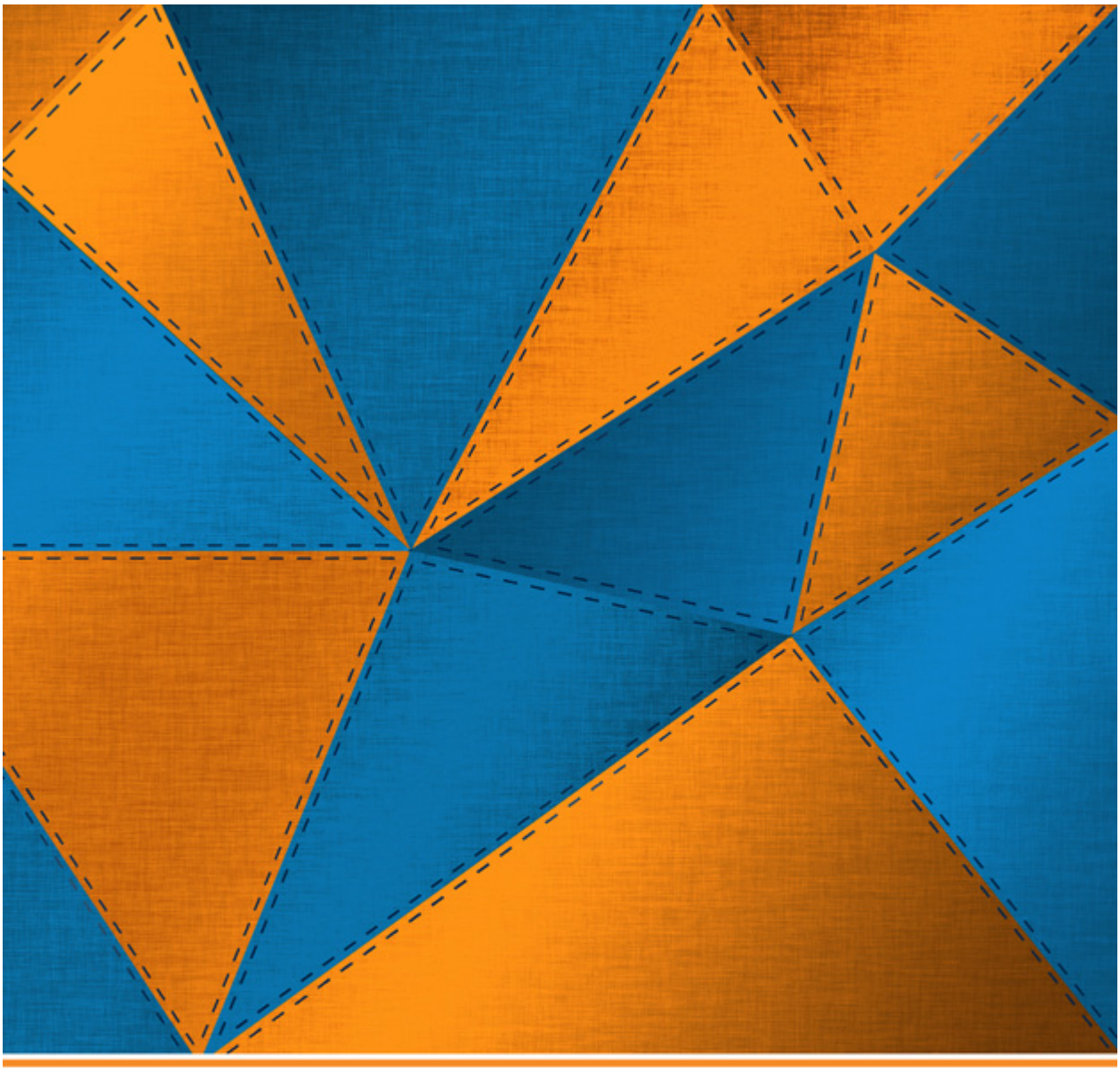

The Progressive Corporation

REPORT ON LOSS RESERVING PRACTICES—APPENDIX

August 2016

PROGRESSIVE

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Section VI – Loss Reserve Case Study

Based on our segment reviews, we may revise any or all of the following in order to achieve the desired changes to our reserves:

- **Case reserves** can be revised by changing:
  - **Average reserves**, which are applied to open features below the threshold and are determined as part of the review process for the applicable loss reserving segment.
  - The **inflation factor**, which is applied to average reserves in months following a review.
- **IBNR reserves** can be revised by changing:
  - **IBNR factors**, which are applied to trailing periods of earned premium.

In this section, we present an example of a loss reserve review for a sample segment. Most segments are defined by state, product, and coverage grouping with reasonably similar loss characteristics.

Note that the data in this example is not from any specific segment and any similarity to a specific segment is coincidental. Also, the investigations that are undertaken, the conclusions that are drawn, and the selections that are made in this case study are not necessarily the same as those that would be made in an actual review. The results of this case study are also not intended to represent the actual results of the Company. Our intent is to illustrate and discuss many of the issues that we consider during an analysis. The calculations involved in the process will also be explained.

This case study will illustrate how we estimate the adequacy of our loss reserves by reviewing loss data organized in three different ways:

Type of Loss Reserve	Claims Data Organized by
Total (Case + IBNR)	Accident Period
Case	Record Period
IBNR	Record within Accident Period

By definition, the following identities are always true as of the designated evaluation date:

Required Loss Reserves = Total Indicated Ultimate Losses – Total Paid Losses

Loss Reserve Adequacy = Held Loss Reserves – Required Loss Reserves

Carried reserves and paid losses are known statistics and reconcile with our financial records. However, we use judgment in the estimation of the ultimate losses. As stated above, we make these estimations by accident period, record period, and record within accident period. Our objective is to estimate how losses will develop over time using past development as a key indicator. In order to make reasonable selections, we look at several parameters and also consider the business issues that underlie the data.

We produce several exhibits to summarize our reviews which are used in our discussions with management. Throughout this appendix, we present and provide an overview of the key exhibits.

Exhibit A – Accident Period Analysis
Exhibit B – Accident Period Average Incurred Loss Development
Exhibit C – Record Period Analysis
Exhibit D – Summary of Estimated IBNR
Exhibit E (5 pages) – IBNR Analysis

As mentioned in the report, in our exhibits and explanations, we may use the terms “claim” and “feature” interchangeably. However, the Progressive definition of “feature” is the smallest divisible part of a claim, i.e., it is a loss on one coverage for one person or property, so one claim can have multiple features. Even though we may generically refer to “claims” in our discussion, our analysis is actually done at the “feature” level. In addition, the term “counts” generally means “number of features.”

Note that rounding in the exhibits as well as the order of calculation may make some of the figures in the case study appear slightly out of balance.

Exhibit A – Accident Period Analysis

This exhibit summarizes the accident period analysis for this segment. The claims are sorted and analyzed by accident date. We use 6-month accident periods (i.e., accident semesters) for this analysis. Each accident semester represents claims that occurred during the 6-month period ending at the end of the designated month (in the left-hand column of the exhibit).

Our accident period analysis measures the adequacy of total reserves. In other words, the estimated ultimate losses for each accident period include losses for claims that have already been reported to the Company plus losses for claims that have occurred during the accident period but have not yet been recorded.

The information on Exhibit A is summarized as follows:

- **COLUMNS (1) through (4):** Estimated ultimate losses, resulting required reserves, and reserve adequacy resulting from four different sets of projections, using three different types of fixed selections of loss development factors (LDFs) for the projections

- **COLUMNS (5) and (6):** Cumulative adjuster-incurred losses (i.e., paid losses plus adjuster reserves) and paid losses as of the evaluation date of 12/31/2015

- **COLUMN (7):** Indicated ultimate losses which have been selected by the Loss Reserving group considering all information obtained during the analysis, along with the resulting required reserves and reserve adequacy

- **COLUMNS (8) and (9):** Estimated ultimate paid and incurred severities, based upon the projections of average paid and average incurred losses

- **COLUMN (10):** Average adjuster case reserves, as of the first evaluation point (i.e. the evaluation date is the end-date of each respective accident semester, which is at 6 months development)

- **COLUMN (11):** The number of paid claims as of the first evaluation point (6 months), divided by the ultimate number of incurred claims

- **COLUMNS (12) and (13):** Closed Without Payment (CWP) Rate is the percentage of reported claims which are closed without any loss payment, as of the first evaluation point (6 months), and projected to ultimate

- **COLUMNS (14) and (15):** Estimated ultimate incurred counts resulting from two different sets of projections

- **COLUMN (16):** Indicated ultimate incurred counts which have been selected by the Loss Reserving group, considering all of the information obtained during the analysis

- **COLUMNS (17) and (18):** Indicated ultimate severities which result from the ultimate selections of losses and counts, along with the change from period to period, and the 4-point and 8-point fitted exponential trends

- **COLUMNS (19) and (20):** Indicated ultimate frequencies which result from the selected ultimate counts, along with the change from period to period, the 4-point and 8-point fitted exponential trends, and the year-over-year change

- **COLUMNS (21) and (22):** The pure premiums and loss ratios which result from the selected ultimate losses, along with the 4-point and 8-point fitted exponential pure premium trends

- **COLUMNS (23) through (27):** Earned premium and earned exposures, which are used in some of the other calculations, along with average earned premium, changes in average earned premium, and the 4-point and 8-point fitted exponential trends for average earned premium

The following chart displays columns (1) through (4) of Exhibit A, which will be explained in more detail below.

Accident Semesters Ending	(1) Paid Projection Ult ($000)	(2) = (8) x (16) Avg. Paid Projection Ult ($000)	(3) Incurred Projection Ult ($000)	(see Exhibit B) (4) = (9) x (16) **Avg. Incurred Projection Ult ($000)**
PRIOR 3 yrs	35,427	35,384	36,012	36,022
Jun-2012	10,330	10,940	11,193	11,165
Dec-2012	13,257	13,163	13,249	13,180
Jun-2013	13,534	13,781	11,943	12,004
Dec-2013	9,962	9,868	10,123	10,140
Jun-2014	9,485	9,492	10,066	9,943
Dec-2014	7,187	6,928	9,332	9,313
Jun-2015	9,689	8,667	9,505	9,498
Dec-2015	11,020	12,069	9,415	9,488
Total Ultimate Loss	120,492	120,293	120,839	120,751
Total Paid Loss	93,601	93,601	93,601	93,601
Required Reserves	**26,831**	**26,692**	**27,238**	**27,150**
Held Reserves	28,038	28,038	28,038	28,038
Reserve Adequacy	**1,148**	**1,347**	**801**	**888**
Avg Last 4	3,132	(2,025)	3,261	3,835
2nd to Last Diagonal	2,865	(3,318)	624	1,951
Last Diagonal	(7,001)	(6,264)	3,470	3,154

We use four sets of projections in most of our loss reserve segment analyses. There are other approaches built into our model that we use occasionally, when conditions warrant their use. However, we typically arrive at our indications using projections from paid losses, average paid losses, incurred losses, and average incurred losses. Exhibit B goes into more detail regarding our selection process using the average incurred loss projection (thus, there is a box around column (4)). However, this discussion will focus more on the merits of each type of projection, the rationale behind the projections and the relationships between various components.

Note that the paid, average paid, incurred and average incurred projections all use a similar actuarial technique to estimate ultimate losses. As illustrated in Exhibit B, we organize the data into a triangular format and project ultimate values by selecting LDFs for each evaluation interval based upon historical patterns and judgment. This is called the Chain-Ladder Method and is illustrated in Exhibit B.

Estimated ultimate losses are projected for the past seven accident years (by accident semester) for each of the four projections. These ultimate losses are shown on the exhibit for each of the

past eight accident semesters (four years), and then the prior three accident years combined. Required reserves and reserve adequacy are then calculated (and shown in bold print below the total ultimate losses) for each projection by using the identities stated at the beginning of this section:

Total Ultimate Losses	–	**Total Paid Losses**	=	**Required Reserves**
Held Reserves	–	**Required Reserves**	=	**Reserve Adequacy**

Below the reserve adequacy for each projection, we show the adequacy that would have resulted from the application of three different types of predefined factor selections for each projection. Exhibit B shows more details behind these calculations, and Exhibit A summarizes the results. The Average Last 4 is the adequacy that would result if we selected future LDFs equal to the average of the last four LDFs at each development point. The 2nd to Last Diagonal and Last Diagonal are the adequacies that would result if we selected future LDFs equal to those on each of the last two diagonals of the LDF triangle. The last diagonal represents the development (payments and/or adjuster case reserve changes) during the most recent six calendar months for each accident semester. The 2nd to last diagonal represents the development during the 6-month period that ended 6 months ago.

Paid and Incurred Method vs. Average Paid and Average Incurred Method for Loss Development: When we make our projections of ultimate losses, we need to consider trends in the frequency and severity of claims and consider the underlying influences on the historical changes in frequency and severity. The dollars of paid and incurred losses would be expected to change directionally as our premium dollars and exposures change. In the development of paid and incurred loss dollars, we observe these changes over time but do not necessarily know whether they are due to changes in frequency or severity of claims, changes in the volume of business, or a mixture of both. On the other hand, by looking at the development of average paid and average incurred losses, we are able to focus upon changes in severity over time. Therefore, we tend to rely more heavily on the development of average paid and average incurred losses, i.e. summarized in columns (2) and (4) of Exhibit A, than that of the total paid and incurred loss dollars (summarized in columns (1) and (3) of Exhibit A).

Each data point in the Average Paid Loss development triangle	=	**Paid Loss Dollars** / **Paid Counts**	*Paid Counts* = Claim features (open or closed) with loss payment
Each data point in the Average Incurred Loss development triangle	=	**Incurred Loss Dollars** / **Incurred Counts**	*Incurred Counts* = Claim features closed with loss payment + all open claim features

The ultimate losses for the Average Incurred Projection, i.e. column (4) of Exhibit A are calculated for each accident semester as:

Ultimate Losses for the **Average Incurred Projection** (4)	=	**Ultimate Average Incurred Severity** (9)	×	**Indicated Ultimate Loss Counts** (16)

The ultimate average incurred severities are derived from the projections of average incurred losses, as shown in Exhibit B. The indicated ultimate counts are selected from the two projections of counts, as described later in this section. Similar calculations are performed for the

average paid projection. The following excerpt from Exhibit A illustrates the result of these calculations:

Accident Semesters Ending	(8) Avg. Paid Severity	(16) Indicated Ultimate Counts	(2) = (8) x (16) Avg. Paid Projection Ult ($000)	(9) [Per Exh B] Avg. Incr Severity	(16) Indicated Ultimate Counts	(4) = (9) x (16) Avg. Incr Projection Ult ($000)
PRIOR 3 yrs	5,863	6,035	35,385	5,969	6,035	36,022
Jun-2012	5,794	1,888	10,940	5,914	1,888	11,165
Dec-2012	6,142	2,143	13,163	6,150	2,143	13,180
Jun-2013	7,358	1,873	13,781	6,409	1,873	12,004
Dec-2013	5,404	1,826	9,868	5,553	1,826	10,140
Jun-2014	6,278	1,512	9,492	6,576	1,512	9,943
Dec-2014	4,865	1,424	6,928	6,540	1,424	9,313
Jun-2015	6,782	1,278	8,667	7,432	1,278	9,498
Dec-2015	8,364	1,443	12,069	6,575	1,443	9,488

Paid and Average Paid Losses: The development of paid losses is influenced by the rate at which the claims are paid and settled as well as the severity of the claims. Injury claims (BI, PIP, and UMBI) tend to have more variability in development and a longer payment period than property claims (Comprehensive, Collision, and Property Damage).

Some or all of the same items as mentioned for claim reporting and recording can also influence the rate at which claims are paid and settled. In addition, the rate of payment of claims tends to be related to the severity of claims. Smaller claims tend to settle more quickly than larger claims. As a result of this relationship, we consider the closure rate when making our judgments regarding paid and average paid loss development.

As stated above:

$$\textbf{Closure Rate} = \frac{\textbf{Number of Features Closed with Loss Payment}}{\textbf{Selected Ultimate Loss Counts}}$$

We look at this ratio to see if there is a change in the rate of claim closure, which may impact the paid loss development (historically and in the future). Column (11) of Exhibit A shows the closure rate at the first evaluation point for each accident period. We also look at further development points for the same reason, but it is the first development point (i.e., six months) that tends to be the most informative, since the closure rate tends to vary more when claims are less mature. Greater variability in the closure rate causes greater distortions in the development of paid and average paid losses.

The following section from Exhibit A (as well as the underlying data) illustrates this point:

Accident Semesters Ending	(Data) Features Closed w/ Pay @ 6 Months	(16) Indicated Ultimate Counts	(11) =(Data) / (16) Closure Rate @ 6 Months
Jun-2012	636	1,888	33.7%
Dec-2012	613	2,143	28.6%
Jun-2013	568	1,873	30.3%
Dec-2013	589	1,826	32.3%
Jun-2014	466	1,512	30.8%
Dec-2014	322	1,424	22.6%
Jun-2015	273	1,278	21.4%
Dec-2015	290	1,443	20.1%

For this segment, the closure rate has been decreasing for the past four accident semesters. This will tend to distort the predictive value of our historical paid and average paid loss development. The current paid losses will therefore not be expected to develop similarly to the historical paid losses. If a standard paid development projection is applied blindly, the resulting indication will likely not be reasonable.

Assuming that the lower severity claims are settled first, the trend seen in the closure rate would imply that the claims that have been paid in the most recent accident periods have a lower average severity (at the 6-month evaluation point) than those in the past. See the example on page 9 for an illustration. In addition, the future development of these losses may be understated if historical development patterns are applied. Therefore, the ultimate losses may be understated, the required reserves may be understated, and the reserve adequacy may be overstated.

The closure rate pattern is discussed with our Claims area to determine what may be causing it to change (e.g., process changes, staffing changes, or change in the volume of claims). We consider whether the trend is expected to continue or reverse, or whether we are now at a level that is expected to remain consistent. We consider this information in our selections for future development of paid and average paid losses.

With this specific segment, some of the hypotheses stated above are not necessarily true. In fact, application of the paid and average paid LDFs from the most recent 6-month period – i.e., the result of the Last Diagonal, as shown at the bottom of columns (1) and (2) of Exhibit A – would result in lower reserve adequacy.

Upon further review, we conclude that the vast majority of the reserve inadequacy that results from the Last Diagonal of the paid projections is due to the most recent accident semester. For this period, even though the closure rate is lower than history, the average paid loss is higher than history. This is a time when it is especially helpful to discuss these issues with management, to get additional information that may help in the analysis. It is possible that there are process changes or specific claims that may help to explain this development and help us to make better projections. This type of volatility in paid development also indicates that it may be preferable to give more credibility to the incurred projections in making our final selections of indicated ultimate losses.

Incurred and Average Incurred Losses: To find the incurred losses, we add current reserves to the amount of paid losses. Recall from Section III – Types of Reserves that the financial case reserve amount carried on the Company's records takes the average reserve if it is below the predetermined threshold for the applicable segment, or uses the adjuster reserve if it is greater

than or equal to the threshold. However, when we analyze incurred loss data in our reviews, we use the adjuster reserve for all claims, not just those above the threshold.

When a claim is recorded, it immediately receives an average reserve. Once the adjuster has enough information about the claim to make a reasonable estimate of its ultimate cost, the adjuster may enter an estimate into the claims system. The adjuster may revise this estimate as additional information becomes available. Using adjuster reserves in our incurred data is appropriate in our reviews because it allows us to consider the most current information available on claims as we track their development.

The recording of claims can be influenced by the time it takes for the claimant to report the claim and the time it takes for the Company to record the claim. The time it takes for the claimant to report the claim can be influenced by external forces, such as laws and regulations in the state, the legal environment, and the economy. The time it takes for the Company to record the claim can be influenced by changes in claim processing.

Incurred (and average incurred) losses can be more reliable than paid (and average paid) losses for projecting ultimate losses. Since incurred losses include the case reserve, and the case reserve is established as soon as the claim opens, incurred losses more accurately reflect ultimate losses in the early life of a claim. Also, case reserves are adjusted when additional information is known, making incurred losses more reliable over time.

We especially prefer incurred loss projections when we have volatile closure rates affecting our paid projections as in this example. Any data distortions in the paid data are mitigated as a result of including case reserves as a component of incurred data, making incurred loss development more stable than paid loss development in many cases.

However, adding case reserves adds a new type of uncertainty. Injury claims (BI, PIP, and UMBI) develop longer and vary more than property claims (Comprehensive, Collision and Property Damage). Since injury claims can involve lawsuits, adjusters have more difficulty making accurate estimates. Furthermore, changes in the adjusting process and personnel can affect the development of incurred losses. In our reviews, we watch for changes in the adjusting process that may affect how losses develop.

Earlier, we mentioned that the closure rate influences the average paid severity. Also, note that the closure rate influences the average adjuster case reserve amount**.** The trend in both the average adjuster case reserve amount and the average paid severity are expected to be in the same direction as the trend in the closure rate. The following example illustrates these points:

Assume: (1) All open claims are reserved at their ultimate payment amount
(2) The lower severity claims close before the higher severity claims
(3) The distribution of claims is as follows:

				Total
# of Claims:	25	25	50	100
Severity:	5,000	10,000	16,000	11,750
Incurred Loss:	125,000	250,000	800,000	1,175,000

Scenario I: Closure Rate = 50%

	Closed	**Open**	**Total**
# of Claims:	50	50	100
Severity:	7,500	16,000	11,750
Incurred Loss:	375,000	800,000	1,175,000

Scenario II: Closure Rate = 25%

	Closed	**Open**	**Total**
# of Claims:	25	75	100
Severity:	5,000	14,000	11,750
Incurred Loss:	125,000	1,050,000	1,175,000

As a result of the decrease in closure rate from Scenario I to Scenario 2, the paid severity of the closed claims and the incurred severity of the open claims, which would be reflected in the average adjuster case reserve amounts, have both decreased as well.

We consider how much of the average adjuster case reserve amounts (and changes in those amounts) is due to adjuster estimates versus the averages from the tables. At the 6-month development point, 88.5% of our open BI liability claims countrywide have adjuster estimates (as of year-end 2015.) For a given state, the percentage may change over time (at the same development point). In addition, as claims age, the adjusters will enter estimated reserves on a greater proportion of the open claims. In total, over 94% of our open BI liability claims have adjuster estimates.

We look at this group of parameters to see if there is a change in adjuster activity that may be affecting incurred loss development or incurred severity. The following excerpt from Exhibit A illustrates this point for this segment. Column (10) of Exhibit A shows the average adjuster case reserve at the first evaluation point (i.e., six months) for each accident period. While we also look at later evaluation points, the first evaluation point tends to be the most informative.

	(10)	(11)
Accident Semesters Ending	Avg. Adjuster Case Reserves @ 6 Months	Closure Rate @ 6 Months
Jun-2012	4,207	33.7%
Dec-2012	4,321	28.6%
Jun-2013	5,341	30.3%
Dec-2013	5,291	32.3%
Jun-2014	5,462	30.8%
Dec-2014	5,213	22.6%
Jun-2015	4,606	21.4%
Dec-2015	4,153	20.1%

This data for the most recent periods supports the hypothesis that a decreasing closure rate will lead to decreasing average adjuster case reserves. However, there could also be other reasons for the decrease in these average adjuster case reserve amounts. Several possibilities are as follows:

- There may have been a lower percentage of large claims.
- There may have been a significant change in the mix of business by limit.
- There may have been process changes, causing:
    - Adjusters to leave claims at the financial reserve for a longer period of time before assigning their own estimates.
    - Adjusters to estimate the value of the claims differently.
    - Higher severity claims to settle more quickly.
- There may have been external (legal, regulatory, or environmental) forces causing severity of open claims (or all claims) to decrease.

We discuss the adjuster reserving patterns with claims management to determine what may be causing this trend, whether it is expected to continue or reverse, or whether we are now at an expected level. We consider this information in our selections for future development of incurred (and average incurred) losses. For example, if adjuster estimates are lower than history for similar claims, we select higher LDFs to project ultimate losses.

The selected reserve adequacies shown in columns (3) and (4) of Exhibit A are lower than those that would result from applying the LDFs from the recent diagonals (i.e., the “default” adequacies). This results from our selected factors for the incurred projections being somewhat higher, on average, than those from the recent diagonals because we determined that the development in the recent past (the last few diagonals of the incurred triangles) was more favorable than we expect for the future.

Indicated Ultimate Losses: After consideration of the paid and incurred projections (in columns (1) through (4)) and all of the issues involved in those selections, we make our indicated ultimate loss selections for each accident semester. For this segment, we determined that the incurred projections are more reliable than the paid projections. Therefore, our selected ultimate losses consider the ultimate loss amounts from the two incurred projections.

Sometimes, we may use additional analysis to select ultimate loss amounts for some of the periods, usually the most recent periods, that are not based directly upon the four standard projections. It may be that the projected loss amount from the standard methods does not lead to a reasonable ultimate severity, pure premium and/or loss ratio. We would normally expect severity and pure premium to have trends that reasonably reflect internal and external trends in loss costs and inflation. These trends, as well as the frequency trends, are discussed with Product Management and Pricing to verify the reasonableness of our assumptions. We do not necessarily expect to match their selected trends, but management should understand the reasons for the differences. We also expect the loss ratio and pure premium to be relatively stable, other than changes due to business operations, rate levels or business mix.

Consider the following chart, which contains information from Exhibit A:

Accident Semesters Ending	(7) Indicated Ultimate Loss ($000)	(16) Indicated Ultimate Counts	(17) = (7) / (16) Ultimate Severity	(18) Semiannual Change In Severity	(21) Pure Premium	(22) Loss Ratio
PRIOR 3 yrs	36,017	6,035	5,968		192	62.7%
Jun-2012	11,179	1,888	5,921		178	64.5%
Dec-2012	13,215	2,143	6,166	4.1%	211	70.5%
Jun-2013	11,974	1,873	6,393	3.7%	213	67.8%
Dec-2013	10,132	1,826	5,549	-13.2%	192	64.7%
Jun-2014	10,004	1,512	6,617	19.3%	197	67.8%
Dec-2014	9,322	1,424	6,547	-1.1%	179	66.6%
Jun-2015	9,501	1,278	7,435	13.6%	212	66.8%
Dec-2015	9,451	1,443	6,550	-11.9%	198	62.3%
Total	120,795	19,422	2.0%	4-pt Exp Tr	4.0%	
			4.6%	8-pt Exp Tr	0.7%	
Total Paid Loss	93,601					
Required Reserves	27,194					
Held Reserves	28,038					
Reserve Adequacy	844	3.0%	⇐ Percent of required reserves			

Severity	=	**Ultimate Losses / Ultimate Counts**	**Pure Premium**	=	**Ultimate Losses / Earned Exposures**	**Loss Ratio**	=	**Ultimate Losses / Earned Premium**

If we do not believe that the severity is reasonable, we may select a different ultimate loss amount or ultimate count to make the resulting severity more reasonable. A revised selection would also be tested against the other parameters for reasonableness. For this segment, the ultimate severity (column (17)) for the last accident semester is 11.9% lower than the previous accident semester, but it is about the same as it was two semesters ago ($6,550 vs. $6,547), and the fitted annual trend of approximately 2.0% appears reasonable. Large losses or fluctuations in ultimate loss experience may be causing volatility in severity over the recent periods. The pure premiums (column (21)) and loss ratios (column (22)) that result from the selected losses also appear to be within a reasonable range. Thus, we conclude that the ultimate loss selections are reasonable.

The required reserves and reserve adequacy in column (7) are then calculated by using the identities as follows:

Required Reserves	=	**Total Ultimate Losses**	–	**Total Paid Losses**	=	**$27,194,000**
Reserve Adequacy	=	**Held Reserves**	–	**Required Reserves**	=	**$844,000**

Therefore, based upon this accident period analysis, our total held reserves are adequate by $844,000.

Claim Counts and Frequency: The following chart contains columns (12) through (15) of Exhibit A:

Accident Semesters Ending PRIOR 3 yrs	(12) CWP Rate @ 6 Months	(13) Ultimate CWP Rate	(14) Incurred Counts Projection	(15) Recorded Counts Projection
			6,032	6,035
Jun-2012	26.3%	37.9%	1,888	1,887
Dec-2012	29.4%	40.4%	2,145	2,141
Jun-2013	27.6%	41.3%	1,875	1,871
Dec-2013	26.3%	39.8%	1,827	1,825
Jun-2014	30.7%	41.8%	1,514	1,510
Dec-2014	29.2%	42.5%	1,422	1,426
Jun-2015	32.4%	47.2%	1,279	1,277
Dec-2015	28.7%	43.1%	1,439	1,447
			19,421	19,419

Column (13) shows our projections of the ultimate CWP rates. Changes in CWP rates are usually due to process changes. In this example, the previous process may have been to open claims as soon as they were reported, without sufficiently verifying whether coverage existed. Under another process, claims may not open until there is additional information regarding the validity of the claim, causing the CWP rate to decrease. Note that this change in process should not affect the closure rate, since the calculation of closure rate excludes claims closed without payment.

Claim counts shown in columns (14) and (15) represent our projections of estimated ultimate counts of claims with loss payment for each accident semester. These estimates are made using different sets of data for each projection, sorted and analyzed by accident semester.

- The **Incurred Count Projection** (column (14)) uses feature counts for claims that have closed with loss payment, plus claims that are currently open (whether or not there have been payments on them).

- The **Recorded Count Projection** (column (15)) uses feature counts for all claims that have been recorded. The projected ultimate recorded counts are multiplied by [100% minus the ultimate CWP rates in column (13)] for the same respective accident periods to derive the ultimate counts in column (15). We do this to get the ultimate counts for claims with loss payment.

The following chart shows the selected ultimate incurred counts, which considers the incurred and recorded projections, underlying information, and the various projection methods discussed above. Also shown are the resulting frequencies, the change in frequency from period to period, and the 4 point and 8 point annual fitted exponential trends. These fitted trends represent the average annual change in frequency, considering the historical selections over the past two years (4 points) and four years (8 points).

Accident Semesters Ending	(16) **Indicated Ultimate Counts**	(24) Earned Exposures	(19) = (16) / (24) **Ultimate Frequency**	(20) Semi-Annual Change In Frequency
PRIOR 3 yrs	**6,035**	187,526	**3.22%**	
Jun-2012	**1,888**	62,827	**3.01%**	
Dec-2012	**2,143**	62,734	**3.42%**	13.7%
Jun-2013	**1,873**	56,287	**3.33%**	-2.6%
Dec-2013	**1,826**	52,642	**3.47%**	4.2%
Jun-2014	**1,512**	50,881	**2.97%**	-14.3%
Dec-2014	**1,424**	52,158	**2.73%**	-8.1%
Jun-2015	**1,278**	44,804	**2.85%**	4.5%
Dec-2015	**1,443**	47,667	**3.03%**	6.1%
Total	**19,422**	617,528	**2.0%**	4-pt Exp Tr
			-3.7%	8-pt Exp Tr

Generally, we would expect frequency to have trends that reasonably reflect the Company's mix of business and/or the industry results. We discuss this with Product Management and Claims in order to check the reasonableness of our assumptions. If we do not believe that the frequency is reasonable, we may select a different ultimate count to make the resulting frequency more reasonable. However, changes in the counts may also change the resulting severities.

Once we determine that the selected indicated loss amounts, frequencies, severities, pure premiums, and loss ratios are what we consider to be reasonable, we are finished with this phase of the analysis. However, we may revisit some of these selections after we have done the record period and IBNR analyses if they result in significantly different conclusions.

As calculated above in column (7) of Exhibit A, our total held reserves are adequate by $844,000 based upon this accident period analysis. We may reduce the reserves by that amount, or we may change the reserves by an amount other than that. We base this judgment upon several factors such as the consistency or credibility of the indications in the review. When the credibility of the review is higher and the review is consistent, the overall reserve change will be closer to the indicated amount. The credibility is higher if our projections are relatively consistent with each other and the indications are consistent with prior reviews. On the other hand, if our projections are not reasonably consistent, or if there are recent changes in our indications of adequacy or trend, we attach less credibility to the current review.

The record period and IBNR analyses (shown in Exhibits C, D, and E, and discussed later in this section) will determine how the adequacy is distributed by type of reserve, and how we should implement the changes by category.

Exhibit A

State XYZ Auto BI as of December 31, 2015

ACCIDENT PERIOD ANALYSIS

Accident Semesters Ending	(1) Paid Projection Ult ($000)	(2) Avg. Paid Projection Ult ($000)	(3) Incurred Projection Ult ($000)	(4) Avg. Incurred Projection Ult ($000)	(5) Adj. Inc. @ 12/31/2015 ($000)	(6) Pd. Loss @ 12/31/2015 ($000)	(7) **Indicated Ult Loss ($000)**
PRIOR 3 yrs	35,427	35,384	36,012	36,022	35,372	34,936	**36,017**
Jun-2012	10,930	10,940	11,193	11,165	11,111	10,434	**11,179**
Dec-2012	13,257	13,163	13,249	13,180	13,087	12,197	**13,215**
Jun-2013	13,534	13,781	11,943	12,004	13,738	11,955	**11,974**
Dec-2013	9,962	9,868	10,123	10,140	10,117	8,248	**10,132**
Jun-2014	9,485	9,492	10,066	9,943	9,888	7,014	**10,004**
Dec-2014	7,187	6,928	9,332	9,313	7,891	4,238	**9,322**
Jun-2015	9,689	8,667	9,505	9,498	8,529	3,221	**9,501**
Dec-2015	11,020	12,069	9,415	9,488	8,107	1,357	**9,451**
Total	120,492	120,293	120,839	120,751	117,839	93,601	**120,795**
Paid Loss	93,601	93,601	93,601	93,601			**93,601**
Required Reserves	**26,891**	**26,692**	**27,238**	**27,150**			**27,194**
Held Reserves	**28,038**	**28,038**	**28,038**	**28,038**			**28,038**
Reserve Adequacy	**1,148**	**1,347**	**801**	**888**			**844**
Average Last 4	**3,132**	**(2,025)**	**3,261**	**3,835**			
2nd to Last Diagonal	**2,865**	**(3,318)**	**624**	**1,951**			
Last Diagonal	**(7,001)**	**(6,264)**	**3,470**	**3,154**			

	% of Reserves	
Required Reserves		**27,194**
Held Reserves		**28,038**
Reserve Adequacy	**3.0%**	**844**

Accident Semesters Ending	(8) Ultimate Paid Severity	(9) Ultimate Incurred Severity	(10) Avg. Adjuster Case Reserves @ 6 Months	(11) Closure Rate @ 6 Months	(12) CWP Rate @ 6 Months	(13) Ultimate CWP Rate	(14) Incurred Counts Projection	(15) Recorded Counts Projection	(16) **Indicated Ultimate Counts**
PRIOR 3 yrs	5,863	5,969					6,032	6,035	**6,035**
Jun-2012	5,794	5,914	4,207	33.7%	26.3%	37.9%	1,888	1,887	**1,888**
Dec-2012	6,142	6,150	4,321	28.6%	29.4%	40.4%	2,145	2,141	**2,143**
Jun-2013	7,358	6,409	5,341	30.3%	27.6%	41.3%	1,875	1,871	**1,873**
Dec-2013	5,404	5,553	5,291	32.3%	26.3%	39.8%	1,827	1,825	**1,826**
Jun-2014	6,278	6,576	5,462	30.8%	30.7%	41.8%	1,514	1,510	**1,512**
Dec-2014	4,865	6,540	5,213	22.6%	29.2%	42.5%	1,422	1,426	**1,424**
Jun-2015	6,782	7,432	4,606	21.4%	32.4%	47.2%	1,279	1,277	**1,278**
Dec-2015	8,364	6,575	4,153	20.1%	28.7%	43.1%	1,439	1,447	**1,443**
							19,421	19,419	**19,422**

Accident Semesters Ending	(17) Ultimate Severity	(18) Change In Severity	(19) Ultimate Frequency	(20) Change In Frequency	(21) Pure Premium	(22) Loss Ratio	(23) Premium ($000)	(24) Earned Exposures	(25) Change in Earned Exp.	(26) Avg EP	(27) Change In Avg EP
PRIOR 3 yrs	5,968		3.22%		192	62.7%	57,454	187,526		306	
Jun-2012	5,921		3.01%		178	64.5%	17,325	62,827		276	
Dec-2012	6,166	4.1%	3.42%	13.7%	211	70.5%	18,744	62,734	-0.1%	299	8.4%
Jun-2013	6,393	3.7%	3.33%	-2.6%	213	67.8%	17,670	56,287	-10.3%	314	5.1%
Dec-2013	5,549	-13.2%	3.47%	4.2%	192	64.7%	15,652	52,642	-6.5%	297	-5.3%
Jun-2014	6,617	19.3%	2.97%	-14.3%	197	67.8%	14,749	50,881	-3.3%	290	-2.5%
Dec-2014	6,547	-1.1%	2.73%	-8.1%	179	66.6%	14,007	52,158	2.5%	269	-7.4%
Jun-2015	7,435	13.6%	2.85%	4.5%	212	66.8%	14,233	44,804	-14.1%	318	18.3%
Dec-2015	6,550	-11.9%	3.03%	6.1%	198	62.3%	15,162	47,667	6.4%	318	0.1%
					196	65.8%	184,996	617,528			
		Chg Dec-15		Chg Dec-15							
4 Point Ann Exp Trend	2.0%	vs. Dec-14	2.0%	vs. Dec-14	4.0%					9.3%	
8 Point Ann Exp Trend	4.6%	0.0%	-3.7%	10.9%	0.7%					2.0%	

Exhibit B – Accident Period Average Incurred Loss Development

The average incurred loss method is one of the standard projections that we use to estimate ultimate losses.

The top portion of Exhibit B (unshaded area) contains actual data in a triangular format. The section of Exhibit B shown below includes the actual data from the last 8 accident semesters, evaluated at 6-month intervals (semi-annual). The figures in the **Blue Shaded** cells are projected data points, which will be discussed later. The last column shows ultimate severities that result from the analysis that follows. Note that these ultimate severities are also carried over to column (9) of Exhibit A, as discussed previously.

AVERAGE INCURRED LOSSES - ACCIDENT PERIOD ANALYSIS

Semiannual Accident Periods Ending	1	2	3	4	5	6	7	8	**Ultimate Severity**
Jun-2012	4,315	5,241	5,457	5,704	5,786	5,787	5,822	5,865	**5,914**
Dec-2012	4,830	5,839	5,985	5,975	6,088	6,058	6,068	6,100	**6,150**
Jun-2013	6,277	6,306	6,180	6,140	6,283	6,269	6,324	6,357	**6,409**
Dec-2013	5,440	5,411	5,274	5,440	5,456	5,432	5,479	5,508	**5,553**
Jun-2014	6,155	6,126	6,269	6,366	6,461	6,432	6,488	6,522	**6,576**
Dec-2014	5,657	5,850	6,189	6,331	6,426	6,397	6,453	6,486	**6,540**
Jun-2015	5,513	6,756	7,033	7,195	7,302	7,269	7,332	7,371	**7,432**
Dec-2015	5,289	5,977	6,222	6,365	6,460	6,431	6,487	6,521	**6,575**

Each data point in the **Average Incurred Loss** development triangle	=	**Incurred Loss Dollars** / **Incurred Counts**	*Incurred Counts* = the number of claim features closed with loss payment + the number open claim features

Also recall that incurred losses that we use in our analysis are made up of paid losses plus case reserves. The case reserves are the adjuster estimates when they exist, or the averages from the case tables (per the actuarial reviews) when the adjusters have not made estimates.

The ending month of each accident semester is in the left-hand column. The evaluation points (across the top) represent 6-month periods. The first evaluation point is the same date as the end of each respective accident period. Each successive evaluation point represents 6 additional months of development. The last (i.e., most recent or current) evaluation of the average incurred loss by accident semester has the end of December 2015 as its evaluation point and is indicated in **red** on the chart above. The collection of all such points is referred to as the **Last Diagonal** since it forms the boundary separating the actual loss experience from the ultimate projections.

For example, for the accident semester ending December 2014, the loss amount and count data that underlie the average incurred losses (in **blue**, with the current evaluation being on the same line in **red**) in the above chart are as follows:

Accident Semester Ending Dec-2014		@ Dec-2014	@ Jun-2015	@ Dec-2015
(a)	Paid Losses ($000)	646	2,414	4,238
(b)	Adjuster Case Reserves ($000)	6,719	5,295	3,653
(c) = (a) + (b)	Incurred Losses ($000)	7,365	7,709	7,891
(d)	Features closed with payment	322	677	969
(e)	Open features	980	641	307
(f) = (d) + (e)	Incurred Counts	1,302	1,318	1,275
(g) = (c) / (f)	Average Incurred Loss ($)	**5,657**	**5,850**	**6,189**

The middle portion of Exhibit B contains the age-to-age LDFs, or link ratios, in a triangular format. Each link ratio represents the development from one evaluation point to the next. For example, the link ratios for the accident semester ending December 2014 are calculated as follows and summarized on the next page.

The link ratio development of average incurred losses (from the triangle at the top portion of Exhibit B) from evaluation point 1 to evaluation point 2 (i.e., from December 2014 to June 2015) is calculated by **$5,850** / **$5,657** = **1.034**. Thus, during the 6-month period from December 2014 to June 2015, the average incurred losses for that accident period increased by 3.4%. Similarly, from June 2015 to December 2015 (evaluation point 2 to evaluation point 3), the link ratio was **$6,189** / **$5,850** = **1.058**. In other words, State XYZ experienced a 5.8% increase in the average incurred loss during that interval.

These calculations are done for successive pairs of data points on the triangle. (Notice that the **Last Diagonal** in the chart below is again colored **red**. Also, the **2nd to Last Diagonal** is colored **Blue**).

The purpose of this is to see how the claims have developed historically. This historical information is then used, along with other information and judgment, to estimate how the claims will develop in the future. If the data were well-behaved, you would expect the link ratios to be consistent down each column. This would indicate that claim reporting, reserving and settlement patterns have been consistent throughout history.

You can see in the following table that the link ratios are not consistent for State XYZ. We need to consider other parts of our analysis, as well as other information that management can provide to try and understand the reasons for this inconsistent pattern. We use that information to select the factors for estimated future development.

In order to assist in this process, we take the average of the link ratios down each column. We also look at selections we made at the same intervals from previous reviews. This information is near the bottom of Exhibit B. Significant portions of this are also included in the chart below, along with the selected factors and the resulting ultimate severities.

Semiannual Accident Periods Ending	Average Incurred Losses Age-to-Age Link Ratios						
	1-2	**2-3**	3-4	4-5	5-6	6-7	7-8
Jun-2012	1.215	1.041	1.045	1.014	1.000	1.006	1.007
Dec-2012	1.209	1.025	0.998	1.019	0.995	1.002	
Jun-2013	1.005	0.980	0.993	1.023	0.998		
Dec-2013	0.995	0.975	1.031	1.003			
Jun-2014	0.995	1.023	1.016				
Dec-2014	**1.034**	**1.058**					
Jun-2015	1.225						

	Default and Selected Link Ratios						
	1-2	2-3	3-4	4-5	5-6	6-7	7-8
Avg. Last 4	**1.062**	**1.009**	**1.010**	**1.015**	**0.996**	**1.009**	**1.005**
Avg Last 4 x HiLo	1.015	1.002	1.007	1.017	0.996	1.006	1.004
Prior Select @ 6 Months	1.014	1.001	1.022	1.016	1.002	1.008	1.003
Prior Select @ 3 Months	1.130	1.030	1.007	1.021	1.007	1.011	1.009
Selected Factor (a_i) for $1 \le i \le 14$	**1.130**	**1.041**	**1.023**	**1.015**	**0.996**	**1.009**	**1.005**
Cumulative Factor (b_n), where $b_n = \Pi_{i=1}^{n}(a_i)$ for $1 \le n \le 14$	**1.243**	**1.100**	**1.057**	**1.033**	**1.018**	**1.022**	**1.014**

Accident Semester Ending	**Dec-15**	**Jun-15**	**Dec-14**	**Jun-14**	**Dec-13**	**Jun-13**	**Dec-12**
Last Diagonal (c_n)	5,289	6,756	**6,189**	6,366	5,456	6,269	6,068
Ultimate Severity, (d_n) = (b_n) x (c_n)	**6,575**	**7,432**	**6,540**	**6,576**	**5,553**	**6,409**	**6,150**

Avg. Last 4 means the arithmetic mean of the last four link ratios from that respective development interval (i.e., from the column directly above). This tells us how the average incurred losses have developed over that interval during the past four semesters.
For example, for the first development interval, we have:

$$\textbf{Avg. Last 4} = \frac{(0.995 + 0.995 + 1.034 + 1.225)}{4} = \textbf{1.062}.$$

Since we review many segments every three months, the Prior Selections are shown for the most recent review (@ 3 months), and the review prior to that (@ 6 months). This gives us some perspective on how the actual development compares to our prior estimate of future development, and how our opinions have changed with updated information.

The **Selected Factors** are colored **green** in the chart above. The most significant amount of judgment goes into the selection of the initial link ratio for the first development interval, since these claims are the least mature. Therefore, our ultimate projection is based on less information than older accident periods, which have had more time to develop. The selected factor of **1.130** is higher than the average of the last four factors, as well as the 6-month prior selection for that interval. The actual from the most recent 6 months (i.e., the **Last Diagonal**) was **1.225**. This is the highest that it has been in recent history and the selection shows that we expect this higher development in the future.

Similarly, in the second and third age intervals, we have selected factors that are higher than the average of the last four factors. This is because of inconsistency in the last four link ratios for each column. The link ratios in the **Last Diagonal** and **2nd to Last Diagonal** are much higher than those in the 3rd and 4th to last diagonal. Looking down each column, historical link ratios for

each development interval indicate that the link ratios from the 3rd and 4th to last diagonals are unusually low. Thus, the average of the last four factors for 2-3 and 3-4 age intervals are understated. The selected factors of **1.041** for the second interval and **1.023** for the third age interval are obtained by taking the arithmetic mean of the last two factors only.

Recall the discussion of the average adjuster case reserves from Exhibit A. They decreased (at the 6-month evaluation point) for each of the past three semesters. Not surprisingly, the average incurred losses have also decreased for each of the past three semesters (at the 6-month evaluation point, i.e., the first column). Therefore, we expect the future development on the incurred losses to be similar to our experience in the last two diagonals.

The **blue shaded** portion in the chart at the beginning of this section (and at the top of Exhibit B) shows how we expect the average incurred losses to develop over time based upon our selected factors. For example, for the accident semester ending December 2015, the current evaluation of the average incurred losses (**Last Diagonal**) is **$5,289** per claim. When this is multiplied by the selected 1-2 factor of **1.130**, the resulting average in the first **blue shaded** cell of that accident period is **$5,977**. That is what we project the average incurred losses to be for accident semester December 2015 when they are evaluated 6 months later (at June 2016). Similar calculations are done for each development period and each accident period. This technique is sometimes referred to as "completing the rectangle."

When the selected age-to-age factors are multiplied by each other from the current development point (**Last Diagonal**) to the ultimate development (when all claims are expected to be closed), the resulting factor is called the **Cumulative LDF**. The ultimate severity for each accident period is then the amount at the **Last Diagonal**, multiplied by the cumulative factor. For example, for the Accident Semester ending December 2015:

Ultimate Severity = $5,289 × 1.243 = $6,575

As explained previously (in the discussion of Exhibit A), ultimate severities are multiplied by the indicated ultimate counts, to derive the ultimate losses from this projection. Both the ultimate severities and the ultimate losses are carried onto Exhibit A, to be considered in the final selections.

There is another reasonableness test done on Exhibit B. We compare the adequacies that would be derived from several different selections of future LDFs. These estimates represent various point estimates for the indication. This chart is from the box in the middle of Exhibit B, about two-thirds of the way across the page, and it is also carried onto Exhibit A for reference.

Reserve Adequacy based on defaulted and actual selections of LDFs using Average Incurred Development	
Loss Development Factors	Adequacy ($000)
Average Last 4	3,835
2nd to Last Diagonal	1,951
Last Diagonal	3,154
Selected Avg Inc Indication	888
Selected Ultimate Indication	844

As discussed previously, we calculate required reserves and reserve adequacy as follows:

Required Reserves	**=**	**Total Ultimate Losses**	**–**	**Total Paid Losses**

Reserve Adequacy	=	Held Reserves	–	Required Reserves

According to the final selections of indicated ultimate losses, the loss reserve adequacy is **$844,000**. This calculation is summarized on Exhibit A. The chart shows that, according to our selections from the average incurred development projection, the adequacy would be **$888,000**. We relied upon this projection, as well as the incurred loss projection for our final selections.

Had we used default selections for the LDFs from the average incurred development, our adequacy would have been higher. These default adequacies, as shown in the chart, are the result of the **Average of the Last 4** factors, as well as the factors from the **2nd to Last Diagonal** and the **Last Diagonal**. For example, the factors on the **Last Diagonal** are shown in **red** above (in the triangle of Age-to-Age Link Ratios). If the current losses would develop at the rate indicated by this set of factors, adequacy would be **$3,154,000**. Similarly, if the current losses would develop according to the factors along the **2nd to Last Diagonal**, as shown in **blue** above, adequacy would be **$1,951,000**.

On average, our selected factors are higher than the default factors, because we expect the average incurred losses to develop at a higher rate in the future than they have in the recent past. Higher selected LDFs lead to higher ultimate losses, which lead to higher required reserves, thus a lower reserve adequacy. Therefore, even though our selected adequacy is outside of the range of the default selections, we conclude that it is reasonable, based upon other information we have gained through the analysis.

Exhibit B

State XYZ Auto BI as of December 31, 2015

AVERAGE INCURRED LOSSES - ACCIDENT PERIOD ANALYSIS

Semiannual Accident Periods Ending	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Ultimate Severity	Ultimate Loss ($000)
Jun-2009	5,790	5,876	5,928	5,553	5,688	5,796	5,792	5,988	6,019	5,999	5,969	5,960	5,962	5,950	**5,950**	**6,057**
Dec-2009	5,365	5,961	5,385	5,730	5,636	5,514	5,782	5,928	5,884	5,970	5,939	5,981	5,981	5,969	**5,969**	**6,035**
Jun-2010	6,087	6,084	5,795	6,852	6,652	6,833	6,832	6,825	6,882	6,907	6,900	6,912	6,913	6,899	**6,899**	**6,954**
Dec-2010	5,031	5,470	5,558	5,623	5,774	5,974	6,084	6,102	6,139	6,230	6,160	6,172	6,173	6,161	**6,161**	**6,173**
Jun-2011	4,778	5,342	5,383	5,465	5,489	5,617	5,653	5,661	5,651	5,710	5,677	5,689	5,690	5,678	**5,678**	**5,673**
Dec-2011	4,153	4,765	4,971	4,988	5,030	4,974	5,078	5,124	5,118	5,174	5,145	5,155	5,156	5,146	**5,146**	**5,130**
Jun-2012	4,315	5,241	5,457	5,704	5,786	5,787	5,822	5,865	5,882	5,946	5,913	5,924	5,925	5,914	**5,914**	**11,165**
Dec-2012	4,830	5,839	5,985	5,975	6,088	6,058	6,068	6,100	6,117	6,184	6,149	6,161	6,162	6,150	**6,150**	**13,180**
Jun-2013	6,277	6,306	6,180	6,140	6,283	6,269	6,324	6,357	6,375	6,444	6,408	6,421	6,422	6,409	**6,409**	**12,004**
Dec-2013	5,440	5,411	5,274	5,440	5,456	5,432	5,479	5,508	5,524	5,584	5,552	5,563	5,564	5,553	**5,553**	**10,140**
Jun-2014	6,155	6,126	6,269	6,366	6,461	6,432	6,488	6,522	6,541	6,612	6,575	6,588	6,589	6,576	**6,576**	**9,943**
Dec-2014	5,657	5,850	6,189	6,331	6,426	6,397	6,453	6,486	6,505	6,576	6,539	6,552	6,553	6,540	**6,540**	**9,313**
Jun-2015	5,513	6,756	7,033	7,195	7,302	7,269	7,332	7,371	7,392	7,473	7,430	7,445	7,447	7,432	**7,432**	**9,498**
Dec-2015	5,289	5,977	6,222	6,365	6,460	6,431	6,487	6,521	6,540	6,611	6,574	6,587	6,588	6,575	**6,575**	**9,488**

	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10	10-11	11-12	12-13	13-14
Jun-2009	1.015	1.009	0.937	1.024	1.019	0.999	1.034	1.005	0.997	0.995	0.998	1.000	0.998
Dec-2009	1.111	0.903	1.064	0.984	0.978	1.049	1.025	0.993	1.015	0.995	1.007	1.000	
Jun-2010	1.000	0.953	1.182	0.971	1.027	1.000	0.999	1.008	1.004	0.999	1.002		
Dec-2010	1.087	1.016	1.012	1.027	1.035	1.018	1.003	1.006	1.015	0.989			
Jun-2011	1.118	1.008	1.015	1.004	1.023	1.006	1.001	0.998	1.010				
Dec-2011	1.147	1.043	1.003	1.009	0.989	1.021	1.009	0.999					
Jun-2012	1.215	1.041	1.045	1.014	1.000	1.006	1.007						
Dec-2012	1.209	1.025	0.998	1.019	0.995	1.002							
Jun-2013	1.005	0.980	0.993	1.023	0.998								
Dec-2013	0.995	0.975	1.031	1.003									
Jun-2014	0.995	1.023	1.016										
Dec-2014	1.034	1.058											
Jun-2015	1.225												

Loss Development Factors	Adequacy
Average Last 4	3,835
2nd to Last Diagonal	**1,951**
Last Diagonal	**3,154**
Selected Avg Inc Indication	**888**
Selected Ultimate Indication	**844**

Avg Last 4 x-HiLo	1.015	1.002	1.007	1.017	0.996	1.006	1.004	1.003	1.013	0.995				
Avg Last 4	**1.062**	**1.009**	**1.010**	**1.015**	**0.996**	**1.009**	**1.005**	**1.003**	**1.011**	**0.994**				
Pr Sel @ 6 Mth	1.014	1.001	1.022	1.016	1.002	1.008	1.003	1.004	1.007	0.997	1.001	1.002	1.000	
Pr Sel @ 3 Mth	1.130	1.030	1.007	1.021	1.007	1.011	1.009	1.006	0.997	1.006	0.998	1.000	1.000	
Select	**1.130**	**1.041**	**1.023**	**1.015**	**0.996**	**1.009**	**1.005**	**1.003**	**1.011**	**0.994**	**1.002**	**1.000**	**0.998**	**Tail**
Cumulative	1.243	1.100	1.057	1.033	1.018	1.022	1.014	1.008	1.005	0.995	1.000	0.998	0.998	1.000

	Dec-15	Jun-15	Dec-14	Jun-14	Dec-13	Jun-13	Dec-12	Jun-12	Dec-11	Jun-11	Dec-10	Jun-10	Dec-09	Jun-09
Ultimate Severity	**6,575**	**7,432**	**6,540**	**6,576**	**5,553**	**6,409**	**6,150**	**5,914**	**5,146**	**5,678**	**6,161**	**6,899**	**5,969**	**5,950**
Ultimate Counts	**1,443**	**1,278**	**1,424**	**1,512**	**1,826**	**1,873**	**2,143**	**1,888**	**997**	**999**	**1,002**	**1,008**	**1,011**	**1,018**
Ultimate Loss	**9,487,725**	**9,498,096**	**9,312,960**	**9,942,912**	**10,139,778**	**12,004,057**	**13,179,450**	**11,165,632**	**5,130,562**	**5,672,322**	**6,173,322**	**6,954,192**	**6,034,659**	**6,057,100**
Ultimate LR	**62.6%**	**66.7%**	**66.5%**	**67.4%**	**64.8%**	**67.9%**	**70.3%**	**64.4%**	**58.5%**	**60.1%**	**68.5%**	**68.8%**	**60.3%**	**59.8%**
Ultimate PP	**199**	**212**	**179**	**195**	**193**	**213**	**210**	**178**	**171**	**182**	**198**	**220**	**190**	**190**

Exhibit C – Record Period Analysis

- **COLUMNS (1) and (2):** Estimated ultimate incurred losses, resulting required reserves, and reserve adequacy from two different sets of projections, using three different types of fixed selections of LDFs for the projections

- **COLUMNS (3) and (4):** Cumulative adjuster-incurred losses (i.e., paid losses plus adjuster reserves) and paid losses as of the evaluation date of 12/31/2015

- **COLUMN (5):** Indicated ultimate losses which have been selected by the Loss Reserving area considering all information obtained during the analysis, along with the resulting required reserves and reserve adequacy

- **COLUMN (6):** Estimated ultimate incurred severities, based upon the projections of average incurred losses

- **COLUMNS (7) and (8):** Indicated ultimate severities which result from the ultimate selections of losses and counts, along with the change in severities when comparing two consecutive periods in time, and the 4-point and 8-point fitted exponential trends.

- **COLUMNS (9) and (10):** Indicated ultimate counts which have been selected by the Loss Reserving area, considering all of the information obtained during the analysis

This exhibit summarizes our record period analysis for this segment, so the claims are sorted and analyzed by record date. We utilize 6-month record periods (i.e., record semesters), which represent all claims that have been recorded during the 6-month period ending at the end of the designated month (in the left-hand column of the exhibit).

The record period analysis measures the adequacy of our case reserves. In other words, the estimated ultimate losses for each record period include losses for claims that have already been recorded. They do not include losses for unrecorded claims, thus they exclude IBNR.

The information summarized on this exhibit is similar to the information summarized on Exhibit A. The issues involved in the analysis of record period losses are similar to the issues for accident period losses**.** The calculations of the components of the analyses are also very similar. Therefore, the focus of this discussion will be to compare and contrast the results of Exhibit C (Record Period Analysis) with Exhibit A (Accident Period Analysis).

Severity: The timing difference between when accidents occur and when they are recorded/reopened will help explain how severities differ between the analyses. A given accident could occur in one accident period, but be reported in a later record period. Accidents are reported and recorded after they occur, and severity is normally expected to change over time. Therefore, for a given period-ending date, the record period severity (for accidents from earlier periods) is expected to be different than the accident period severity for the same respective semester. The following chart illustrates the differences in severity for this segment:

Semesters Ending	Ultimate Severity Exh A (17) Accident Period	Exh C (7) Record Period
PRIOR 3 yrs	5,968	5,867
Jun-2012	5,921	5,404
Dec-2012	6,166	6,265
Jun-2013	6,393	6,651
Dec-2013	5,549	5,521
Jun-2014	6,617	6,770
Dec-2014	6,547	6,618
Jun-2015	7,435	7,333
Dec-2015	6,550	6,622

Counts: The indicated ultimate counts (shown in column (10) of Exhibit C and column (16) of Exhibit A) should also be similar, in aggregate, between the two analyses**.** If frequency is relatively flat and we are growing in volume, the aggregate claim counts should be higher for the accident period analysis than for the record period analysis due to the expected time lag between the occurrence and the recording of accidents. Over the past two years, this segment experienced a decreasing trend in earned premium and exposure volume. In addition, frequency had been decreasing over most of the period, but it flattened out over the past year. The aggregate accident period counts (19,422) are slightly higher than the aggregate record period counts (19,331), which is a reasonable result.

Reserve Adequacy: Almost every one of the default and selected adequacies is lower for the Record Period Analysis than for the same respective projections in the Accident Period Analysis. This is summarized in the following chart, which pulls information from both Exhibits A and C:

Reserve Adequacy	(1) Incurred Projection ($000s)	(2) Avg. Incurred Projection ($000s)	(5) Indicated ($000s)
Accident Period Analysis (Exhibit A)			
Selected	801	888	844
Avg Last 4	3,261	3,835	
2nd Last Diag	624	1,951	
Last Diag	3,470	3,154	
Record Period Analysis (Exhibit C)			
Selected	(1,079)	(1,103)	(1,029)
Avg Last 4	559	1,378	
2nd Last Diag	(1,436)	242	
Last Diag	1,646	1,614	

Based on the analyses in Exhibits A and C, we have determined the following:

Adequacy of Total Reserves, per accident period analysis = **$844,000**
Adequacy of Case Reserves, per record period analysis = **($1,029,000)**

Since **Total Reserves** = **Case Reserves** + **IBNR Reserves**, we expect that the adequacy of IBNR Reserves is reasonably well-approximated, as follows:

IBNR Reserve Adequacy	=	Total Reserve Adequacy	–	Case Reserve Adequacy
	=	$844,000	–	($1,029,000)
	=	$844,000	+	$1,029,000
	=	$1,873,000		

This calculation suggests that since the total reserves are adequate overall, and the case reserves are inadequate, the IBNR reserves are expected to be adequate.

In the next section we will discuss a separate analysis of late report claims by lag period, in order to independently determine IBNR reserve adequacy. We compare the results of that analysis to the results above to test for reasonableness.

Exhibit C

State XYZ Auto BI as of December 31, 2015

RECORD PERIOD ANALYSIS

Record Semesters Ending	(1) Incurred Projection Ult ($000)	(2) Avg. Incurred Projection Ult ($000)	(3) Adj. Inc. @ 12/31/2015 ($000)	(4) Pd. Loss @ 12/31/2015 ($000)	(5) **Indicated Ultimate Loss ($000)**
PRIOR 3 yrs	34,729	34,727	34,672	34,324	**34,729**
Jun-2012	9,934	9,944	9,867	9,368	**9,937**
Dec-2012	12,658	12,724	12,573	11,966	**12,681**
Jun-2013	14,656	14,692	14,440	12,747	**14,666**
Dec-2013	10,588	10,658	10,482	8,918	**10,611**
Jun-2014	10,923	10,955	10,802	7,770	**10,928**
Dec-2014	8,067	8,067	7,995	4,535	**8,067**
Jun-2015	8,584	8,727	8,771	3,565	**8,631**
Dec-2015	9,486	9,161	9,597	1,768	**9,350**
Total	119,627	119,656	119,199	94,961	**119,577**
Paid Loss	94,961	94,961			**94,961**

Required Reserves	**24,666**	**24,694**		**24,615**
Held Reserves	**23,587**	**23,587**		**23,587**
Reserve Adequacy	**(1,079)**	**(1,108)**	-4.2%	**(1,029)**
Average Last 4	**559**	**1,378**		
2nd to Last Diagonal	**(1,436)**	**242**		
Last Diagonal	**1,646**	**1,614**		

Record Semesters Ending	(6) Projected Incurred Severity	(7) **Ultimate Severity**	(8) **Change In Severity**	(9) Incurred Counts Projection	(10) **Indicated Ultimate Counts**
PRIOR 3 yrs	5,868	**5,867**		5,919	**5,919**
Jun-2012	5,409	**5,404**		1,839	**1,839**
Dec-2012	6,293	**6,265**	**16.0%**	2,024	**2,024**
Jun-2013	6,669	**6,651**	**6.2%**	2,205	**2,205**
Dec-2013	5,548	**5,521**	**-17.0%**	1,922	**1,922**
Jun-2014	6,798	**6,770**	**22.8%**	1,614	**1,614**
Dec-2014	6,637	**6,618**	**-2.1%**	1,219	**1,219**
Jun-2015	7,517	**7,333**	**12.0%**	1,177	**1,177**
Dec-2015	7,047	**6,622**	**-3.5%**	1,412	**1,412**
			Chg Dec-15 vs Dec-14	19,331	**19,331**
4 Point Ann Exp Trend		0.7%	0.1%		
8 Point Ann Exp Trend		5.9%			

Exhibit D – Summary of Estimated IBNR

This exhibit discusses the IBNR analysis in our loss reviews. Section III of the manual explained that IBNR reserves represent estimates of losses for claims that have already occurred but have not yet been recorded by the Company. These are sometimes called late reported claims.

In 2014 we changed our process for how we set IBNR factors. Before this change, we had only quarterly factors; now, the first quarter will be replaced by three monthly factors followed by the usual quarterly factors. Throughout the Exhibit D commentary these three monthly factors are split out in the exhibits. When we get to the Exhibit E commentary, we will still refer to quarterly lags to keep the analysis less complicated; just keep in mind that the first lag is a combination of the first three months.

Recalling from Section III, late reported claims are grouped by the lag period between the date on which the claim occurred (the accident date) and the date when the claim was reported (the record date). For example, all claims occurring in one quarter and reported in the subsequent quarter are classified as Quarterly Lag 1 claims. Loss Reserving uses two methods to project the amount of pure premium necessary to accurately reserve for IBNR for each accident period.

- **Method 1 (Frequency × Severity)** projects ultimate counts and ultimate average incurred losses by accident period and lag period. We obtain ultimate frequency by normalizing ultimate counts by calendar period exposures. Then, we obtain the amount of pure premium by taking the product of ultimate frequency and ultimate severity. This process is detailed in Exhibit E.

- **Method 2 (Losses / Exposures)** projects incurred losses by accident period and lag period to ultimate. Then, ultimate losses are normalized by calendar period exposures to determine how many dollars of premium per exposure should be reserved for IBNR claims. This method may be used in segments with very short-tailed IBNR.

Once we have projected a needed pure premium for each accident period, we summarize the results, as seen in Exhibit D. Exhibit D summarizes four and a half years of required IBNR, by accident quarter. The relevant accident periods are shown in column (3). The most recent period should have the largest proportion of required IBNR, since it is expected to have the largest proportion of unreported claims. Therefore, we will focus on the most recent accident quarter. The following chart shows columns (1) through (9) from the December 2015 row of Exhibit D:

Column	Description	Amount
(1)	Prior Review Future Pure Premium	$41.17
(2)	Calculated Pure Premium using 6-mo. Emerged	**$34.05**
(3)	Quarterly Record w/in Accident Period Ending	Dec-2015
(4)	Total Future Pure Premium*	$45.21
(5)	Earned Exposures	8,926
(6)	Earned Premium	$3,033,424
(7)	Indicated IBNR = **(4) × (5)**	$403,544
(8)	Indicated IBNR Factor = **(7) / (6)**	13.3%
(9)	Current IBNR Factor	16.5%

*Pure Premium is defined as Losses per Exposure (or per Earned Car Year).

At the time of the prior review, we projected that the required IBNR reserves were $41.17 per exposure (column (1)) for the most recent accident quarter. However, we now have updated

information on claims that have been reported or have emerged since that evaluation date, on accidents that occurred prior to that date. Based upon the emergence over the past 6 months, we now retrospectively project that the required IBNR reserves should have been **$34.05** per exposure (column (2)) for the most recent accident quarter. Therefore, the actual emergence has been lower than expected for this period.

Note that the 6 Month Emerged Pure Premium of **$34.05** is used in our judgment of future pure premium for accident quarter December 2015. However, it is based upon data from the June 2015 accident quarter because June 2015 is the most recent quarter for which there has been 6 months of emergence. It is a retrospective result because it restates what we would have needed six months ago if we had the next six months of information at that time. The following chart shows the calculation of the retrospective indicated IBNR factor and the retrospective 6-month emerged pure premium for accident quarter June 2015 which are used in our projections for accident quarter December 2015:

Column	Data for Accident Quarter Ending June 2015	Amount
(10)	IBNR Emerged since June 2015	$570,118
(7)[1]	Estimated Future Indicated IBNR	$202,219
(sum)	Retrospective Indicated IBNR @ June 2015 = **(10) + (7)**	$772,337
(6)	Earned Premium	$7,197,385
(11)	Retro Indicated IBNR Factor @ June 2015 = **(sum) / (6)**	10.7%
(5)	Earned Exposures	22,681
(2)	Retro 6-month Emerged Pure Premium = **(sum) / (5)**	**$34.05**

The following chart shows the first 4 columns of Exhibit D for the eight most recent accident quarters:

(1)	(2)	(3)	(4)
Prior Review Future Pure Premium	Calculated Pure Premium Using 6 month Emerged	Quarterly Record within Accident Periods Ending	**Selected Total Future Pure Prem**
5.14	3.80	Mar-2014	3.44
5.69	4.08	Jun-2014	4.00
6.81	5.14	Sep-2014	4.78
7.58	5.64	Dec-2014	5.47
8.95	6.28	Mar-2015	6.59
11.31	8.52	Jun-2015	8.92
15.82	13.83	Sep-2015	11.74
19.46	NA	Oct-2015	22.76
26.45	NA	Nov-2015	29.71
41.17	**34.05**	**Dec-2015**	45.21

[1] (7) is our Estimated Future Indicated IBNR for Accident Period ending June 2015 = (4) * (5)

If you compare all of column (2) to column (1) on Exhibit D, you can see that we have generally experienced favorable IBNR emergence. As stated at the beginning of this section, the results of this case study are not intended to represent the actual results of the Company. Our intent is to illustrate and discuss issues that we consider during an analysis. The result in this case study may be due to:

- Fewer claims than expected were reported (i.e., lower frequency than expected).
- The severity of the late reported claims has been lower than expected.
- There may have been a process change that impacts the timing of claim reporting and/or the severity of late reported claims.
- There may be external forces that impact timing of claim reporting and/or the severity of the late reported claims.

Our selected pure premiums are based upon the actual emergence and development of late reported claims (by reporting lag period within each accident period). They also include an expected level of inflation, since our current IBNR reserves need to be at the cost level that is relevant to each respective accident and record period. The selected Future Pure Premiums are shown in column (4). We selected **$45.21** per exposure for the most recent accident period. The details of the calculations that make up these Future Pure Premiums are included in Exhibit E, and explained later in this section.

The following chart shows columns (3) through (9) of Exhibit D for the eight most recent accident quarters:

(3)	(4)	(5)	(6)	(7) = (4) x (5)	(8) = (7) / (6)	(9)
Quarterly Rec w/n Acc Periods Ending	**Total Future Pure Prem**	Earned Exposures	Earned Premium	**Indicated IBNR**	Indicated IBNR Factors	Current IBNR Factors
Mar-2014	**3.44**	26,502	7,425,622	**91,225**	1.2%	3.0%
Jun-2014	**4.00**	24,379	7,323,851	**97,579**	1.3%	3.1%
Sep-2014	**4.78**	25,217	7,089,295	**120,576**	1.7%	4.1%
Dec-2014	**5.47**	26,942	6,917,614	**147,457**	2.1%	4.5%
Mar-2015	**6.59**	22,123	7,035,903	**145,689**	2.1%	4.9%
Jun-2015	**8.92**	22,681	7,197,385	**202,219**	2.8%	5.7%
Sep-2015	**11.74**	24,375	7,246,432	**286,051**	3.9%	6.9%
Oct-2015	**22.76**	7,135	2,424,581	**162,392**	6.7%	7.8%
Nov-2015	**29.71**	7,231	2,457,192	**214,826**	8.7%	10.6%
Dec-2015	**45.21**	8,926	3,033,424	**403,544**	13.3%	16.5%

The indicated IBNR in column (7) represents the expected late emergence of features that have been incurred but not yet recorded for each respective accident period. In order to calculate the expected amount of late reported losses, we multiply pure premium, defined as losses per exposure, by the number of exposures during that period (column (5)). For the accident quarter ending December 2015 shown above, this calculation is as follows:

Indicated IBNR	**=**	**Future Pure Premium**	**×**	**Earned Exposures**
	=	**45.21**	**×**	**8,926**
	=	**403,544**		

In order to carry the appropriate level of IBNR reserves in the Company's financials, we assign IBNR factors to each trailing 3-month period of earned premium. Therefore, our IBNR reserves will change as our premium volume changes. Assuming profitability remains consistent, this should allow our IBNR reserves to keep up with inflation and changes in mix of business for months in which we do not complete a review.

The indicated IBNR factors in column (8) are then calculated by dividing the indicated IBNR losses by earned premium, as shown in the following example for the accident quarter ending December 2015:

Indicated IBNR Factor	**=**	**Indicated IBNR Losses / Earned Premium**
	=	**$403,544 / $3,033,424**
	=	**13.3%**

The indicated factors in column (8) are less than the current factors in column (9). This is not surprising since we experienced favorable emergence. We test the reasonableness of our indicated factors in column (8) by comparing these to the factors in column (11) which result from the actual emergence over the past 6 months added to the expected future emergence for each respective accident quarter. This information is shown in the following excerpt from Exhibit D:

(3) Quarterly Record w/n Accident Periods Ending	(8) Indicated IBNR Factors	(11) 6-mo Emerged Indicated IBNR Factors
Sep-2013		1.2%
Dec-2013		1.5%
Mar-2014	1.2%	1.8%
Jun-2014	1.3%	1.9%
Sep-2014	1.7%	2.2%
Dec-2014	2.1%	3.3%
Mar-2015	2.1%	4.3%
Jun-2015	2.8%	**10.7%**
Sep-2015	3.9%	
Oct-2015	6.7%	
Nov-2015	8.7%	
Dec-2015	**13.3%**	

Each indicated factor from the current evaluation in column (8) would be compared to the emerged indicated factors in column (11) from two quarters prior (that is, several rows up). This shows that the selected indicated factors are reasonable, based upon the recent emergence patterns.

The bottom portion of Exhibit D summarizes the IBNR reserve adequacy by comparing the indicated IBNR reserves to the carried (or held) IBNR reserves. This is summarized below:

IBNR Reserves

Indicated [sum of column (7)]	**2,317,000**
Held IBNR Reserves	**4,404,000**
Adequacy = Held – Indicated	**2,086,000**

The indicated IBNR of $2,317,000 at the bottom of column (7) is the sum of the indicated IBNR for all accident periods, based upon the calculations as illustrated above. The carried IBNR of $4,404,000 is equal to each of the current IBNR factors in column (9) multiplied by each of the quarterly earned premium values in column (6). The calculation shows that our IBNR reserves are adequate by $2,086,000.

As mentioned previously, **IBNR Reserves = Total Reserves – Case Reserves**.

IBNR Reserve Adequacy (Expected)	**=**	**Total Reserve Adequacy** (Accident Period Analysis)	**–**	**Case Reserve Adequacy** (Record Period Analysis)
	=	**$844,000**	**–**	**($1,029,000)**
	=	**$1,873,000**		
Difference in IBNR Adequacy	**=**	**Adequacy per IBNR Analysis** (per separate analysis)	**–**	**Expected IBNR Adequacy** (Acc Period – Rec Period)
	=	**$2,086,000**	**–**	**$1,873,000**
	=	**$213,000**		

Since our total carried loss reserves for this segment are $28,038,000 (as shown on Exhibit A), this difference in IBNR adequacy of $213,000 is approximately 0.8%. We conclude that this is a reasonable difference.

We may revise our IBNR factors in the indicated direction, in order to move our carried IBNR reserves toward the indicated amount. By decreasing IBNR reserves and increasing case reserves, we would obtain a reserve level that is consistent with our indications. Therefore, the case, IBNR and total loss reserves for this segment will be a reasonable provision for the expected future payments on claims for which we are liable.

IBNR for coverages such as PIP, Property Damage, and Physical Damage includes consideration of future salvage and subrogation recoveries, which can lead to distortions in the indicated pure premiums. To address this, the model has been enhanced to allow the analyst to develop salvage recoveries, subrogation recoveries, and gross losses separately.

Net Losses = Gross Losses – Salvage Recoveries – Subrogation Recoveries

This result is compared to the analysis using net losses as a reasonableness check to determine if the pure premium selections make sense.

Exhibit D

State XYZ Auto BI as of December 31, 2015

SUMMARY OF ESTIMATED IBNR

(1) Prior Review Future Pure Premium	(2) Calculated PP using 6 month Emerged	(3) Quarterly Rec w/n Acc Periods Ending	(4) Total Future Pure Prem	(5) Earned Exposures	(6) Earned Premium	(7) Indicated IBNR	(8) Indicated IBNR Factors	(9) Current IBNR Factors	(10) IBNR Emerged Since Jun-2015	(11) 6 Mth Emg. Indicated IBNR Factors
1.17	0.89	Sep-2011	0.60	22,103	8,156,777	13,163	0.2%	0.5%	6,110	0.2%
1.65	1.22	Dec-2011	0.78	23,265	8,307,946	18,249	0.2%	0.5%	6,110	0.3%
2.12	0.87	Mar-2012	0.98	30,751	8,417,123	29,984	0.4%	1.1%	17,913	0.6%
2.43	1.05	Jun-2012	1.16	32,076	8,907,753	37,252	0.4%	1.1%	17,913	0.6%
2.74	1.56	Sep-2012	1.35	31,817	9,331,069	42,937	0.5%	1.1%	17,913	0.7%
3.05	1.72	Dec-2012	1.54	30,918	9,413,188	47,598	0.5%	1.1%	17,913	0.7%
3.36	1.91	Mar-2013	1.73	29,011	9,094,404	50,229	0.6%	2.1%	30,074	0.9%
3.80	2.12	Jun-2013	2.15	27,276	8,575,229	58,721	0.7%	2.1%	30,074	1.0%
4.24	2.77	Sep-2013	2.58	24,674	7,995,863	63,618	0.8%	2.1%	30,074	1.2%
4.69	3.26	Dec-2013	3.01	27,968	7,655,772	84,133	1.1%	2.1%	30,074	1.5%
5.14	3.80	Mar-2014	3.44	26,502	7,425,622	91,225	1.2%	3.0%	45,060	1.8%
5.69	4.08	Jun-2014	4.00	24,379	7,323,851	97,579	1.3%	3.1%	39,863	1.9%
6.81	5.14	Sep-2014	4.78	25,217	7,089,295	120,576	1.7%	4.1%	37,814	2.2%
7.58	5.64	Dec-2014	5.47	26,942	6,917,614	147,457	2.1%	4.5%	82,033	3.3%
8.95	6.28	Mar-2015	6.59	22,123	7,035,903	145,689	2.1%	4.9%	160,243	4.3%
11.31	8.52	Jun-2015	8.92	22,681	7,197,385	202,219	2.8%	5.7%	570,118	10.7%
15.82	13.83	Sep-2015	11.74	24,375	7,246,432	286,051	3.9%	6.9%		
19.46	*NA*	Oct-2015	22.76	7,135	2,424,581	162,392	6.7%	7.8%		
26.45	*NA*	Nov-2015	29.71	7,231	2,457,192	214,826	8.7%	10.6%		
41.17	*34.05*	Dec-2015	45.21	8,926	3,033,424	403,544	13.3%	16.5%		
				475,369	144,006,425	2,317,443			1,139,299	

Annual IBNR Frequency Trend
Current: 2.0%
Revised: 2.0%

Annual Pure Premium Trend
Current: 4.0%
Revised: 4.0%

Annual IBNR Severity Trend
Current: 2.0%
Revised: 2.0%

Zero Runoff		Six Mth Runoff
2,317	Indicated IBNR ($000)	2,390
4,404	Carried IBNR ($000)	4,196
2,086	Adequacy ($000)	1,806

Exhibit E – IBNR Analysis

In order to estimate the indicated level of IBNR reserves, we need to estimate the expected future pure premiums by accident quarter. These selected pure premiums are shown in column (4) of Exhibit D. They are determined by estimating the ultimate frequency and ultimate severity for each report lag period. We then sum the estimated future pure premiums for each report lag period within each accident quarter, adjusted for inflation. We select these lag pure premiums by grouping the incurred count and average incurred loss data by lag period. We then sort and analyze the data by accident quarter for each lag period. Exhibit E summarizes the steps involved in this process.

Although we are referring to quarterly lags here, as mentioned above, the first lag is actually broken up into three monthly lags in our analysis. Here we kept the first lag as a combination of those three months to help keep the commentary less complicated.

Step 1: Select ultimate counts by accident period for each report lag group. We do this for 8 quarterly lag groups (from Quarterly Lag 0 through Quarterly Lag 7) and for 5 annual lag groups (from Annual Lag 2 through Annual Lag 6).

The Quarterly Lag 0 triangle includes all counts that are recorded in the same quarter in which the accidents occurred. Therefore, these are the recorded counts as of the end of the accident quarter. The Quarterly Lag 1 triangle includes all counts that are recorded in the quarter following the quarter in which the accidents occurred. The following chart is an excerpt from page 1 of Exhibit E, showing the development of incurred counts for the Quarterly Lag 1 group by accident quarter, as well as the selected LDFs and ultimate feature counts:

INCURRED COUNTS QUARTERLY LAG 1 - IBNR ANALYSIS

Quarterly Rec w/n Acc Periods Ending	0	1	2	3	4	Ultimate
Jun-2014	118	111	109	106	104	**99**
Sep-2014	134	122	119	117	117	**111**
Dec-2014	132	116	112	109		**103**
Mar-2015	115	109	105			**96**
Jun-2015	139	118				**104**
Sep-2015	**148**					**120**
	0-1	1-2	2-3	3-4	4-5	
Jun-2014	0.941	0.982	0.972	0.981	0.981	
Sep-2014	0.91	0.975	0.983	1.000		
Dec-2014	0.879	0.966	0.973			
Mar-2015	0.948	0.963				
Jun-2015	0.849					
Avg Last 8	0.922	0.969	0.966	0.991	0.980	
Average Last 4	0.896	0.972	0.974	0.99	0.987	
Select	**0.922**	**0.969**	**0.966**	**0.991**	**0.980**	
Cumulative	0.812	0.881	0.91	0.942	0.951	
Ult Counts = Last Diagonal x Cumulative	**120**	**104**	**96**	**103**	**111**	

The development column labeled "0" represents the incurred losses evaluated as of the end of the quarter that the claims were recorded. For example, the **red** amount of **148** in the above chart represents the number of incurred features for claims that occurred in the quarter ending September 2015 that were recorded in the quarter ending December 2015 (i.e. one lag quarter), evaluated as of the end of December 2015. We note that the accident quarter ending December 2015 has not yet experienced any Quarterly Lag 1 claims, since those would be recorded in the future – i.e., the first quarter of 2016. Thus, the most recent accident period in the Quarterly Lag 1 triangle is September 2015.

In order to select LDFs for the IBNR analysis, we go through a process similar to what we do for the accident period and record period analyses. We use averages of the link ratios, as well as judgment in the selection process. We go through this selection process for each of the report lag groups.

We repeat this procedure to develop ultimate count by accident period for each of the report lag groups mentioned earlier.

Step 2: Calculate projected ultimate frequency for all lag groups by dividing the projected ultimate feature count for each accident quarter by the corresponding calendar period earned exposures (from column (5) of Exhibit D). An excerpt from page 2 of Exhibit E is shown below. Note that the columns of this exhibit represent the various quarterly lags.

Quarterly Rec w/n Acc Periods	**INCURRED QUARTERLY LAG 1-6 FREQUENCY - IBNR ANALYSIS**						[From col (5) of Exh D] Earned
Ending	1	2	3	4	5	6	Exposures
Jun-2014	**0.406%**	0.127%	0.082%	0.070%	0.053%	0.082%	24,379
Sep-2014	**0.441%**	0.059%	0.091%	0.063%	0.059%		25,217
Dec-2014	**0.381%**	0.063%	0.056%	0.067%			26,942
Mar-2015	**0.432%**	0.081%	0.095%				22,123
Jun-2015	**0.459%**	0.132%					22,681
Sep-2015	**0.494%**						24,375

Step 3: Trend ultimate frequencies to the level of the Last Diagonal using the selected Annual IBNR Frequency Trend. We have selected an Annual IBNR Frequency Trend of +2.0%. This is based upon judgment, considering the historical frequency trends for this segment. This is done because our objective is to estimate the required IBNR Reserves as of the current date, so we adjust the losses to the current cost level. The following chart is from the bottom of page 2 of Exhibit E and illustrates this point:

Quarterly Rec w/n Acc Periods Ending	INFLATED INCURRED QUARTERLY LAG 1-6 FREQUENCY - IBNR ANALYSIS (using a +2.0% IBNR Frequency Trend)					
	1	2	3	4	5	6
Jun-2014	**0.417%**	0.130%	0.083%	0.071%	0.054%	0.082%
Sep-2014	**0.451%**	0.061%	0.092%	0.064%	0.060%	
Dec-2014	**0.388%**	0.064%	0.056%	0.067%		
Mar-2015	**0.438%**	0.082%	0.095%			
Jun-2015	**0.462%**	0.133%				
Sep-2015	**0.495%**					
Avg Last 8	0.418%	0.104%	0.077%	0.064%	0.049%	0.045%
Avg Last 4	0.446%	0.085%	0.082%	0.062%	0.051%	0.051%
Prior Select	**0.423%**	**0.097%**	**0.075%**	**0.069%**	**0.050%**	**0.038%**
Select	**0.446%**	**0.085%**	**0.077%**	**0.062%**	**0.051%**	**0.045%**

Note that the June 2015 Quarterly Lag 1 inflated frequency of **0.462%** is equal to the projected ultimate frequency of **0.459%** from the previous chart, adjusted for one quarter of the 2.0% annual trend to bring its value forward one quarter to the level of the Last Diagonal:

Step 4: Select projected frequency for each lag period as shown at the bottom of the chart above.

Step 5: Select ultimate severity by accident period for each report lag group. We do this for 8 quarterly lag groups (from Quarterly Lag 0 through Quarterly Lag 7), and for 5 annual lag groups (from Annual Lag 2 through Annual Lag 6).

Though we are not showing it here, we carry out a similar procedure for average severity. We develop average severity by accident period for each lag to ultimate. Then we trend these to current level using a selected severity trend, similar to show we trended ultimate frequencies on the prior pages. Once we have these ultimate severities for prior accident periods at current level for each lag, we select severity for each lag. Now that we have a projected ultimate severity and frequency for each lag, we are ready to compute projected pure premium.

Step 6: Compute projected pure premiums by taking the product of Ultimate Frequency and Ultimate Severity for each lag period. The chart below summarizes the selected ultimate frequency (page 2 of Exhibit E), the selected ultimate severity (page 4 of Exhibit E), and the calculated ultimate pure premium (page 5 of Exhibit E) for each of Quarterly Lag 0 through Quarterly Lag 7:

Lag Period	1	2	3	4	5	6	7
Ult Frequency	0.446%	0.085%	0.077%	0.062%	0.051%	0.045%	0.035%
x Ult Severity	4,837	3,197	2,708	1,655	1,617	1,784	1,596
Ult Pure Prem	**21.56**	**2.71**	**2.08**	**1.03**	**0.82**	**0.81**	**0.57**

Step 7: Inflate the selected pure premiums by the pure premium trend (of +4.0% annually for this segment) to the future periods for which the claims are expected to be reported.

For example, the selected pure premium for Quarterly Lag 2 is **$2.71**. The accident quarters that will have future claims recorded two quarters after their occurrence are the accident quarters ending September 2015 and December 2015. All accident periods prior to that no longer need IBNR reserves from Quarterly Lag 2 for the current analysis. This is because those accidents

have already been recorded as of the end of December 2015. However, the pure premium of **$2.71** is at the cost level of December 2015 recorded values. Therefore, this pure premium needs to be inflated to the monetary level that is relevant for each future record period.

The chart displayed on page 5 of Exhibit E show the results of these calculations. An excerpt from that exhibit is included below to illustrate the calculations.

Lag Period	1	2	3	4	5	6	7
Pure Premium	**21.56**	**2.71**	**2.08**	**1.03**	**0.82**	**0.81**	**0.57**

FUTURE PURE PREMIUM BY QUARTERLY LAG, INFLATED

Quarterly Rec w/n Acc Periods Ending	1	2	3	4	5	6	7	8-27	Total Future Pure Prem
Jun-2014							0.57	3.43	4.00
Sep-2014						0.82	0.58	3.39	4.78
Dec-2014					0.83	0.82	0.58	3.24	5.47
Mar-2015				1.04	0.84	0.83	0.59	3.29	6.59
Jun-2015			2.10	sA	0.84	0.84	0.60	3.49	8.92
Sep-2015		2.74	2.12	1.06	0.85	0.85	0.60	3.52	11.74
Dec-2015	**21.77**	**2.76**	**2.14**	**1.07**	**0.86**	**0.86**	**0.61**	**3.46**	**33.52**

The Quarterly Lag 2 selected pure premium of **$2.71** is inflated by one quarter of the 4.0% annual Pure Premium trend for accidents that occur in the quarter ending September 2015 (since they will be recorded in the quarter ending March 2016), and by two quarters (i.e., ½ of a year) of the annual trend for accidents that occur in the quarter ending December 2015 (since they will be recorded in the quarter ending June 2016, i.e., two quarters in the future):

$$\$2.71 \times (1.04)^{1/2} = \$2.76$$

Step 8: For each accident quarter, calculate the total future pure premium by summing all lag periods' future pure premiums. For example, the total future pure premium for accident quarter ending December 2015 is **$33.52.** This is the sum of the future pure premiums for accidents that occurred during this quarter, but are expected to be recorded in future quarters:

Quarterly Lag 1	=	Claims expected to be recorded in the first quarter of 2016
	=	Future pure premium of **$21.77**
Quarterly Lag 2	=	Claims expected to be recorded in the second quarter of 2016
	=	Future pure premium of **$2.76**
Quarterly Lags 3-27	=	Claims expected to be recorded in the third quarter of 2016 or later
	=	Future pure premium of **$8.99**

The total future pure premiums are then transferred to column (4) of Exhibit D (Summary of Estimated IBNR), in order to calculate the total indicated IBNR reserves (these pure premiums will match for Sept-2015 period and prior, remember the quarter ending Dec-2015 is split into months in Exhibit D).

Exhibit E
Page 1

Exhibit E (Page 1)

State XYZ Auto BI as of December 31, 2015

INCURRED COUNTS QUARTERLY LAG 1 - IBNR ANALYSIS

Quarterly Rec w/n Acc Periods Ending	0	1	2	3	4	5	6	7	**Ultimate**
Sep-2011	123	111	103	100	97	96	95	93	**92**
Dec-2011	109	95	88	84	83	82	80	79	**78**
Mar-2012	111	103	100	99	97	92	92	91	**90**
Jun-2012	83	80	76	75	73	73	73	71	**71**
Sep-2012	129	120	117	114	109	107	107	107	**106**
Dec-2012	113	102	98	94	94	88	87	86	**86**
Mar-2013	134	120	117	110	109	107	105	105	**103**
Jun-2013	128	114	111	108	107	106	104	102	**101**
Sep-2013	145	140	135	127	125	125	124	123	**123**
Dec-2013	126	115	110	108	107	106	103	103	**102**
Mar-2014	95	92	89	86	85	83	81		**80**
Jun-2014	118	111	109	106	104	102			**99**
Sep-2014	134	122	119	117	117				**111**
Dec-2014	132	116	112	109					**103**
Mar-2015	115	109	105						**96**
Jun-2015	139	118							**104**
Sep-2015	148								**120**

	0-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8
Sep-2011	0.902	0.928	0.971	0.970	0.990	0.990	0.979	1.000
Dec-2011	0.872	0.926	0.955	0.988	0.988	0.976	0.988	1.000
Mar-2012	0.928	0.971	0.990	0.980	0.948	1.000	0.989	0.989
Jun-2012	0.964	0.950	0.987	0.973	1.000	1.000	0.973	1.000
Sep-2012	0.930	0.975	0.974	0.956	0.982	1.000	1.000	0.991
Dec-2012	0.903	0.961	0.959	1.000	0.936	0.989	0.989	1.000
Mar-2013	0.896	0.975	0.940	0.991	0.982	0.981	1.000	0.981
Jun-2013	0.891	0.974	0.973	0.991	0.991	0.981	0.981	0.990
Sep-2013	0.966	0.964	0.941	0.984	1.000	0.992	0.992	1.000
Dec-2013	0.913	0.957	0.982	0.991	0.991	0.972	1.000	
Mar-2014	0.968	0.967	0.966	0.988	0.976	0.976		
Jun-2014	0.941	0.982	0.972	0.981	0.981			
Sep-2014	0.910	0.975	0.983	1.000				
Dec-2014	0.879	0.966	0.973					
Mar-2015	0.948	0.963						
Jun-2015	0.849							
Straight Avg	0.916	0.962	0.969	0.984	0.980	0.987	0.989	0.995
Avg x HiLo	0.917	0.964	0.970	0.985	0.983	0.987	0.990	0.996
Wtd Avg All	0.914	0.963	0.968	0.984	0.981	0.987	0.990	0.994
Avg Last 8	0.922	0.969	0.966	0.991	0.980	0.986	0.990	0.994
Wt Avg.8	0.919	0.968	0.966	0.991	0.981	0.986	0.991	0.993
Avg Last 4	0.896	0.972	0.974	0.990	0.987	0.980	0.993	0.993
Wt Avg.4	0.894	0.972	0.974	0.990	0.988	0.981	0.993	0.993
Select	**0.922**	**0.969**	**0.966**	**0.991**	**0.980**	**0.986**	**0.990**	**0.994**
Cumulative	0.813	0.882	0.911	0.942	0.951	0.971	0.984	0.994
Ult Counts	**120**	**104**	**96**	**103**	**111**	**99**	**80**	**102**

Exhibit E
Page 2

State XYZ Auto BI as of December 31, 2015

INCURRED QUARTERLY LAG 0-7 FREQUENCIES - IBNR ANALYSIS

Quarterly Rec w/n Acc Periods Ending	0	1	2	3	4	5	6	7
Sep-2011	2.050%	**0.416%**	0.172%	0.050%	0.054%	0.086%	0.059%	0.077%
Dec-2011	1.973%	**0.335%**	0.155%	0.082%	0.069%	0.047%	0.026%	0.073%
Mar-2012	1.623%	**0.293%**	0.098%	0.088%	0.068%	0.059%	0.049%	0.046%
Jun-2012	1.515%	**0.221%**	0.122%	0.044%	0.050%	0.031%	0.034%	0.031%
Sep-2012	1.499%	**0.333%**	0.116%	0.050%	0.075%	0.053%	0.022%	0.025%
Dec-2012	1.611%	**0.278%**	0.104%	0.058%	0.029%	0.023%	0.049%	0.039%
Mar-2013	1.899%	**0.355%**	0.134%	0.076%	0.059%	0.052%	0.045%	0.034%
Jun-2013	2.101%	**0.370%**	0.147%	0.088%	0.040%	0.037%	0.040%	0.026%
Sep-2013	1.937%	**0.499%**	0.118%	0.069%	0.085%	0.073%	0.041%	0.049%
Dec-2013	1.495%	**0.366%**	0.107%	0.050%	0.072%	0.043%	0.021%	0.029%
Mar-2014	1.883%	**0.301%**	0.128%	0.072%	0.045%	0.045%	0.057%	0.038%
Jun-2014	2.022%	**0.406%**	0.127%	0.082%	0.070%	0.053%	0.082%	
Sep-2014	1.844%	**0.441%**	0.059%	0.091%	0.063%	0.059%		
Dec-2014	1.511%	**0.381%**	0.063%	0.056%	0.067%			
Mar-2015	2.482%	**0.432%**	0.081%	0.095%				
Jun-2015	2.394%	**0.459%**	0.132%					
Sep-2015	2.437%	**0.494%**						
Dec-2015	2.220%							

State XYZ Auto BI as of December 31, 2015

INFLATED INCURRED QUARTERLY LAG 0-7 FREQUENCIES - IBNR ANALYSIS

Quarterly Rec w/n Acc Periods Ending	0	1	2	3	4	5	6	7
Sep-2011	2.235%	**0.452%**	0.186%	0.053%	0.058%	0.091%	0.062%	0.081%
Dec-2011	2.141%	**0.362%**	0.166%	0.087%	0.073%	0.050%	0.027%	0.077%
Mar-2012	1.752%	**0.314%**	0.104%	0.093%	0.072%	0.062%	0.051%	0.047%
Jun-2012	1.628%	**0.237%**	0.129%	0.046%	0.053%	0.033%	0.036%	0.032%
Sep-2012	1.603%	**0.354%**	0.123%	0.053%	0.079%	0.056%	0.023%	0.026%
Dec-2012	1.714%	**0.294%**	0.109%	0.061%	0.030%	0.023%	0.050%	0.040%
Mar-2013	2.011%	**0.374%**	0.141%	0.079%	0.061%	0.053%	0.046%	0.035%
Jun-2013	2.213%	**0.388%**	0.153%	0.091%	0.042%	0.038%	0.041%	0.026%
Sep-2013	2.031%	**0.520%**	0.122%	0.071%	0.087%	0.075%	0.041%	0.049%
Dec-2013	1.559%	**0.380%**	0.111%	0.051%	0.073%	0.044%	0.022%	0.029%
Mar-2014	1.954%	**0.311%**	0.132%	0.073%	0.046%	0.046%	0.057%	0.038%
Jun-2014	2.088%	**0.417%**	0.130%	0.083%	0.071%	0.054%	0.082%	
Sep-2014	1.895%	**0.451%**	0.061%	0.092%	0.064%	0.060%		
Dec-2014	1.545%	**0.388%**	0.064%	0.056%	0.067%			
Mar-2015	2.525%	**0.438%**	0.082%	0.095%				
Jun-2015	2.424%	**0.462%**	0.133%					
Sep-2015	2.455%	**0.495%**						
Dec-2015	2.225%							
Straight Avg	2.000%	0.390%	0.122%	0.073%	0.063%	0.053%	0.045%	0.044%
Avg x HiLo	1.995%	0.392%	0.121%	0.073%	0.063%	0.052%	0.043%	0.042%
Avg Last 8	2.139%	0.418%	0.104%	0.077%	0.064%	0.049%	0.045%	0.034%
Avg Last 4	2.407%	0.446%	0.085%	0.082%	0.062%	0.051%	0.051%	0.035%
Prior Select	**2.097%**	**0.424%**	**0.097%**	**0.075%**	**0.069%**	**0.050%**	**0.038%**	**0.038%**
Select	**2.407%**	**0.446%**	**0.085%**	**0.077%**	**0.062%**	**0.051%**	**0.045%**	**0.035%**

Exhibit E (Page 3)

State XYZ Auto BI as of December 31, 2015

AVERAGE INCURRED LOSSES QUARTERLY LAG 1 - IBNR ANALYSIS

Quarterly Rec w/n Acc Periods Ending	0	1	2	3	4	5	6	7	Ultimate
Sep-2011	4,038	4,667	4,572	4,787	4,583	4,628	4,570	4,553	**4,553**
Dec-2011	5,166	6,346	6,523	6,938	6,433	6,357	6,498	6,467	**6,467**
Mar-2012	6,321	7,033	6,836	7,297	7,800	9,491	9,237	9,437	**9,437**
Jun-2012	11,158	12,411	12,316	14,329	14,256	13,567	12,090	13,186	**13,186**
Sep-2012	5,908	6,186	6,070	6,110	5,639	5,592	5,492	5,424	**5,424**
Dec-2012	12,425	14,019	13,560	13,645	13,015	13,832	14,049	14,180	**14,180**
Mar-2013	8,608	9,094	8,050	8,086	7,951	8,025	8,324	7,966	**7,966**
Jun-2013	9,950	9,053	8,064	7,659	7,656	7,425	7,130	7,361	**7,361**
Sep-2013	6,553	6,446	5,901	5,897	5,806	5,640	5,635	5,626	**5,626**
Dec-2013	7,502	7,868	8,045	7,749	7,447	7,227	7,274	7,242	**7,242**
Mar-2014	9,533	8,638	9,666	9,537	9,479	9,676	10,276		**10,363**
Jun-2014	4,014	3,604	3,607	3,537	3,398	3,199			**3,207**
Sep-2014	3,908	3,643	3,218	3,919	3,337				**3,320**
Dec-2014	5,850	6,041	5,400	5,301					**5,068**
Mar-2015	4,815	4,555	4,447						**4,430**
Jun-2015	4,023	5,269							**5,053**
Sep-2015	4,553								**4,606**

	0-1	1-2	2-3	3-4	4-5	5-6	6-1	7-8
Sep-2011	1.156	0.980	1.047	0.957	1.010	0.988	0.996	0.997
Dec-2011	1.229	1.028	1.064	0.927	0.988	1.022	0.995	0.994
Mar-2012	1.113	0.972	1.067	1.069	1.217	0.973	1.022	1.020
Jun-2012	1.112	0.992	1.163	0.995	0.952	0.891	1.091	0.985
Sep-2012	1.047	0.981	1.007	0.923	0.992	0.982	0.988	1.001
Dec-2012	1.128	0.967	1.006	0.954	1.063	1.016	1.009	0.992
Mar-2013	1.056	0.885	1.004	0.983	1.009	1.037	0.957	1.034
Jun-2013	0.910	0.891	0.950	1.000	0.970	0.960	1.032	0.975
Sep-2013	0.984	0.915	0.999	0.985	0.971	0.999	0.998	0.974
Dec-2013	1.049	1.022	0.963	0.961	0.970	1.007	0.996	
Mar-2014	0.906	1.119	0.987	0.994	1.021	1.062		
Jun-2014	0.898	1.001	0.981	0.961	0.941			
Sep-2014	0.932	0.883	1.218	0.852				
Dec-2014	1.033	0.894	0.982					
Mar-2015	0.946	0.976						
Jun-2015	1.310							
Straight Avg	1.050	0.967	1.031	0.966	1.009	0.994	1.008	0.997
Avg x HiLo	1.043	0.962	1.023	0.967	0.995	0.998	1.005	0.995
Wtd Avg All	1.046	0.970	1.029	0.973	1.013	0.990	1.014	0.997
Avg Last 8	1.007	0.963	1.010	0.961	0.992	0.994	1.012	0.997
Wt Avg.8	0.997	0.970	0.995	0.968	1.004	0.990	1.017	0.997
Avg Last 4	1.055	0.939	1.042	0.942	0.976	1.007	0.996	0.994
Wt Avg.4	1.049	0.934	1.018	0.956	0.985	1.012	0.994	0.995
Select	**1.055**	**0.963**	**1.042**	**0.961**	**0.992**	**0.994**	**1.012**	**0.997**
Cumulative	1.012	0.959	0.996	0.956	0.995	1.003	1.008	0.997
Avg Ult Loss	**4,606**	**5,053**	**4,430**	**5,068**	**3,320**	**3,207**	**10,363**	**7,220**

State XYZ Auto BI as of December 31, 2015

AVERAGE INCURRED LOSSES QUARTERLY LAG 0-7 - IBNR ANALYSIS

Quarterly Rec w/n Acc Periods Ending	0	1	2	3	4	5	6	7
Sep-2011	5,780	**4,553**	3,623	1,862	2,926	269	1,871	1,316
Dec-2011	7,277	**6,467**	6,295	5,089	2,159	2,002	3,312	560
Mar-2012	7,877	**9,437**	2,993	13,307	3,799	4,477	1,781	1,277
Jun-2012	8,420	**13,186**	6,539	10,352	7,313	5,099	2,573	1,994
Sep-2012	10,954	**5,424**	5,001	11,964	1,530	3,500	15,290	2,680
Dec-2012	9,699	**14,180**	7,829	15,638	4,694	4,620	1,086	885
Mar-2013	11,625	**7,966**	3,305	5,106	2,059	7,940	6,892	686
Jun-2013	8,594	**7,361**	3,367	7,047	8,354	(5,836)	7,446	2,121
Sep-2013	8,758	**5,626**	4,826	6,784	811	794	1,330	1,798
Dec-2013	9,637	**7,242**	2,311	2,146	1,797	1,316	2,929	880
Mar-2014	8,758	**10,363**	5,567	1,961	2,031	1,375	1,994	1,515
Jun-2014	8,004	**3,207**	2,494	2,605	818	1,827	805	
Sep-2014	7,260	**3,320**	2,330	2,306	1,849	549		
Dec-2014	7,991	**5,068**	2,383	3,237	1,860			
Mar-2015	6,832	**4,430**	5,893	2,580				
Jun-2015	6,046	**5,053**	2,063					
Sep-2015	6,113	**4,606**						
Dec-2015	6,208							

State XYZ Auto BI as of December 31, 2015

INFLATED AVERAGE INCURRED LOSSES QUARTERLY LAG 0-7 - IBNR ANALYSIS

Quarterly Rec w/n Acc Periods Ending	0	1	2	3	4	5	6	7
Sep-2011	6,303	**4,940**	3,912	2,001	3,128	286	1,980	1,386
Dec-2011	7,896	**6,983**	6,763	5,441	2,297	2,120	3,489	587
Mar-2012	8,505	**10,140**	3,200	14,157	4,022	4,716	1,867	1,332
Jun-2012	9,047	**14,098**	6,957	10,959	7,703	5,344	2,683	2,069
Sep-2012	11,712	**5,771**	5,293	12,602	1,603	3,651	15,869	2,768
Dec-2012	10,318	**15,011**	8,247	16,391	4,896	4,795	1,122	909
Mar-2013	12,306	**8,392**	3,464	5,325	2,136	8,200	7,083	702
Jun-2013	9,053	**7,715**	3,512	7,313	8,627	(5,997)	7,614	2,158
Sep-2013	9,180	**5,868**	5,008	7,006	834	812	1,353	1,820
Dec-2013	10,052	**7,516**	2,387	2,206	1,837	1,339	2,966	887
Mar-2014	9,089	**10,702**	5,720	2,005	2,067	1,392	2,009	1,519
Jun-2014	8,266	**3,296**	2,551	2,651	828	1,841	807	
Sep-2014	7,460	**3,395**	2,370	2,334	1,862	550		
Dec-2014	8,171	**5,157**	2,413	3,261	1,865			
Mar-2015	6,952	**4,485**	5,937	2,586				
Jun-2015	6,122	**5,090**	2,068					
Sep-2015	6,159	**4,618**						
Dec-2015	6,224							
Straight Avg	8,490	7,246	4,363	6,416	3,122	2,235	4,070	1,467
Avg x HiLo	8,399	6,991	4,249	5,988	2,854	2,441	3,216	1,420
Avg Last 8	7,305	5,532	3,557	3,670	2,507	1,617	4,853	1,604
Avg Last 4	6,364	4,837	3,197	2,708	1,655	1,281	1,784	1,596
Prior Select	**7,176**	**4,083**	**3,264**	**2,299**	**1,391**	**1,181**	**2,031**	**1,397**
Select	**6,364**	**4,837**	**3,197**	**2,708**	**1,655**	**1,617**	**1,784**	**1,596**

Exhibit E (Page 5)

State XYZ Auto BI as of December 31, 2015

FUTURE PURE PREMIUMS BY QUARTERLY LAG

Lag Quarter	0	1	2	3	4	5	6	7	8 - 27
Selected PP	**153.196**	**21.559**	**2.709**	**2.079**	**1.025**	**0.820**	**0.808**	**0.567**	**3.402**

FUTURE PURE PREMIUMS BY QUARTERLY LAG, INFLATED

Quarterly Rec w/n Acc Periods Ending	0	1	2	3	4	5	6	7	8 - 27	**Total Future Pure Prem**
Sep-2011									0.596	**0.60**
Dec-2011									0.784	**0.78**
Mar-2012									0.975	**0.98**
Jun-2012									1.161	**1.16**
Sep-2012									1.350	**1.35**
Dec-2012									1.540	**1.54**
Mar-2013									1.731	**1.73**
Jun-2013									2.153	**2.15**
Sep-2013									2.578	**2.58**
Dec-2013									3.008	**3.01**
Mar-2014									3.442	**3.44**
Jun-2014								0.572	3.430	**4.00**
Sep-2014							0.816	0.578	3.388	**4.78**
Dec-2014						0.828	0.824	0.583	3.238	**5.47**
Mar-2015					1.035	0.836	0.832	0.589	3.293	**6.59**
Jun-2015				2.100	1.045	0.844	0.840	0.595	3.491	**8.92**
Sep-2015			2.736	2.121	1.055	0.853	0.849	0.601	3.522	**11.74**
Dec-2015		21.771	2.763	2.141	1.066	0.861	0.857	0.607	3.455	**33.52**

Inflation rate used in IBNR calculation 4.0%

Section VII – Loss Adjustment Expenses Case Study

When a claim occurs, the ultimate amount of the loss is not known until final settlement (payment) of that claim. Through the life of the claim, we need to make sure that our loss reserves are adequate for all future payments on that claim, as illustrated in Section VI. However, we also incur expenses to adjust and settle claims. Costs incurred in this loss adjustment process are called Loss Adjustment Expenses (LAE). Like loss reserves, we also need to make sure that our carried LAE reserves are adequate to cover the future payment of these expenses as we settle our outstanding claims.

There are two major categories of LAE:

- **Defense and Cost Containment (DCC) Expenses**. This category is comparable to, but not exactly the same as, what was called Allocated Loss Adjustment Expenses (ALAE) prior to the definition change by the National Association of Insurance Commissioners (NAIC) in 1998. Since 1998, this category includes:
    - Defense and litigation-related expenses, whether internal or external
    - Medical cost containment
    - Other related expenses incurred in the defense of claims

- **Adjusting & Other (A&O) Expenses**. This category is comparable to, but not exactly the same as, what was called Unallocated Loss Adjustment Expenses (ULAE) prior to the definition change by the NAIC in 1998. Since 1998, this category includes:
    - Fees of external vendors involved in adjusting our claims
    - Salaries and related overhead expenses relative to Company employees involved in a claim adjusting function
    - Other related expenses incurred in determination of coverage

We hold both case and IBNR reserves for each expense category. We may revise any or all of the following parameters in order to achieve the desired changes to case and/or IBNR LAE reserves for a given segment:

- Revise **case LAE reserves** by changing:
    - **Average reserves** for DCC and/or A&O, which are applied to open claims below the threshold. (Note that the threshold for DCC expense reserves is usually $15,000 per claim, although very few case reserve amounts exceed that threshold. There is no threshold for A&O expense reserves).
    - The **inflation factor**, which can differ between DCC and A&O and which is applied to the averages in subsequent months

- Revise **IBNR LAE reserves** by changing:
    - **IBNR factors** for DCC and/or A&O, which are applied to earned premium

We evaluate the adequacy of many of our LAE reserve segments at least two times per year. DCC expense reserves are analyzed separately from A&O expense reserves.

The segment reviewed in this case study is for a sample state and coverage for Personal Auto. **Note that the data in this example is not from any specific segment and any similarity to specific segments is coincidental. Also, the investigations that are undertaken, the conclusions that are drawn, and the selections that are made are not necessarily the same as those that we would make in an actual review. The results of this case study are also not intended to represent the actual results of the Company.** Our intent is to illustrate and discuss many of the issues that we consider during our analysis, in order to make reasonable selections. The calculations involved in the process will also be explained.

The identities for loss reserves are also relevant for LAE reserves, as follows:

Required LAE Reserves = Total Indicated Ultimate LAE – Total Paid LAE

LAE Reserve Adequacy = Held LAE Reserves – Required LAE Reserves

Ultimate LAE is derived differently for each of the two major LAE categories (DCC and A&O). In general, we attempt to determine how these expenses will develop in the future based on how they developed in the past. In order to make reasonable selections, we look at several parameters and also consider the business issues that underlie the data.

We include several exhibits in our reviews to summarize our analysis that are also used in our discussions with the relevant business units. In this section, we present and describe Exhibit DCC and Exhibit ADJ, which summarizes the DCC expense analysis and the A&O expense analysis, respectively. Each exhibit is followed by an explanation of the calculations and a discussion of some of the issues that may be involved in the underlying data, as well as certain judgments we make in the selection process. We also discuss how different components of the analysis relate to each other.

Note that the DCC and A&O reserve reviews for a segment are usually done in the same month as a loss reserve review for that segment. Therefore, when loss projections are used in the DCC review, they are based on the projections from the loss review. Also note that rounding in the exhibits, as well as the order of calculation, may make some of the figures in the case study appear slightly out of balance.

Exhibit DCC – Defense and Cost Containment Reserve Analysis

This exhibit summarizes our accident period analysis of the adequacy of DCC reserves for this segment. The claims are sorted and analyzed by accident date using 6-month accident periods (i.e., accident semesters). Each accident semester represents all claims that have occurred during the 6-month period ending at the end of the designated month (in the left-hand column of the exhibit).

The information on Exhibit DCC is summarized as follows:

- **COLUMNS (1) through (3):** Estimated ultimate DCC, resulting required reserves, and reserve adequacy resulting from three different sets of projections.

- **COLUMNS (4) through (6):** Paid DCC as of the evaluation date of September 30th, 2015, stated in total as well as broken out by expense type.

- **COLUMNS (7) and (8):** Estimated ultimate DCC broken out by expense type.

- **COLUMN (9):** Indicated ultimate DCC which has been selected by the Loss Reserving group considering all information obtained during the analysis, along with the resulting required reserves and reserve adequacy

- **COLUMNS (10) and (11):** Estimated ultimate utilization ratio by expense type, along with the 4-point and 8-point fitted exponential trends.

- **COLUMNS (12) and (13):** Estimated ultimate losses and loss counts.

- **COLUMNS (14) through (17):** Earned Premium, Earned Exposures, Pure Premium, and Estimated Ultimate Loss Severity.

- **COLUMN (18):** The current and indicated ratio of DCC reserves to loss reserves.

- **COLUMNS (19) and (20):** Estimated ultimate DCC severity by expense type, along with the 4-point and 8-point fitted exponential trends.

- **COLUMNS (21) through (23):** Estimated ultimate DCC-to-Loss ratios using each of the three projections of ultimate DCC from Columns (1) through (3).

- **COLUMN (24):** Indicated ultimate DCC-to-Loss ratio.

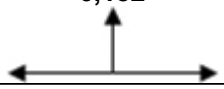
- **COLUMNS (25) and (26):** Estimated ultimate DCC-to-Loss ratio by expense type.

Since this is an accident period analysis, it measures the adequacy of our total DCC expense reserves (case + IBNR). In other words, the estimated ultimate amounts for each accident period include DCC expenses for claims that have already been reported plus DCC expenses for claims that have occurred but not yet been reported.

In the following illustration, we discuss the analysis of total DCC, followed by the analyses of its two major components: Attorney & Legal and Medical & Other.

Total DCC Expense Analysis

The table below is a section from Exhibit DCC. It summarizes our selection of the estimated ultimate total DCC expenses by accident semester for the four most recent accident years.

Semiannual Accident Periods Ending	(1) (Proj Pd Trgl) Paid DCC Method Ult ($000)	(2) = (12) × (22) Paid DCC to Paid Loss Method Ult ($000)	(3) = (7) + (8) Att & Legal + Med & Oth Method Ult ($000)	(4) Paid Total DCC To Date ($000)	(9) use (1),(2),(3) **Selected Ultimate DCC Total ($000)**
Mar-2012	646	656	609	569	**637**
Sep-2012	956	988	903	766	**949**
Mar-2013	943	998	889	634	**943**
Sep-2013	1,165	1,218	1,101	554	**1,162**
Mar-2014	921	897	869	284	**896**
Sep-2014	1,071	1,091	1,050	178	**1,071**
Mar-2015	1,125	1,123	1,223	68	**1,157**
Sep-2015	1,612	1,667	1,656	10	**1,645**
Total	11,617	11,823	11,297	**6,182**	**11,579**
Paid DCC	6,182	6,182	6,182		**6,182**
	5,436	**5,641**	**5,115**	**Required Reserves**	**5,397**
	5,089	**5,089**	**5,089**	**Held Reserves**	**5,089**
	(346)	**(552)**	**(26)**	**Reserve Adequacy**	**(308)**

Columns (1) through (3) contain three projections that we typically use to estimate the ultimate amount of DCC expenses by accident semester (shown in column 9). We use three projections (columns (1), (2), and (3)) to select the ultimate DCC amounts shown in column (9). For more recent accident periods, the existing data may be volatile since newer claims may take several years from the accident date for the majority of DCC expenses to be paid. For example, in the September 2015 accident period, we are selecting ultimate expenses of $1,645,000, while only $10,000 has been paid to date, as shown in column (4).

For the Paid DCC projections (column (1)), we project the paid DCC expenses to ultimate amount by organizing the historical paid DCC amounts in a triangular format (by accident period and by evaluation period).

Column (2) is the Paid DCC to Paid Loss or Paid-to-Paid projection. Similar to other projections, this one organizes the data in a triangular format, with each data point in the triangle being the ratio of paid DCC expense to paid loss. We project the ultimate Paid-to-Paid ratio by accident period, as shown in column (22). This ultimate ratio is then multiplied by the ultimate projected losses (as derived from analysis of the losses, and shown here in column (12)) for each respective accident period. The result, in column (2), is the estimated ultimate DCC expense amount for each accident period. The following chart illustrates this calculation:

Semiannual Accident Periods Ending	(22) (Proj Pd/Pd) Paid to Paid Ult DCC/Loss	(12) (Proj Loss Trgl) Indicated Ultimate Loss ($000)	(2) = (22) × (12) Paid DCC to Paid Loss Method Ult ($000)
Mar-2012	8.9%	7,375	656
Sep-2012	12.4%	7,944	988
Mar-2013	10.1%	9,849	998
Sep-2013	10.5%	11,640	1,218
Mar-2014	9.1%	9,877	897
Sep-2014	10.0%	10,969	1,091
Mar-2015	10.1%	11,142	1,123
Sep-2015	12.7%	13,091	1,667

Column (3) shows our third projection, the sum of Ultimate Medical & Other DCC from column (7) and Ultimate Attorney & Legal DCC from column (8). The expense dollars for these components are obtained by making projections of the utilization ratios and severities for the Attorney & Legal versus Medical & Other components of DCC expenses, using the following identity:

$$\textbf{Expense Dollars} = \textbf{Utilization Ratio} \times \textbf{Loss Counts} \times \textbf{Expense Severity}$$

$$\textbf{Utilization Ratio} = \frac{\textbf{Expense Counts}}{\textbf{Loss Counts}}$$

The utilization ratios and severities for each component are projected from triangles of the historical utilization ratios and severities for each component.

The following chart shows the indicated utilization ratios for each component by accident semester:

Semiannual Accident Periods Ending	(10) (Proj Util Trgl) Indicated Attorney Utilization	(11) (Proj Util Trgl) Indicated Medical Utilization
Mar-2012	14.7%	13.3%
Sep-2012	10.4%	11.0%
Mar-2013	14.7%	12.6%
Sep-2013	14.4%	14.5%
Mar-2014	10.0%	8.6%
Sep-2014	12.2%	12.6%
Mar-2015	12.0%	12.4%
Sep-2015	15.0%	12.5%
4-pt Exp Tr	27.4%	25.1%
8-pt Exp Tr	-0.2%	-0.9%

The following chart shows the indicated severities for each component by accident semester:

Semiannual Accident Periods Ending	(19) (Proj Sev Trgl) Indicated Att & Legal Severity	(20) (Proj Sev Trgl) Indicated Med & Oth Severity
Mar-2012	2,308	148
Sep-2012	4,621	193
Mar-2013	2,949	180
Sep-2013	3,942	177
Mar-2014	4,174	251
Sep-2014	4,200	241
Mar-2015	4,250	260
Sep-2015	4,400	270
4-pt Exp Tr	3.5%	6.0%
8-pt Exp Tr	13.2%	18.0%

As mentioned earlier, DCC utilization and severity are used to calculate our projections of ultimate DCC expenses for each component. The following exhibit illustrates this calculation for the Attorney & Legal component of total DCC:

Semiannual Accident Periods Ending	(10) (Proj Util Trgl) Indicated Attorney Utilization	(13) (Proj Ct Trgl) Indicated Ultimate Loss Counts	(19) (Proj Sev Trgl) Indicated Att & Legal Severity	(8) = (10) × (13) × (19) Indicated Ult Att & Legal ($000)
Mar-2012	14.7%	1,695	2,308	576
Sep-2012	10.4%	1,796	4,621	865
Mar-2013	14.7%	1,951	2,949	845
Sep-2013	14.4%	1,855	3,942	1,054
Mar-2014	10.0%	1,985	4,174	827
Sep-2014	12.2%	1,939	4,200	991
Mar-2015	12.0%	2,256	4,250	1,151
Sep-2015	15.0%	2,387	4,400	1,575

The following identities are used in the calculations above:

Expense Counts	=	**Utilization Ratio** × **Loss Counts**	=	(10) × (13)
Expense Severity	=	**Expense Dollars / Expense Counts**	=	(19)
Expense Dollars	=	**Expense Count** × **Expense Severity**	=	(10) × (13) × (19)

Once we have our three projections, we calculate the required reserves and the reserve adequacy for each of the three projections and for the selected amounts by using the identities:

Required DCC Expense Reserves	=	**Total Indicated Ultimate DCC Expenses**	–	**Total Paid DCC Expenses**

DCC Expense Reserve Adequacy	=	**Held DCC Expense Reserves**	–	**Required DCC Expense Reserves**

The results are shown at the bottom of columns (1) through (3) and (9). For this segment, we determined that our **DCC expense reserves are inadequate by $308,000**. As a result of this analysis, we may increase our reserves by changing the case averages and the IBNR factors for the DCC expense category.

When making selections for many of the DCC segments we tend to give greater weight to the Paid-to-Paid projection because the legal costs for claims tend to be related to their loss costs. Although the losses may develop at a different rate than the expenses, the ultimate relationship tends to be consistent over time.

However, there can be changes in the claim adjustment process that would potentially cause this relationship to change. This may be due to changes in the legal/regulatory environment or to changes in the Company's loss adjustment process. We discuss these issues with Claims to better understand the underlying data. We use additional approaches in our projections for segments in which we observe process changes, because the historical development may be less relevant for the future.

The following table shows the ratios of ultimate DCC expense dollars to ultimate loss dollars for this segment over the past eight accident semesters for the three methods:

(12) Indicated Ultimate Loss ($000)	Semiannual Accident Periods Ending	(21) = (1) / (12) Paid Ult DCC/Loss	(22) (Proj Pd/Pd) Paid to Paid Ult DCC/Loss	(23) = (3) / (12) Att & Legal + Med & Oth Ult DCC/Loss	**(24) = (9) / (12) Selected Ultimate DCC/Loss**
7,375	Mar-2012	8.8%	8.9%	8.3%	**8.6%**
7,944	Sep-2012	12.0%	12.4%	11.4%	**11.9%**
9,849	Mar-2013	9.6%	10.1%	9.0%	**9.6%**
11,640	Sep-2013	10.0%	10.5%	9.5%	**10.0%**
9,877	Mar-2014	9.3%	9.1%	8.8%	**9.1%**
10,969	Sep-2014	9.8%	10.0%	9.6%	**9.8%**
11,142	Mar-2015	10.1%	10.1%	11.0%	**10.4%**
13,091	Sep-2015	12.3%	12.7%	12.7%	**12.6%**

Each of the **DCC/Loss Ratios**	=	**Ultimate DCC Dollars for the Period *** / **Ultimate Loss Dollars for the Period**	* from each of the projections

As discussed above for the Paid-to-Paid projection, the ultimate DCC/Loss ratios in column (22) are projections based on a triangle of the historical ratios of paid DCC to paid loss. The selected ultimate DCC/Loss ratios in column (24) use our selected ultimate DCC expense dollars from column (9).

For this segment, the DCC/Loss ratios have been fluctuating over the past four accident years, but the last four semesters are showing an increasing trend. In this example, we began spending more on DCC in an attempt to keep our total loss severity lower. This may be due to higher amounts spent on each claim (severity) and/or a higher proportion of claims utilizing DCC.

It is also useful to compare the sum of the DCC expense components to the total using the ratio of ultimate DCC expense dollars to loss dollars.

Semiannual Accident Periods Ending	(25) = (8) / (12) Indicated Attorney & Legal / Loss $	(26) = (73) / Indicated Medical & Other / Loss $	(23) = (3) / (12) Att & Legal + Med & Oth Ult DCC/Loss	**(24) = (9) / (12) Selected Ultimate DCC/Loss**
Mar-2012	7.8%	0.5%	8.3%	**8.6%**
Sep-2012	10.9%	0.5%	11.4%	**11.9%**
Mar-2013	8.6%	0.5%	9.0%	**9.6%**
Sep-2013	9.1%	0.4%	9.5%	**10.0%**
Mar-2014	8.4%	0.4%	8.8%	**9.1%**
Sep-2014	9.0%	0.5%	9.6%	**9.8%**
Mar-2015	10.3%	0.7%	11.0%	**10.4%**
Sep-2015	12.0%	0.6%	12.7%	**12.6%**

The above DCC/Loss ratios use the ultimate DCC expense dollars for each of the components and the total. We also show the Selected Ultimate DCC/Loss ratios. Since the Medical & Other expenses make up only a small proportion of the total DCC expense dollars for this segment, the DCC/Loss ratios are driven by the Attorney & Legal component.

The contribution of the utilization and severity parameters to the total DCC expense dollars is also relevant in the analysis of each DCC expense component. In order to make the most appropriate reserve change for DCC expenses, we have to be comfortable with each of the parameters for each of the components in the analysis.

The final parameter to consider is the ratio of DCC reserves to loss reserves, as shown in column (18) below.

DCC Reserves / Loss Reserves	(18)
Current Reserve to Reserve Ratio:	16.4%
Indicated Reserve to Reserve Ratio:	19.0%

This is a final check for reasonableness of other selections. We expect this ratio to be fairly consistent over time for a given segment. If there is a significant change from one review to the next, we may look at the ratio by accident period, which could indicate a change in the claim adjustment process. These observations would be discussed with Claims to get a better understanding of any process changes. For this segment, the indicated ratio is higher than the current ratio because our DCC reserves indicated inadequacy.

Exhibit DCC

State LMN Auto BI DCC (ALAE) as of September 30, 2015

ESTIMATED ULTIMATE DCC - ACCIDENT PERIOD ANALYSIS

Semiannual Accident Periods Ending	(1) (Proj Pd Trgl) Paid DCC Method Ult ($000)	(2) = (12) x (22) Paid DCC to Paid Loss Method Ult ($000)	(3) = (7) + (8) Att & Legal + Med & Oth Method Ult ($000)	(4) Paid Total DCC To Date ($000)	(5) Paid Med & Oth To Date ($000)	(6) Paid Att & Legal To Date ($000)	(7) = (11) x (13) x (20) **Indicated Ultimate Med & Oth**	(8) = (10) x (13) x (19) **Indicated Ultimate Att & Legal**	(9) use (1), (2), (3) **Selected Ultimate DCC Total**		(10) (Proj Util Trgl) **Indicated Attorney Utilization**	(11) (Proj Util Trgl) **Indicated Medical Utilization**
Prior 3 Years	3,178	3,184	2,995	3,119	194	2,925	**184**	**2,811**	**3,119**			
Mar-2012	646	656	609	569	34	535	**33**	**576**	**637**		**14.7%**	**13.3%**
Sep-2012	956	988	903	766	37	729	**38**	**865**	**949**		**10.4%**	**11.0%**
Mar-2013	943	998	889	634	39	595	**44**	**845**	**943**		**14.7%**	**12.6%**
Sep-2013	1,165	1,218	1,101	554	35	519	**47**	**1,054**	**1,162**		**14.4%**	**14.5%**
Mar-2014	921	897	869	284	22	261	**43**	**827**	**896**		**10.0%**	**8.6%**
Sep-2014	1,071	1,091	1,050	178	21	157	**59**	**991**	**1,071**		**12.2%**	**12.6%**
Mar-2015	1,125	1,123	1,223	68	11	57	**73**	**1,151**	**1,157**		**12.0%**	**12.4%**
Sep-2015	1,612	1,667	1,656	10	5	5	**81**	**1,575**	**1,645**		**15.0%**	**12.5%**
Total	11,617	11,823	11,297	6,182	398	5,784	**602**	**10,694**	**11,579**			
Paid DCC	6,182	6,182	6,182				**398**	**5,784**	**6,182**	4pt Trend	27.4%	25.1%
										8pt Trend	-0.2%	-0.9%
Required Reserve	**5,436**	**5,641**	**5,115**				**204**	**4,911**	**5,397**			
Held Reserve	**5,089**	**5,089**	**5,089**						**5,089**			
Reserve Adequacy	**(346)**	**(552)**	**(26)**						**(308)**			

Semiannual Accident Periods Ending	(12) (Proj Loss Trgl) Indicated Ultimate Loss ($000)	(13) (Proj Ct Trgl) Indicated Ultimate Loss Counts	(14) Earned Premium ($000)	(15) Earned Exposures	(16) Pure Premium	(17) Indicated Ultimate Loss Severity	(18)		(19) (Proj Sev Trgl) Indicated Att. & Legal Severity	(20) (Proj Sev Trgl) Indicated Med. & Oth. Severity
Prior 3 Years	55,956	11,858	110,303	415,310	135	4,719				
Mar-2012	7,375	1,695	16,893	65,209	113	4,351			2,308	148
Sep-2012	7,944	1,796	17,808	71,798	111	4,423			4,621	193
Mar-2013	9,849	1,951	19,990	81,197	121	5,048			2,949	180
Sep-2013	11,640	1,855	22,326	86,394	135	6,275			3,942	177
Mar-2014	9,877	1,985	23,173	88,720	111	4,976			4,174	251
Sep-2014	10,969	1,939	23,898	95,008	115	5,657			4,200	241
Mar-2015	11,142	2,256	24,471	103,970	107	4,939	Current Reserve to Reserve Ratio:	16.4%	4,250	260
Sep-2015	13,091	2,387	27,766	119,015	110	5,484	Indicated Reserve to Reserve Ratio:	19.0%	4,400	270
	137,843	27,722	286,629	1,126,621	-2.2%	3.2%			3.5%	6.0%
									13.2%	18.0%

Semiannual Accident Periods Ending	(21) = (1) / (12) Paid Ult DCC/Loss	(22) (Proj Pd/Pd) Paid to Paid Ult DCC/Loss	(23) = (3) / (12) Att & Legal + Med & Oth Ult DCC/Loss	(24) = (9) / (12) Indicated Ultimate DCC/Loss $	(25) = (8) / (12) Indicated Attorney & Legal/Loss $	(26) = (7) / (12) Indicated Medical & Other/Loss $
Prior 3 Years	5.7%	5.7%	5.4%	5.6%	5.0%	0.3%
Mar-2012	8.8%	8.9%	8.3%	8.6%	7.8%	0.5%
Sep-2012	12.0%	12.4%	11.4%	11.9%	10.9%	0.5%
Mar-2013	9.6%	10.1%	9.0%	9.6%	8.6%	0.5%
Sep-2013	10.0%	10.5%	9.5%	10.0%	9.1%	0.4%
Mar-2014	9.3%	9.1%	8.8%	9.1%	8.4%	0.4%
Sep-2014	9.8%	10.0%	9.6%	9.8%	9.0%	0.5%
Mar-2015	10.1%	10.1%	11.0%	10.4%	10.3%	0.7%
Sep-2015	12.3%	12.7%	12.7%	12.6%	12.0%	0.6%

Exhibit ADJ – Adjusting and Other Expense Reserve Analysis

This exhibit summarizes our analysis of the adequacy of A&O reserves for this segment. The data is sorted and analyzed by accident date using 6-month (i.e., semi-annual) periods.

The information on Exhibit ADJ is summarized as follows:

- **COLUMN (1):** Estimated ultimate A&O, resulting required reserves, and reserve adequacy in total for all coverages
- **COLUMNS (2) thru (5):** Estimated ultimate A&O, resulting required reserves, and reserve adequacy for each individual coverage
- **COLUMN (6):** Property Damage earned exposures by period
- **COLUMN (7):** Earned Premium by period
- **COLUMN (8):** Calendar Semester charged A&O amount
- **COLUMN (9):** Ratio of Calendar Semester charged A&O to Calendar Semester earned premium
- **COLUMN (10):** Ratio of Calendar Semester charged A&O to Calendar Semester earned exposures
- **COLUMN (11):** Count of Claims with Charged A&O
- **COLUMN (12):** Ratio of Calendar Semester charged A&O to A&O counts
- **COLUMN (13):** Ultimate Accident Semester charged A&O amount
- **COLUMN (14):** Ratio of Ultimate Accident Semester charged A&O to Calendar Semester earned premium
- **COLUMN (15):** Ratio of Ultimate Accident Semester charged A&O to Calendar Semester earned exposures

In 2014, we implemented a new methodology for reserving A&O costs. Over the course of the year, all A&O reviews were phased over from the old methodology to the new one.

Based on internal studies of various claims functions, we are now able to allocate A&O charges into various segments by state, coverage, and accident year. This allows us to build various accident year triangles, which we then use to develop charged A&O to ultimate, in a manner similar to what we've already shown for the Loss and DCC components earlier in this report.

For each coverage being reviewed, we will look at two different triangles as follows:

1. Charged A&O Dollars (also known as the Development Method)
2. Ratio of Charged A&O Dollars to Property Damage earned exposures (also known as the Ratio Method. We use PD EE to have a consistent denominator in order to aggregate and compare to total ratios of A&O per EE.

The following is an example of the first triangle mentioned above – Charged A&O Dollars. For presentation purposes, we are only showing the 6 most recent accident periods of raw data, and 6 periods of LDFs and CDFs. Note that in an actual review, we look at the 14 most recent accident periods.

State XYZ Auto Charged Adjusting & Other (ULAE)

Accd Date	1	2	3	4	5	6	Ultimate A&O
201306	809,168	1,233,201	1,450,515	1,565,281	1,631,776	1,667,594	**1,707,323**
201312	646,961	1,104,492	1,334,138	1,449,338	1,516,810	1,544,515	**1,581,312**
201406	770,750	1,226,937	1,465,007	1,591,331	1,658,167	1,688,455	**1,728,681**
201412	871,013	1,437,194	1,691,196	1,833,612	1,910,623	1,945,523	**1,991,573**
201506	832,601	1,311,581	1,555,536	1,686,527	1,757,361	1,789,461	**1,832,094**
201512	914,403	1,488,263	1,765,080	1,913,717	1,994,093	2,030,517	**2,078,893**

	1 - 2	2 - 3	3 - 4	4 - 5	5 - 6	6 - 7
201306	1.524	1.176	1.079	1.042	1.022	
201312	1.707	1.208	1.086	1.047		
201406	1.592	1.194	1.086			
201412	1.650	1.177				
201506	1.575					
Wtd Avg All	1.584	1.166	1.076	1.038	1.020	1.011
Avg L6 xHiLo	1.631	1.185	1.084	1.042	1.020	1.010
Wtd Avg L4	1.628	1.188	1.084	1.039	1.018	1.009
Select	**1.628**	**1.186**	**1.084**	**1.042**	**1.018**	**1.009**
CDF	2.273	1.397	1.178	1.086	1.043	1.024

Accd Sem	**Dec-2014**	**Jun-2014**	**Dec-2013**	**Jun-2013**	**Dec-2012**	**Jun-2012**
Ultimate A&O	**2,078,893**	**1,832,094**	**1,991,873**	**1,728,681**	**1,581,312**	**1,707,323**
A&O to PD EE	**25.3**	**23.0**	**25.5**	**22.6**	**20.8**	**22.7**
A&O to EP	**11.4%**	**10.3%**	**11.4%**	**10.0%**	**9.2%**	**9.9%**
PD EE	**82,223**	**79,619**	**78,207**	**76,370**	**76,083**	**75,183**
EP	**18,219,597**	**17,825,203**	**17,532,001**	**17,210,576**	**17,111,974**	**17,183,389**

The triangle is set up very similarly to the triangles that we've shown in previous sections. Based on the triangle, we calculate age-to-age LDFs, or link ratios in a triangular format, for each successive pair of data points on the triangle. The purpose of this is to see how A&O has developed over time.

These historical link ratios, along with judgment, are used to estimate how A&O will develop in the future. The selected age-to-age factors are in **blue**. We then multiply the age-to-age factors to get a CDF for each age, which is then multiplied by the appropriate value along the last diagonal of the triangle to get Ultimate A&O by accident semester. The Ultimate values are shown in the right-most column.

Our second method – the Ratio of Charged A&O Dollars to Property Damage earned exposures –is set up the same way, except for one difference. Instead of using multiplicative LDFs, we use additive LDFs. An example of this triangle is as follows:

State XYZ Auto Ratio of Charged A&O to PD EEs

Accd Date	1	2	3	4	5	6	Ultimate Ratio	Ultimate A&O
201306	10.76	16.40	19.29	20.82	21.70	22.18	**22.77**	**1,711,834**
201312	8.50	14.52	17.54	19.05	19.94	20.38	**20.96**	**1,595,056**
201406	10.09	16.07	19.18	20.84	21.70	22.14	**22.73**	**1,735,551**
201412	11.14	18.38	21.62	23.21	24.07	24.51	**25.10**	**1,962,899**
201506	10.46	16.47	19.58	21.17	22.03	22.47	**23.06**	**1,835,806**
201512	11.12	17.43	20.54	22.13	22.99	23.43	**24.02**	**1,974,650**

	1 - 2	2 - 3	3 - 4	4 - 5	5 - 6	6 - 7
201306	5.64	2.89	1.53	0.88	0.48	
201312	6.01	3.02	1.51	0.89		
201406	5.97	3.12	1.65			
201412	7.24	3.25				
201506	6.02					
Avg All	6.56	2.98	1.58	0.86	0.46	0.27
Avg L6 xHiLo	6.24	3.03	1.59	0.92	0.45	0.24
Avg L4	6.31	3.07	1.59	0.78	0.42	0.23
Select	**6.31**	**3.11**	**1.59**	**0.86**	**0.44**	**0.23**
CDF	12.89	6.58	3.47	1.89	1.03	0.59

Accd Sem	**Dec-2014**	**Jun-2014**	**Dec-2013**	**Jun-2013**	**Dec-2012**	**Jun-2012**
Ultimate A&O	**1,974,650**	**1,835,806**	**1,962,899**	**1,735,551**	**1,595,056**	**1,711,834**
A&O to PD EE	**24.0**	**23.1**	**25.1**	**22.7**	**21.0**	**22.8**
A&O to EP	**10.8%**	**10.3%**	**11.2%**	**10.1%**	**9.3%**	**10.0%**
PD EE	**82,223**	**79,619**	**78,207**	**76,370**	**76,083**	**75,183**
EP	**18,219,597**	**17,825,203**	**17,532,001**	**17,210,576**	**17,111,974**	**17,183,389**

Once we have projected ultimate A&O using the two different triangle methods, we use that information, along with actuarial judgment to select a final required reserve amount. We do this for each coverage that is being reviewed.

For our sample review, State XYZ, we simply take a simple average of the indications produced by the Development Method Triangle and the Ratio Method Triangle. In an actual review, we may put different weights on the two triangle methods if we have reason to believe one method will be more appropriate over the other.

The following excerpt from Exhibit ADJ shows the indications and implied adequacy by coverage and in total that are obtained by carrying out the analysis described above. We get to the required reserves by taking the indicated ultimate A&O and subtracting out charged A&O to date.

	(1) Total	(2) BI	(3) UMBI	(4) PhysDmg	(5) Other
Development Method Ultimate	3,625	2,287	763	232	343
Ratio Method Ultimate	3,440	2,186	652	240	362
Required Reserves	3,532	2,236	708	236	352
Held Reserves	3,486	2,268	637	213	368
Reserve Adequacy	(47)	32	(70)	(24)	15

As part of the review, we will also look at various trends and other parameters that help us understand and explain what types of things are driving the indication. The following excerpt from Exhibit ADJ illustrates this:

	Calendar Semester Charged A&O						**Accident Semester Charged A&O**		
	(8)	(9)	(10)	(11)	(12)		(13)	(14)	(15)
	Amount *($000s)*	**to EP**	**to EE**	**Count**	**per Count**		**Amount** *($000s)*	**to EP**	**to EE**
Prior 3 Yrs	34,289	10.1%	$85.33	161,716	$212.03	Prior 3 Yrs	35,036	10.3%	$87.19
Jun-2012	5,520	8.9%	$74.83	27,991	$197.21	Jun-2012	5,051	8.2%	$68.46
Dec-2012	5,353	8.6%	$71.54	30,062	$178.07	Dec-2012	5,281	8.5%	$70.68
Jun-2013	5,235	8.3%	$69.63	27,584	$189.78	Jun-2013	5,107	8.1%	$67.93
Dec-2013	5,198	8.1%	$68.32	32,021	$162.34	Dec-2013	5,388	8.4%	$70.82
Jun-2014	5,324	8.0%	$69.72	29,464	$180.71	Jun-2014	5,548	8.4%	$72.64
Dec-2014	6,838	10.0%	$87.43	33,010	$207.15	Dec-2014	6,876	10.0%	$87.92
Jun-2015	5,471	7.8%	$68.72	30,470	$179.56	Jun-2015	5,435	7.7%	$68.27
Dec-2015	5,445	7.5%	$66.22	30,788	$176.85	Dec-2015	5,556	7.6%	$67.57
2 Year Trend	-3.1%	-9.0%	-7.6%	1.0%	-4.1%	2 Year Trend	-4.5%	-10.3%	-9.0%
4 Year Trend	2.0%	-2.8%	-0.9%	2.9%	-0.8%	4 Year Trend	4.2%	-0.7%	1.3%

On a calendar semester basis, we look at the ratio of Calendar Semester charged A&O per dollars of earned premium, per earned exposure, and per claim. On an accident semester basis, we look at ratios of Accident Semester Charged A&O per dollar of earned premium and per earned exposure.

Exhibit ADJ

PROGRESSIVE CORPORATION

State XYZ Auto Adjusting & Other (ULAE) Summary as of December 31, 2014

All amounts in $000's	(1) Total	(2) BI	(3) UMBI	(4) PhysDmg	(5) Other
Development Method Ultimate	3,625	2,287	763	232	343
Ratio Method Ultimate	3,440	2,186	652	240	362
Required Reserves	3,532	2,236	708	236	352
Held Reserves	3,486	2,268	637	213	368
Reserve Adequacy	(47)	32	(70)	(24)	15
Avg All	255	87	54	17	97
Avg L6 xHiLo	49	22	(28)	16	39
Avg L4	(94)	60	(115)	(54)	15

	(6) PD EEs (000s)	(7) EP ($000s)
Prior 3 Yrs	402	340,416
Jun-2012	74	61,965
Dec-2012	75	62,320
Jun-2013	75	63,007
Dec-2013	76	63,913
Jun-2014	76	66,143
Dec-2014	78	68,555
Jun-2015	80	70,418
Dec-2015	82	72,771
2 Year Trend	4.9%	6.5%
4 Year Trend	2.9%	4.9%

Calendar Semester Charged A&O

	(8) Amount ($000s)	(9) to EP	(10) to EE	(11) Count	(12) per Count
Prior 3 Yrs	34,289	10.1%	$85.33	161,716	$212.03
Jun-2012	5,520	8.9%	$74.83	27,991	$197.21
Dec-2012	5,353	8.6%	$71.64	30,062	$178.07
Jun-2013	5,235	8.3%	$69.63	27,584	$189.78
Dec-2013	5,198	8.1%	$68.32	32,021	$162.34
Jun-2014	5,324	8.0%	$69.72	29,464	$180.71
Dec-2014	6,838	10.0%	$87.43	33,010	$207.15
Jun-2015	5,471	7.8%	$68.72	30,470	$179.56
Dec-2015	5,445	7.5%	$66.22	30,788	$176.85
2 Year Trend	-3.1%	-9.0%	-7.6%	1.0%	-4.1%
4 Year Trend	2.0%	-2.8%	-0.9%	2.9%	-0.8%

Accident Semester Charged A&O

	(13) Amount ($000s)	(14) to EP	(15) to EE
Prior 3 Yrs	35,036	10.3%	$87.19
Jun-2012	5,051	8.2%	$68.46
Dec-2012	5,281	8.5%	$70.68
Jun-2013	5,107	8.1%	$67.93
Dec-2013	5,388	8.4%	$70.82
Jun-2014	5,548	8.4%	$72.64
Dec-2014	6,876	10.0%	$87.92
Jun-2015	5,435	7.7%	$68.27
Dec-2015	5,556	7.6%	$67.57
2 Year Trend	-4.5%	-10.3%	-9.0%
4 Year Trend	4.2%	-0.7%	1.3%

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