



## Workers Compensation Excess Loss Development

### INTRODUCTION

Large loss development and excess loss development are relevant in determining excess loss factors used in NCCI's ratemaking methodology and in retrospective rating. In this research brief, NCCI presents the results of an update to the periodic review of these development patterns.

This brief is an update to the prior NCCI studies, completed in 2007, 2011, and 2016 [1, 2, 3]. An additional four calendar years of large loss experience are added to the most recent study.

In this update of the analysis, we explore development patterns by size of loss using enhanced visualization techniques and review claim closure rates for different sizes of loss across a broad array of accident years<sup>1</sup> and maturities. Additionally, we include tables of cumulative excess loss and excess claim count development factors through development year 35 for a variety of excess layers.

Please note, in the context of this paper, "smaller losses" is a relative term as it refers to claim amounts reported on NCCI's Large Loss Call 31, where the case-incurred value of every claim is at least \$500,000.

### KEY FINDINGS

For large claims reported to NCCI in Financial Call 31 (Large Loss and Catastrophe Call) during the time period studied and development through 35 years:

- The development of case-incurred loss amounts, paid loss amounts, and claim counts varies significantly by loss size and development year
- Claim counts for larger losses are identified quickly and reported faster than those for smaller losses
- Claims with case-incurred losses less than \$5 million generally developed upward, while claims with case-incurred losses in excess of \$7 million generally developed downward
- Claims with case-incurred losses between \$5 million and \$7 million generally developed downward during earlier reporting periods and upward during later reporting periods
- On average, the loss cohorts (groups of similarly sized claim amounts) observed in this analysis experience upward development in later development periods
- Smaller claims tend to close faster than larger claims

<sup>1</sup> Accident Year is a loss accounting definition in which experience is summarized by the calendar year in which an accident occurred. This summarized experience is updated annually as additional loss payments are made and reserves are adjusted; development (or report) year signifies the calendar year of summarization.

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- For Florida, claims under large deductible policies had significantly more development in the excess layers than claims under other policies (i.e., guarantee cost and small deductible)

## STUDY DATA

The data source used in this study is NCCI's Call 31—Large Loss and Catastrophe Call. This call was initiated in 2003 and provides NCCI with carriers' annually reported information by individual claim for injuries occurring in Accident Year 1984 or later, where the case-incurred value of the claim is at least \$500,000. Call 31 experience used in this study reflects:

- All jurisdictions for which NCCI provides ratemaking services, except TX and WV<sup>2</sup>
- Accident Years 1984 to 2017, evaluated annually from 12/31/2000 to 12/31/2018<sup>3</sup>
- Private carrier, State Fund, voluntary business, and assigned risk data, where applicable

The data used in the study does not include catastrophe claims,<sup>4</sup> loss adjustment expenses, or large deductible policies unless otherwise noted.

Experience is trended with a 5% annual inflationary trend on an Accident Year basis, to bring loss amounts to present level. More details on the data, trend adjustments, and development factor calculations can be found in the **Background and Methodology** section in the Appendix, along with the average development factors in tabular format.

NCCI recently began collecting Large Deductible data for states other than Florida as of the 12/31/2017 valuation. However, due to the scarcity of this data, we focus solely on Florida Large Deductible data when discussing this topic.

## EXCESS LOSS DEVELOPMENT PATTERNS

### Claim Count and Loss Emergence

Exhibit 1 shows claim count emergence for claims excess of different attachment points for development years 1 to 10 relative to the 35th development year. The percent emergence at development year N is calculated as the reciprocal of the N-to-35th cumulative claim count development factor.

The percent of claims reported in early maturities is higher for claims in the larger layers (excess of \$5 million and excess of \$10 million) than it is for those in the lower layer (excess of \$2.5 million). The reverse pattern is observed at the intermediate stages of development, past the 7th year. This indicates that large claims are initially reported faster than smaller claims.

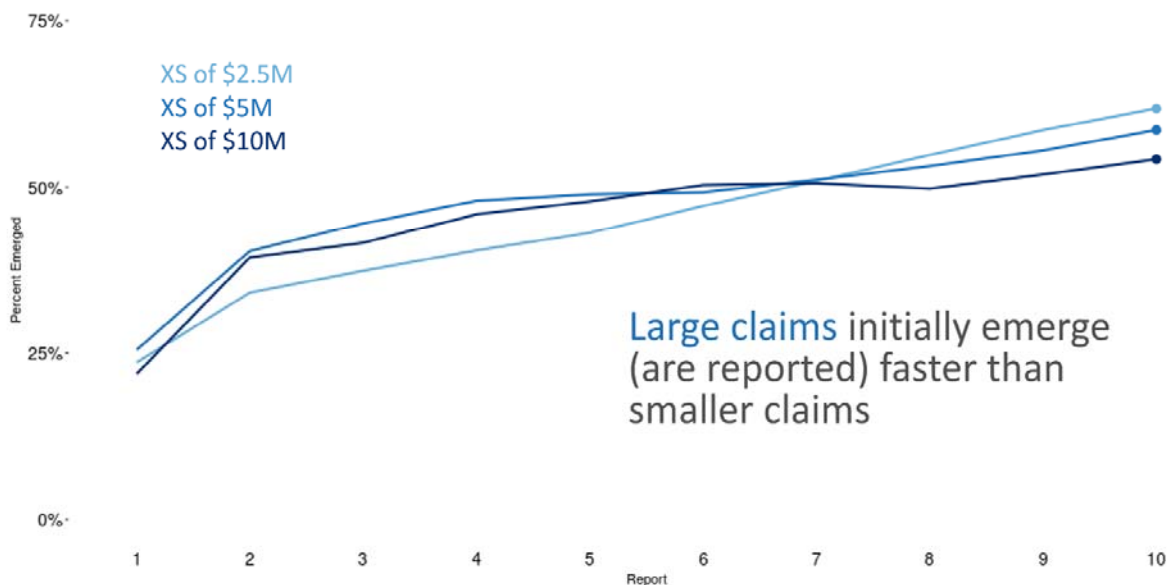
<sup>2</sup>The 36 jurisdictions included in this study are AK, AL, AR, AZ, CO, CT, DC, FL, GA, HI, IA, ID, IL, IN, KS, KY, LA, MD, ME, MO, MS, MT, NC, NE, NH, NM, NV, OK, OR, RI, SC, SD, TN, UT, VA, and VT.

<sup>3</sup>Call 31 was initiated in 2003, initially gathering information for Accident Years 1984 and later, valued as of 12/31/1998 through 12/31/2002, and yearly after that. As in previous studies, valuations 1998 and 1999 were deemed unusable due to unusually high volatility.

<sup>4</sup>For consistency with NCCI's ratemaking methodology, Extraordinary Loss Events (ELEs), aside from ELE codes 14 and 77, are excluded from this analysis. A list of ELEs are defined here: [https://ncci.com/Articles/Pages/DR\\_ELE-Code-Description.aspx](https://ncci.com/Articles/Pages/DR_ELE-Code-Description.aspx).

## Claim Count Emergence - Results

As percent of large claim counts at 35 years



**Exhibit 1**

### Individual Claim Behavior

In this section, we discuss the development by size of loss that occurred between different periods of time. Although blocks of Accident Years and reports<sup>5</sup> were reviewed throughout all the available experience, we focus on three different time periods in this brief:

- “Early reports”—Accident Years 2009 through 2013, reports 2 through 6
- “Later reports”—Accident Years 2001 through 2005, reports 10 through 14
- “Oldest reports”—Accident Years 1984 through 1987, reports 23 through 32

Several different size of loss cohorts were also examined, but in this brief we focus on the loss layers displayed below. Due to the distinct loss development patterns observed, the following size of loss cohorts were chosen:

- \$1 million to \$3 million
- \$3 million to \$5 million
- \$5 million to \$7 million
- Greater than \$7 million

For Call 31, carriers report on an annual basis those claims where the case-incurred value is at least \$500,000. As a result of this fixed threshold, claims that develop below \$500,000 are no longer reported on Call 31, and claims can therefore fall in and out of the Call throughout the duration of the claim. Such claims are not included in this section of the analysis, as the loss amounts at every report in the time period being analyzed are needed to track their development.

<sup>5</sup>Losses change over time from initial estimates to final values. Therefore, interim snapshots have associated report dates. Example: Accident Year 2009 is at 2nd report on 12/31/2010.

In the Exhibits below, we look at the movement of claims from the beginning of the time period discussed to the end of this period. Each circle represents a single claim, ranked by case-incurred loss amount as of the first report year in the respective time period on the horizontal axis; the case-incurred loss evaluated as of the last year in the corresponding period is displayed by the vertical axis.

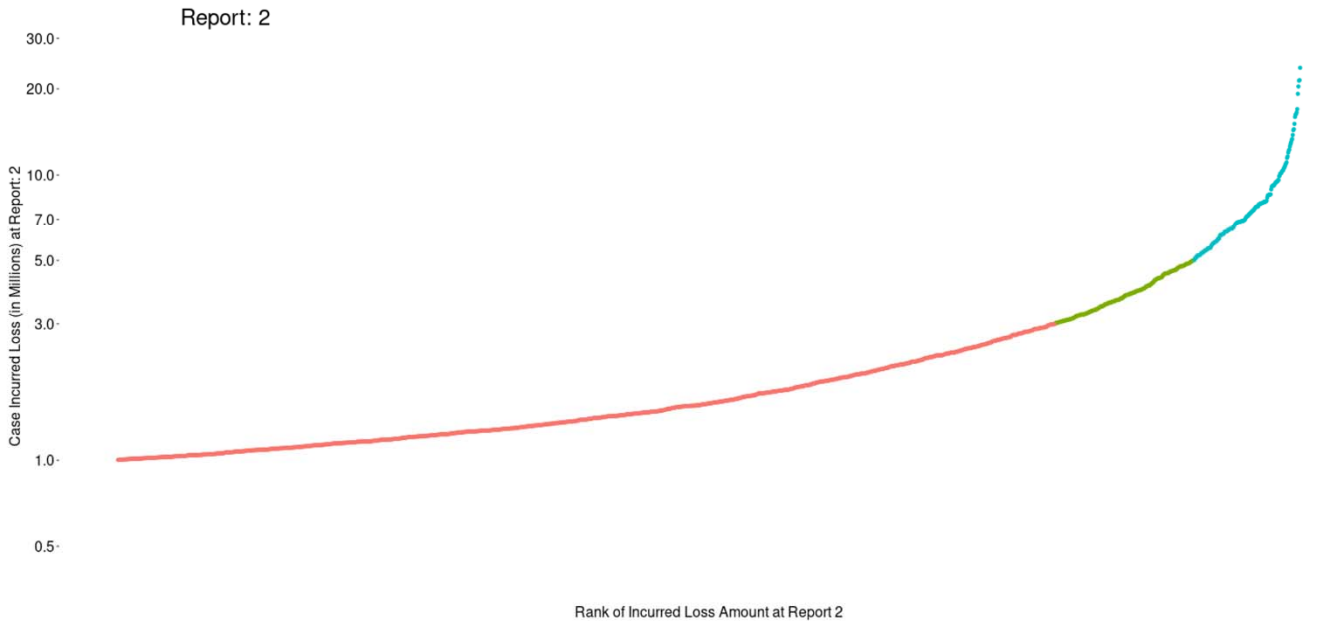
**INDIVIDUAL CLAIM BEHAVIOR—EARLY REPORTS**

In this section of the brief, we focus on what we refer to as the Early Reports. Exhibit 2 shows all the individual claims that were included in our analysis of this time period, which consists of Accident Years 2009 through 2013, reports 2 through 6. These claims are those which were reported on Call 31 for all five reports. As mentioned below, any claim that drops off Call 31 at any point, i.e., that has the incurred value fall below \$500,000 at any point in the studied time, was excluded from this analysis.

In Exhibit 2, the individual claims are rank-ordered by their amount at the beginning of the time period being studied, in this case, 2nd report.

**Early Reports – AYs 2009-2013, Report 2**

1M to 3M    3M to 5M    5M+



**Exhibit 2**

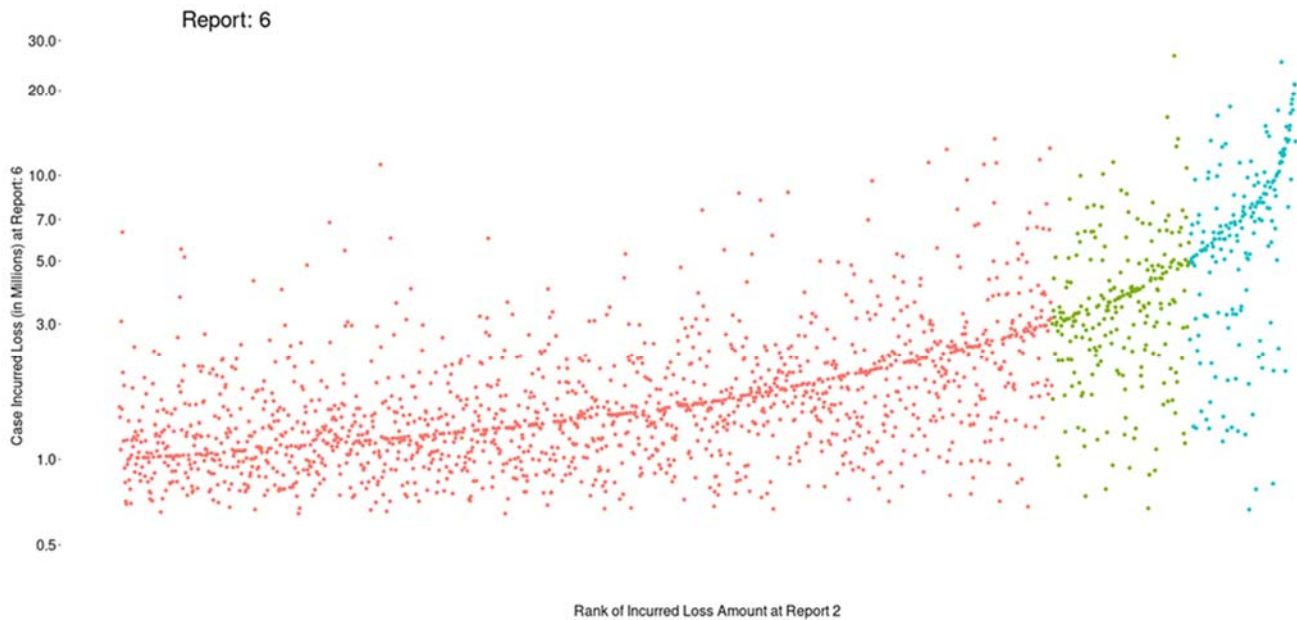
In previous updates, we observed that the largest claims were more likely to show dramatic drops in case-incurred loss than were smaller claims. For Early Reports, claims in excess of \$5 million appear more likely to develop downward than upward. This can be seen in Exhibit 3, which contains the same claims as Exhibit 2, but now displaying their case-incurred loss amounts at the 6th report, ordered by their amount at the beginning of the time period, in this case, 2nd report.

## Early Reports – AYs 2009-2013, Report 6

1M to 3M

3M to 5M

5M+



### Exhibit 3

The development tendency of smaller claims is more difficult to assess visually due to the higher concentration of claims that show both increased and decreased amounts.

Exhibits 4 and 5 are revisions of Exhibits 2 and 3, respectively, and provide a horizontal line representing the average claim amount for each loss cohort at the corresponding reports. When the final report is displayed, the initial average amount is displayed with a gray horizontal line and the average amount during the final report is displayed with a colored horizontal line. In Exhibit 5, the difference between the gray and the colored lines represents the average development observed from a 2nd report to the end of the 6th report. It is now clear that the average case-incurred loss amounts for the lower loss cohorts increased from 2nd to 6th report, while the average case-incurred loss amount decreased for claims in excess of \$5 million.

## Early Reports – AYs 2009-2013, Report 2

1M to 3M    3M to 5M    5M+

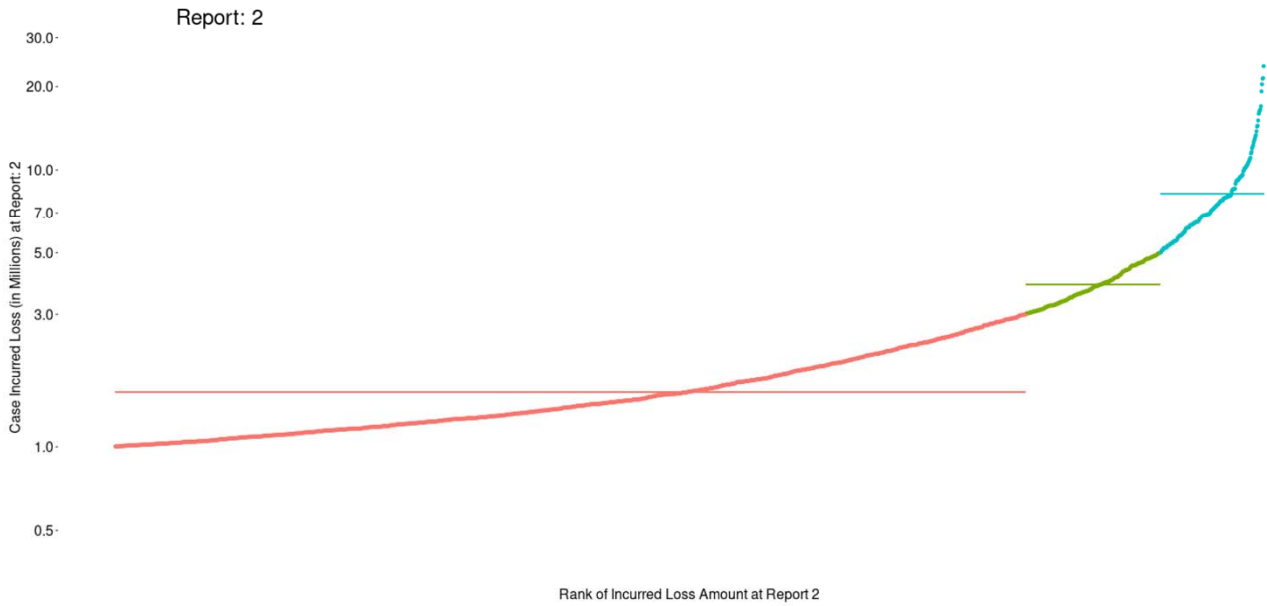


Exhibit 4

## Early Reports – AYs 2009-2013, Report 6

1M to 3M    3M to 5M    5M+

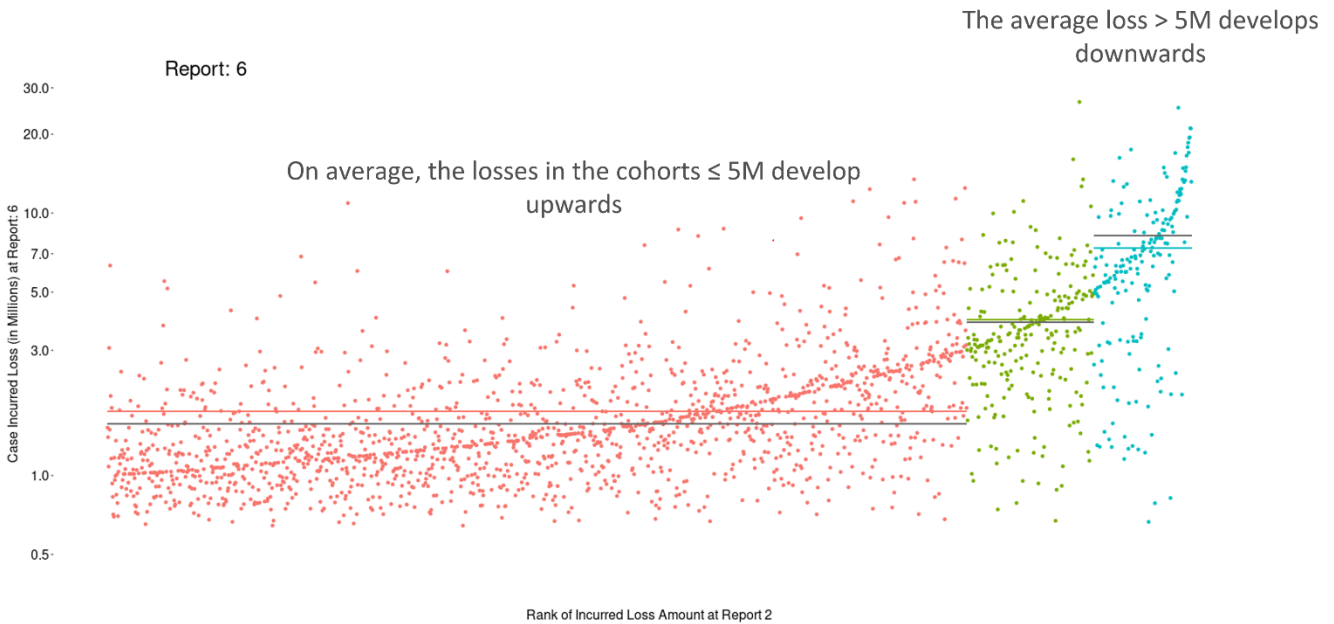


Exhibit 5

Next, we take a deeper dive into the highest loss cohort of claims: excess of \$5 million. We split these claims into two groups, based on their incurred value at the initial report, \$5 to \$7 million and excess of \$7 million, and observe how their incurred loss amounts change across reports. In later reports, these two loss cohorts experience different development patterns, which will be discussed in the **Later Reports and Oldest Reports** sections.

Exhibits 6 and 7 illustrate how individual claims develop between the 2nd and 6th reports, with each claim displayed as a dotted line moving from left to right. The report number is on the horizontal axis and the case-incurred loss amount is again displayed on the vertical axis. Exhibit 6 is made up of claims with case-incurred loss amounts between \$5 million and \$7 million at the 2nd report, while Exhibit 7 displays those claims with case-incurred loss amounts in excess of \$7 million at the 2nd report. Although these claims start in their corresponding loss cohort at the beginning of the time period studied, they may end up outside of these loss ranges by the end of the time period due to development.

In Exhibit 6, those claims whose loss amount increased to more than \$7 million by the 6th report are displayed with a **red dot**, while those whose loss amounts decreased to less than \$5 million are shown with a **blue dot**. The claims that remained in the \$5 to \$7 million cohort are displayed in gray. Similarly, in Exhibit 7, those claims whose loss amounts decreased to less than \$7 million are shown in **blue**. It is worthy to note that no claim in Exhibit 7 shows **red**, as no increase would lead to an escape from the “greater than \$7 million” loss cohort.

## Early Reports – AYs 2009-2013, Reports 2-6

Losses  $5M < x \leq 7M$

Claims whose loss amounts increase to  $> 7M$  at the report shown

Claims whose loss amounts decrease to  $\leq 5M$  at the report shown

On average,  $5M < x \leq 7M$  losses developed **downward** at earlier reports

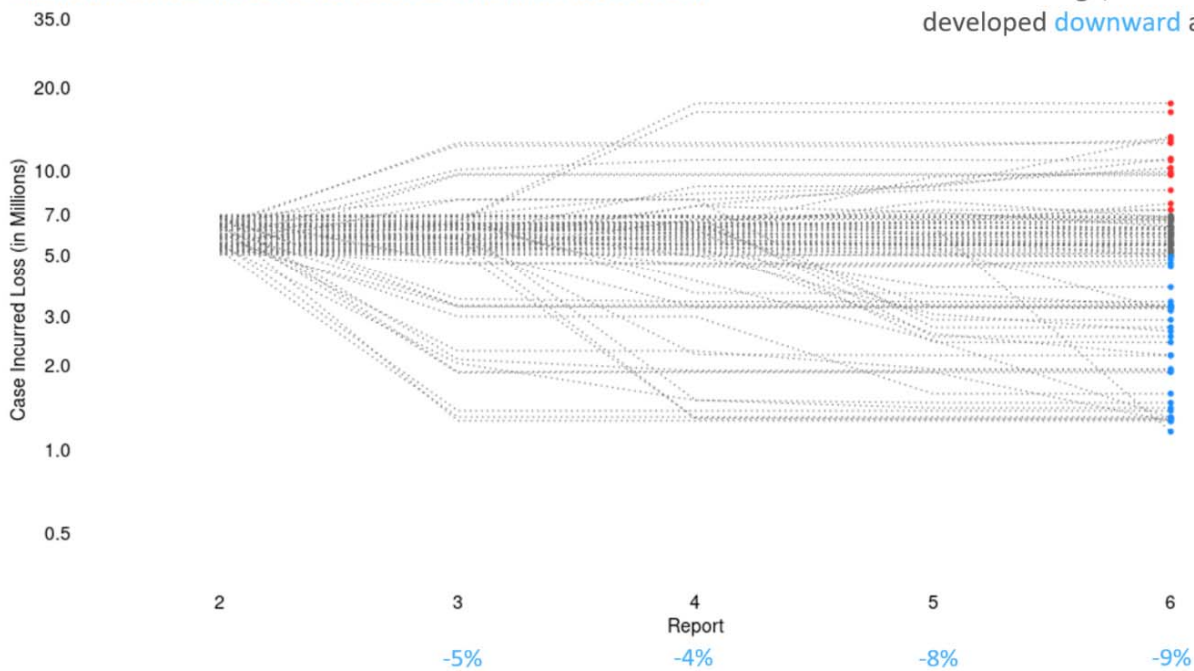


Exhibit 6

## Early Reports – AYs 2009-2013, Reports 2-6

Losses > 7M

Claims with loss amounts ≤ 7M by 6th report

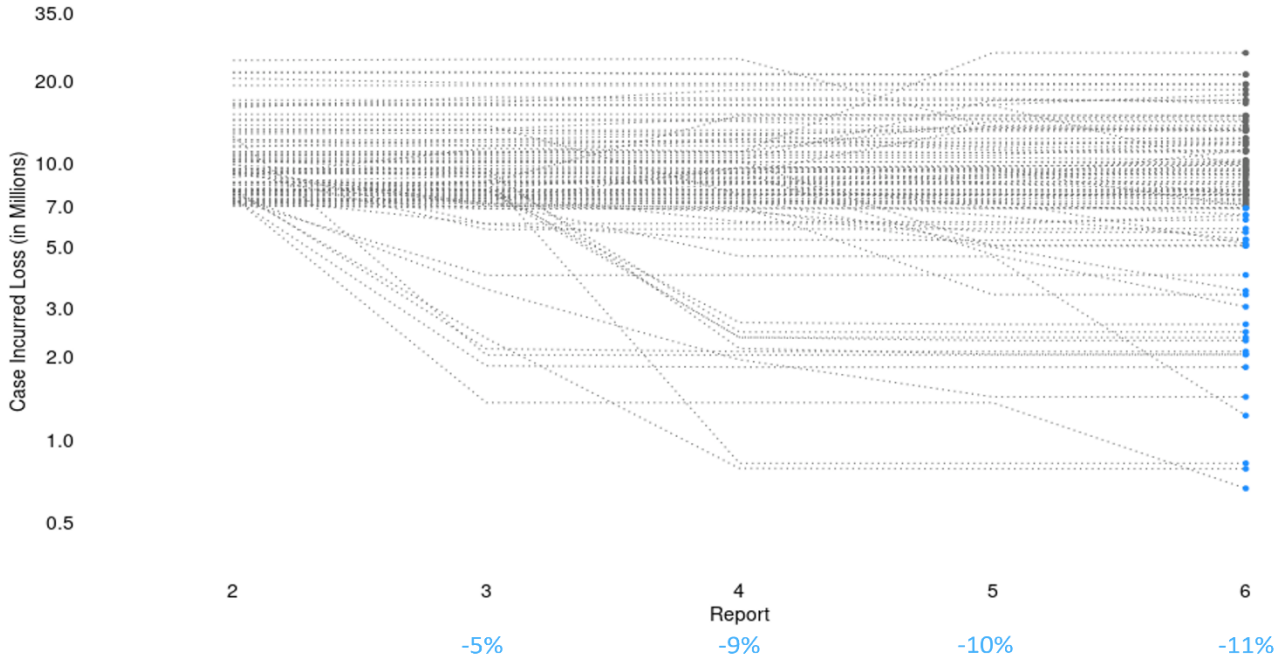


Exhibit 7

The following development patterns can be observed in Exhibits 5 through 7:

- Claims with case-incurred amounts of less than \$5 million at a second report generally developed upwards
- Claims with case-incurred amounts of more than \$5 million at a second report generally developed downward
- Of the claims in the greater than \$5 million category, those greater than \$7 million show a modestly larger downward development pattern

The table below summarizes the change in average case-incurred loss amounts for the loss cohorts discussed in this section:

Loss Cohort	Development (2nd to 6th Report)
1M < x ≤ 3M	+11%
3M < x ≤ 5M	+3%
5M < x ≤ 7M	-9%
x > 7M	-11%

### INDIVIDUAL CLAIM BEHAVIOR—LATER REPORTS

Exhibits 8 through 10 investigate whether the development patterns previously observed for Early Reports hold for claims observed during a later stage of development. In these exhibits, we explore the development by size of loss for individual claims in Later Reports—Accident Years 2001 and 2005, reports 10 through 14.

The horizontal lines, representing the average case-incurred amount for each loss cohort at the identified report, show that the \$5 to \$7 million claims now tend to develop slightly upwards, while they previously developed downwards, on average.



## Later Reports – AYs 2001-2005, Report 10

3M to 5M    5M to 7M    7M+

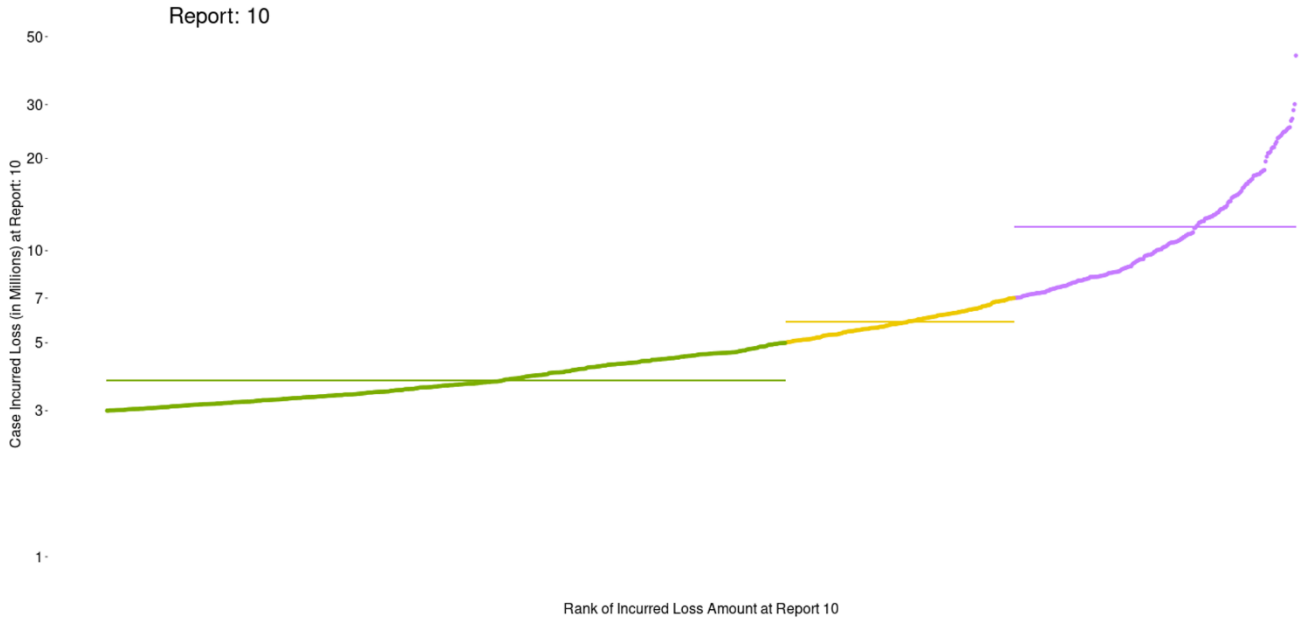


Exhibit 8

## Later Reports – AYs 2001-2005, Report 14

3M to 5M    5M to 7M    7M+

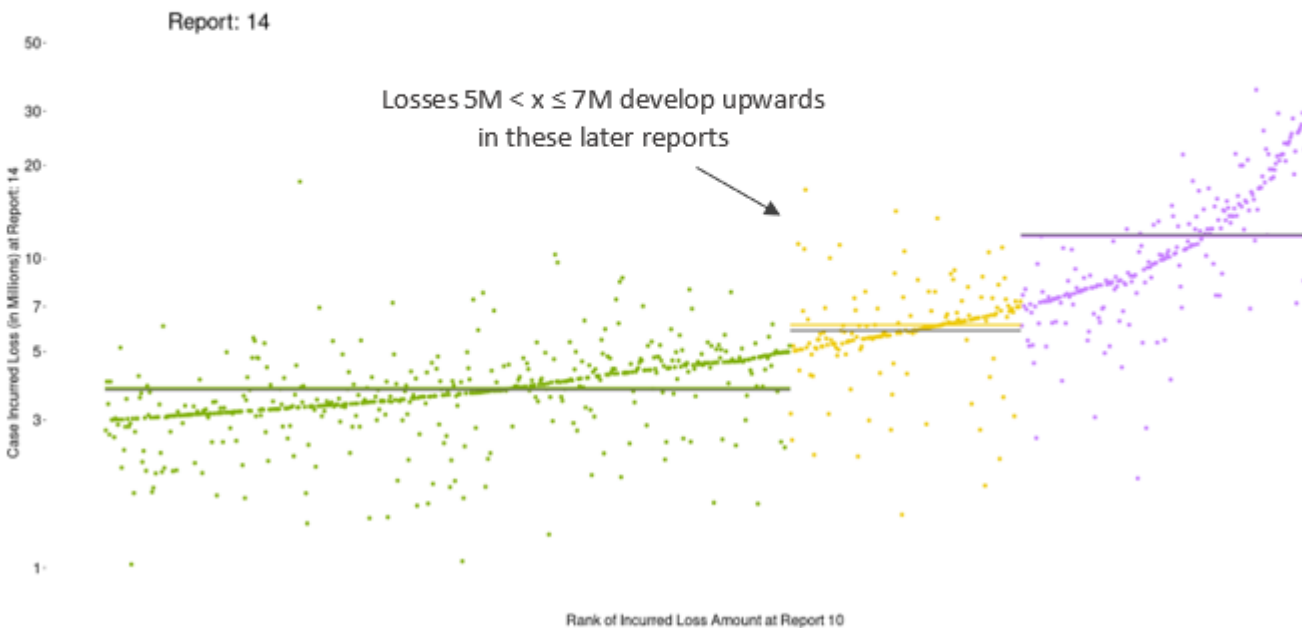


Exhibit 9

The difference between the gray and colored lines on Exhibit 9 is difficult to identify in these later reports, meaning that the average case-incurred loss amounts increased or decreased less between reports 10 and 14 than in the earlier reports. This is not unusual, because more information is known about a claim at later reports compared to early reports where the claim is still immature; therefore, less changes in incurred amounts are expected.

Given the difficulty of identifying the changes in average incurred loss amounts in these Exhibits, we compiled Exhibit 10, shown below. Time is displayed on the horizontal axis, while the percent change in the average loss amounts for each loss cohort is displayed on the vertical axis. Here, it is more evident that the \$3 to \$5 million and \$5 to \$7 million groups increased on average, while the greater than \$7 million claim group experienced a decrease.

## Later Reports – AYs 2001-2005, Reports 10-14 Changes in Average Loss Amounts



Exhibit 10

The following development patterns can be observed in Exhibits 8 through 10:

- Claims with case-incurred amounts less than \$5 million at 10th report generally developed upward
- In contrast to the development patterns of claims from Early Reports, reports 2 through 6, claims with case-incurred amounts between \$5 and \$7 million at a 10th report generally developed upward
- Claims with case-incurred amounts above \$7 million at a 10th report generally developed downward

### INDIVIDUAL CLAIM BEHAVIOR—OLDEST REPORTS

In this final section of Individual Claim Behavior, we focus on the Oldest Reports, looking at individual claims occurring between 1984 and 1987, reports 23 through 32.

## Oldest Reports – AYs 1984-1987, Report 23

3M to 5M    5M to 7M    7M+

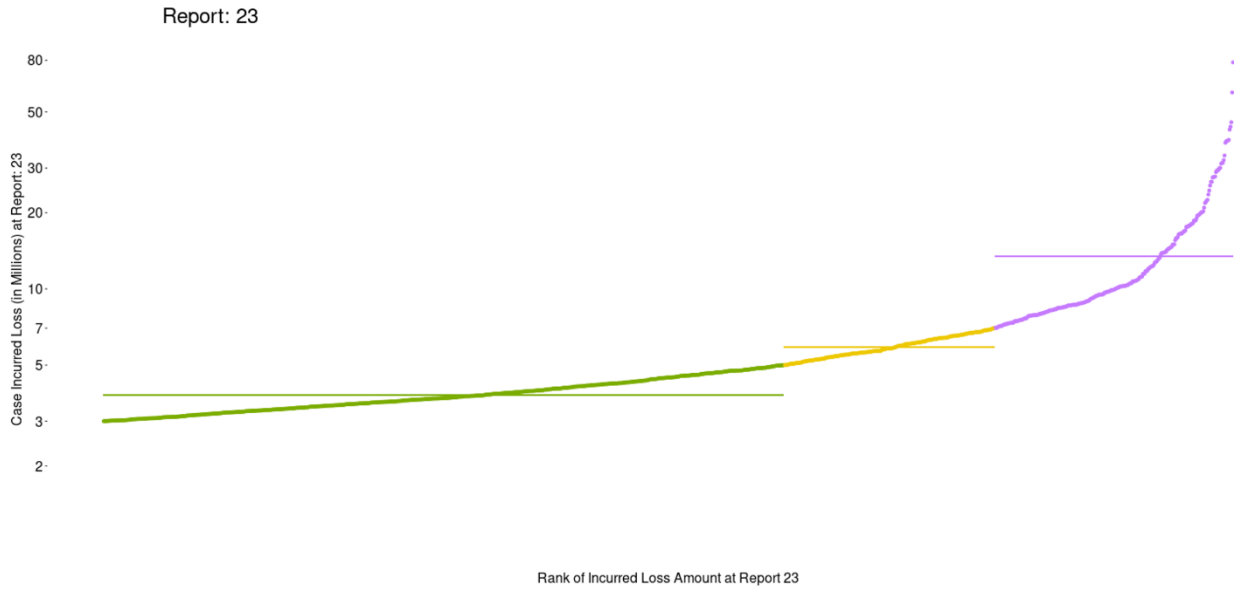


Exhibit 11

## Oldest Reports – AYs 1984-1987, Report 32

3M to 5M    5M to 7M    7M+

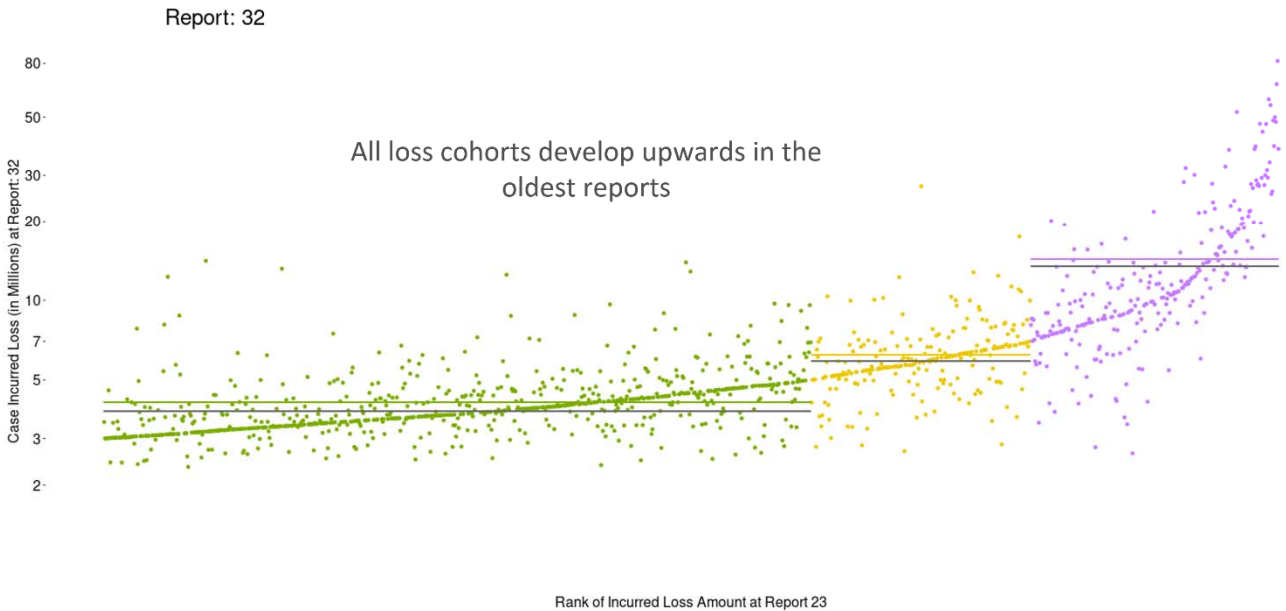
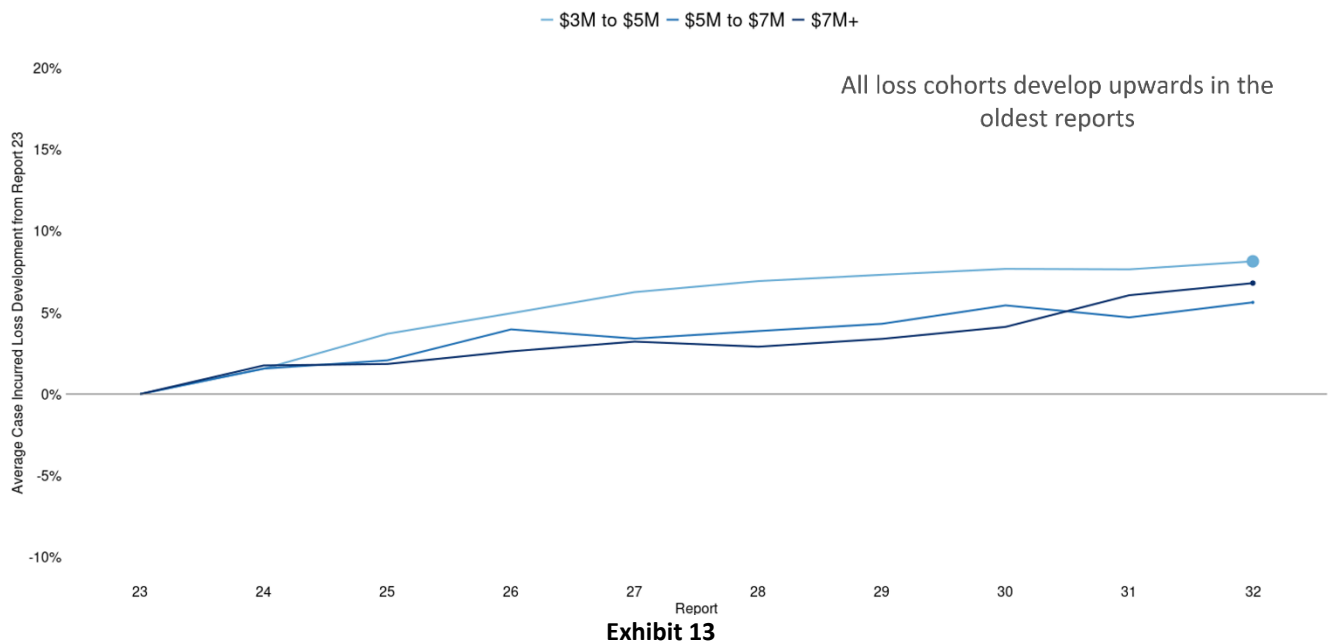


Exhibit 12

In Exhibits 11 and 12, not only can we see that there is still claim activity 32 years past a claim’s accident date, but that all loss cohorts develop upwards on average in these oldest reports. This is unlike the previously discussed time frames, where the largest loss cohorts experienced downward development.

Exhibit 13 is similar to Exhibit 10 but is now applied to these oldest Accident Years and reports. As previously mentioned, all loss cohorts now experience upward development. Additionally, the percent change in these Oldest Reports is larger than what we saw for reports 10 through 14.

## Oldest Reports – AYs 1984-1987, Reports 23-32 Changes in Average Loss Amounts



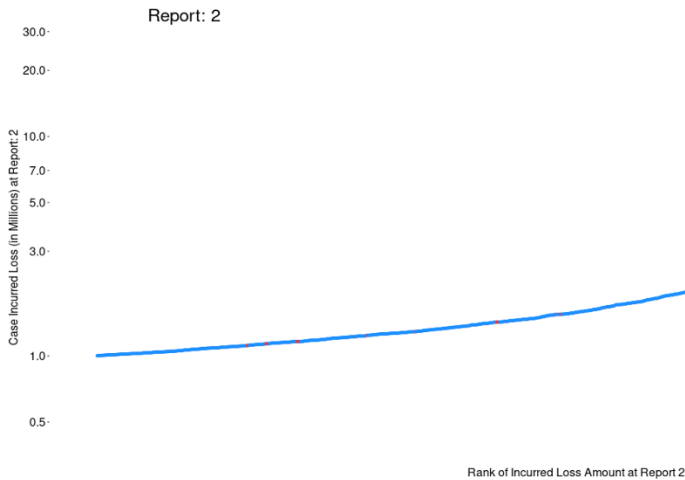
## CLAIM CLOSURE RATES

In this update of the study, we dive deeper into the claim closure rate of large losses. We use the same Accident Years and report groups as discussed in the Individual Claim Behavior section and similar visualization techniques; however, we now focus on the open versus closed status of the claims, instead of the different loss cohorts and their average development.

For each group of Accident Years and reports, we show the incurred amounts and status at the beginning and end of the report window. The claims that are open during the Accident Year and report shown in each are displayed in blue, while those that are closed are displayed in red. This can be seen in Exhibits 14 through 19.

## Early Reports – Open vs. Closed

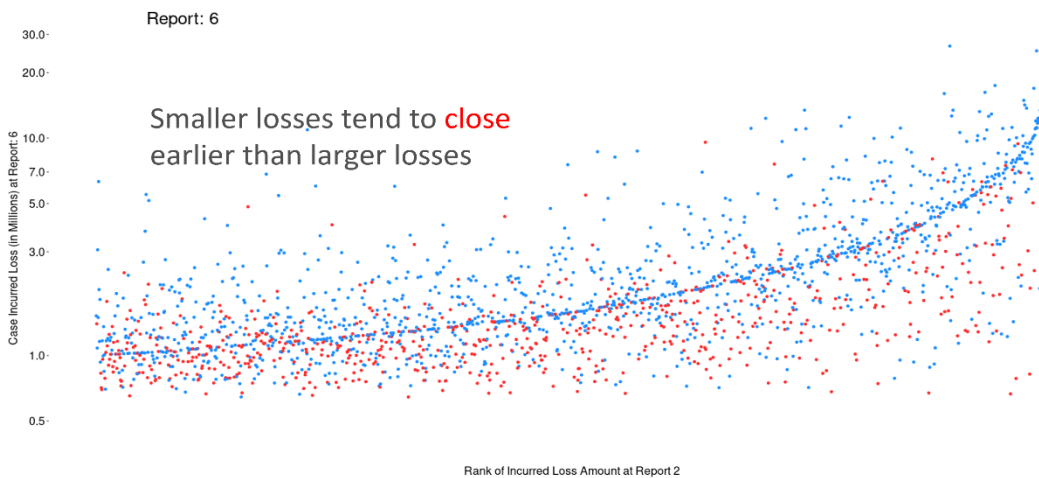
AYs 2009-2013, Report 2



**Exhibit 14**

## Early Reports – Open vs. Closed

AYs 2009-2013, Report 6



**Exhibit 15**

The following table summarizes the proportion of claims that are closed at 2nd report compared to 6th report, by loss cohort, for Accident Years 2009 through 2013:

Loss Range	% Closed at 2nd	% Closed at 6th
1M < x ≤ 3M	4.2%	50.4%
3M < x ≤ 5M	2.0%	39.8%
5M < x ≤ 7M	1.1%	36.7%
x > 7M	0.0%	22.4%

## Later Reports – Open vs. Closed

AYs 2001-2005, Report 10

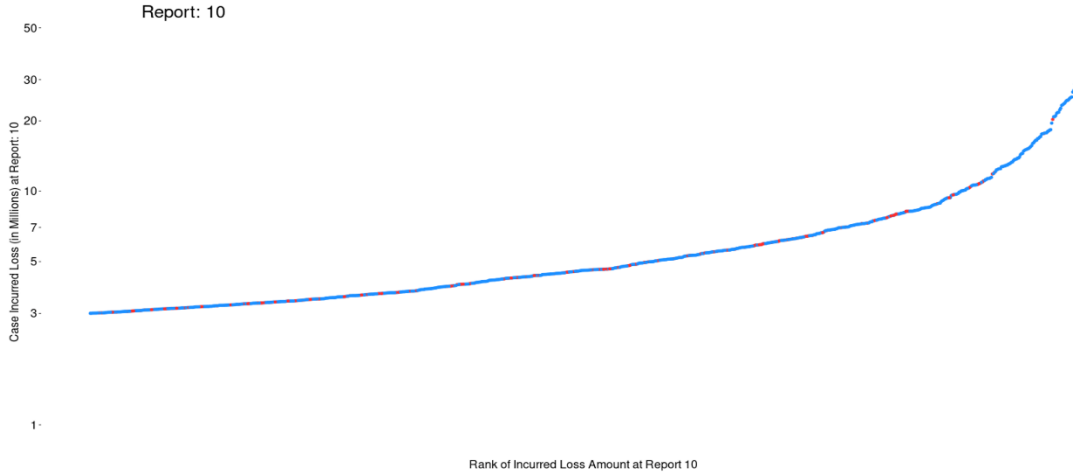


Exhibit 16

## Later Reports – Open vs. Closed

AYs 2001-2005, Report 14

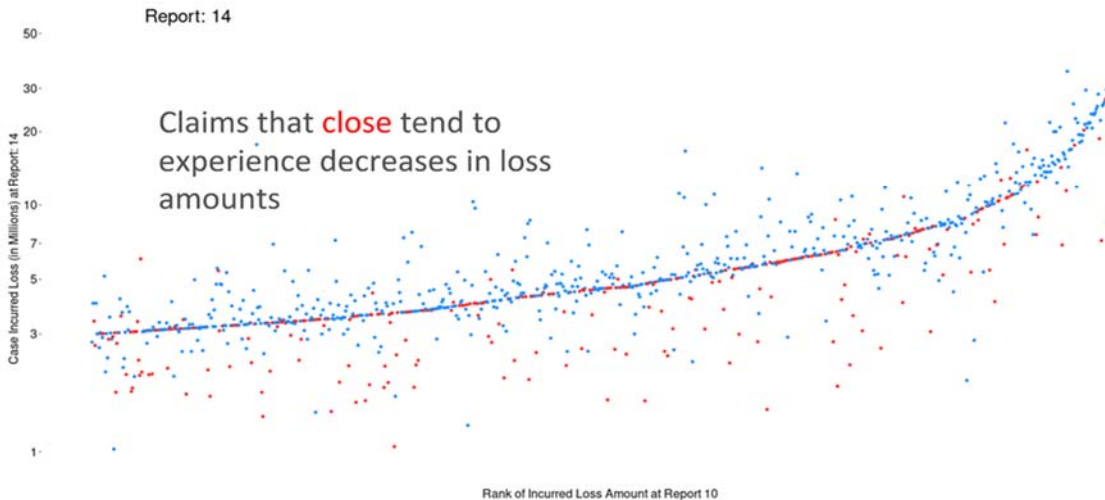


Exhibit 17

The following table summarizes Exhibits 16 and 17, showing the proportion of claims that are closed at 10th report compared to 14th report, by loss cohort, for accidents occurring in the years 2001 through 2005. Note, the 1M to 3M layer was eliminated, since trended claims occurring in 2001 with loss amounts below the Call 31 reporting threshold are not available, and would be trended into this range:

Loss Range	% Closed at 10th	% Closed at 14th
3M < x ≤ 5M	26.7%	45.1%
5M < x ≤ 7M	27.0%	46.0%
x > 7M	16.7%	34.8%

## Oldest Reports – Open vs. Closed

AYs 1984-1987, Report 23

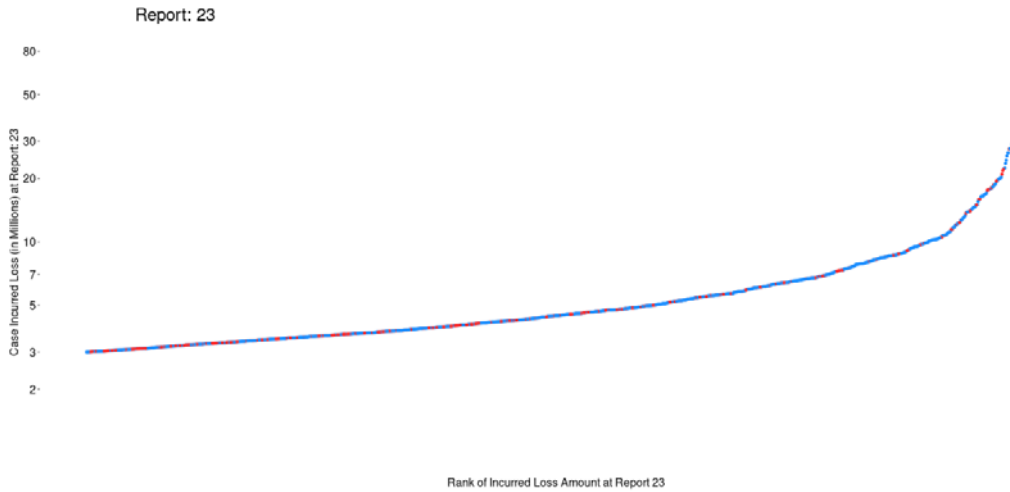


Exhibit 18

## Oldest Reports – Open vs. Closed

AYs 1984-1987, Report 32

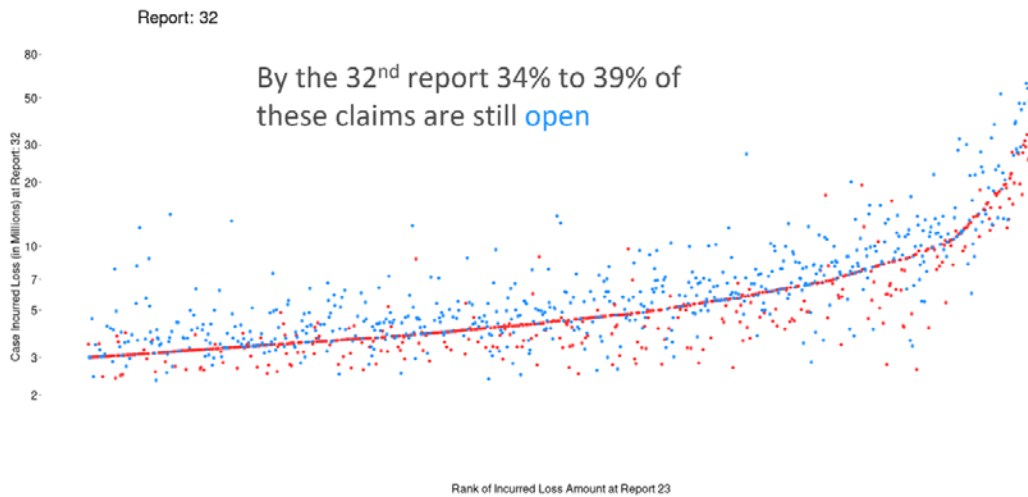


Exhibit 19

The following table summarizes the proportion of claims that are closed at 23rd report compared to 32nd report, by loss cohort, for Accident Years 1984 through 1987:

Loss Range	% Closed at 23rd	% Closed at 32nd
3M < x ≤ 5M	43.0%	66.3%
5M < x ≤ 7M	34.3%	61.3%
x > 7M	29.9%	60.9%

The following development patterns are observed, for all Accident Years and reports investigated:

- Claims with lower case-incurred loss amounts at a certain point in time tend to close faster than those with higher case-incurred loss amounts at that same time
- Claims observed tend to experience a decrease in case-incurred loss amounts prior to closing. This pattern is in part explained by lump-sum settlements (in some jurisdictions), or when an injured worker passes prematurely.

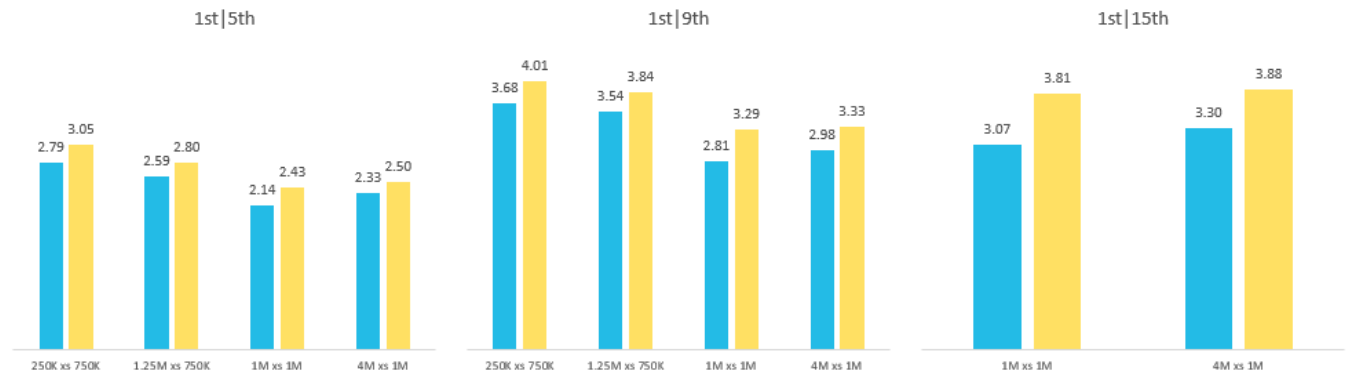
### DEVELOPMENT FOR LARGE DEDUCTIBLE POLICIES

In prior studies, a comparison of average loss development factors including and excluding large deductible policies was established using Call 31 data. We provide an update to this analysis in this 2021 study, with the results shown below in Exhibit 20. We use Florida-only data given the lack of large deductible information collected from the other NCCI states. NCCI started collecting large deductible data for states other than Florida beginning with the 12/31/2017 valuation; however, this is not considered enough volume of data to draw meaningful conclusions.

Exhibit 20 shows the impact of large deductible policies on excess development, by comparing loss development factors including and excluding large deductible claims. Consistent with the prior studies, including claims under large deductible policies produced significantly more development in the reviewed excess layers.

### Impact of LD Policies in Florida Cumulative Loss Development Factors – Incurred Losses

■ Excluding LD   ■ Including LD



**Note:** Accident Years 2010 through 2017 are used to calculate the cumulative loss development factors for the layers excess of \$750,000. Accident Years 2004 through 2017 are used to calculate those for the layers excess of \$1 million.

Exhibit 20

### SOME CAVEATS

Some precautions should be taken into consideration when interpreting the implications of this study with respect 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 predictive. These are statistical compilations of historical data and does not imply that we recommend them for any particular application.

Underlying losses are trended to Accident Year 2018 using a 5% annual inflationary rate. Actual reinsurance excess layers will be affected by contractual provisions not reflected in the per-claim layers produced from Call 31 data.

Development beyond the 35th year is not addressed in this study. High development beyond the 35th year for high layers might result from longevity of some individual claimants. At early stages, claims are reserved at expected values. At very late stages, claims with extended longevities will begin to penetrate higher layers at a time beyond the point when the notable drops due to early mortality and other causes are likely to have generally ended.



## CLOSING REMARKS

Claims over \$7 million generally showed downward development on average until reaching the oldest reports studied, where these began to develop upwards. Claims less than \$5 million showed upward development on average across the time period studied. Those claims between \$5 and \$7 million generally developed downward during earlier reporting periods and upward during later reporting periods.

Claims with lower case-incurred amounts tend to take less time to close than those with higher case-incurred amounts, and in general, claims tend to experience decreases prior to closing. By the 32nd report, there is still claim activity occurring, with a good proportion of claims still open.

Including large deductible claims produced significantly more development in the excess layers.

## ACKNOWLEDGMENTS

We thank Dan Benzshawel, Tom Daley, Saiying He, Barry Lipton, and John Robertson from NCCI's Actuarial & Economic Services Division for valuable contributions to this study.

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- [4] Independent Bureaus and NCCI, Countrywide Mega Claims, 2020, [ncci.com](http://ncci.com)

## APPENDIX

### Background and Methodology

Loss development factors and patterns presented in this research brief are derived from data reported to NCCI under Call 31. The Call was initiated to allow limited loss development in aggregate ratemaking. The data utilized in this report includes all claims, gross of reinsurance recoveries, at least \$500,000 from Accident Years 1984 to 2017, valued at annual intervals from 12/31/2000 through 12/31/2018.

### Adjustment for Trend

The average size of claims for workers compensation benefits have generally been increasing for an extended period. As a result, the share 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 10-year period, then loss development patterns in excess of \$2 million at the end of the period are expected to be similar to loss development patterns in excess of \$1 million at the beginning of the period.

We have adjusted for this inflation by trending ground-up loss amounts for each individual claim at a constant rate of 5% from the midpoint of the accident year of the claim to the midpoint of Accident Year 2018. This adjustment approximates changes in prices (wages and prices for medical services) but does not account for changes in claim duration or the utilization of medical services. While not shown in this report, NCCI analyzed several alternative trends and determined the sensitivity of the results of this study to the selected accident year trend was immaterial.

### Loss Cohorts

Exhibits 2 through 19 segregated ground-up claim amounts into loss cohorts with which average development was summarized over time. As the selection of these loss cohorts was arbitrary, NCCI conducted a sensitivity analysis by varying the ranges of loss size for the cohorts. For example, the lower (upper) boundary of the \$3 million to \$5 million loss cohort was shifted down (up) in \$100K increments with each neighboring cohort adjusted accordingly. While not shown in this report, NCCI determined the findings of the report generally hold with alternative loss cohorts.

### Basis for Loss Development Factors

Call 31 data was used to compute development factors on the following bases:

- Claim values are either paid amounts or case-incurred amounts (paid plus case reserves) for indemnity and medical benefits combined, without loss adjustment expenses.
- Individual claim amounts are trended from the midpoint of the accident year of the claim to the midpoint of Accident Year 2018, using a constant rate of 5% per year.
- Losses or claim counts, underlying the denominators of individual accident year link ratios, are used as weights to calculate volume-weighted average incremental development factors across accident years. Volume-weighted cumulative development factors across multiple years are the product of volume-weighted incremental development factors

### NCCI's Excess Loss Development (ELD) Research vs. 2020 Countrywide Mega Claims Report

As part of this ELD research, we calculated the percent of large losses emerged by each report, as shown on Exhibit 1 of this brief. A separate NCCI research project that included partnering with several independent bureaus (IB) and combining data across all participating bureaus, the Countrywide Mega Claims [4] research, also calculated the emergence of large losses, but showed higher percentages of mega claims emerged by the 10th report than the ELD research. Multiple differences in assumptions and datasets contribute to the discrepancy; these are summarized in the table below:

	<b>ELD Research</b>	<b>Countrywide Mega Claims Report</b>
<b>Large Loss Defined</b>	Reported amount of \$500,000 and higher	\$3,000,000 and higher, after trending to mid-point of 2018
<b>Tail Factor</b>	LDF beyond 35th report = 1	Generalized Bondy method attached at the 10th report
<b>LDF Avg</b>	All-year weighted avg (AY1984–2018, valuations 2000–2018)	AY2001–2017 using development factors based on the latest year of development
<b>Large Deductible Claims</b>	Excluded	Included
<b>Trend Losses to AY18 Cost Loss Method</b>	Apply 5% annual inflationary trend	Varies by IB-NCCI states (Indemnity—trended by average weekly wage; Medical—trended by CMS personal healthcare index)
<b>States Included</b>	NCCI states only	NCCI states and participating Independent Bureau states combined

### Weighted-Average Cumulative Development Factors to Age 35

Tables 1 through 4 contain the cumulative development factors calculated from the data underlying this research. These factors **do not** represent selections made by NCCI and are instead provided as a convenience to the reader.

**Table 1: Excess Case-Incurred Loss Development Factors to Development Year 35**

Age to 35	XS of \$2.5M	XS of \$5M	XS of \$10M
1 35	4.234	4.539	5.167
2 35	2.640	2.635	2.869
3 35	2.419	2.408	2.637
4 35	2.259	2.235	2.420
5 35	2.185	2.181	2.331
6 35	2.093	2.098	2.146
7 35	2.009	2.041	2.077
8 35	1.946	2.020	2.099
9 35	1.857	1.939	2.026
10 35	1.783	1.886	2.006
11 35	1.710	1.808	1.902
12 35	1.654	1.760	1.838
13 35	1.573	1.680	1.741
14 35	1.519	1.632	1.713
15 35	1.465	1.577	1.674
16 35	1.423	1.535	1.635
17 35	1.379	1.493	1.587
18 35	1.337	1.446	1.532
19 35	1.290	1.391	1.480
20 35	1.249	1.340	1.433
21 35	1.221	1.309	1.392
22 35	1.194	1.275	1.356
23 35	1.169	1.242	1.299
24 35	1.147	1.210	1.254
25 35	1.127	1.183	1.214
26 35	1.101	1.144	1.162
27 35	1.088	1.127	1.147
28 35	1.075	1.111	1.134
29 35	1.055	1.080	1.090
30 35	1.046	1.068	1.071
31 35	1.029	1.042	1.030
32 35	1.012	1.018	1.015
33 35	1.003	1.007	1.004
34 35	1.007	1.011	1.008

**Table 2: Excess Claim Count Development Factors to Development Year 35 Based on Case-Incurred Losses**

Age to 35	XS of \$2.5M	XS of \$5M	XS of \$10M
1 35	4.239	3.927	4.577
2 35	2.937	2.482	2.543
3 35	2.680	2.246	2.408
4 35	2.475	2.085	2.177
5 35	2.322	2.044	2.089
6 35	2.120	2.031	1.987
7 35	1.963	1.956	1.976
8 35	1.823	1.880	2.009
9 35	1.707	1.801	1.926
10 35	1.618	1.706	1.845
11 35	1.541	1.651	1.726
12 35	1.464	1.604	1.675
13 35	1.391	1.523	1.594
14 35	1.333	1.455	1.567
15 35	1.289	1.392	1.521
16 35	1.257	1.347	1.477
17 35	1.217	1.309	1.459
18 35	1.190	1.283	1.430
19 35	1.158	1.235	1.377
20 35	1.138	1.185	1.332
21 35	1.113	1.161	1.312
22 35	1.095	1.137	1.287
23 35	1.080	1.120	1.255
24 35	1.073	1.109	1.218
25 35	1.061	1.093	1.186
26 35	1.052	1.071	1.166
27 35	1.047	1.053	1.157
28 35	1.037	1.045	1.137
29 35	1.031	1.029	1.106
30 35	1.026	1.030	1.095
31 35	1.023	1.020	1.074
32 35	1.018	0.996	1.012
33 35	1.016	0.981	0.992
34 35	1.014	0.995	0.985

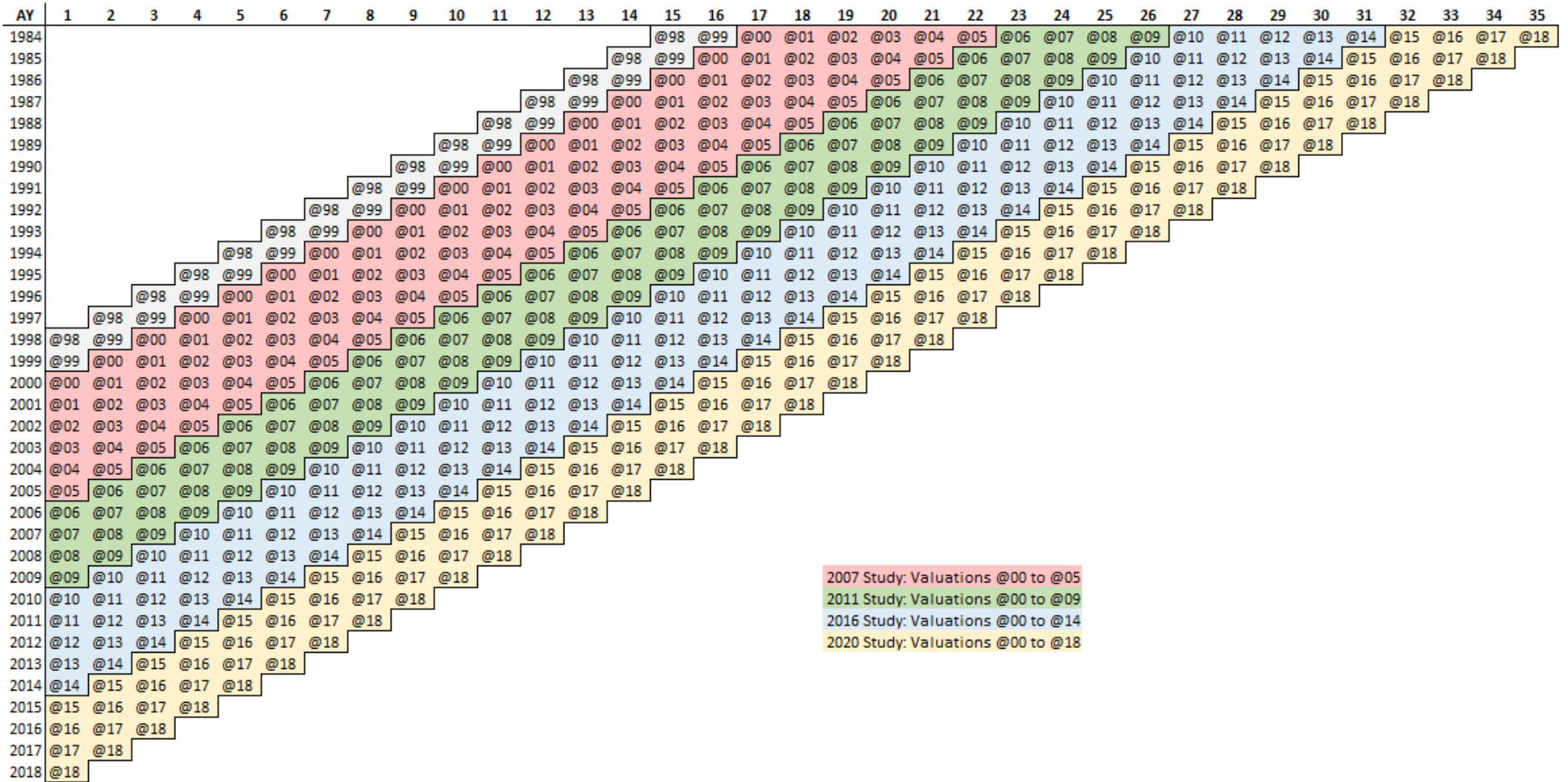
**Table 3: Excess Paid Loss Development Factors to Development Year 35**

Age to 35	XS of \$2.5M	XS of \$5M	XS of \$10M
10 35	5.043	7.308	14.678
11 35	4.453	6.166	11.745
12 35	4.047	5.466	10.297
13 35	3.676	4.791	8.485
14 35	3.383	4.300	7.296
15 35	3.093	3.836	6.035
16 35	2.840	3.438	5.130
17 35	2.615	3.111	4.351
18 35	2.422	2.836	3.801
19 35	2.236	2.584	3.338
20 35	2.082	2.389	3.006
21 35	1.922	2.172	2.603
22 35	1.786	1.993	2.304
23 35	1.673	1.850	2.087
24 35	1.575	1.724	1.897
25 35	1.493	1.623	1.760
26 35	1.406	1.509	1.590
27 35	1.340	1.427	1.480
28 35	1.282	1.361	1.402
29 35	1.225	1.286	1.301
30 35	1.181	1.234	1.245
31 35	1.138	1.176	1.176
32 35	1.096	1.120	1.112
33 35	1.059	1.073	1.065
34 35	1.029	1.039	1.033

**Table 4: Excess Claim Count Development Factors to Development Year 35 Based on Paid Losses**

Age to 35	XS of \$2.5M	XS of \$5M	XS of \$10M
10 35	3.453	4.308	7.509
11 35	3.158	3.767	5.678
12 35	2.899	3.435	4.895
13 35	2.675	3.110	4.166
14 35	2.489	2.928	3.703
15 35	2.313	2.721	3.364
16 35	2.152	2.519	3.022
17 35	1.993	2.391	2.761
18 35	1.880	2.257	2.519
19 35	1.748	2.120	2.264
20 35	1.633	2.003	2.063
21 35	1.525	1.874	1.932
22 35	1.437	1.781	1.736
23 35	1.370	1.700	1.599
24 35	1.316	1.600	1.495
25 35	1.267	1.529	1.406
26 35	1.219	1.452	1.345
27 35	1.186	1.394	1.286
28 35	1.153	1.319	1.238
29 35	1.122	1.268	1.173
30 35	1.096	1.196	1.140
31 35	1.069	1.154	1.107
32 35	1.042	1.111	1.077
33 35	1.026	1.070	1.054
34 35	1.010	1.017	1.021

Triangle 1: Graphical Representation of Call 31 Data Utilized





Triangle 2: Graphical Representation of Call 31 Data Underlying Early Reports—Exhibits 2–7 and 14–15

AY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
1984															@98	@99	@00	@01	@02	@03	@04	@05	@06	@07	@08	@09	@10	@11	@12	@13	@14	@15	@16	@17	@18
1985														@98	@99	@00	@01	@02	@03	@04	@05	@06	@07	@08	@09	@10	@11	@12	@13	@14	@15	@16	@17	@18	
1986												@98	@99	@00	@01	@02	@03	@04	@05	@06	@07	@08	@09	@10	@11	@12	@13	@14	@15	@16	@17	@18			
1987											@98	@99	@00	@01	@02	@03	@04	@05	@06	@07	@08	@09	@10	@11	@12	@13	@14	@15	@16	@17	@18				
1988										@98	@99	@00	@01	@02	@03	@04	@05	@06	@07	@08	@09	@10	@11	@12	@13	@14	@15	@16	@17	@18					
1989										@98	@99	@00	@01	@02	@03	@04	@05	@06	@07	@08	@09	@10	@11	@12	@13	@14	@15	@16	@17	@18					
1990										@98	@99	@00	@01	@02	@03	@04	@05	@06	@07	@08	@09	@10	@11	@12	@13	@14	@15	@16	@17	@18					
1991								@98	@99	@00	@01	@02	@03	@04	@05	@06	@07	@08	@09	@10	@11	@12	@13	@14	@15	@16	@17	@18							
1992							@98	@99	@00	@01	@02	@03	@04	@05	@06	@07	@08	@09	@10	@11	@12	@13	@14	@15	@16	@17	@18								
1993					@98	@99	@00	@01	@02	@03	@04	@05	@06	@07	@08	@09	@10	@11	@12	@13	@14	@15	@16	@17	@18										
1994				@98	@99	@00	@01	@02	@03	@04	@05	@06	@07	@08	@09	@10	@11	@12	@13	@14	@15	@16	@17	@18											
1995			@98	@99	@00	@01	@02	@03	@04	@05	@06	@07	@08	@09	@10	@11	@12	@13	@14	@15	@16	@17	@18												
1996		@98	@99	@00	@01	@02	@03	@04	@05	@06	@07	@08	@09	@10	@11	@12	@13	@14	@15	@16	@17	@18													
1997	@98	@99	@00	@01	@02	@03	@04	@05	@06	@07	@08	@09	@10	@11	@12	@13	@14	@15	@16	@17	@18														
1998	@98	@99	@00	@01	@02	@03	@04	@05	@06	@07	@08	@09	@10	@11	@12	@13	@14	@15	@16	@17	@18														
1999	@99	@00	@01	@02	@03	@04	@05	@06	@07	@08	@09	@10	@11	@12	@13	@14	@15	@16	@17	@18															
2000	@00	@01	@02	@03	@04	@05	@06	@07	@08	@09	@10	@11	@12	@13	@14	@15	@16	@17	@18																
2001	@01	@02	@03	@04	@05	@06	@07	@08	@09	@10	@11	@12	@13	@14	@15	@16	@17	@18																	
2002	@02	@03	@04	@05	@06	@07	@08	@09	@10	@11	@12	@13	@14	@15	@16	@17	@18																		
2003	@03	@04	@05	@06	@07	@08	@09	@10	@11	@12	@13	@14	@15	@16	@17	@18																			
2004	@04	@05	@06	@07	@08	@09	@10	@11	@12	@13	@14	@15	@16	@17	@18																				
2005	@05	@06	@07	@08	@09	@10	@11	@12	@13	@14	@15	@16	@17	@18																					
2006	@06	@07	@08	@09	@10	@11	@12	@13	@14	@15	@16	@17	@18																						
2007	@07	@08	@09	@10	@11	@12	@13	@14	@15	@16	@17	@18																							
2008	@08	@09	@10	@11	@12	@13	@14	@15	@16	@17	@18																								
2009	@09	@10	@11	@12	@13	@14	@15	@16	@17	@18																									
2010	@10	@11	@12	@13	@14	@15	@16	@17	@18																										
2011	@11	@12	@13	@14	@15	@16	@17	@18																											
2012	@12	@13	@14	@15	@16	@17	@18																												
2013	@13	@14	@15	@16	@17	@18																													
2014	@14	@15	@16	@17	@18																														
2015	@15	@16	@17	@18																															
2016	@16	@17	@18																																
2017	@17	@18																																	
2018	@18																																		

Triangle 3: Graphical Representation of Call 31 Data Underlying Later Reports—Exhibits 8–10 and 16–17

AY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
1984															@98	@99	@00	@01	@02	@03	@04	@05	@06	@07	@08	@09	@10	@11	@12	@13	@14	@15	@16	@17	@18
1985														@98	@99	@00	@01	@02	@03	@04	@05	@06	@07	@08	@09	@10	@11	@12	@13	@14	@15	@16	@17	@18	
1986												@98	@99	@00	@01	@02	@03	@04	@05	@06	@07	@08	@09	@10	@11	@12	@13	@14	@15	@16	@17	@18			
1987											@98	@99	@00	@01	@02	@03	@04	@05	@06	@07	@08	@09	@10	@11	@12	@13	@14	@15	@16	@17	@18				
1988										@98	@99	@00	@01	@02	@03	@04	@05	@06	@07	@08	@09	@10	@11	@12	@13	@14	@15	@16	@17	@18					
1989										@98	@99	@00	@01	@02	@03	@04	@05	@06	@07	@08	@09	@10	@11	@12	@13	@14	@15	@16	@17	@18					
1990									@98	@99	@00	@01	@02	@03	@04	@05	@06	@07	@08	@09	@10	@11	@12	@13	@14	@15	@16	@17	@18						
1991								@98	@99	@00	@01	@02	@03	@04	@05	@06	@07	@08	@09	@10	@11	@12	@13	@14	@15	@16	@17	@18							
1992							@98	@99	@00	@01	@02	@03	@04	@05	@06	@07	@08	@09	@10	@11	@12	@13	@14	@15	@16	@17	@18								
1993					@98	@99	@00	@01	@02	@03	@04	@05	@06	@07	@08	@09	@10	@11	@12	@13	@14	@15	@16	@17	@18										
1994				@98	@99	@00	@01	@02	@03	@04	@05	@06	@07	@08	@09	@10	@11	@12	@13	@14	@15	@16	@17	@18											
1995			@98	@99	@00	@01	@02	@03	@04	@05	@06	@07	@08	@09	@10	@11	@12	@13	@14	@15	@16	@17	@18												
1996		@98	@99	@00	@01	@02	@03	@04	@05	@06	@07	@08	@09	@10	@11	@12	@13	@14	@15	@16	@17	@18													
1997	@98	@99	@00	@01	@02	@03	@04	@05	@06	@07	@08	@09	@10	@11	@12	@13	@14	@15	@16	@17	@18														
1998	@98	@99	@00	@01	@02	@03	@04	@05	@06	@07	@08	@09	@10	@11	@12	@13	@14	@15	@16	@17	@18														
1999	@99	@00	@01	@02	@03	@04	@05	@06	@07	@08	@09	@10	@11	@12	@13	@14	@15	@16	@17	@18															
2000	@00	@01	@02	@03	@04	@05	@06	@07	@08	@09	@10	@11	@12	@13	@14	@15	@16	@17	@18																
2001	@01	@02	@03	@04	@05	@06	@07	@08	@09	@10	@11	@12	@13	@14	@15	@16	@17	@18																	
2002	@02	@03	@04	@05	@06	@07	@08	@09	@10	@11	@12	@13	@14	@15	@16	@17	@18																		
2003	@03	@04	@05	@06	@07	@08	@09	@10	@11	@12	@13	@14	@15	@16	@17	@18																			
2004	@04	@05	@06	@07	@08	@09	@10	@11	@12	@13	@14	@15	@16	@17	@18																				
2005	@05	@06	@07	@08	@09	@10	@11	@12	@13	@14	@15	@16	@17	@18																					
2006	@06	@07	@08	@09	@10	@11	@12	@13	@14	@15	@16	@17	@18																						
2007	@07	@08	@09	@10	@11	@12	@13	@14	@15	@16	@17	@18																							
2008	@08	@09	@10	@11	@12	@13	@14	@15	@16	@17	@18																								
2009	@09	@10	@11	@12	@13	@14	@15	@16	@17	@18																									
2010	@10	@11	@12	@13	@14	@15	@16	@17	@18																										
2011	@11	@12	@13	@14	@15	@16	@17	@18																											
2012	@12	@13	@14	@15	@16	@17	@18																												
2013	@13	@14	@15	@16	@17	@18																													
2014	@14	@15	@16	@17	@18																														
2015	@15	@16	@17	@18																															
2016	@16	@17	@18																																
2017	@17	@18																																	
2018	@18																																		

Triangle 4: Graphical Representation of Call 31 Data Underlying Oldest Reports—Exhibits 11–13 and 18–19

AY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	
1984															@98	@99	@00	@01	@02	@03	@04	@05	@06	@07	@08	@09	@10	@11	@12	@13	@14	@15	@16	@17	@18	
1985													@98	@99	@00	@01	@02	@03	@04	@05	@06	@07	@08	@09	@10	@11	@12	@13	@14	@15	@16	@17	@18			
1986												@98	@99	@00	@01	@02	@03	@04	@05	@06	@07	@08	@09	@10	@11	@12	@13	@14	@15	@16	@17	@18				
1987											@98	@99	@00	@01	@02	@03	@04	@05	@06	@07	@08	@09	@10	@11	@12	@13	@14	@15	@16	@17	@18					
1988											@98	@99	@00	@01	@02	@03	@04	@05	@06	@07	@08	@09	@10	@11	@12	@13	@14	@15	@16	@17	@18					
1989										@98	@99	@00	@01	@02	@03	@04	@05	@06	@07	@08	@09	@10	@11	@12	@13	@14	@15	@16	@17	@18						
1990									@98	@99	@00	@01	@02	@03	@04	@05	@06	@07	@08	@09	@10	@11	@12	@13	@14	@15	@16	@17	@18							
1991								@98	@99	@00	@01	@02	@03	@04	@05	@06	@07	@08	@09	@10	@11	@12	@13	@14	@15	@16	@17	@18								
1992							@98	@99	@00	@01	@02	@03	@04	@05	@06	@07	@08	@09	@10	@11	@12	@13	@14	@15	@16	@17	@18									
1993					@98	@99	@00	@01	@02	@03	@04	@05	@06	@07	@08	@09	@10	@11	@12	@13	@14	@15	@16	@17	@18											
1994				@98	@99	@00	@01	@02	@03	@04	@05	@06	@07	@08	@09	@10	@11	@12	@13	@14	@15	@16	@17	@18												
1995			@98	@99	@00	@01	@02	@03	@04	@05	@06	@07	@08	@09	@10	@11	@12	@13	@14	@15	@16	@17	@18													
1996		@98	@99	@00	@01	@02	@03	@04	@05	@06	@07	@08	@09	@10	@11	@12	@13	@14	@15	@16	@17	@18														
1997	@98	@99	@00	@01	@02	@03	@04	@05	@06	@07	@08	@09	@10	@11	@12	@13	@14	@15	@16	@17	@18															
1998	@98	@99	@00	@01	@02	@03	@04	@05	@06	@07	@08	@09	@10	@11	@12	@13	@14	@15	@16	@17	@18															
1999	@99	@00	@01	@02	@03	@04	@05	@06	@07	@08	@09	@10	@11	@12	@13	@14	@15	@16	@17	@18																
2000	@00	@01	@02	@03	@04	@05	@06	@07	@08	@09	@10	@11	@12	@13	@14	@15	@16	@17	@18																	
2001	@01	@02	@03	@04	@05	@06	@07	@08	@09	@10	@11	@12	@13	@14	@15	@16	@17	@18																		
2002	@02	@03	@04	@05	@06	@07	@08	@09	@10	@11	@12	@13	@14	@15	@16	@17	@18																			
2003	@03	@04	@05	@06	@07	@08	@09	@10	@11	@12	@13	@14	@15	@16	@17	@18																				
2004	@04	@05	@06	@07	@08	@09	@10	@11	@12	@13	@14	@15	@16	@17	@18																					
2005	@05	@06	@07	@08	@09	@10	@11	@12	@13	@14	@15	@16	@17	@18																						
2006	@06	@07	@08	@09	@10	@11	@12	@13	@14	@15	@16	@17	@18																							
2007	@07	@08	@09	@10	@11	@12	@13	@14	@15	@16	@17	@18																								
2008	@08	@09	@10	@11	@12	@13	@14	@15	@16	@17	@18																									
2009	@09	@10	@11	@12	@13	@14	@15	@16	@17	@18																										
2010	@10	@11	@12	@13	@14	@15	@16	@17	@18																											
2011	@11	@12	@13	@14	@15	@16	@17	@18																												
2012	@12	@13	@14	@15	@16	@17	@18																													
2013	@13	@14	@15	@16	@17	@18																														
2014	@14	@15	@16	@17	@18																															
2015	@15	@16	@17	@18																																
2016	@16	@17	@18																																	
2017	@17	@18																																		
2018	@18																																			