MEASUREMENTS OF RATES OF RETURN

FOR CASUALTY-PROPERTY INSURANCE COMPANIES

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A major subject of discussion in National Association of Insurance Commission-
ers meetings and among casualty and property insurers has been the measurement of
profitability. Included in these discussions have been considerations of invest-
ment income, not only in the determination of profitability, but also in rate-
making. Beginning with the 1971 Insurance Expense Exhibit, all non-life insur-
ance companies have been required to report two types of investment gains -- net
investment income and net realized capital gains or losses -- allocated to lines
of business or to capital and surplus accounts.

Effective with 1971 figures, the NAIC has published "Profitability Test Re-
ports" in which Rates of Return are calculated on three bases: Mean Assets, Mean
Net Worth and Earned Premium (Sales).

The Earned Premium base has been the traditional method of measuring under-
writing gain or loss. This premium base has also been important in ratemaking,
being related to the price base which is of direct concern to policyholders.

The Net Worth base is an accepted method for measuring profitability in non-
insurance enterprises for stockholders. This method has been used for comparisons
with other industries, and by investors and security analysts, for the Securities
Exchange Commission and the Stock Exchange reportings, and in GAAP accounting for
parent/holding companies for insurance corporations.

The Assets base is appropriate for the total income from all sources approach
(underwriting plus investment income) in the determination of profitability rates.
Assets represent a suitable base for combined policyholder and stockholder interests
in measuring profitability. Assets equal liabilities plus net worth. Over 90% of
liabilities comprise policyholder-premium related liability accounts. Net worth
represents the stockholders' equity in stock insurance companies and policyholder
funds in non-stock companies.

Casualty-property insurance plays a vital role in the United States because it is needed to keep the economy moving by protecting individual and business invest-' ments to encourage risk-taking by the enterprise "movers" in a system of private enterprise. These insurers need a return on total assets comparable to that of the non-insurance risk-takers whose investments they protect.

The return on assets is the preferable measurement for general economic analyses and of the productive utilization of financial resources by a regulated enterprise operating in the public interest. It is the appropriate tool for appraising and comparing Opportunity Costs. For the measurement of profitability for current pricing the assets base is a sounder one for evaluating the rate of return generated by both underwriting and investment operations. Even in non-insurance enterprises the net worth base is not a factor in product pricing.

The assets base avoids conflicts between segments of the liability and surplus divisions of the balance sheet (above or below the line). It is a more uniform base for combining stock, mutual, reciprocal, Lloyds and state fund classes of insurers. The assets base is not affected by loss reserve adequacy levels nor by a company's net worth to premium ratio. The mutuality of insurance makes the division between owners and customers less significant in insurance as compared with non-insurance companies.

The assets base draws management attention to the productivity of capital. The management of assets is highly important because the investment function of a casualty-property insurance company produces far greater dollar net returns than the net underwriting income. For the three year period, 1975-1977, the total net return for all companies in the NAIC Profitability Test Reports 4.60% of mean assets, derived from minus .86% from underwriting and plus 5.46% from investment operations.

In regulated public utilities the "total useful and usable assets" is a basis for analysing rate of return in utility rate regulation. Also, in public

utility rate decisions the rate of return on assets is a consideration in arriving at an approved rate of return on equity.

Several writers on financial managment have given recent and positive argument for considering the rate of return on total assets:

In a Wall Street Journal article, Dr. Peter F. Drucker stated: "Performance in a business means applying capital productivity and there is only one appropriate yardstick of business performance. This is the return on all assets employed.... A business that does not earn the going cost of capital on all the money in the business fails to cover its true costs and has an earnings deficiency, whatever its earnings per share."[1]

Sheshunoff and Company, specialists in making performance analyses for banks, publishes rates of return on average assets.[2] Japanese life and non-life insurance companies' average investment yields are calculated as equal to: "Interest and dividend divided by expired employed assets which are obtained by adding year-top and year-end assets, divided by two, from which is subtracted hald of interest and dividend income." [3]

A leading corporation has introduced the rate of return on assets in its management incentive system. "Return on assets became the name of the game. In other words, how many dollars of earnings you generate is'nt the only consideration. The important thing is how many dollars it takes to generate those earnings."[4] This comment appeared in the annual report of another corporation: "While we regard the return on stockholders' equity as an important indicator of corporate performance, we recognize that it can be favorably affected by leverage, that is, by borrowing. Accordingly, for purposes of self-evaluation, we look carefully at the return on total capital, which reflects the return on stockholders' equity, minority interest, and long-term debt combined." In its 1977 chart on profitability, this company reported three rates of return: On equity, 20.2%; on total capital, 13.8%; and on sales, 6.9%.[5]

Dr. Irving H. Plotkin, Economist with Arthur D. Little, Inc., has written
extensively on this subject of rate of return for casualty-property insurance
companies. He has made many appearances at Casualty Actuarial Society meetings
and has served as a consultant for several insurance organizations. He has advo-
cated consideration of the rate of return on total capital and total assets, in
addition to the rate of return on net worth, to give a complete analysis of the
unique casualty-property insurance business. He has stressed the totality of
monies tied up in the insurance enterprise and to which policyholders who have
claims for payment may look for satisfaction of their claims. "In insurance com-
panies, all of those financial instruments stand to make good the debts or poten-
tial debts of the insurer to the policyholder."[6]

This study of rates of return requires a consideration of four elements:
The Total Return and its components measured on three bases -- Total Assets, Net
Worth and Earned Premiums. The NAIC data used in this paper contain several ad-
justments in the usual Annual Statement or Insurance Expense Exhibit statutory
definitions:

> Underwriting income = premium - losses and expenses incurred + other
> income - dividends to policyholders - Federal income taxes
> + change in prepaid expenses net of deferred taxes.
>
> Insurance operating income = underwriting income + the portion of the in-
> vestment income attributable to reserves for unearned prem-
> iums and unpaid losses, net of income taxes.
>
> Overall operating income = underwriting income + all investment income
> net of income taxes.
>
> Total return = overall operating income + realized and unrealized capital
> gains net of capital gains taxes.
>
> Assets = statutory assets + prepaid expenses + furniture and equipment.
>
> Net Worth = statutory capital and surplus + prepaid expenses net of de-
> ferred taxes - deferred taxes on unrealized capital gains + non-
> admitted furniture and equipment + unauthorized reinsurance bal-
> ances + Schedule P statutory reserves.

The following data from NAIC Profitability Reports summarizes the results of
rates of return for the components of Net Return related to the three bases:

Table 1
NAIC Profitability Test Reports
Summary 1975, 1976, 1977

	Dollars ,000	Rate of Return to:		
		Mean Assets	Mean Net Worth	Earned Premiums
Underwriting Income	- 2,862,475	-0.86	-3.21	-1.62
Investment Income allocated				
To lines of business	7,259,003	2.17	8.15	4.12
To capital & surplus	4,685,102	1.40	5.26	2.66
Real.* & Unreal. capital gains	6,308,548	1.89	7.08	3.57
Totals	15,390,178	4.60	17.28	8.73
Mean Assets	334,607,193			
Mean Net Worth	89,041,478			
Earned Premiums	176,281,584			

* In the Insurance Expense Exhibit the Realized capital gains are allocated to
lines of business or to capital & surplus

Two critical components of the total rate of return are Unrealized Capital
Gains or Losses and Federal Income Taxes. Both enter into the calculation of the
"bottom line" in the official Annual Statement and the NAIC Profitability Test Re-
ports include both components in establishing total company rates of return.

However, in rates of return by lines of business these two components are
not practical for line allocations, and both are omitted in the Insurance Expense
Exhibit. Effective with the 1975 I. E. E., there have been definite instructions
for allocating net investment gain or loss and other income to lines of business.

The sharp swings in unrealized capital gains or losses make the inclusion in
a measure of total return distortive except over long time spans. The following
table illustrates this characteristic of unrealized returns generated by wide
swings in the market value of stocks.

Table 2
Capital Gains or Losses

000s $s

Year	Realized	Unrealized
1967	$ 159,830	$ 1,313,465
1968	417,192	1,004,509
1969	691,537	-2,693,660
1970	150,109	-337,236
1971	194,996	1,977,123
1972	301,446	3,138,677
1973	408,305	-4,915,390
1974	-154,197	-6,999,087
1975	139,650	4,034,722
1976	286,670	3,802,988
1977	367,572	-283,838
1967-1974 Sub-total	2,169,218	-7,511,599
1975-1977 " "	793,892	7,553,872
1967-1977 Totals	2,963,110	42,273

Source: Best's Aggregates and Averages, 1968-1978
Consolidated Industry Totals, Property-Casualty Companies
Investment Accounts - Appreciation and Depreciation

During this eleven year period there were six appreciation and five depre-
ciation results for Unrealized Capital Gains or Losses, with a relatively small
net difference. But there were four major swings .in the annual changes over
two year periods: 1968-1969, $3.7 billion decrease; 1972-1973, $8.1 billion
decrease; 1974-1975, $11.0 billion increase; and 1976-1977, $4.1 billion de-
crease.

To remove the distortion in rates of return in Table 1 caused by the influence
of Unrealized Capital Gains a modification has been made in Table 3 below to
eliminate the effect of such unrealized losses from the net returns and also
from the assets and net worth bases, to normalize such net returns for estab-
lishing objective ratios.

Table 3

Adjusted Profitability Ratios
To Mean Assets

	Total	Underwriting	Capital & Surplus
Investment Gain allocated			
To lines of business	2.21 %	2.21 %	%
To capital & surplus	1.42		1.42
Realized capital gains allocated			
To lines of business	.13	.13	
To capital & surplus	.08		.08
Sub-total	3.84	2.34	1.50
Underwriting gain or loss	- 0.87	- 0.87	
Total	2.97	1.47	1.50

These adjusted rates of return are after Federal taxes as are those in
Table 1. The 2.34% in Table 3 represents the total investment allocation to
the underwriting function.

For the total operations of an insurance corporation the rate of return can
be calculated either on the Mean Assets or on the Mean Net Worth bases. But any
method of determining a rate of return or profitability on the separate lines of
business must utilize the Earned Premium base since it is the only one of the
three bases which identifies operations by lines.

Exhibit A is a summary of investment operations allocated to lines of busi-
ness and to capital and surplus, for consolidated 1975-1977. In addition to a
reporting of data derived from this consolidation, there is a calculation of
Equivalent Assets by lines with related percentages and averages to analyze
returns on equivalent assets by line of business.

To relate assets to lines of business we can divide total assets into sup-
portive or equivalent assets by lines, on the basis of the instructions for allo-
cating investment gains or losses by lines in the Insurance Expense Exhibit. By
this method lines of insurance with large policy reserves would have greater

weight in the calculation of equivalent assets. With this method of segregating
asset dollars for analysis purposes the final result will be a uniform rate of
return for all lines. The only real result of this circuitous calculation is to
record estimated dollar assets supportive of the various lines of insurance in a
multiple-line insurance organization. The purpose is to quantify the general
premise that lines of insurance with fast settlement claims will have relatively
small claim reserves while third party lines with long settlement periods and
"long-tail" reserves require large claim liabilities. Large reserves require
large supportive asset investments and generate more investment income than
the early settlement lines, relative to respective dollars of earned premiums.
Table 4 below sets forth data from Exhibit A for major lines:

Table 4

	Assets per $1 Earned Premium	Percentage of Investment Income:		
		Allocated to Underwrtg.	Allocated to Und. & C.S.	To Mean Assets
Auto Private Passenger	$ 1.51	4.4	7.2	4.8
Auto Commercial	1.69	4.8	7.8	4.6
Workers' Compensation	2.49	7.2	11.9	4.8
Liability	3.71	10.7	17.5	4.7
Medical Malpractice	4.59	13.2	21.7	4.7
Fire & Allied	1.25	3.7	6.0	4.8
Homeowners	1.04	3.0	4.9	4.7
Commercial Multi-Peril	1.52	4.4	7.2	4.8
- - - -				
All Lines	1.82	5.3	8.7	4.8

This method used to calculate equivalent assets by lines of business is a pro-
portional one and may be too simplified in that supportive assets for the lines with
"long-tail" loss liabilities can be invested in longer term and higher yield secur-
ities. In the above table these lines are workers' compensation, liability and
medical malpractice. The Annual Statement and Insurance Expense Exhibit combining
of auto bodily injury with auto property damage and the further combining in the

above table with auto physical damage into private passenter and commercial divisions, dilutes the single effect of the bodily injury coverage which also has "long-tail" loss liabilities. Medical malpractice, being a recently segregated coverage, does not have time-span data available for reliable analysis at this time. It does have long period reserves requiring large supportive assets relative to the premium volume.

Exhibit B is a Model Chart which shows inter-relationships among the variables which determine net rates of return. The grid sets forth Break-even Percentages of Net Returns to Earned Premiums with the interaction of the three variables: Net Premium Growth, Policyholder Surplus to Net Premium ratios and the required Net Returns to Earned Premiums. Table 5 illustrates some typical relationships. In addition to the figures in Exhibit B, reference is made to the Adjusted Rate of Return on Mean Assets showing the investment income allocation to the underwriting function, in Table 3.

Table 5
Net Return Requirements

	Auto Private	Auto Commer.	Workers' Comp.	Liability	Malpractice	Homeowners
1. Premium growth %	15	20	20	30	50	20
2. Surplus/premium	.40	.40	.50	.60	.75	.30
3. Required return % (Exhibit B)	5.58	7.27	9.09	15.65	30.00	5.45
4. Assets/earned prem. (Exhibit A 6)	1.51	1.69	2.49	3.71	4.59	1.04
5. Return on assets % (3 ÷ 4)	3.70	4.30	3.65	4.22	6.54	5.24
6. From Investments % (Table 3)	2.34	2.34	2.34	2.34	2.34	2.34
7. Balance needed % (5 - 6)	1.36	1.96	1.31	1.88	4.20	2.90
8. Line 7 on earn. prem. (7 x 4)	2.05	3.31	3.26	6.97	19.28	3.02
9. Line 8 before Fed.Tax	3.94	6.37	6.27	13.40	37.06	5.81

A study of the complete Exhibit B will reveal the total impact of eleven growth rates and eight surplus/premium ratios. The vertical figures under each surplus/premium ratio can be interpreted as "indexes of capital crunch."

Conclusions

In this paper on Measurements of Rates of Return the emphasis has been on the Assets base because it is the least written about or used in financial reports for casualty-property insurance companies. It has been my purpose to record some of the distinctive advantages of this rate of return. The management of assets has become most important because of the predominance of the investment function over the underwriting function in the generation of net rates of return. Returns on investments are more directly related to the total assets rather than solely to net worth (surplus to policyholders) as a base.

If the casualty-property insurance companies are to serve the national economy and obtain the necessary capital and to retain adequate earnings to finance normal and inflationary growth, there should be a concern about Opportunity Costs. The opportunity cost of capital is what that capital could earn if used in other enterprises of similar risks and hazards.

Related to the discussions of measurements of profitability in this paper and the above comments on opportunity costs is the serious capital and surplus "crunch" which casualty-property companies face today in order to meet the demands of business and individuals for insurance in a growth and inflationary period. The return on total assets invested or used in the business must be competitive to attract new investment and to retain and create funds to finance growth.

The growing requirement that insurance assume more and more of the costs of the involuntary markets, provide availability of coverage and lower premiums as a "social gesture," will lead to increases in risks and to the need for higher rates of return on all assets used in the business.

INSURANCE EXPENSE EXHIBIT DATA   1975-1977

With Equivalent Assets Calculation

	Earned Premium 1	Invest. Income 2	Equivalent Assets 3	Percent E. P. 4	Percent E. P. 5	Assets to E.P. 6	Total Inv. to Assets 7
					$s in Millions		
Auto Private Passenger	$ 44,621.4	$ 1,962.7	$ 67,563.0	4.399	7.22	$ 1.51	4.78
Auto Commercial	10,619.3	519.2	17,998.5	4.756	7.80	1.69	4.62
Workers' Compensation	19,264.4	1,392.2	47,923.9	7.227	11.86	2.49	4.76
Liability	10,028.2	1,070.9	37,176.9	10.679	17.52	3.71	4.72
Medical Malpractice	1,668.5	220.7	7,662.6	13.227	21.70	4.59	4.73
Fidelity & Surety	1,846.3	90.8	3,176.8	4.918	8.07	1.72	4.69
Glass	71.1	1.1	40.4	1.547	2.54	.57	4.45
Burglary & Theft	313.4	6.5	230.2	2.074	3.40	.76	4.48
Boiler & Machinery	645.0	34.1	1,144.8	5.287	8.68	1.77	4.90
Fire & Allied Lines	9,620.7	354.6	12,161.3	3.686	6.05	1.25	4.84
Homeowners	12,106.6	360.4	12,586.2	2.977	4.89	1.04	4.70
Commercial Multi-Peril	9,480.2	414.2	14,430.3	4.375	7.18	1.52	4.78
Inland Marine	3,285.2	99.2	3,446.0	3.020	5.00	1.06	4.67
Farm & Ranchers	119.5	3.2	109.1	2.678	4.39	.92	4.78
TOTALS	123,690.7	6,530.7	225,669.9	5.280		1.82	
Capital & Surplus		4,184.6		3.383			
Total Investment Income		10,715.3		8.663	8.66		4.76

Notes: Columns 1 and 2 from consolidated Insurance Expense Exhibits for 1975, 1976, 1977 *
       Column 3 is the proportion of assets by lines allocated by the percentages of investment income
            dollars in column 2, calculated separately by years.
       Column 4 is % of investment income (allocated by lines) to Earned Premiums 2÷1
       Column 5 is % of total investment income to Earned Premiums 8.663 / 5.280 x column 4
       Column 6 is the equivalent assets $s supportive of each $1 of Earned Premium
       Column 7 is the % of total investment income to Assets. Variances due to mix of figures by
            separate years.

By I. E. E. definitions the above investment income data excludes unrealized capital gains/losses and
            provision for Federal income taxes.

* Compiled by the Staff Actuarial Unit of the Texas State Board of Insurance

BREAK-EVEN PERCENTAGES OF NET RETURNS TO EARNED PREMIUMS

By Premium Growth Rates and Surplus Ratios

Net Premium Growth	— — — — — — Surplus to Net Premium Ratios — — — — — —							
	1.00	.75	.70	.60	.50	.40	.30	.25
7 %	6.77	5.07	4.74	4.06	3.38	2.71	2.03	1.69
10	9.52	7.14	6.66	5.71	4.76	3.81	2.86	2.38
12½	11.77	8.83	8.24	7.06	5.89	4.71	3.53	2.94
15	13.95	10.46	9.77	8.37	6.98	5.58	4.19	3.49
20	18.18	13.63	12.72	10.91	9.09	7.27	5.45	4.54
25	22.22	16.67	15.56	13.33	11.11	8.89	6.67	5.56
30	26.08	19.56	18.25	15.65	13.04	10.43	7.82	6.52
40	33.34	25.55	23.34	20.00	16.67	13.34	10.00	8.33
50	40.00	30.00	28.00	24.00	20.00	16.00	12.00	10.00
75	54.53	40.89	38.17	32.72	27.26	21.81	16.36	13.63
100	66.67	50.00	46.67	40.00	33.33	26.67	20.00	16.67

Equation: $p \times 100 \,(1+g) \times e = 100 \,(1+g) \times n - 100n$

p = break-even ratio
g = net premium growth ratio
n = surplus to policyholders/net premium ratio
e = earned to net premium ratio *

	growth	e	growth	e	growth	e
* e values by growth ratios:	.07	.967	.10	.955	.12½	.944
	.15	.935	.20	.917	.25	.900
	.30	.885	.40	.857	.50	.833
	.75	.786	1.00	.750		

Notes:

1. Dr. Peter F. Drucker, "Measuring Business Performance," Wall Street Journal, August 3, 1976

2. Sheshunoff and Company, Austin, Tx, "Return on Average Assets," in Banks of Wisconsin, 1978.

3. Japan Insurance News, September 1976, "Non-Life Insurance Companies in Japan

4. Nation's Business, February 1976, "Restructuring a Company for Greater Earnings," by Chairman Robert Reneker of Esmark, Inc.

5. 1977 Annual Report, Northwest Industries

6. Dr. Irving H. Plotkin, Statement before State Board of Insurance, Austin, TX, 1970