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Challenges in Estimating Self-Insured Liabilities

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Actuarial Challenges

- **Data Challenges**
- **How Claims Specialists Can Assist Actuaries**
- **Company Perspective**
- **Company Knowledge**
- **Large Losses**
- **Gross Liabilities**

Data Challenges

Loss data frequently is provided at claim-level detail and can come from:

1. TPAs

- TPAs have individual case reserving methodologies
- When a self-insured has multiple TPAs providing data, the level of case reserves is often different between different TPAs
- New TPA with different reserve philosophy

2. In-house claims handling

- May not have experienced claims handling team
- Lack of policies and controls in place can lead to inconsistency in case reserving, claim records, etc.
- Data maintained by the self-insured is different than what the TPA is reporting
- Inconsistencies due to changes in staff (i.e. new risk manager)

3. Combination of the above

Data Challenges

Data restrictions limit the actuary's ability to use company-specific development history

- Not enough volume or history to be credible
- Changing sources of data (i.e. changing TPAs) distorts incurred loss development due to differences in case reserving methodology
- When self-insureds acquire a company, the claims data from new company is lacking sufficient details and when combined with the old company can cause distorted development patterns.
- Typically don't have triangles
- Often don't have history of insured years or claims
- Often don't have historical payroll data readily available

Analyses for self-insureds typically require a larger time commitment to organizing data and reviewing it for reasonableness than for insurance entities

Use of Claim Statistics To Supplement Actuarial Data

- Claim distributions - by incurred value and line of business
- Diary - pending open and stale diaries
- Inventory - open claim count per adjuster
- Claim cycle times - average number of days to closing by exposure type
- Claim by cause of loss, injury type, jurisdiction - claim counts and incurred values)
- Average claim expenses - legal vs. adjusting
- Open claims in litigation
- Incident-only / Precautionary claim count

How a Claims specialist can assist Actuarial analysis

Reserve Adequacy Review	Targeted review to ensure claims are properly and consistently valued.
Operational Review	Audit to ensure compliance with company and industry standards
Affiliate/Strategic Partner Management Review	Review of affiliate and TPAs to assess compliance with company (industry) standards
Leakage Study	Examination of hard and soft leakage to gain efficiencies and cost savings
Defense Cost Analysis	Review company's defense strategy and litigation spend
Forensic Underwriting Reviews	Claims due diligence of underwriting effectiveness
Corporate Self Insured Studies	Evaluate TPA effectiveness and develop loss control initiatives

Company Perspective

- Self-insureds may have non-insurance backgrounds such as financial reporting or risk management (claims handled by corporate general counsel)
 - Often don't utilize actuary
 - May not even know history of insurance program
- Leads to a focus on results rather than actuarial methods and assumptions
 - Size of reserve liability on balance sheet compared to prior year
 - Impact of change in reserves on income statement
- Difficulties can arise trying to reconcile year-over-year changes
 - Self-insured may have little or no prior experience with actuarial work
 - Discussions framed in a context they are used to working with rather than in terms of technical actuarial assumptions

Company Perspective

- Self-insureds typically take a more granular view than an insurance entity would
 - Knowledge of specific claims as they are reported
 - Using case adjusters' specific claim estimates to develop booked reserves
 - May not consider Incurred But Not Enough Reported
 - May not anticipate the possibility of claims re-opening
 - Don't consider having a deductible as being "self insured"
- In managing TPAs, self-insureds might not be well versed in:
 - The claims handling fees for life of a claim ("cradle to grave")
 - The additional fees for certain claims that remain open after a certain point of time ("anniversary priced")
 - The future costs associated with medical bill review and PPO
 - Case management services, claims in runoff, etc.

Company Perspective

Companies may push back on the concept of IBNR and actuarial techniques to estimate it

- “We know about all our claims immediately, we don’t need IBNR.”
- “Our TPA gave us the liability for this already.”
- “Our claims are case reserved to ultimate.”
- “Our previous auditor never looked at this.”
- “Can you just tell us what to book?”

Often the company has only their broker to rely on or someone else who is not an actuary

Large Losses

- Almost all self-insureds will get hit with the occasional very large claim or even several which exceed their deductible
- Self-insureds often try to pull out large losses that hit the self-insured retention and use LDFs on resulting data
 - They don't want to add any additional IBNR on claims that have already hit their retention
 - Pulling out these capped losses creates a mismatch as LDFs are developed to be applied in the aggregate to all losses limited to retention

Ultimate = (losses excluding capped claims × LDF) + capped claims

- It takes judgment to determine if large losses are actually unusual or just part of the self-insured's typical loss experience

Gross Liabilities

- Pursuant to former *FASB Interpretation 39, Offsetting of Amounts Related to Certain Contracts (FIN 39, now ASC 210-20-45)*, an entity is generally required to accrue the gross amount of the loss even if the entity has purchased insurance to cover the loss
- On a gross basis, this entails computing all liabilities as if insurance never was purchased
- On a net basis, an entity should still carry reserves for deductibles and any estimable insured amounts; this will amount to offsetting the gross liability with amounts expected to be recovered from insurer
- This is a sore spot particularly for companies with minimal or no net exposure

Gross Liabilities

- Actuary may not have unlimited losses to determine the gross development pattern
- Can use gross industry benchmark LDFs to produce a gross estimate of the reserve
 - May not reflect the self-insured's actual net-to-gross ratio
 - If the self-insured has no claims that hit the deductible, then applying gross industry LDFs could overstate the reserve

Accident Year	Age	Net			Gross			Net IBNR	Ceded IBNR	Gross IBNR
		Incurred Loss	Industry CDFs	Incurred LDM	Incurred Loss	Industry CDFs	Incurred LDM			
2012	60	1,200	1.030	1,236	1,200	1.100	1,320	36	84	120
2013	48	1,150	1.050	1,208	1,150	1.125	1,294	58	86	144
2014	36	1,000	1.075	1,075	1,000	1.200	1,200	75	125	200
2015	24	950	1.150	1,093	950	1.300	1,235	143	143	285
2016	12	800	1.500	1,200	800	1.700	1,360	400	160	560
Total		5,100		5,811	5,100		6,409	711	598	1,309

Net: Limited to \$250,000 per claim

Gross: Unlimited

Questions?

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An aerial photograph of a triathlon swim leg. Numerous participants in black wetsuits and white swim caps are swimming in clear, turquoise water. A single kayaker in a bright pink kayak is positioned in the center of the frame, paddling through the water. The kayaker is wearing a yellow shirt and a white cap. The overall scene is dynamic and captures the intensity of the event.

Self-insurance challenges: dealing with unusual situations

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Topics

1. Exposures
2. Changing retentions
3. Industry factors
4. Retrospective contracts
5. Very high layers
6. Tail
7. Ranges
8. Questions?

Key takeaways

Self-insurance has unique circumstances where loss estimation is not always straightforward — a few simple resources can help the process



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Exposures

Exposures

- Different lines of business require different exposure types to be collected and maintained for use in actuarial reviews
- Can be difficult for self-insureds to produce reliable exposures to use in expectation-based methods
- Exposures aren't maintained by TPAs, so they are the responsibility of the self-insured

Line of business	Preferred exposure
Workers' compensation	Payroll
General liability	Sales/revenue
Auto liability	Vehicle count
Medical malpractice	Bed count/average patient days

Changing retentions

Changing retentions

Adjusting LDFs and loss rates

- Mix retention triangles/loss rates not ideal — what are the options?

	LDFs	Loss rate	Issues
Use industry data	One option is using industry factors like NCCI limited with industry excess loss factor (ELF) and RAA factor (Pinto Gogle)	Adjust with same ELF for WC or industry ILF for other lines	<ul style="list-style-type: none"> Difficulty in matching state or hazard group Difficulty in finding appropriate RAA factor Need unlimited
Reconstruct triangles at all limits	Patterns can be selected at each retention; apply correct pattern to correct years	The relationship between them can be used to develop company-specific increased limits factors (ILFs), which are inputs to method calculations	Do you have the data for this from prior evaluations?
Leverage existing patterns to estimate	Can “interpolate” between patterns at limits or develop a relationship to industry pattern	Develop company specific	Requires judgment

Changing retentions

Reconstructed triangle ILF

Limited to 250			Limited to 500		
Paid	CDF	Ultimate	Paid	CDF	Ultimate
7,840	1.050	8,232	8,002	1.075	8,602
11,600	1.100	12,760	11,600	1.120	12,992
25,680	1.150	29,532	27,323	1.180	32,241
35,520	1.200	42,624	36,600	1.300	47,580
38,960	1.570	61,167	39,680	1.750	69,440
119,600		154,315	123,205		170,855
				ILF	1.107

Changing retentions

Using mixed data for single indexed loss rate

Exposures	Paid losses at retention	ILF	Trend	LDF	LDM	Indicted rate	Indicated rate at current	Cape Cod rate
400	7,840	1.107	1.126	1.050	8,232	20.58	25.65	26.74
500	11,600	1.107	1.093	1.100	12,760	25.52	30.88	27.54
1,200	25,680	1.107	1.061	1.150	29,532	24.61	28.91	28.36
1,400	36,600	1.000	1.030	1.300	47,580	33.99	35.01	32.35
1,800	39,680	1.000	1.000	1.750	69,440	38.58	38.58	33.32
5,300	121,400				167,544			

Changing retentions

Estimating LDFs at other limits

- If you are lucky enough to have unlimited and limited factors at an old retention (say 250k) and you need to get to a new retention of 500k
 - You can linearize the relationship between retention on your development factors
 - Supposed CDF at 250 = 1.500 and unlimited CDF = 3.000

1. Develop relativity

$$Rel_{250} = \ln(CDF_{250}) / \ln(CDF_{unlimited}) = .369$$

2. Use linear interpolation to develop a relativity at 500k (assume unlimited is 10m) such that relativity at 500k = .385

$$[.369 \times (10m - 500k) / (10m - 250k) + 1.000 \times (500k - 250k) / (10m - 250k)]$$

3. CDF at 500 = 1.527 = 3.000^{.385}

Industry factors

Best sources

Loss development factors

Source	Description
NCCI	Indemnity + medical loss only limited by state for WC
SNL/AM Best	Loss + DCC by Schedule P line of business
RAA	WC, GL, AL, Med Mal excess reinsurance loss + ALAE

ELFs/ILFs

Source	Description
NCCI	ELFs for WC by limit, hazard group and state
ISO	ILFs for CAL, Med Mal and GL by limit

Using industry factors

- Different sources
 - NCCI — unlimited
 - ISO — different limits might be available
 - AM Best/SNL — different limits mixed
 - Internal benchmarking
- Limiting LDFs
 - Can make limited factors by using company's own ELF's or industry ELF's with NCCI unlimited LDFs and RAA excess factors
 - Limited LDF = $[1 - \text{ELF}] / [1 / \text{unlimited CDF} - 1 / \text{RAA} \times \text{ELF}]$
 - Tough to get right, as ELF and RAA patterns may not fit
 - Alternatively, other comparisons can be made if there is some triangle data

Using industry factors

Dealing with the tail

- Hard to estimate a tail factor that you believe in based on industry benchmarks
 - Industry factors can overstate the tail for lower layers
 - If an excess loss factor can be estimated from the self-insured's historical loss experience, the industry tail can be modified downward
 - If the data isn't credible may be best to use an industry tail

	12:24	24:36	36:48	48:60	60:72	72:94	Tail
Unlimited client data	1.350	1.170	1.080	1.050	0.950	1.010	
Industry source	1.500	1.250	1.100	1.075	1.050	1.030	1.100
Relativity*	0.700	0.680	0.800	0.667	(1.000)	0.333	0.600
							1.060
Limited to 250 client data	1.200	1.120	1.050	1.030	0.900	1.000	
Relativity	0.400	0.480	0.500	0.400	(2.000)	—	0.400
							1.040

Relativity = (client factor -1)/(industry source -1)

Example : 0.700 = (1.350 - 1)/(1.500 - 1)

Using industry factors

- When a self-insured regularly cleans up outstanding claims (closing claims and reducing or removing case reserves)
 - May make sense to use industry patterns but remove or adjust the tail factor
 - Inclusion of a full industry tail factor when the self-insured makes conscious effort to close out older claims may overstate reserves
 - Different opinions may form the basis for ranges (scenarios)

Using industry factors

Other adjustments

- For self-insured exposures (especially GL)
 - Exposures may be more mundane/tame than insurance industry
 - Claims may be handled more quickly
 - Industry limits may or may not be higher or hard to determine
 - Option 1 — flatten
 - Option 2 — shift

			Industry			Option 1		Option 2	
Paid	Incurred	P:I ratio	Paid CDF	Incurred CDF	P:I ratio	Paid CDF	Incurred CDF	Paid CDF	Incurred CDF
7,800	7,800	100.0%	1.150	1.100	95.7%	1.000	1.000	1.000	1.000
10,100	10,100	100.0%	1.300	1.150	88.5%	1.000	1.000	1.150	1.100
17,500	20,000	87.5%	1.450	1.200	82.8%	1.115	1.043	1.300	1.150
8,600	10,200	84.3%	1.700	1.350	79.4%	1.308	1.174	1.450	1.200
15,360	20,400	75.3%	2.100	1.400	66.7%	1.615	1.217	1.700	1.350
59,360	68,500								

Retrospective contracts

Retrospective contracts

Final premium depends on losses

- Retro contracts consider actual losses when determining final premium
 - Higher than expected losses result in additional premium
 - Lower than expected losses results in return premium
 - Subject to minimum and maximum premium amounts
- Self-insureds should book a best estimate of the additional/return premium
 - Often, companies with retro policies don't understand that the possibility of an additional premium creates a liability
 - Gross liabilities are unchanged, but net liabilities are more difficult to explain
 - Typical ranges of reasonability won't make sense for estimates of retrospective premium

Retrospective contracts

Impact on ranges

- Standard reserve ranges don't always produce intuitive retro premium liability ranges
- Depends on the structure of the retro contract

Accident year	Ultimate loss			Loss conversion factor	Tax multiplier	Basic premium	Minimum premium	Maximum premium	Ultimate retro premium		
	Low	Central	High						Low	Central	High
2012	1,275	1,320	1,410	1.095	1.030	450	495	2,970	1,902	1,952	2,054
2013	1,250	1,295	1,385	1.095	1.030	465	510	3,060	1,889	1,940	2,041
2014	1,150	1,200	1,300	1.100	1.040	440	485	2,910	1,773	1,830	1,945
2015	1,200	1,235	1,305	1.100	1.040	455	500	3,000	1,846	1,886	1,966
2016	1,300	1,360	1,480	1.105	1.042	460	505	3,030	1,976	2,045	2,183
Total	6,175	6,410	6,880			2,270	2,495	14,970	9,386	9,653	10,189
Paid loss	1,850	1,850	1,850					Paid premium	9,480	9,480	9,480
Reserves	4,325	4,560	5,030					Outstanding premium	(94)	173	709
Variation	-5.2%		10.3%					Variation	-154.4%		308.8%

Narrower reserve range

Even though the loss reserve range is narrower, the retro liability range isn't intuitive

Very high layers

High layers of coverage considerations

- Per Financial Accounting Standards 5 — *Accounting for Contingencies*, only accrue if reasonably estimable
 - Other lines of business often see the primary layer self-insured (i.e., a high deductible plan with a \$250,000 deductible)
 - Medical malpractice can see high self-insured excess layers (i.e., excess of a \$5m medical malpractice policy)
 - These high layers of medical malpractice are often difficult, sometimes too difficult, to reasonably estimate
- Development patterns are difficult to estimate using self-insured's historical data
 - May have only ever had a few claims breach the excess layer
 - Have to consider if on an occurrence or claims-made basis
 - Very few sources of industry benchmarks (i.e., SNL for ground up, RAA for excess)

Tail

Tail (unasserted) liabilities

- When a company purchases a claims-made medical malpractice policy, they are still exposed to claims that occurred before but were reported after the policy coverage period expires
- The unasserted portion of the exposures can be difficult to estimate
 - For claims made, the coverage trigger is report date, rather than occurrence date
 - Alternate options:
 1. Measure the reporting lag of each claim and select a “reporting lag” pattern and use pattern to calculate the unexpired portion of exposures. Apply the pure premium with trend
 2. Measure the dollars by accident year/report year matrix developed to ultimate, using claims made factors and produce a lag with dollars
 3. Subtract claims made ultimate from occurrence ultimate

Tail (unasserted) liabilities

Occurrence year	Exposures	Reporting lag CDFs	Percent reported	Unasserted exposures	20XX+1	20XX+2	20XX+3	20XX+4	20XX+5	Total
2012	500	1.010	100.0%	5	5					5
2013	505	1.030	99.0%	15	10	5				15
2014	510	1.061	97.1%	29	14	10	5			29
2015	508	1.273	94.2%	109	80	14	10	5		109
2016	506	1.719	78.5%	212	103	79	14	10	5	212
Total	2,529		58.2%	370	212	109	29	15	5	370
				Selected pure premium	250					
				2.0% trend factor	1.020	1.040	1.061	1.082	1.104	
				Trended pure premium	255	260	265	271	276	
				Unasserted liability	94,302	55,139	28,849	7,906	4,100	190,295

$$103 = 212 * (.785 - .582) / (1 - .582)$$

- Use reporting lag pattern to determine amount of exposures that are “unasserted,” and then project them out over future years
- Selected pure premium can be based on industry benchmarks or the company’s historical asserted (claims-made) experience

Ranges

Management's best estimate

- Management should book management's best estimate
- Management should always document any difference between actuaries' best estimate and accrual and the reasoning
 - This is **difficult** in practice!
- Accruals that move around in range can imply earnings management
- Consultant needs to be particularly wary of pressure on estimate
 - For a large company, the self-insurance accrual can be a large portion of liabilities

Practical ranges

- Self-insurance does not have the benefit of law of large numbers as an insurance companies do.
 - All else being equal, the range should be wider
- Good options to scenario test
 - Industry vs. client development factors
 - Loss cost range
 - Change your assumed trend factors

Questions?

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