserving.

IRIS Ratio 5 is calculated for Fictitious in the following table.

Appendix I. Fictitious Insurance Company

Data from Fictitious Insurance Company 2018 Annual Statement (USD)

		2018 (Current Year)	2017 (Prior Year)	Sum over 2-Year	Source
(1)	Combined Ratio	108%	94%	101%	= (2) + (8)
(2)	Loss Ratio	76%	62%	69%	= (3) / (7)
(3)	Loss & LAE plus Dividends to Policyholders incurred	20,208,000	15,838,000	36,046,000	= (4) + (5) + (6)
(4)	Losses incurred	16,907,000	12,798,000	29,705,000	Statement of Income, Line 2, Columns 1 and 2, respectively
(5)	Loss Adjustment Expenses (LAE) incurred	3,255,000	3,008,000	6,263,000	Statement of Income, Line 3, Columns 1 and 2, respectively
(6)	Dividends to policyholders	46,000	32,000	78,000	Statement of Income, Line 17, Columns 1 and 2, respectively
(7)	Net premiums earned	26,512,000	25,535,000	52,047,000	Statement of Income, Line 1, Columns 1 and 2, respectively
(8)	Expense Ratio	32%	32%	32%	= (9) / (13)
(9)	Expenses Incurred	8,450,000	8,194,000	16,664,000	= (10) + (11) - (12)
(10)	Other underwriting expenses	8,483,000	8,240,000	16,723,000	Statement of Income, Line 4, Columns 1 and 2, respectively
(11)	Aggregate write-ins for underwriting deductions	–	1,000	1,000	Statement of Income, Line 5, Columns 1 and 2, respectively
(12)	Total other income	33,000	47,000	80,000	Statement of Income, Line 15, Columns 1 and 2, respectively
(13)	Net premiums written	26,752,000	25,936,000	52,688,000	Underwriting & Investment Exhibit, Part 1B, Column 6, Total*
(14)	Investment Income Ratio	16%	19%	18%	= (15) / (16)
(15)	Investment income earned	4,290,000	4,860,000	9,150,000	Statement of Income, Line 9, Columns 1 and 2, respectively
(16)	Net premiums earned	26,512,000	25,535,000	52,047,000	Statement of Income, Line 1, Columns 1 and 2, respectively

Results of IRIS Ratio 5

IRIS Ratio 5	84%	= (1) - (14) for two-year period

***Also provided in Five-Year Historical Data*

As displayed above, the result of IRIS Ratio 5 for Fictitious of 84% was well within the 100% benchmark imposed for unusual values.

IRIS Ratio 6 provides the yield in the company's investment portfolio over the past year. IRIS Ratio 6 is calculated as net investment income earned during the year divided by the average of cash plus invested assets over the current and prior year. The source of this data can be readily found in an insurance company's Annual Statement, from the balance sheet and Statement of Income.

The purpose of IRIS Ratio 6 is to identify companies earning unusually low or high yields, potentially indicating a risky, inefficient or expensive investment strategy. Unusual values are outside of a 3.0% to

6.5% range. That is, it is expected that companies will achieve a 3.0% to 6.5% yield on their invested assets during the year.

When reviewing the result of this ratio, consideration should be made for the cause by looking at each of the components of the calculation, and further investigation into the types of investment should be made.

The following provides the calculation of IRIS Ratio 6 for Fictitious.

Data from Fictitious Insurance Company 2018 Annual Statement (USD)				
	2018 (Current Year)	**2017 (Prior Year**	**Sum over 2-Year**	**Source**
(1) Net investment income earned	4,290,000			Statement of Income, Line 9, Column 1
(2) Cash and invested assets	88,551,000	88,534,000	88,542,500	= (3) + (4) - (5); Average over two-year
(3) Total cash and investment assets	87,825,000	87,784,000		Page 2, Line 12, Columns 3 and 4, respectively
(4) Investment income due and accrued	726,000	750,000		Page 2, Line 14, Columns 3 and 4, respectively
(5) Borrowed money	–	–		Page 3, Line 8, Columns 1 and 2, respectively
Results of IRIS Ratio 6				
IRIS Ratio 6			5.0%	= 2 * (1) current year /[(2) for two-year period – (1) current year]

As displayed in the above table, the result of IRIS Ratio 6 for Fictitious of 5.0% was right around the midpoint of the expected benchmark range of 3.0% to 6.5% for usual values. This means that the company earned a return on its invested assets within what would be considered the "norm" for companies in 2018.

IRIS Ratio 7 is what the NAIC calls "the ultimate measure of improvement or deterioration in the insurer's financial condition during the year."[236] It provides the change in policyholder surplus, current year over prior year, as a percentage of prior year surplus, with the surplus figures coming directly from the company's balance sheet. We note that historical surplus figures are also provided in the Five-Year Historical Data of the company's Annual Statement.

Unusual values are outside of a -10% to +50% range. That is, a decrease in a company's surplus by 10% or more, or an increase by 50% or more, is considered a signal for the analyst to perform further inquiry and investigation. The NAIC recognizes that a 10% decrease is conservative; however, decreases in policyholder surplus are of course a greater concern than increases. Increases in surplus of 50% or more

[236] NAIC, *Insurance Regulatory Information System (IRIS) Ratios Manual*, 2017 edition, page 18.

are very unusual for a stable company absent an acquisition or redistribution of capital amongst affiliates and therefore would be a sign of financial instability. According to the NAIC, "a number of insolvent insurers report dramatic increases in policyholders' surplus prior to insolvency."[237]

Using the Five-Year Historical Data exhibit, we can calculate the result of IRIS Ratio 7 over the past four years.

Data from Fictitious Insurance Company 2018 Annual Statement (USD)					
	2018	**2017**	**2016**	**2015**	**2014**
26. Surplus as regards policyholders (PHS)	31,024,000	31,608,000	35,793,000	32,572,000	34,567,000
Results of IRIS Ratios 7					
IRIS Ratio 7 (= Line 26 current less prior year / Line 26 prior year)	-1.8%	-11.7%	9.9%	-5.8%	

As displayed in the above table, the result of IRIS Ratio 7 for Fictitious did breach the -10% mark for unusual values in 2017 at -12%.

IRIS Ratio 8 is similar to IRIS Ratio 7, with the exception that current-year policyholders' surplus is adjusted to remove changes in surplus notes, capital paid-in or transferred, and surplus paid-in or transferred. Removal of these items provides a picture of the improvement or deterioration in financial results due to operations. The source of the data used in the calculation of IRIS Ratio 8 is the balance sheet and Statement of Income of the company's Annual Statement.

Unusual values are outside of a -10% to +25% range. That is, a decrease in a company's surplus resulting from operations by 10% or more, or an increase by 25% or more, is considered a signal for the analyst to perform further inquiry and investigation. The lower bound benchmark is the same as in Ratio 7; however, the upper bound of +25% is lower, reflecting the expectation that operations would not typically cause an increase in surplus by more than 25%.

The calculation of IRIS Ratio 8 is shown below for Fictitious.

[237] Ibid.

Appendix I. Fictitious Insurance Company

Data from Fictitious Insurance Company 2018 Annual Statement (USD)				
		2018 (Current Year)	**2017 (Prior Year)**	**Source**
(1)	Adjusted policyholders' surplus	(584,000)	(4,546,000)	= (2) - (3) - (4) – (8) – (12)
(2)	Policyholders' surplus	31,024,000	31,608,000	Statement of Income, Line 39, Columns 1 and 2, respectively
(3)	Change in surplus notes	–	–	Statement of Income, Line 29, Columns 1 and 2, respectively
(4)	Capital paid-in or transferred	–	–	= (5) + (6) + (7)
(5)	Paid in	–	–	Statement of Income, Line 32.1, Columns 1 and 2, respectively
(6)	Transferred from surplus (Stock Dividend)	–	–	Statement of Income, Line 32.2, Columns 1 and 2, respectively
(7)	Transferred to surplus	–	–	Statement of Income, Line 32.3, Columns 1 and 2, respectively
(8)	Surplus paid-in or transferred	–	361,000	= (9) + (10) + (11)
(9)	Paid in	–	361,000	Statement of Income, Line 33.1, Columns 1 and 2, respectively
(10)	Transferred to capital (Stock Dividend)	–	–	Statement of Income, Line 33.2, Columns 1 and 2, respectively
(11)	Transferred from capital	–	–	Statement of Income, Line 33.3, Columns 1 and 2, respectively
(12)	Policyholders' surplus prior year	31,608,000	35,793,000	Statement of Income, Line 21, Columns 1 and 2, respectively
Results of IRIS Ratio 8				
IRIS Ratio 8		-2%	-13%	= (1) / (12)

As displayed in the above table, the result of IRIS Ratio 8 for Fictitious did breach the -10% mark for unusual values in 2017 at -13%. This is consistent with the finding from IRIS Ratio 7; however, it shows that the surplus enhancement during 2017 of $361,000 helped to cushion the impact of the change in surplus observed in IRIS Ratio 7.

This ratio is telling us that the unusual value in 2017 could be attributed to the company's operations. However, going back and reviewing the components of IRIS Ratio 5, we see that the company's combined ratio for 2017 was 94%, indicating that the company was operating at a profit from its underwriting results. Further, the investment income ratio in 2017 was 19%, which was higher than in 2018. This indicates that the decrease in the company's surplus was not a result of the company's income; net income earned in 2017 was positive, at $4.955 million (see page 4, line 20, column 2). We therefore need to look to the capital and surplus account within the Statement of Income for the reason.

Within column 2 of the capital and surplus account, we see the biggest decrease in surplus came from dividends to stockholders totaling $10.023 million in 2017. This was more than $7 million higher than

dividends made in 2018 and was the reason for the decrease in surplus greater than 10%. Further investigation would determine why the company made such a large dividend payment in 2017 and whether regulatory approvals were required and obtained.

LIQUIDITY RATIOS

The liquidity ratios focus on the amount of liquid assets that the insurance company has to cover its obligations. There are two liquidity ratios:

IRIS Ratio 9: Adjusted liabilities to liquid assets
IRIS Ratio 10: Gross agents' balances (in collection) to policyholders' surplus

IRIS Ratio 9 provides an indication of the company's ability to pay its financial obligations out of assets that are readily convertible into acceptable forms of payment (i.e., cash). In this calculation, an insurance company's liabilities are adjusted to remove deferred agents' balances, as these balances are not liquid assets. Liquid assets include the following:

- Bonds, excluding affiliates
- Stocks, excluding affiliates
- Cash, cash equivalents and short-term investments, excluding affiliates
- Receivable for securities
- Investment income due and accrued

Unusual values are greater than or equal to 100%, suggesting that the company would not be able to pay its liabilities with current liquid assets as defined above.

The primary source of this information is the balance sheet, with investments in parent, subsidiaries and affiliates coming from Five-Year Historical Data, lines 42 through 45 in the 2018 Annual Statement.

The following provides the calculation of IRIS Ratio 9 for Fictitious.

Appendix I. Fictitious Insurance Company

Data from Fictitious Insurance Company 2018 Annual Statement (USD)				
		2018 (Current Year)	**2017 (Prior Year)**	**Source**
(1)	Adjusted Liabilities	63,862,000	63,141,000	= (2) - (3)
(2)	Total liabilities	68,976,000	68,068,000	Page 3, Line 28, Columns 1 and 2, respectively
(3)	Deferred agent's balances	5,114,000	4,927,000	Page 2, Line 15.2, Columns 3 and 4, respectively
(4)	Liquid assets	79,759,000	79,960,000	= (5) + (6) + (9) + (10) + (11) – (12)
(5)	Bonds	58,676,000	58,861,000	Page 2, Line 1, Columns 3 and 4, respectively
(6)	Stocks	19,374,000	19,116,000	= (7) + (8)
(7)	Preferred stocks	34,000	35,000	Page 2, Line 2.1, Columns 3 and 4, respectively
(8)	Common stocks	19,340,000	19,081,000	Page 2, Line 2.2, Columns 3 and 4, respectively
(9)	Cash, cash equivalents and short-term investments	983,000	1,233,000	Page 2, Line 5, Columns 3 and 4, respectively
(10)	Receivables for securities	–	–	Page 2, Line 9, Columns 3 and 4, respectively
(11)	Investment income due and accrued	726,000	750,000	Page 2, Line 14, Columns 3 and 4, respectively
(12)	Investments in parent, subsidiary and affiliates	–	–	= (13) + (14) + (15) + (16)
(13)	Affiliated bonds	–	–	Five-Year Historical Data, Line 42, Columns 1 and 2, respectively
(14)	Affiliated preferred stocks	-	-	Five-Year Historical Data, Line 43, Columns 1 and 2, respectively
(15)	Affiliated common stocks	–	–	Five-Year Historical Data, Line 44, Columns 1 and 2, respectively
(16)	Affiliated short-term investments	–	–	Five-Year Historical Data, Line 45, Columns 1 and 2, respectively
Results of IRIS Ratio 9				
IRIS Ratio 9		80%	79%	= (1) / (4)

As displayed above, the result of IRIS Ratio 9 for Fictitious Insurance Company was 80% in 2018, about 20 points below the 100% benchmark for unusual values. This ratio was consistent with that in 2017 of 79%.

IRIS Ratio 10 provides the ratio of agents' balances in the course of collection to policyholders' surplus. The purpose is to show how dependent a company's surplus is to assets that may not be collectible upon liquidation or are of questionable liquidity.

The source of the data is the balance sheet of the company's Annual Statement. Unusual values are greater than or equal to 40% of surplus.

The following provides the calculation of IRIS Ratio 10 for the current and prior year for Fictitious.

Data from Fictitious Insurance Company 2018 Annual Statement (USD)

	2018 (Current Year)	2017 (Prior Year)	Source
(1) Uncollected premiums and agent's balances in course of collection	2,626,000	2,866,000	Page 2, Line 15.1, Columns 3 and 4, respectively
(2) Policyholders' surplus	31,024,000	31,608,000	Page 3, Line 37, Columns 1 and 2, respectively
Results of IRIS Ratio 10			
IRIS Ratio 10	8%	9%	= (1) / (2)

As displayed above, the result of IRIS Ratio 10 for Fictitious was 8% in 2018, which was well below the 40% threshold for unusual values. This was consistent with the result in 2017 of 9%.

RESERVE RATIOS

The reserve ratios focus on the development of an insurance company's net loss and LAE reserves for purposes of understanding reserve adequacy. These are probably the most important ratios to the property/casualty actuary and where the actuary places most attention, as these ratios are specifically commented on by the appointed actuary in the SAO.

There are three reserve ratios:

IRIS Ratio 11: One-year reserve development to policyholders' surplus
IRIS Ratio 12: Two-year reserve development to policyholders' surplus
IRIS Ratio 13: Estimated current reserve deficiency to policyholders' surplus

IRIS Ratio 11 is the same one-year development test as provided in the Five-Year Historical Data exhibit within the Annual Statement (line 74 in the 2018 Annual Statement). It measures development in the company's net loss and LAE reserves over the past year, whether adverse or favorable, relative to prior year surplus. Essentially, this test looks to see how much surplus would have been absorbed or enhanced in the prior year as a result of adverse or favorable development in the corresponding net loss and LAE reserves. Adverse development is shown as an increase to reserves and therefore a positive number. Results of IRIS Ratio 11 greater than or equal to 20% are considered unusual.

The following table provides the calculation of IRIS Ratio 11 for Fictitious over the period 2015 through 2018.

Data from Fictitious Insurance Company 2018 Five-Year Historical Data (USD)					
	2018	2017	2016	2015	2014
73. Development in estimated losses and loss expenses incurred prior to current year	(875)	(1,354)	(1,618)	(1,935)	(918)

Appendix I. Fictitious Insurance Company

(Schedule P, Part 2, Summary, Line 12, Col. 11; *in 000s*					
74. Percent of development of losses and loss expenses incurred to policyholders' surplus of prior year end (line 73 divided by Page 4, Line 21, Col. 1 x 100)	(2.8)	(3.8)	(5.0)	(5.6)	(2.6)
26. Surplus as regards policyholders (PHS)	31,024,000	31,608,000	35,793,000	32,572,000	34,567,000
Results of IRIS Ratios 11					
IRIS Ratio 11 (= Line 74 above; = Line 73 / Line 26 prior * 1000)	-2.8%	-3.8%	-5.0%	-5.7%	

As displayed in the above table, Fictitious' loss and LAE net reserves developed favorably over the period 2014 through 2018. As a result, IRIS Ratio 11 has historically been negative, ranging from -3% to -6%, and therefore well below the benchmark imposed for unusual values (greater than or equal to +20%).

The trigger of an "unusual" value is a current year ratio greater than or equal to 20%. This will capture reserve deficiencies in the immediate prior year. In addition to this warning, the AOS serves to notify regulators of any trends whereby development in three of the prior five years exceeds 5%. The AOS has a lower threshold than IRIS 11, as it serves to identify those companies that consistently underestimate their loss and LAE reserves.

IRIS Ratio 12 is the same two-year development test as provided in the Five-Year Historical Data exhibit within the Annual Statement (line 76 of the 2018 Annual Statement). It measures development in the company's net loss and LAE reserves over the past two years, relative to surplus at the end of the second prior year. Similar to Ratio 11, results of test 12 greater than or equal to 20% are considered unusual.

The following table provides the calculation of IRIS Ratio 12 for Fictitious over the period 2016 through 2018.

Appendix I. Fictitious Insurance Company

Data from Fictitious Insurance Company 2018 Five-Year Historical Data (USD)					
	2018	**2017**	**2016**	**2016**	**2014**
75. Development in estimated losses and loss expenses incurred 2 years before the current year and prior year (Schedule P, Part 2, Summary, Line 12, Col. 12); *in 000s*	(2,602)	(2,906)	(3,680)	(2,544)	(1,059)
76. Percent of development of losses and loss expenses incurred to policyholders' surplus of second prior year end (Line 75 divided by Page 4, Line 21, Col. 2 x 100)	(7.3)	(8.9)	(10.6)	(7.3)	(3.0)
26. Surplus as regards policyholders (PHS)	31,024,000	31,608,000	35,793,000	32,572,000	34,567,000
Results of IRIS Ratios 12					
IRIS Ratio 12 (= Line 76 above; = Line 75 / Line 26 2nd prior * 1000)	-7.3%	-8.9%	-10.6%		

As displayed in the above table, Fictitious' IRIS Ratio 12 results have historically been negative, ranging from -7% to -10%, and therefore well below the benchmark imposed for unusual values (+20%).

IRIS Ratio 13 is a hindsight test. It looks at a company's net outstanding loss and LAE reserves at the immediate prior two years relative to calendar year earned premium for those years and adds to the reserves development that has emerged over that period (one-year development for the immediate prior year; two-year development for the year prior to that). The test then applies the average of the resulting two "adjusted" loss ratios to earned premium for the recent year (2018) to determine what the outstanding loss reserve should be for that year (2018). A calculated deficiency in recorded loss and LAE reserves of 25% or more is deemed to be unusual.

The purpose of this test is to identify companies that may not have gotten their reserves "right" in the past. The expectation inherent in this test is if companies have had adverse development in the past, they will probably have adverse development in the future. Regulators want to see if companies who have had such adverse development have corrected for it in their current estimates.

The following are examples of considerations that should be made when reviewing the results of IRIS Ratio 13:

- The losses and premiums are not matched in Ratio 13; the numerator is unpaid loss and LAE for all accident years, whereas the denominator is earned premium for the current accident year.
    - This mismatch obstructs the usefulness of the ratio because growth or decline in premium volume, or changes in the mix of business between short- and long-tailed lines, will distort the "outstanding" loss ratio.

- Similarly, because it is strictly a quantitative test, IRIS Ratio 13 cannot take into account qualitative factors that may mitigate adverse development in the future on current reserves, such as change in mix of business.
    - A good example is a company that had observed adverse development on its commercial automobile liability (CAL) line of business in the prior two years but significantly changed their product mix in the current year to be more heavily weighted toward short-tailed homeowners business. As a result of this change in mix, such adverse development would not be expected in the future.

IRIS Ratio 13 requires use of the prior year Annual Statement. While we have not included the 2017 Annual Statement for Fictitious, we have included the required values in the following table to calculate the result of IRIS Ratio 13 for 2018.

	2016	2017	2018		Source
One-Year Development			(875)	(1)	Schedule P, Part 2, Line 12, Column 11; Five-Year Historical Data, Line 73
Two-Year Development			(2,602)	(2)	Schedule P, Part 2, Line 12, Column 12; Five-Year Historical Data, Line 75
Earned Premium	25,618	25,535	26,512	(3)	Stmt of Income, Line 1, divided by 1,000
Loss Reserves	41,643	40,933	41,894	(4)	Page 3, Line 1, divided by 1,000
LAE Reserves	9,955	9,664	9,663	(5)	Page 3, Line 3, divided by 1,000
Policyholder Surplus	35,793	31,608	31,024	(6)	Page 3, Line 37, divided by 1,000
Result of IRIS Ratio 13	**2016**	**2017**	**2018**		**Source**
IRIS Ratio 13					
Outstanding Loss Ratios	201%	198%	194%	(7)	Sum of (4) thru (5), divided by (3)
Restated Loss and LAE Reserves	48,995	49,722		(8)	Sum of (4) thru (5), + (1) for 2017 or + (2) for 2016
Restated Outstanding Loss Ratios	191%	195%		(9)	= (8) divided by (3)
Average Outstanding Loss Ratio			193%	(10)	= average of row (9)
Implied Loss and LAE Reserves			51,165	(11)	= (10) * (3)
Actual Loss and LAE Reserves			51,557	(12)	Sum of (4) through (5)
Deficiency/(Redundancy)			(392)	(13)	= (11) – (12)
Ratio of Def/(Red to PHS)			-1%	(14)	= (13) divided by (6)

As displayed in the above table, Fictitious' IRIS Ratio 13 result was -1% for 2018, which was well below the benchmark imposed for unusual values (greater than or equal to 25%).

APPENDIX II. CANADIAN FINANCIAL STATEMENTS

2018 BALANCE SHEET FOR ALL PROPERTY/CASUALTY INSURANCE COMPANIES

2018 INCOME STATEMENT FOR ALL PROPERTY/CASUALTY INSURANCE COMPANIES