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ALL LINES INSURANCE OPERATIONS

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1. Practical and theoretical considerations in all-lines insurance operations, including differences between direct insurance and reinsurance operations.

2. Solvency of all-lines companies, including consequences of insolvency of one line (e.g., life or casualty).

3. Financial implications of all-lines operations, including investment of assets and Federal income tax.

MR. FREDERICK W. KILBOURNE: This is to be a session to discuss all-lines insurance, including the chartering of all-lines companies, and to consider all-lines insurance operations, including differences between direct insurance and reinsurance operations. Also, we shall consider solvency of all-lines companies, including consequences of insolvency of one line, and financial implications of all-lines insurance, including investment of assets and Federal income tax. All-lines insurance narrowly defined means the combination of life and health insurance with property and liability insurance and, as a product, it has not caught on particularly as yet. We define it here a bit more broadly to include combination companies, where a great deal has been done.

From left to right, the panelists are Roy Anderson, Jim MacGinnitie, Fred Knox and Charlie Hewitt. All are Fellows of the Society of Actuaries except for Charlie. Charlie and Jim are Fellows of the Casualty Actuarial Society and Charlie is a past President of the CAS. All are vice presidents of their respective organizations which are located in Northbrook, Atlanta, St. Paul and Providence, Rhode Island. Their responsibilities extend: in Roy's case to strategic planning for Allstate; in Jim's case to casualty operations for the new firm Tillinghast, Nelson and Warren; in Fred's case to actuarial operations at St. Paul Fire and Marine Insurance Company; and in Charlie's case to actuarial, underwriting and reinsurance for Metropolitan's property and liability insurance company.

MR. W. JAMES MACGINNITIE: Our topic today is all-lines insurance operations, which contemplates a single insurance company transacting both life and casualty business, without benefit of separate companies or subsidiaries. To better understand our topic, it seems desirable to first examine some of the reasons for insurers transacting both life and casualty business. Those reasons can be categorized broadly into four principal areas of efficiency:

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1. Marketing efficiency. Use of a single agent can result in a lower cost of distributing the insurance product to the policyholder. Viewed from the other side, revenue per agent should be greater where both life and casualty coverages are being sold to the same client. It is notable that one of the most successful life insurance sales forces in the country today is State Farm's.

2. Coverage efficiency. Reduction or elimination of overlaps and gaps in coverage is facilitated where life and casualty are transacted together. This is particularly true in the medical expense and disability income area, where the overlap with worker's compensation and no-fault auto coverages is apparent.

3. Operational efficiency. Insurance company operations can be more efficient if an all-lines approach is followed. This would extend from such basics as policy issue, collections and claims, to corporate overhead items such as licensure, dealings with regulators, board meetings, contracts, etc.

4. Capital efficiency. Policyholders' surplus can provide underwriting capacity for all lines of coverage, rather than just the restricted set of life and health, or casualty alone. In this connection, it should be noted that growth of a casualty operation is not self-funding, given the traditional solidity tests of premiums to surplus on the order of three-to-one.

Improvements in efficiency are a major way for our industry to maintain its competitive advantage and to do our part to reduce the inflationary pressures of which we are so keenly aware.

History

Turning next to the history of all-lines operations, we note that the traditional form of insurance company organization in the U.S. is separate companies for life and casualty. This seems to have been largely true since the early 19th Century, by choice of the insurers. Indeed, the INA originally sold life insurance on sea captains, but decided there was no future in the life business and restricted its activities to casualty. By about 1865, New York required separate life companies, and after the Chicago fire of 1871, the NAIC (then known as the National Convention of Insurance Commissioners) recommended model legislation requiring separate life and casualty companies. This thinking was extended to require separate fire and liability companies, the theory being that fire had a conflagration hazard producing a risk of insolvency that would unduly imperil the other lines of business. In some cases regulations or laws required separate surety companies and separate worker's compensation companies.

By 1910 the Appleton Rule was in place. This rule, by the New York Commissioner of that name, stated that companies writing in New York had to follow New York rules, which included segregation of life and casualty coverages by company. So, with the exception of the two grandfathered Hartford companies, we have been essentially under the Appleton Rule since 1910 with respect to life and casualty lines.

The fire versus liability merger movement really was not able to get under way until 1950, when New York finally enacted multiple line legislation permitting a single contract to be issued for automobile insurance covering both the risks of fire and third party liability. Throughout this period, fleets of life and non-life companies operating together have grown, initially with casualty companies entering the life insurance business, then with the stock life insurance companies entering the casualty business. The holding company movement in the 1960's contributed to the combining of life and casualty companies as well as increased diversification into both ancillary related businesses and unrelated (generally unprofitable) businesses. Most recently, of course, has been the substantial entry of the large mutual life insurance companies into the casualty business.

When the jumbo jets came out, legislation was enacted permitting life insurance companies to engage in aviation reinsurance on an all-perils basis. In some states reinsurance is now permitted without restriction as to line.

We should also note that casualty companies currently provide a great deal of coverage for the same risks that life insurers cover. Health insurance, of course, can be written by either kind of company, both accidental death and dismemberment, disability, and medical expense coverages. In addition, casualty companies offer worker's compensation, which is really a specified-peril accident and sickness form. (Note that the benefits are somewhat better adapted to the need than they are in the health insurance contract where the sum is specified in advance and not adjusted depending on status of dependency or earnings at the time of death or disability.) Casualty companies also provide a great deal of liability insurance, the major portion of which is related to providing compensation to injured persons and to their survivors. I would observe that it is perhaps unevenly distributed compensation and that it is an extremely costly system to operate, but nevertheless we are talking about the same perils of death and disability. Finally, in the last several years we have the growth of automobile no-fault insurance, which has essentially transformed auto insurance into a specified-peril accident and sickness form. In some states, no-fault provides unlimited lifetime medical expense benefits without the inside limits, coinsurance provisions, and coverage restrictions that the life insurance or health insurance company is accustomed to.

Given all these corporate movements to get together and given the overlap of the perils insurers are covering, the question naturally arises as to why we insist on separate corporate entities. The NAIC identified this issue in 1974 and formed a committee to deal with model all-lines charter legislation. The industry advisory committee has been meeting regularly ever since, and has drafted model legislation which would permit all lines of insurance to be written by a single insurer. It would also permit insurers to engage directly in ancillary businesses, such as administration or investment management.

The legislation also deals with the question of alternative liquidation preferences. The problem of liquidation arises when such an all-lines company becomes insolvent, or has its capital impaired, and some priorities need to be assigned for the division of the assets. There are three major alternatives. The first provides for no preference, i.e., the company is viewed as a single entity and if it has to be liquidated, everyone will be dealt with

equally during the liquidation. In the draft legislation this alternative requires a minimum capital and surplus of twenty times the stated minimums for the lines of insurance in which the company is operating. The second alternative is a one-way preference to protect the long term life insurance reserves. (As an aside, if we want to protect the long term interests in an all-lines company, perhaps we should worry more about the medical malpractice than the deposit term.) The third alternative is to provide preferences both ways between life and casualty lines. The reserves for each line would be protected in that the assets assignable to those reserves would not be chargeable for liabilities arising out of other operations of the company. The surplus of the firm would exist for the protection of all classes of policyholders.

This model legislation has been through many drafts. It potentially could be adopted within the next year or so and then would have to wind its way through many state legislatures, which could be a very long and tedious process.

There are at least eleven states that do permit all-lines operations in one form or another today. A couple of them require what are essentially separate accounts, including separate surplus accounts, and really are all-lines in form only. The Brooke bill in the U.S. Senate, while it is clearly only in the discussion stages at the moment, leaves the all-lines question with the individual states and says that it will not override them on that particular issue.

What are the advantages and disadvantages of all-lines operations? The proponents point out that it would create additional capacity in the marketplace. It would permit the development of all-lines coverage packages, possibly including homeowners policies with decreasing term providing essentially mortgage redemption protection, and group automobile coordinated with group health, coordinated with worker's compensation, so that injuries from every cause receive reasonable and just compensation without overlaps in coverage and without double recovery encouraging malingering. Another advantage cited is the reduced number of corporate entities that are required and the potential reduction in overhead expense. That, of course, leads to the advantage of reduced regulatory burdens, freeing the regulator from keeping track of ten different companies in a fleet and allowing him to look at a single unified statement. The final and perhaps most important advantage, in terms of the economics of our business, is the increased range of coverages available to agents, presumably in more easily sold packages.

The cons to all-lines legislation include the potential impairment of life insurance reserves and of the savings represented by those life insurance reserves as a consequence of volatile casualty operating results. There is also the simple question of inertia. Changes like this are very difficult to effect if there is no strong force or compelling interest for enactment. Finally, there are some competitive considerations. Some interests are not interested in additional competitors entering their marketplace All-lines insurance is clearly designed to bring additional capacity and additional competition into several areas. In this regard, it can be observed that the Appleton Rule is perhaps in violation of the Federal antitrust laws.

In the future, I think we are going to see increasing all-lines operations whether we get enabling legislation or not. The economic pressures of providing income for our agents and of efficiently dealing with our group customers are too great to resist and will inevitably lead to greater all-lines operations. That, in turn, will lead to increasing pressures for legislation that removes some of the complications that we now have and some of the legal barriers to a true all-lines operation.

MR. CHARLES C. HEWITT, JR.: I should like to talk to you today about the way a mutual life insurer looks at the property-liability insurance business, but almost exclusively from the standpoint of financial management.

I. Differences - Life vs. Property-Liability

A. Definitions:

For the purposes of this discussion, I shall insist that life insurance and life insurance policyholders are concerned with those types of insurance which we commonly refer to as:

(1) Ordinary (individual) life
(2) Individual annuities
(3) Group annuities

You will immediately recognize these types as lines that have a substantial element of savings for the policyholders and hence a substantial amount of financial guarantee for these same policyholders. (Allow me to include claimants in with the group of policyholders since they too have a substantive interest in the solidity of the insurer with which they must deal.)

Property-liability insurance has the characteristic that the savings element for its policyholders is minimal. In fact, in many lines where premiums are paid on a monthly or quarterly basis, the policyholder has little more concern with the safety of his money than does a magazine subscriber who has prepaid a year's subscription to some expensive publication. I intend to include some types of insurance which you and the public are accustomed to thinking of as "life," for example:

(1) Term life insurance
(2) Group life and health
(3) Individual A & H

Therefore, "life" shall mean lines with a substantial savings element and "property-liability" shall refer to lines with a minimal savings element including some lines more popularly thought of as "life."

B. Affected Interests

With these matters disposed of we can look at the various interests of persons touched by the insurance business--always with particular emphasis on the element of financial management.

Life insurance policyholders, because of the principle of savings that is introduced into their product, may be thought of as having an historical interest in the financial management of a particular company. Policyholders who purchased life insurance (including annuities) forty or fifty years ago may no longer be paying premiums, but are still just as clearly customers of a life insurer as bank depositors, who have not made a deposit or withdrawal in years, are customers of a bank. This historical interest is clearly so important that life insurers who have been in business many years talk frequently about "generations" of policyholders -- not only with respect to protecting the solvency of their contractual rights, but with respect to such niceties as rates of interest earned on monies deposited at different points in time and even mortality experience or expense allocations which may differ with the passing of the years. In mutual and participating life insurance companies, a very important part of actuarial work is concerned with the "dividend formula" -- a device which, at least in part, recognizes differences among such "generations" of policyholders.

Such policyholders might be termed "active" since their contractual rights have not matured. But there is another group of life policyholders with a more immediate expectation -- that their contractual rights have matured or are about to mature. Once again I will take the broad view and include beneficiaries with the group of policyholders, since here their interests are similar. It is a tribute to the solidity of the institution of life insurance that this group of "current claimants" seldom needs to pause or worry about the solidity of the company from which they expect to collect.

Mention of a "current" interest in fiscal stability leads naturally into a recognition that the basic concern of property-liability policyholders is not historic -- but almost totally current. There is only one generation of policyholders in property-liability insurance -- the current generation. Like the life policyholders with maturing contractual rights, they really care only that they can collect on an obligation now becoming due or on an obligation that will come due on a contingency basis within the very near future (one year or less - although in liability claims the period may be extended to five, six or seven years).

In summary, we must deal with "generations" of policyholders on life insurance, including the present generation, while in property-liability insurance we deal only with the present generation (including claimants and their representatives).

C. Solidity

The concern of both past and present generations of policyholders in life insurance and the present generation in property-liability insurance that financial expectations be realized deals with the financial management of insurers, or to use another term -- with the solidity of the insurers. I am indebted to Professor Spencer Kimball for a concise expression of six factors which should go toward the determination of solidity for any type of insurance company.

As Professor Kimball points out, too often great emphasis is placed upon the first of these factors (surplus) when any one or more of the other factors may also be essential to measuring the solidity of an insurer. Discussing these factors individually and in turn --

1. Surplus (cushion) - a margin by which an insurer protects itself and hence its policyholders against the three important threats of the insurance business:

   (a) Possible errors in measuring past performance. In property-liability insurance this most often means underreserving for losses already incurred but not yet disposed of. Many insurance company failures have been attributed to this problem. The life insurance business seems to be generally free from this worry.

   (b) Possible errors in measuring future performance. The life insurance business certainly has this problem "in spades." Underestimating the possible adverse effects of mortality, interest income and/or expenses is a contingency with which you gentlemen live every day and the realization of which none of you may outlive. I shall deal with one of your methods of meeting this problem in a few moments when discussing redundancy of rates. Suffice it to remind ourselves here that conservative bases for reserving "active lives" are a way of rebutting the threat of future adverse experience.

   In property-liability insurance, however, the "sins of the fathers" cannot wait to be "visited upon the sons." Unless one changes jobs within a company or changes companies, the "sins" of failing to measure future loss and expense experience correctly become apparent rather quickly in most instances. Unless one is good at shifting the blame to underwriters, claims men or even rate supervisory officials, "mea culpa, mea culpa" is a way-of-life in the property-liability business.

   (c) Variability of asset values. Once again there is a clear distinction between the two branches of the insurance business. Because life insurers generally choose to protect the interests of past generations of policyholders by investing in fixed-income securities, there is, normally, no great worry over changing asset values. Although I hasten to state that I am not unaware of something called a Mandatory Securities Valuation Reserve.

   Many property-liability insurers have historically taken the conscious or subconscious positions that they do not have to make an underwriting profit but can live with the income from investments. In many cases these investments

have a much stronger element of risk than is found in the life insurance business. I am talking about substantial portfolios of common stocks which in times of a "down-market" can cause embarrassment to the surplus position of a property-liability insurer and even affect its ability to write an increasing volume of premiums.

2. Reinsurance arrangements - Depending upon size, surplus (cushion) and risks assumed through underwriting, the solidity of any insurer must be measured in part by the adequacy of the guarantees contained in its reinsurance arrangements.

3. Redundancy of rate structure - Life insurance with its guarantee of rates over long periods of time absolutely must leave a margin for conservativeness when making rates. Those life insurers who expect and hope to pay a dividend may then pass along any realized gain - at least in part - to policyholders. This process almost makes these same policyholders partners with the insurer in hoping for the stability which will produce the anticipated saving from which dividends will then be paid.

   In property-liability the insurer normally reserves the right to change rates at frequent intervals. Some very important companies in the automobile insurance business write six-month policies and upon occasions change rates at each successive renewal. Also implicit -- at least at one time -- in the property-liability insurance business was the right to cancel or non-renew policies. These temporal ingredients in the property-liability contracts have, along with double-digit inflation and the intervention of socio-political forces, produced a strange and unfortunate brew of inadequate rate levels, high loss ratios, underwriting losses, and inability to provide insurance for all who desire or are in need of such insurance. In my lifetime some mutual property-liability insurers paid dividends of 15 percent regularly and one company for which I worked paid as high as 40 percent dividends. Today casualty actuaries do not know the meaning of the word "redundant" as it applies to most important lines of property-liability insurance.

4. Experience and competency of management - At one time there were almost two thousand property and liability insurance companies. Admittedly many of these were part of groups of insurers which shared the same management talent. Even so, it would be foolish to believe that so much good management talent was to be found in the insurance business.

   Notice, when you take down a volume of BEST'S REPORTS for the property-liability business, how much emphasis is placed on the experience and competency of the persons who run a particular company or group of companies. BEST'S knows from many years of analyzing results that it is impossible to overestimate the value of good, sound management.

As for the life business, I am sure your assessment of the solidity of those insurers is weighted heavily by the abilities of their management.

5. Marketing structure - Is a company so organized and located from a marketing and sales management standpoint to take advantage of future market opportunities or is it so structured as to be disadvantaged by current and future conditions?

   (a) How sound would the Buggy-Whip Manufacturers Mutual have been in 1925?

   (b) How sound are insurers whose sole line is accident and health insurance in the face of the threat of National Health Insurance?

   (c) How sound is an auto insurer writing exclusively in New Jersey?

   By now I hope I have made my point and have not worried anyone too much. Marketing structure is an important factor but not the only factor in determining solidity.

6. Sponsorship as a source of additional surplus - Those of us who work for offshoot companies with large life insurers as sponsors are well aware of the ease with which such sponsorship provides acceptance at almost any level of the community -- regulatory and competitive -- and with customers and claimants, too.

D. Measuring Solidity

Unfortunately as Professor Kimball reminds there are no good measures of solidity for all-lines insurance. In life insurance there are means of evaluating companies by applying certain reserve standards for the active lives and there are measurements of the worth of an inforce book and of an agency plant. In a clear sense these valuations contain expressions of solidity (or lack of it) for a particular life insurer. The property-liability insurance business limps along with the antiquated thought that premiums ought to be no more than a multiple of surplus to policyholders -- two to one or three to one are often used.

But who among you has an adequate measurement for the solidity of an all-lines insurer? How do you measure the exposure of the assets of the life side of the business to assessments for insolvency or guarantee funds found in the property-liability business? How do you offset variation in demands for cash surrender values against the variability of the property-liability underwriting results? How do you merge surplus fluctuations in the property-liability business resulting from a down-market with the surplus drain, albeit statutory, upon the surplus of a life insurer who adds a large volume of group annuity business in a particular time period?

Professor Kimball suggests that an answer to these questions may be near at hand with the advent of the Theory of Risk developed in Europe and actually applied in Finland. This theory plus the assistance of high-speed computers may be an impending answer to some of these problems of measuring solidity. Let us hope so!

E. Conclusion

Recent results in the United Kingdom foretell the answer to the underlying question posed here. All-lines insurance has existed in the U.K. and in the rest of Free Europe for many years. Yet persons analyzing recent insurance company failures in the U.K. have suggested that certain assets representing policyholder long term funds be segregated against the vicissitudes of other portions of an all-lines insurance business. Life insurers compete with other financial institutions for savings dollars from the insurance buying public. Can life insurers afford not being able to offer essentially the same guarantees of security of funds that these other institutions can provide? My answer to that question is "No!"

II. "Facts-of-Life" in Multiple-Line Insurance

If I have not painted too black a picture of the property-liability situation, permit me to suggest quickly that there are reasons for mutual life insurers to go into the property-liability market. To name a few:

(1) Limited capacity among property-liability insurers

(2) Total marketing effort must be supported by additional dollars of income for sales representatives and sales managers

(3) Imminence of some form of "pure group" auto and homeowners insurance

(4) Imminence of some form of National Health Insurance.

And, I hope not too facetiously, the prospect of a successful investment opportunity, if one takes the long term view.

III. Financial Management Problems in Multiple-Line

Mutual life insurers operating in New York and New Jersey have certain legal restrictions with respect to the amount that they may invest in property and liability insurance subsidiaries. In New Jersey there is a limit of 5% of assets which may be increased to 10% with the approval of the supervisory authority. In New York there is a similar limit of 5% of assets, but there is also the restriction that if 50% of surplus is less than 5% of assets, then the 50% of surplus limit is applied.

Furthermore, there is an "inside" limit in New York with respect to the amount that may be invested in any one subsidiary--it is 1% of assets.

To illustrate, if we assume a mythical life insurer with assets of $35 billion and surplus of $1.20 billion, the New Jersey insurer could invest up to $1.75 billion, whereas the New York insurer could only invest $600 million. Furthermore, the New York insurer could only put $350 million in any one property and liability insurance subsidiary.

The amount invested may not be replenished from an outside source. In other words, if the subsidiary loses money, the limit of investment may not be increased by the amount of this loss. This places an important restriction because, in all real life situations today, the large life insurers have had heavy start up costs and initial adverse underwriting results which have resulted in substantial depletion of the initial surplus contribution from the parent.

If we were to assume that a ratio of premiums written to surplus of 3 to 1 were permissible, then a single subsidiary of a New York life insurer with $350 million of surplus could write up to slightly in excess of $1 billion of premium if there were to be no surplus loss. Such volume would make it about the tenth largest property and liability insurer in the United States today. On the other hand, substantial underwriting losses not offset by investment income would reduce surplus and hence the ability of this subsidiary to write additional volume.

MR. FREDERICK J. KNOX: I would like to discuss portfolio theory application to corporate strategy and planning in an all-lines insurance operation.

Most companies have a limited capacity for growth not only in terms of capital and surplus, but in qualified personnel. A company that markets many different products or lines of insurance must choose the best combination, or mix of business, to most likely achieve the company's long range objectives. These objectives normally include optimum long term growth and surplus accumulation. Even in a mutual company, surplus accumulation is necessary to provide the basis for additional growth. Good management would imply some logical plan of growth by line of business considering the different expected returns and risks for each line of insurance. In addition, the investment risk cannot be ignored. Investment income is a significant but risky source of surplus growth or depletion. The stock market catastrophe of 1974 proved the hazard of the investment element.

For most companies uncontrolled growth does not pose a solvency problem, but it can impair their surplus capacity.

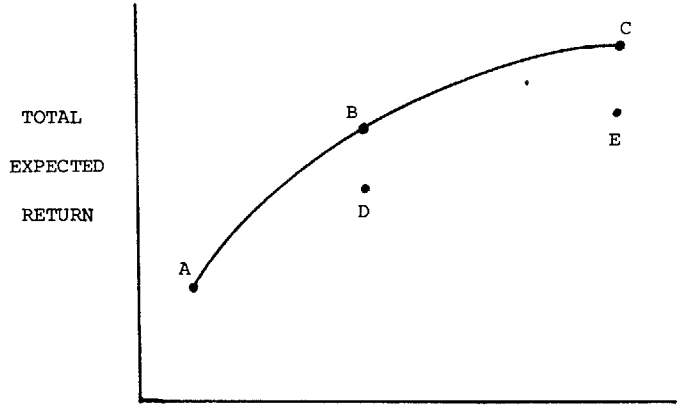
There are various methods to measure impaired surplus such as the traditional premium-to-surplus ratio or loss-reserves-to-surplus ratio. When these ratios exceed a predetermined critical value, surplus is assumed to be impaired. When the company's surplus becomes impaired, its ability to grow is restricted. Some factors that affect the likelihood of impaired surplus are: (a) large increases in new business, (b) a large premium-to-surplus ratio, (c) risky investment portfolio, (d) poor insurance product line mix, (e) high risk associated with certain loss reserves, and (f) poor management.

How would a company determine an appropriate mix of business and investment portfolio so as to optimize its profits and growth and to minimize the likelihood of impairing its surplus? That seems like an impossible task. One answer may lie in a technique developed by Harry Markowitz called "Portfolio Selection Theory" which is a means of selecting an efficient investment portfolio. This investment portfolio theory recognizes the fact that high yielding investments tend to be relatively risky and that diversification of an investment portfolio can be used to reduce risk. By applying this portfolio concept to insurance it is possible to determine the product line mix and investment portfolio composition that will maximize expected return to the stockholder at an acceptable level of risk.

In applying portfolio theory to insurance, an insurance product line is analogous to an investment component, or security, within a portfolio. The expected income, plus appreciation, of an investment component equals the expected or forecasted underwriting profit plus the present value of the investment return for the expected cash flow of a line of insurance. In addition, the uncertainty of investment income, plus appreciation, is equal to the uncertainty of the underwriting profits plus the uncertainty in the present value of the investment return. These uncertainties measure the risk (which for this purpose is the standard deviation of total profit).

The theory uses the notion of an "efficient frontier" of investment portfolios or for insurance purposes product line mixes. A product line mix would be on the efficient frontier if there is no other product line mix with higher expected return and no higher risk, or if there is no other product line mix with lower risk and no lower return. Conversely, if a product line mix is not on the efficient frontier, then another product line mix can be found which has either higher expected return or lower risk. An example of the efficient frontier is shown in the figure below.

EFFICIENT FRONTIER OF PRODUCT LINE MIXES



A, B, C are on the efficient frontier, D and E are not.

To apply this concept, the optimum product line mix for a selected investment portfolio composition (e.g., an x% investment in bonds and a (100 - X)% investment in stocks) is first determined. The expected value and variance of both underwriting profit and present value of investment return are calculated for each product line for the specific investment portfolio. Then the efficient frontier of the product line mix is determined by an optimization routine.

The optimization routine only examines product line mixes that satisfy management specified constraints. For example, suppose that a company feels that they needed to produce a minimum volume of personal lines business in order to attract a more desirable larger volume of commercial line business. Therefore, the user would specify a minimum constraint of X% of premium for personal lines insurances. Another example would be a company that sets an upper limit on highly profitable lines of business to avoid growth too rapid for existing qualified personnel to handle.

These constraints are designed to limit the set of product line mixes to those that actually can occur in practice or would be feasible. Such constraints arise due to the need to maintain agency relationships, unwillingness to drop certain product lines even if short term losses may occur, etc.

Thus far, we have been dealing with assumptions on a present value basis. However, impaired surplus is measured by calendar year accounting methods. Therefore, it is necessary to translate various choices on the efficient frontier into a series of calendar year results so as to determine the effect on current operations and surplus. For each point on the efficient frontier the probability of impaired surplus is computed. Based on the expected value and variance for the underwriting profit and investment income for each line plus the total premium volume, the expected value and variance of the change in surplus is computed. This is used to determine the likelihood that the premium-to-surplus ratio would exceed a predetermined critical value. Adjustments for other corporate activities and estimated effects for old business must be reflected in the estimated surplus change to obtain a completed picture. A second efficient frontier can now be constructed showing the relationship between the present value of total return (investment plus underwriting) and probability of impaired surplus.

Finally, a point on the efficient frontier is specified by selection of an acceptable level of risk or expected return. Then by examining a number of different investment portfolio compositions, the optimum product line mix and investment portfolio composition can be determined.

There are obviously some tradeoffs in these calculations. How important are current calendar year results versus larger present value of total return over the long run? Do we accept a greater risk of impairing surplus for a greater potential total return over time?

There are several implications in this analysis.

1. Diversification tends to reduce risk at a given level of expected return.

2. Investment income is relevant in selecting the optimal mix of business.

3. Impaired surplus measurements influence the optimal mix of business and investment strategy.

4. In a large multi-line insurance company, the degree to which underwriting profit from different lines tends to covary is the principal determinant of non-investment risk.

In summary, portfolio theory can be used to determine the investment portfolio composition and product line mix that maximizes expected return at a given level of risk or to minimize risk at a given level of expected return.

Portfolio theory is only a tool and like any other tool it is usually a means to an end and not an end in itself. There are many variables and complications in an all-lines insurance operation and any analytical tool can only be used to better understand the effects of different alternatives. Management must examine all practical alternatives and ultimately make the final decisions.

Technical Note:

The efficient frontier is generated by solving the following model equations for several values of R. This is a quadratic programming problem (see "Nonlinear and Dynamic Programming" by G. Hadley, 1964)

$$\text{Minimize } \sigma^2 = \sum_{i=1}^{j} \sum_{j=1}^{n} f_i \cdot f_j \left(S_{ij} + V_{ij} \right)$$

$$\text{Subject to: } {}_{o}f_i \leq f_i \leq {}^{o}f_i$$

$$\sum_{i=1}^{n} f_i \left(r_i + R_i \right) \geq E$$

Where:

r_i = forecasted underwriting profit per premium dollar, line i (r_i = 1 - combined ratio)

R_i = present value of investment return per premium dollar, line i (depends on loss payout distribution, discount rate, and expected investment yield)

S_{ij} = covariance matrix of underwriting profit per premium dollar

V_{ij} = covariance matrix of present value of investment return, line i

f_i = fraction of premium volume generated by line i (output of model)

$_{o}f_{i}, {}^{o}f_{i}$ = minimum and maximum values of f

n = number of product lines in model

E = minimum required return per premium dollar

MR. ROY R. ANDERSON: Each of the preceding panelists has discussed various problems of the insurance business from the perspective of the corporate planner. In contrast, my remarks will be from the perspective of the strategic planner. I will explain in a few moments the difference between the two.

At yesterday's meeting, reference was made to an author who had begun his actuarial paper with a quotation from poetry. I will begin with an attempt to quote from Dickens' A Tale of Two Cities: "It was the best of times, it was the worst of times. . .it was the spring of hope, it was the winter of despair."

You will recall that Dickens used those words to describe conditions at the time of the French Revolution -- a time when Western civilization was in an historic transition from an agrarian society to what became known as an industrial society.

Dickens' words are equally appropriate today -- because our civilization is now undergoing another such period of transition -- and perhaps one of even greater magnitude. We have already left the Western industrial society. Our values, our beliefs and our major institutions are now undergoing dramatic and fundamental changes. They are experiencing the discontinuities that Peter Drucker told us about -- and we are feeling the traumatic, psychic shocks of which Toffler warned us.

The speaker at this meeting of our Society who most directly spoke about these issues was Dean Rusk during his luncheon address. He referred to the crises that now confront the nations of the world: the danger of nuclear war -- the population explosion -- the energy crisis. These are among the global problems that the Club of Rome has described as the "world problematique."

If we are to understand the major challenges that will confront our various lines of insurance in the years ahead, we must first understand the impact that the foregoing global problems are going to have on the society and the economies of the United States and Canada. Once you understand the scope of these problems, you will come to the realization that the rest of the nations of the world are not going to permit our two countries -- representing about 8% of the world's population -- to continue to squander one-third to 40% of the world resources that are consumed each year. They will not allow us to continue our affluent and wasteful style of living. We will have to gear down to a more frugal way of life. In simple terms, in the years ahead, we will have a decreasing "pie" of goods to allocate among the people of our two countries.

At the same time that we must undertake this challenge of being more sparing in our use of natural resources, our myriad systems of compensation will continue to issue forth an ever increasing number of dollars with which to purchase that decreasing amount of goods. For me, this leads to the inevitable conclusion that one of the major factors that will challenge the operations of all of our lines of insurance as we move into the future will be a chronic, heavy rate of inflation. Needless to say, heavy inflation will also be one of the major challenges of the political leaders -- and for the people of our nation themselves. Yesterday, Dean Rusk said that the forthcoming energy program that will be announced by President Carter may prove to be the first real test of the will and fiber of our people. It may well be our first taste of a new way of life.

There was another speaker at yesterday's session who touched on issues of the nature of strategic planning: Bob Houser of the Bankers Life. He mentioned that the reports of the TAP Program are circulated and discussed among all of the senior officers of his company -- and that periodically the senior officers of his company meet at three-day retreats during which they study the major developments of our society in broad perspective. As Bob explained, they search for clues as to the long range future of the insurance business by asking themselves a series of questions in the nature of "what if?"

Bob Houser was describing a procedure that differs greatly from the traditional approach of corporate planning. In my view, what corporate planning has come to mean is a process whereby the events of the past and present are analyzed for trends -- and then these trends are projected into the future. Such a project may be made by use of graphs -- or by economic models run on a computer -- or similar means. But this kind of planning for the future does not really contemplate the possibility of discontinuous changes in any of our systems. It does not anticipate real shocks.

Strategic planning, in contrast, analyzes the events that are occurring -- and tries to find clues that foretell the possibility of major systemic changes in our systems. In the extreme, it might even contemplate the complete breakdown of one of the systems -- or subsystems. The future for some of our lines of insurance has the possibility of such systemic breakdowns.

I will illustrate the concepts of strategic planning by discussing each of the four major multiple lines: Property, Casualty, Life and Health.

As to Property Insurance, I believe that economic inflation will prove to be the most important factor. A major characteristic of the Property business is that it must deal with two "cottage" industries in the administration of claims, the garage repair business and the home repair business. These repair businesses tend to be small outfits, over which neither the insurance companies nor the state and Federal agencies have much effective control over the prices they choose to charge. The cottage industries are much more able to reflect an increase in their prices than is the remainder of

society. As our economy encounters chronic inflation in the future, whatever proves to be the rate of inflation for the over-all economy, the inflation rate for the costs of property insurance will be higher. Ultimately, I foresee the possibility of the breakdown of the present, packaged homeowners and businessowners policies -- as the property insurance companies face the need to more nearly tailor their product to the loss potential of individual risks.

As for the casualty line, the days of the tort liability system are now numbered. Society will not continue to endure the costs of what the legal profession has been doing to this sytem. Currently, these problems are now being addressed in Washington -- and in most of the states -- on a piecemeal basis -- that is, separately for auto liability, medical malpractice liability, product liability, and so forth. This piecemeal approach is not going to work. The tort liability system must now be reviewed in its broadest context -- including the burgeoning problems of class action suits and punitive damages. Fortunately, this approach is now being taken out in California by the California Commission On Tort Reform. Ultimately, the answer will have to be the virtual elimination of the present tort liability system.

But, if we eliminate the tort liability system, then it would have to be replaced by some form of system of compensation. However, in order to do this, that system would have to dovetail with all of the myriad systems of compensation that are already in place -- including Social Security. This gives rise to still another major project that we have yet to undertake: the cataloging of all such systems of compensation. A full description of that project is beyond the scope of today's discussion.

With respect to problems of a strategic nature as far as the life insurance business is concerned, I will refer you to the excellent discussions that were presented yesterday by Jim Anderson and Jack Moorhead during their debate on the future of the life insurance business. I will add one comment: most of the problems that they described have been created or brought into focus by the impact of economic inflation. For example, if we were to come to the judgment that future annual rates of inflation are going to be on the order of 5% or more, we are then confronted with questions with respect to the viability of the whole life policy and the appropriateness of net cost comparisons for a period as long as 20 years.

Now we come to the health insurance line -- and it is here that I believe we have the greatest need to view the challenges of this business with the concept of strategic planning. With respect to the disability income coverages, the evidence is already before us that the disability income portion of OASDI is having a crushing effect -- in two ways. First, it has virtually eliminated the market for all but those in the higher income brackets. Second, the lack of adequate controls in the handling of claims under DI will progressively undermine the morbidity experience of the various forms of private insurance coverages. These coverages have already suffered a "future shock."

With respect to the various forms of medical care coverages, we have been viewing our problems from the wrong perspective. We have been assuming that solutions can be found within the context of the present system of health insurance -- and within the context of the present system of medical care.

For some time now we have been asking ourselves the wrong questions. As recently as a year or two ago, the conventional wisdom was that some form of national health insurance would be enacted within the very near future. Almost all of the debate was with respect to the type of national health that would be enacted -- and, of particular interest to our business, the role that the insurance business would have in such a program. But, by the end of 1974 it should have been apparent to us that the future rate of inflation in the costs of medical care would make impractical the enactment of national health insurance until we faced up to the need to control costs.

As of today, the issue of national health insurance has drifted into the background -- and the question now being asked is how to control costs. But, it would appear that we are still asking ourselves the wrong question. A simple, straightforward analysis of the present system of financing medical care should make it clear that there can be no effective means of controlling the increase in medical care costs. There is now recognition of the role that third party payors -- both private and governmental systems -- have had on inducing higher medical care costs. But as we try to devise means of controlling these costs, we should also recognize that the key decision as to the quality and quantity of care that will be afforded a patient is being made by the doctor and by his sick patient under circumstances where neither is in the least concerned about the costs of that specific treatment. Further, in the last few years, another character has been added to the scene: the plaintiff's lawyer who waits in the wings to sue on his client's behalf if he has not received the best possible care.

I am very much afraid that all of the efforts that are now being expended in developing planning agencies -- in hospital budget reviews -- in PSRO's -- in peer review panels -- etc., etc., will only help in dampening the rate of inflation in medical care costs -- but that their effect will be limited. They will not solve the basic problem -- because the present system of financing medical care is systemically flawed.

If we are to ask ourselves the right questions as to what is wrong with our present system of health care and health insurance, we must first recognize that we do not have a system of health care. Instead, we have a system of sickness care. It is a system that has become increasingly specialized and increasingly expensive -- to the point where, in some areas of the country, it has priced itself beyond reason.

The kinds of questions we should be asking ourselves about the health insurance business are: how best we can reeducate ourselves as to the nature of health - and how the state of health is best achieved -- and what role we, as individuals, should play in maintaining our state of health. Ultimately, society must determine what should be the proper role of the medical profession in all of this. And, finally, society must determine what method should be used to finance a system of holistic health care -- and the role that the insurance business should play in that financing.

The foregoing is a broad subject that goes well beyond the scope of today's discussion. For the purpose of today's discussion, I will only say that, in my judgment, neither the present system of medical care nor the present system of medical care financing will continue in their present structure for another 5 years without major dislocations. This leads to a series of strategic questions in the nature of "what if?" -- as Bob Houser mentioned yesterday.

I will close with the observation that the thoughts that emerge during the process of strategic planning are often viewed in the nature of "bad news" by many. Very few people ever welcome change -- and especially a change that portends a discontinuity in the system to which they have become accustomed. However, I would also observe that if such a change is in the offing, those who recognize it and plan for it are those who are most likely to prosper from it. I began with a quotation from literature -- and I will end with another one -- this one from Shakespeare: "There is a tide in the affairs of men, which, taken at the flood, leads on to fortune; omitted, all the voyage of their life are bound in shallows and in miseries."

For us in the insurance business, there is more than one flood tide in our future. Some such tides, in fact, are already within our vision.

MR. ROBERT J. JOHANSEN: I have been attending a number of meetings of the NAIC Industry Advisory Committee on All Lines Charters. The answer to the question of whether an All Lines Bill will get through the NAIC in December 1977 or December 1978 depends on whom you talk to. There are still some knotty problems to be settled, including how to handle or, hopefully, avoid an insolvency (many of us are worried about that aspect).

Frankly, more people should be concerned because an all-lines insolvency could have a widespread financial effect on many companies, considering that some 47 states have insolvency funds for casualty companies and 17 states have insolvency funds for life companies, with bills in state legislatures this year in several more states, including some big ones. If we assume that at some point in time all-lines companies start proliferating and a few of them go under, we could find that life insurance companies that had no intention of becoming involved in the all-lines business will suddenly be involved in paying claims through guaranty funds. This should concern us and more actuaries should become involved in some of these questions on all-lines.

Risk theory would indicate that for different kinds of risks, particularly those that do not necessarily covary the more you can bring one risk-pooling mechanism the better off you should be. On the other hand, we have in the all-lines situation a mix of insureds with very different interests. Consider an individual with automobile insurance, who, if his company goes under and assuming he is not involved in a claim, can just go across the street and pick up another policy - no big problem. The life insurance policyholder, however, may have a paid-up life policy which represents a sizeable part of his assets. Or, he may have a term policy with no cash value but he has been given six months to live. There is no way in which he can replace that coverage. So we have to look at the effects on both classes of insureds and this is not an easy problem to solve satisfactorily.

We also must face the possibility of political problems. Some states today do not require very large amounts of capital and surplus to start an insurance company. I am not sure that if we say that no company can do an all-lines business unless it has $10 billion of assets, $1 billion or $10 million, or whatever, somebody will not want a smaller limit - and get it. Realistically, we cannot rely for security solely on limits of minimum capital and surplus. I think we have to look seriously to internal mechanisms to protect the policyholder who would be grievously hurt by an insolvency. However, we cannot go to extremes and have a complete walling off so that an all-lines company can go broke in pieces. Rather all surplus should support all lines - if capital and surplus are depleted by severe losses in any one line, the entire company is insolvent. Any legislation must include protection for the long term policyholder. I think too that any such legislation must also take into consideration how an insolvency is to be handled by guaranty funds. This could be a difficult problem.

All-lines is a concept that has something going for it, but there are problems that still must be solved and I think there is far from unanimous support (even within the Industry Advisory Committee) today for any one of these diametrically opposed systems of providing protection to policyholders.

The question that was just asked as to whether all-lines would be voluntary or involuntary raises an interesting point. I strongly believe that entry of any company into an additional line of business should be voluntary. However, suppose a company would be permitted under various state laws to write all lines but did not choose to do so? Then it should not be forced into a pool or joint underwriting association merely because it is permitted to write those lines. That this could be a problem of no small dimensions seems evident from current efforts of several states - with life companies drawn into medical malpractice pools on the basis of health premiums written or even on life premiums - even in the absence of all-lines authority. Any all-lines legislation should provide that a company which chooses not to write particular lines of business cannot be forced to do so by requiring its participation in a joint underwriting association or similar pool.