CAPACITY AND SOLVENCY—THE OUTSIDE INFLUENCE

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DR. WILLIAM FAIRLEY**, FREDERICK S. TOWNSEND, JR.

1. Regulated rate of return

   a. On what basis – sales, net worth, assets.

   b. Premium to surplus ratios.

2. Life new business limitation – New York

3. Guarantee funds

   a. States.

   b. Federal (Brooke bill).

4. Availability of capital from public investors

   a. Current structures.

   b. Combination of life with property/casualty companies.

   c. Conglomerates.

5. Solvency – What measure?

MR. ROBERT P. HILL: We have a fundamental subject for discussion at this session, but it is one that receives comparatively little attention. It is the solvency of insurers and their capacity to write business. Our concentration will be on the outside influences on solvency and capacity. Internal considerations will be discussed in Concurrent Session K.

MR. JOSEPH W. LEVIN: Most insurers face risk and uncertainty from a source not normally covered by classical theory of risk texts. This additional element of risk is insolvency, not of your company, but that of other licensed insurers. The projected total assessments for insolvencies prior to December 31, 1977 by state insurance guaranty funds was approximately $170 million dollars for property and casualty insurers. State insurance guaranty funds will be discussed later. While the financial consequences of insurer insolvency has fallen most heavily on property and casualty carriers, life and

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accident and health companies are not immune from such demands on surplus.
I will address these topics from a property and casualty viewpoint, although
most of these concepts apply to all lines of insurance.

According to most authorities, the prime objective of state insurance regula-
tion is insurer solvency. Other subordinate objectives such as availability
of insurance at a reasonable cost and fair treatment of policyholders and
claimants have an indirect effect on the primary objective of insurer solvency.
Today in the brief time allowed, I will discuss how solvency is considered by
state insurance regulators and possibly other critics of the business, the
NAIC early warning test system – a tool for the detection of and, hopefully,
prevention of insolvency; the state insurance guaranty funds – one mechanism
for dealing with insurer insolvencies; other proposed mechanisms dealing with
regulation and insolvency; and alternative measures of solvency or solidity.

Apart from the normal accounting definition of solvency, insurance law does
not deal with many specific commandments nor guidelines. Insurance law does
address itself to minimum capital and surplus requirements, restrictions on
investments, standards for accounting for assets and some liabilities, and in
some instances prohibitions against certain practices which would ultimately
lead to insolvency or impairment.

From an actuarial point of view and in elementary terms, solvency requires
that:

   A.   Premiums are sufficient to meet expected claims and expenses and,

   B.   That assets are adequate to meet known liabilities within an appro-
        priate safety margin.

There may be temporary intermediate demands where sufficiently large assets
may balance out inadequate premiums, but not for the long run.

It seems paradoxical that the regulators whose prime objective is insurer
solvency have not developed a precise definition of solvency let alone
empirical measures for this.

Early Warning System. After a dismal history of insurer failures, especially
in the property and casualty field, the NAIC through one of its subcommittees
developed an early warning test system. The test system is a series of
financial ratio tests applied to convention statement data filed annually by
licensed insurers with state insurance departments. Without going into the
intimate detail of each test and the standards applicable to these tests, I
will first describe the general categories of the test system.

There are four such categories of tests: overall tests, profitability tests,
liquidity tests, and reserve tests. In the area of overall tests, there are
the well-known ratio of premiums to surplus, change in writings, and surplus
aid as a function of surplus. There is no general agreement as to what is
the proper standard for a premium to surplus ratio. Mr. Kenney has generally
prescribed a two to one ratio. The NAIC has liberalized this somewhat in
that it allows a ratio of up to three to one. It is possible that with
consistent results and overall profitability, a company could operate at five
to one or possibly ten to one, be solvent, yet fail to fall within the normal
range of this test.

The change in writings test is used to detect any substantial changes in writings. Review of past insolvencies has reflected a consistent pattern of troubled companies increasing writings to cover the payment of prior losses. Surplus aid is another way of expressing the effect of reinsurance on un-earned premiums and the balance sheet effect of such transactions. A trou-bled company may also use inflated surplus to mask underlying problems.

The next category is profitability. Here a two-year adjusted underwriting ratio is used. This is the familiar combined ratio, but includes dividends to policyholders and other income in the test ratio. Values in excess of 110% gives recognition to the investment income generated from insurance operations. Another profitability test of interest is the investment yield as a function of average invested assets. Too high or too low a yield may reflect speculative investments intended to produce large capital gains, but little current income. Too high yield may reflect large investments in tax exempt bonds which may possibly default as a result of a high yield and little protection. As an aside, the capital market slide of the 1960s and 1970s reduced substantially insurance companies' surplus, hence capacity. More rigid tests for scrutiny of insurance company investment portfolios seems imperative. The remaining profitability test is the relative change in surplus. Review of past insolvencies has shown that problem companies prior to insolvency introduced substantial sums into capital and surplus. Heavy increases in themselves are not a sign of insolvency, but are a first warning.

The next two tests are considered liquidity tests. The first is the ratio of liabilities to liquid assets. Analysis of prior insolvencies shows that companies headed for trouble exhibit increasing ratios of liabilities to liquid assets. The other liquidity test is a ratio of agent balances or uncollected premiums to surplus. This test relates the portion of surplus which is backed by the major receivable assets.

The remaining three tests are loss reserve tests, the first two being retro-spective in nature, and the third being prospective. The former are basically tests of the total loss reserve development over one and two year periods. Developed inadequacies are compared to surplus as of the time these reserves are evaluated. Results in excess of 25% of existing surplus are considered outside the normal range. These tests are probably the most determinate in that under-reserving,whether intentional or not, most often leads to inad-equate rates and hence probably ultimate disaster.

The NAIC early warning system is intended to be a tool of insurance regulators and not the final measure of solvency nor trend toward insolvency. The NAIC establishes a priority list of companies in which further on-site examination is needed on the basis of the number of tests outside of the normal ranges. Presently, having four tests or greater outside the normal range constitutes a priority company. One apparent flaw in this test system is that it gives equal weight to each test. The NAIC through its advisory committee is attempting to develop a more comprehensive scoring system in which all results are translated into one possible variable which then can be used in the ranking process. Again, this measure is not intended to be the ultimate measure of solvency or insolvency, but establishes priorities of which companies should be more closely scrutinized.

State Insurance Guaranty Funds. Since the NAIC early warning test system has been only implemented for a few years, problems which began earlier, and are now being manifested, were not perceivable by the early warning test

system and, therefore, it is possible more insolvencies will occur. In order
to alleviate the financial burden on individual policyholders and claimants,
many states adopted, beginning around 1969, mechanisms called state insurance
guaranty funds. There are two basic forms of these funds -- pre-assessment
and post-assessment. New York has a form of the pre-assessment fund. In
this mechanism certain lines of business written by the property and casualty
carriers are subject to assessments on net written premiums until a sufficient
fund level is accomplished. In New York, I believe, the fund limit has a
ceiling of $200 million and a floor of $150 million. In other words, if
claims to the fund deplete the total amount below $150 million, the New York
plan can then assess member companies until the fund level exceeds that
amount. The other form of fund is post-assessment. In this form no funds
are generated until an insolvency has been declared and measured. The cost
from the particular insolvency is then pro-rated among similarly licensed
insurers in that state in proportion to their net direct written premiums.
The NAIC model bill for legislation is for this latter type of fund as
opposed to the pre-assessment fund. As with many mechanisms, there are
proponents and opponents of each alternative. Proponents of pre-assessment
believe that the preexisting fund is immediately available for payment of
covered claims, that a very large fund can be accumulated over a period of
years, that future assessments can be budgeted, and from the standpoint of
fairness, part of the fund will have been contributed by the company whose
bad management, or bad fortune, caused it to be insolvent. Proponents of the
post-assessment plan feel that the size of the fund can be manageable and
will cover only a known insolvency and, therefore, large sums are not generated
and accessible by the politically motivated. Proponents of post-assessment
also feel that there is no timing problem in the collection and distribution
of funds since the assessment mechanism can be activated in a relatively
short time after notice of liquidation. With respect to the criteria of
fairness, it has been decided legislatively that the burden of insolvency
should fall on the insurance industry as a whole. This concept dilutes
somewhat the fairness argument of the pre-assessment proponents that insolvent
companies have contributed in part to their own insolvency fund. In all
funds there is a governing board made up of member company personnel who
serve as a management of the fund. The cost of the fund is surprisingly low
as a percentage of total premiums in light of the $170 million assessable
value given earlier. This represents less than 1% of total premiums written
by property and casualty companies during that period of time (1960-1977).
Most funds, whether pre-assessment or post-assessment, have limits on annual
assessments. These generally are 1% or less of subject premiums. Therefore,
there is a minimal impact on operations in any one year. Some states have an
additional feature which allows for recoupment of past assessments. The
recoupment formula is flexible enough in that it allows an additional fraction
of a percent in the ratemaking formula for expenses while recoupment is
necessary.

Experience over the last several years has shown that these funds are not
without fault. One of the more glaring problems is the fact that insolvencies
of interstate companies leave questions as to which state has priority in the
proceeds of any liquidation. It is after all proceeds have been exhausted
that the state insurance guaranty fund mechanism activates. There is also
concern over the expenses of running and administering these funds. Most
states have to hire full time staff to process claims and to account for all
transactions handled by the state insurance fund.

Other Proposed Mechanisms. The Federal Government, specifically Congress,
has been observing the difficulties of the insurance industry, not only from
insolvencies, but in the way the industry has failed to cope with social
problems, including those not necessarily generated by the insurance industry.
Rapidly rising rates, apparent widespread cancellations, difficulty in
securing insurance and alleged discrimination have invited the Federal
Government directly into the insurance arena. Congress is not the only
federal entity interested in the business of insurance. The Department of
Justice conducted a study a year or so ago with particular interest in the
anti-trust implications of the business, but also with an eye on the mechanisms
dealing with rates, accessibility, and in some instances, insolvency.
Senator Brooke proposed that insurers have the ability to elect to be feder-
ally chartered or remain in the purview of state regulations. Those that
elect to go the federal route would be a member of a Federal insurance
guaranty fund, akin to the F.D.I.C. or F.S.L.I.C. mechanisms which are
essentially prefunded. A key to the proposal, of course, is the questions of
whether states would have the same authority over those companies that
elected to stay regulated by states and that which exists under present
regulation. Due to the time limitation of this panel, I cannot go into the
pros and cons of state versus federal regulation, but I can say that the
Brooke bill stalled in Congress and is now a dormant proposal. Another
proposal of interest is that forwarded by the Nationwide Insurance Companies.
It was their idea to form a non-profit mutual company funded by surplus notes
which would be carried as individual member companies admitted assets.
Although this mechanism appears to be similar to the New York prefunding
mechanism, the asset would be allowed to work for the benefit of and for the
protection of member companies against insolvencies, and also for the genera-
tion of investment income on the surplus notes. Almost all claims would be
covered subject to a maximum of $300,000 per claim, and it is anticipated
that the cost of such a mechanism would be comparable to that of the existing
plans. I believe the proposal was made in response to, or possibly in
defense of, the state versus the federal approach to regulation.

Alternative Measures of Solvency. In my view, insurance solvency is best
expressed in terms of margins of safety. Insurance in the property and
casualty field tends to be cyclic and, therefore, experiences occasional
periods of rate inadequacy caused by unanticipated levels of inflation,
overzealous competition, catastrophic occurrences, and in some cases,
poor management and planning. Included in this measure of solvency should be
a provision of safety for changing equity market prices. Another area of
concern is the establishment of adequate loss reserves. There is presently
movement afoot to require certification by Casualty Actuaries of the loss
reserves of property and casualty insurance company financial statements. It
appears such certification is likely and that most Casualty Actuaries should
prepare themselves for this requirement. In any respect, loss reserves are a
key to continued solvency. My alternative measures are quite simple in
nature. The first has already been discussed and that is a measure of
profitability over time. I would expand the time frame to about ten years to
absorb the normal, yearly fluctuations. A consistently unprofitable company
is a prime candidate for insolvency, irrespective of other values. Closely
related to this would be ratio of the total loss reserve to surplus. This
gives a direct measurement of the sensitivity of under reserving on company
surplus. The last measure to be mentioned today would be a ratio of equity
investments to surplus. Again this is a direct measure of the sensitivity of
a change in the market on surplus. I am sure that many of you have other

methods that are as sensitive and meaningful, but most tests will rely on
historic rather than prospective data.   The challenge to us all is to
develop a system which utilizes dynamics rather than past or static results
of insurance operations, so that the primary goal of insurance regulation -
that of solvency - can be met on a predictable and systematic basis.

DR. WILLIAM B. FAIRLEY: For at least as far back as 1911, when the Merritt
Committee of the New York State Legislature issued its report on casualty
insurers, state regulators have tilted with property-liability insurers over
the proper role of the investment income of companies in determining insurance
prices.   Companies have often maintained that they are in essence two busi-
nesses -- one devoted to "underwriting" and one devoted to investment, and
that for purposes of setting prices, the underwriting side be considered in
isolation.   Regulators and consumer groups have argued that this bifurcated
view of the insurance business serves only to conceal and protect lucrative
investment earnings.

The present discussion draws on testimony for the State Rating Bureau at the
Massachusetts Division of Insurance in rate hearings and on subsequent
research.   See, for example, "Rate of Return and Profit Provision in Auto-
mobile Insurance," September 26, 1977 and "The Investment Income Contro-
versy and the Regulation of Profits in Property-Liability Insurance: Theory
and Practice in Massachusetts," March 9, 1978.   The point of departure of the
work reported here was the May, 1975 decision on workers' compensation rates
in Massachusetts by Commissioner James M. Stone, in which he proposed a fresh
approach to insurance profits regulation.

In almost every state companies include traditional values for profit allow-
ances as part of rate filings to state insurance regulators.   Thus, in auto,
they are generally 5 percent, in homeowners, 6 percent, and in workers'
compensation, 2.5 percent.   These values were adopted at various times in the
past by the National Association of Insurance Commissioners.   While regarded
as reasonable figures, they were not then, nor have they been subsequently,
derived from any explicit financial or economic analysis of what appropriate
profit margins should be.

There has been some recent movement in the investment income controversy.
The National Association of Insurance Commissioners reported a lengthy
analysis of the question in its 1970 Proceedings and has made subsequent
studies.   In New Jersey Commissioner Robert L. Clifford in 1972, after
extensive hearings, and in an opinion whose practical implications for
setting profit margins have similarities with the proposal made in the
present discussion, required that the rates in the different lines reflect
the amount of investment income derived from the investment of unearned
premiums and loss reserves for those lines.   Insurers at those hearings did
agree that consideration of rate of return on capital, using earnings from
all sources, was appropriate.   Other states have introduced some kind of
consideration of investment returns.

In a recent article devoted to the investment income controversy -- one which
discussed the work in the Massachusetts Division--the London Economist noted
some signs of change in the industry on this issue.   It quoted comments by a
"leading insurance executive," who give some sound reasons for change:

    The idea that investment profits are of no concern to regulators or
    the public has permeated regulatory and management thinking.   This
    has harmed the business by developing and maintaining a regulatory

> system that has largely preoccupied itself with tilting at windmills
> rather than dealing with issues of substance; creating a public mis-
> trust of insurance companies, and captivating managers into believ-
> ing traditional cliches at the expense of making sound management
> decisions. (The Economist, August 20, 1977, p. 46).

It is instructive to begin a discussion of appropriate profit allowances by
looking at the actual sizes of (1) the investment earnings, and (2) the
underwriting earnings in property-liability insurance lines. The State
Rating Bureau of the Massachusetts Division of Insurance has assembled data
provided by industry rating bureaus on the cash flows and the returns on
these cash flows for writing coverage for one year of protection in the
following lines: auto bodily injury (a Massachusetts category which is auto
liability coverages less property damage liability); homeowners; workers'
compensation; and medical malpractice.

The key fact about these cash flows is that premiums are generally paid in
prior to their payout in claims and expenses, though the different lines have
very different patterns of pay-in and pay-out over time. Companies have the
use of policyholders' funds for investment purposes from the time of receipt
of the premiums to the time of disbursement. For example, in Massachusetts—
and values not far from these can be expected in other States—homeowners
premiums can be invested for an average of 0.35 years, while medical malprac-
tice premiums can be invested an average of 3.74 years.

As a result of these differences, and assuming an average investment discount
rate of 10.5 percent, the return on the cash flow alone, setting the underwrit-
ing profit margin arbitrarily at zero, is 3.7 percent of premiums for home-
owners and 40.3 percent of premiums for medical malpractice. Table 1 gives
for five lines the returns on cash flow at an investment discount rate of
10.5 percent and the average number of years premiums are invested based upon
recent Massachusetts experience. The rate of 10.5% is an anticipated average
investment return. However, the exact value assumed for this rate is not
important, because the results on profit allowances discussed below are very
insensitive to the rate chosen.

Table 1

Return on Cash Flow
and
Average Years Premiums Invested

Line of Insurance	Return on Cash flow	Average years premiums invested
1. Auto bodily injury	16.8	1.60
2. Auto property damage	3.2	0.31
3. Homeowners	3.7	0.35
4. Workers' compensation	16.8	1.60
5. Medical malpractice	40.3	3.74

Underwriting profits for the two most recent decades for all property-liabil-
ity lines combined for stock companies in the U.S. have been negative: -1.3
percent of premiums earned for 1956-65 and -1.0 percent for 1966-75. "Under-
writing profit", as defined for example in Best's, is for each calendar year
the difference between premiums earned and the total of losses and expenses
incurred during the year.

Actual average profit margins by line in recent years have varied inversely
with the sizes of returns on cash flow in those lines: the larger the return
on cash flow the smaller the profit margin for the lines. For example, for
auto bodily injury, with a shorter than average length of cash flow, the
average margin for 1971-75 was -1.2 percent. Table 2 gives average historical
underwriting profit margins for the four major property-liability lines for
U.S. stock companies for the last two decades and for the last five years
based upon Best's data. The traditional profit allowances are also shown.
The premium-weighted average of the historical margins is about 7 percentage
points below the traditional allowances used in rate filings. Actual under-
writing profits have not, on average, been as high as those implied in rate
filings.

Table 2

Traditional Allowances and Historical Margins

	Line of Insurance	Traditional allowance	Historical margin (1956-75)	Historical margin (1971-75)
1.	Auto bodily injury	1	-5.6	-5.3
2.	Auto property damage	5	-1.6	-1.2
3.	Homeowners	6	-9.7	-0.4
4.	Workers' compensation	2.5	-2.3	-6.4
	Weighted average	3.7	-4.0	-3.2

During the last three years the Massachusetts Division of Insurance has
conducted extensive research on appropriate profit allowances to be used in
rate filings in the major lines of property and liability insurance. The
starting point of the analysis adopted by the Division is the accepted legal
standard for judging rates of return in regulated industries set forth by the
United States Supreme Court in 1944 in the Hope Natural Gas case:

> The return to the equity owner should be commensurate with returns
> on investments in other enterprises having corresponding risks.
> (Federal Power Commission v. Hope Natural Gas Co., 320 U.S. 591,
> 603 (1944)

Applied to property-liability insurance, the standard—which can be called
the "capital attraction standard"—requires that total returns on capital
equal an appropriate risk-adjusted target rate of return. As a correlary,
underwriting return should satisfy the following equation:

$$\text{Target return} = \text{Investment return} + \text{Underwriting return} \qquad (1)$$

In May, 1975, in his decision on workers' compensation rates in Massachusetts,
Commissioner James M. Stone proposed a solution to some of the practical
problems of determining actual rates of return. He proposed that the earnings
that could be made by a hypothetical company investing only in U.S. Treasury
bills be used as a minimum standard for the investment earnings available to
insurers, and that those earnings plus underwriting earnings should yield an
appropriate required or target rate of return on capital. This approach was
given a practical application in the Commissioner's decision on 1976 auto

rates in Massachusetts, which incorporated a profit allowance of -4 percent
for bodily injury and 5 percent for property damage coverages. These allow-
ances withstood an industry challenge in 1976 in the state's highest court,
the Supreme Judicial Court, which noted in its opinion:

> Traditionally, the allowance for profit was 1% of the total
> premium for compulsory coverages and 5% of the total premium
> for other coverages. But these figures were likely to be a
> very misleading indication of the actual profit made by the in-
> surer on a given line of insurance. Because the premium dollars
> are paid to the insurers early in the policy year and the payment
> of insurance claims stretches out over several years, the cash
> flow produces funds that the insurer can invest. This income
> from investment is not directly adverted to in formulating the
> profit allowance by the traditional method. (Attorney General v.
> Commissioner of Insurance, 1976 Mass. Adv. Sh. 2068)

Both the decision and the Court in its opinion called for further work on the
rate of return approach. Subsequent research in the Division on profits and
rates of return in property-liability insurance lines has put the analysis of
risk and return in the industry in the framework of modern financial theory.
In so doing, the nature of risk bearing and the proper compensation for risk
bearing in property-liability lines has been clarified and explicit solutions
for new profit allowances to replace the dated traditional allowances now in
use in rate filings have been determined.

In modern financial theory—specifically, in the capital asset pricing
model—compensation for "risk" that appears as an explicit contribution to
the size of the target rate of return is compensation for "systematic" risk.
The systemataic risk of a security is that part of the total variability of
the returns it provides to investors that cannot be diversified away by
pooling the security with others in a portfolio. It is, therefore, the part
of total variability that is systematically related to overall stock market
movements. The measure of this systematic risk is the "beta coefficient" of
the stock, which is proportional to the covariance of the stock's returns
with an overall market index. Stock returns over a period are dividends plus
the change in price of the stock, all as a ratio to the initial price.

The model predicts that investors' required average return on a stock will be
equal to the return on a risk-free security (Treasury bill) plus a compensa-
tion for risk equal to the product of the stock's beta coefficient times the
average market return to risk.

In some cases, the term "risk" is used to refer to the existence of some
chance of a loss or large loss, as in the threat of insolvency. The returns
discussed here all refer to returns over and above expected costs, where
expected costs include contributions from all the chances of loss as well as
all the chances of gain. No specific "compensation", therefore, is included
in the target return for the risk of insolvency except insofar as that risk
has a systematic component.

The beta coefficents of samples of property-liability insurers average about
1, which is also the average for the stock market as a whole. This means
that if, for example, the market index moves up 10 percent then, on average,
the returns on property-liability stocks move up 10 percent, and if the
market index moves down 10 percent, so do the returns on property-liability

stocks. A volatile stock would have a beta greater than 1. For example, a stock with a beta of 2 moves up 20 percent when the market moves up 10. Its systematic risk is greater, and investors require a correspondingly higher return. Estimates based on historical returns are that the average market return for risk is 8.8 percent and an average risk-free yield is 6 percent. Investors therefore require an estimated 14.8 percent return after tax for a stock with a beta of 1. (A readable discussion of capital asset pricing theory is given by Franco Modigliani and Gerald a. Pogue, "An Introduction to Risk and Return: Concepts and Evidence, "Financial Analysts Journal, Part I in Vol. 30, NO.2, 1974 and Part II in Vol. 30, NO. 3, 1974. A more technical account is Michael C. Jensen, Editor, Studies in the Theory of Capital Markets, Praeger, 1972). To determine the target return by line, the systematic risk of a property-liability insurer is analyzed into a component associated with the systematic risk of its investments and a component associated with the systematic risk of its underwriting activities. Analysis of a sample of multi-line insurers writing predominantly property-liability insurance yields an estimate of 80 percent of overall systematic risk for all lines combined flowing from investments and only 20 percent from underwriting.

The same analysis can be adapted to estimate systematic risk by line. Lines, like auto bodily injury, with longer than average cash flow, have about 40 percent of systematic risk flowing from underwriting, while auto property damage, with shorter than average cash flow, has about 10 percent of systematic risk flowing from underwriting. The result that the underwriting component of the overall systematic risk of insurers is the smaller fraction of the total is surprising because we are accustomed to thinking of risk as total variability, and it is well known that underwriting profits undergo very wide swings up and down. There is, however, no evidence that the capital markets regard these swings as cause for very much additional return beyond that required for the systematic risk of investments.

Capital markets will look to the anticipated earnings of insurers from all sources to judge if they are adequate to produce the required risk-adjusted target rate of return. If actual returns equal the target return then there will be no pressure to bid share prices up or down--the capital market is in equilibrium. Substituting estimated values for (1) the target rate of return and from the investment of equity, for that line in equation (1) above, the underwriting return is determined as the residual unknown. Converting the underwriting return, which is expressed as a return on capital, to the underwriting profit, which is expressed as a percentage of premiums, gives the value of the underwriting profit for the line. The analytical solution of equation (1) for underwriting profits by line that equate target with actual returns, either for the industry as a whole or for a particular company is:

$$\overline{P}_N = -k_N \overline{r}_f + B_{p,N}(\overline{r}_m - \overline{r}_f) + (t/((1-t)s))\overline{r}_f \qquad (2)$$

where

$\overline{P}_N$ = underwriting profit for line N

k_N = average number of years premiums are invested

$\overline{r}_f$ = anticipated risk-free yield

$B_{p,N}$ = measure of systematic risk of underwriting by line

$\bar{r}_m$ = anticipated market index return

t   = average corporate tax rate on earnings

s.   = ratio of premiums to shareholders' equity

The solution (2) for profits by line has the property that profits are inversely dependent upon the length of the cash flow by line, and thus policyholders do receive reduced rates in lines with long cash flows. In competitive insurance markets it would be surprising to find any other result, for insurers can be expected to bid against each other in rates for the privilege of holding investable funds.

The solution (2) for profits by line also was the property that it is independent, except weakly through the last term on the right, of the composition of the investment portfolio of industry or company. This property of separation between indicated underwriting profits and the composition of the investment portfolio is important because it means that regulators need not concern themselves with the investment strategies or results of individual companies of the industry as a whole.

Riskier investment strategies will, over the long run, be rewarded with higher returns on investments. However, the target returns required by the capital markets must, in this event, rise in anticipated returns. Underwriting profits, given by (2), remain the same. Stockholders share in both the risks and the returns of investments. Policyholders' rates do vary according to the lengths of time their funds are invested, but they do not bear the risk nor earn the return of investments riskier than U.S. Treasury bills. In mutual companies, in contrast to stock companies, policyholders do share in the risks and returns of investments because their dividends are affected by investment results.

Where markets for insurance services are competitive, underwriting profits determined by equation (2), slightly modified by a factor to convert them from discounted values to traditional undiscounted values, are appropriate profit allowances to be included in rate filings. They will be referred to as "competitive profit allowances". Competitive profit allowances for five lines are given in Table 3.

Table 3

Competitive Profit Allowances

	Line of Insurance	Competitive profit allowance
1.	Auto bodily injury	-6.0
2.	Auto property damage	-0.1
3.	Homeowners	-0.3
4.	Workers' compensation	-6.3
	Weighted average	-2.9
5.	Medical malpractice	-20.9

Three features of competitive profit allowances stand out. First, they are
much closer to the actual historical record of underwriting profits than are
the traditional allowances. Second, they vary inversely in size with the
average lengths of cash flow of the lines. In this sense, they do reflect
the opportunities that companies have for investing policyholders' funds held
by them. Third, since they depend on the anticipated risk-free yield, an
economy-wide value, and not on the varying returns to different portfolios,
they are simple to adopt in rate filings and result in rates that do not vary
with particular investment results.

To sum up, the case for adopting the competitive profit allowances described
here in place of the traditional allowances long used in companies' rate
filings to state insurance regulators is that they are closer to actual
historical experience, they are based upon a contemporary understanding of
the relation between returns and risks in the markets for capital, and,
finally, that they show the way in which investment returns in the property-
liability insurance business should and should not influence the determina-
tion of the price of insurance.

MR. JOHN CONNERS: I heard you just mention a 14.8% return. In the Massa-
chusetts hearings on 1978 rates, I believe on property damage, you recommended
that the insurance companies be given a 5.6% target rate of return on property
damage. Now my question is: Who could you attract -- what investor would
invest in a venture that would pay 5.6% rate of return?

DR. FAIRLEY: The 5.6% figure that you refer to did not apply to real companies;
it applied to a hypothetical insurance company, introduced by Commissioner
Stone in his 1975 Workers' Compensation decision, which invested only in U.S.
Treasury Bills and which wrote only one line. That was an artificially
constructed company, used as a methodological device. I later called it the
"regulatory standard company." The 14.8% return refers to the average stock
property liability insurer.

The 5.6% figure is after-tax, assuming a corporate tax rate of 48% for the
regulatory standard company. Now real property-liability companies have an
average corporate tax rate closer to 20 percent. Thus, the regulatory
standard company model contains some unrealism because of taxation features.
The use of the regulatory standard company model was, however, conservative
from the point of view of insurers in that the profit allowances derived from
it were biased upward. The allowances given in the present Discussion are
based upon a more realistic treatment of taxes, and they are not biased up or
down in any way known to me.

MR. FREDERICK S. TOWNSEND: Doctor Fairley and Mr. Levin have touched upon
regulated rates of return in the property-casualty industry, and measures of
solvency in the property-csualty industry, which translate into a need for
capital. I will attempt to relate both the need for capital and prospective
rates of return to the next logical consideration, namely the availability of
capital. All of these considerations are very definitely interrelated. We
must consider the following:

    1. Need for capital. How does an insurance company measure its need
        for capital?

    2. Rates of return. What rates of return are available on invested
        capital in the insurance industry?

3. Availability of capital. Are investors, or parent company share-holders, willing to place capital into the insurance industry?

LIFE INSURANCE INDUSTRY

Need for Capital

A quick distinction between the property-casualty industry and the life insurance industry is that the property-casualty underwriter relates its need for capital to its volume of premium writings, or to its level of loss reserves, or a combination of the two.

Property-casualty contracts are one year contracts, and premiums written are immediately related to current year's losses as premiums are earned. Reserves are set aside on unsettled claims.

The life insurance industry is different.

Premiums written today on permanent forms of life insurance are accumulated in statutory reserves at statutory interest rates. Such reserves use conser-vative interest rate assumptions, and under present circumstances are consid-ered very conservative estimates of future liabilities.

By way of contrast, the property-casualty reserve may be considered a best estimate reserve for a liability which is due and pending settlement. Thus, property-casualty reserves may prove to be either redundant or deficient, while life insurance reserves represent a conservative valuation of a future policy liability.

The need for capital in a life insurance company, once beyond its requirements for original formation, etc., appear to be limited to the amount of surplus needed to support new business writings. Both the property-casualty and life insurance company need surplus to support new business writings, as statutory losses are incurred by the writing of new business. However, once a life insurance company has grown to a size and age where renewal profits exceed first year losses, the company reports an operating gain in aggregate, and conservative reserve liabilities, in periods of high interest rates, protect the company from reserve deficiencies. Thus, a life insurance company's need for capital appears to be related closely to the support of new business and current year claim ratios, with less concern placed on reserve adequacy in times of high interest rates.

Rates of Return

Since late 1976, large numbers of acquisitions have been made in the life insurance industry by noninsurance corporations. Why?

1. GAAP accounting has diminished the need for, and focus upon, the accumu-lation of statutory surplus.

2. Money flows to the industries with the highest rates of return. The purchase price of a life insurance company is not dependent upon its statutory capital and surplus or statutory earnings. Therefore, in-vestors relate to projected GAAP earnings in establishing a purchase price of a company.

3. While group insurance and health insurance coverages may have strong similarity to property-casualty lines, the investment features of

ordinary life and industrial life insurance create high profit margins
on seasoned books of business and require no additional capital invest-
ment to support reasonably attainable growth rates in new business
production.

4.   An examination of 8 major stock life insurance companies, including both
     specialists in ordinary life and large group insurers, showed GAAP
     earnings in 1976 ranged from 11.2% to 15.2% of mean GAAP surplus. On
     average, the eight companies reported GAAP earnings equal to a 13.1%
     rate of return on mean equity. While this is not high as the 14.4%
     return on the Standard & Poor's industrial stocks, the slight differ-
     ential in favor of industrial stocks is diminished by the cyclicality of
     earnings exhibited by industrial companies, compared to the consistent
     earnings growth shown by life insurance companies in their present
     operating environment.

Availability of Capital

Because noninsurance companies wish to purchase established companies, and
not go through the painful process or risk of forming new companies, they
must match their available capital with the need for capital within the life
insurance industry. As previously discussed, there is little need for
capital by an established life insurance company. If there is no need for
capital, companies are not seeking additional capital. Therefore, in lieu of
capital investment in the industry, a transfer of ownership of companies is
taking place between conglomerates wishing to establish a position in the
life insurance industry and present shareowners who are willing to accept a
profit on their previous investment in the life insurance industry by selling
their respective companies to new owners.

It is dangerous to quote general rules of thumb, but we note that many recent
acquisitions in the life insurance industry have taken place at about 12
times GAAP earnings, and 1.5 to 2.0 time GAP book value. These are represent-
ative prices which conglomerates are willing to pay to enter the life
insurance business.

PROPERTY-CASUALTY INDUSTRY

Need for Capital

It is interesting to note that in the life insurance industry, because (1) a
mature life insurance company does not need additional capital to support
growth in new business, (2) reserves are considered to be conservative, and
(3) profit margins are very favorable on ordinary life insurance, a need for
capital does not exist.

By way of contrast, in the property-casualty industry, the need for capital
exists and has been growing. Ten years ago, premium writings were 1.5 times
surplus and loss reserves were 0.9 times surplus. Today, the property-casualty
industry is more highly leveraged with premium writings of 2.4 times surplus
and loss reserves of 1.9 times surplus. With premiums written and loss
reserves aggregating 4.3 times statutory surplus, an underwriting loss of 24%
of premiums and a reserve deficiency of 24% of reserves in any given year
could wipe out the statutory surplus of the entire industry. Fifteen years
ago, it would have required a 60% underwriting loss and a 60% deficiency in
reserves to wipe out the industry's surplus.

The addition of capital to property-casualty companies not only satifies the
practical risk of insolvency, but also permits the company the added luxuries
of an uninterrupted flow of operations, reduces the prospect of restraints
imposed by state insurance departments, and eases relationships with other
parties, such as agents and banks, who may be concerned with the financial
solvency of the companies they are doing business with.

Rates of Return

For the ten year period, 1966-1975, return on mean equity for the property-
casualty industry ranged from a low of 6.9% to a high of 13.3%, while the
return on mean equity for the Standard & Poor's industrial stocks ranged from
a low of 10.4% to a high of 14.8%. More recently, due not only to profitable
underwriting but also to a highly leveraged ratio of premium writings and
loss reserves to statutory surplus, the stock property and casualty industry
achieved a 20.0% return on mean equity in 1977, and I project returns of
20.4% and 19.9% in 1978 and 1979, respectively. Against these measures, the
property-casualty industry appears to offer very attractive rates of return
under present operating conditions.

Availability of Capital

The market for property-casualty stocks was quite depressed at the end of
January, 1978. While the Standard & Poor, or 500 stocks, were selling at a
7.8 times price-earnings multiple, 12 major life insurance stocks averaged a
6.6 times price-earnings multiple and group of 12 major property-casualty
insurers averaged 4.0 times estimated 1978 GAAP earnings. Granted that this
represented a period of high underwriting profits, the 12 property-casualty
companies still averaged a price equal to only 5.8 times estimated 1978 net
investment income. Clearly, investor interest and availability of capital
seemed much more limited in the property-casualty industry. Why?

One may point to:

1. Regulated rates of return.
2. Reliance upon approval of rate increases by Commissioners who may
   run for political office.
3. Underwriting losses created by the lag of time between emerging
   claim experience and subsequent approvals of rate increases.
4. Resulting underwriting cycles and, in some cases, the inability to
   underwrite business at a reasonable profit margin in a favorable
   underwriting year.
5. Historically high leveraged positions with respect to both premium
   writings and loss reserves in relation to statutory surplus.

The need for capital exists, and prospective rates of return are high.
However, availabilty of capital from noninsurance investors appears limited.
Additional capital is being provided either internally or through nonequity
financing.

With underwriting losses approaching 10% of premium income for some property-
casualty companies in 1975 and 1976, several companies moved to strengthen
statutory surplus in relation to premium writings. Since outside investors
seemed unwilling to commit capital to the property-casualty industry, or
parent companies wished to retain surplus funds for investment in other
businesses, some property-casualty companies raised additional capital

through debenture offerings. The largest such bond issue was a $250 million offering by Aetna Life & Casualty, reportedly to raise funds for supporting property-casualty business.

In view of the lack of investor interest in property-casualty stocks, property-casualty companies which are the subsidiaries of holding companies have resorted to other means, in addition to bond issues, to raise capital in the present market.

In the case of multi-line insurance companies, where the parent company is paying a sizable annual dividend to stockholders, some companies have ceased using the earnings of the property-casualty subsidiaries to bring funds for dividend payments up to the parent company, and are drawing solely upon the earnings of the life insurance subsidiaries. This leaves the earnings of the property-casualty companies undistributed and free to accumulate as additional surplus in such companies, in lieu of transfer payments to the parent company for ultimate payment of shareholder dividends.

A number of property-casualty companies were acquired by noninsurance corporations in the late 1960s. At that time, many such corporations paid special one-time dividends to the parent company to transfer surplus from the property-casualty business to the other businesses or corporate needs of the parent corporation. In some cases, such dividend payments were used to reduce debts incurred in the purchase of the property-casualty subsidiaries. Recently, a reversal has been taking place. Many such companies have been making contributions to their subsidiary property-casualty companies to reduce the ratio of premium writings to surplus.

SOLVENCY MEASURES - LIFE INSURANCE

The property-casualty industry appears to have developed quantifiable relationships of premium writings to surplus and loss reserves to surplus which provide managements with some guidelines as to comfortable levels of statutory surplus to support current year's business and to support loss reserves for prior years' losses.

Neither the managements of life insurance companies, nor the commercial credit departments of major banks lending substantial funds to life insurance companies have been able to evolve such simplistic relationships of solvency measures for the life insurance industry.

Exhibit I shows the effect which a significant increase in production of permanent insurance can have upon the operating results of major, mature life insurance companies. In the case of Provident Life & Accident, we note that the ordinary life department incurred five consecutive years of statutory underwriting losses from 1965-1969 accentuated by 46% and 33% production gains in 1965 and 1969, respectively. In those years where the company experienced a ratio of new to renewal premiums of 22% or larger, operating losses were reported. When new business was curtailed in 1970, statutory profits resumed.

In the case of Aetna Life Insurance Company, statutory ordinary life earnings did not disappear, but were sharply reduced in 1973 and 1974 when new business rose to a level equal to 19% of renewal premiums.

In the example shown in Exhibit I, it can be seen that a substantial percentage increase (say 33% or more) in production of a major life insurance

company may have exerted a depressing influence upon statutory ordinary life earnings. However, investment income on capital and surplus and underwriting profits from other lines of business may be sufficient to carry a temporary bulge in new ordinary life production, and such companies are not likely to jeopardize their solvency from the production of new business.

It is more likely that external forces, such as depreciation of asset values experienced in the 1930s and 1940s, or unanticipated changes in operating expenses, lapse experience, adverse mortality experience or selection practices, are factors which could create irreversible trends in operating losses and jeopardize a company's solvency. I am pleased to say that I do not have a large number of case histories to present to you on that score.

NEW YORK INSURANCE LAWS

One state which does attempt to regulate expenses, gains in new business production, and place a limit on surplus accumulation for mutual life insurance companies is New York State. While such statutes may not have been enacted for purposes of solvency, they undoubtedly are present to prevent excesses of one sort or another.

Section 212 of the New York Law allows a company with $50 million to $100 million of insurance in force to increase its new business by a maximum of 35% in the following year, graded down to a maximum 15% increase in production for a company with more than $600 million of ordinary life insurance in force. As demonstrated in Exhibit I, a 15% limitation on the increase in new business would not seem to seriously affect an established life insurance company if its production were not already at a high level. New York State itself appears to agree that a 15% increase in production will not jeopardize the solvency of a company, as it will suspend the limit where business is being "properly and economically conducted."

Section 207 of the New York Statutes specifically excludes any stock life insurance company doing exclusively a nonparticipating business. In the case of other companies, the accumulation of surplus is limited to 10% of the company's policy reserves and policy liabilities. Presumably, insofar as mutual companies are concerned, this prevents excess accumulation of surplus, and the forced distribution of surplus in excess of 10% of policy reserves helps to maintain policyholder equity.

However, in examining stock life insurance companies, where policyholder equity is not a concern and greater weight may be given either to maintaining solvency or accumulating surplus, we find very few companies operating within a 10% limitation.

Exhibit II shows some illustrative ratios for some medium sized to larger stock life insurance companies which are publicly held, and which have modest group insurance accounts relative to an Aetna, Connecticut General, Travelers, etc.

Referring to Exhibit II, 20 companies selected at random are listed in descending order by their ratio of capital to ordinary life reserves. The lowest ranking company in the list is a relatively young company whose new business production had restricted surplus growth, putting capital at less than $2 million and forcing the company to seek a merger earlier this year. The second and third to last companies on the list, in recent years, had a restatement of statutory surplus due to transactions in the real estate and mortgage areas, reducing their capital position below previously reported positions.

The remaining 17 companies all had a ratio of capital to ordinary life reserves exceeding 10%, with many of the companies falling in the 14% to 26% range. Could these companies safely operate on a capital to reserve ratio of 15% or less?

It may be even more interesting to contrast the ordinary life premiums in these companies relative to their capital positions. If you recall my earlier remarks, the property-casualty industry is subject to an underwriting cycle, many marginal lines of business, and a heavy equity position, all of which jeopardize a company's capital position. However, the property-casualty industry operates at a ratio of premiums written to surplus of 2.4 to 1. Eight of the 20 companies shown in Exhibit II operate on a premiums to capital ratio of less than 1 to 1. Only four of the 20 companies exceed our property-casualty industry ratio 2.4 to 1.

Obviously, the same ratio cannot have the same solvency meaning for two different industries. However, if you were to ask the casual observer whether he would feel his company were more solvent as a life company or a property-casualty company with a premium writing ratio of 2.4 times capital and surplus, would he choose the lady or the tiger?

In looking at Exhibit II, do not feel that any company would jeopardize its solvency if it were to reduce capital to the point where ordinary life premiums were 2.0 times capital, but it must be remembered that premium income in a life insurance company is not the full premium paid to cover a liability. The annual premium received by a life insurance company is merely an installment premium being paid towards an ultimate liability. As it is an installment premium and not the full premium, a lower than average ratio of premiums to capital may be appropriate.

EXHIBIT I

PROVIDENT LIFE & ACCIDENT

Year	Whole Co. (mns.) B.O.Y. Surplus	Stat. Earns.	Ordinary Life				
			Whole Life & Endow. Issued	In Force	New Premiums	New to Renewal Premiums	(000's) Statutory Earnings
1965	$ 75.5	$ 4.5	+46%	+27%	+33%	34%	$(1,756)
1966	78.2	7.2	- 9%	+16%	- 1%	27%	(746)
1967	82.7	8.7	- 8%	+11%	- 6%	22%	(478)
1968	88.7	9.2	+15%	+13%	+20%	24%	(724)
1969	97.4	8.6	+33%	+17%	+27%	27%	(2,263)
1970	101.2	11.9	-17%	+ 9%	-21%	19%	690
1971	109.0	15.1	-11%	+ 6%	- 2%	17%	3,402

AETNA LIFE INSURANCE COMPANY = NONPAR DEPT.

Year	Whole Co. (mns.) B.O.Y. Surplus	Stat. Earns.	Ordinary Life				
			Whole Life & Endow. Issued	In Force	New Premiums	New to Renewal Premiums	(000's) Statutory Earnings
1971	$464	$35.1	+ 2%	+ 2%	- 3%	10%	$ 23,413
1972	467	34.6	+88%	+ 7%	+56%	14%	20,249
1973	487	36.7	+75%	+14%	+57%	19%	6,550
1974	475	23.6	+ 5%	+14%	+ 8%	19%	8,356

EXHIBIT II

PUBLICLY HELD STOCK LIFE COMPANIES

DECEMBER 31, 1976

	Capital to OL Reserves	OL Premiums to Capital
Independent Life & A	39.6%	0.9x
Equitable, VA	31.5%	0.5x
American Fidelity	26.3%	1.3x
Gulf United Corp.	25.7%	0.7x
Great Southern	22.0%	0.5x
Security-Conn.	22.4%	3.4x
Monumental	20.0%	0.6x
National Reserve	19.9%	0.5x
Kentucky Central	19.6%	1.0x
National Old Line	16.7%	1.3x
New Jersey Life	16.5%	2.5x
Equitable, Iowa	15.1%	0.7x
Transport	15.1%	3.3x
Kansas City	14.5%	0.9x
Fidelity Union	14.6%	2.0x
First United	14.0%	1.3x
Southland	10.4%	1.2x
Republic National	10.3%	1.8x
World Service	8.0%	1.6x
Empire General	5.1%	7.9x