

Workers Compensation Excess Development

Executive Summary

Large loss and excess development is relevant to pricing excess insurance and reinsurance, pricing large deductibles, and estimating tail factors.

Workers compensation large loss and excess development patterns have a number of interesting characteristics. For large claims reported to NCCI:

- Total loss amounts and numbers of claims in excess layers tend to develop upward overall (see Exhibits 1 and 2).
- The very largest claims, on a case-incurred basis, are more likely to drop significantly than to increase (see Exhibits 3 to 8).
- Case-incurred excess and large claim count excess development factors do not always increase as the attachment point increases (see Exhibits 10 to 13).
- Case-incurred excess development patterns vary significantly by calendar year. Case-incurred development for higher layers beyond six years was lower in Calendar Years 2004 and 2005 than in earlier calendar years (see Exhibits 10 to 13 and Appendix).

Most of the excess loss development patterns presented in this report are derived from claim information reported to NCCI in Call 31. Under this Call, carriers report annually certain data elements for every claim for injuries in 1984 or later when the case-basis incurred value of the claim is at least \$500,000. We have trended these claims by 3% and 5% per year on an accident year basis for the analysis.

Every two years, the Reinsurance Association of America (RAA) publishes a loss development study, which includes several workers compensation loss development triangles. This report briefly compares the patterns seen in the Call 31 data to those in the RAA study (see Exhibit 9). In contrast to Call 31 development patterns, for data reported to the RAA, case-incurred development factors mostly increase with increasing attachment point.

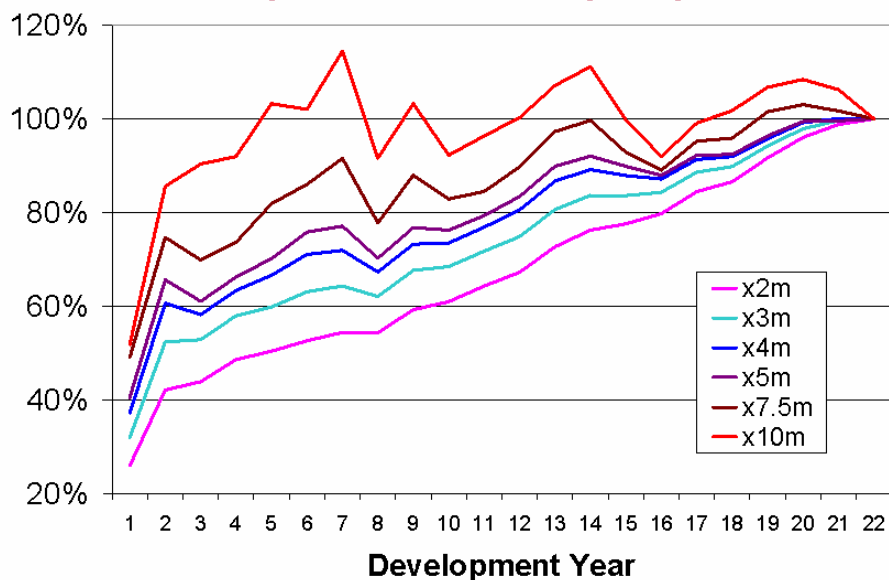
Excess Development Patterns

Exhibit 1 shows the case-incurred loss excess of the attachment point at development years 1 to 22 relative to the 22nd year. The proportion of losses at any given stage of development increases with increasing attachment point, indicating that cumulative development from the 1st to 22nd year decreases with increasing attachment point.

Exhibit 2 shows the number of cases reported exceeding several attachment points at development years 1 to 22 relative to the 22nd year. Similar to Exhibit 1, cumulative development decreases with increasing attachment point, with the exception that counts of claims in excess of \$5 million develop a little bit more than counts of claims in excess of \$7.5 million.

Exhibit 1

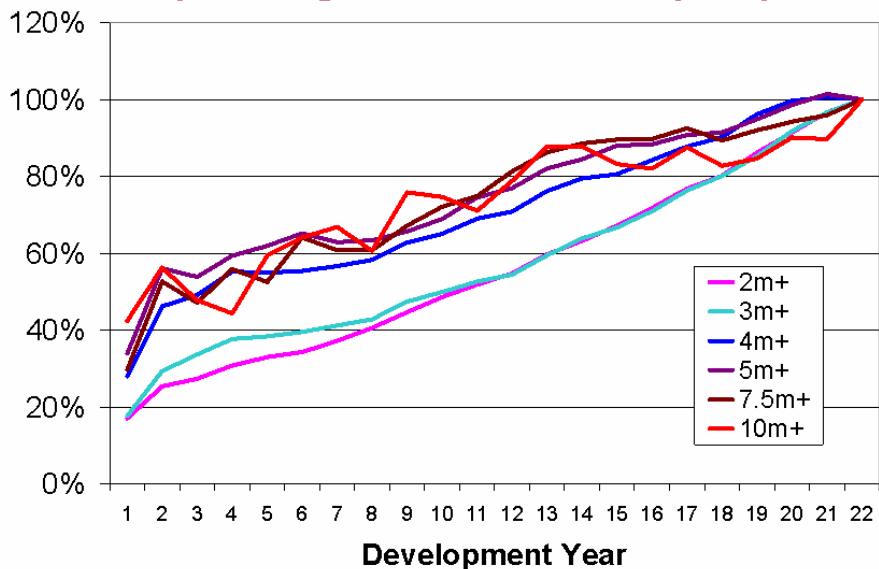
Excess Case Incurred Loss Emergence (% of Losses at 22 years)



Source: Call 31 data, accident years 1984-2004, calendar years 2000-2005, combination of 3% and 5% trend loss adjustment, NCCI states

Exhibit 2

Large Claim Counts Emergence (% of large claim counts at 22 years)



Source: Call 31 data, accident years 1984-2004, calendar years 2000-2005, combination of 3% and 5% trend loss adjustment, NCCI states

Individual Claim Development Patterns by Size of Loss

Exhibits 3 through 8 show development of individual claims by size of loss. Each circle in these exhibits represents a single claim and shows the beginning case-incurred loss of the claim (on the horizontal axis) and subsequent percentage change in the case-incurred loss (on the vertical axis) over a certain calendar year period. The exhibits cover different calendar year (CY) periods:

- CY 2001 in Exhibits 3 and 4
- CY 2005 in Exhibits 5 and 6
- CY 2001–2005 in Exhibits 7 and 8

The exhibits also cover different accident years:

- Exhibits 3, 5, and 7 include the five most recent accident years having development through the whole calendar year period
- Exhibits 4, 6, and 8 include earlier accident years back to accident year 1984

These exhibits demonstrate that:

- As the size of loss becomes larger, the proportion of claims that develop upward becomes smaller.
- As the size of loss becomes larger, dramatic drops in estimated claim values become more frequent. For example, in Exhibit 3, above \$4 million (right half of the graph) only three claims show an increase of at least 5%, but four claims show decreases of 40% or more.
- Larger claims often appear to “hit the ceiling and fall back down.” The death of a disabled worker or an agreement to a lump-sum settlement are among possible reasons for sharp reductions in estimated values for large claims.

Exhibit 3

Case Incurred Loss Development By Size Of Loss In 2001

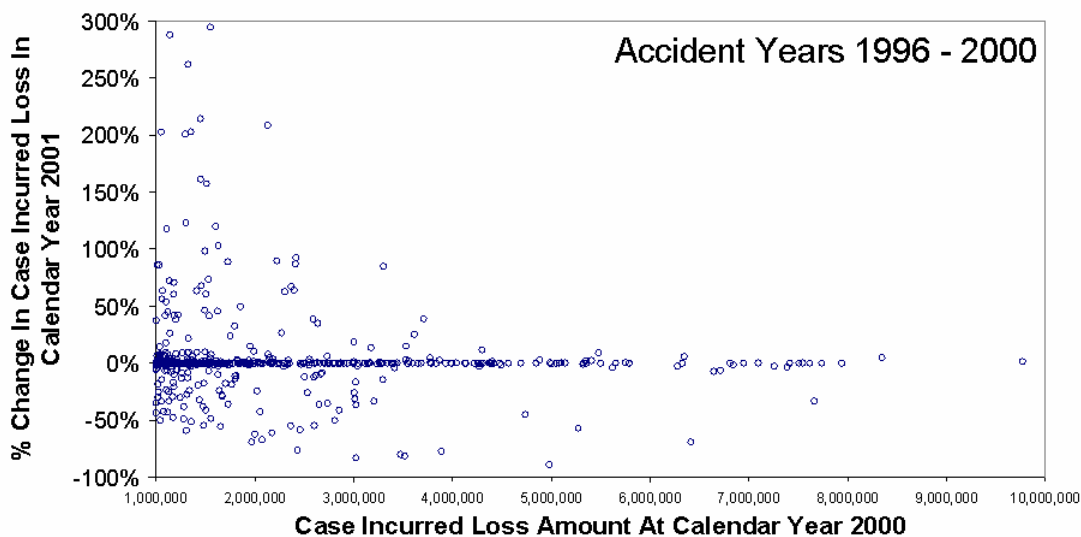


Exhibit 4

Case Incurred Loss Development By Size Of Loss In 2001

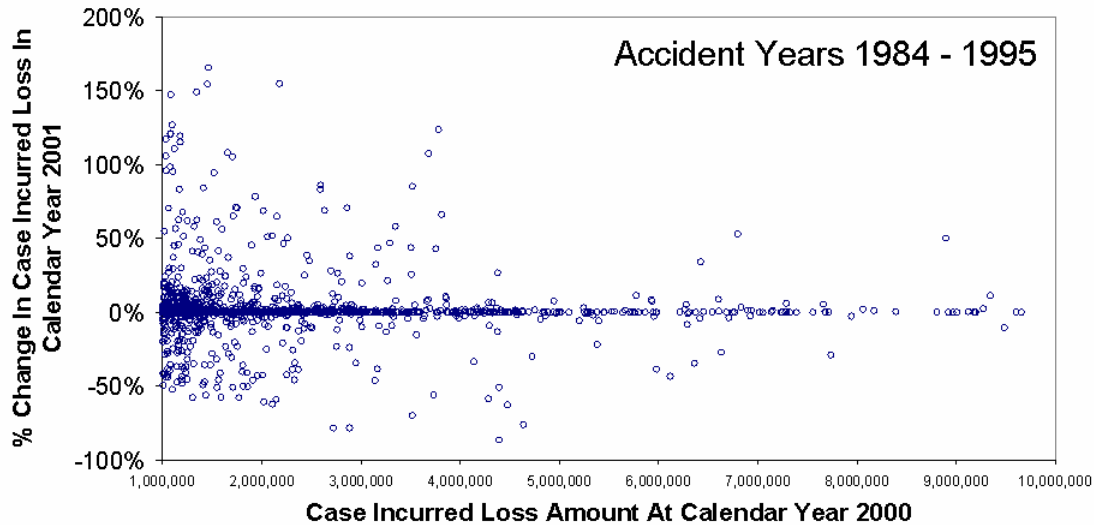


Exhibit 5

Case Incurred Loss Development By Size Of Loss In 2005

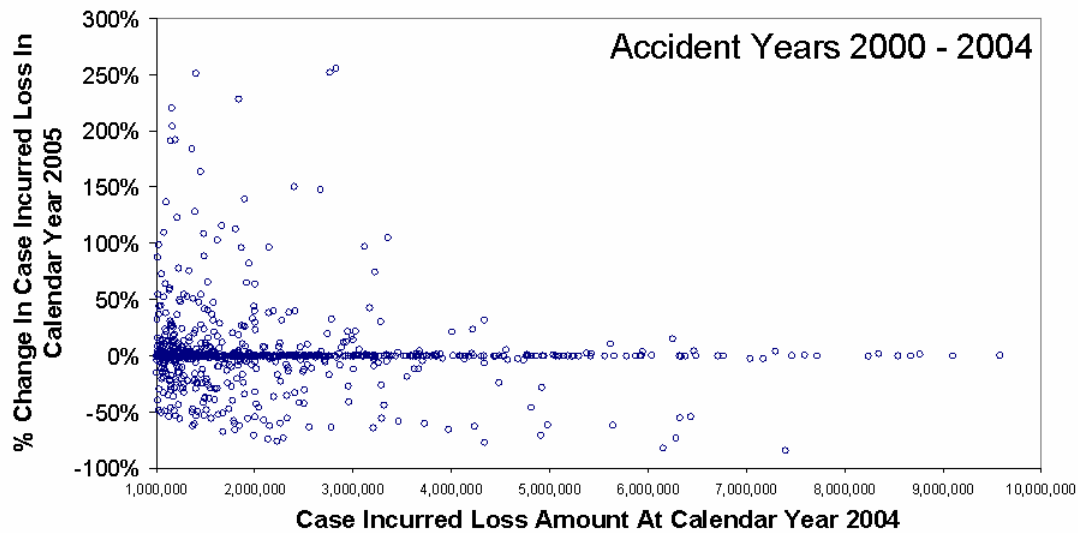


Exhibit 6

Case Incurred Loss Development By Size Of Loss In 2005

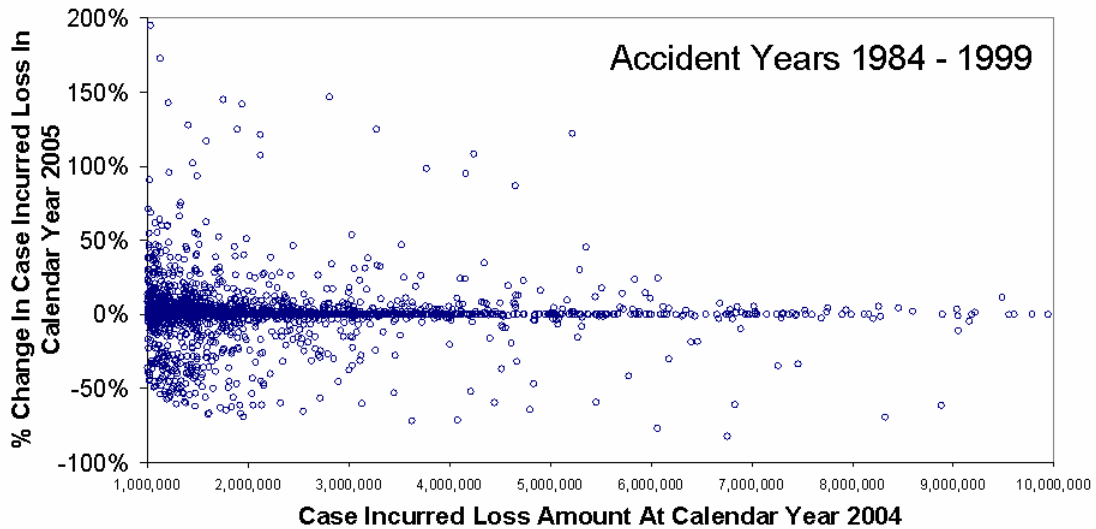


Exhibit 7

Case Incurred Loss Development By Size Of Loss In 2001-2005

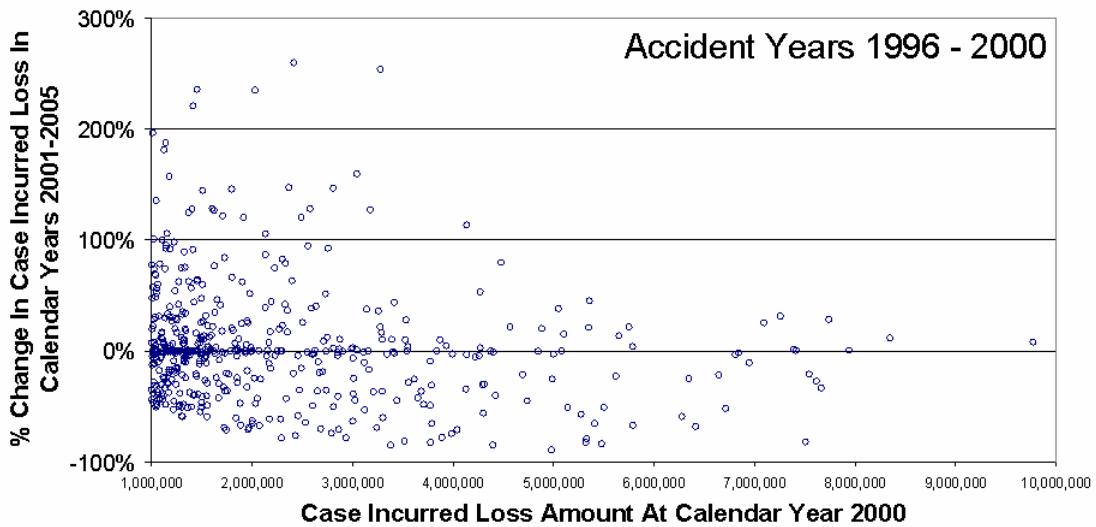
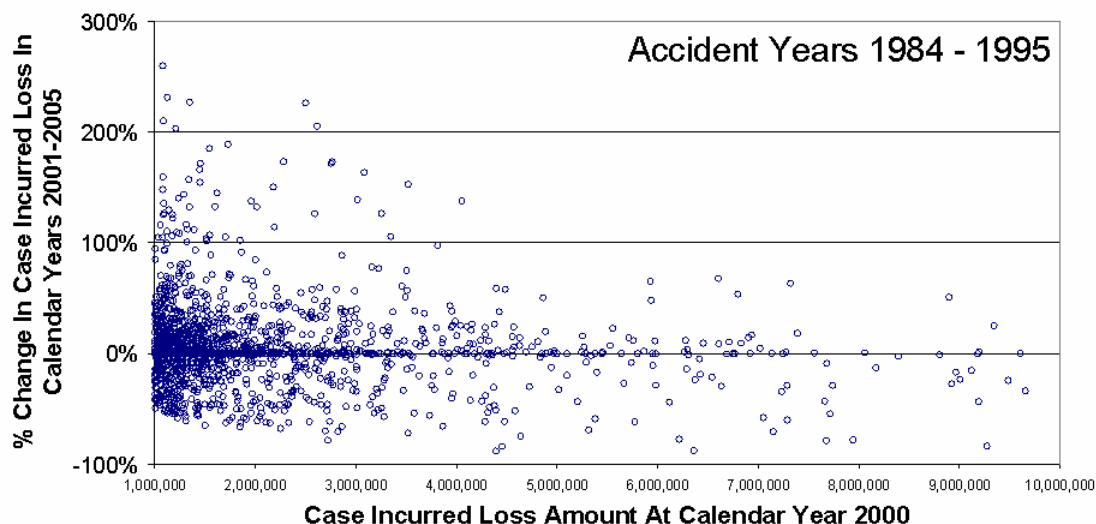


Exhibit 8

Case Incurred Loss Development By Size Of Loss In 2001-2005



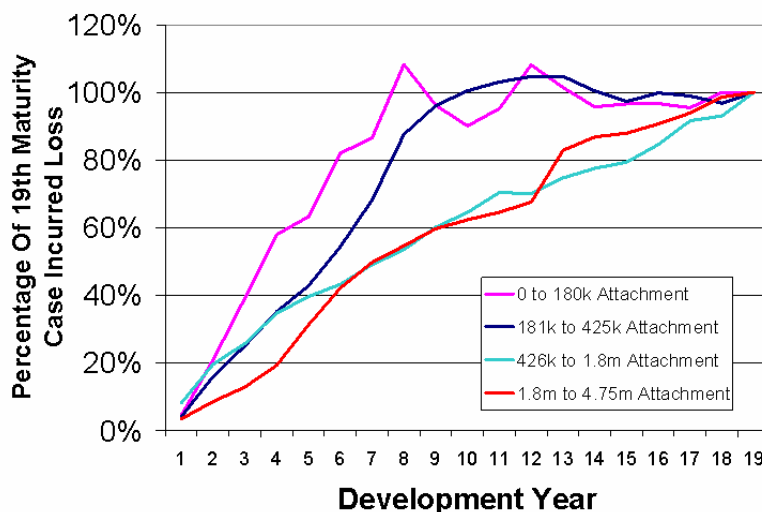
Comparison With RAA Excess Development

Every two years, the Reinsurance Association of America (RAA) publishes excess workers compensation development factors based on data voluntarily reported to the RAA by reinsurers. The RAA excess triangles differ from the NCCI excess triangles in the following ways:

- The RAA limit ranges are mostly lower than the attachment points used in the NCCI study
- Various limits are mixed together in the RAA report
- Reinsurance coverage is usually on a per occurrence basis, while the NCCI Call 31 data is on a per claim basis
- Amounts reported for losses in the RAA report may be affected by various provisions of actual reinsurance contracts
- Losses in the RAA report may include reinsurer-adjusted estimates for ceded case reserve
- Losses in the RAA report may include excess loss for claims actually settling below a given attachment point, due to a commutation agreement
- The time it takes to report claims to reinsurers affects the observed development pattern in the RAA report

Exhibit 9

RAA Excess Reinsurance Loss Development



Source: volume weighted for accident years 1986-2004 and calendar years 2000-2004, derived from the Reinsurance Association of America's *Historical Loss Development Study (2005)*

The RAA development patterns for the most part show higher development with increasing attachment points (see Exhibit 9), whereas the NCCI Call 31 data mostly shows the reverse. Given the key differences between the underlying data and the development factor calculations, the differences in these excess development patterns are not entirely surprising. It is also a manifestation of the "hitting the ceiling" phenomenon at the individual claim level at the higher NCCI attachments, but less so at the lower RAA attachments.

Development Factors by Accident Year and Calendar Year Groups

Exhibits 10–13 compare development over Calendar Years 2000–2005 to development over Calendar Years 2000–2003.

When Calendar Years 2004 and 2005 are included, overall development factors are generally lower from the 6th to 22nd year of development and generally higher from the 1st to 6th year of development. However, in almost all cases, whether 2004 and 2005 are included or excluded, development factors show little increase or even a significant decrease as the attachment point increases.

A notable exception is the big increase in the 1st to 6th factor at 3% trend from \$7.5 million to \$10 million (see Exhibit 12). This increase is much less at 5% trend and hence not likely to be a very credible indication of a general development pattern.

An important caveat is that development beyond the 22nd year is not addressed in this study, and there is some anecdotal evidence suggesting that there can be significant development in the higher layers at late stages of development (see Gary G. Venter, "Workers Compensation Excess Reinsurance—The Longest Tail?," NCCI *Issues Report*, 1995). High development beyond the 22nd year for high layers might result from the dispersion of longevity of individual claimants. At early stages, claims are reserved at expected values. At very late stages, those claims with great longevity will begin to penetrate higher layers at a time beyond the point when the big drops from early mortality and other causes are likely to have mostly ceased.

Exhibit 10

Cumulative Development Factors Derived From Call 31

1st through 22nd calendar year past accident year
trended at 5% from accident year to 2006

	1st to 6th		6th to 11th		11th to 22nd	
	CY 2000 to 2005	CY 2000 to 2003	CY 2000 to 2005	CY 2000 to 2003	CY 2000 to 2005	CY 2000 to 2003
AY 1984-2004						
xs 2m	2.02	1.73	1.25	1.30	1.62	1.75
xs 3m	1.98	1.62	1.16	1.22	1.48	1.70
xs 4m	1.91	1.55	1.10	1.17	1.36	1.63
xs 5m	1.87	1.47	1.07	1.12	1.27	1.59
xs 7.5m	1.78	1.14	1.01	1.05	1.26	1.75
xs 10m	1.85	1.22	0.94	1.06	1.20	1.76
1m xs 2m	2.29	2.27	1.56	1.58	1.85	1.71
3m xs 2m	2.07	1.82	1.38	1.43	1.89	1.85
5m xs 5m	1.88	1.51	1.14	1.14	1.32	1.49
10m xs 10m	1.91	1.29	1.08	1.12	1.25	1.95

Note: A volume weighted average is used for cumulative development factors.

Exhibit 11

Cumulative Development Factors Derived From Call 31

1st through 11th calendar year past accident year
trended at 5% from accident year to 2006

	1st to 6th		6th to 11th	
	CY 2000 to 2005	CY 2000 to 2003	CY 2000 to 2005	CY 2000 to 2003
AY 1995-2004				
1m xs 1m	2.37	2.42	1.56	1.54
4m xs 1m	2.23	2.12	1.43	1.39
unlimited xs 1m	2.17	2.00	1.30	1.26
AY 2000-2004				
300k xs 700k	3.22			
1.3m xs 700k	3.01			
unlimited xs 700k	2.81			

Note: A volume weighted average is used for cumulative development factors.

Exhibit 12
Cumulative Development Factors Derived From Call 31
 1st through 22nd calendar year past accident year
 trended at 3% from accident year to 2006

	1st to 6th		6th to 11th		11th to 22nd	
	CY 2000 to 2005	CY 2000 to 2003	CY 2000 to 2005	CY 2000 to 2003	CY 2000 to 2005	CY 2000 to 2003
AY 1984-2004						
xs 2m	2.04	1.70	1.20	1.26	1.50	1.70
xs 3m	1.98	1.59	1.12	1.18	1.32	1.59
xs 4m	1.91	1.52	1.07	1.12	1.25	1.61
xs 5m	1.88	1.39	1.03	1.07	1.25	1.72
xs 7.5m	1.74	1.01	0.96	1.03	1.11	1.70
xs 10m	2.08	2.23	0.95	1.19	0.91	1.38
1m xs 2m	2.22	2.16	1.50	1.53	1.94	1.84
3m xs 2m	2.08	1.79	1.30	1.37	1.65	1.67
5m xs 5m	1.87	1.40	1.08	1.01	1.43	1.91
10m xs 10m	2.10	2.29	1.09	1.30	0.80	1.33

Note: A volume weighted average is used for cumulative development factors.

Exhibit 13
Cumulative Development Factors Derived From Call 31
 1st through 11th calendar year past accident year
 trended at 3% from accident year to 2006

	1st to 6th		6th to 11th	
	CY 2000 to 2005	CY 2000 to 2003	CY 2000 to 2005	CY 2000 to 2003
AY 1995-2004				
1m xs 1m	2.25	2.29	1.49	1.45
4m xs 1m	2.17	2.04	1.36	1.32
unlimited xs 1m	2.13	1.94	1.25	1.21
AY 2000-2004				
300k xs 700k	3.19			
1.3m xs 700k	2.98			
unlimited xs 700k	2.81			

Note: A volume weighted average is used for cumulative development factors.

Some Caveats

Some precautions should be taken into consideration when interpreting the implications of this study to excess loss reserve estimation.

Losses to date can be volatile for excess layers, and applying Call 31-derived excess development factors—or any excess development factors—to actual losses may not be very predictive. However, excess development factors may be more useful for exposure-based reserving methods, such as Bornhuetter-Ferguson.

Underlying losses are trended to Accident Year 2006, and the resulting development factors may be less indicative of development in other accident years.

Actual reinsurance excess layers will be affected by contractual provisions not reflected in the per claim layers produced from Call 31 data.

Background and Methodology

Loss development factors and patterns presented in this report are derived from data reported to NCCI under Call 31. Call 31 was initiated to allow limited loss development in aggregate ratemaking. The data reported includes all claims, gross of reinsurance recoveries, over \$500,000 from Accident Year 1984 forward, valued at annual intervals from December 31, 1998 through December 31, 2005.

Adjustment for Trend

Workers compensation average claim sizes have been increasing in the recent past. As a result, the proportion of claims and the share of claim dollars that exceed a fixed attachment point generally grow over time. For example, if the average claim size has doubled over a ten-year period, then loss development patterns in excess of \$2 million at the end of the period will likely be similar to loss development patterns in excess of \$1 million at the beginning of the period.

We have adjusted for trend by trending individual ground-up claim-incurred claim amounts at constant rates of 3% and 5% from the accident year of the claim to Accident Year 2006. This is only a rough first order adjustment and accounts for changes in prices (wages or price per service for medical services), but does not account for changes in claim duration or utilization of medical services. We think that this trend increases the consistency of link ratios across accident years.

Bases for Loss Development Factors

The Call 31 data was used to compute development factors (see Exhibits 10 to 13 and Appendix) on the following bases:

- Development is per claim
- Claim values are case-incurred amounts (paid plus case reserves) for indemnity and medical benefits combined, without loss adjustment expenses
- Claims are trended on a ground-up basis by 3% and 5% from the accident year of the claim to Accident Year 2006
- The number of years of development varies by attachment point:
 - 22 years of development for attachment points \$2 million or greater
 - 10 years for attachment points \$1 million or greater
 - 5 years for attachment points \$700,000 or greater
- Link factors are shown for Calendar Years 1999–2005
- Weighted average development factors are presented for two calendar year groups:
 - Calendar Years 2000–2005
 - Calendar Years 2000–2003

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