# UNDERWRITING PROFITS NECESSARY TO KEEP PACE WITH THE INCREASING PREMIUM GROWTH FOR PROPERTY-CASUALTY COMPANIES

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The long title of this paper expresses the only concept which will be discussed. However, in order to set-up all the relationships, it was necessary to review historical data.

#### I. SOURCE OF HISTORICAL DATA

The most convenient place to obtain continuous historical data for a number of years and including a number of companies was the publication by A. M. Best -- Aggregrate and Averages. On pages 70 and 71 of the 1978 publication (39th Annual Edition), the Grand Totals of 969 Stock Property- Casualty Companies 1977 Annuals Statement figures are shown. Page 70 sets forth the Assets, Liabilities and Capital-Surplus. Page 71 sets forth the pertinent information of Underwriting Income and Distribution, Investment Accounts and Surplus Accounts. The Best's A & A publication goes back many years.

#### II. DISCUSSION OF THE DATA

All definitions are those of the Annual Statement. No attempt was made to change any value to any other accounting method mainly because the main thrust of this paper is Underwriting Profit necessary to keep pace with the ever increasing premiums and only relationships are necessary. Any attempt to use another accounting method would result in more time spent on the system than the conclusion. There are as many systems to convert to Net Worth as people doing the conversions.

#### A. Assets, Liabilities and Capital-Surplus

These balance sheet items (as of date items) are strictly Annual Statement summations. The mean of the beginning and end of the year for these items has been used when ratios are needed to income or disbursement items (period of time items). No attempt was made to adjust the Capital and Surplus account for intracompany ownership. Again, because of the relative nature of this analysis, it is not necessary.

#### B. Underwriting Profit or Loss

Dividends to policyholders has been substracted from Underwriting Profit. The other income has, also, been included.

No calculation to a so-called Trade basis has been made in basic data. However, the relativity of Earned Premiums to Written Premiums are shown and a calculation can be made. (see Exhibit II) This analysis will stay strictly with the Annual Statement definitions and the financing of new business would become a separate subject.

# C. Investment Income, Realized and Unrealized Capital Gains

These Accounts are grouped together and related to the mean total Assets.

#### D. Federal Income Tax

This item is actual and will be used as a guide in setting up the tax calculations for the four different "situations."

#### E. Adjustment to Surplus

- 1. Annual Statement Requirements are:
  - a. Unauthorized Reinsurance
  - b. Assets non-admitted

- c. Foreign Exchange
- d. Loss Reserve Adjustments
- e. Special Reserves

#### 2. Capital and Surplus Changes are:

- a. Capital Paid in
- b. Capital from Surplus
- c. Surplus Paid in
- d. Surplus from Capital
- e. From Home Office
- f. Statutory Deposits
- g. Capital to Surplus
- h. Exchange of Insurance Company Shares

#### F. Dividend to Stockholders

This account includes Stock Dividends as well as Dividends to Stockholders.

#### G. Balance to Capital and Surplus Account

As expected all the above accounts B. through F. balance to the Increase or Decrease in Surplus.

#### III. RELATIONSHIPS

#### A. Premiums to Surplus (Exhibit I)

Both Written and Earned Premiums were related to the Mean Capital and Surplus' or Surplus regards policyholders.

As the only concept to be reviewed in this paper is the relationship of Underwriting Profit necessary to keep pace with the increasing premium growth, there will be no discussion of what number is good, bad or indifferent in the relationship of premiums to surplus. The increasing change in the premiums to surplus ratio, because of the premium growth and underwriting loss, is the main concern.

Historical numbers will be used and are as follows:

	Written	Earned	Rounded
1977	2.04	1.95	2.00
1971	1.58	1.52	1.50
1965	1.81	0.97	1.00

#### B. Relationships to Capital and Surplus (Exhibit I)

	Assets	<u>Liabilities</u>
1977	3.68	2.68
1971	2.85	1.85
1965	2.29	1.29

#### C. Underwriting Profit or Loss (Exhibit II)

The last complete cycle was six - 1972 through 1977 and average underwriting loss was 3.0% on an equal weight per year basis.

#### D. Investment Income (Exhibit III)

This account as a ratio to mean Admitted Assets has steadily increased since 1960 from 2.7% to 5.1% for 1977. Rather than use an average that could be considered low, the last year in the cycle was used.

#### E. Realized and Unrealized Capital Gains or Losses (Exhibit III)

It is very difficult to know how many years to use in getting a good average on these accounts. The problem was solved by using the same six years as was used in arriving at the cycle average for Underwriting Profit. The numbers are of sufficient differences to have an effect on the "situations" as set forth.

#### F. Federal Income Tax (Exhibit IV)

- A 48% tax factor was used to apply against the Underwriters Profit or Loss.
- A 15% tax factor was used to apply against the sum of Investment Income and Realized Capital Gains or Losses. (Note - a calculation of this average number can be obtained if necessary).
- The actual Federal Tax averages are reasonably close to the sum obtained by using the factors in a proceding paragraphs.

#### G. Adjustments to Surplus (Exhibit IV)

- Annual Statement requirements are generally minus and range from minus 1.3% to 0.8% and will continue as the Operations continue.
- 2. Capital and Surplus changes have been rather large and on the plus side the last four years. The question is --- Will these items continue?

#### H. Dividends to Stockholders (Exhibit IV)

The six year average shows the changing percentage patterns.

#### IV. THE SITUATIONS

Three different years have been selected for review:

1977 because it is the last year available

1971 because it is one underwriting cycle from 1977

1965 because it is about one underwriting cycle from 1971.

In addition to the underwriting cycles, these three years have "round" number relationships of premiums to surplus. The other numbers used are pertinent to the time period.

#### A. The 1977 Situation (Exhibit V)

This exhibit sets forth the 1977 factors to calculate a new premium to surplus ratio and then the "necessary underwriting profit ratio" to maintain the beginning premium to surplus ratio.

The critical number is on line 17 -- a premium growth of 20%. This number was obtained from Exhibit II.

The 1977 factors as shown on Exhibit V by the line numbers on the exhibit are as follows:

- 1. Base to Capital Surplus
  - a. Premium 2.00(Exhibit I)
  - b. Assets 3.68(Exhibit I)
- 3. Operating Profit to Premiums
  - a. (3.0)% to Premium (Exhibit II)
  - b. (6.0)% to Capital-Surplus
- 4. Investment Income 5.1% for 1977 (Exhibit III)
- 5. Realized Capital Gains 0.3% six year average (Exhibit III)
- 6. Unrealized Capital Loss (0.7)% six year average (Exhibit III)

- 7. Subtotal related to Surplus 17.3%
- 9. Underwriting Federal Tax times 48% factor
- 10. Investment Income and Realized Federal Tax of 15%
- 11. Total Federal Tax reasonable close to actual (Exhibit IV)
- 13. Adjustments to Surplus -- a six year average of Annual Statement requirements and changes (Exhibit IV)
- 15. Dividends to Stockholders -- six year average (Exhibit IV)
- 16. Addition to Surplus 8.2%
- 17. Premium Growth of 20%
- 19. New Ratio of Premiums to Surplus of 2.22

The last three colums of Exhibit V are nothing more than working backwards, holding all numbers the same except the Underwriting Profits, and of course, retaining the beginning relationships of premiums to surplus.

The result is that with the 1977 "situation" of 2 to 1 premium to surplus ratio and a 20% premium growth, an 8.3% "underwriting" profit is necessary to at least maintain the same premiums to surplus ratio.

Note that the 8.3% is in reality 4.0% for Federal Income Tax and 4.3% for profit.

#### B. The 1971 Situation

With a beginning 1.5 to 1.0 premiums to surplus ratio, a premium growth of 12%, a six year underwriting cycle loss of 1.0% and other account figures from the numbers available back in 1971; the result is a 1.6 to 1.0 premium to surplus ratio. Again holding the beginning premiums to surplus ratio and working backwards, the result is a 7.5% underwriting profit necessary to maintain the same ratio of premiums to surplus.

#### C. 1965 Situation

With a beginning 1 to 1 ratio, the results with a 10% growth are only 1.4% 1 necessary underwriting profit. However, it should be noted that there was a large smount of Unrealized Capital Gain in that period and a lesser leverage.

#### D. Future Situation

If the trend of a higher and higher premiums to surplus ratio continues, it won't be long before the combined all companies ratio is 3 to 1 as shown on Exhibit VIII. Also, if inflation continues as it has been, the rate of growth could move up to 2% a year. The results, even with a higher Investment Income of 5.%, could be a greater ratios of premiums to surplus unless the underwriting profits are increased.

The necessary underwriting profit to maintain the same ratio of premiums to surplus is 4.7% as shown on Exhibit VIII. This number is near the present average rate-making formula profit of 7% for all property and casualty lines.

#### V. CONCLUSION

The conclusion, using the most conservative of assumptions and approaches, is that at least a 5% underwriting profit (before tax) is necessary to maintain present relationships of premiums to surplus. And that to enable companies to obtain an average underwriting profit of 5% over the period of a cycle, the addition of a contingency factor is necessary. If the last 18 years of an average 2% underwriting loss is any criteria, the contingency factor would need to be in the neighborhood of 7% (5% target profit plus 2% underwriting loss).

# Assets, Liabilities & Premiums

Relationship to Capital-Surplus

Exhibit I

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(000,000's) Assets Capital Assets Liability Mean Written Earned Assets-Premiums Calendar Admitted and Capital to Premiums Cap-Sur (3)-1.0 Surplus Amount Amount Years Total Cap-Sur -Surplus To Mean To Mean  $(1) \div (2)$  $(6) \div (5)$  $(8) \div (5)$ (3) (4) (6) (7) (1) (2) (5) (8) (9) \$22,777 25,585 25,780 27,989 30,077 31,299 \$ 9,495 11,719 11,146 12,642 \$10,527 10,783 11,207 11,881 2.40 \$ 9,438 1960 1.12 \$10,266 1.09 10,607 11,433 11,894 1961 2.18 2.31 2.21 1.02 10,710 11,278 11,595 1.01 1962 0.98 0.99 1963 1.00 0.98 13,167 13,676 1964 13,691 2.20 12,648 13,855 12,356 13,307 0.96 0.94 1965 13,660 2.29 1.29 0.97 1.01 31,035 34,183 37,691 37,992 42,568 49,333 12,007 13,580 14,887 12,699 15,197 16,343 17,833 19,970 22,430 24,824 1966 2.58 2.52 12,834 12,794 1.18 14,582 15,775 17,225 19,096 1.14 1967 1.28 1.23 14,234 13,793 1968 2.53 1.25 1.21 1969 2.99 1.45 1.38 1970 14,014 3.04 13,357 1.68 21,446 1.61 1971 17,308 2.85 1.85 15,661 1.58 23,804 1.52 19,353 20,727 17,444 16,641 20,736 25,042 1972 1973 1974 1975 58,461 62,214 60,294 69,716 83,573 99,648 27,595 30,051 32,110 35,644 26,557 29,098 31,421 34,528 21,398 20,056 14,831 18,451 2.73 1.43 1.37 3.10 1.45 1.40 4.07 3.78 1.84 1.80 2.14 2.08 40,957 48,732 1976 23,021 43,138 2.08 1.98 3.63 27,062 2.68 51,165 2.04 1.95 1977 3.68 1.33 1.22 1965 1.00 1971 1.00 1.38 1.00 1977 1.00 1.30 3.00 3.90 Future (Possible) 4.90 1.00

Source: A. M. Best's A & A

### <u>Premiums:</u> Written & Earned <u>Yearly Change & Relationship</u> <u>Underwriting Profit (or Loss)</u>

Exhibit II

Calendar Years	Write Premi Amount		Earne Premi Amount		Underwi Profit (d Amount		Relation Earned To Written (3) ÷ (1)
	_(1)	_(2)	(3)	(4)	_(5)	(6)	 (7)
1960 1961 1962 1963 1964 1965	\$10,527 10,783 11,207 11,881 12,648 13,855	1.02 1.04 1.06 1.06 1.10	\$10,266 10,710 11,278 11,595 12,356 13,307	1.04 1.05 1.03 1.07 1.08	\$ 10 (25) (53) (283) (417) (504)	0.1% (0.2) (0.5) (2.4) (3.4) (3.8)	.975 .993 1.006 .976 .977 .960
1966 1967 1968 1969 1970 1971	15,197 16,343 17,833 19,970 22,430 24,824	1.10 1.08 1.09 1.12 1.12	14,582 15,775 17,225 19,096 21,446 23,804	1.10 1.08 1.09 1.11 1.12 1.11	5 (116) (346) (564) (346) 462	0.0 (0.7) (2.0) (3.0) (1.6) 1.9 (0.9)	.960 .965 .966 .956 .956 .959
1972 1973 1974 1975 1976 1977	27,595 30,051 32,110 35,644 43,138 51,165	1.11 1.09 1.07 1.11 1.21 1.19	26,557 29,098 31,421 34,528 40,957 48,732	1.12 1.10 1.08 1.10 1.19 1.19	688 (32) (2,047) (3,146) (1,680) 464	2.5 (0.1) (6.5) (9.1) (4.1) 1.0 (3.0)	.962 .968 .979 .969 .949 .952

Source: A. M. Best's A & A

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# Investment Income, Realized & Unrealized

# Relationship to Mean Total Assets

(000,000's)

Exhibit III

Calendar Years	Mean Asset <b>s</b> Admitted	Investment Amount	to Mean (2)÷(1)		Capital (or Loss) to Mean (4):(1)		zed Cap. or Loss) to Mean	To <u>Inv., Real</u> Amount (2)+(4)+(6)	to Mean
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	<u>(9)</u>
1960 1961 1962 1963 1964 1965	\$22,289 24,181 25,683 26,885 29,033 30,688	\$ 592 621 673 721 782 852	2.7% 2.6 2.6 2.7 2.7 2.8	\$ 79 175 102 161 191 248	0.4% 0.7 0.4 0.6 0.7 0.8	\$ (16) 1,720 (1,006) 1,136 848 366	(0.1)% 7.1 (3.9) 4.2 2.9 1.2	\$ 655 2,516 (231) 2,018 1,821 1,466	2.9% 10.4 (0.9) 7.5 6.3 4.8
1966 1967 1968 1969 1970 1971	31,167 32,609 35,937 37,842 40,280 45,951	896 987 1,101 1,238 1,439 1,787	2.8 3.0 3.1 3.3 3.6 3.9	315 125 336 651 176 191	1.0 0.4 0.9 1.8 0.4 0.4	(1,764) 1,189 842 (2,381) (365) 1,439	(5.6) 3.6 2.3 (6.3) (0.9) 3.1 (0.6)	(553) 2,301 2,279 (492) 1,250 3,417	(1.8) 7.1 6.3 (1.3) 3.1 7.4 3.5
1972 1973 1974 1975 1976 1977	53,897 60,338 61,254 65,005 76,645 91,611	2,068 2,514 2,891 3,143 3,629 4,648	3.8 4.2 4.7 4.8 4.7 5.1	265 407 (101) 127 249 332	0.5 0.7 (0.2) 0.2 0.3 0.4	2,391 (4,362) (6,041) 3,299 2,993 (260)	4.4 (7.2) (9.9) 5.1 3.9 (0.3)	4,724 (1,441) (3,251) 6,569 6,871 4,720	8.8 (2.4) (5.3) 10.1 9.0 5.2 4.2

Source: A. M. Best's A & A

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# Federal Tax, Adjustments & Dividends Relationship to Mean Capital-Surplus

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								(00	0,000's)
Calendar	Mean Capital	Federal	Income Tax		Statement rements		& Surplus nges	Div To Stock	idends holders
Years	-Surplus	Amount	to Mean (2)÷(1)	Amount	to Mean (4)÷(1)	Amount	to Mean (6):(1)	Amount	to Mean (8) • (1)
	_(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1960 1961 1962 1963 1964 1965	\$ 9,438 10,607 11,433 11,894 13,167 13,676	\$ 122 116 102 52 41 49	1.3% 1.1 0.9 0.4 0.3 0.4	\$ (68) (64) (47) (96) (74) (113)	(0.7)% (0.6) (0.4) (0.8) (0.5) (0.8)	\$ 141 276 221 387 355 94	1.5% 2.6 1.9 3.2 2.6 0.7 2.1	\$ 360 333 333 356 437 388	3.8% 3.1 2.9 3.0 3.3 2.8 3.1
1966 1967 1968 1969 1970 1971	12,834 12,794 14,234 13,793 13,357 15,661	135 146 140 97 139 450	1.1 1.1 1.0 0.7 1.0 2.9	(108) (128) (69) (134) (110) (113)	(0.8) (1.0) (0.5) (1.0) (0.8) (0.7) (0.8)	81 152 245 526 384 567	0.6 1.2 1.7 3.8 2.9 3.6 2.3	389 378 584 1,421 576 812	3.0 3.0 4.1 10.3 4.3 5.2 5.0
1972 1973 1974 1975 1976 1977	19,353 20,727 17,444 16,641 20,736 25,042	563 328 (334) (418) 115 658	2.9 1.6 (1.9) (2.5) 0.6 -2.6 0.6	(245) (222) (86) (170) (425) (475)	(1.2) (1.0) (0.5) (1.0) (2.0) (1.9) (1.3)	473 564 884 982 919 1,392	2.4 2.7 5.1 5.9 4.4 5.6 4.3	973 1,682 1,067 959 1,036 1,394	5.0 8.1 6.1 5.8 5.0 5.6

Source: A. M. Best's A & A

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Exhibit IV

# With 20% Growth

		1977 Situation			Necessary Profit			
		Premiums		Capital -Surplus	Premiums	Assets	Capital -Surplus	
1.	Base-Capital & Surplus	2.00	3.68	1.00	2.00	3.68	1.00	
2. 3.	Base by column Underwriting Profit (or Loss)	100.0 (3.0)	100.0	100.0 (6.0)	8.3		16.6	
4. 5. 6. 7.	Investment Income, Net Realized Capital Gains Unrealized Capital Gains sub-total (4, 5 & 6)		5.1 0.3 (0.7) 4.7	<u>17.3</u>		4.7	<u>17.3</u>	
8. 9. 10. 11.	Underwriting & Inv. Inc. (3 & 7) Federal Income Tax: Underwriting (48% x 3) Inv. Inc. & Real. (15% x 4 & 5) sub-total (9 & 10)	(1.4)	0.8	$   \begin{array}{c}     11.3 \\     (2.8) \\     \hline     2.9 \\     \hline     0.1   \end{array} $	4.0	0.8	$   \begin{array}{r}     33.9 \\     \hline     8.0 \\     \underline{2.9} \\     \hline     10.9   \end{array} $	
12.	Net of Federal Tax (8-11)			11.2			23.0	
13. 14. 15. 16.	Adjustments to Cap. & Sur.  sub-total (12 & 13) Dividends to Shareholders Adjustment to Cap Sur. (14 & 15)			3.0 14.2 6.0 8.2			$\begin{array}{r} 3.0 \\ 26.0 \\ 6.0 \\ \hline 20.0 \end{array}$	
1. 17. 18. 19.	Base-Capital & Surplus Premium Growth 20% New Surplus New Ratio to Surplus	2.00 2.40 2.22		1.00 1.08 1.00	2.00 2.40 2.00		1.00 1.20 1.00	

#### 1971 Situation With 12% Growth

1971 Situation Necessary Profit Premiums Assets Capital Premiums Assets Capital -Surplus -Surplus 1. Base-Capital & Surplus 1.50 2.85 1.00 1.50 2.85 1.00 100.0 100.0 2. Base by column 100.0 Underwriting Profit ( or Loss) (1.0)7.5 11.2 (1.5)3.9 Investment Income, Net 0.8 Realized Capital Gains 6. Unrealized Capital Gains (0.6) $\frac{11.7}{22.9}$ 7. sub-total (4, 5 & 6) 4.1 11.7 8. Underwriting & Inv. Inc. (3 & 7) 10.2 Federal Income Tax: 3.6 9. Underwriting (48% x 3) (0.5)(0.7)5.4 0.7 0.7 10. Inv. Inc. & Real. (15% x 4 & 5) 2.0 1.3 sub-total ( 9 & 10) 8.9 15.5 12. Net of Federal Tax (8-11) 13. Adjustments to Cap. & Sur. 1.5 1.5 10.4 17.0 sub-total (12 & 13) 14. Dividends to Shareholders 16. Adjustment to Cap. - Sur. (14 & 15) 1. Base-Capital & Surplus 1.50 1.00 1.50 1.00 1.68 17. Premium Growth 12% 1.68 1.05 1.12 18. New Surplus 1.00 1.50 1.00 19. New Ratio to Surplus 1.60

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Exhibit VI

# 1965 Situation With 10% Growth

Exhibit VII

		196	55 Situat	tion	Necessary Profit			
		Premiums	Assets	Capital -Surplus	Premiums	Assets	Capital -Surplus	
1.	Base-Capital & Surplus	1.00	2.29	1.00	1.00	2.29	1.00	
2. 3.	Base by column Underwriting Profit ( or Loss)	100.0 (1.7)	100.0	100.0 (1.7)	1.4		1.4	
4. 5. 6.	Investment Income, Net Realized Capital Gains Unrealized Capital Gains		2.8 0.6 1.9 5.3					
7.	sub-total (4, 5 & 6)		5.3	$\frac{12.1}{10.4}$		5.3	<u>12.1</u>	
8.	Underwriting & Inv. Inc. (3 & 7) Federal Income Tax:			10.4			13.5	
9.	Underwriting (48% x 3)	(0.8)		(0.8)	0.7		0.7	
10.	Inv. Inc. & Real. (15% x 4 & 5)		0.5	1.1		0.5	1.1	
11.	sub-total (9 & 10)			0.3			1.8	
12.	Net of Federal Tax (8-11)			10.1			11.7	
13.	Adjustments to Cap. & Sur.			1.3			1.3	
14.	sub-total (12 & 13)			11.4			13.0	
15.	Dividends to Shareholders			3.0			_3.0_	
16.	Adjustment to CapSur. (14 & 15)			8.4			10.0	
ı.	Base-Capital & Surplus	1.00		1.00	1.00		1.00	
17.	Premium Growth 10%	1.10			1.10			
18.	New Surplus			1.08			1.10	
19.	New Ratio to Surplus	1.02		1.00	1.00		1.00	

# "Future" Situation

# With 25% Growth

Exhibit VIII

		"Future" Situation			Nece	ssary Pr	ofit
		Premiums	Assets	Capital -Surplus	Premiums	Assets	Capital -Surplus
1.	Base-Capital & Surplus	3.00	4.90	1.00	3.00	4.90	1.00
2. 3.	Base by column Underwriting Profit (or Loss)	100.0 (2.0)	100.0	100.0 (6.0)	4.5		13.5
4. 5. 6. 7.	Investment Income, Net Realized Capital Gains Unrealized Capital Gains sub-total (4, 5 & 6)		5.5 0.5 0.0 6.0	29.4		6.0	29.4 42.9
8. 9. 10. 11.	Underwriting & Inv. Inc. (3 & 7) Federal Income Tax: Underwriting (48% x 3) Inv. Inc. & Real. (15% x 4 & 5) sub-total (9 & 10)	(1.0)	0.9	23.4 (3.0) 4.4 1.4	2.2	0.9	6.5 4.4 10.9
12.	Net of Federal Tax (8-11)			22.0			32.0
13. 14. 15. 16.	Adjustments to Cap. & Sur. sub-total (12 & 13) Dividends to Shareholders Adjustment to CapSur. (14 & 15)			$\begin{array}{r} 0.0 \\ 22.0 \\ \hline 7.0 \\ \hline 15.0 \end{array}$			$\begin{array}{r} 0.0 \\ \hline 32.0 \\ \hline 7.0 \\ \hline 25.0 \end{array}$
1. 17.	Base-Capital & Surplus Premium Growth 25%	3.00 3.75		1.00	3.00 3.75		1.00
18. 19.	New Surplus New Ratio to Surplus	3.26		1.15 1.00	3.00		1.25 1.00
	Source: Exhibits I, II, III, & IV						1-19-79