The Scorecard System
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The Scorecard System

Abstract

The basic concept of a "scorecard system" has been part of the actuarial literature for many years. This concept measures the accuracy of previously estimated losses against the most current estimates. Retrospective or "after the fact" tests are other names which convey the concept. The keeping of a scorecard and following the outcome year by year or quarter by quarter is the basic idea.

Whenever any loss reserving method is applied to a given set of data, there is a need to test. The scorecard system presented in this paper tests loss reserve methods, thereby helping the actuary determine the most accurate reserving method for a specific application. It is an excellent tool to be used any time, but it is specifically applicable to the "first-time" loss reserving situations.

The presentation is called the "scorecard" system because it keeps the score "inning by inning" until the "game is over" and all the losses are paid.

The Scorecard System

Introduction

This paper is written with the conviction that actuaries should track the accuracy of their estimates. Many actuaries already use some form of a scorecard test in their daily work, but some do not. The retrospective or after the fact testing system is a scorecard against which actuarial methods and wisdom can be judged. It acts as an alarm bell which alerts us to system faults and points out possible repairs.

The scorecard concept is not new. Similar concepts can be found in statistical textbooks. The name of the concept will not be called scorecard but rather something such as "hindcasting". This paper applies the concept to loss reserving.

The paper presents a system which compares the accuracy of competing actuarial methods. The system was developed and written for the actuary who is mainly presented with a line of business (or state, division, layer of loss, etc.) for the first time and is asked to express an opinion about the ultimate losses and, of course, the reserves. This situation arises for reserving actuaries when they change jobs or consult with a new client. However, it may certainly be used by an actuary who wants to add a new method to an existing analysis or wants to get a fresh start with an old assignment. It is a valuable system to test a new loss reserving method.

The Scorecard System

The scorecard system is a robust test as it may be used in conjunction with any loss reserve method no matter its complexity. It requires mainly logic and the knowledge of arithmetic rather than loss distributions assumptions, covariance terms or Monte Carlo simulation. However, the scorecard system is essential to test the more theoretically based projection methods as it promotes accountability and acceptability at the same time.

Section 1 of this paper begins with a simplified, although typical, description of a "first-time" loss reserving analysis. It then describes how the scorecard system can be applied to the first-time reserving situation. In Section 2, an example is provided which illustrates the technique. Section 3 summarizes the technique and notes its wider application.

The Scorecard System

Section 1 - The Scorecard Test

The First-Time Loss Reserve Analysis

The simplified version of a first-time actuarial analysis may occur as follows: The actuary receives the loss data triangles (assuming it has no data problems) from the computer department or client and runs several reserve methods. These methods may include the traditional loss development (or chain ladder) method for both paid losses and case incurred losses, a so-called Bornhuetter/Ferguson method with pricing information for the a priori loss ratios and the loss ratio method. All of these methods produce estimates of ultimate losses using the most recent valuation of paid and case incurred losses. The methods' results are averaged to produce the final estimate of ultimate losses. The paid losses are subtracted from the estimated ultimate losses to arrive at the total liability (case outstanding and IBNR) estimate. The actuary produces a report discussing the assumptions and the conclusions and sends it to the CFO or client company.

The story has no mention of comparing past loss estimates with the current loss estimates. How could the loss reserve method be tested in this fashion because this is the first time the actuary has performed the analysis so there are no prior estimates? Does the comparison have to wait for the next year to provide a one year test?

The Scorecard System

How The Scorecard System Can Be Conducted

There is a way to unite the scorecard system and a first-time analysis.

Keeping the traditional incurred loss triangle in mind, the actuary must strip away the most recent one, two, three or more diagonals (or valuations) of data. By doing so, the actuary turns back the clock and projects the ultimate losses as if the more recent diagonals did not exist. The actuary would then add the next diagonal and re-project the ultimate losses. The actuary repeats the process until the most recent diagonal of the data is used. This approach builds a history quickly from which to construct a scorecard system. A similar process would be used for all of the methods being considered (e.g., paid loss development, loss ratio method, Bornhuetter/Ferguson method, etc.).

Considerations in the Application of the Scorecard System

The actuary should strive for consistency with each valuation of the method. One way to quickly and conveniently achieve consistency is to computerize the formula which calculates the link ratios. By doing so, the actuary is testing the method's (and the formula's) ability to overcome changes in the data which arise from internal and external environment sources.

The Scorecard System

If the actuary's practice is to select link ratios "by eye" the scorecard system would become more time consuming since there would be several diagonals (not to mention lines of business, layers of loss, profit centers, etc.) for which to make selections. Moreover, there is a consistency issue which arises. Would the same actuary given the same data "pick" the same link ratios on a different day or under different political pressures?

However, there are situations, one can argue, which require judgment in the selection of link ratios. Consider a processing change which leads to case outstanding reserves being setup more quickly in the middle of the loss triangle history. Barring an adjustment to the data or use of an alternative method less sensitive to the change, judgment in link ratio selection is required. However, link ratio selections made to "pretty up" the scorecard (i.e., minimize runoff) should be avoided. Future adverse runoff is almost a certainty. Judgment which is applied consistently and based on solid facts can be a part of the scorecard system.

Other aspects of consistency are described below.

- Let's say, for example, an actuary begins the process using a six year average link ratio, but decides halfway through the latest three average is better. The actuary is advised to complete the analysis two ways: 1) using the six year average link ratios for the first set of projections and 2) using the three year average link ratios for the second set of projections. Having two distinct sets of projections is preferable to having half of the projections using six year averages and the other half using three year averages.

  This approach allows the actuary to focus on the effect of one change (e.g., number of years in the average) at time. In addition, it is not terribly costly or time consuming given the advancement of computer processing and storage abilities.

- If the actuary initially uses a tail factor and then decides halfway through the process one is not needed, it is recommended that the tail be void throughout. In all cases, the tail factor should be consistently applied.

- The actuary should <u>not</u> "work backwards." In other words, the actuary should <u>not</u> start with the most recent valuation, determine the final estimates, then apply "judgment" to the prior valuations that would result in little or no runoff. It may be easiest to avoid this trap if the actuary starts with the oldest data first and works forward.

- Do not combine different loss reserve methods before the scorecard is constructed. It is fine to test more than one loss reserving method, but keep separate scorecards as it is the comparison of scorecards which helps the actuary select the final estimated ultimate losses. After the individual scorecards are constructed, a scorecard which combines all of the individual scorecards may by completed, but only if combined consistently.

Measurement of Variability

Once all of the methods have produced estimates for the desired valuations, the comparison process starts. The changes in ultimate losses or loss reserves from valuation to valuation are compared within each method and between methods. When selecting the method or group of methods to base the final ultimate loss estimate and the corresponding loss reserves, the actuary should consider the runoff produced by each method in relation to the other methods. Guidelines for selecting the best method from a group of methods are presented below.

- In the situation where the ultimate losses are increasing then decreasing, then increasing, then decreasing over and over again, then the method which exhibits the least variation from valuation to valuation would be viewed most favorably.

- If all of the ultimate losses are consistently increasing (or decreasing), then the method which shows the least change in the latest valuation or two should be given strong consideration as it, perhaps, has adjusted most quickly to the changing data.

- If all of the ultimate losses are consistently increasing (or decreasing) and there are no turning points, then a new method needs to be considered. In addition, the tested method, if used, requires a strong dose of (upward) judgment.

This paper, as described in Section 2, uses the percentage change in restated loss reserves from valuation to valuation to measure the loss reserve method's performance or variability. It is the comparison of percentage changes among all the methods' which helps lead the actuary to the best method.

Scorecard Summary and Limitations

The scorecard system tests the performance of a method. In essence, the system shows the actuary which method performed "best" under the constraints of the historical data. It provides a strong base on which the actuary can recommend reserve levels.

In addition, it is a very useful diagnostic tool as an indicator of where an actuary's attention should be turned. For example, if the actuary is unaware of a change in the development pattern, then the scorecard system would help identify it through loss reserve inadequacies or redundancies in the runoff of more recent accident years.

However, the selection of the final ultimate losses should include the actuary's expectations that the selected method's assumptions (e.g., loss development patterns) will continue into the future. Adjustments may be warranted if the expected future patterns will be different than the historical patterns. Adjustments should be based on a sound review of the company's (or client's) underwriting and claim processes The actuary needs to be convinced that any verbal pronouncements of faster claim settlements or improved case reserve adequacy are in place. Statistics like closed claim to total claim count ratios and average initial reserves are extremely important indicators of actual change. External factors, such as changes in inflation and law changes, need to be considered too. Actuarial judgment is likely required.

Section 2 - An Example

Introduction

The example presented in this section illustrates the scorecard system. It uses four separate formulas or approaches to projected link ratios. Exhibit I, page 5 shows the case incurred loss triangle from which the projections are made. Admittedly, the incurred losses are contrived - they show a situation where the case outstanding loss reserves become progressively "weaker". However, it is not the data nor the formulas but the concept and the process of the scorecard system that is important.

Given a similar "real life" situation, the actuary would most likely see a problem right away and strive to understand what is causing the trend in link ratios. In fact, some actuaries, in order to highlight the problem, would go directly to the "Fourth Try" which produces the highest loss reserve levels of the four approaches tested.

The scorecard system could have been illustrated by comparing the results from different reserve methods such as the incurred and paid loss development, claim count times averages, Bornhuetter/Ferguson, etc. but this would have required more data creation. This was not necessary to demonstrate the concept.

The Scorecard System

First Try - Formula Link Ratios

As explained in section 1, the scorecard system requires the actuary to strip away known valuations of the data. Exhibit I, page 1 shows the case incurred loss triangle through 12-31-92 as four years of valuations have been stripped away.

The top section of Exhibit I, page 1 shows the case incurred losses by accident year and evaluation month. The middle section shows the individual link ratios. Five composite statistics are calculated from the individual link ratios. Each of the composite ratios are described below:

Mean	Straight average of all available link ratios.
Median	Median of all available link ratios.
Weighted	Weighted average of all available link ratios; the earliest ratio receives a weight of 1, the next earliest receives a weight of 2, and so on.
Current	Weighted average of the latest two link ratios; the most current receives a weight of 2, the second most current receives a weight of 1.
Formula	The median of the four composite link ratio statistics above (Mean, Median, Weighted & Current).

The formula link ratio is calculated and accumulated. The accumulated factor is then used to project the ultimate losses. This is all done by the computer so as not to inject any changing concepts or new judgment. (One area of judgment required on Exhibit I, page 1 is the tail factor (72 months to ultimate); in this case one-half of the preceding formula link ratio is used as the tail factor. The same tail factor assumption is used throughout the calculations when needed.)

The Scorecard System

Section 1 explained that the analyst should add the next known valuation of data (i.e., 12-31-93) and re-project the ultimate losses.

Exhibit I, page 2 shows the projection using data through 12-31-93. This process is repeated to obtain ultimate loss projections with data through 12-31-94, 12-31-95 and 12-31-96. Their exhibits are labeled Exhibit I, pages 3, 4 and 5, respectively.

The result is a history of ultimate loss projections using the traditional case incurred loss development method in conjunction with a set of formula link ratios.

At the top of Exhibit I, page 6, and to the left of the vertical line, the ultimate losses by accident year from the five time periods are displayed. To the right of the vertical line, the cumulative paid losses and indicated loss reserve (total ultimate minus cumulative paid) are displayed. The remaining sections of Exhibit I, page 6 compare the ultimate losses and loss reserves from the five valuations.

First, the ultimate losses projected with data through 12-31-92 are compared to ultimate losses through 12-31-93, and the difference is shown. The positive numbers indicate that the estimated ultimate losses projected at 12-31-92 were inadequate one year later. In fact, the inadequacy becomes more pronounced when the 12-31-92 projections are compared to the 12-31-94, 12-31-95 and 12-31-96 ultimate loss projections. To the right of the vertical line, the initial loss reserves as of 12-31-92 are restated (i.e., initial reserve plus the change in the total ultimate losses) and the percentage changes from the initial loss reserve are shown. The percentage changes show that the initial loss reserves are increasingly inadequate as newer data is provided.

In the next portion of Exhibit I, page 6, the ultimate losses projected with data through 12-31-93 are compared to ultimate losses and the corresponding loss reserves valued at 12-31-94, 12-31-95 and 12-31-96. As with the prior comparison, the 12-31-93 estimated loss projections are inadequate, and become increasingly inadequate as new valuations are added.

Similarly, the 12-31-94 and 12-31-95 projections prove inadequate when compared to the ultimate loss projections using data through 12-31-96.

The Scorecard System

In the case of the test data, Exhibit I, page 6 shows that the combination of the traditional loss development method with the formula link ratios produce inadequate loss reserves for the four prior data points. The example illustrates an important aspect of the scorecard system - its use as a diagnostic tool. That is, given the results on Exhibit I, page 6, the actuary would know that something in amiss.

In practice, the actuary should understand the process and the reasons for the changes before proceeding to "fit another curve". The actuary needs to go beyond the numbers. Internal and external issues need to be considered as well as the tail factor selection. However, given the results of Exhibit I, page 6, the actuary would require extremely compelling evidence that "things are not as bad as they seem" to maintain the 12-31-96 loss reserves at $336,963.

To demonstrate the scorecard system's ability to discriminate between multiple methods or, in this case, approaches, additional formulas are fit to the data.

Second Try - High Link Ratios

Instead of using the formula link ratios, the highest link ratio in the triangle for each development period is used. Exhibit II, page 1 shows the projection of the ultimate losses at each valuation using the highest link ratio. (All the valuations are put on one page for conciseness.)

Exhibit II, page 2 shows the comparison of the ultimate losses and loss reserves from the five valuations using the high link ratio assumption. The exhibit is structured similarly to Exhibit I, page 6. Given the results of Exhibit II, page 2 and Exhibit I, page 6 the high link ratio approach outperformed the formula link ratio approach by virtue of its lower percentage reserve changes. This is another function of the scorecard system - it distinguishes between competing reserve methods and formulas.

To continue the example, another approach is provided.

Third Try - Link Ratios Trended One Year

Instead of using the high link ratios, link ratios are trended one year into the future (or one year past the valuation date). For example, referring to Exhibit I, page 1, the link ratios from 24 to 36 months are 1.243, 1.248, 1.253, and 1.259 for accident periods 1987, 1988, 1989 and 1990, respectively. The average difference between the successive link ratios is ".005." Extending this pattern one year, the projected link ratio is 1.264 (1.259 plus .005). The one year trended link ratio of 1.264 is shown on Exhibit III, page 1 in the 12-31-92 valuation of ultimate losses under accident year 1991.

The ultimate loss projections using the one year trended link ratios, and data through 12-31-92, 12-31-93, 12-31-94, 12-31-95 and 12-31-96 are shown on Exhibit III, page 1. (Again, all the valuations are put on one page for conciseness.)

Exhibit III, page 2 shows the comparison of the ultimate losses from the five valuations using the one year trended link ratio assumption. The exhibit is structured similarly to Exhibit I, page 6. As with formula and high link ratio methods (see Exhibit I, page 6 and Exhibit II, page 2, respectively), the method using the one year trended link ratios show consistent and increasing loss reserve inadequacy but by smaller amounts than the previous two approaches.

Fourth Try - Trended Link Ratios

The fourth method trends the link ratios beyond one year. Exhibit IV, page 1 shows the "squaring of the triangle" for the 12-31-92 valuation. As the exhibit demonstrates, the trend in the historical link ratios (above and to the left of the "steps") is extrapolated into the future periods (below and to the right of the "steps"). The differences in the successive historical link ratios are calculated and averaged (e.g., ".005" in the example above), and are used as the incremental adjustments to the projected link ratios. The product of the projected future link ratios (each column below the "steps") is calculated and shown in the accumulated link ratio row. The ultimate losses are the case incurred losses times the accumulated link ratios.

Exhibit IV, pages 2, 3, 4 and 5 show the trended link ratios and ultimate loss calculations for the 12-31-93, 12-31-94, 12-31-95 and 12-31-96 valuations, respectively. The detailed calculations are provided for this "try" for two reasons: 1) the reader can see the progression in the projected link ratios and 2) necessity - unlike the previous "tries", the projected link ratios are unique for each accident year, thereby making the accumulation more involved.

The Scorecard System

Exhibit IV, page 6 shows the comparison of the ultimate losses and loss reserves from the five valuations using the trended link ratio assumption. The exhibit is consistent in structure with the prior scorecards, however, the similarities stop there.

- For the first time, there are some downward changes in ultimate losses (i.e., the "Total" column).
- The remaining upward changes (in the "Total") are much smaller than previously seen.
- The initial loss reserves are very close to the restated reserve amounts producing negligible percentage changes.

According to the scorecard system, the trended link ratio approach produces the most stable loss reserves of the four approaches, based on the criteria of least percentage change. However, before its 12-31-96 estimates are used, the actuary should consider whether or not the historical link ratio trend will continue into the future as projected.

Summary Comments

The data in the preceding example would be typical of a situation where the case reserve adequacy is continually decreasing over time. Most of the time, the link ratio pattern is not quite as obvious as presented in the example. However, it is not the data or the link ratio formulas but the process or system which is important. The process, or scorecard system, lets the actuary test the selected method(s) for the particular set of data, but in a disciplined, consistent fashion. The resulting scorecards help the actuary decide on the best estimates.

The Scorecard System

It needs to be reemphasized that the scorecard system is only a test, albeit compelling, leading the actuary to the proper loss reserve level. The scorecard system relies on historical patterns and trend to help the actuary, but will the future be similar to the past or will there be some kind of change? Judgment is needed if systematic changes (e.g., new Third Party Administrator, law changes, inflation rate changes, etc.) are expected in the future.

Section 3 - Final Words

The inspiration for this paper is a simple one, but truly telling nevertheless. Actuaries need to keep score of themselves by comparing historical estimates to current estimates. This statement goes beyond the scorecard system as presented here. An exhibit like Schedule P, part 2 of the Annual Statement that shows a comparison of recommended ultimate losses for a given accident year (or policy year) overtime should be a fixture in actuarial analyses. This "scorecard" is not of a method but of our overall judgment. If historical estimates have proven inadequate then current estimates should be scrutinized and considered inadequate until proven otherwise.

The paper provides "a trick" of sorts to the actuary challenged with an analysis for the first time. By stripping away the most recent data, year by year, the actuary can test the method(s) accuracy without waiting for the next valuation of data. The concept is not limited to first-time analyses; it can be used when a new method is being added to an existing analysis or the actuary wants to start from scratch with an old problem. Another use of the scorecard is that it lets the actuary test the adequacy of arbitrary "tail factors" from past years in order improve the judgment in the current year.

The testing concept could also be used with non-loss reserving applications. In fact, it can be implemented whenever projections are made: Traditional Loss Cost Making, Catastrophe Modeling, Experience Rating, Financial Dynamic Analysis and even Financial Ratings to name a few. Its uses are not limited to the "big ticket" items either. It may be used when estimating losses in different layers of loss, classifications, territories, divisions, etc.

SCORECARD SYSTEM
COMPANY XYZ
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Loss Development - Case Incurred Losses

Accident Period
as of 12/31/92

		1987	1988	1989	1990	1991	1992
Months	12	47,073	48,603	50,054	51,427	52,721	53,937
	24	69,668	72,162	74,563	76,870	79,082	
	36	86,614	90,079	93,463	96,764		
	48	95,499	99,718	103,883			
	60	99,061	103,767				
	72	99,709					
As of 12/31/92		99,709	103,767	103,883	96,764	79,082	53,937
Months	12- 24	1.480	1.485	1.490	1.495	1.500	
	24- 36	1.243	1.248	1.253	1.259		
	36- 48	1.103	1.107	1.111			
	48- 60	1.037	1.041				
	60- 72	1.007					
	Mean		1.007	1.039	1.107	1.251	1.490
	Median		1.007	1.039	1.107	1.251	1.490
	Weighted		1.007	1.040	1.109	1.254	1.493
	Current		1.007	1.040	1.110	1.257	1.498
	Formula	1.003	1.007	1.039	1.108	1.252	1.491
	Accumulated	1.003	1.010	1.049	1.162	1.455	2.169
	Ultimates	100,008	104,805	108,974	112,439	115,064	116,990
	Accumulated	100,008	204,813	313,787	426,226	541,291	658,281
	IBNR	299	1,038	5,090	15,676	35,982	63,053
	Total	299	1,337	6,427	22,103	58,085	121,138

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SCORECARD SYSTEM
COMPANY XYZ
LINE OF BUSINESS abc

Loss Development - Case Incurred Losses

Accident Period
as of 12/31/93

		1987	1988	1989	1990	1991	1992	1993
Months	12	47,073	48,603	50,054	51,427	52,721	53,937	55,075
	24	69,668	72,162	74,563	76,870	79,082	81,200	
	36	86,614	90,079	93,463	96,764	99,982		
	48	95,499	99,718	103,883	107,996			
	60	99,061	103,767	108,450				
	72	99,709	104,633					
	84	100,000						
As of 12/31/93		100,000	104,633	108,450	107,996	99,982	81,200	55,075
Months	12- 24	1.480	1.485	1.490	1.495	1.500	1.505	
	24- 36	1.243	1.248	1.253	1.259	1.264		
	36- 48	1.103	1.107	1.111	1.116			
	48- 60	1.037	1.041	1.044				
	60- 72	1.007	1.008					
	72- 84	1.003						
	Mean		1.003	1.007	1.041	1.109	1.254	1.492
	Median		1.003	1.007	1.041	1.109	1.253	1.492
	Weighted		1.003	1.008	1.042	1.112	1.257	1.497
	Current		1.003	1.008	1.043	1.115	1.262	1.504
	Formula	1.000	1.003	1.008	1.041	1.110	1.255	1.495
	Accumulated	1.000	1.003	1.011	1.052	1.168	1.466	2.192
	Ultimates	100,000	104,947	109,643	113,612	116,779	119,040	120,724
	Accumulated	100,000	204,947	314,590	428,203	544,982	664,022	784,746
	IBNR		314	1,193	5,616	16,797	37,839	65,649
	Total		314	1,507	7,123	23,920	61,759	127,408

Total of last diagonal:657,338

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SCORECARD SYSTEM
COMPANY XYZ
LINE OF BUSINESS abc

Loss Development - Case Incurred Losses

Accident Period
as of 12/31/94

		1987	1988	1989	1990	1991	1992	1993	1994
Months	12	47,073	48,603	50,054	51,427	52,721	53,937	55,075	56,134
	24	69,668	72,162	74,563	76,870	79,082	81,200	83,224	
	36	86,614	90,079	93,463	96,764	99,982	103,119		
	48	95,499	99,718	103,883	107,996	112,056			
	60	99,061	103,767	108,450	113,110				
	72	99,709	104,633	109,551					
	84	100,000	105,000						
	96	100,000							
As of 12/31/94		100,000	105,000	109,551	113,110	112,056	103,119	83,224	56,134
Months	12- 24	1.480	1.485	1.490	1.495	1.500	1.505	1.511	
	24- 36	1.243	1.248	1.253	1.259	1.264	1.270		
	36- 48	1.103	1.107	1.111	1.116	1.121			
	48- 60	1.037	1.041	1.044	1.047				
	60- 72	1.007	1.008	1.010					
	72- 84	1.003	1.004						
	84- 96	1.000							
Mean			1.000	1.003	1.008	1.042	1.112	1.256	1.495
Median			1.000	1.003	1.008	1.042	1.111	1.256	1.495
Weighted			1.000	1.003	1.009	1.044	1.115	1.261	1.500
Current			1.000	1.003	1.010	1.046	1.119	1.268	1.509
Formula		1.000	1.000	1.003	1.009	1.043	1.113	1.259	1.498
Accumulated		1.000	1.000	1.003	1.012	1.056	1.175	1.479	2.216
Ultimates		100,000	105,000	109,880	114,467	118,332	121,164	123,089	124,393
Accumulated		100,000	205,000	314,880	429,347	547,679	668,843	791,932	916,326
IBNR				329	1,357	6,275	18,046	39,865	68,259
Total				329	1,686	7,961	26,007	65,871	134,131

Total of last diagonal:782,195

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SCORECARD SYSTEM
COMPANY XYZ
LINE OF BUSINESS abc

Loss Development - Case Incurred Losses

Accident Period
as of 12/31/95

		1987	1988	1989	1990	1991	1992	1993	1994	1995
Months	12	47,073	48,603	50,054	51,427	52,721	53,937	55,075	56,134	57,115
	24	69,668	72,162	74,563	76,870	79,082	81,200	83,224	85,154	
	36	86,614	90,079	93,463	96,764	99,982	103,119	106,172		
	48	95,499	99,718	103,883	107,996	112,056	116,064			
	60	99,061	103,767	108,450	113,110	117,746				
	72	99,709	104,633	109,551	114,464					
	84	100,000	105,000	110,000						
	96	100,000	105,000							
	108	100,000								
As of 12/31/95		100,000	105,000	110,000	114,464	117,746	116,064	106,172	85,154	57,115
Months	12-24	1.480	1.485	1.490	1.495	1.500	1.505	1.511	1.517	
	24-36	1.243	1.248	1.253	1.259	1.264	1.270	1.276		
	36-48	1.103	1.107	1.111	1.116	1.121	1.126			
	48-60	1.037	1.041	1.044	1.047	1.051				
	60-72	1.007	1.008	1.010	1.012					
	72-84	1.003	1.004	1.004						
	84-96	1.000	1.000							
	6-108	1.000								
Mean			1.000	1.000	1.004	1.009	1.044	1.114	1.259	1.498
Median			1.000	1.000	1.004	1.009	1.044	1.114	1.259	1.497
Weighted			1.000	1.000	1.004	1.010	1.046	1.118	1.265	1.504
Current			1.000	1.000	1.004	1.011	1.050	1.124	1.274	1.515
Formula		1.000	1.000	1.000	1.004	1.010	1.045	1.116	1.262	1.501
Accumulated		1.000	1.000	1.000	1.004	1.014	1.060	1.183	1.493	2.241
Ultimates		100,000	105,000	110,000	114,922	119,395	123,027	125,602	127,136	127,994
Accumulated		100,000	205,000	315,000	429,922	549,317	672,344	797,946	925,081	1,053,076
IBNR					458	1,648	6,964	19,430	41,981	70,880
Total					458	2,106	9,070	28,500	70,481	141,360

Total of last diagonal:911,715

A maximum of 8 factors are used.
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SCORECARD SYSTEM
COMPANY XYZ
LINE OF BUSINESS abc

Accident Period
as of 12/31/96

Loss Development - Case Incurred Losses

		1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
Months	12	47,073	48,603	50,054	51,427	52,721	53,937	55,075	56,134	57,115	58,017
	24	69,668	72,162	74,563	76,870	79,082	81,200	83,224	85,154	86,990	
	36	86,614	90,079	93,463	96,764	99,982	103,119	106,172	109,144		
	48	95,499	99,718	103,883	107,996	112,056	116,064	120,018			
	60	99,061	103,767	108,450	113,110	117,746	122,359				
	72	99,709	104,633	109,551	114,464	119,371					
	84	100,000	105,000	110,000	115,000						
	96	100,000	105,000	110,000							
	108	100,000	105,000								
	120	100,000									
As of 12/31/96		100,000	105,000	110,000	115,000	119,371	122,359	120,018	109,144	86,990	58,017
Months	12-24	1.480	1.485	1.490	1.495	1.500	1.505	1.511	1.517	1.523	
	24-36	1.243	1.248	1.253	1.259	1.264	1.270	1.276	1.282		
	36-48	1.103	1.107	1.111	1.116	1.121	1.126	1.130			
	48-60	1.037	1.041	1.044	1.047	1.051	1.054				
	60-72	1.007	1.008	1.010	1.012	1.014					
	72-84	1.003	1.004	1.004	1.005						
	84-96	1.000	1.000	1.000							
	96-108	1.000	1.000								
	108-120	1.000									
	Mean		1.000	1.000	1.000	1.004	1.010	1.046	1.116	1.262	1.501
	Median		1.000	1.000	1.000	1.004	1.010	1.046	1.116	1.262	1.500
	Weighted		1.000	1.000	1.000	1.004	1.011	1.049	1.121	1.268	1.508
	Current		1.000	1.000	1.000	1.004	1.013	1.053	1.129	1.280	1.521
	Formula	1.000	1.000	1.000	1.000	1.004	1.011	1.047	1.119	1.265	1.504
	Accumulated	1.000	1.000	1.000	1.000	1.004	1.015	1.063	1.189	1.504	2.262
	Ultimates	100,000	105,000	110,000	115,000	119,848	124,194	127,579	129,772	130,833	131,235
	Accumulated	100,000	205,000	315,000	430,000	549,848	674,043	801,621	931,393	1,062,227	1,193,461
	IBNR					477	1,835	7,561	20,628	43,843	73,218
	Total					477	2,313	9,874	30,502	74,345	147,563

Total of last diagonal:1,045,899

A maximum of 9 factors are used.
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SCORECARD SYSTEM
COMPANY XYZ
LINE OF BUSINESS abc

Method: Loss Development using formula link ratios

Comparison of Ultimate Losses

Ultimate Losses As Of:	Accident Year 1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	Total
12-31-92	100,008	104,805	108,974	112,439	115,064	116,990					658,281
12-31-93	100,000	104,947	109,643	113,612	116,779	119,040	120,724				784,746
12-31-94	100,000	105,000	109,880	114,467	118,332	121,164	123,089	124,393			916,326
12-31-95	100,000	105,000	110,000	114,922	119,395	123,027	125,602	127,136	127,994		1,053,076
12-31-96	100,000	105,000	110,000	115,000	119,848	124,194	127,579	129,772	130,833	131,235	1,193,461

Comparison of Loss Reserves

Aggregate Paid Losses	Initial (a) Loss Reserves	Restated (b) Loss Reserves	Percentage Change (c)
359,616	298,665 (a)		
476,336	308,410		
598,057	318,269		
724,777	328,299		
856,498	336,963		

Change in Estimated Ultimate Losses

12-31-92 to:													
12-31-93	(8)	142	670	1,173	1,715	2,049					5,741	304,406 (b)	1.9% (c)
12-31-94	(8)	195	906	2,028	3,267	4,174					10,562	309,227	3.5%
12-31-95	(8)	195	1,026	2,482	4,330	6,037					14,063	312,728	4.7%
12-31-96	(8)	195	1,026	2,561	4,784	7,204					15,762	314,427	5.3%
12-31-93 to:													
12-31-94	0	53	237	855	1,552	2,125	2,365				7,186	315,596	2.3%
12-31-95	0	53	357	1,310	2,615	3,988	4,878				13,200	321,610	4.3%
12-31-96	0	53	357	1,388	3,069	5,154	6,854				16,875	325,285	5.5%
12-31-94 to:													
12-31-95	0	0	120	455	1,063	1,863	2,513	2,742			8,756	327,024	2.8%
12-31-96	0	0	120	533	1,517	3,030	4,490	5,379			15,068	333,336	4.7%
12-31-95 to:													
12-31-96	0	0	0	78	454	1,167	1,977	2,636	2,839		9,151	337,450	2.8%

(a) Total Ultimate Losses minus Aggregate Paid Losses, for example: $658,281 minus $359,616 equals $298,665
(b) Initial Losses Reserves plus Total Change in Estimated Ultimate Losses, for example: $298,665 plus $5,741 equals $304,406
(c) (Restated Loss Reserve divided by the Initial Loss Reserve) minus 1, for example: ($304,406 divided by $298,665) minus 1 equals 1.9%

Source: Exhibits I, pages 1, 2, 3, 4 and 5
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SCORECARD SYSTEM
COMPANY XYZ
LINE OF BUSINESS abc

Calculation of Ultimate Losses

Method: Loss Development using highest link ratios in triangle

	Accident Year										
As Of:	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	Total
12-31-92											
a. Case Inc. Losses	99,709	103,767	103,883	96,764	79,082	53,937					537,143
b. Link Ratios (High)	1.003	1.007	1.041	1.111	1.259	1.500					
c. Accum. Factors	1.003	1.010	1.051	1.168	1.470	2.205					
d. Ultimate Losses	100,008	104,805	109,182	113,020	116,251	118,932					662,198
e. IBNR	299	1,038	5,299	16,256	37,169	64,995					125,055
12-31-93											
a. Case Inc. Losses	100,000	104,633	108,450	107,996	99,982	81,200	55,075				657,338
b. Link Ratios (High)	1.001	1.003	1.008	1.044	1.116	1.264	1.505				
c. Accum. Factors	1.001	1.004	1.012	1.056	1.179	1.491	2.245				
d. Ultimate Losses	100,100	105,052	109,752	114,044	117,879	121,070	123,643				791,540
e. IBNR	100	419	1,302	6,048	17,897	39,870	68,568				134,202
12-31-94											
a. Case Inc. Losses	100,000	105,000	109,551	113,110	112,056	103,119	83,224	56,134			782,195
b. Link Ratios (High)	1.000	1.000	1.004	1.010	1.047	1.121	1.270	1.511			
c. Accum. Factors	1.000	1.000	1.004	1.014	1.062	1.190	1.511	2.283			
d. Ultimate Losses	100,000	105,000	109,990	114,694	119,004	122,711	125,752	128,154			925,305
e. IBNR	0	0	439	1,584	6,948	19,592	42,528	72,020			143,110
12-31-95											
a. Case Inc. Losses	100,000	105,000	110,000	114,464	117,746	116,064	106,172	85,154	57,115		911,715
b. Link Ratios (High)	1.000	1.000	1.000	1.004	1.012	1.051	1.126	1.276	1.517		
c. Accum. Factors	1.000	1.000	1.000	1.004	1.016	1.068	1.202	1.533	2.326		
d. Ultimate Losses	100,000	105,000	110,000	114,922	119,630	123,956	127,619	130,542	132,849		1,064,518
e. IBNR	0	0	0	458	1,884	7,892	21,447	45,388	75,734		152,803
12-31-96											
a. Case Inc. Losses	100,000	105,000	110,000	115,000	119,371	122,359	120,018	109,144	86,990	58,017	1,045,899
b. Link Ratios (High)	1.000	1.000	1.000	1.000	1.005	1.014	1.054	1.130	1.282	1.523	
c. Accum. Factors	1.000	1.000	1.000	1.000	1.005	1.019	1.074	1.214	1.556	2.370	
d. Ultimate Losses	100,000	105,000	110,000	115,000	119,968	124,684	128,899	132,501	135,357	137,500	1,208,909
e. IBNR	0	0	0	0	597	2,325	8,881	23,357	48,367	79,483	163,010

Notes
a: Case Incurred Losses as of the valuation date.
b: Link Ratio - This is the highest link ratio in the triangle for each period of development.
c: Accumulated Link Ratios
d: Ultimate Losses equal the case incurred losses times the accumulated link ratios.
e: IBNR equals the ultimate losses minus the case incurred losses.

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SCORECARD SYSTEM
COMPANY XYZ
LINE OF BUSINESS abc

Method: Loss Development using highest link ratios in triangle

Comparison of Ultimate Losses

Ultimate Losses	Accident Year										
As Of:	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	Total
12-31-92	100,008	104,805	109,182	113,020	116,251	118,932					662,198
12-31-93	100,100	105,052	109,752	114,044	117,879	121,070	123,643				791,540
12-31-94	100,000	105,000	109,990	114,694	119,004	122,711	125,752	128,154			925,305
12-31-95	100,000	105,000	110,000	114,922	119,630	123,956	127,619	130,542	132,849		1,064,518
12-31-96	100,000	105,000	110,000	115,000	119,968	124,684	128,899	132,501	135,357	137,500	1,208,909

Comparison of Loss Reserves

Aggregate Paid Losses	Initial (a) Loss Reserves	Restated (b) Loss Reserves	Percentage Change (c)
359,616	302,582 (a)		
476,336	315,204		
598,057	327,248		
724,777	339,741		
856,498	352,411		

Change in Estimated Ultimate Losses

12-31-92 to:												
12-31-93	92	247	570	1,024	1,628	2,138					5,699	308,281 (b) 1.9% (c)
12-31-94	(8)	195	808	1,674	2,753	3,779					9,201	311,783 3.0%
12-31-95	(8)	195	818	1,902	3,379	5,024					11,310	313,892 3.7%
12-31-96	(8)	195	818	1,980	3,717	5,752					12,454	315,036 4.1%
12-31-93 to:												
12-31-94	(100)	(52)	238	650	1,125	1,641	2,109				5,611	320,815 1.8%
12-31-95	(100)	(52)	248	878	1,751	2,886	3,976				9,587	324,791 3.0%
12-31-96	(100)	(52)	248	956	2,089	3,614	5,256				12,011	327,215 3.8%
12-31-94 to:												
12-31-95	0	0	10	228	626	1,245	1,867	2,388			6,364	333,612 1.9%
12-31-96	0	0	10	306	964	1,973	3,147	4,347			10,747	337,995 3.3%
12-31-95 to:												
12-31-96	0	0	0	78	338	728	1,280	1,959	2,508		6,891	346,632 2.0%

(a) Total Ultimate Losses minus Aggregate Paid Losses, for example: $662,198 minus $359,616 equals $302,582
(b) Initial Losses Reserves plus Total Change in Estimated Ultimate Losses, for example: $302,582 plus $5,699 equals $308,281
(c) (Restated Loss Reserve divided by the Initial Loss Reserve) minus 1, for example: ($308,281 divided by $302,582) minus 1 equals 1.9%

Source: Exhibits II, page 1
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6-2-97

SCORECARD SYSTEM
COMPANY XYZ
LINE OF BUSINESS abc

Calculation of Ultimate Losses

Method: Loss Development using link ratio trended one year past valuation date

As Of:	Accident Year 1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	Total
12-31-92											
a. Case Inc. Losses	99,709	103,767	103,883	96,764	79,082	53,937					537,143
b. Link Ratios (1 yr trend)	1.004	1.009	1.045	1.115	1.264	1.505					
c. Accum. Factors	1.004	1.013	1.058	1.180	1.491	2.244					
d. Ultimate Losses	100,108	105,116	109,909	114,181	117,911	121,036					668,261
e. IBNR	399	1,349	6,026	17,417	38,829	67,099					131,118
12-31-93											
a. Case Inc. Losses	100,000	104,633	108,450	107,996	99,982	81,200	55,075				657,338
b. Link Ratios (1 yr trend)	1.001	1.004	1.009	1.048	1.120	1.269	1.510				
c. Accum. Factors	1.001	1.005	1.014	1.063	1.191	1.512	2.284				
d. Ultimate Losses	100,100	105,156	109,969	114,800	119,079	122,775	125,791				797,670
e. IBNR	100	523	1,519	6,804	19,097	41,575	70,716				140,332
12-31-94											
a. Case Inc. Losses	100,000	105,000	109,551	113,110	112,056	103,119	83,224	56,134			782,195
b. Link Ratios (1 yr trend)	1.000	1.000	1.005	1.012	1.051	1.126	1.276	1.517			
c. Accum. Factors	1.000	1.000	1.005	1.017	1.069	1.203	1.535	2.329			
d. Ultimate Losses	100,000	105,000	110,099	115,033	119,788	124,052	127,750	130,736			932,458
e. IBNR	0	0	548	1,923	7,732	20,933	44,526	74,602			150,263
12-31-95											
a. Case Inc. Losses	100,000	105,000	110,000	114,464	117,746	116,064	106,172	85,154	57,115		911,715
b. Link Ratios (1 yr trend)	1.000	1.000	1.000	1.005	1.014	1.055	1.131	1.282	1.523		
c. Accum. Factors	1.000	1.000	1.000	1.005	1.019	1.075	1.215	1.557	2.371		
d. Ultimate Losses	100,000	105,000	110,000	115,036	119,983	124,768	128,999	132,585	135,419		1,071,790
e. IBNR	0	0	0	572	2,237	8,704	22,827	47,431	78,304		160,075
12-31-96											
a. Case Inc. Losses	100,000	105,000	110,000	115,000	119,371	122,359	120,018	109,144	86,990	58,017	1,045,899
b. Link Ratios (1 yr trend)	1.000	1.000	1.000	1.000	1.006	1.016	1.058	1.135	1.288	1.529	
c. Accum. Factors	1.000	1.000	1.000	1.000	1.006	1.022	1.082	1.229	1.583	2.421	
d. Ultimate Losses	100,000	105,000	110,000	115,000	120,087	125,051	129,859	134,138	137,706	140,459	1,217,300
e. IBNR	0	0	0	0	716	2,692	9,841	24,994	50,716	82,442	171,401

Notes
a: Case Incurred Losses as of the valuation date.
b: Link Ratio - Trended one year past valuation date.
c: Accumulated Link Ratios
d: Ultimate Losses equal the case incurred losses times the accumulated link ratios.
e: IBNR equals the ultimate losses minus the case incurred losses.

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SCORECARD SYSTEM
COMPANY XYZ
LINE OF BUSINESS abc

Method: Loss Development using link ratio trended one year past valuation date

Comparison of Ultimate Losses

Ultimate Losses	Accident Year										
As Of:	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	Total
12-31-92	100,108	105,116	109,909	114,181	117,911	121,036					668,261
12-31-93	100,100	105,156	109,969	114,800	119,079	122,775	125,791				797,670
12-31-94	100,000	105,000	110,099	115,033	119,788	124,052	127,750	130,736			932,458
12-31-95	100,000	105,000	110,000	115,036	119,983	124,768	128,999	132,585	135,419		1,071,790
12-31-96	100,000	105,000	110,000	115,000	120,087	125,051	129,859	134,138	137,706	140,459	1,217,300

Comparison of Loss Reserves

Aggregate Paid Losses	Initial (a) Loss Reserves
359,616	308,645 (a)
476,336	321,334
598,057	334,401
724,777	347,013
856,498	360,802

Change in Estimated Ultimate Losses

											Restated (b) Loss Reserves	Percentage Change (c)
12-31-92 to:												
12-31-93	(8)	40	60	619	1,168	1,739				3,618	312,263 (b)	1.2% (c)
12-31-94	(108)	(116)	190	852	1,877	3,016				5,711	314,356	1.9%
12-31-95	(108)	(116)	91	855	2,072	3,732				6,526	315,171	2.1%
12-31-96	(108)	(116)	91	819	2,176	4,015				6,877	315,522	2.2%
12-31-93 to:												
12-31-94	(100)	(156)	130	233	709	1,277	1,959			4,052	325,386	1.3%
12-31-95	(100)	(156)	31	236	904	1,993	3,208			6,116	327,450	1.9%
12-31-96	(100)	(156)	31	200	1,008	2,276	4,068			7,327	328,661	2.3%
12-31-94 to:												
12-31-95	0	0	(99)	3	195	716	1,249	1,849		3,913	338,314	1.2%
12-31-96	0	0	(99)	(33)	299	999	2,109	3,402		6,677	341,078	2.0%
12-31-95 to:												
12-31-96	0	0	0	(36)	104	283	860	1,553	2,287	5,051	352,064	1.5%

(a) Total Ultimate Losses minus Aggregate Paid Losses, for example: $668,261 minus $359,616 equals $308,645
(b) Initial Losses Reserves plus Total Change in Estimated Ultimate Losses, for example: $308,645 plus $3,618 equals $312,263
(c) (Restated Loss Reserve divided by the Initial Loss Reserve) minus 1, for example: ($312,263 divided by $308,645) minus 1 equals 1.2%

Source: Exhibits III, page 1
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SCORECARD SYSTEM
COMPANY XYZ
LINE OF BUSINESS abc

Loss Development - Trended Link Ratios

Accident Period as of 12/31/92

		1987	1988	1989	1990	1991	1992
Months	12	47,073	48,603	50,054	51,427	52,721	53,937
	24	69,668	72,162	74,563	76,870	79,082	
	36	86,614	90,079	93,463	96,764		
	48	95,499	99,718	103,883			
	60	99,061	103,767				
	72	99,709					
As of 12/31/92		99,709	103,767	103,883	96,764	79,082	53,937
Months	12- 24	1.480	1.485	1.490	1.495	1.500	1.505
	24- 36	1.243	1.248	1.253	1.259	1.264	1.269
	36- 48	1.103	1.107	1.111	1.115	1.119	1.123
	48- 60	1.037	1.041	1.044	1.047	1.050	1.053
	60- 72	1.007	1.009	1.011	1.013	1.015	1.017
	72 to Ult.	1.003	1.004	1.005	1.006	1.007	1.008
Accumulated		1.003	1.013	1.061	1.190	1.518	2.315
Ultimates		100,008	105,116	110,220	115,149	120,047	124,865
Accumulated		100,008	205,124	315,345	430,494	550,540	675,405
IBNR		299	1,349	6,337	18,385	40,965	70,928
Total		299	1,648	7,985	26,370	67,335	138,262

Total of last diagonal:537,143

A maximum of 5 factors are used.
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SCORECARD SYSTEM
COMPANY XYZ
LINE OF BUSINESS abc

Loss Development - Trended Link Ratios

Accident Period
as of 12/31/93

		1987	1988	1989	1990	1991	1992	1993
Months	12	47,073	48,603	50,054	51,427	52,721	53,937	55,075
	24	69,668	72,162	74,563	76,870	79,082	81,200	
	36	86,614	90,079	93,463	96,764	99,982		
	48	95,499	99,718	103,883	107,996			
	60	99,061	103,767	108,450				
	72	99,709	104,633					
	84	100,000						
As of 12/31/93		100,000	104,633	108,450	107,996	99,982	81,200	55,075
Months	12- 24	1.480	1.485	1.490	1.495	1.500	1.505	1.510
	24- 36	1.243	1.248	1.253	1.259	1.264	1.269	1.274
	36- 48	1.103	1.107	1.111	1.116	1.121	1.126	1.131
	48- 60	1.037	1.041	1.044	1.048	1.052	1.056	1.060
	60- 72	1.007	1.008	1.009	1.010	1.011	1.012	1.013
	72- 84	1.003	1.004	1.004	1.005	1.005	1.006	1.006
	84 to Ult	1.001	1.002	1.002	1.002	1.002	1.003	1.003
Accumulated		1.001	1.006	1.015	1.066	1.201	1.541	2.357
Ultimates		100,100	105,261	110,077	115,124	120,079	125,130	129,812
Accumulated		100,100	205,361	315,438	430,562	550,641	675,771	805,583
IBNR		100	628	1,627	7,128	20,096	43,929	74,737
Total		100	728	2,355	9,482	29,579	73,508	148,245

Total of last diagonal:657,338

A maximum of 6 factors are used.
Source:Test Data
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SCORECARD SYSTEM
COMPANY XYZ
LINE OF BUSINESS abc

Loss Development - Trended Link Ratios

Accident Period
as of 12/31/94

		1987	1988	1989	1990	1991	1992	1993	1994
Months	12	47,073	48,603	50,054	51,427	52,721	53,937	55,075	56,134
	24	69,668	72,162	74,563	76,870	79,082	81,200	83,224	
	36	86,614	90,079	93,463	96,764	99,982	103,119		
	48	95,499	99,718	103,883	107,996	112,056			
	60	99,061	103,767	108,450	113,110				
	72	99,709	104,633	109,551					
	84	100,000	105,000						
	96	100,000							
As of 12/31/94		100,000	105,000	109,551	113,110	112,056	103,119	83,224	56,134
Months	12- 24	1.480	1.485	1.490	1.495	1.500	1.505	1.511	1.517
	24- 36	1.243	1.248	1.253	1.259	1.264	1.270	1.276	1.282
	36- 48	1.103	1.107	1.111	1.116	1.121	1.126	1.131	1.136
	48- 60	1.037	1.041	1.044	1.047	1.050	1.053	1.056	1.059
	60- 72	1.007	1.008	1.010	1.012	1.014	1.016	1.018	1.020
	72- 84	1.003	1.004	1.005	1.006	1.007	1.008	1.009	1.010
	84- 96	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
	96 to Ult.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Accumulated		1.000	1.000	1.005	1.018	1.072	1.214	1.565	2.410
Ultimates		100,000	105,000	110,099	115,146	120,125	125,186	130,246	135,283
Accumulated		100,000	205,000	315,099	430,245	550,370	675,556	805,802	941,085
IBNR				548	2,036	8,068	22,067	47,022	79,149
Total				548	2,584	10,652	32,719	79,741	158,890

Total of last diagonal:782,195

A maximum of 7 factors are used.
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SCORECARD SYSTEM
COMPANY XYZ
LINE OF BUSINESS abc

Loss Development - Trended Link Ratios

Accident Period as of 12/31/95

		1987	1988	1989	1990	1991	1992	1993	1994	1995
Months	12	47,073	48,603	50,054	51,427	52,721	53,937	55,075	56,134	57,115
	24	69,668	72,162	74,563	76,870	79,082	81,200	83,224	85,154	
	36	86,614	90,079	93,463	96,764	99,982	103,119	106,172		
	48	95,499	99,718	103,883	107,996	112,056	116,064			
	60	99,061	103,767	108,450	113,110	117,746				
	72	99,709	104,633	109,551	114,464					
	84	100,000	105,000	110,000						
	96	100,000	105,000							
	108	100,000								
As of 12/31/95		100,000	105,000	110,000	114,464	117,746	116,064	106,172	85,154	57,115
Months	12- 24	1.480	1.485	1.490	1.495	1.500	1.505	1.511	1.517	1.523
	24- 36	1.243	1.248	1.253	1.259	1.264	1.270	1.276	1.282	1.288
	36- 48	1.103	1.107	1.111	1.116	1.121	1.126	1.131	1.136	1.141
	48- 60	1.037	1.041	1.044	1.047	1.051	1.054	1.057	1.060	1.063
	60- 72	1.007	1.008	1.010	1.012	1.014	1.016	1.018	1.020	1.022
	72- 84	1.003	1.004	1.004	1.005	1.006	1.007	1.008	1.009	1.010
	84- 96	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
	96-108	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
	108 to Ult.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Accumulated		1.000	1.000	1.000	1.005	1.020	1.078	1.227	1.589	2.456
Ultimates		100,000	105,000	110,000	115,036	120,101	125,117	130,274	135,310	140,274
Accumulated		100,000	205,000	315,000	430,036	550,137	675,254	805,528	940,838	1,081,112
IBNR					572	2,355	9,053	24,101	50,156	83,159
Total					572	2,927	11,980	36,081	86,237	169,397

Total of last diagonal:911,715

A maximum of 8 factors are used.
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SCORECARD SYSTEM
COMPANY XYZ
LINE OF BUSINESS abc

Loss Development - Trended Link Ratios

		1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
Months	12	47,073	48,603	50,054	51,427	52,721	53,937	55,075	56,134	57,115	58,017
	24	69,668	72,162	74,563	76,870	79,082	81,200	83,224	85,154	86,990	
	36	86,614	90,079	93,463	96,764	99,982	103,119	106,172	109,144		
	48	95,499	99,718	103,883	107,996	112,056	116,064	120,018			
	60	99,061	103,767	108,450	113,110	117,746	122,359				
	72	99,709	104,633	109,551	114,464	119,371					
	84	100,000	105,000	110,000	115,000						
	96	100,000	105,000	110,000							
	108	100,000	105,000								
	120	100,000									
As of 12/31/96		100,000	105,000	110,000	115,000	119,371	122,359	120,018	109,144	86,990	58,017
Months	12-24	1.480	1.485	1.490	1.495	1.500	1.505	1.511	1.517	1.523	1.529
	24-36	1.243	1.248	1.253	1.259	1.264	1.270	1.276	1.282	1.288	1.294
	36-48	1.103	1.107	1.111	1.116	1.121	1.126	1.130	1.134	1.138	1.142
	48-60	1.037	1.041	1.044	1.047	1.051	1.054	1.058	1.062	1.066	1.070
	60-72	1.007	1.008	1.010	1.012	1.014	1.016	1.018	1.020	1.022	1.024
	72-84	1.003	1.004	1.004	1.005	1.006	1.007	1.008	1.009	1.010	1.011
	84-96	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
	96-108	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
	108-120	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
	120 to Ult.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Accumulated		1.000	1.000	1.000	1.000	1.006	1.023	1.086	1.239	1.613	2.503
Ultimates		100,000	105,000	110,000	115,000	120,087	125,173	130,339	135,229	140,315	145,217
Accumulated		100,000	205,000	315,000	430,000	550,087	675,260	805,599	940,829	1,081,144	1,226,361
IBNR						716	2,814	10,322	26,085	53,325	87,200
Total						716	3,530	13,852	39,937	93,262	180,462

Total of last diagonal:1,045,899

A maximum of 9 factors are used.
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SCORECARD SYSTEM
COMPANY XYZ
LINE OF BUSINESS abc

Method: Loss Development using trended link ratios

Comparison of Ultimate Losses

Ultimate Losses As Of:	Accident Year 1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	Total
12-31-92	100,008	105,116	110,220	115,149	120,047	124,865					675,405
12-31-93	100,100	105,261	110,077	115,124	120,079	125,130	129,812				805,583
12-31-94	100,000	105,000	110,099	115,146	120,125	125,186	130,246	135,283			941,085
12-31-95	100,000	105,000	110,000	115,036	120,101	125,117	130,274	135,310	140,274		1,081,112
12-31-96	100,000	105,000	110,000	115,000	120,087	125,173	130,339	135,229	140,315	145,217	1,226,361

Comparison of Loss Reserves

Aggregate Paid Losses	Initial (a) Loss Reserves	Restated (b) Loss Reserves	Percentage Change (c)
359,616	315,789 (a)		
476,336	329,247		
598,057	343,028		
724,777	356,335		
856,498	369,863		

Change in Estimated Ultimate Losses

12-31-92 to:													
12-31-93	92	144	(143)	(25)	32	265					366	316,155 (b)	0.1% (c)
12-31-94	(8)	(116)	(121)	(3)	78	321					150	315,940	0.0%
12-31-95	(8)	(116)	(220)	(112)	54	251					(151)	315,638	0.0%
12-31-96	(8)	(116)	(220)	(149)	40	308					(145)	315,644	0.0%
12-31-93 to:													
12-31-94	(100)	(261)	22	22	46	56	434				219	329,466	0.1%
12-31-95	(100)	(261)	(77)	(88)	22	(13)	462				(55)	329,192	0.0%
12-31-96	(100)	(261)	(77)	(124)	8	43	527				17	329,263	0.0%
12-31-94 to:													
12-31-95	0	0	(99)	(110)	(23)	(69)	27	27			(247)	342,781	-0.1%
12-31-96	0	0	(99)	(146)	(37)	(13)	93	(54)			(257)	342,772	-0.1%
12-31-95 to:													
12-31-96	0	0	0	(36)	(14)	57	66	(81)	41		32	356,367	0.0%

(a) Total Ultimate Losses minus Aggregate Paid Losses, for example: $675,405 minus $359,616 equals $315,789
(b) Initial Losses Reserves plus Total Change in Estimated Ultimate Losses, for example: $315,789 plus $366 equals $316,155
(c) (Restated Loss Reserve divided by the Initial Loss Reserve) minus 1, for example: ($316,155 divided by $315,789) minus 1 equals 0.1%

Source: Exhibits IV, pages 1, 2, 3, 4 and 5
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