



# SIGMA Circle Solutions

## *Components of a Loss Analysis*

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**Note: The following article uses workers compensation as an example only. The technique is applicable to any line of coverage.**

A workers compensation loss analysis can be utilized for a reserve certification, satisfaction of self-insurance requirements, negotiation of security requirements and letters of credit, insurance budgeting and to determine if quoted insurance costs are reasonable. The methodology can take many forms with loss development as a common technique. Below is an explanation of each step.

### *Loss Development Analysis*

A loss development analysis tracks the historical development of losses at annual evaluations for past periods. When reported losses are utilized, this method assumes that reporting patterns and reserving practices are consistent over time. When paid losses are utilized, this method assumes that payment patterns and settlement practices are consistent over time. Once development factors are estimated based on the historical patterns, they are applied to the most recent evaluation of losses. The fully developed losses give an estimate of the final settlement values of all claims. Depending on the amount of data available, other methods can be utilized. At this point, a weighting of the various methods is taken based on the credibility of each method. The selected estimated ultimate

losses are then used as input to a reserve analysis or carried forward to a loss projection analysis.

### *Reserve Analysis*

A reserve analysis is used to satisfy various regulatory requirements. Current paid losses are subtracted from the estimated ultimate losses to yield estimated outstanding reserves. A cash flow analysis can then be created using the estimated outstanding reserves and paid development patterns. Once the cash flow has been estimated, a discount factor can be incorporated into the analysis to estimate the present value of these liabilities.

Where losses are settled over an extended period of time, the money held in reserves earns interest, and the time value of money can be a major factor. For those exposures with long-tail reserves, the recognition given future investment earnings can have an important bearing on needed security levels.

### *Loss Projection Trend Adjustments*

When utilized as input to a loss projection, the estimated ultimate losses are restated through the use of benefit level change factors, payroll trends and medical cost trends. The restated losses for each historical period are now at a common loss date. Appropriate trend factors should be selected based on your knowledge of the industry or com-

## Components of a Loss Analysis

pany.

An exposure base is utilized as a way to quantify the exposure to loss experienced by a company. The common base used for workers compensation is payroll. The payroll for each period is restated to a constant dollar basis using payroll trends.

### *Pure Loss Rate Calculation*

The pure loss rate is calculated as the adjusted losses divided by the adjusted payrolls. Since the losses and payrolls have been restated to a common basis, a credible comparison can be made between the actual loss experience for each period. It is suggested that at least five to seven periods be analyzed so that characteristics common to the implementation of a loss control program, random large losses, plant closings and acquisitions/divestitures do not bias the data.

### *Loss Projection*

The choice of a pure loss rate demonstrates judgment, otherwise a computer could do it. A straight average is usually not the best selection unless the rates are very stable. Steadily decreasing rates could indicate that a loss control program is working. An erratic set of rates could indicate that the company is plagued by infrequent, but serious, large losses. The closing of a plant could cause one or two of the years to show a large rate relative to the other years. In addition, acquisitions or divestitures should usually be segregated in this part of the analysis. However, if that is not possible, be careful of swings in the rates soon after an acquisition or divestiture. After an analysis of all relevant information has been completed, choose a rate that is most indicative of the projected period.

The rate is then applied to the projected payroll. The result is a point estimate of losses for the projected period. As long as historical experience is indicative of future experience, then your company may feel comfortable with this

estimate. However, there is potentially a wide range of estimates due to internal and external factors.

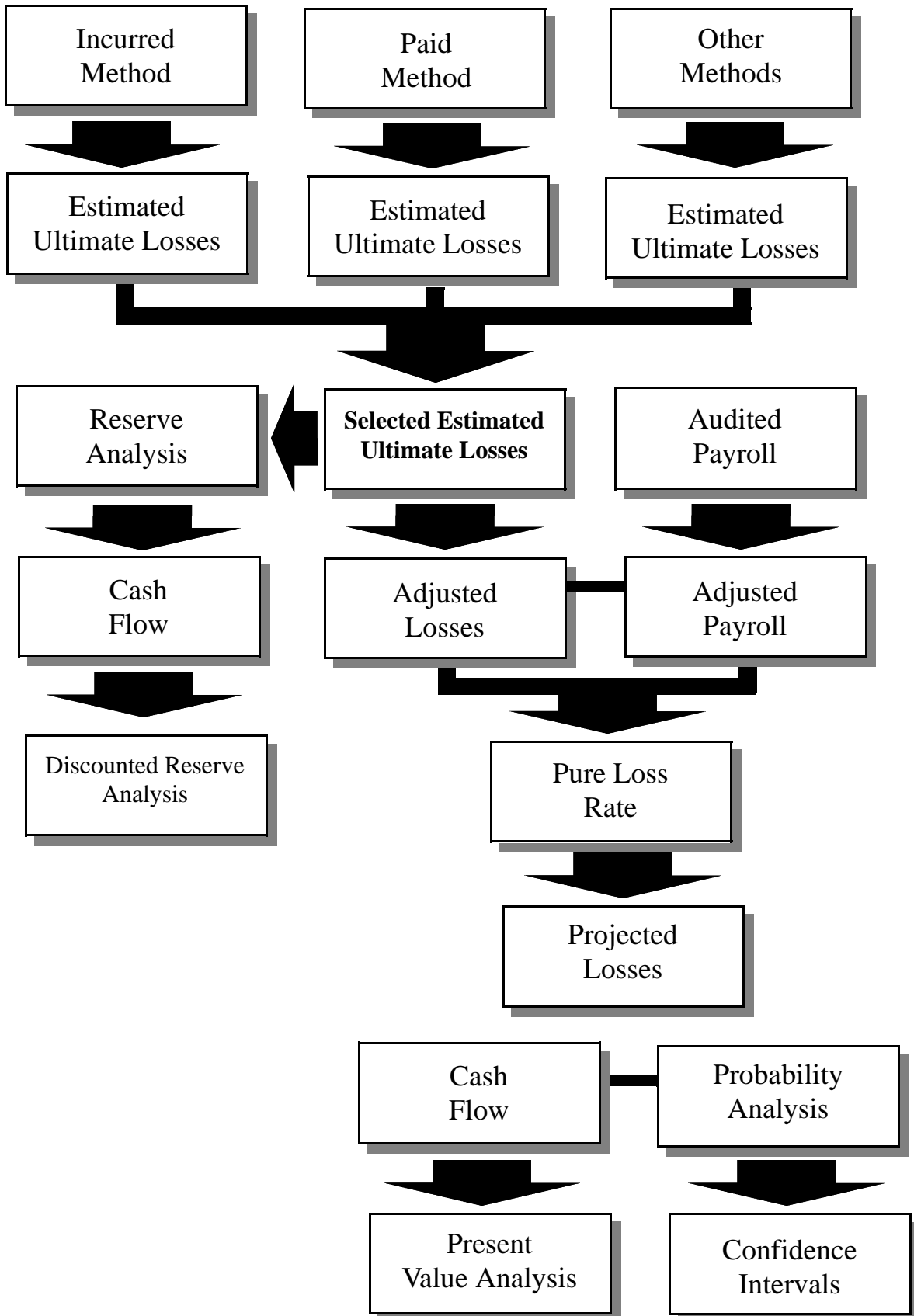
### *Additional Analyses*

When a point estimate is not sufficient, a probability distribution can be an important measure of variability and volatility. A probability distribution, or spread of loss, shows the practical application of the work completed in estimating the projected losses. A spread of loss allows confidence levels to be calculated. These levels then allow the company to choose a funding level according to their aversion to risk.

There are two more steps that can be undertaken once an appropriate funding level has been established. A cash flow exhibit will show estimated payouts over time. A discount analysis can then show the present value of the projected losses.



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