EDUCATION COMMITTEE

OF THE

SOCIETY OF ACTUARIES

GENERAL INSURANCE

ADVANCED TOPICS IN GENERAL INSURANCE STUDY NOTE

REINSURANCE SECTIONS FROM

FUNDAMENTALS OF GENERAL INSURANCE ACTUARIAL ANALYSIS

The Education Committee provides study notes to persons preparing for the examinations of the Society of Actuaries. They are intended to acquaint candidates with some of the theoretical and practical considerations involved in the various subjects. While varying opinions are presented where appropriate, limits on the length of the material and other considerations sometimes prevent the inclusion of all possible opinions. These study notes do not, however, represent any official opinion, interpretations or endorsement of the Society of Actuaries or its Education Committee. The Society is grateful to the authors for their contributions in preparing the study notes.

12.6.4 PROPERTY CATASTROPHE AND AGGREGATE STOP LOSS REINSURANCE

Property catastrophe reinsurance for hurricanes or hail coverage are examples of GI reinsurance that may not be earned evenly through the year as the exposure to claims is not spread evenly throughout the year but instead concentrated over specific months. This coverage is similar conceptually to the seasonal risks of snowmobile, motorcycle, and ocean marine, and thus earned premiums should reflect the provision of coverage.

Another coverage that is not typically earned evenly throughout the year is **aggregate stop loss coverage**. Aggregate stop loss coverage is a form of excess of loss reinsurance that provides protection to the reinsured against the amount by which its claims (net of other reinsurance recoveries) during a specified period (usually a 12-month period) exceed an agreed upon threshold. This agreed threshold may be an amount, such as 150 million, or a percentage, such as a claim ratio of 150%. Given the nature of the coverage, the exposure to claims is much greater near the end of the policy term rather than during the initial months of coverage.

An example demonstrates the differing exposure to loss by calendar quarter for an aggregate stop-loss policy. Assume that the primary insurer has expected claims of 100 million for CY1 with exposure to claims equal throughout the year; further assume that the primary insurer purchases a 150 million aggregate stop-loss reinsurance policy for CY1. Table 12.7 presents details of the expected claims and the relationship to the aggregate stop-loss limit.

Table 12.7

Aggregate Stop-Loss Example
Review based on Initial Expectations

Period	Expected Claims	% Required to Exceed 150M Aggregate Stop-Loss
(1)	(2)	(3)
Jan 1, CY1 - Mar 31, CY1	25	600%
Jan 1, CY1 - June 30, CY1	50	300%
Jan 1, CY1 - Sept 30, CY1	75	200%
Jan 1, CY1 - Dec 31, CY1	100	150%

Column (2) shows the cumulative expected claims each quarter. At the end of the first quarter, expected claims are 25 million, and actual claims would have to be more than 600% of expected for the aggregate stop-loss to have affect. At the end of the second quarter, expected claims are 50 million (25 million for the first quarter plus 25 million for the second quarter), and actual claims would have to be more than 300% to have affect. Similarly, at the end of the third and fourth quarters, actual claims would have to be more than 200% and 150%, respectively, to have affect.

Continuing this example, assume that actual claims in the first quarter were 35 million, which is significantly more than expected. Table 12.8 presents revised calculations that show the percentage of claims required to exceed the aggregate stop-loss limit. While the adverse claims

experience in the first quarter may make the possibility of utilizing the aggregate stop-loss more likely, the first quarter claims do not yet trigger the reinsurance coverage.

Table 12.8

Aggregate Stop-Loss Example
Higher than Expected Q1 Claims Experience

Period	Expected Claims	% Required to Exceed 150M Aggregate Stop-Loss
(1)	(2)	(3)
Jan 1, CY1 - Mar 31, CY1	35	429%
Jan 1, CY1 - June 30, CY1	60	250%
Jan 1, CY1 - Sept 30, CY1	85	176%
Jan 1, CY1 - Dec 31, CY1	110	136%

There are implications to both the insurer and the reinsurer in how premiums are earned for such coverage. Some, though certainly not all, insurers and reinsurers recognize the differences in the exposure to claims for these types of coverages and modify the general assumption of even earnings throughout the policy term.

12.6.6 REINSTATEMENTS

Reinstatement of the policy limits in the context of reinsurance contracts is described in Chapter 10. Reinstatements can also be used in primary insurance policies. IRMI defines **reinstatement premium** as:

> A prorated insurance or reinsurance premium charged for the reinstatement of the amount of a primary policy or reinsurance coverage limit that has been reduced or exhausted by loss payments under such coverages.[115]

As an example, assume a primary insurer purchased 50 million limits catastrophe excess of loss property coverage above a retention of 25 million. Assume further that a severe catastrophe event (such as a wildfire or hurricane) occurred on June 5 in which total claims were 80 million and thus the excess reinsurance layer was exhausted. Given that the insurer still faces exposure to other catastrophe events during the year, the insurer will want to reinstate its excess of loss reinsurance limit. Such reinstatement may be included within the original reinsurance premium or may require additional premiums to be paid to the reinsurer.

The cost and number of reinstatements is subject to negotiation between the insured and the insurer, or the primary insurer and the reinsurer for reinsurance. The reinstatement premium may be included in the original premium or may be an additional premium required of the insured. A reinstatement may be automatic or may require action by the

[115] https://www.irmi.com/term/insurance-definitions/reinstatement-premium, January 27, 2019

insured. Some contacts allow for one or two automatic reinstatements within the original premium, with additional premium required for further reinstatements.

Reinstatement premiums can have a distorting effect on earned premiums, which are a common type of data used for projecting ultimate claims and for interpreting results from year to year. When reinstatement premiums are charged on a reinsurance policy, the primary insurer will have lower than normal net earned premiums and higher than normal claims from the event exhausting the original reinsurance protection. Thus, it is important for the actuary to be aware of when such premiums are required and how they are treated in an insurer's financial data.

15.8 THE DEVELOPMENT METHOD AND REINSURANCE

15.8.1 USING THE DEVELOPMENT METHOD TO ESTIMATE CEDED REINSURANCE OF A PRIMARY INSURER

In projecting ultimate values, actuaries may determine ultimate ceded reinsurance using one of two approaches:

- Project ultimate claims gross and net of reinsurance and derive ultimate ceded reinsurance as the difference; or
- Project ultimate claims for ceded reinsurance directly.

Important considerations in determining appropriate methodology and assumptions for estimating unpaid claims include the type of reinsurance program, the credibility of the claims experience, and changes in the reinsurance program (e.g., changes in overall structure and changes in terms and conditions).

15.8.1.1 Quota Share Example for Auto Insurer

For quota share reinsurance, the ultimate ceded claims are a percentage of the gross ultimate claims. Thus, separate development analyses are not necessary as all the multiplicative relationships are the same for claims aggregated on a gross of reinsurance, ceded reinsurance, and net of reinsurance bases. To determine ultimate ceded claims, the actuary can directly apply the percentage quota share to the estimate of ultimate claims gross of reinsurance from the development method.

For example, assume that Auto Insurer maintained a quota share reinsurance program with ceded percentage of 15% for AY1 through AY6, 12.5% for AY7 through AY10, and 10% for AY11 and AY12. Using the projected ultimate claims based on total limits reported claims experience, estimates of the ultimate ceded claims are presented in Table 15.51.

Table 15.51

Auto Insurer - Third Party Liability Bodily Injury
Estimate of Ultimate Claims Ceded Reinsurance
Based on Development Method Applied to Reported Claims

Accident Year	Projected Ultimate Claims Using Rptd Dev Gross of Reins	Ceded Quota Share Percentage	Estimated Ultimate	
			Ceded to Reinsurance	Net of Reinsurance
(1)	(2)	(3)	(4)	(5)
AY1	33,265	15.0%	4,990	28,275
AY2	29,329	15.0%	4,399	24,930
AY3	26,087	15.0%	3,913	22,174
AY4	22,502	15.0%	3,375	19,127
AY5	12,977	15.0%	1,947	11,030
AY6	19,564	15.0%	2,935	16,629
AY7	17,538	12.5%	2,192	15,346
AY8	17,121	12.5%	2,140	14,981
AY9	22,639	12.5%	2,830	19,809
AY10	21,209	12.5%	2,651	18,558
AY11	23,598	10.0%	2,360	21,238
AY12	37,489	10.0%	3,749	33,740
Total	283,318		37,481	245,837

The projected ultimate claims in column (2) are from column (7) of Table 15.19. The projected ultimate claims are labelled gross of reinsurance in the preceding table and reflect claims at total limits. The quota share percentages in column (3) are provided by the reinsurance department. Column (4) is equal to column (2) multiplied by column (3). Column (5) can be calculated as column (2) minus column (4) or as column (2) multiplied by (100% minus column (3)).

15.8.1.2 Excess of Loss Example for Auto Insurer

If the reinsurance program is excess of loss, then the actuary's decision about how to aggregate the data and conduct the analysis will depend to a large extent on the volume of data and changes in the attachment point or reinsurance limit, if any, over the experience period. If the volume of ceded claims is sufficient to be credible for the purpose of selecting age-to-age and tail factors and the structure of the reinsurance program has not changed, then the actuary can conduct a similar analysis as that described in Section 15.7.2 for salvage, which is a type of recovery for the insurer.

There can be additional challenges when conducting development analyses on a ceded basis if attachment points or reinsurance limits have changed over time. Furthermore, reinsurance terms and conditions that are related to claims sharing (including treatment of ALAE) may change over time. These types of changes can complicate the review of historical claims

experience and potentially invalidate the two primary assumptions that historical experience is predictive of future experience and that activity observed to date is relevant for projecting future activity.

It is not uncommon for primary insurers to select development factors using development triangles with gross of reinsurance data and apply these factors to claims data net of reinsurance. The appropriateness of this approach depends on the attachment point and limits of reinsurance and the extent of claims experience in that layer.

Assume that Auto Insurer maintained an excess of loss insurance program with an attachment point of 1 million per claim. Per the information provided in Section 15.5 on large claims, there are three large claims, with a value of 3.5 million for AY10 and for AY12, claims of 1.5 million and 1 million. Two of these large claims exceed the excess of loss insurance program. Table 15.52 presents one approach to determine ultimate claims ceded and net of reinsurance using the projection of ultimate claims from the reported development method as the starting point.

Table 15.52

Auto Insurer - Third Party Liability Bodily Injury
Estimate of Ultimate Claims Ceded Reinsurance
Based on Development Method Applied to Reported Claims

Accident Year	Projected Ultimate Claims Using Rptd Dev Gross of Reins	Large Claims at 12/31/CY12 xs Attachment Point	Estimated Ultimate	
			Ceded to Reinsurance	Net of Reinsurance
(1)	(2)	(3)	(4)	(5)
AY1	33,265		0	33,265
AY2	29,329		0	29,329
AY3	26,087		0	26,087
AY4	22,502		0	22,502
AY5	12,977		0	12,977
AY6	19,564		0	19,564
AY7	17,538		0	17,538
AY8	17,121		0	17,121
AY9	22,639		0	22,639
AY10	18,430	2,500	2,500	15,930
AY11	23,598		0	23,598
AY12	29,491	500	500	28,991
Total	272,541	3,000	3,000	269,541

Like Table 15.51, the total limits projected ultimate claims (labelled gross of reinsurance) in column (2) are from column (7) of Table 15.19 with the exception of AY 10 and AY 12, where the ultimate claims are from line (D) of Table 15.20. Thus, the projected ultimate claims in

column (2) for AY 10 and AY 12 include an adjustment for large claims. The claims in column (3) reflect the claims value excess of the insurer's 1 million retention. The actuary typically receives this information from large claims reports provided by the claims department and reinsurance program details provided by the reinsurance department. In this example, the estimated ultimate claims ceded to reinsurance in column (4) are simply the latest estimates of the reported claims that are above Auto Insurer's retention of 1 million per claim.

Whether or not the excess claims are adjusted for further development depends on the treatment of large claims for the development of ultimate claims in column (2). In this example, given that the projected ultimate claims in column (2) do not include further development on the large claims, there is no further development included in column (3). It is important that the actuary is consistent in the assumptions for columns (2) and (3). If development factors are applied to large claims in column (2), then the actuary would need to apply development to the reported excess claims in column (3). Sources of such excess development may be based on the insurer's own experience if sufficiently credible or may be based on external benchmarks such as the RAA. Appendix G contains further examples of using the development method to project excess claims.

15.8.1.3 Relevance of Historical Data Following Change in Reinsurance Program

Changes in an insurer's reinsurance program can have a significant effect on claims experience net of reinsurance. Thus, the actuary must be knowledgeable of the reinsurance program and adjust the aggregation of data, methodologies, and assumptions as appropriate.

For example, assume a commercial property insurer had maintained a per risk excess of loss reinsurance program with a 1 million retention for ten years, with an effective date of July 1 for the reinsurance policy. Assume on July 1, CY11, this insurer changed its excess of loss reinsurance program to a 5 million retention with an AAD of 10 million.

The historical data on a net of reinsurance basis would likely not be appropriate for projecting the ultimate values for AY 11 as historical claims would be capped at 1 million. Furthermore, accident year aggregation using January 1 to December 31 may not be appropriate given the change in reinsurance program at July 1.

One approach for projecting ultimate claims net of reinsurance at December 31, AY12 includes the following steps:

- Prepare data triangles for both net and gross of reinsurance reported claims by semi-annual period over the experience period January 1, AY1 to June 30, AY11.

- Determine if there are claims in the gross of reinsurance triangle that exceed the new 5 million retention, and if so, remove these claims.

- Use the data net of reinsurance to project ultimate claims for accidents occurring June 30, AY11 and prior.

- Use the data gross of reinsurance adjusted to remove claims greater than 5 million to determine development patterns to apply to reported claims data for the semi-annual periods after July 1, AY11.

- Using gross of reinsurance data with adjustments to remove claims in excess of 5 million per occurrence, combine the semi-annual projections to an annual basis and determine the likelihood of ultimate claims reaching the AAD of 10 million.

There are many other approaches that the actuary can implement. The important point is that the actuary must consider the implication of changes in reinsurance on the types of data and how such data are aggregated as well as the actuarial projection factors, including age-to-age and tail factors.

15.8.2 USING THE DEVELOPMENT METHOD TO ESTIMATE ULTIMATE VALUES FOR A REINSURER

Actuaries working with reinsurers frequently rely on the development method as one of several methods used to project ultimate values for more mature years and often for short-tail lines of business. Given the lengthy lags in reporting experienced by reinsurers, the reported and paid claims may be too sparse to be relevant for use in the development method for many years in the experience period. In the reinsurance reserving chapter of *Foundations of Casualty Actuarial Science*, Patrik notes that there is an advantage and a disadvantage to using the development method for reinsurance. The advantage is that there is a strong relationship between future development and both the reporting pattern as well as the reported claims, by lag and by year. However, this strong relationship leads to a disadvantage, especially for long-tailed lines, as random deviations in reported claims will have a magnified effect because the projected ultimate values are highly dependent on reported claims. (Patrik, 2001)

The importance of the actuary using the development triangle to better understand the insurer's circumstances is discussed repeatedly in this and the previous chapter. Reinsurance actuaries are often less aware of the many operational changes that influence the claims experience of the primary insurers ceding risk. As a result, there can be greater uncertainty in assumptions for reinsurers and the resulting estimates of ultimate claims. This uncertainty is exacerbated if a reinsurer does not receive timely or complete claims data from its cedent insurers.

Changes in retentions, limits, and treatment of ALAE can affect the analysis of ultimate claims for a reinsurer just as they can for a primary insurer. Reinsurance contracts are often complex with numerous participants sharing differing layers of coverage; at times, the primary insurer will also participate in the reinsurance coverage. The layers and percentages frequently change from year to year based on the insurer's experience in the prior year as well as the overall market cycle. All of these changes can influence the data and the applicability of historical experience for projecting future experience. Thus, reinsurers will generally rely to a greater extent on methods that incorporate expected values. These methods are addressed in subsequent chapters of this textbook.

16.7 FREQUENCY-SEVERITY METHODS AND REINSURERS

Count data are often not available to reinsurers, and thus frequency-severity methods tend not to be used as frequently for projecting ultimate claims for reinsurers as they are for primary insurers.

17.8 EXPECTED METHOD AND REINSURERS

The expected method is frequently used to project ultimate claims for reinsurers for the most recent accident or underwriting years. This method is used with both short-tail and long-tail lines of business written by reinsurers. Given the significant lags in reporting of claims to reinsurers, the reported and paid claims for the most recent years often do not contain sufficient data for reliable development-based projections.

For a reinsurer, the expected method is almost always based on a claim ratio approach as other exposures are not usually available. Actuaries working with a reinsurer would strive to adjust historical claim data for trend, tort reform, and other measurable changes in claims over time. Because detailed exposure data are not available, the same level of insight into trends may not be available to actuaries working with reinsurers. Similarly, earned premiums should be adjusted for rate changes. However, actuaries working with reinsurers do not always have detailed information about applicable rate level changes; nevertheless, when working with reinsurers, actuaries would strive to adjust historical claim ratios for changes in rates over the experience period. To the extent that historical limits or attachment points have changed, actuaries would strive to adjust historical claims and premiums for these changes as well.

In selecting the expected claim ratio for any particular year, it is important to take into account claims that have already been reported. By its nature, reinsurance responds to catastrophes and very large claims. In most circumstances, actuaries would not want to select an expected claim ratio that is less than current reported claims.

The selection of the expected claim ratios for reinsurers is often based on significant professional judgment and much less rigorous supporting calculations than that found for actuaries working with primary insurers. It is important to recall that the Standards for actuarial work apply equally to actuaries working with primary insurers and those working with reinsurers.

18.8 THE BORNHUETTER FERGUSON METHOD AND REINSURERS

The Bornhuetter Ferguson is often used to project ultimate claims for reinsurers. Once the reported and paid claims have sufficient volume to be relevant to the estimate of ultimate claims, actuaries seek to incorporate them into the analysis. Return to the two fundamental assumptions of the development method:

1. Historical experience is predictive of future experience; and
2. Activity observed to date is relevant for projecting future claim activity.

While the historical experience of a reinsurer's claims[179] may not be predictive for the earliest maturity ages due to the lag in reporting, there is often an age at which the data does have sufficient volume and reliability in its reporting and payment behavior that actuaries can select age-to-age factors and calculate a development pattern. Similarly, while the claims observed to date may not be relevant for the most recent years in the experience period, the reported and/or paid claims often do have relevance for projection purposes as the accident year (or underwriting year) matures. Thus, actuaries turn to the Bornhuetter Ferguson method as a way to bridge the most immature years, for which the expected method is often used, and the most mature years, for which development methods are frequently used.

In deriving development patterns for use in the Bornhuetter Ferguson method, actuaries working with a reinsurer may turn to internal data (i.e., development triangles based on the reinsurer's experience) or reinsurance industry benchmarks. The actuary would need to consider limitations of external data as described in Chapter 4 before proceeding with industry benchmarks.

[179] For reinsurers, the analysis of ultimate values is usually limited to claims and not counts. Detailed data on counts is often not available to the reinsurer.

19.6 THE CAPE COD METHOD AND REINSURERS

The Cape Cod method may be used instead of or in addition to the Bornhuetter Ferguson method. Actuaries would turn to both of these methods as a way to bridge the most immature years, for which the expected method is often used, and the most mature years, for which development methods are frequently used.

Recall Formula 18.1, the basic formula for ultimate values of both the Bornhuetter Ferguson and Cape Cod methods:

Formula 18.1

$$\text{ultimate value} = \text{observed experience} + [(\text{expected value}) \times (\text{expected \% unobserved})].$$

For reinsurers, the expected values are frequently based on a claim ratio approach because other exposures are typically not available. The difference between the two methods is the derivation of the expected claim ratio and thus the expected claims. One challenge facing reinsurance actuaries with both methods is the dependence of the unobserved claims (using the terminology of Formula 18.1) upon the on-level earned premiums by year. For actuaries working with reinsurers, detailed information about premium rate changes is not always available, but it remains an important component of the Cape Cod and Bornhuetter Ferguson methods.

20.6 BERQUIST-SHERMAN ADJUSTMENTS AND ACTUARIES WORKING WITH REINSURANCE

It is far more challenging for actuaries working for reinsurers to use the Berquist-Sherman adjustments to modify claims development triangles for assumed claims. The data for reinsurers typically represent the combined experience of multiple primary insurers. While some of these primary insurers may be experiencing change, the change is likely different from one insurer to the next. For example, one insurer may be experiencing a shift in case reserve adequacy due to procedures implemented by a new leader, while another insurer may be experiencing change in the settlement pattern related to the implementation of claims modernization initiatives that include use of drones, robotics, and digital technologies. Thus, it is important that reinsurance actuaries strive to have open lines of communication with their reinsureds to understand how changing environments could influence ceded claims.

For primary insurers working in environments of change, it is also important to consider if the effects of change (due to internal or external forces) could have different effects on claims at different layers, particularly between retained and ceded claims. Typically, such would be reflected in qualitative and judgment adjustments instead of the quantitative adjustments achieved through the Berquist-Sherman techniques.

21.3.5 ATTACHMENT POINTS

An attachment point is the dollar value at which excess insurance or reinsurance coverage applies. For example, a primary insurer may purchase excess insurance for its automobile TPL and GL books of business with an attachment point of 1 million per occurrence. The insurer may also buy reinsurance coverage for its property portfolios (personal and commercial) with an attachment point of 2 million per claim. When primary insurers determine the attachment point at which they seek excess insurance and reinsurance protection, there are numerous considerations including but not limited to: recent claims experience (of the insurer and the industry), anticipated changes in their portfolio (which may be a result of recent merger or acquisition activity), their risk appetite, and the underwriting cycle (e.g., soft or hard market). Reinsurers also examine these issues when they decide the attachment points that they want to offer insurers.

Like changes in policy limits, changes in attachment points can have a significant effect on the claims experience. Increasing the attachment point for excess or reinsurance coverage could have a similar effect as that described for increasing policy limits, with longer reporting and settlement development patterns, higher severity values, and higher trends underlying the severity. Conversely, decreasing the attachment point (e.g., a change from a 2 million attachment point to a 1.5 million attachment point) could lead to shorter reporting and payment patterns on a net of reinsurance basis and lower net of reinsurance severity. The actuary would consider whether the change in attachment points led to a violation of the underlying assumption that the future can be estimated based on historical experience. If this fundamental assumption no longer holds following the change in attachment point, then adjustments, quantitative or qualitative, would be required for the actuarial estimation of ultimate claims.

21.3.6 REINSURANCE REINSTATEMENT PROVISION

Reinsurance policy contracts often offer reinstatement provisions in which the coverage becomes effective following a full limit occurrence. This is particularly important for insurers who are faced with catastrophic losses early in the policy year. The option to reinstate the coverage may be included in the original premium or may be offered at an additional cost.

For example, many Canadian insurers opted to reinstate their reinsurance protection following the June 2013 catastrophic floods in Alberta. Given the extreme floods that occurred in Ontario in July 2013, this proved to be a critical decision for many insurers. In December of 2013, there was a catastrophic ice storm in Ontario. More insurers in December would have debated the value of reinstating their reinsurance protection (if it was not automatically provided for in the terms and conditions) given how close that event was to the January 1 renewal date. In Canada, with significant earthquake exposure in British Columbia as well as elsewhere in the country, the reinstatement of property reinsurance is particularly important.

Other jurisdictions around the world face similar situations as Canada. The official Atlantic hurricane season starts on June 1 and ends November 30. There are numerous examples over the past twenty years of multiple large hurricanes making landfall in the U.S. in the same calendar year including 2005 (Hurricanes Katrina in August, Rita in September, and Wilma in October) and 2012 (Hurricanes Isaac in August and Sandy in October). Bushfires in Australia and wildfires in the western U.S. and Canada can result in multiple catastrophic losses for insurers.

While a reinstatement of reinsurance coverage following a catastrophic event can be vitally important for an insurer, it can result in a distortion of historical experience for both exposures (particularly earned premium) and claims. Reinstatement premium, which is often considered earned immediately, is a ceded value and thus reduces the net earned premium for the primary insurer. Where a catastrophic event has occurred, the claims net of reinsurance will be unusually high (due to the catastrophe), and the net earned premium will be even lower than usual due to the additional ceded reinstatement premium. The comparison on a net of reinsurance basis could appear distorted for years in which the limit is breached, and reinstatement premiums are paid when compared to years in which no reinstatement is paid. Similarly, claims net of reinsurance could be higher for a year in which the reinsurance limits were available more than once. The actuary needs to carefully review development patterns, expected claims ratios, as well as expected frequency and severity values when estimating ultimate claims for a coverage and time frame for which reinstated reinsurance is applicable.

23.4 UNPAID ULAE FOR REINSURERS

Primary insurers typically retain ULAE and do not cede these expenses to their reinsurance partners. Thus, unpaid ULAE for many reinsurers are not as significant a proportion of total unpaid claims as for primary insurers. Reinsurers may only have limited or even no staff in their claim department. In some cases, ULAE may be related to recording data only. Where reinsurers do have claim professionals on staff, they are likely to be involved to a greater extent in the management of claims arising from excess of loss contracts than in the management of claims resulting from proportional contracts.

Given the reinsurer's limited role in the claim-handling process, actuaries working with reinsurers may have less reason to differentiate between the ULAE ratio applied to pure IBNR and the ratio applied to development on case estimates when estimating unpaid ULAE.[204]

One method for testing the reasonableness of an estimate of unpaid ULAE for a reinsurer is to consider the reinsurer from a run-off perspective. Actuaries working with a reinsurer may determine the number of years to run off the claim liabilities, the number of claim staff to manage the claims during the run-off period, and the annual costs. For example, assume that the actuary determines that it will take 20 years to dispose of (also referred to as "run off") the claim liabilities. Furthermore, assume that three claim professionals are required for the first 15 years, then only two professionals for the next three years, and then only one professional for the last two years of the run-off period. The current annual wage for each claim professional is 50,000, and annual wage inflation of 2.5% is assumed. Table 23.19 presents the total estimate of unpaid ULAE for this hypothetical reinsurer.

[204] Note that while the differentiation of IBNR into development on case estimates and pure IBNR produces a more accurate application of the unpaid ULAE formula (see Formula 23.2), in practice many actuaries working with primary insurers also do not separate IBNR into these components when estimating unpaid ULAE and instead use Formula 23.1 without any modification.

Table 23.19

Reinsurer - Runoff Example

Unpaid ULAE

Calendar Year	Number of Claims Professionals	Trend Factor at 2.5%	Annual Expense Per Professional	Total Annual Expenses
(1)	(2)	(3)	(4)	(5)
CY1	3	1.000	50,000	150,000
CY2	3	1.025	51,250	153,750
CY3	3	1.051	52,550	157,650
CY4	3	1.077	53,850	161,550
CY5	3	1.104	55,200	165,600
CY6	3	1.131	56,550	169,650
CY7	3	1.160	58,000	174,000
CY8	3	1.189	59,450	178,350
CY9	3	1.218	60,900	182,700
CY10	3	1.249	62,450	187,350
CY11	3	1.280	64,000	192,000
CY12	3	1.312	65,600	196,800
CY13	3	1.345	67,250	201,750
CY14	3	1.379	68,950	206,850
CY15	3	1.413	70,650	211,950
CY16	2	1.448	72,400	144,800
CY17	2	1.485	74,250	148,500
CY18	2	1.522	76,100	152,200
CY19	1	1.560	78,000	78,000
CY20	1	1.599	79,950	79,950
Total				3,293,400

Another method for testing the reasonableness of the estimated unpaid ULAE for a reinsurer is to look at the situation from a going-concern perspective. The actuary would first determine the duration of the claim liabilities. In this context, duration refers to the expected number of years until final settlement of all claims. The actuary can then compare the implied annual costs based on the estimate of unpaid ULAE (derived from a ratio-based approach or a run-off approach) to the reinsurer's latest annual expenses to determine if the result is reasonable for an active reinsurer given the duration.