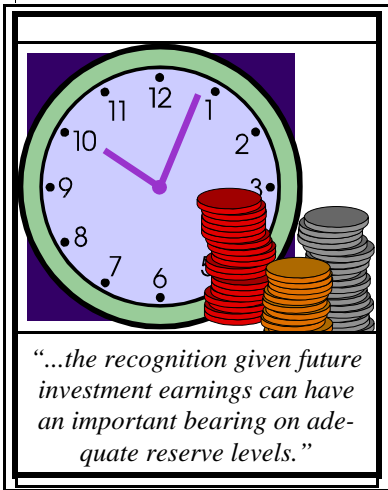


SIGMA CIRCLE SOLUTIONS

Volume 3, Issue 1

The Value of a Cash-Flow Analysis

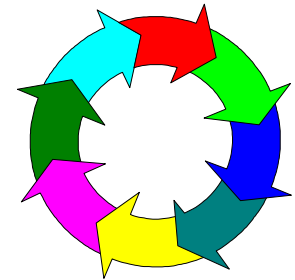


One of the more valuable analyses a broker, actuary or risk management consultant can provide to a client involves the impact of cash-flow. Consideration of when losses are expected to be paid can affect everything from the premium on a guaranteed cost program to a letter of credit requirement on a loss sensitive program to budgeting for a completely self-insured program.

I will often review an analysis that ends when a point estimate (either a loss pick or a calculation of IBNR) has been calculated. Because losses are usually settled over an extended period of time, the point estimate used as-is, is less valuable than it can be. For those insurance pro-

grams with long-tail reserves, the recognition given future investment earnings can have an important bearing on adequate reserve levels.

A cash-flow analysis provides a valuable tool for management's decision making process. For example, say an analysis was completed which indicated that projected losses for the next policy year are expected to be \$1,000,000. Further analysis also indicates that if the time value of money is considered, then only \$860,000 would be needed to fund the \$1,000,000 loss pick. A conservative or risk averse company may still decide to set aside \$1,000,000 rather than \$860,000. However, in order to make an informed decision, both numbers should be presented with a full explanation of all calculations.



Prospecting with the Loss Forecaster II

Loss Forecaster II software, which is utilized by many SIGMA Circle members, is an excellent prospecting tool. In today's competitive market, delivering true value added service and analysis can make the difference in landing medium to large accounts and marketing the account to underwriters.

For more information on specialized software training available to SIGMA Circle members, Call Al Rhodes at 615-352-3944.

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Cash-Flow: Example

Example

The first step in a cash-flow analysis is the calculation of reserves for completed policy periods and/or a loss projection for a future policy period. For the example shown below, we will assume projected losses are \$1,000,000 for the upcoming policy period. The second step is to determine the timing of payments. A payout schedule unique to the program analyzed is preferable to a broad industry average. Table 1 is a simple example of how to calculate a unique payout schedule. A real-life example will not be as straightforward.

| Policy Year | Months After Inception Date | | | | | | | | | | Estimated Ultimate Losses |
|-------------|-----------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|------------|------------|---------------------------|
| | 12 Months | 24 Months | 36 Months | 48 Months | 60 Months | 72 Months | 84 Months | 96 Months | 108 Months | 120 Months | |
| 1988 | \$140,000 | \$280,000 | \$330,000 | \$390,000 | \$410,000 | \$440,000 | \$470,000 | \$500,000 | \$520,000 | \$550,000 | \$550,000 |
| 1989 | 150,000 | 300,000 | 360,000 | 420,000 | 450,000 | 480,000 | 510,000 | 540,000 | | | 600,000 |
| 1990 | 160,000 | 330,000 | 390,000 | 460,000 | 490,000 | 520,000 | 550,000 | | | | 650,000 |
| 1991 | 180,000 | 350,000 | 420,000 | 490,000 | 530,000 | 560,000 | | | | | 700,000 |
| 1992 | 190,000 | 380,000 | 450,000 | 530,000 | 560,000 | | | | | | 750,000 |
| 1993 | 200,000 | 400,000 | 480,000 | 560,000 | | | | | | | 800,000 |
| 1994 | 210,000 | 430,000 | 510,000 | | | | | | | | 850,000 |
| 1995 | 230,000 | 450,000 | | | | | | | | | 900,000 |
| 1996 | 240,000 | | | | | | | | | | 950,000 |

$$\frac{\$390,000}{\$550,000} = 71\%$$

| Policy Year | Months After Inception Date | | | | | | | | | |
|-------------|-----------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|------------|------------|
| | 12 Months | 24 Months | 36 Months | 48 Months | 60 Months | 72 Months | 84 Months | 96 Months | 108 Months | 120 Months |
| 1988 | 25% | 51% | 60% | 71% | 75% | 80% | 85% | 91% | 95% | |
| 1989 | 25% | 50% | 60% | 70% | 75% | 80% | 85% | 90% | | |
| 1990 | 25% | 51% | 60% | 71% | 75% | 80% | 85% | | | |
| 1991 | 26% | 50% | 60% | 70% | 76% | 80% | | | | |
| 1992 | 25% | 51% | 60% | 71% | 75% | | | | | |
| 1993 | 25% | 50% | 60% | 70% | | | | | | |
| 1994 | 25% | 51% | 60% | | | | | | | |
| 1995 | 26% | 50% | | | | | | | | |
| 1996 | 25% | | | | | | | | | |
| Average | 25% | 50% | 60% | 70% | 75% | 80% | 85% | 90% | 95% | |
| Selected | 25% | 50% | 60% | 70% | 75% | 80% | 85% | 90% | 95% | 100% |

Table 1 looks very similar to a loss development triangle (see our **Loss Development Primer** for further reference). However, the purpose here is to calculate payout percentages rather than loss development factors. With five to ten years of historical reported payment data, a relatively credible unique payout schedule can be calculated.

Cash-Flow

In Section A, actual payments are summarized for each policy year at yearly evaluations. The estimated ultimate losses for each policy year are also displayed. In Section B, the ratio of paid losses to estimated ultimate losses are calculated for each evaluation date. A payout percentage is then selected based on the yearly averages. The selected payout percentages are used to allocate projected losses to periods in which they are expected to be paid.

If historical data is not available in the detail needed to calculate unique percentages, then ask your broker, TPA or actuary for industry information. There are also a number of sources which publish this type of information.

The third step in our analysis is to “spread” the expected payments. Table 2 summarizes information from Table 1 and shows an estimated schedule of cumulative and yearly payments for the projected policy period. For example, an expected payment pattern for the first three years of 25%, 50% and 60% would indicate that total payments at the end of the first three years are expected to be \$250,000, \$500,000 and \$600,000. The actual payments during the first three years are expected to be \$250,000, \$250,000 and \$100,000.

| Year | Expected Payment Pattern | Expected Cumulative Payments | Expected Yearly Payments |
|------|--------------------------|------------------------------|--------------------------|
| 1 | 25% | \$250,000 | \$250,000 |
| 2 | 50% | 500,000 | 250,000 |
| 3 | 60% | 600,000 | 100,000 |
| 4 | 70% | 700,000 | 100,000 |
| 5 | 75% | 750,000 | 50,000 |
| 6 | 80% | 800,000 | 50,000 |
| 7 | 85% | 850,000 | 50,000 |
| 8 | 90% | 900,000 | 50,000 |
| 9 | 95% | 950,000 | 50,000 |
| 10 | 100% | 1,000,000 | 50,000 |

For step four, we estimate the potential effect of investment income by discounting these payments to present value. In Table 3, the estimated yearly payments are discounted to reflect the timing of future loss payments at annual rates of investment interest of 3.0%, 5.0% and 7.0%. The discounting procedure assumes all losses will be paid in the middle of the year.

In our example, if this company can realize a 5.0% investment return (after taxes) on funds, it will need to invest approximately \$860,000 to fund estimated liabilities of \$1,000,000. This assumes that payments follow the pattern selected in Table 1 and losses are paid evenly through each year. In choosing a discount rate each organization must evaluate what is an appropriate rate based on operating and financial strategies.

Cash-Flow

| Table 3 - Discounted Payout Schedule | | | | |
|---|---------------|---------------|---------------|---------------|
| Year | Expected | Expected | Expected | Expected |
| | Yearly | Yearly | Yearly | Yearly |
| | Payments | Payments | Payments | Payments |
| | Discounted at | Discounted at | Discounted at | Discounted at |
| | 3% | 5% | 7% | |
| 1 | \$250,000 | \$246,332 | \$243,975 | \$241,684 |
| 2 | 250,000 | 239,158 | 232,357 | 225,873 |
| 3 | 100,000 | 92,877 | 88,517 | 84,439 |
| 4 | 100,000 | 90,172 | 84,302 | 78,914 |
| 5 | 50,000 | 43,773 | 40,144 | 36,876 |
| 6 | 50,000 | 42,498 | 38,232 | 34,463 |
| 7 | 50,000 | 41,260 | 36,412 | 32,209 |
| 8 | 50,000 | 40,058 | 34,678 | 30,102 |
| 9 | 50,000 | 38,891 | 33,026 | 28,132 |
| 10 | 50,000 | 37,759 | 31,454 | 26,292 |
| Total | \$1,000,000 | \$912,778 | \$863,097 | \$818,984 |

Conclusion

Two variations are introduced when estimating expected payouts on a discounted present value basis. First, the timing of future payments could differ from the estimated payout due to random variations in the payments of large claims. Second, the future yield on the underlying assets is susceptible to significant changes in economic conditions. Therefore, while the recognition given future investment earnings is important, discounting does add an additional uncertainty to an already projected amount. Due to this uncertainty, one can not provide assurance that the amount and timing of actual claim payments will not deviate materially from a projection.

Contact SIGMA

**Al Rhodes, ACAS, MAAA
President**

**Timothy L. Coomer, MBA, ARM
CEO**

SIGMA Actuarial Consulting Group, Inc.
116 Bellevue Drive South
Nashville, TN 37205
Phone: 615-352-3944
Fax: 615-352-7555
Email: alrhodes@aol.com
WEB: WWW.SIGMAACTUARY.COM

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