Analytics Training

Creating and Using Reserve Analyses

RISK 66 | SIGMA ACTUARIAL CONSULTING GROUP, INC.

Meet the Trainers:

ReSource Pro & SIGMA Actuarial Consulting Group

Tony King
Senior Actuarial Consultant
SIGMA Actuarial Consulting

Enoch Starnes, ACI
Actuarial Consultant
SIGMA Actuarial Consulting

Frank Pennachio
Principal
ReSource Pro

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Training Series Overview

Our goal with this training program is to reinforce the necessity of analytics and show ways they can be used in relation to both pursuing and retaining clients.

We want you to feel comfortable enough with analytics to be able to confidently use them in your everyday work.

Why are Reserve Analyses Needed?

Year-End Budgeting

On year-end financial statements, companies are required to record their retained outstanding loss and ALAE as of a date at or near the end of the year.

This line item includes both case reserves, which come directly from a loss run, and IBNR, which is estimated within an actuarial report.

Why are Reserve Analyses Needed?

Collateral/Letter of Credit Negotiations

When working with a carrier to negotiate the collateral required for outstanding historical losses, having an **independently** produced reserve analysis allows clients to have an analytic foundation for their discussions.

Note:
This is also possible with internally produced reserve analyses using independent tools.

Why are Reserve Analyses Needed?

Acquisitions

When a company is being acquired, a **recently evaluated** reserve analysis <u>must</u> be used as part of the acquisition process.

Depending on which side of the process they're on, some clients may have a vested interest in this amount being lower or higher than expectations.

Why are Reserve Analyses Needed?

Self-Insurance Requirements

Companies with self-insured programs in **certain states** or **domiciles** may be required to provide an annual reserve analysis.

Creating a Reserve Analysis

Using Historical Retentions

While loss projections analyze historical losses as if their retention matches the projected period, reserve analyses typically use **each** historical period's **actual** retention.

This isn't always the case, as we'll see in XYZ's case study, but the determining factor is generally whether or not the reserve analysis will be used for internal or external purposes.

Creating a Reserve Analysis

Selecting Ultimate Losses

Period Start	Estimated Ultimate Losses (Incurred Method)	Estimated Ultimate Losses (Paid Method)	Selected Estimated Ultimate Losses	Weighting
01/01/15	$644,470	$712,725	$680,000	50% Inc / 50% Paid
01/01/16	675,024	660,127	670,000	50% Inc / 50% Paid
01/01/17	646,554	643,701	650,000	50% Inc / 50% Paid
01/01/18	693,719	818,202	760,000	50% Inc / 50% Paid
01/01/19	593,918	482,142	540,000	50% Inc / 50% Paid
01/01/20	742,665	530,399	640,000	50% Inc / 50% Paid

Creating a Reserve Analysis

Calculating Reserves

Period	Retention	Selected Estimated Ultimate Incurred Losses	Reported Paid Losses	Estimated Required Reserves
01/01/15	$100,000	$680,000	$559,000	$121,000
01/01/16	100,000	670,000	493,000	177,000
01/01/17	100,000	650,000	437,000	213,000
01/01/18	100,000	760,000	483,000	277,000
01/01/19	100,000	540,000	214,000	326,000
01/01/20	100,000	640,000	107,000	533,000
Total		$3,940,000	$2,293,000	$1,647,000

Creating a Reserve Analysis

Cash Flows

Period Start	Expected Future Payments									
	2021	2022	2023	2024	2025	2026	2027	2028	2029	Total
01/01/15	$48,506	$29,897	$21,077	$21,519	$0	$0	$0	$0	$0	$121,000
01/01/16	56,128	48,455	29,866	21,055	21,497	0	0	0	0	177,000
01/01/17	50,180	51,631	44,573	27,473	19,368	19,774	0	0	0	213,000
01/01/18	76,010	47,351	48,720	42,060	25,924	18,276	18,659	0	0	277,000
01/01/19	115,208	57,842	36,033	37,075	32,007	19,728	13,908	14,199	0	326,000
01/01/20	254,583	98,392	49,399	30,774	31,663	27,335	16,848	11,878	12,127	533,000
Total	**$600,615**	**$333,568**	**$229,669**	**$179,956**	**$130,459**	**$85,114**	**$49,415**	**$26,077**	**$12,127**	**$1,647,000**

Creating a Reserve Analysis

Discounting

Period Start	Expected Future Payments									
	2021	2022	2023	2024	2025	2026	2027	2028	2029	Total
01/01/15	$48,506	$29,897	$21,077	$21,519	$0	$0	$0	$0	$0	$121,000
01/01/16	56,128	48,455	29,866	21,055	21,497	0	0	0	0	177,000
01/01/17	50,180	51,631	44,573	27,473	19,368	19,774	0	0	0	213,000
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Total	**$600,615**	**$333,568**	**$229,669**	**$179,956**	**$130,459**	**$85,114**	**$49,415**	**$26,077**	**$12,127**	**$1,647,000**

Discount Rate	Expected Future Payments - Discounted Basis									
	2021	2022	2023	2024	2025	2026	2027	2028	2029	Total
2.0%	$594,700	$323,800	$218,600	$167,900	$119,300	$76,300	$43,400	$22,500	$10,200	$1,576,700

Creating a Reserve Analysis

Calculating a Reserve Range

Range of Required Reserves as of 12/31/20

	Selected Estimated Ultimate Incurred Losses	Reported Paid Losses	Estimated Required Reserves	Percentile
Favorable	$3,773,000	$2,293,000	$1,480,000	90%
Expected	3,940,000	2,293,000	1,647,000	100%
Adverse	4,103,000	2,293,000	1,810,000	110%

Important Considerations

Choosing a Discount Rate

This choice will depend on a number of factors:

- A client's internal rate of return
- What is acceptable from an audit standpoint

Note:
When in doubt, select a discount rate at or near the current risk-free rate.

Important Considerations

Discounted vs Undiscounted

- A client may wish to book their reserves at the discounted amount.
- Whether or not this is reasonable will likely depend on conversations with their auditors.

Important Considerations

Optimistic vs Pessimistic

When calculating an **estimate of required reserves**, it is implicitly understood that the amount calculated will almost certainly not represent the exact cost.

A **range** may be calculated around the reserves to represent reasonable expectations.

You'll want to work closely with both your **client** and their **auditor** to determine both an **acceptable range** and where a client's booked reserves may lie within that range.

Such as
+/- 20%
of the IBNR

Important Considerations

Reasons to Continue or Switch Methods

As you gain a better understanding of a client's program, expectations, and **tolerance for risk**, it may be necessary to tweak the calculations being used.

If so, make sure that their auditor is kept in the loop about any changes to prevent surprises or disruptions at **year-end**.

Case Study – ABC Corp

ABC Corp is concerned that their collateral requirements are too high and not reflective of their improving loss experience.

DECEMBER

With year-end coming up soon, they're seeking an independently produced reserve analysis.

This will determine whether their concern is valid and, if so, it will then be used for negotiation purposes.

Case Study – ABC Corp

Quantitative Information Required

- Recently evaluated losses
- LDFs
- Historical retentions

Case Study – ABC Corp

Quantitative Information Required

To help us make reasonable selections for the ultimate loss estimates, we discuss any recent changes in payment patterns or reserving philosophies.

During this discussion, ABC points out reserve strengthening that began three years ago.

As a result, we weight our selections slightly closer to the paid development method in those years, as we suspect the incurred development method may be unreasonably high.

Case Study – ABC Corp

Selected Ultimate Loss Estimates

Period Start	Estimated Ultimate Losses (Incurred Method)	Estimated Ultimate Losses (Paid Method)	Selected Estimated Ultimate Losses	Weighting
01/01/15	$644,470	$712,725	$680,000	50% Inc / 50% Paid
01/01/16	675,024	660,127	670,000	50% Inc / 50% Paid
01/01/17	646,554	643,701	650,000	50% Inc / 50% Paid
01/01/18	693,719	818,202	760,000	50% Inc / 50% Paid
01/01/19	593,918	482,142	510,000	25% Inc / 75% Paid
01/01/20	742,665	530,399	580,000	25% Inc / 75% Paid

Case Study – ABC Corp
Reserve Table

Period	Retention	Selected Estimated Ultimate Incurred Losses	Reported Paid Losses	Estimated Required Reserves
	$100,000	$680,000	$559,000	$121,000
01/01/16	100,000	670,000	493,000	177,000
01/01/17	100,000	650,000	437,000	213,000
01/01/18	100,000	760,000	483,000	277,000
01/01/19	100,000	510,000	214,000	296,000
01/01/20	100,000	580,000	107,000	473,000
Total		**$3,850,000**	**$2,293,000**	**$1,557,000**

Range of Required Reserves as of 12/31/20

	Favorable (80%)	Expected	Adverse (120%)
Undiscounted =	$1,400,000	$1,557,000	$1,710,000
Discounted @ 3% =	1,340,000	1,491,000	1,637,000

Case Study – ABC Corp

Comparing to Carrier

Based on a collateral calculation produced using the independent reserve analysis, it's determined that the carrier's requirements do appear to be unreasonably high.

Specifically, they are even outside of the pessimistic end of the range of the independent analysis.

Case Study – ABC Corp

Negotiations

Ultimately, ABC Corp is able to negotiate a sizable decrease in their collateral requirements.

Going forward, they're now incentivized to undergo an annual collateral review to ensure their collateral requirements remain in a reasonable state.

Case Study – XYZ Inc

XYZ, Inc. would like to evaluate whether their carrier's current reserving practices line up with industry indications.

To help with this, we've decided to create an unlimited reserve analysis for the last five years of their loss history.

We'll then compare these results to industry indications to provide context.

Case Study – XYZ Inc

Results

Period	Selected Estimated Ultimate Incurred Losses	Reported Paid Losses	Estimated Required Reserves
01/01/15	$80,000	$71,000	$9,000
01/01/16	70,000	49,000	21,000
01/01/17	100,000	76,000	24,000
01/01/18	120,000	69,000	51,000
01/01/19	140,000	53,000	87,000
01/01/20	220,000	42,000	178,000
Total	**$730,000**	**$360,000**	**$370,000**

	Range of Required Reserves as of 12/31/20		
	Favorable (80%)	**Expected**	**Adverse (120%)**
Undiscounted =	$330,000	$370,000	$410,000
Discounted @ 3% =	316,000	354,000	392,000

Case Study – XYZ Inc

Comparison Tables

Period	Reserves (Independent Analysis)	Reserves (Industry Indications)
01/01/15	$9,000	$12,000
01/01/16	21,000	28,000
01/01/17	24,000	32,000
01/01/18	51,000	56,000
01/01/19	87,000	96,000
01/01/20	178,000	196,000
Total	**$370,000**	**$420,000**

Case Study – XYZ Inc

Understanding Industry Indications

As shown on the previous slide, it appears that XYZ, Inc's carrier may be under-reserving claims.

Combined with deterioration experienced in recent history, this may lead to unnecessarily high costs in the future if those claims end up closer to industry averages and force the carrier to make a sudden, significant adjustment in reserving philosophy.

Case Study – XYZ Inc

Providing Value

Again, despite a lack of significant change in XYZ, Inc's current operations, we've shown the value of analytics and provided our client with another action item for the future.

If costs rise unnecessarily, they could then evaluate the costs and benefits of self-insuring and selecting a different method of claim handling.

Conclusion

Subjectivity in Reserving

Despite reserve analyses being relatively simple, calculation-wise, there remains plenty of room for nuance and subjectivity in terms of selections, ranges, and discounting.

Making sure you, your client, and their auditor are on the same page for each of these topics will be vital to guiding them toward a reasonable, cost-efficient reserving stance.

Conclusion

Additional Complexities

Some auditors or regulators may require reserve calculations on both a net and gross basis.

For any number of reasons, mid-year analyses and roll-forward exhibits may be needed.

We'll be covering these topics, as well as a few additional scenarios, in the next session.

Next Session: Advanced Reserve Analysis Topics