OBSERVATIONS ON THE CALIFORNIA PROPOSITION 103 DEBATE OVER PROFITABILITY AND SURPLUS

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1. Introduction

In November, 1988, the voters of California narrowly passed Proposition 103, which requires the California Insurance Department to approve certain insurance rates, primarily homeowners, automobile, and the commercial coverages. There is also a provision requiring an immediate 20% rollback in these rates; however, the California Supreme Court made this rollback requirement subject to an insurer's right to earn a "fair and reasonable" rate of return. Premiums on the affected coverages amounted to $25 billion in 1989, probably the largest single property-casualty market in the world.

In order to implement Proposition 103, two issues had to be addressed: (1) what is a "fair and reasonable" rate of return, and (2) what are the appropriate criteria for the prior approval of rates. Lawsuits were filed and hearings were held, while the world insurance, investment, and academic communities watched hoping to see a stimulating intellectual inquiry into the issues and a leadership in the advancement of knowledge and theory on the issues of required profitability and required risk-based capital and surplus. However, after two years of public hearings, the result has been no discernable resolution of the issues, hours of indeterminate, unproductive, and excruciatingly boring attorney controlled proceedings, and huge legal and consulting fees. History will show that this was a golden opportunity to advance the science of insurance regulation and it was lost.

There are a number of specific reasons why these hearings failed:

(1)   The group of attorneys and staff who were put in charge of the hearings knew surprisingly little about insurance, but they did not let that fact interfere with their work or inhibit them in the drafting of regulations.

(2)   There seemed to be an insistence on ignoring whatever work that has been done in the past on these issues. The issues of profitability, investment return, and required capital and surplus are issues which have been explored by many state insurance departments in the years since World War II.   In addition, financial

economists, actuaries, and academicians around the world have done much work on these issues. Instead of making an effort to review this work, there was an insistence on addressing these issues from scratch, with the result that proposed regulations were constantly being revised.

(3)   Even though some of the country's leading economists, investment experts, and actuaries were called to testify and, in many cases, submitted lengthy written documents, what emerged was a perception that no unified theory has yet been worked out which would connect the insurer's need to raise capital with the regulator's duty to approve or disapprove a specific insurance rate. Casualty actuaries estimate required rates based on an individual insurer's losses, claims inflation, and frequency trends. Financial economists deal with such issues as optimizing investment strategies, the pricing of assets, the relationship between profit and risk, solvency, and ruin probabilities. The casualty actuaries and the financial economists need to get together and exchange business cards.

(4)   A decision was made to use a methodology for estimating profitability which has long since proven to be defective and unworkable. The methodology involves taking an insurer's national figures for expenses, investment income, capital gains or losses, and federal taxes and to allocate these figures proportionately to get by line by state results, which are then combined with the state loss experience to get a profit or rate of return as a percent of premium. The insurer's surplus was then imputed by line by state using estimated premium to surplus ratios, called "leverage ratios", to get a rate of return by line for California as a percent of surplus (or net worth). The leverage ratios would vary by line of insurance depending on the perceived risk, such as a 2.5 ratio of premiums to surplus for homeowners insurance, but a 1.0 ratio for medical malpractice. This approach has long since proven to be defective and unworkable and was so characterized by many witnesses. The problem is that the insurance business involves a wide range of risks from underwriting and investment to catastrophe and credit, some of which are unrelated to the premium volume in a given year. The result is that the true premium to surplus ratios can vary widely between insurers writing the same lines of business. A simple example would be two insurers currently writing the same premium volume in automobile liability insurance, where one insurer has large loss reserves from business written in prior years and another, new insurer which has practically no loss reserves from prior years. Clearly, the required risk-based surplus would be different for these two insurers. In any event, the problem with the methodology is that it requires the choice of some arbitrary assumptions, which then inevitably lead to strange results. It is a mathematical based procedure, while this paper will suggest an economic based procedure.

    The purpose of this paper is to describe some of the serious misconceptions about insurance which have dominated these Proposition 103 hearings and to demonstrate that the issues of "fair and reasonable return", the criteria for prior approval of rates, and the proper measure of return should all be analyzed using the general principles of economics, combined with an actuarial analysis of the structure and trends in the insurance industry.

2. What is income?

There has been endless testimony on what constitutes income in calculating rates of return. A common assertion is that "total rate of return" should be used. However, when this term is explained, it is revealed that many items of income are omitted, especially either realized or unrealized capital gains and losses.

This issue of "what is income?" has a long history, and, surprisingly, disagreement at the Proposition 103 hearings was widespread.

In 1921, the National Association of Insurance Commissioners adopted the so-called 1921 Profit Formula, which provided that (see NAIC (1922), NAIC (1970)):

(1) a reasonable underwriting profit is 5% of premiums plus 3% for conflagrations, and

(2) no items of profit or loss connected with the so-called banking end of the business should be taken into consideration.

This remained the standard meaning of income until 1970. In that year, the NAIC published a 233 page study of the issue prepared by the NAIC Central Office. The study for the most part was only a discussion of insurance accounting and a discussion of numerous approaches and techniques that have been proposed to measure profitability. Such approaches included use of investment earnings on unearned premiums and/or loss reserves, including or excluding realized and/or unrealized capital gains. There are also discussions of premium to surplus leverage, proper level of surplus, policyholder versus stockholder surplus, and the need to attract capital. Also, the study noted that income can be measured against sales, net worth, or total investable funds, each with its advantages and disadvantages. The proper base against which income is compared is as important an issue as the issue of what is income.

The most important result of this study is that it repudiated the 1921 Profit Formula. The study recommended that income from all sources be ascertained and considered, including income on capital funds. However, the study reported that it could not conclude how much capital was required nor the proper base against which to measure rate of return. The study concluded that income should be determined from an investor's perspective.

The issue was not raised again by the NAIC until 1984, when the "NAIC Study of Investment Income" was published as a supplement to Volume II of the 1984 NAIC Proceedings. By 1984, interest rates, and therefore investment income, had risen so high that now investment income has become the dominant, if not the only, source of net income for insurers. The study easily reaffirmed the repudiation of the 1921 Profit Formula. The study concluded that the "total return approach" was most appropriate in regulating property/casualty insurance rates. However, the approach suggested in the study contained the same defects, intractable problems, and dead ends that were to visit the Proposition 103 hearings later. Namely,

(1) despite the use of the term "total return approach", significant items of income are excluded, such as unrealized capital gains, policy fees and sometimes even realized capital gains.

(2) the approach suggested relied on an allocation of surplus by line by state in order to set a by line by state rate of return. Modern risk theory has conclusively shown

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that it is not meaningful to do this. Curiously, the study eventually recognized this, but did not attempt to suggest a solution or an alternative.

(3)   there is an implication that the proper rate of return is a constant to be determined. In fact, it is a dynamic target, requiring econometric expertise to determine.

Most of the reason for the controversy lies in the question, "whose income is it?" The claim that income on stockholder invested funds belongs to stockholders and income on policyholder invested funds belongs to policyholders only distracts from the proper analysis.

In economic terms, annual income is the annual increase in net worth of the business. This is the only correct meaning of "total return" and the only meaning which conforms to the vision of an investor. Specifically, if an insurer's annual statement for 1989 reports the following figures:

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Surplus at 12/31/88            $10,000,000
Surplus at 12/31/89            $12,000,000
Stockholders dividends            $500,000
Additional paid-in capital      $1,000,000
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Then the income of the insurer based on the business conducted in 1989 is:

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Income = ($12,000,00 - $10,000,000) + $500,000 -
              $1,000,000 = $1,500,000
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In other words, if there were no dividends or capital paid-in, then the business earned $1,500,000, or 15% of $10,000,000, the initial net worth, which we call surplus. Thus, the insurer earned a 15% rate of return.

Let S equal the beginning statutory surplus of the insurer. Let dS equal the increase in surplus over the year, including stockholder dividends and excluding additional paid-in capital. Then the term dS/S is the total rate of return.

The calculation of dS is shown in detail on page 4 of every insurer's Annual Statement. For 1989 the industry results were:

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dS = net underwriting gain or loss          -$16,895m
    + net investment income                   31,207
    + net realized capital gains or losses     4,649
    + other income                            -1,228
    - dividends to policyholders               2,713
    - federal taxes                            2,802
    + net unrealized capital gains or losses   8,035
    + change in non-admitted assets              43
    + change in liability for reinsurance      -702
    + change in foreign exchange                29
    + change in excess statutory reserves       195
    + other write-in items                     -645
    = total economic income                 $19,173m
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Therefore, dS/S = 19,173/117,935 = 16.2% for 1989, since the surplus of the industry was $117,935 million at the beginning of 1989.

To my knowledge, no one in the Proposition 103 hearings ever advocated that the definition of income should be expanded to be defined in terms of change in surplus, yet this is the only true definition of economic income and the only definition which includes all sources of income. Note the importance of net unrealized capital gains in 1989.

If instead surplus is measured on a generally accepted accounting principle (GAAP) basis, then we get GAAP net worth from statutory surplus as follows:

To statutory surplus (SAP)
  Add: unauthorized reinsurance
         excess statutory reserves
         prepaid expenses
         non-admitted assets
         special reserves
  Less: tax on prepaid expenses
         tax on unrealized capital gains
  Equals GAAP net worth.

It turns out that GAAP net worth is equal to about 1.15-1.20 times SAP surplus. Since prepaid expenses are by far the dominant item and since prepaid expenses are proportional to premiums, which in turn, are proportional to surplus, it is often assumed that GAAP net worth is proportional to SAP surplus by a fixed factor, such as 1.15 or 1.20. In that event, dS/S is the same whether S is based on GAAP or SAP. dS/S has the property that any change in the accounting definition of surplus will affect both the numerator and the denominator.

3. Surplus and Risk

In the 1984 NAIC Study of Investment Income, the chosen base for measuring profitability was surplus (or net worth). It is also the base used in the Proposition 103 hearings as proposed by the Department of Insurance and others. It is the correct base. However, in order to get a by line by state measure of profitability, the 1984 NAIC Study indicated that an insurer's surplus could be allocated by line by state in proportion to either premiums, reserves, or a combination of premiums and reserves. Alternatively, the Proposition 103 hearings imputed surplus by line by state using leverage ratios. Both methods have the same theoretical faults.

For a given multi-line, multi-state insurer, there is an appropriate level of risk-based surplus. This level of surplus is based on the sources of risk, which include:

(1) underwriting risk - the adequacy of the premium to pay losses and expenses.
(2) investment risk - whether or not the expected investment performance is realized.
(3) financial risk - the leverage of total assets to surplus, particularly with respect to fluctuations in invested asset values.
(4) reserve risk - the leverage of total liabilities to surplus, particularly the loss and expense reserves.
(5) specific sources of risk - such as inflation, changes in the law, deficiency of reinsurance recoveries, and changes in claim frequency.
(6) catastrophe risk - the whole of an insurer's surplus is at risk for a catastrophe in any one state or line of insurance.

The risk-based surplus must increase each year to support the annual inflation rate, the increase in new business, and any change in risk leverage ratios.

The appropriate level of risk-based surplus is determined for the insurer as a whole and will vary between insurers of the same size. If for each state and each line, the appropriate risk-based surplus were determined separately, then the aggregate surplus would be too great; that is, there would be an inefficient use of capital.

This point has been proven with great rigor and completeness in the 1989 book entitled, Insurance Solvency and Financial Strength, by Pentikainen, Bonsdorff, Pesonen, Rantala, and Ruohonen. These Finnish authors are the world's leading theoreticians on the subject of risk and solvency. The conclusion of their work is that an appropriate aggregate surplus is unique to each insurer depending on all of the sources of risk. These sources of risk interact. The result is that the premium to surplus ratios of insurers may vary widely. A result of their analysis is that an appropriate aggregate surplus once determined cannot be subdivided or allocated by line by state, nor by year. Furthermore, even if premium to surplus ratios could be determined by line by state for each insurer, they would not be the same between insurers.

Thus, only two quantities are meaningful: (a) the required surplus of the insurer group and, (b) the required marginal surplus for a specified change in assets, liabilities, or premiums. Therefore, there are no fixed premium to surplus ratios by line which are appropriate for all insurers.

As mentioned, the lengthy 1984 NAIC study relies heavily on the efficacy of allocating surplus by line. However, an interesting aside is made on page 44 of the study, in which an admission is made that allocating surplus by either premiums or liabilities is not producing satisfactory results. Then the following statement is made:

> "Whether target returns should vary for each line of insurance is a final consideration in analyzing the variations between lines. The risk of the industry as a whole can be estimated, but any effort to determine the risk for each line will meet with the same problem faced in allocating surplus. No definitive answer is apparent."

In other words, the authors of the 1984 NAIC study intuitively realized that it is not proper to subdivide surplus or risk. The Proposition 103 hearings are also showing that you get strange results when you attempt to subdivide surplus. The high point of absurdity was reached in the Proposition 103 hearings when the California Insurance Department published a proposed allocation of surplus for earthquake insurance using a one dollar of premium to one dollar of surplus ratio. In fact, for a portfolio of dwellings in one earthquake zone, as much as seventy-five dollars of surplus may be required for each dollar of premium, which is why earthquake insurance can only really be sold by a multi-line insurer. The earthquake coverage is a clear example of a situation in which the required surplus is so great that the whole of the insurer's surplus is at stake. This is true of any catastrophe potential, and one of the fundamental reasons why reinsurance is used to protect the insurer's surplus against catastrophic losses.

Myers and Cohn prepared a famous paper for the 1982 Massachusetts automobile rate hearings (published in Fair Rate of Return in Property - Liability Insurance). The paper is famous because it outlines a discounted cash flow model using risk-based discount rates derived from the capital asset pricing model. The paper contains this sentence (p.68): "The premiums-to-surplus ratio is assumed to be given exogenously - e.g., by the regulator." The Proposition 103 hearings are showing the world that regulators are not up to doing that correctly.

The theory that it is not proper to subdivide surplus or risk is subject to some qualification. First, the insurer may write only one or two lines, in which case a reasonable allocation of surplus by state by line might be possible. Second, the application of risk theory may justify imputing a required surplus for the purposes of establishing a rate of return, regardless of what the actual surplus might be. This approach is discussed, under certain risk limiting conditions, by Richard A. Derrig in his paper in Financial Models of Insurance Solvency.

4. "Fair and Reasonable Rate of Return"

That a regulated industry is entitled to earn a fair (or just) and reasonable rate of return was affirmed in the U. S. Supreme Court case, Hope Natural Gas. When Proposition 103 passed, the insurance industry immediately sued over the provision requiring a 20% rollback. In the resulting case, Calfarm Insurance Company, the California Supreme Court referred to Hope Natural Gas to affirm the fair and reasonable rate of return standard for insurers under Proposition 103.

In this famous case, the U.S. Supreme Court enunciated the test that income or return to the equity owner should:

(1) be commensurate with returns on investments in other enterprises having corresponding risks, and

(2) be sufficient to attract capital and maintain credit.

This test is also what is meant by the term, "fair and reasonable return". The only definition of income which can be used in the application of this test is the change in net worth.

For the past two years, the Proposition 103 hearings have been trying to put a number on "fair and reasonable" rate of return. Someone looked at the industry figures for the 15 year period 1973-87 and estimated that the average after tax "rate of return on equity" was 11.2%. No other justification has been given for this figure. Apparently, statutory net income divided by average surplus was used as "rate of return on equity". This definition excludes unrealized capital gains. The insurance industry's expert witnesses have been vigorous in condemning this figure as arbitrary and too low. While they are certainly correct in that it is arbitrary, the expert witnesses have not been successful in establishing an alternative figure and there may be a good reason for this.

A "fair and reasonable" rate of return is not necessarily something which can be measured. Like the concept of "competition", it can only be described. That is, we can only determine whether the rate of return is adequate or inadequate in the present economic environment, but we can't give it a number, such as 11.2%. For instance, the rate of return is adequate if
- the industry attracts capital
- new companies are being formed
and inadequate if
- stockholder dividends exceed the in-flow of capital
- little competition exists or companies are withdrawing.

The problem is that the cost of capital is not static, it depends on perceived, prospective returns, not past returns.

In his book, The Economics of Regulation, Alfred E. Kahn makes this point when he explains that the cost of capital depends on the moment in time, the volatility of the stock market, the concept of "comparable earnings", and the need to create incentives for efficiency and innovation. So, there is no objective, unequivocal method of ascertaining the cost of capital, even for a particular regulated company at a particular time and place. Thus, it is impossible to measure a fair and reasonable rate of return precisely. (Volume I, pp. 43-54)

The law does not require a fair and reasonable rate of return, but only the fair and reasonable opportunity to make a fair and reasonable rate of return. This distinction is very important in the regulatory rate approval process. The issue is whether average expenses, actual expenses, or capped expenses should be allowed. Inefficient insurers should not be protected, nor should efficient insurers be penalized. Similarly, heavily capitalized insurers should not be forced to give up the additional investment income. That the rate approval process is not intended to guarantee a fair and reasonable rate of return was emphasized in the 1984 NAIC study (page 24). It was also stated in the Hope Natural Gas Case (320 U.S. 591, 603).

Table 1 shows the historical rate of return for the period 1977 to 1989, which covers a complete underwriting cycle. The rate of return is defined in terms of dS/S, defined above, using data from A. M. Best and Co. Table 1 shows that:

(1)   the industry paid dividends to stockholders each year, and
(2)   the industry attracted capital (paid-in surplus) each year, even in 1984 when the industry lost money.

From this we can draw the conclusion that during this time period the U. S. insurance industry earned at least a fair and reasonable rate of return. While it is true that the actual return ranged from -3.1% to 23.5%, the perception existed that a fair and reasonable rate of return was obtainable.

The insurance industry is very unusual among industries in that about 35% of the business is conducted by mutual insurers, owned by the policyholders. Unlike stock insurers, mutual insurers cannot raise capital, nor do they pay stockholder dividends. Table 2 shows a comparison of stock insurers versus mutual insurers. If mutual insurers don't pay stockholder dividends and cannot attract capital, how can the fair and reasonable test be applied to the rates of these insurers? The answer lies as follows.

After adjusting for inflation, Table 3 shows that surplus, premiums and reserves have each been increasing annually in deflated terms. This growth represents the growth in the demand for insurance and the growth in the need for surplus to support the growth in reserves of the insurance business. Note that the ratio of reserves to premiums has increased from .80 to 1.29, reflecting the increasing importance of workers' compensation insurance and liability insurance. This has caused the premium to surplus ratio to decline over the years, as surplus has increased to support the increase in reserves.

From 1975 to 1989, the industry appears to have tried to maintain a level reserve to surplus ratio of around 2.00, but this constancy is only a coincidence, since the theoretical risk-based reserve to surplus ratio varies significantly by line of insurance and the mix of lines of insurance changes over time. In fact, the ratio is significantly higher for most insurers as seen in Table 4, where the reserve to surplus ratio for most insurers is about 2.2 - 2.3. Table 4 breaks out State Farm Mutual Automobile Insurance Company separately to show the effect of its large size. It is the largest writer of private passenger automobile and homeowners insurance in the U.S.

Tables 4 and 5 are shown in order to point out some important differences between stock insurers and mutual insurers. In Table 5, stock insurers tend to concentrate on the commercial lines which require larger loss and expense reserves, such as Workers' Compensation and Other Liability. On the other hand, mutual insurers tend to concentrate on the personal lines which require smaller loss and expense reserves, such as Auto Liability and Auto Physical Damage. This is seen in Table 4, line (4), where the reserve to earned premium ratio is highest for stock insurers.

Table 1
Historical Insurance Industry Rate of Return
(in billion dollars, unless a %)

	1977	1978	1979	1980	1981
1. Beginning Surplus (S)	$24.7b	$29.4b	$35.5b	$42.5b	$51.0b
2. Ending Surplus	29.4	35.5	42.5	51.0	54.0
3. Increase in Surplus	4.7	6.1	7.0	8.5	3.0
4. Stockholders Dividends	1.1	1.4	1.8	2.2	2.4
5. Surplus Paid-In	1.0	.6	.6	.7	.6
6. Surplus Change (dS)	4.8	6.9	8.2	10.0	4.8
7. dS/S	19.4%	23.5%	23.1%	23.5%	9.4%

	1982	1983	1984	1985	1986
1. Beginning Surplus (S)	$54.0b	$61.0b	$65.4b	$63.7b	$76.4b
2. Ending Surplus	61.0	65.4	63.7	76.4	94.8
3. Increase in Surplus	7.0	4.4	-1.7	12.7	18.4
4. Stockholders Dividends	2.7	3.0	2.5	2.7	2.8
5. Surplus Paid-in	1.5	1.1	2.8	7.7	6.8
6. Surplus Change (dS)	8.2	6.3	-2.0	7.7	14.4
7. dS/S	15.2%	10.3%	-3.1%	12.1%	18.8%

	1987	1988	1989
1. Beginning Surplus (S)	$94.8b	$105.0b	$117.9b
2. Ending Surplus	105.0	117.9	133.9
3. Increase in Surplus	10.2	12.9	16.0
4. Stockholders Dividends	4.4	4.9	5.5
5. Surplus Paid-In	4.0	1.7	2.4
6. Surplus Change (dS)	10.6	16.1	19.1
7. dS/S	11.2%	15.3%	16.2%

Note: line (6) = line (3) + line (4) - line (5)

Source: A.M. Best & Co., _Aggregates & Averages_, respective years.

Table 2
Stock Insurers vs. Mutual Insurers
(in billion dollars, unless a %)

Stock Insurers	1984 B$	%S	1985 B$	%S	1986 B$	%S
(1) Beginning Surplus (S)	$40.1	100.0%	$36.4	100.0%	$45.8	100.0%
(2) Ending Surplus	36.4		45.8		57.7	
(3) Increase in Surplus	-3.7	-9.2%	9.4	25.8%	11.9	25.9%
(4) Stockholders Dividends	2.5	6.2%	2.7	7.4%	2.8	6.1%
(5) Surplus Paid In	2.8	7.0%	7.7	21.1%	6.8	14.8%
(6) Return on Surplus, dS	-4.0	-10.0%	4.4	12.1%	7.9	17.2%
Note: (6) = (3) + (4) - (5)						

	1987 B$	%S	1988 B$	%S	1989 B$	%S
(1) Beginning Surplus (S)	$57.7	100.0%	$63.8	100.0%	$72.5	100.0%
(2) Ending Surplus	63.8		72.5		82.4	
(3) Increase in Surplus	6.1	10.6%	8.7	13.6%	9.9	13.7%
(4) Stockholders Dividends	4.4	7.6%	4.9	7.7%	5.5	7.5%
(5) Surplus Paid In	4.0	6.9%	1.7	2.6%	2.4	3.3%
(6) Return on Surplus, dS	6.5	11.3%	11.9	18.7%	13.0	17.9%
Note: (6) = (3) + (4) - (5)						

Mutual Insurers	1984 B$	%S	1985 B$	%S	1986 B$	%S
(1) Beginning Surplus (S)	$21.6	100.0%	$23.3	100.0%	$26.0	100.0%
(2) Ending Surplus	23.3		26.0		31.0	
(3) Increase in Surplus	1.7	7.9%	2.7	11.6%	5.0	19.2%
(4) Stockholders Dividends	0.0		0.0		0.0	
(5) Surplus Paid In	0.0		0.0		0.0	
(6) Return on Surplus, dS	1.7	7.9%	2.7	11.6%	5.0	19.2%
Note: (6) = (3) + (4) - (5)						

	1987 B$	%S	1988 B$	%S	1989 B$	%S
(1) Beginning Surplus (S)	$31.0	100.0%	$35.2	100.0%	$38.5	100.0%
(2) Ending Surplus	35.2		38.5		43.4	
(3) Increase in Surplus	4.2	13.5%	3.3	9.4%	4.9	12.7%
(4) Stockholders Dividends	0.0		0.0		0.0	
(5) Surplus Paid In	0.0		0.0		0.0	
(6) Return on Surplus, dS	4.2	13.5%	3.3	9.4%	4.9	12.7%
Note: (6) = (3) + (4) - (5)						

Source: A. M. Best & Co., Aggregates and Averages, respective years.

Table 3
Inflation Adjusted Times Series and Ratios

	Value of $ vs 1967	Policyholders' Surplus		Net Premiums Written		Loss & Expense Reserves		Ratio Premiums to Surplus	Ratio Reserves to Premiums	Ratio Reserves to Surplus
		Actual	in 1967 $	Actual	in 1967 $	Actual	in 1967 $			
1975	.62	19,712	12,228	49,605	30,772	39,513	24,512	2.51	.80	2.00
1976	.59	24,631	14,446	60,439	35,448	47,105	27,628	2.45	.78	1.91
1977	.55	29,300	16,143	72,406	39,893	56,970	31,388	2.47	.79	1.94
1978	.51	35,379	18,106	81,699	41,811	68,767	35,193	2.31	.84	1.94
1979	.46	42,395	19,501	90,169	41,476	81,113	37,310	2.13	.90	1.91
1980	.41	52,174	21,140	95,702	38,777	92,493	37,477	1.83	.97	1.77
1981	.37	53,805	19,752	99,373	36,480	102,422	37,600	1.85	1.03	1.90
1982	.35	60,395	20,891	104,038	35,987	111,959	38,727	1.72	1.08	1.85
1983	.34	65,606	21,986	109,247	36,611	122,715	41,124	1.67	1.12	1.87
1984	.32	63,809	20,511	118,591	38,120	134,926	43,371	1.86	1.14	2.11
1985	.31	75,511	23,436	144,860	44,960	154,425	47,928	1.92	1.07	2.05
1986	.30	94,288	28,720	176,993	53,912	184,577	56,222	1.88	1.04	1.96
1987	.29	103,996	30,551	193,689	56,900	217,646	63,938	1.86	1.12	2.09
1988	.28	118,195	33,370	202,285	57,110	241,692	68,236	1.71	1.19	2.04
1989	.27	133,972	36,092	208,834	56,259	269,294	72,547	1.56	1.29	2.01
Annual Change	6.1%	14.7%	8.0%	10.8%	4.4%	14.7%	8.0%			

Source: 1990 Best's Aggregrates and Averages, page 94, consolidated figures.

Table 4
Comparison of Dividend and Leverage Ratios
(in billion dollars, unless a ratio)

		Stock Insurers		State Farm Mutual	
		1988	1989	1988	1989
(1)	Ending Surplus	$72.5b	$82.4b	$15.9b	$18.4b
(2)	Loss & Expense Reserve	$166.6b	$183.3b	$12.1b	$14.4b
	Ratio to Surplus	2.30	2.22	.76	.78
(3)	Policyholders Dividends	$1.1b	$1.3b	$ .2b	$0.0b
	Ratio to Surplus	.015	.016	.013	.0
(4)	Earned Premiums	$124.2b	$126.4b	$19.6b	$21.5b
	Ratio Reserve to EP				
	(2)/(4)	1.34	1.45	.62	.67

		Other Mutual Insurers		Reciprocal & Lloyds	
		1988	1989	1988	1989
(1)	Ending Surplus	$22.6b	$25.0b	$7.2b	$8.1b
(2)	Loss & Expense Reserve	$51.7b	$56.2b	$11.3b	$15.4b
	Ratio to Surplus	2.29	2.25	1.57	1.90
(3)	Policyholders Dividends	$1.1b	$1.0b	$ .4b	$ .4b
	Ratio to Surplus	.049	.040	.056	.049
(4)	Earned Premiums	$42.7b	$44.3b	$13.5b	$14.5b
	Ratio Reserve to EP				
	(2)/(4)	1.21	1.27	.84	1.06

Source: Best's _Aggregates and Averages_, respective years, consolidated figures

Table 5
Percent Comparison of Lines Written - 1989

Lines	Stock Insurers	Mutual Insurers
Workers' Compensation	14.87%	12.61%
Commercial multi-peril	10.24%	4.55%
Other Liability	11.17%	4.28%
Auto Liability	22.24%	35.35%
Auto Physical Damage	13.55%	22.95%
Other Lines	27.93%	20.26%
Total	100.00%	100.00%

Source: 1990 Best's _Aggregates and Averages_, pages 125-127.

In Table 4, line (2) shows the ratio of loss and expense reserves to surplus for mutual insurers (reciprocals are like mutuals) and for stock insurers. Generally, mutual insurers (including reciprocals) are more conservative in that they put aside more surplus for each dollar of loss and expense reserves than stock insurers do. This is clear looking at State Farm Mutual Automobile Insurance Company and looking at the reciprocals (in California, the insurers affiliated with the northern and southern auto clubs are reciprocals and are major auto insurers in the state.) It is also true in general, but this is not clear from Table 4, line (2) for Other Mutual Insurers, since this group contains a large number of medical malpractice mutuals which have ratios of reserves to surplus on the order of 3 or 4 to 1.

Therefore, mutual insurers not only concentrate on those lines which require smaller loss and expense reserves, but often they put up more surplus for the loss and expense reserves which they do have to provide. This follows as a natural consequence of their inability to raise capital: They must take a risk adverse strategy. The medical malpractice mutuals do have large loss and expense reserves and a high ratio of reserves to surplus, but these mutuals were created to satisfy an unwanted market which the stock insurers largely found too uncertain. As another conservative approach, mutual insurers pay higher policyholder dividends than stock insurers do. This is conservative because policyholder dividends act as a cushion against adversely high losses, since they aren't paid if the losses are high. In California, medical malpractice mutuals rely heavily on dividends.

Any insurance enterprise must make enough money and increase surplus enough this year to support the insurance enterprise the following year. Since certain risk to surplus relationships must be maintained and since any increased risk must be supported by additional surplus, the profit provision (or new capital) must provide for:

(1) expense and claims inflation
(2) increase in the aggregate reserves
(3) increase in the demand for insurance
(4) dividends to stockholders

In general economic terms, surplus must increase each year in order to support the business next year in terms of projected inflation and new business. For a stock insurer, the profit provision must provide a sufficient return to pay stockholder dividends and a return on capital sufficient to attract additional capital to fund the increase in liabilities, inflation, and the increase in demand for insurance.

This brings us back to the rates which mutual insurers must charge. Table 6 shows the approximate rate of return components which mutual and stock insurers needed in 1989. Table 6 also shows where the need for the rate of return (dS/S) arises. Back in Table 2, for 1989, it is shown that stock insurers earned 17.9% rate of return on surplus, and mutual insurers earned 12.7%. Table 6 is a breakdown of these rates of return, using information obtained from the A. M. Best time series in Table 3. The inclusion of State Farm Mutual Automobile Insurance Company does not distort Table 6 nor affect the conclusions.

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Table 6
Rate of Return Components - 1989
(as a percent of surplus (S))

	Stock Insurers	Mutual Insurers
Required surplus change:		
(1) expense and claims inflation	5.7%	4.7%
(2) increase in demand for insurance	4.4%	4.4%
(3) increase in reserves	3.6%	3.6%
Total	13.7%	12.7%
Actual surplus change:		
(4) retained return on capital	10.4%	12.7%
(5) surplus paid in	3.3%	0.0%
Total	13.7%	12.7%
Rate of return (dS/S):		
(6) dividends to stockholders	7.5%	0.0%
(7) retained return on capital	10.4%	12.7%
Total (dS/S)	17.9%	12.7%

Source: based on data from Tables 2 and 3

Note: If the shares of a stock insurer are selling for twice "book value" or surplus, then the dividend yield on the stock would be 7.5%/2 = 3.75% and the total return per share at market value would be 17.9%/2 = 8.95% (or a price/earnings ratio of 11.2). This is the way to compare insurance companies and non-insurance companies. In other words, you need to know the ratio of market value to book value.

The details of Table 6 are explained as follows:

(1)   The general inflation rate in the United States in 1989 was about 4.0%. However, the inflation rate for medical expenses was higher. Furthermore, in insurance claims, particularly workers' compensation and auto liability, there has been an increasing claims frequency as well as severity inflation. Therefore, 5.7% for stock insurers is a reasonable estimate of the additional surplus required in 1990 to support the same volume of risks that were insured in 1989. A lower value of 4.7% is reasonable for mutual insurers, which sell homeowners and auto physical damage.

(2)   The demand for insurance coverages increases each year, as the population increases and as the desire to protect property and business increases. The surplus of the industry must expand to support this additional demand for insurance. An estimate of the long term growth in this demand is given by the average annual increase in net premiums written (deflated), which is shown to be 4.4% in Table 3.

(3)   Table 3 also shows that the loss and expense reserves have been growing faster than net written premiums, due mainly to increased litigation, increased delay in resolving disputes, and increased demand for the liability coverages. The average annual increase in the deflated reserves was 8.0%, less 4.4% for the increasing demand for insurance leaves 3.6% for the annual increase in reserves. This increase each year must be supported by a proportional increase in surplus.

(4)   For stock insurers, Table 2 shows that, for 1989, surplus paid in was $2.4 billion or 3.3% of beginning surplus. The actual surplus change was $9.9 billion, or 13.7% of beginning surplus, which implies that the retained return on capital must have been 10.4%.

(5)   The rate of return for mutual insurers of 12.7% was exactly the right amount to cover inflation and the increase in surplus necessary to support the increase in demand for insurance and the increase in reserves.

(6)   For stock insurers, the story is different. They can only obtain the surplus required to support inflation, the additional demand, and the increase in reserves by attracting new capital. They needed 13.7% (5.7% + 4.4% + 3.6%) and did this with 3.3% for capital paid in and 10.4% from retained return on capital to give the required 13.7%. To attract and retain this capital, the stock insurers had to pay 7.5% back in stockholder dividends.

The point of table 6 is to show that even though the profit provisions for stock insurers and mutuals are quite different, the profit provisions, and therefore the fair and reasonable rate of return, can be determined by examining the financial economics of the business of insurance. It also shows that a fair and reasonable rate of return may vary by type of insurer, depending on stock or mutual, and even by the lines of business which the insurer writes.

If stock insurers require a higher rate of return, how can they compete against mutual insurers? The answer lies in market segmentation as seen in Table 5, where it is shown that mutual insurers focus on the lower risk personal lines and the unwanted market, while stock insurers focus on the higher risk commercial lines.

A reviewer of this paper asked two important questions about Table 6 which should be answered here:

(1)   What if the demand for insurance suddenly increased to a 20% annual rate, shouldn't the rate of return to stockholders remain the same? The answer is yes. In Table 6, if the 4.4% increase in demand became 20%, then the required surplus change would be 29.3%. This could be met by increasing the surplus paid in from 3.3% to 18.9% by selling shares of stock. The rate of return of 17.9% would not need to change (which is now on a much larger surplus base). Note: mutual insurers probably could not grow 20%, because their rate of return would have to increase to 28.3% to fund the growth, and this could only be accomplished by premium rate increases.

(2)   If the investor is only receiving 7.5% (the amount of the dividends to stockholders), why is the investor investing in the risks of the insurance business? The investor is actually

receiving 7.5% in cash dividends and 10.4% in growth in value of the stock, for a total of 17.9%. If the insurance needs stop growing, then the retained return on capital would drop and the dividends to stockholders would rise. The dividends to stockholders, the retained return on capital, and the surplus paid in are all continually adjusting to maintain the competitive equilibrium rate of return.

Perhaps the most common method advanced by economists at the Proposition 103 hearings for determining the proper rate of return was a method based on a discounted cost flow (DCF) model. The numerical results of these models give a rate of return in the 16-18% range for publicly traded stock insurers, in agreement with Table 6. Since the models are formulated in terms of an annual change in the investment of investors, the resulting rate of return is actually equivalent to dS/S. Furthermore, most models include an estimate of the growth in earnings per share, which is equivalent to recognizing that some return on capital is being retained for the increase in demand for insurance. However, these models do not include all of the dynamics of the insurance industry, nor do they explain the rate of return requirements for mutual insurers. Also, these models offer no procedure for setting rates or rollbacks by line by state for a particular insurer, other than by assuming constant leverage or risk.

It has now been shown that the proper measure of the required rate of return is dS/S, which will vary between stock and mutual insurers and vary depending on inflation and the dynamics of the insurance business.

5. Competition and Loss Ratios

At the national level, there is little doubt that the property/casualty insurance industry is highly competitive and getting more so as insurance and reinsurance become more international. The issue of competition has been a subject of study since the NAIC All Industry Model Laws were proposed in 1946 and adopted in some form by all states by 1951. California was one of the few states which chose an open competition rating law, relying entirely on competition. This open competition rating law remained in effect until the passage of Proposition 103.

In 1974, the NAIC produced a major study of the issue of competition and published a 767 page supplement to the 1974 NAIC Proceedings. The NAIC used these tests of competition: (1) structural indices such as concentration ratios and product differentiation, (2) performance indices such as price differentiation and solvency, and (3) conduct, meaning the degree of independent behavior. The NAIC did not find a failure of competition and did find that the type of rating law utilized by a state did not seem to have a great impact upon the structure of the market in that state. In other words, when a state adopts an open rating law, there does not seem to be a movement towards a non-competitive structure.

In 1989, Dr. Robert Klein of the NAIC staff wrote a report to the NAIC Personal Lines (c) Committee entitled, "Competition in Private Passenger Automobile Insurance". He concluded that from readily available evidence on traditional structural and performance measures of competition, the market for private passenger auto insurance is competitive, at least at the national level.

Therefore, without questioning the issue further, let us assume that, at the national level, the property/casualty insurance industry is competitive. It turns out that if we can accept this one conclusion, which certainly seems to be true, then a number of useful conclusions follow:

Conclusion #1: **If the property/casualty insurance industry is competitive at the national level, then it expects to earn a fair and reasonable rate of return at the national level.**

This conclusion derives from the necessary condition for competition that there be ease of entry and exit. Therefore, the return on capital for the national insurance industry must be neither excessive nor inadequate.

Conclusion #2: **If the by line loss ratios for a particular state match the by line loss ratios for the nation, then the insurance market in that state is competitive.**

There is no way to prove this statement other than to demonstrate that it is true. National insurers move capital and marketing efforts among the states to maximize profit, with the result that profit opportunities between the states are about equal and equal to the profitability of the national account figures. There are certain obvious exceptions to this conclusion, namely automobile insurance in certain states. However, if this conclusion can be established, then the national account figures can be used to establish the test for fair and reasonable rate of return in a particular state.

This conclusion was the central assumption (if not conclusion) in the 1969 New York Insurance Department Report on measuring insurer profitability. The report concluded that since both California and New York have loss ratios near country-wide median values, that the rates in these states are neither excessive nor inadequate.

Table 7 shows a comparison of California versus national loss ratios by line. These loss ratios are "calendar year" loss ratios, meaning that they include adjustments for policies written in past years, so there is some volatility in the ratios. Also, some of the differences are explainable by catastrophes or changes in the law in the California. In any event, Table 7 shows a general similarity in the loss ratios by line.

Why loss ratios?

The premium rates vary significantly by state and even within a state, but the loss ratios tend to be the same by line of insurance. It is not surprising to actuaries that the loss ratios would be the same, because actuaries determine the premium rates by making a percentage loading to the losses. It turns out that despite significant differences in corporate form between stock insurers and mutual insurers, the loss ratios between these two types of insurers tend to be the same. See Table 8.

If the loss ratios are low, there is a lack of competition and the premium rates are too high. If the loss ratios are high, the insurance industry is losing money, probably because the state insurance department is refusing to grant rate increases or has a rate freeze on that particular line (most likely automobile).

Table 9 shows the loss ratios by state for automobile liability and physical damage insurance written by State Farm Mutual Automobile Insurance Company, the country's largest insurer. In the major states, the loss ratios consistently centered around 75%. In three states, Michigan, New York, and Texas, the situations were special. Both Tables 7 and 10 show that the loss ratios vary significantly by line of insurance.

Where competition exists or the rate approval process works efficiently, we can conclude that:

(1)   the loss ratios do not vary by type of insurer (Table 8), nor by state (Table 9), but

(2)   the loss ratios do vary by line of insurance (Tables 7 and 10) and do vary over time (Table 7).

Conclusion #3: **If the insurance market in the state is competitive, then the rate for a particular insurer for a specific line set such that the permissible loss ratio is equal to the national loss ratio is a rate which is neither excessive nor inadequate. Equivalently, the rate will enable the insurer the opportunity to make a fair and reasonable rate of return.**

Naturally, the actual rate of return will depend on the actual losses, the actual expenses, and the investment income earned. In actual practice, the experience of insurers will vary widely, but the average return will be a fair and reasonable rate of return.

During the Proposition 103 hearings, no one actively advocated using loss ratios as a standard for approving rates, or even as a measure of fair and reasonable rate of return. However, the California Insurance Department has been using this loss ratio approach to approve workers' compensation rates for 75 years. The standard has been a 65% loss ratio for years, which would approximate the 78.1% national loss ratio after policyholder dividends. In fact, no specific estimate of the return on surplus is shown in any workers' compensation filing, only a general discussion of average expense provisions, investment income, and policyholders dividends.

Many insurance departments have been prior approving rates for years and most use a loss ratio approach or, equivalently, assume a proper expense provision and use a combined ratio standard.

Table 7
Comparison of National and California Loss Ratios

	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
Homeowners Multiple Peril													
National	53.8	53.3	60.4	66.4	63.0	64.5	63.7	66.4	70.7	61.9	56.0	59.1	70.9
California	45.5	52.1	79.8	64.7	58.9	62.1	75.2	67.6	75.1	66.4	53.4	57.6	54.4
Commercial Multiple Peril													
National	45.9	43.5	50.6	53.0	58.5	64.8	69.6	81.2	72.2	51.3	44.8	45.5	53.0
California	40.4	43.5	45.5	52.0	61.0	67.7	84.2	88.2	78.7	56.6	50.2	50.0	51.1
Private Auto Liability													
National	64.3	63.4	65.7	67.1	72.7	73.5	74.5	77.2	82.7	82.3	80.8	80.0	80.7
California	56.9	59.7	62.3	65.0	70.1	70.7	75.8	83.5	84.6	85.4	86.8	81.9	74.8
Private Auto Physical Damage													
National	61.3	64.4	68.6	64.8	66.1	68.5	63.9	68.2	67.5	62.7	59.3	61.2	64.4
California	60.0	68.6	69.8	65.5	64.9	67.7	68.6	67.9	61.9	59.4	59.8	62.4	59.5
Commercial Auto Liability													
National	62.6	62.9	66.4	68.8	74.6	81.0	86.6	96.7	87.1	75.1	69.5	69.3	70.4
California	53.0	58.3	64.3	67.1	72.6	83.8	96.3	128.3	93.8	74.5	69.9	69.6	80.7
Commercial Auto Physical Damage													
National	54.9	56.0	59.8	60.3	61.9	66.2	65.2	71.8	61.5	49.4	44.7	46.1	50.2
California	47.4	53.2	59.3	62.3	62.9	62.2	70.9	80.0	58.1	42.7	41.2	44.0	49.1
TOTAL ALL LINES													
National	61.6	61.1	63.9	65.4	66.8	69.4	70.7	77.1	77.0	70.2	66.6	66.4	69.2
California	52.7	58.1	58.5	59.7	61.8	69.9	74.3	78.5	78.8	70.8	69.6	66.1	66.7

Source: California figures – Aggregates of Annual Statements, page 14, respective years
          National figures – Best's _Aggregates and Averages_, respective years

Table 8
Showing the Similarity Between Stock and Mutual Insurers
Loss and Adjustment Expense Ratios (as a %)

Year	Homeowners		Auto Liability	
	Stock	Mutual	Stock	Mutual
1979	68.2	65.4	76.1	79.1
1980	74.0	75.2	78.1	80.4
1981	70.8	70.6	84.9	86.8
1982	72.4	75.5	87.5	86.5
1983	72.1	69.5	89.3	87.1
1984	74.9	75.0	94.4	92.7
1985	80.0	76.3	95.9	98.2
1986	71.4	69.6	91.9	94.0
1987	64.7	65.5	88.7	92.5
1988	68.7	67.0	88.3	93.6
Average	71.5	70.8	88.3	90.4

Source: __Best's Aggregates and Averages__ (figures reported include loss
adjustment expenses)

Table 9
Showing the Consistency in Loss Ratios by State
for Automobile Insurance Written by State Farm Mutual Automobile Insurance Company

State	Loss Ratio	State	Loss Ratio
Major States			
Alabama	74.6%	Indiana	78.4%
Arizona	77.6	Iowa	77.0
California	74.3	Kansas	74.1
Colorado	72.9	Missouri	70.2
Florida	73.7	North Carolina	77.3
Georgia	74.8	Ohio	74.2
Illinois	74.8	Pennsylvania	75.7
Exceptions			
Michigan	92.0	no fault state	
New York	86.2	no fault state	
Texas	85.0	state sets rates	

<u>Comments</u>

The lower volume states have volatile loss ratios.
These loss ratios include both liability and physical damage coverages and no
expenses.

Source: 1989 Annual Statement, Schedule T.

Table 10
Showing the Significant Differences between Loss Ratios by Line

Line	Loss Ratio
(1) Boiler and Machinery	40.9%
(2) Inland Marine	53.3
(3) Fire	54.8
(4) Commercial Auto Physical Damage	55.5
(5) Commercial Multi Peril	56.3
(6) Homeowners Multi Peril	64.1
(7) Private Auto Physical Damage	64.1
(8) Other Liability	67.6
(9) Commercial Auto Liability	75.8
(10) Workers' Compensation	78.1
(11) Private Auto Liability	78.2
(12) Medical malpractice	83.5

Source: Best's Aggregates & Averages, 1990, pp. 108-109, ten year average for the industry.

6. Actual Prior-Approval Procedure

With the passage in the 1940's of state laws regulating the business of insurance pursuant to the federal McCarran-Ferguson Act, most states adopted a prior approval rate provision. Thus, state departments of insurance have been in the business of prior approving rates for many years.

In general, the prior approval process has been working as follows: There is a small staff of 6 to 10; if possible, supervised by an actuary. There is no standard format for the filings, since the coverages and lines of insurance vary so much and can vary significantly from insurer to insurer. The insurers are required to show loss and expense statistics and to explain the loss development, inflation, and frequency trend factors. In the last few years, there has been increasing attention given to investment income. The insurance department staff look for completeness and reasonableness in the filing. Generally, if the increase requested is in line with known loss and inflation trends in the state, the requested increase is routinely approved. More attention is given to the personal lines, especially private passenger automobile.

As a practical matter, it is almost impossible to prior approve commercial rates effectively. The commercial premium for a risk is determined by the choice of debits and credits, as well as a choice of a rating base (such as number of customers or gross receipts). Since there is so much room for manipulation and since no two commercial risks are really the same, there is no assurance that the rates will be applied in the manner that they were approved.

Another aspect of prior approval ratemaking that is not commonly mentioned is underwriting, or the criteria used to decide whether or not to insure a risk at all. When rates are approved, the assumption is that the underwriting criteria will remain unchanged. However, approval of the rates does not include approval of the underwriting criteria. Therefore, for a given set of approved rates, the insurer can significantly affect its profitability by loosening or tightening its underwriting criteria.

Hence, state insurance departments usually use a pragmatic, judgment-based approach to prior approving rates. Also, since the loss development, inflation, and frequency trend assumptions are so influential in the ratemaking calculations, very little attention is usually given to the issue of rate of return.

The approach can change dramatically when there is a contested public hearing. In that event, the pragmatic approach gives way to the theoretical approach demanded by the consumer groups and the lawyers. Now, what is a fair and reasonable rate of return becomes the all consuming issue. Financial economists and actuaries need to master the issue of fair and reasonable rate of return if only to restore a proper perspective as to what is really involved in ratemaking. This is not to down play the importance of the issue of fair and reasonable rate of return in a broader context. The issue of fair and reasonable rate of return involves a necessary financial and economic analysis of the industry which is basic in the work of legislators, regulators, investment analysts, and insurance management in their efforts to monitor and manage the industry.

Solvency, not the prior approval of rates, is the primary responsibility of state insurance departments. Regulating solvency involves monitoring both surplus and profitability. So, the issue of rate of return is important to regulating solvency as well as to prior approving rates. Ideally, a financial analysis of the insurers should always precede an approval of the rates, but this seems to happen rarely.

Now, how can the results in the last sections be applied in an actual ratemaking situation? Suppose a multi-state, multi-line insurer makes a rate filing in California for private passenger automobile bodily injury liability coverage. The filing includes:

(1)   loss statistics for California, including loss development, inflation, and frequency trend factors.

(2)   the latest annual statement, showing expenses, investments, and surplus for the insurer as a whole on a national account basis.

In reviewing the filing, the insurance department is subject to two formidable constraints:

(1)   the following items are only available on a national account basis:

    (a) surplus
    (b) invested assets
    (c) investment income
    (d) realized capital gains
    (e) unrealized capital gains
    (f) general expenses
    (g) federal income taxes
    (h) other income and surplus adjustments

(2)   the surplus cannot be subdivided by line by state and be meaningful, since the surplus supports a complex array of asset, liability, premium and coverage risks.

The discussions in the preceding sections argued that the way to get around this problem was to use loss ratios, provided that the conditions of competition exist. Table 7 shows a comparison

of calendar year loss ratios for California and nationally. In most cases, the two loss ratios are remarkably close, considering that calendar year loss ratios include adjustments from prior years. Many of the cases in which differences occur can be readily explained. For instance, in 1989, for homeowners insurance, the national loss ratio jumped to 70.9 from 59.1 because of natural catastrophes, mainly hurricane Hugo, which was far more costly than the Loma Prieta earthquake in California. For private passenger auto liability, the low California loss ratio of 74.8% for 1989 could possibly be explained by rate increases taken before passage of Proposition 103. Therefore, Conclusions 2 and 3 in Section 5 hold.

For private passenger automobile liability, the national loss ratios were:

	1987	1988	1989	Average
Auto liability	80.8%	80.0%	80.7%	80.5%

Therefore, the filing should be approved for a permissible loss ratio of 80.5%. As an example, if the insurer files in 1990 a projected loss ratio at current rates of 91.0% for business to be written in 1991, then a 13% rate increase should be approved (.910/.805 = 13% increase). By the arguments presented in Section 5, the average insurer with this loss ratio and average expense and investment income will earn a fair and reasonable rate of return. Note that it is not considered what this particular insurer's actual expenses, taxes, and investment income are or will be.

The same approach could be used for the rollback. If in 1989, an insurer had a loss ratio of 75% for private passenger auto liability compared to a national loss ratio of 80.7%, then the insurer should have to refund 7% of its 1989 premium in order to bring the loss ratio up to 80.7%.

This example ignores the effects of the insurance cycle, which will be discussed in a following section. It also ignores the possible argument that auto liability is a loss leader for auto physical damage (note the much lower loss ratio for auto physical damage).

7. Advantage of Using a Loss Ratio Approach

The advantage of using a loss ratio approach is that it overcomes the disadvantages of using an approach based on a by line by state apportionment of surplus, expenses, and investment income, as used in the Proposition 103 hearings. Specifically, the approach used by the California Insurance Department lawyers in the Proposition 103 hearings had these unfavorable characteristics:

(1)　Heavy reliance was placed on by line premium to surplus ratios (called "leveraged norms"), which were outdated, artificial, and based only on intuitive judgment and not on a recognized risk analysis.

(2)　By using an insurer's actual expenses, inefficient (high cost) insurers are favored over efficient (low cost) insurers.

(3)　Overcapitalized insurers will get higher rates approved than undercapitalized insurers. This is so because the permissible rate of return was applied to the actual surplus, and the permissible rate of return is greater than the investment rate of return.

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(4)   An attempt was made to solve the overcapitalization problem by excluding "surplus-surplus". This would be a hopelessly complex project to do correctly. This effort gets even more complex when it is realized that if surplus-surplus is excluded, then the investment income earned and taxes paid on surplus-surplus must also be excluded.

(5)   Most proposals excluded unrealized capital gains in measuring "total income" in the calculation of rate of return. This encourages the postponing of realized capital gains in order to make the insurer appear less profitable than it really is. Of course, excluding unrealized capital gains understates "total income" in the first place.

(6)   The approach requires an artificial allocation of national accounts (such as overhead expenses, investment income, and federal taxes) based on premiums, reserves, or invested assets. This allocation creates the appearance that actual California experience is being used when in fact it is only a pro rata apportionment of the national experience.

(7)   The 11.2% permissible rate of return was chosen arbitrarily without any serious economic analysis. In fact, the correct economic rate of return required may vary from year to year depending on changes in inflation. Furthermore, the 11.2% was based on a restricted definition of net income which makes it non-comparable with any of the other measures of rate of return.

(8)   There are no ordinary premium to surplus guidelines for surety (where the risk is fully collateralized), or boiler and machinery (where the insurance policy is basically an inspection service contract), or earthquake (where the whole of the insurer's surplus is at stake).

(9)   There is no easy way to assign investment income or an investment yield to capital.

(10)   There is no easy way to allocate federal taxes by line by state, since federal taxes are paid at the holding company level and often include non-insurance business with substantial depreciation charges.

(11)   There is the issue of whether to base the rate of return on GAAP net worth, SAP surplus market value of stock, or economic value (discounted).

Using the loss ratio approach avoids all of these issues.

8. Approving Rates in a Cyclical Business

Whether called underwriting, business, or economic cycles, cycles are a fact of economic life. Cycles are characterized by high and low periods of profitability for an industry or an economy. They have a whole range of causes; namely, changes in interest rates, changes in inflation, changes in demand, social changes, political changes, even catastrophes and weather. Just changes in collective optimism and pessimism can cause business cycles. No two cycles are usually the same.

The business of insurance is greatly affected by cycles in the national economy, particularly with respect to inflation and interest rates. While consideration of economic cycles greatly

increases the complexity of the rate approval process, economic cycles must be recognized. In California workers' compensation rate approval hearings, the economic cycle is recognized by requiring the filing to show an econometric projection for the following year of the:

(1) workers' wage inflation in California, since the premium income is a function of wage levels.
(2) hospital and medical inflation in California.
(3) investment yield.

In general, these factors are affected by the economic cycle:

(1) expense and claims inflation.
(2) demand for insurance.
(3) leverage of reserves.
(4) investment yield (including interest rates and required return to stockholders).

All of these factors affect the rate of return analysis in Table 6, and, therefore, the required rate of return (dS/S) is not a fixed number, but a number which varies with the economic cycle. In order to project the required rate of return for a succeeding year, these factors must be individually projected. For mutual insurers, only the first three factors and interest rates need to be projected to get the required rate of return.

As can be seen in Table 7, the loss ratios by line vary in a wave pattern with the economic cycle. Also, Table 1 shows that the rate of return (dS/S) of the insurance industry can be volatile. In fact, the rate of return was negative in 1984, the bottom of the underwriting cycle in the 1980's. On the other hand, the rate of return for years 1978, 1979, and 1980 could be considered excessive.

Even though the national insurance industry is competitive and is therefore earning a fair and reasonable rate of return, it cannot completely deflect the vicissitudes of a national economic cycle, and, therefore, will not earn a fair and reasonable rate of return each year.

As a regulator, a decision has to be made whether, in the prior approval process, to ride with the cycle or to try to counteract it. Counteracting a cycle will mean mandating rate increases and denying rate decreases, not easy things to do. However, by monitoring the rate of return (dS/S), the regulator has, through the prior approval process, a lot of power to dampen the sudden changes in insurance rates which often occur at some point in an economic cycle.

When the national loss ratios reached an unreasonable high level (as they did in 1984-85), the regulator must adjust the loss ratios downward to achieve the proper dS/S.

Changes in claims cost inflation are taken care of automatically in projecting the losses by established actuarial methods. However, the impact of changes in inflation on premium (such as is the case in workers' compensation) and the impact of changes in interest rates on investment income have not necessarily been worked out by actuaries and must be examined by the regulator.

In the last decade, there has been a wealth of new research started on the subject of modelling cyclical behavior and emerging cost analysis. See the First and Second International Conferences on Insurer Solvency and the work of the British Solvency Working Party (1990).

In particular, the work of Derrig and Woll is very important, because their work is based on a discounted cash flow analysis. Richard Woll assumes a leverage ratio and calculates a target

loss ratio based on a discounted cash flow analysis. This approach could be used to get the implied leverage ratio, and therefore the particular risk based rate of return, given the target (permissible) loss ratio. Furthermore, by projecting changes in interest rates during the business cycle, the change in permissible loss ratio could be determined. Both Woll and Derrig generalize their work to include risk based discount rates.

9. General Comments on Insurance Rate Regulation

The differences between insurance industry regulation and public utility regulation should be made clear:

(a) Public utility regulation

- high fixed costs, low marginal costs
- cost minimization
- homogeneous product
- ineffective competition
- barriers to entry

(b) Insurance industry regulation

- low fixed costs, high marginal costs
- profit maximization
- heterogeneous products
- effective competition
- low barriers to entry

There is really nothing about the theory of utility rate regulation which is transferable to insurance rate regulation. Fortunately, insurance regulators can rely heavily on the benefits of national and international competition and don't have to worry about such issues as cost of capital replacement and depreciation.

Prior approval will not in general produce lower insurance rates. Prior approval will not increase the availability of insurance coverages; if anything, the requirements of the prior approval process will reduce availability slightly. However, prior approval can stabilize rates, particularly in the liability coverages, where rates in California have shown wide swings with the insurance economic cycle.

Some of the weaknesses of the prior approval process:

(1) If done properly, the rate approval process requires a full actuarial analysis of the loss and expense reserves.
(2) It is very difficult to regulate commercial rates.
(3) The approval process is slow to react to rapid changes, such as rapid increases in auto bodily injury frequency in Los Angeles.

General regulatory issues:

(1)   The regulator should be mainly interested in the percent of the premium which is returned to the policyholder, i.e., the loss ratio.
(2)   Policyholder dividends should be encouraged, especially for mutual insurers. This promotes insurer economic stability and enables insureds with low loss histories to be rewarded.
(3)   Insurers should have the opportunity to be innovative and flexible in developing new coverages and new markets.

What does it mean then to ask if insurers are earning excessive profits? Insurers are making excessive profits if the profits that they are earning are greater than is necessary to support the business the following year. If, in Table 6, the assumed projected rates are all correct, then any profit level greater than 17.9% or 12.7% would be excessive. In economic theory, excessive profits can only occur if the industry has at least some monopolistic characteristics. As already discussed, there is strong evidence that the insurance industry is highly competitive, at least at the national level.

10. Conclusion

The California Proposition 103 hearings have revealed that the theory of rate of return for the insurance industry has not been satisfactorily worked out by financial economists and actuaries. Allocating national account financials (such as surplus, assets, liabilities, investment income, expenses, taxes) in order to get by line by state rates of return has been producing strange and unworkable results, mainly because the procedure is essentially arbitrary.

Modern risk theory has shown rigorously that the optimum surplus of an insurer cannot be subdivided by line by state, since the risks which the surplus supports cannot be subdivided. Therefore, any procedure based on the allocation of surplus by line by state is academically as well as realistically invalid.

How, then, can the regulator approve rates subject to the legal requirement that the insurer be able to earn a fair and reasonable rate of return, that is, the rates are adequate, but not excessive? The proposed procedure is based on the conclusion that, at the national level, the insurance industry is competitive and therefore is earning a fair and reasonable rate of return. The argument is made that if an insurer's loss ratio by line is set equal to the national loss ratio by line, then the insurer will have the opportunity to earn a fair and reasonable rate of return and the rates so set are adequate and not excessive.

Practically every prior approval state relies on loss ratios (or, equivalently, a combined ratio of losses and expenses). The California workers' compensation rates have been set based on a target loss ratio for 75 years. This paper presents an economic justification for using loss ratios to approve rates and presents an economic analysis of the components that make up the required rate of return which the insurance industry must have in order to remain economically viable.

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