MEASURING DIVISION OPERATING PROFIT

by David Skurnick, FCAS

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ABSTRACT

We have developed a "Company Return" of operating results by division office and line. Company Return actuarially reflects loss development, retrospective rating plans, dividend plans, reinsurance, cash flow plans, and investment income. Losses are on an accident year basis. A retro accrual is deducted from the premium for retrospective returns paid or anticipated. A similar adjustment is made for dividends to policyholders. Large audits appearing in the wrong year are adjusted to the proper year. Reinsurance ceded is deducted from premiums and losses.

Division investment income is split into two components. Investment income reflecting the fact that losses are paid out over a period of time is handled by an incurred loss discount factor, which varies by line of business. The investment income gained or lost based on the speed with which the premium is collected is measured by a so-called Cash Collection Adjustment. Our top management uses the Company Return as the primary measure of division profitability.

MEASURING DIVISION OPERATING PROFITABILITY

Insurance companies traditionally measure their division office profitability in an accounting sense. Premiums, losses, and expenses are shown on a calendar year basis. Dividends to policyholders are either ignored or shown on a paid or declared basis. Retrospective return reserves and IBNR reserves are calculated countrywide, then distributed to divisions using the "meat axe" method. No adjustment is made for investment of unearned premiums or loss reserves. This accounting type report will accurately tie to the company totals, but is inadequate for management of a division.

It is said than an actuary is content to be approximately right, while an accountant would rather be exactly wrong. We have developed an "Argonaut Return" of operating results by division office and line (Exhibit I). Argonaut Return actuarially reflects loss development, retrospective rating plans, dividend plans, reinsurance, cash flow plans, and investment income. Losses are on an accident year basis. A retro accrual is deducted from the premium for retrospective returns paid or anticipated. A similar adjustment is made for dividends to policyholders. Large audit premiums appearing in the wrong year are adjusted to the proper year. Reinsurance ceded is deducted from premiums and losses.

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The starting point is accident year loss development by line, by division office. An example is shown in Exhibit 2. Since the investment income is explicitly credited to the divisions, there is no cushion for adverse loss development. Therefore, loss development factors must be fully adequate. We develop losses to 10 years, with an additional factor to a 20 year ultimate. This development also provides an IBNR balance by division, which is used in internal calendar year reports.

In order to improve the accuracy of the loss development factors, we use a weighted average of division LDF's and countrywide (Total) LDF's. (See Exhibit 3). A credibility weighted LDF is selected, where credibility is:

$$Z = \sqrt{\frac{\text{\# of division claims in last 5 years}}{10{,}623}}$$

In the example shown, the division is large enough to receive full credibility.

An adjustment factor is used when it appears that the formula derived loss development factors may not be appropriate. These adjustment factors are somewhat judgmental. The most common reason for an adjustment would be a change in average severity, shown in Exhibit 4.

For example, the 1984 adjustment was derived by comparing the average value at age 1 (8761) with a projection based on the five prior values. These earlier values were increased corresponding to a change in workers' compensation benefits and trended for inflation, producing a projected 1984 value of 8612. Presumably the actual value is higher than the projected value because the 1984 case reserves are stronger than they were during the period used for deriving the LDF's. Hence we adjust the 1984 LDF by a factor of .983 (8612 ÷ 8761).

Another situation in which an LDF adjustment would be made would be a $1 million (policy limits) liability claim in a division with only $2 million of incurred liability loss, for an immature accident year. We would reduce the LDF, since this large claim could not develop adversely.

Adjusted Net Premium Earned, shown on line 7 of Exhibit 1, is the amount we expect to retain after after retrospective returns, dividends to policyholders, and reinsurance. Line 1 of Exhibit 1 is the calendar year direct earned premium. Line 2, Audit Adjustments, gives the actuary an opportunity to correct the premium for large final audits or coding errors that have transferred premium from one year to another. The sum of lines (1) and (2) corresponds more closely to the accident year losses than line (1) above.

The dividend accrual on line 4 of Exhibit 1 represents the dividends to policyholder paid or anticipated, by accident year. In order to estimate this number, we compute dividends paid and dividend reserves by policy year. The accrual (paid and reserve) for a more recent year is estimated from the amounts paid in older years, taking into account changes in the dividend plans used by the division. The accident year accrual rates are weighted averages of the policy year accrual rates, based on the distribution of premiums by policy month.

Retro accruals are handled in a similar fashion. Policy year retro returns follow the Berry method with individual input by division.[1]. The accident year retro accrual rate is a weighted average of policy year retro accrual rates. The use of accident year retro and dividend accrual ratios provides much more stability than the use of calendar year retro and dividend returns.

[1] C.H. Berry, "A Method for Setting Retro Reserves," PCAS LXVII 1980, p. 226

Expenses shown are the same as the calendar year expenses done by the accountants.

Line 13 of Exhibit I shows an accident year underwriting profit or loss. However, in today's insurance world there are several reasons to take investment income into account. First, the true operating profit of a company is significantly due to its investment income, especially as relates to casualty lines. Also, the division management has the power to affect the rate at which premium is collected. In some cases, the full premium may be collected at policy inception. Alternatively, the premium may be paid in monthly or quarterly installments and the deposit percentage can vary. With cash flow retro policies, a substantial percentage of the premium may be deferred until the first retro adjustment. In a paid loss retro plan, the company collects only the retro basic and the paid losses, with the reimbursement for loss reserves deferred to the fifth retro adjustment or even later.

We decided to handle investment income in two pieces. The investment income on the loss reserves is measured prospectively by discounting incurred losses. We discount the loss payment patterns for our various lines of business at an assumed interest rates. As a result, workers' compensation losses were discounted at 20% in most states. (We chose to discount incurred loss rather than apportion interest to loss reserves in order to encourage prompt claims settlement. Also, we preferred to reflect estimated future investment income on the current accident year rather than actual current investment income on past accident years.)

The investment income on the premium is measured by comparing the collected premium to the earned premium. If the all-time collected premium is greater than the all-time earned premium, the division receives interest on the difference, currently .9% per

month. If the all-time collected premium is less than the earned premium, the division is charged at the same rate.

The difference between the all-time collected premium and the all-time earned premium equals the unearned premium reserve plus the dividend reserve plus the retrospective returns minus the Agents' Balances.[2] Fortunately, our company calculates each of these reserve balances by division, so the calculation of our Cash Collection Adjustment is straight-forward.

The Cash Collection Adjustment properly penalizes the divisions for lost investment income when they sell cash flow policies. It also rewards them for prompt premium collection or large deposits. A policy with a large anticipated retro or dividend return will generate extra Cash Collection Adjustment, reflecting the period the company holds the premium until the return is paid.

Not only is the Cash Collection Adjustment a part of Argonaut Return, but its display also calls attention to the speed of collecting premium. It serves as a management barometer of timely policy issuance, deposit adequacy, speed of audit adjustments, and promptness of collections. One can see the improvement made by the Division shown in Exhibit I, an improvement encouraged by the company's use of the Cash Collection Adjustment.

Never before has division management had a greater opportunity to control their own profitability. Divisions have enormous pricing flexibility as well as the ability to select

[2] (Written Premium) − (Earned Premium) = (Unearned Premium Reserve) + (Retro Reserve) + (Dividend Reserve)

(Written Premium) − (Collected Premium) = (Agents' Balances)

or reject accounts. They also control the rate at which premium is collected and the commission rates. It is essential that we have a measured of bottom line profit which is stable and accurate. The Argonaut Return provides division management with a convenient and realistic measurement of the operating profit of their business.

In the past, lacking a meaningful measure of operating income, management has not always focused on the key items. A low expense ratio might be rewarded while a high loss ratio was considered bad luck or a timing problem. The appearance of proper management took priority over the substance of profitable results. The use of Argonaut Return has helped us combine all the factors and work toward achieving profit for each division, and thus for the entire company.

DIy-26

Argonaut Return
Evaluated at 9/84

Division or Branch Name:
Workers' Compensation

		Calendar and Accident Year ($000)					
		1982		1983		1984 (9 months)	
1.	Direct Premium Earned	$38,056	128.5%	$39,217	130.0%	$33,000	143.4%
2.	Final Audit Adjustment			1,326	4.4	-1,326	-5.8
3.	Retro Accrual	-1,699	5.7	-2,109	-7.0	-2,259	-9.8
4.	Dividend Accrual	-6,621	22.4	-8,137	-27.0	-6,135	-26.7
5.	Adjusted Direct Earned Premium	29,736	100.4	30,297	100.4	23,280	101.2
6.	Ceded Premium	-126	-0.4	-129	-0.4	-268	-1.2
7.	Adjusted Net Earned Premium	29,610	100.0	30,168	100.0	23,012	100.0
8.	Direct AY Loss & ALAE	23,498	79.4	29,199	96.8	21,349	92.8
9.	Ceded Loss & ALAE	-564	-1.9	-701	-2.3	-512	-2.2
0.	Net AY Loss & ALAE	22,934	77.5	28,498	94.5	20,837	90.5
1.	ULAE	1,175	4.0	1,460	4.8	1,067	4.6
2.	Net Underwriting Expense	8,090	27.3	7,744	25.7	6,540	28.4
3.	Adjusted Net Underwriting Income	-2,589	-8.7	-7,534	-25.0	-5,432	-23.6
4.	Loss Discount	4,587	15.5	5,700	18.9	4,167	18.1
5.	Cash Collection Adjustment	-1,034	-3.5	-602	-2.0	149	0.6
6.	Company Return	964	3.3	-2,436	-8.1	-1,116	-4.8

Exhibit 1

ACCIDENT YEAR LOSS DEVELOPMENT REPORT
PRODUCT LINE: WORKERS' COMPENSATION
AS OF SEPTEMBER 30, 1984

DIVISION NAME:

ACCIDENT YEAR	ADJ. DIRECT EARNED PREMIUM	LOSS DEVELOPMENT - YEARS * (000-OMITTED)											LOSS DEVELOPMENT FACTOR	GROSS ULTIMATE LOSS	IBNR
		1	2	3	4	5	6	7	8	9	10	CURRENT			
All Prior	-	245,340	254,268	258,878	264,339	265,774	266,592	266,871	269,700	269,802	271,072	271,691	1.029	279,570	7,879
1975	31,043	18,369	20,111	21,124	20,503	20,795	20,716	20,512	20,760	21,097	21,336	21,336	1.060	22,616	1,280
1976	29,808	16,829	19,163	21,381	21,560	21,726	21,350	21,406	21,375	21,445		21,445	1.071	22,968	1,523
1977	42,162	22,196	24,762	25,811	26,083	26,396	26,537	26,528	27,035			27,035	1.075	29,063	2,028
1978	44,994	24,269	28,367	29,812	30,640	31,141	30,903	31,069				31,069	1.082	33,617	2,548
1979	46,906	25,082	28,341	30,759	30,710	29,890	29,897					29,897	1.075	32,139	2,242
1980	30,413	18,099	21,176	22,081	22,420	22,463						22,463	1.064	23,900	1,437
1981	32,253	18,079	22,203	23,818	23,704							23,704	1.071	25,387	1,683
1982	29,736	17,055	21,214	21,479								21,479	1.094	23,498	2,019
1983	30,297	21,532	25,886									25,886	1.128	29,199	3,313
1984	23,280	15,558										15,558	1.372	21,349	5,791
												511,563		543,306	31,743

* Cumulative dollar incurred losses at yearly intervals past each accident year.

IBNR = Gross Ultimate Loss - Current Incurred Loss

Exhibit 2

ACC YEAR	DIVISION LDF	CNTRYWDE LDF	CRD-WTD* LDF	ADJUSTMENT FACTOR	APPLIED LDF
1974	1.029	1.029	1.029	1.000	1.029
1975	1.060	1.060	1.060	1.000	1.060
1976	1.071	1.070	1.071	1.000	1.071
1977	1.075	1.061	1.075	1.000	1.075
1978	1.082	1.070	1.082	1.000	1.082
1979	1.075	1.067	1.075	1.000	1.075
1980	1.064	1.068	1.064	1.000	1.064
1981	1.071	1.072	1.071	1.000	1.071
1982	1.094	1.109	1.094	1.000	1.094
1983	1.174	1.174	1.174	0.961	1.128
1984	1.396	1.403	1.396	0.983	1.372

* 100.0% X DIVISION LDF + 0.0% X COUNTRYWIDE LDF

Exhibit 3

ACCIDENT	AVERAGE SEVERITY - EXCLUDING M.O.'s, CWP's, & CZP's									* NOTE 2	
YEAR	1	2	3	4	5	6	7	8	9	10	CURRENT
All Prior											
1975	4,073	3,957	4,141	3,930	3,943	3,918	3,880	3,923	3,984	4,030	
1976	3,708	3,660	3,840	3,829	3,850	3,779	3,780	3,776	3,787		
1977	4,098	4,014	4,141	4,164	4,204	4,221	4,216	4,291			
1978	3,977	4,104	4,272	4,385	4,450	4,412	4,433				
1979	4,737	4,719	5,107	5,075	4,922	4,924					
1980	4,997	5,118	5,275	5,342	5,350						
1981	5,193	5,665	6,003	5,952							
1982	5,933	6,454	6,454								
1983	7,892	8,435									
1984	8,761										

* NOTE 2

Excludes from claim count and incurred loss
--Medical only (M.O.) claims
--Claims closed without payment (CWP)
--Claims closed with zero loss payment, but with allocated expense payment (CZP)

Exhibit 4