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ABSTRACT

This report on the profitability of the property/casualty insurance industry and in particular of the medical malpractice insurance line was prepared at the request of Representatives Henry A. Waxman and James J. Florio and Senators Paul Simon, Daniel K. Inouye, Albert Gore, Jr., and Jay D. Rockefeller. Four different estimates of medical malpractice and general liability profitability are provided using different assumptions about reserve adequacies and discounting. These estimates show that over the 11-year period from 1975 to 1985 the medical malpractice line incurred losses when the reserves were valued at their full estimated payout, but was profitable when the reserves were discounted to present values. It was further found that the general liability line was profitable over this 11-year period under all but one of the estimating assumptions. In that estimate, it was assumed that the reserves were not discounted to present values and that they were 20 percent deficient. The report concludes that despite incurring substantial underwriting losses over the period from 1976 through 1985 the property/casualty insurance industry has more than offset those aggregate losses with investment gains. The report estimates the industry had an \$81 billion profit during this period but notes that the industry estimates profit at \$54 billion. An explanation of scope and methodology, data tables, and a glossary are appended.

(ABL)

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INSURANCE

Profitability of the Medical Malpractice and General Liability Lines



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General Government Division

B-220675

July 13, 1987

The Honorable Henry A. Waxman
Chairman, Subcommittee on Health
and the Environment
Committee on Energy and Commerce
House of Representatives

The Honorable James J. Florio
Chairman, Subcommittee on Commerce,
Consumer Protection, and Competitiveness
Committee on Energy and Commerce
House of Representatives

The Honorable Paul Simon
United States Senate

The Honorable Daniel K. Inouye
United States Senate

The Honorable Albert Gore, Jr.
United States Senate

The Honorable Jay D. Rockefeller
United States Senate

On May 27, 1986, you requested that we provide you with information relating to the affordability and availability of commercial liability insurance. Part of your request dealt with information on the profitability of the property/casualty insurance industry and in particular on the profitability of the medical malpractice insurance line. In a subsequent discussion with your offices, we agreed to estimate the profitability of the property/casualty insurance industry, concentrating on the medical malpractice and general liability insurance lines. We also agreed that other parts of your request would be addressed in separate studies.

Profitability in the insurance industry is determined by combining both underwriting results and investment results. Despite incurring substantial underwriting losses over the 10-year period 1976 through 1985, the property/casualty insurance industry has more than offset those aggregate losses with investment gains. The underwriting losses resulted, in part, from the industry's "cash flow underwriting" pricing strategy in which companies sacrificed underwriting gains in an attempt to attract more business and thereby enhance investment gains. We estimate that

the industry had about \$81 billion in after-tax income over this period. We estimated the industry's profitability over this period rather than concentrating our analysis on the last few years because the industry is subject to underwriting profit and loss cycles. Therefore, data covering longer periods provide better perspective on the industry's profitability.

The industry disagrees with our 10 year profitability estimate of \$81 billion—its method of calculation would show \$54 billion. Even the lower estimate by the industry shows that the industry's average rate of return on net worth has not been out of line with those of other industries. We believe that the industry's reported rates of return are conservative since they are based on reserves that have not been discounted, i.e., their reserves do not reflect the present value of claims that are estimated to be payable in the future. Furthermore, we believe that the relatively low rates of return earned in recent years are not necessarily indicators of serious longer term problems in the industry. Indeed, the industry reported substantial earnings improvement in 1986.

Profitability estimates for the medical malpractice and general liability lines depend primarily on the adequacy of the reserves for future payment of claims (losses) and whether those reserves are discounted to reflect their present values. These reserves, which are an expense of operation, are of necessity actuarial estimates of losses that are expected to be paid out in the future. Furthermore, these reserves are adjusted periodically to take account of claim and loss expense estimates that may differ from earlier estimates. Thus, measures of profitability in any given year may understate or overstate the ultimate results of an insurance operation.

Of additional importance, by industry accounting standards and as required by state regulators, reserves are frequently booked as expenses at the full value of expected future loss payouts despite the fact that only the present value of the reserve invested at interest need be set aside to meet expected future claims settlements. For example, if a claim will cost \$100 in 10 years, should a \$100 reserve be immediately established for that claim or should a reserve of a lesser amount—a discounted amount—be established that, when invested over the 10-year period, will yield \$100?

We have recommended in the past¹ that for tax purposes reserves be set aside on a "discounted" basis because, in reality, this amount invested at interest will be sufficient to meet expected future losses as long as expectations do not materially change. In its consideration of the Tax Reform Act of 1986, Congress agreed with our recommendation and required insurers to discount their reserves for tax purposes.

In this report we present four different estimates of medical malpractice and general liability profitability using different assumptions about reserve adequacies and discounting. Essentially, those estimates show that over the 11-year period 1975 to 1985 the medical malpractice line incurred losses when the reserves were valued at their full estimated payout but was profitable when the reserves were discounted to present values. The general liability line was profitable over this 11-year period under all but one of our estimating assumptions. In that estimate we assumed that the reserves were not discounted to present values and that they were 20-percent deficient.

Objective, Scope, and Methodology

Our objective was to estimate the profitability of the property/casualty insurance industry, concentrating on the medical malpractice and general liability insurance lines. To do this, we used publicly available data reported by the A.M. Best Company on premiums, losses, and expenses. We used Best's data because it is the only aggregated data base readily available for making such estimates. Best gathers its data from the annual financial statements the insurance companies file with state regulators. We did not test the accuracy or adequacy of the data reported by the companies or by Best. The data reported by Best do not cover the entire industry. Among those not included in the Best data are (1) joint underwriting associations, (2) a small portion of physician-owned insurance companies, (3) reinsurers, (4) small commercial insurers, and (5) self-insurance mechanisms. Because our analyses are based on aggregated industry data, the operational and investment experience of individual companies could well vary.

Because Best does not allocate all investment income and gains by insurance line, we had to estimate the investment results for these lines. Our estimates were derived by calculating net cash flow after federal income taxes and by assuming that the net cash flow amounts were invested in a representative investment vehicle, i.e., 10-year Treasury securities.

¹Congress Should Consider Changing Federal Income Taxation Of The Property/Casualty Insurance Industry (GAO/GGD-85-10, March 25, 1985).

Treasury securities were selected because they are virtually risk free, and because claims in the medical malpractice and general liability lines, in many cases, are not settled for 10 years or longer after the premiums are written. Furthermore, we assumed that the securities were held until maturity, and therefore our investment income estimates do not incorporate either capital gains or losses.

For our purposes, the after-tax cash flow was the amount assumed to be available for investment in the following year. The amount of investment income produced by the after-tax cash flow would depend on how those funds were invested and the return they generated. Each year's estimated investment income then became a component of cash flow for that year. Furthermore, since we assumed that each year's net cash flow was invested in 10-year securities, the total estimated interest earned annually was an accumulation of the interest earned on all prior years' net cash flows.

Annual earnings are the excess of after-tax cash flow over the amounts the reserves are changed annually (reserve at the end of the year less the reserve at the beginning of the year). Annual earnings depend on the adequacy of the reserve established and whether a reserve equivalent to all expected claim payments or a discounted reserve is established.

We should also note that medical malpractice insurers are not a homogeneous group. Medical malpractice insurance providers are comprised of both stock and mutual insurance companies. Among the mutual insurers are insurance companies formed by medical professionals to assure the availability of medical malpractice insurance at the lowest possible cost. Thus, their motivation is not necessarily profit oriented. The physician-owned and hospital-owned companies included in our analysis comprised approximately 38 percent of our data base. However, to estimate the profitability of the medical malpractice insurance line we included both stock and mutual insurers. Our scope and methodology are explained in greater detail in appendix I.

The analysis and conclusions contained in this report are concerned solely with the estimation of property/casualty insurance industry profitability. While our conclusions about discounting reserves for profitability purposes are based on principles of general applicability, it should not be assumed that they apply to any other industry in exactly the same way as they apply to the property/casualty insurance industry without studying that other industry. Furthermore, because premium determination and investment decisions are so complex, it was not

within the scope of this review to ascertain the extent to which the discounting of reserves would influence premiums, the industry's investment decisions, or the ability of companies to be competitive.

Property/Casualty Insurance Industry Profitability

In July 1986, we testified² that over the 10-year period 1976 through 1985, the property/casualty industry had about \$81 billion in after-tax income despite almost \$65 billion in underwriting losses. This income resulted primarily from investments the industry made with funds collected from premiums. Over the 10-year period 1976 through 1985, the industry had investment income and capital gains of approximately \$144 billion. (See tables II.1 and II.2.) Thus, profitability in the insurance industry is determined by combining both underwriting results and investment results.

These figures are derived from our own computations, and the industry disagrees with some of the elements of these computations. Specifically, the industry objects to our including unrealized capital gains of \$12 billion as reported by Best in calculating investment gains and excluding policyholder dividends of \$15 billion in calculating expenses. We recognize that unrealized gains are just that, unrealized, and, therefore, are subject to investment risks that could result in lower or higher amounts. However, we have chosen to include unrealized gains in our industry-wide calculations because it is within a company's control to manage its investment portfolio to realize these gains while the investments are profitable. We have excluded policyholder dividends because we consider them to be voluntary, not mandatory, distributions by the companies. Since the companies are not required to make these distributions, we have chosen to exclude them from our underwriting loss figure.

If we adjusted our figures to exclude unrealized gains and to include policyholder dividends (the approach used by the industry in its calculations), the industry's net underwriting loss for this 10-year period would be about \$80 billion and its investment income and capital gains would be about \$132 billion. Overall, its after-tax net gain would be about \$54 billion. Thus, the industry's concern with our computations does not rest with the issue of whether or not the industry was profitable, only with the degree of profitability.

²Profitability of the Property/Casualty Insurance Industry, statement by William J. Anderson, GAO, before the U.S. House of Representatives, Subcommittee on Economic Stabilization, Committee on Banking, Finance and Urban Affairs, July 30, 1986.

Property/casualty industry underwriting losses over the last several years have been substantial (see table II.1), with record losses being recorded in 1985. It should be noted, however, that the industry is subject to profit and loss underwriting cycles. For example, during profitable periods, insurance companies can increase their capacity, take varied and greater risks, and generally lower their premium rates in an attempt to achieve a greater, or to defend their existing, market share. Such actions engender price competition as other firms lower their prices to retain their market shares. As price competition progresses, favorable premium profit margins erode; and if competition continues unabated, premium profit margins turn negative and underwriting losses occur.

As the cycle continues, companies respond to their underwriting losses by instituting greater underwriting discipline—restricting policy issuances—and/or raising the prices they charge for their policies. A consequence of these actions is that consumers find it more difficult to obtain insurance, and the insurance they obtain will be more costly. The companies' actions, however, generate improved profit margins that eventually lead the underwriting cycle back to a profitable state. Once profitable, the cycle begins again.

As we reported in April 1986,³ the most recent loss cycle was more protracted in duration than usual with underwriting losses resulting in every year since 1980. The continuation of the industry's underwriting losses was exacerbated by the industry's cash flow underwriting pricing strategy, which relied upon investment income to overcome underwriting losses. Basically, companies were willing to accept lower premiums for certain insurance lines in order to encourage sales and obtain funds for investment. This strategy, however, changed as underwriting losses became unacceptably high.

Although the industry's after-tax income may seem quite large in absolute terms, it needs to be compared to some standard or base to give it appropriate meaning. The measure commonly used by investors, financial analysts, and others to make inter-industry or company comparisons of profitability is the rate of return on net worth. Using that standard, we testified in July on the basis of data reported by the industry that the industry's longer term profitability was not out of line with

³Financial Cycles in the Property/Casualty Industry (GAO/GGD-86-56FS, April 9, 1986). This fact sheet covered the period 1945 through 1984 and showed that profitability in the property/casualty industry is cyclical.

those of other industries, such as the banking, transportation, and utility industries. (See table II.3.) We note, however, that the property/casualty industry's reported rate of return is conservative in that the rate is based on reserves that have not been discounted.

It should also be noted that the property/casualty industry's rate of return has varied more dramatically from year to year than has the rate of return in other industries. Moreover, the rates of return earned by the property/casualty industry have been substantially lower than those earned by comparable industries in the last several years. Because the property/casualty insurance industry is cyclical in nature, we believe that it is more appropriate to compare average returns over a period of time than returns in any given year. Thus, we do not believe that the relatively low returns earned by the property/casualty industry from 1982 through 1985 are necessarily indicators of serious, longer term profitability problems in this industry. Indeed, recent reports by the industry and investment advisory services indicate that its rate of return has improved.

Since our July testimony, the Insurance Information Institute has reported⁴ that the property/casualty industry's earnings improved substantially in 1986. On the basis of its data, we calculate that the industry's after-tax net gain increased from \$9.7 billion in 1985 to about \$17 billion in 1986. Using the industry's method of calculation, the industry's after-tax income increased from \$1.9 billion in 1985 to \$12.7 billion in 1986. Importantly, the 1986 data indicate that the industry's pricing and underwriting actions over the last few years have caused the underwriting loss cycle to turn and begin moving in a positive direction.

Furthermore, two investment advisory services, Value Line, Inc., and Salomon Brothers, Inc., forecast improving industry profitability. The Value Line Investment Survey dated April 17, 1987, estimates significant improvement in the industry's rate of return on net worth. It estimates that the rate will average about 16 percent annually through 1991. Salomon Brothers' Property/Casualty Insurance Quarterly - Year-End 1986 dated May 8, 1987, predicts that for its index of insurers, "consolidated earnings will increase more than Salomon Brothers' expectations of 17% and 18% corporate growth in 1987 and 1988, respectively." Salomon Brothers attributes the industry's expected performance to rate increases in the 1985 to 1986 period, moderate economic activity, and returns on a strong cash flow.

⁴The Executive Letter Special Report, March 23, 1987.

Medical Malpractice and General Liability Profitability Results

We first estimated the profitability of the medical malpractice and general liability lines using both undiscounted and discounted reserves. As described earlier, these estimates assumed that the reserves established by the industry were adequate to cover future claims. We also did similar analyses assuming that reserves were inadequate and needed to be increased by 10 percent and 20 percent. For the medical malpractice and general liability lines, we expressed their profitability as a rate of return on premiums earned rather than a return on net worth. We expressed the rate of return in this manner because it was not practical to determine for companies with multiple insurance lines the portion of their net worth attributable to the medical malpractice and/or general liability lines.

Tables II.4 and II.5 are provided to give perspective on the top 10 medical malpractice insurers in 1985 and their relationship to all medical malpractice insurers. These tables show (1) the companies' net medical malpractice premiums written, (2) their underwriting losses, (3) their combined ratios (an indicator commonly used in the industry to indicate underwriting profitability), (4) the relationship of the medical malpractice line to other lines the companies offer, (5) the relationship of the company's medical malpractice business to the total industry's medical malpractice business, and (6) the relationship of the top 10 companies' medical malpractice business to the total industry's medical malpractice business. Tables II.9 and II.10 provide like information on the top 10 general liability insurers in 1985.

Profitability When Reserves Are Not Discounted

We computed the annual earnings of the medical malpractice and general liability lines using reserves that had not been discounted. In the case of the medical malpractice line, we computed a cumulative \$653 million loss over the 11-year period 1975 through 1985. For the same period, the general liability line yielded a profit of \$2.0 billion. The cumulative rate of return expressed as a percent of premiums earned was a negative 4.6 percent for the medical malpractice line and a positive 3.4 percent for the general liability line. (See tables II.6 and II.11.)

Profitability Estimates Improve When Reserves Are Discounted

As noted earlier, both the medical malpractice and general liability lines are typical of insurance lines where claims are commonly paid many years after the reserves for those claims are established. Once established, the assets underlying the reserves are invested and earn income until claims associated with the reserves are paid out. To measure the line's profitability, accounting principles require the application of the

“matching concept.” This concept is founded upon the principle that to appropriately measure the net income of a business transaction all expenses associated with the transaction should be matched against the income generated by the transaction. Normally, periodic expense recognition achieves the intent of the matching concept. However, when the transaction produces income over many years, as in the case of insurance reserves, the recognition of the entire expense in only the first year, the method generally followed in the industry, understates net income in that year. This can be corrected by using an alternative measure of income that deducts from current revenues only the present value of the future amounts that will be paid. This alternative measure involves discounting the reserves to recognize their present value.

The National Association of Insurance Commissioners generally does not allow the discounting of reserves by requiring that insurers use accounting principles prescribed by the states. For legitimate solvency considerations, those accounting principles generally require that certain costs be deducted immediately, including reserve amounts equal to total future claim payments. However, for determining profitability, those accounting principles understate earnings by overstating current expenses. Some states (e.g., New York, Illinois, Pennsylvania, Ohio, and Michigan) have allowed physician-owned medical malpractice insurance companies to discount their reserves. Our calculations using discounted reserves took account of the discounting already performed by physician-owned insurance companies.⁵

We discounted the reserves by the average annual interest rate earned on 10-year Treasury securities. Using this approach, the medical malpractice line yielded a profit of \$2.2 billion over the 11-year period 1975 through 1985. (See table II.7.) The general liability line yielded a profit of \$8.0 billion over the same period. (See table II.12.) As a percentage of premiums earned, the medical malpractice line’s cumulative rate of return increased from a negative 4.6 percent to a positive 15.3 percent when the reserves were discounted in this manner. (See table II.7.) Similarly, the general liability line’s cumulative return increased from 3.4 percent to 13.4 percent. (See table II.12.)

⁵Data provided by the Physician Insurers Association of America.

Profitability Estimates Deteriorate If the Reserves Established Are Not Adequate to Cover Claims

As noted earlier, one set of our profitability estimates assumed that the industry-established reserves were sufficient to settle future claims. We made this assumption because companies review their reserve estimates at least annually and are bound by state regulators to provide for fully adequate reserves. Future events, however, may show that the reserves are either excessive or inadequate. Some in the industry believe that the reserves are inadequate. If, due to unforeseen circumstances, the undiscounted reserves proved insufficient, then the profitability of the lines would deteriorate. To provide a degree of conservatism in light of this possibility, we prepared another set of profitability estimates on the alternative assumptions that the estimated reserve requirements are inadequate to the extent of 10 percent or 20 percent of their current stated value.

If the undiscounted reserves needed to be increased by 10 percent, our estimate of the medical malpractice line's profitability for the 11-year period 1975 through 1985 would decline from a \$653 million loss to a \$1.2 billion loss, and its rate of return as a percentage of premiums earned would decline from a negative 4.6 percent to a negative 8.8 percent. Similarly, the general liability line's profitability would decline from a \$2.0 billion profit to a \$783 million profit, and its rate of return would decline from 3.4 percent to 1.3 percent.

If the undiscounted reserves were insufficient and needed to be increased by 20 percent, the estimated profitability of the lines would deteriorate further. The estimated profitability and rate of return on the medical malpractice line would decline from a \$653 million loss to a \$1.8 billion loss and from a negative 4.6 percent rate of return to a negative 13.0 percent, respectively. (See table II.8.) Similarly, the estimated profitability and rate of return for the general liability line would decline from a positive \$2.0 billion and a positive 3.4 percent to a negative \$462 million and a negative 0.8 percent, respectively. (See table II.13.)

Likewise, if reserves that had been discounted proved to be deficient and an additional 10 percent needed to be added to settle future claims, then our estimate of the medical malpractice line's profitability and rate of return would decline from a \$2.2 billion profit to a \$1.9 billion profit and from a 15.3 percent rate of return to a 13.1 percent rate of return. Similarly, the general liability line's estimated profitability and rate of return would decline from an \$8.0 billion profit to a \$7.4 billion profit and from a 13.4 percent rate of return to 12.5 percent return.

If the discounted reserves needed boosting by 20 percent to be sufficient, then the estimated profitability and rates of return on the medical malpractice and general liability lines would decline further to a \$1.6 billion profit and a 10.9 percent return and a \$6.7 billion profit and an 11.2 percent return, respectively. (See tables II.8 and II.13.)

Conclusions

Profitability in the insurance industry is determined by combining both underwriting results and investment results. Despite incurring substantial underwriting losses over the 10-year period 1976 through 1985, the property/casualty insurance industry has more than offset those aggregate losses with investment gains. The underwriting losses resulted, in part, from the industry's cash flow underwriting pricing strategy in which companies sacrificed underwriting gains in an attempt to attract more business and thereby enhance investment gains. We estimate that the industry had about \$81 billion in after-tax income over this period. Because of the cyclical character of the industry's underwriting experience, we believe that data covering longer periods, rather than concentrating on the last few years, provide better perspective on the industry's profitability.

The industry disagrees with our 10 year profitability estimate of \$81 billion—its method of calculation would show \$54 billion. Even the lower estimate by the industry, however, shows that the industry's average rate of return on net worth has not been out of line with those of other industries. We believe that the industry's reported rates of return are conservative since they are based on reserves that have not been discounted. Furthermore, we believe that the relatively low rates of return earned in recent years are not necessarily indicators of serious longer term problems in the industry. Indeed, the industry reported substantial earnings improvement in 1986, and both Value Line and Salomon Brothers project substantial improvement in the industry's profitability and rate of return on net worth for the next several years.

Profitability estimates for the medical malpractice and general liability lines depend primarily on the adequacy of the reserves for future payments of claims and whether those reserves are discounted to reflect their present values. If the reserves established to cover future loss payouts are inadequate, boosting the reserves to cover those losses will produce lower estimates of the profitability of the line. Conversely, the estimated profitability of the line will improve if the reserves are discounted. We have recommended in the past, and Congress has agreed, that for tax purposes reserves be established on a discounted basis.

Using reserve amounts as established by the industry and applying different assumptions about reserve adequacies and discounting, we developed four profitability estimates for each line. Essentially, those estimates show that over the 11-year period 1975 to 1985 the medical malpractice line incurred losses when the reserves were valued at their full estimated payout, but the line was profitable when the reserves were discounted to present values. The general liability line was profitable over this 11-year period under all but one of our estimating assumptions. In that estimate, we assumed that the reserves were not discounted to present values and that they were 20-percent deficient.

At your request, we have not obtained comments on this report. As arranged with your offices, unless you publicly announce its contents earlier, we plan no further distribution of this report until 15 days from its issue date. At that time, we will send copies of the report to various Senate and House Committees, Members of Congress, and other interested parties. If you have questions regarding the tables, please contact Mr. Natwar Gandhi of my staff on 376-0023.

W. J. Anderson

William J. Anderson
Assistant Comptroller General

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Scope and Methodology

The data used in this report were obtained entirely from publicly available information contained in Best's Aggregates and Averages and Best's Casualty Loss Reserve Development and from financial information prepared by the Physician Insurers Association of America. Information for our analysis was developed for the 11-year period 1975 through 1985. We selected this period because 1975 was the first year that medical malpractice insurance was reported by Best as a separate insurance line and 1985 was the latest year for which data was available. Prior to 1975, this data had been combined with the data for general liability and, therefore, could not be separately identified. We developed our methodology and performed our profitability analyses between July 1986 and May 1987.

We used Best's data because it is the only aggregated data base readily available for such an analysis. Best gathers its data from the annual financial statements the insurance companies file with state regulators. We did not test the accuracy or adequacy of the data reported by the companies or by Best. The data reported by Best do not cover the entire industry. Among those not included in the Best data are (1) joint underwriting associations, (2) a small portion of physician-owned insurance companies, (3) reinsurers, (4) small commercial insurers, and (5) self-insurance mechanisms. Because our analyses are based on aggregated industry data, the operational and investment experience of individual companies could well vary.

Since 1975 is the first year that data for these lines were reported separately, prior years' medical malpractice and general liability data (i.e., reserves, earnings, and cash flow) are not included in our analysis. As a result we did not compute estimated interest earned for the first year of our analysis although, in actual practice, cash flow from prior years' operations had been invested and premiums earned during 1975 would have been available for investment throughout the year. Our analysis is based only on the premiums on business issued in the years of our study.

We had to refine the data obtained from Best's Casualty Loss Reserve Development because companies used in the Best surveys varied somewhat from year to year. This occurred for a variety of reasons, including company mergers, liquidations, and companies dropping that line of business. When companies were no longer included in the Best data, we continued to include claims that were still being paid. When actual claim

data for these companies were no longer available, we applied the average claim rate for the industry in those years to determine the amount of claims.

Our first step in estimating a line's profitability was to determine the line's after-tax cash flow. We estimated the annual after-tax cash flow for each line on business issued in those years by adding the premium dollars earned and our estimate of the interest earned and subtracting claims paid, loss adjustment expenses paid, underwriting expenses paid, and federal income taxes paid.

To estimate investment income, we considered it impractical to attempt to identify and trace the investment actions taken by insurance companies over the 11-year period. We deemed it more practical to estimate the amount of annual investment income by identifying a conservative investment that would correlate, to the extent possible, with the time frame that funds would be available for investment and compute the income that such an investment would produce.

Claims in the medical malpractice and general liability lines, characteristically, take a long time to be reported and settled—frequently 10 years or longer. Our industrywide analysis of medical malpractice claims showed that after 10 years, 26 percent of claims were still outstanding. Our analysis for general liability claims showed that after 10 years, 13 percent of the claims were still outstanding.

Accordingly, we selected 10-year Treasury securities as appropriate investment vehicles. The interest rate we associated with this investment was the average annual interest rate for such securities in the year of investment. Thus, for example, the 1975 net annual cash flow was assumed to be invested in 10-year Treasury securities at the average annual interest rate such securities earned in 1976. The average annual interest rates used in our analyses are shown in table I.1.

Table I.1: Average Annual Interest Rates on 10-Year Treasury Securities, 1976-1986

Year	Rate	Year	Rate
1976	7.61%	1982	13.00%
1977	7.42	1983	11.10
1978	8.41	1984	12.44
1979	9.44	1985	10.62
1980	11.46	1986	7.62
1981	13.91		

The annual earnings of the line is the amount remaining, if any, after premiums earned and interest earned are reduced by annual expenses, losses, and taxes and the amount that the companies reserve for future claims payments. As can be seen from this methodology, the amount set aside for the reserve directly affects the line's annual earnings. The reserve amounts established are based on actuarial estimates the companies make using past claims experience and future claims expectations. If the reserves ultimately prove to be inadequate, then the reserve was underestimated and the line's annual earnings were overstated. Conversely, the annual earnings were understated if the reserves ultimately prove to be too great.

Our first 11-year cumulative profitability estimates for medical malpractice and general liability assumed that the reserves established by the industry were adequate to cover future claims. We made this assumption because the industry reevaluates its reserves and adjusts them at least annually, and more often when its experience deviates materially from its earlier expectations or when its future expectations change. Furthermore, state regulators for legitimate solvency considerations require companies to provide for fully adequate reserves. On the basis of its review, the property/casualty industry should add to its reserves when it believes them inadequate to cover future claims payments. Similarly, it should reduce its reserves, and thereby increase its earnings, if the reserves are believed to exceed future claims payments.

Future events may show that the reserves are either excessive or inadequate. Some in the industry believe that the reserves are inadequate. If, due to unforeseen circumstances, the undiscounted reserves proved insufficient, then the profitability of the lines would deteriorate. To provide a degree of conservatism in light of this possibility, we prepared another set of profitability estimates on the alternative assumptions that the estimated reserve requirements are inadequate to the extent of 10 percent or 20 percent of their current stated value.

How insurance companies currently value their future claims will directly affect the size of the reserve established and thus the line's annual earnings. For example, if a claim will cost \$100 in 10 years, should a \$100 reserve be immediately established for that claim or should a reserve of a lesser amount—a discounted amount—be established that, when invested over the 10-year period, will yield \$100? If a discounted reserve of less than \$100 is established, then a greater amount of that year's annual cash flow will be credited to the line's earnings. Thus, discounting the reserves increases current earnings.

For the purpose of estimating the profitability of a line, we believe discounting is the appropriate method for valuing the reserves. If the reserves are not discounted and all future claims payments are recognized in the current year, the method generally followed by the industry, then current net income is effectively reduced for payments that customarily are not to be made for several years—understating annual income.

Accounting principles, however, require the application of the “matching concept.” This concept is founded upon the principle that to appropriately measure the net income of a business transaction all expenses associated with the transaction should be matched against the income generated by the transaction. Normally, periodic expense recognition achieves the intent of the matching concept. However, providing fully adequate reserves as legitimately required by the states to assure company solvency does not satisfy the matching concept. For the purpose of determining profitability this can be corrected by deducting from current revenues only the present value of the future amounts that would be paid, i.e., the discounted value of those payments. This would match against current revenues an estimate of the current value of future loss payments. We discounted the reserves using the average annual interest rate earned on 10-year Treasury securities and the claim payout pattern for each line as shown in the 1986 edition of Best’s Casualty Loss Reserve Development.

Generally, reserves reported by companies are not discounted. However, some states (e.g., New York, Illinois, Pennsylvania, Ohio, and Michigan) have allowed physician-owned medical malpractice insurance companies to discount their reserves. Our profitability estimates using discounted reserves took account of the discounting by physician-owned insurance companies.

Also, the medical malpractice line is comprised of both stock and mutual insurance companies. Among the mutual insurers are insurance companies formed by medical professionals to assure the availability of medical malpractice insurance at the lowest possible cost. Thus, the motivation these mutual insurers have for profit differs from the profit motivation other “for profit” companies comprising the medical malpractice line have. The physician-owned and hospital-owned companies included in our analysis comprised approximately 38 percent of our data base. To determine the profitability of this line, both stock and mutual insurers have to be included.

Tables

Table II.1: Combined After-Tax Gains for the Property/Casualty Insurance Industry by Year for the Period 1976-1985 (Consolidated Basis)^a

Dollars in millions

Year	Underwriting gains/losses ^b	Investment gains/losses ^c	Pre-tax total	Federal income tax ^d	After-tax total
1976	(\$1,726)	\$7,173	\$5,447	\$148	\$5,299
1977	1,926	5,063	6,989	1,015	7
1978	2,548	7,758	10,306	1,389	7
1979	24	11,610	11,634	896	10,738
1980	(1,712)	15,870	14,158	593	13,565
1981	(4,464)	10,858	6,394	55	6,339
1982	(8,303)	18,387	10,084	(716)	10,800
1983	(11,088)	19,441	8,353	(1,218)	9,571
1984	(19,379)	17,875	(1,504)	(1,732)	228
1985	(22,597)	30,219	7,622	(2,030)	9,652
1976-1985	(\$64,771)	\$144,254	\$79,483	(\$1,600)	\$81,083

^aConsolidated totals eliminate "double counting" by excluding intercompany transactions between parent and subsidiary companies.

^bNet premiums earned, less losses and expenses. These results are based on undiscounted reserves.

^cNet investment income plus realized and unrealized capital gains.

^dNegative federal income tax occurs because companies report losses for tax purposes and consequently generate negative income taxes. Negative income taxes can be applied to past taxes paid, and they generate refunds or are carried forward to apply against future tax liabilities.

Source: Data used in the preparation of this table obtained from A.M. Best Company publications.

Table II.2: Net Premiums Earned, Underwriting Gains/Losses, and Combined Ratios by Insurance Line for the Period 1976-1985

Dollars in millions

Insurance lines	Net premiums earned	Premiums as a percent of all lines	Underwriting gains/losses ^a	Underwriting gains/losses as a percent of all lines	Combined ratios
Auto liability (Private passenger)	\$192,432	20.49	(\$16,509)	25.49	107.9%
Auto physical damage (Private passenger)	134,515	14.32	815	(1.26)	98.6
Workers' compensation	128,099	13.64	(1,589)	2.45	100.9
Homeowners multiple peril	96,376	10.26	(3,813)	5.89	102.4
Commercial multiple peril	66,002	7.03	(7,014)	10.83	108.5
General liability	61,746	6.57	(13,255)	20.46	120.0
Auto liability (Commercial)	46,150	4.91	(8,746)	13.50	117.6
Auto physical damage (Commercial)	25,599	2.73	(94)	0.15	99.1
Medical malpractice	14,143	1.51	(5,177)	7.99	135.7
All other lines	174,066	18.54	(9,389)	14.50	— ^b
Total - all lines	\$939,128	100.00%	(\$64,771)	100.00%	105.9%

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^aNet premiums earned less losses and expenses. This column does not include investment gains allocated by insurance line.

^bAll other lines includes: reinsurance (114.9); fire (96.9); inland marine (98.0); group accident and health (111.7); allied lines (97.1); burglary and theft (81.2); surety (95.7); ocean marine (108.0); other accident and health (101.8); farmowners multiple perils (103.5); fidelity (104.8); boiler and machinery (93.8); aircraft (104.1); and miscellaneous (111.0).

Source: Data used in the preparation of this table obtained from A.M. Best Company publications.

Table II.3: Average Annual Rates of Return—Net Income After Taxes as a Percent of Net Worth for Selected Industries

Year	Property/ casualty insurance	Banks	Transportation	Utilities	All Industries
1976	10.0%	11.5%	8.8%	10.6%	13.3%
1977	19.0	11.6	10.1	11.1	13.5
1978	18.1	12.0	13.3	11.3	14.3
1979	15.5	14.1	13.2	12.0	15.9
1980	13.1	13.4	11.3	11.7	14.4
1981	11.8	15.0	13.3	12.7	13.8
1982	8.8	12.0	7.9	12.5	10.9
1983	8.3	12.0	11.6	13.3	10.7
1984	1.8	12.8	12.9	13.4	13.6
1985	3.8	13.0	11.5	13.0	11.5
Average: 1976-85	11.0%	12.7%	11.5%	12.2%	13.2%

Source: 1986-87 Property/Casualty Fact Book, Insurance Information Institute.

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Table II.4: Top 10 Medical Malpractice Insurance Company Groups' Medical Malpractice Underwriting Losses for 1985

Dollars in millions

Rank ^a	Company group ^b	Medical malpractice net premiums written	Underwriting gains/losses ^c	Combined ratios
1	St. Paul	\$551	(\$156)	130.5%
2	Medical Liability Mutual, New York	237	(167)	178.0
3	CNA	153	(129)	201.2
4	Employers Re Group	127	(4)	88.1
5	Medical Protective	120	(38)	133.1
6	Parthenon Casualty	95	(2)	102.6
7	Farmers	83	(66)	173.9
8	Illinois State Medical	83	(63)	188.3
9	Southern California Physicians Insurance Exchange	82	(15)	120.2
10	The Doctors' Company, An Interinsurance Exchange	77	(20)	126.5
Total top 10		\$1,608	(\$660)	145.7%
Total industry		\$2,769	(\$1,642)	165.9%
Top 10 as a percent of industry		58.1%	40.2%	

^aBy amount of medical malpractice net premiums written

^bA company group is comprised of a number of subsidiary companies under one umbrella company

^cNet premiums earned, less losses and expenses

Source: Data used in the preparation of this table obtained from A M Best Company publications

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Table II.5: Medical Malpractice Net Premiums Written by the Top 10 Medical Malpractice Company Groups in 1985 as Compared With Group and Industry Product Line Totals

Dollars in millions

Rank*	Company group	Medical malpractice net premiums written	Malpractice net premiums written as a percent of group's total lines	Net premiums written as a percent of total industry net medical malpractice premiums
1	St. Paul	\$551	24.7	19.9
2	Medical Liability Mutual, New York	237	100.0	8.6
3	CNA	153	5.5	5.5
4	Employers Re Group	127	12.5	4.6
5	Medical Protective	120	100.0	4.3
6	Parthenon Casualty	95	76.7	3.4
7	Farmers	83	2.1	3.0
8	Illinois State Medical	83	100.0	3.0
9	Southern California Physicians Insurance Exchange	82	99.1	3.0
10	The Doctors' Company, An Interinsurance Exchange	77	100.0	2.8
Total top 10		\$1,608		58.1
Total industry		\$2,769		100.0

*By amount of medical malpractice net premiums written.

Source: Data used in the preparation of this table obtained from A M Best Company publications

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Table II.6: Profitability of the Medical Malpractice Insurance Line for the 11-Year Period 1975-1985 on Business Issued in Those Years (Undiscounted Reserves—Assumes Established Reserves Are Adequate)

Dollars in millions

Year	(1) Premiums earned	(2) Estimated interest ^a	(3) Loss payments and expenses	(4) Annual reserve increase	(5) Federal income taxes ^b	(6) Annual earnings ^c after taxes	(7) Annual earnings as a percent of premiums earned ^d
1975	\$622	\$0	\$136	\$516	(\$14)	(\$16)	- 2.6
1976	1,033	38	188	790	43	50	4.9
1977	1,150	100	252	782	100	117	10.2
1978	1,175	176	352	723	127	149	12.7
1979	1,155	258	467	800	67	79	6.8
1980	1,305	359	638	906	55	65	5.0
1981	1,220	494	857	673	85	99	8.1
1982	1,295	594	1,185	754	(23)	(27)	-2.1
1983	1,434	675	1,264	811	16	19	1.3
1984	1,599	778	1,439	950	(5)	(6)	-0.4
1985	2,199	879	1,994	3,272	(1,007)	(1,182)	-53.7
Totals^e	\$14,187	\$4,352	\$8,772	\$10,976	(\$556)	(\$653)	- 4.6

^aEach year's estimated interest is the sum of the interest earned on the cash flow from prior years. For example, the \$176 million estimated interest in 1978 is an accumulation of the interest earned on prior years' cash flows—\$38 million interest earned on 1975 cash flow, \$62 million interest earned on 1976 cash flow, and \$76 million interest earned on 1977 cash flow. Interest is calculated using the average rates for 10-year Treasury securities available in respective year(s)

^bFederal income taxes computed using corporate tax rate of 46 percent

^cColumns (1 + 2) - Columns (3 + 4 + 5) Results may not add due to rounding

^d[Column 6 / Column 1] x 100

^eTotals may not add due to rounding

Source: Data used in the preparation of this table obtained from A M Best Company publications

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Table II.7: Profitability of the Medical Malpractice Insurance Line for the 11-Year Period 1975-1985 on Business Issued in Those Years (Discounted Reserves—Assumes Established Reserves Are Adequate)

Dollars in millions

Year	(1) Annual reserve increase (table II.6)	(2) Annual reserve increase discounted ^a	(3) Increased earnings from discounting ^b	(4) Annual earnings after taxes (table II.6)	(5) Annual earnings after taxes discounted reserves ^c	(6) Annual earnings as a percent of premiums earned ^d
1975	\$516	\$355	\$161	(\$16)	\$145	23.3
1976	790	557	233	50	283	27.4
1977	782	624	158	117	275	23.9
1978	723	553	170	149	319	27.2
1979	800	565	235	79	311	27.1
1980	906	602	304	65	369	28.3
1981	673	491	182	99	282	23.1
1982	754	590	164	(27)	137	10.6
1983	811	604	207	19	225	15.7
1984	950	764	186	(6)	180	11.3
1985	3,272	2,446	826	(1,182)	(356)	-16.2
Totals^e	\$10,976	\$8,152	\$2,824	(\$653)	\$2,171	15.3

^aThe annual reserve increase is discounted by the average annual interest rate earned on 10-year Treasury securities.

^bColumn 3 minus Column 2.

^cColumn 5 minus Column 4. Results may not add due to rounding.

^d[Column 5 / Column 1 (table II.6)] x 100

^eTotals may not add due to rounding.

Source: Data used in the preparation of this table obtained from A.M. Best Company publications and from the Physician Insurers Association of America.

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Table II.8: Summary of Profitability of the Medical Malpractice Insurance Line, 1975-1985^a

	Using company-established reserves:	
	Not discounted by GAO	Discounted by GAO
	Dollars in millions	
Premiums earned	\$14,187	\$14,187
Interest earned (estimated)	4,352	4,352
Revenues	18,539	18,539
Payments & expenses	8,772	8,772
Reserves	10,976 ^b	8,152
Taxes	(556)	(556)
Expenses	19,192	16,368
Earnings	(\$653)	\$2,171

Reserves	Not discounted by GAO		Discounted by GAO	
	Earnings	Percent rate of return ^c	Earnings	Percent rate of return ^c
Adequate	(\$653)	(4.6)	\$2,171	15.3
10% inadequate	(1,245)	(8.8)	1,861	13.1
20% inadequate	(1,838)	(13.0)	1,551	10.9

^aMedical malpractice profitability, as shown above, depends on (1) the adequacy of reserves established to settle claims, and (2) the degree to which the reserves are discounted. This table shows the level of profitability assuming three levels of reserve adequacy, and discounting.

^bOf this \$10,976 million reserve, \$2,660 million is shown in the statements of the Physician Insurers Association of America as already having been discounted. The reserve shown in the second column is the result of discounting the remaining \$8,316 million and adding the result to the \$2,660 million already discounted by the companies.

^cRate of return as percent of premiums earned

Source: Data used in the preparation of this table obtained from A.M. Best Company publications and from the Physician Insurers Association of America

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**Table II.9: Top 10 General Liability
Company Groups' General Liability
Underwriting Gains/Losses for 1985**

Dollars in millions

Rank ^a	Company group	General liability net premiums written	Underwriting gains/losses ^b	Combined ratios
1	American International	\$1,038	(\$99)	108.6%
2	CNA	539	(251)	154.1
3	Crum & Forster	535	(280)	159.8
4	Motors Insurance Group	474	26	90.0
5	Travelers	460	(231)	150.3
6	Aetna	445	(192)	144.2
7	Hartford	413	(110)	127.1
8	Chubb Group	393	(43)	105.0
9	Liberty Mutual	367	(130)	137.9
10	Continental	356	(123)	135.9
Total top 10		\$5,020	(\$1,433)	130.4%
Total industry		\$11,544	(\$4,750)	145.3%
Top 10 as a percent of industry		43.5%	30.2%	

^aBy amount of general liability net premiums written.

^bNet premiums earned, less losses and expenses.

Source: Data used in the preparation of this table obtained from A M Best Company publications

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Table II.10: General Liability Net Premiums Written by the Top 10 General Liability Company Groups in 1985 as Compared With Group and Industry Product Line Totals

Dollars in millions

Rank ^a	Company group	General liability net premiums written	General liability net premiums as a percent of group's total lines	Net premiums as a percent of total industry net general liability premiums
1	American International	\$1,038	33.1	9.0
2	CNA	539	19.5	4.7
3	Crum & Forster	535	19.5	4.6
4	Motors Insurance Group	474	52.5	4.1
5	Travelers	460	11.1	4.0
6	Aetna	445	7.8	3.9
7	Hartford	413	11.3	3.6
8	Chubb Group	393	18.3	3.4
9	Liberty Mutual	367	8.8	3.2
10	Continental	356	10.5	3.1
Total top 10		\$5,020		43.5^b
Total industry		\$11,544		100.0

^aBy amount of general liability premiums written

^bDoes not add due to rounding.

Source: Data used in the preparation of this table obtained from A.M. Best Company publications

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Table II.11: Profitability of the General Liability Insurance Line for the 11-Year Period 1975-1985 on Business Issued in Those Years (Undiscounted Reserves—Assumes Established Reserves Are Adequate)

Dollars in millions

Year	(1) Premiums earned	(2) Estimated interest ^a	(3) Loss payments and expenses	(4) Annual reserve increase	(5) Federal income taxes ^b	(6) Annual earnings ^c after taxes	(7) Annual earnings as a percent of premiums earned ^d
1975	\$2,680	\$0	\$1,071	\$1,789	(\$83)	(\$97)	- 3.6
1976	3,564	129	1,594	1,829	124	146	4.1
1977	4,805	275	2,215	2,214	299	352	7.3
1978	5,755	491	2,896	2,693	302	355	6.2
1979	6,117	779	3,513	1,815	721	847	13.8
1980	6,176	1,084	4,041	2,244	448	526	8.5
1981	5,668	1,469	4,638	1,641	395	463	8.2
1982	5,287	1,743	5,238	1,292	230	270	5.1
1983	5,279	1,916	5,739	1,238	100	118	2.2
1984	5,772	2,085	6,381	1,943	(215)	(253)	4.4
1985	8,709	2,264	7,909	4,359	(595)	(699)	-8.0
Totals^e	\$59,812	\$12,234	\$45,235	\$23,056	\$1,726	\$2,028	3.4

^aEach year's estimated interest is the sum of the interest earned on the cash flow from prior years. For example, the \$491 million estimated interest in 1978 is an accumulation of the interest earned on prior years' cash flows—\$129 million interest earned on 1975 cash flow, \$146 million interest earned on 1976 cash flow, and \$216 million earned on 1977 cash flow. Interest is calculated using the average rates for 10-year Treasury securities available in respective year(s).

^bFederal income taxes computed using corporate tax rate of 46 percent.

^cColumns (1 + 2) - Columns (3 + 4 + 5). Results may not add due to rounding.

^d[Column 6 / Column 1] x 100

^eTotals may not add due to rounding.

Source: Data used in the preparation of this table obtained from A.M. Best Company publications.

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Table II.12: Profitability of the General Liability Insurance Line for the 11-Year Period 1975-1985 on Business Issued in Those Years (Discounted Reserves—Assumes Established Reserves Are Adequate)

Dollars in millions

Year	(1) Annual reserve increase (table II.11)	(2) Annual reserve increase discounted ^a	(3) Increased earnings from discounting ^b	(4) Annual earnings after taxes (table II.11)	(5) Annual earnings after taxes discounted reserves ^c	(6) Annual earnings as a percent of premiums earned ^d
1975	\$1,789	\$1,378	\$411	(\$97)	\$313	11.7
1976	1,829	1,439	390	146	535	15.0
1977	2,222	1,695	519	352	871	18.1
1978	2,693	1,995	698	355	1,053	18.3
1979	1,815	1,194	619	847	1,468	24.0
1980	2,244	1,369	875	526	1,401	22.7
1981	1,641	1,023	618	463	1,082	19.1
1982	1,292	953	339	270	609	11.5
1983	1,238	820	418	118	536	10.2
1984	1,943	1,503	440	(253)	188	3.3
1985	4,359	3,701	658	(699)	(42)	-0.5
Totals^e	\$23,056	\$17,069	\$5,986	\$2,028	\$C,014	13.4

^aThe annual reserve increase is discounted by the average annual interest rate earned on 10-year Treasury securities.

^bColumn 1 - Column 2.

^cColumn 3 + Column 4 Results may not add due to rounding

^d[Column 5 / Column 1 (table II.11)] x 100

^eTotals may not add due to rounding

Source: Data used in the preparation of this table obtained from A M Best Company publications.

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Table II.13: Summary of Profitability of the General Liability Insurance Line, 1975-1985^a

Dollars in millions					
	Using company-established reserves:				
	Not discounted by GAO		Discounted by GAO		
Premiums earned		\$59,812		\$59,812	
Interest earned (estimated)		12,234		12,234	
Revenues		72,046		72,046	
Payments & expenses		45,235		45,235	
Reserves		23,056		17,069	
Taxes		1,726		1,726	
Expenses		70,017		64,030	
Earnings^b		\$2,028		\$8,014	
		Not discounted by GAO		Discounted by GAO	
Reserves	Earnings	Percent rate of return ^c	Earnings	Percent rate of return ^c	
Adequate	\$2,028	3.4	\$8,014	13.4	
10% inadequate	783	1.3	7,368	12.3	
20% inadequate	(462)	(0.8)	6,721	11.2	

^aGeneral liability profitability, as shown above, depends on (1) the adequacy of reserves established to settle claims, and (2) the degree to which the reserves are discounted. This table shows the level of profitability assuming three levels of reserve adequacy and discounting.

^bDoes not add due to rounding.

^cRate of return as percent of premiums earned.

Source: Data used in the preparation of this table obtained from A.M. Best Company publications

Glossary

Annual Earnings	The excess of revenue over expenses. Revenue is the sum of premiums earned and investment income. Expenses include claim payments, claim expenses, underwriting expenses, and the annual increase in the reserve for claims and expenses.
Annual Reserve Increase	The change in the amount of the reserve from the beginning to the end of one year.
Combined Ratio	A ratio used by the insurance industry as an indicator of underwriting profitability. It is the ratio of claims and expenses to premium income. A combined ratio over 100 percent generally represents an underwriting loss, while one under 100 percent generally represents an underwriting profit.
Discounting	The process of determining the present value of future amounts.
Loss Adjustment Expenses	The costs attributable to claim and case settlement, such as attorneys' and adjustors' fees.
Loss Payments	The amount paid out to policyholders in claims.
Net Cash Flow	The dollar amount available for investment after annual claims and expenses are paid out of premiums earned and investment income.
Net Investment Income	The amount of investment income remaining after costs associated with the generation of that income are deducted. Brokerage fees are an example of such costs.
Net Premiums Written	Premium income received by insurance companies less payments for business reinsured. Premium income is obtained from policyholders and from reinsuring other insurance companies' policies.

Glossary

Portfolio Rate	The rate used to accumulate cash flow or to discount reserves. The investments of each year are invested at that rate over the whole life of the investment. For purposes of this paper, we have equated the discount rate with the average annual percentage interest rate on 10-year Treasury securities.
Premium	The sum paid by the policyholder for an insurance policy.
Premiums Earned	That portion of an insurance premium that can be considered the property of an insurance company based on the expired portion of the policy period. For example, a 12-month premium written on July 1 will be considered 50-percent earned on December 31. Net premiums earned are the total premiums earned less the portion of premiums earned ceded to other insurance companies or reinsured.
Reserves	Amounts set aside to pay (1) reported claims (2) future claims (unreported), and (3) costs associated with such claims.
Surplus	The excess of assets over liabilities held as a safety margin for policyholders.
Underwriting Expenses	Costs arising from an insurance company's underwriting operations. This includes such items as brokers' commissions, advertising expenses, travel costs, rent, other overhead costs, and equipment costs.

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