A NEW LOOK AT EVALUATING THE FINANCIAL CONDITION OF PROPERTY AND CASUALTY INSURANCE AND REINSURANCE COMPANIES

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ABSTRACT:

Over the past two years insurer solvency and the adequacy of the current regulatory process have been the subject of increasing scrutiny by all sectors of the financial and regulatory community. As a result of this concern and attention, several studies have been performed and reported regarding historical insolvency data. These studies provide much new information with respect to the causes of insolvency that can be incorporated into solvency evaluation reviews of property and casualty insurance and reinsurance companies.

In this paper we survey results of some of the studies previously performed. We evaluate the ability to predict insolvency arising out of certain causes based upon a review of the historical ratings given by one rating agency to subsequently insolvent companies. We identify and discuss lessons from recent history implied from the studies and our analysis. After a brief discussion of solvency evaluation information commonly available, we perform analysis on a study group of 29 companies declared insolvent between 1985 and 1990. We demonstrate that the identification of major exposure areas can be performed relatively easily, and we suggest that any solvency evaluation be focused on the nature and extent of the relationship with the studied company, as well as on probable areas of exposure.

PREVIOUS STUDIES

Several studies and reports published recently provide useful information concerning the causes of insolvency. We briefly summarize a number of these studies below:

(1) Anderson and Formisano, in an article published in June 1988, reviewed six insolvencies in depth and concluded that common causal factors of the insolvencies included rapid growth and expansion to other states, inadequate pricing and under-reserving, lack of proper underwriting, over-concentration of business, reinsurance failures, and general management weaknesses. They noted also that claims management was not a critical factor in the insolvencies but that poor claims practices had made the difficult situations worse.

(2) In a Congressional Research Service Report for Congress dated July 13, 1989, Rappaport found several generic problems among the prominent insolvencies of the 1980's, including fraud, uncollectible reinsurance and under-pricing of insurance services. Rappaport noted that an implied causal factor in the studied insolvencies was the failure of state supervision and also warned that there were potential problems not yet recognized in the financial reports of insurers, including

uncollectible reinsurance, explosive claims areas and difficulties associated with recent innovations such as risk retention groups.

(3) In September 1989 the U.S. General Accounting Office, responding to a request from the Subcommittee on Commerce, Consumer Protection and Competitiveness, Committee on Energy and Commerce of the U.S. House of Representatives, reviewed state monitoring of property/casualty insurer solvency. The review was focused on evaluating how state insurance departments detect financially troubled insurers, the resources available to the departments for this purpose, and the extent of cooperation among states in handling troubled companies. The GAO found and reported a number of perceived weaknesses in the detection and administration of troubled company situations, including a lack of resources to handle the task, the use of unverified data for analysis, time lags in analyzing companies and in performing field reviews, the use of under-qualified staff, and a lack of coordination and cooperation among the states.

(4) Following hearings conducted in 1988 and a lengthy period of research, the U.S. House of Representatives Energy and Commerce Subcommittee on Oversight and Investigations issued a report in February 1990 on its findings: "Failed Promises:

Insurance Company Insolvencies". This widely read and discussed report focused on the failures of Mission Insurance Company, Integrity Insurance Company, Transit Casualty Company and others. The Subcommittee concluded that the studied insolvencies contained a number of similarities, including: an excessive delegation of management authority to managing general agents, brokers and others; under-pricing of insurance products and under-reserving the resulting losses; rapid growth, often into new unfamiliar product lines; excessive reliance on reinsurance; incompetent management and, in some cases, fraud; and inadequate regulation and enforcement by state insurance departments.

(5) In its report issued in May 1990, the U.S. General Accounting Office noted that regulatory controls over reinsurance activity, as outlined in a model law developed by the National Association of Insurance Commissioners (NAIC) in 1984 and amended in 1989, had been strengthened. But the effectiveness of these controls could not be assessed because not all states had adopted the model law. Much concern was expressed about the extent and quality of reinsurance recoverables. The GAO conducted a study of 2,450 property and casualty companies included in the 1987 NAIC database of annual statements and found that nearly 37% reported total reinsurance recoverables on paid and unpaid losses and unearned premiums

greater than their policyholder's surplus. Over 23% of the companies had reinsurance recoverables on paid and unpaid losses alone that exceeded surplus. Nearly 6% reported recoverables on paid and unpaid losses that were 5 times greater than surplus, and more than 2%, or roughly 50 companies, reported recoverables 10 times greater than surplus.

(6) The NAIC issued its report, "State Actions To Improve Insurance Company Solvency Regulation" on July 30, 1990. This report responded to the concerns raised by the House Energy and Commerce Subcommittee in the report, "Failed Promises: Insurance Company Insolvency". While not a study of insolvencies, the NAIC report is noteworthy on this topic for two reasons. First, the report highlights the large number of changes which have recently occurred in regulation of insurance and reinsurance regulation: model acts concerning managing general agents (adopted September 1989) and reinsurance intermediaries (adopted December 1989); a framework for state regulation of insurance in the "NAIC Policy Statement on Financial Regulation Standards" (adopted June 1989); a formal certification program to evaluate each state's compliance with the Financial Regulations Standards; and substantially increased requirements in statutory financial reporting, particularly concerning loss reserves and reinsurance. This suggests that, if the regulation is successful, the insolvency

landscape of the future may be somewhat different than that of the past, although the impact of the changes are at this point very difficult to assess. Secondly, the new, more stringent requirements must be adopted by each of the states. Under such circumstances, greater differences may develop in the relative quality of regulation, state by state, than already exist.

(7) In a report issued in September 1990, the American Academy of Actuaries outlined a study of insurance company insolvencies conducted the previous year. In the study, which was focused upon assessing the effectiveness of loss reserve opinions, questionaires were distributed to state insurance departments for each of 153 companies declared insolvent from 1969 through 1987. 105 responses were returned. Under-reserving was found to be the most commonly cited cause of insolvency, attributed to 58% of the insolvencies in which causes were identified. Mismanagement was the next most frequent cause of insolvency, cited in 41% of the responses. Loss reserve opinions were rendered in only 24 of the 105 insolvencies. In 11 of 20 specific responses received, the signer of the loss reserve opinion was a member of the American Academy of Actuaries and/or an Associate of the Casualty Actuarial Society or a Fellow of the Casualty Actuarial Society. In 5 of the 9 specific responses received, the loss reserve opinion was unqualified. In 7 of the 19 specific responses received, the

signer was a non-employee with at least one of the actuarial credentials just noted. The limited evidence did not clearly suggest that loss reserve opinions assist in identifying potentially troubled companies, although the Academy presented arguments why this may be so.

(8) In November 1990, the GAO reported on a study conducted to determine the effectiveness of the NAIC Insurance Regulatory Information System (IRIS) in detecting potentially troubled insurers. IRIS is a financial surveilance process conducted by the NAIC whereby: certain financial ratios are calculated from data contained within the annual statements submitted by insurance companies; the ratios are used to identify companies for review by an examiner team; the companies may be placed into one of three priority categories based upon the review results; and action is then taken by the domiciliary state insurance department.

Several deficiencies, as noted by regulators and industry officials were outlined in the report, including: (1) a reliance on unverified annual statement data; (2) the restricted scope of the financial ratios used; (3) an ineffectiveness in assessing all types and sizes of insurers; (4) a failure to address some important aspects of insurer operations; (5) a failure to consider other sources of solvency

information; and (6) a trend of identifying an increasing number of companies, some of which may not require attention. The GAO recommended that the NAIC examine whether IRIS could incorporate other solvency, operational and management information to allow a more comprehensive and useful review. The GAO also recommended that the NAIC work to require annual, certification of loss reserves by independent actuaries.

(9) The most comprehensive study on property and casualty insurer insolvency issued to date is contained in a report released in June 1991 by A. M. Best Company. Best examined the 372 property and casualty insurance company insolvencies that occurred between 1969 and 1990 and, wherever possible, identified primary causes of the insolvencies. Deficient loss reserves and inadequate pricing were found to account for 28% of the 302 insolvencies with identified causes. Rapid growth accounted for 21% of the insolvencies, while alleged fraud and overstated assets each accounted for 10% of the insolvencies. Other identified causes included significant change in business (9%), reinsurance failure (7%), and catastrophe losses (6%).

The Best study noted the strong correlation of insolvencies and the underwriting cycle, with most insolvencies coming at the end of the cycle. In 1975, at the end of the first cycle studied, 29 insolvencies occurred. In 1985, at the end of the

second cycle, there were 49 insolvencies. Both were far higher than insolvencies elsewhere in the cycles. Looking forward, Best projected an end to the current underwriting cycle in 1992, and a peak in insolvencies for the cycle at about 45 companies in 1992 or 1993. Further, Best projected that insolvencies in the 1990's will largely occur in personal lines companies, primarily due to the harsh regulatory climate that exists in many states.

Also noteworthy in the study are Best's findings concerning insolvent company characteristics. Small companies (policyholders' surplus of $5 million or less) made up 63% of the insolvencies, compared with 34% for medium companies (policyholders' surplus of $5 million to $50 million), and 3% for large companies (policyholders' surplus greater than $50 million). Medium companies, however, experienced the greatest frequency of insolvency as a percentage of companies within the each respective size category.

Stock companies made up roughly 75% of all insolvencies although comprising only 50% of the companies. Personal lines insolvencies were dominant in the 1970's, while commercial lines insolvencies dominated in the 1980's. Age of the company was an important factor. Roughly 50% of the insolvencies occurred in companies 15 years old or less, although this age

group represents only 27% of companies in the industry.

Abnormal premium growth (defined by Best as less than 5% or greater than 25%) within the last three years prior to insolvency was also a very telling characteristic. Roughly 81% of all insolvencies occurred in companies experiencing abnormal premium growth.

In the next section, using data presented in the Best study, we will review Best ratings for insolvent companies in the three years prior to insolvency with the objective of ascertaining whether a pattern of recognition exists by primary cause of insolvency. That is, we will examine whether the historical record suggests that insolvencies arising from certain causes have been detected more easily or readily than insolvencies arising from other causes. This information may be useful in evaluating the financial condition of property and casualty companies by suggesting areas where additional focus should be placed in the future.

(10) Palermo, in an article published in September 1991, explores the role of the unprecedented inflation of the early 1980's in the subsequent also unprecedented level of insolvencies. Palermo notes that the dynamics of high inflation and interest rates followed by a decline in both

produced a more difficult, higher risk business environment for property and casualty insurers. Failures, as a result, rose during this period. Palermo then suggests that current regulatory restrictions may have the same risk-increasing effect as inflation had in the 1980's. Noted particularly are regulatory restrictions that prevent efficient use of capital, e.g. state requirements that prevent insurers from withdrawing from certain unprofitable lines of business, and the increasing politicalization of rate approval processes in some states.

BEST'S RATINGS PRIOR TO INSOLVENCY - BY CAUSE OF INSOLVENCY

To determine whether the historical record suggests that the success of insolvency recognition has varied depending on the cause of insolvency, we reviewed Best's ratings on insolvent companies for the three years prior to, and the year of, insolvency. For consistency, we used the primary causes assigned by Best in their insolvency study for our review.

Best assigned eight different primary causes of insolvency to 302 of the 372 property and casualty insolvencies that occurred between 1969 and 1990. The causes, and the number of companies to which the causes were assigned, were as follows: deficient loss reserves / inadequate pricing (86); rapid growth (64);

alleged fraud (30); overstated assets (30); significant change in business (26); reinsurance failure (21); catastrophe losses (17); and miscellaneous (28).

For our evaluation, we considered Best's alphabet ratings of Superior (A+) to Fair (C-) as indicators that insolvency was not projected at the time the rating was given. **Exhibit 1** summarizes Best's ratings by cause of insolvency for the three years prior to, and the year of, insolvency. We then calculated the ratio of alphabet ratings to total ratings given, by cause of insolvency by year. This data is displayed on the line graphs in **Exhibits 2, 3 and 4.**

Company ratings generally declined during the three years prior to insolvency arising from each of the identified causes. The rate of success in predicting insolvency, measured in terms of the ratio of alphabet ratings to total ratings given, varied significantly by cause of insolvency. The pattern of recognition reflected in the ratings given in the years prior to insolvency also varied dramatically by cause of insolvency.

Insolvencies resulting from a significant change in business, rapid growth and reinsurance failure were generally well recognized in the ratings of the year of insolvency (although not necessarily before then). Insolvencies resulting from

overstated assets and catastrophe losses were not as well recognized prior to insolvency. Insolvencies from other causes fell somewhere in between these examples.

Alphabet ratings given to companies with deficient loss reserves and pricing declined steadily over the period reviewed, as the companies' loss experience and recorded loss reserves, themselves, deteriorated. A similar recognition pattern exists for companies with insolvencies caused by a significant change in business.

Other causes of insolvency evidence a different recognition pattern. Companies where alleged fraud was involved, for example, show a stepped pattern with little decline between 3 years and 2 years prior to insolvency, a dramatic decline between 2 years and 1 year prior to insolvency, and then no change between 1 year prior to insolvency and the year of insolvency.

Rapid growth is also a stepped pattern, but with the decline coming in the year of insolvency. Prior to the year of insolvency, there is virtually no change in the percentage of companies receiving alphabet ratings. Reinsurance failure and miscellaneous causes of insolvency provide similar, if less dramatic, examples of this pattern.

Insolvencies from the other two causes, overstated assets and catastrophe losses, display a pattern of little decline in ratings overall and relatively less prediction of insolvency, even in the year of insolvency.

The data presented thus far is based on the ratio of total alphabet ratings to total ratings given, without consideration of changes in the alphabet ratings (e.g. A to B+, etc.). **Exhibits 5, 6 and 7** display the same data shown on a weighted basis, where the weighting scheme counts A ratings as 3, B ratings as 2, and C ratings as 1, all taken as a ratio of total ratings given. There is little difference in recognition patterns produced in this manner.

Changes in Best's rating proficiency over time could distort this analysis somewhat, as causes of insolvency have varied through the years. Nearly all insolvencies arising from alleged fraud and reinsurance failure, as examples, have occurred since 1983. **Exhibit 8** displays by calendar year alphabet ratings as a ratio of total ratings given for the three years prior to, and the year of, insolvency. This data suggests that ratings accuracy has not moved on a long term trend of better or worse but, instead has tracked the underwriting cycles, with the 1976 to 1985 cycle producing the least success overall. This appears reasonable as ratings are

primarily tested in the stress periods of soft markets within the cycles and the 1976 to 1985 cycle contained some of the worst underwriting results in history produced within a very dynamic and difficult environment.

LESSONS FROM HISTORY

Recent property and casualty insurance industry history provides some valuable lessons for the future:

1. Property and casualty insurance is a commodity.

There are, of course, exceptions to this rule, but despite a vast number of attempts at differentiation and market niche development, property and casualty insurance is still primarily sold on the basis of price. This commodity marketplace subjects the industry to "Boom or Bust" profitability cycles. Financial evaluations of property and casualty insurers must look beyond company ratios and should include consideration of the state of the industry at the time the evaluation is made as well as how changing conditions through the cycle may impact individual companies. Evaluations should also explicitly consider that the soft market points of the cycle place greater stress on companies than at other times. Consideration should

given to sensitivity testing of surplus under various scenarios, particularly in reviews conducted prior to and in the midst of the low points in the cycle.

2. Company management is critical.

Some degree of mismanagement has been involved with virtually every property and casualty insurance company insolvency. Future operating results cannot be predicted based solely on financial analysis because future results depend to a great extent upon future actions of management. While financial ratios may allow a great deal of insight into the results of past activities and decisions, often they provide little of the information necessary to predict future insolvency in time to do anything about it. Solvency evaluation should lead to an opinion about the company's prospects in the marketplace, not just an opinion about the company's current financial condition. Therefore, an evaluation of management capabilities and integrity is, in our opinion, essential to solvency analysis of any property and casualty insurer.

Evaluation of management is often very difficult but history provides some guidance. Most importantly, does management have a successful track record in the business activity currently undertaken by the company? Many insolvencies have occurred

because of management inexperience in the specific lines of business or new territories attempted, even when management has been in the insurance industry for a number of years.

Evaluation of management is best accomplished in on-site discussions of company plans, operations and results of past activities. There is no good substitute for these discussions although it may not always be possible depending upon the nature of the relationship. Changes in management and company activities should be monitored. History has shown that the actions which lead to insolvency can occur very quickly although it may take some time for the insolvency to become apparent.

3. Rapid growth means additional exposure.

Rapid growth should be viewed very skeptically. In a commodity market such as property and casualty insurance, rapid growth in premium volume is most easily and most often accomplished through lower pricing. This is particularly true during soft markets. Significant increases in premium volume, particularly in slowly developing lines of business, should be a sign that additional financial evaluation work may be necessary.

Also, rapid growth may include movement into new markets, which

may encompass any combination of new products, new distribution channels, or new territories. Expansion activities are generally undertaken only with a greater amount of risk than is present with ongoing business. Expertise in the new markets may be lacking. Internal short term growth objectives may override longer term profitability concerns. Business plans may be overly optimistic. Management capabilities and attention may be strained by the new activities.

Financial evaluations of rapidly growing property and casualty insurance companies should consider the specific nature of the growth and should include, to the extent possible, analysis and verification of the significant assumptions underlying the rapid growth.

4. Company characteristics should be considered.

Stockholder-owned companies have failed more often than mutual companies. Small and medium-sized companies have failed more often than large companies. Young companies have failed more often than older, established companies. Companies writing certain lines of business have failed more often than those writing other lines of business. These characteristics suggest situations where additional risks may be placed upon companies, some of which may be interrelated. Stock companies, for

example, have generally sought higher returns on equity than mutual companies. This has led to adventures into high risk lines of business. It has also produced short term earnings pressures which may lead to under-reserving of losses. Small and medium companies may face growth pressures and may therefore seek to leverage more aggressively than large companies. Changes within the marketplace may make certain lines of business more competitive and reduce prices, or changes may occur in the interpretation of policy language or in the emergence of losses that create greater risks with respect to certain lines of business at certain times.

Company characteristics, therefore, can be used in constructing a risk profile of the company. Generally the characteristics highlight internal or market pressures at work which may otherwise be difficult to see. Company characteristics should be studied as a means of identifying and evaluating these additional pressures and risks.

5. Past rating weaknesses are a guide.

Our review of Best's ratings in the prior section suggests that overstated assets and exposure to catastrophe losses have been areas of rating difficulty in the past. Additional focus on

reviewing assets, particularly intercompany and other difficult to value assets may be helpful. Additional review of the company's ceded reinsurance program may also be very productive, particularly with companies in limited lines of business or territories of operation.

Historical Best's ratings also suggest that insolvencies arising out of rapid growth and reinsurance failure have been difficult to predict. As previously discussed, we believe that rapid growth in this industry should be evaluated in a very cautious manner. Reinsurance failure is an exposure of very significant proportions and should be examined very closely at regular intervals.

6. The future will not be exactly like the past.

The property and casualty industry in the soft market of 1991 is much different than the industry that existed in the soft market of the mid-1980's. The dangers and concerns of the present may be different than existed then. It is important therefore to consider these differences when evaluating the financial condition of property and casualty insurance and reinsurance companies. Past concerns about cash flow underwriting, for example, would appear to be misplaced in the lower interest environment that exists today.

Today's dangers and concerns include the difficult regulatory environment that exists in some states, particularly for companies offering personal lines insurance coverages. Companies operating in these states may find it difficult to achieve adequate rates. The legal environment in which claims are settled has also been quite difficult in some states. To fairly assess a company's prospects for continued solvency, the reviewer will need to consider where the company is operating and the climate that exists in each of the states where a significant amount of business is written.

Collectibility of reinsurance will continue to be a concern for some time. Reinsurance recoverables constitute a significant portion of industry surplus. Reinsurance difficulties abound and all signs suggest that they will continue, if not worsen. Assessing solvency, therefore may require a greater focus on the financial condition of major reinsurers. Particular attention should be placed on evaluating companies that have significant disputes with reinsurers or reinsureds.

The toxic tort claim situation is worrisome and may very well cause the demise of some insurers. The potential amounts involved in pollution, asbestos abatement and related losses are mind-boggling. Companies with significant exposure to these losses will, at the least, incur large legal defense

costs. Evaluating the financial condition of insurers requires that the reviewer make some determination as to the company's exposures to these claims. This may be difficult because of the age of the coverages under which some claims are made. Insurers are now receiving notice of pollution and asbestos claims from policies written during the 1940's and 1950's, for example.

Captives and risk retention groups may also provide cause for concern at some point. Many of these organizations were formed with limited capital, unrealistic expectations, a lack of insurance experience, and a greater amount of reliance on outside managers than is ideal. These organizations have not received a great deal of regulatory attention to date.

Lastly, changing reporting requirements should have a significant but as yet unknown effect on insurance company solvency. There are a number of recent changes to the statutory annual statement: enhancements to schedules F and P, required actuarial certification of loss reserves, independent CPA audit requirements, and increased disclosures in the footnotes and interrogatories. These new reporting rules require much new valuable information and, hopefully, will result in the reporting of more accurate and reliable information. The new reporting requirements should aid in

reducing the number of insolvencies and, at the least, should aid in the detection of the insolvencies that will occur.

History suggests that surveillance techniques should be exposure-based. The reviewer cannot always predict the future, but a comprehensive evaluation should, at the least, identify exposures that a company faces above established norms or industry averages. This information may be very helpful in identifying companies that face an increased risk of insolvency and that, therefore warrant further attention. In the next section we discuss information that is commonly available and some basic exposure-based analyses that can be performed with respect to loss reserves and reinsurance.

AVAILABLE DATA AND BASIC ANALYSIS TECHNIQUES

It is difficult to think of another industry which produces and files with public agencies the volume of data generated by insurance companies. Annual statements, containing over 80 pages of data (ranging from basic financial information to loss development patterns by accident year and line of business) are filed annually with the NAIC and the insurance department in each of the states where insurers are licensed to write

business. Extensive data is also filed with the Insurance Services Office (ISO). And the industry is closely monitored by a number of rating agencies, including A.M. Best Company, Standard and Poor's and Moody's.

In addition to the abundance of financial and statistical data available on each individual company, there is also a considerable amount of aggregate data available for the industry as a whole (for example, Best's Aggregates and Averages, loss development data produced by ISO and the Reinsurance Association of America, and data available in a wide range of periodicals). The extent of available information and the ease of access to the information should assist in the development of effective surveillance programs.

To demonstrate the effectiveness of fairly simple financial surveillance procedures using information readily available from public agencies, we have analyzed financial and statistical data for a sample of companies which became insolvent between 1985 and 1990. In order to keep the analyses in this paper fairly concise, we have limited our use of available data to the five year historical data exhibit in the annual statement and certain financial and ratio data contained in Best's Insurance Reports - Property/Casualty Edition. As you will see, even using this limited information our analyses

provided sufficient evidence for concern about the financial strength of the companies being analyzed.

The source of our selection of companies was the previously noted Best's Insolvency Study. Of the 372 insolvencies studied by Best, 86 were categorized as resulting primarily from deficient loss reserves/inadequate pricing and 21 as resulting from reinsurance failure. We have accumulated data on 29 of these insolvencies (all occurring since 1985 with 20 identified as deficient loss reserves failures and 9 as reinsurance failures) to determine the degree to which these problems were readily identifiable in the years prior to the companies' insolvencies.

Since our primary concern for each of these companies was the adequacy of recorded loss reserves and the exposure to failure due to reinsurance problems, we focused on the relevant loss reserve and leverage tests used by Best's to evaluate a company's loss reserve position and reinsurance exposure. Currently, A.M. Best uses more than 45 financial tests to evaluate the adequacy of the company being reviewed. For purposes of this study, we used the following four tests:

* **Loss Reserves to PHS:** The ratio of reported loss reserves to policyholders' surplus. This ratio

measures the potential impact of loss reserve deficiencies on policyholders' surplus. As this ratio increases, the adequacy of loss reserves becomes more critical. The normal range for this test is 50% to 150% for companies writing predominantly property risks and 200% to 300% for companies writing primarily long-tailed liability business.

* **Reserve Development to PHS:** The change in the original loss reserves to policyholders' surplus. This ratio measures the size of the company's reserve deficiency or redundancy as a percentage of policyholder surplus. A ratio greater than 25% is considered to be above the norm.

* **Net Leverage:** The sum of net premiums written to policyholders' surplus and net liabilities to policyholders' surplus. This ratio measures the company's accumulated net exposure to pricing errors in its current book of business and errors of estimation in its liabilities in relation to policyholders' surplus. The normal ranges for this test are 2.5 to 4.0 for companies writing predominantly property risks, and 5.0 to 5.8 for companies writing primarily long-tailed liability risks.

* **Gross Leverage:** The sum of net leverage and ceded reinsurance leverage (ratio of the reinsurance premiums ceded, plus net ceded reinsurance balances for unpaid losses and unearned premiums recoverable, plus ceded reinsurance balances payable to policyholders' surplus). This ratio measures a company's exposure to pricing errors, to errors in estimating liabilities and to exposure to its reinsurance. Normal ranges for this ratio are considered to be 3.0 to 5.0 for property writers and 5.0 to 7.0 for longer-tail liability writers.

Exhibit 9 is a graph of the average results of the loss reserve to PHS test for the companies studied as compared to the industry averages over the past five years. As you might expect given the population studied, the companies identified as failing due to reserve deficiencies have ratios considerably higher than both the industry average and the ratios of the companies affected by reinsurance failures. The final year before insolvency has been excluded from this graph as the weighted average ratio of the group soared to almost 25.0. Although the weighted average of the study group for the preceding four years does not exceed 3.2, it should be noted that a significant number of the individual companies' ratios were in excess of the expected norms and industry averages for

this ratio. **Exhibit 15** indicates that for each of the five years preceding insolvency more than 50% of the companies studied exceeded the industry average for the ratios studied and **Exhibit 14** illustrates that, on average, approximately 45% of the companies exceeded the established norm for this ratio during that five year period.

Exhibit 10 was developed from Best's data which measures loss reserve development as compared to a company's policyholders' surplus. We accumulated this information as of December 31 for the years before insolvency for each of the companies studied. As you can see from this graph, the companies studied performed considerably worse than the industry as a whole for the last five years. And, the companies identified as having reserve problems were significantly worse than the companies identified as having reinsurance problems. It is readily apparent that these companies have fairly significant reserve difficulties at the point of observation (the year before insolvency), however, this analysis does not give us an indication of the extent to which these problems were evident in previous years. In order to get this insight, we assembled the data which is summarized in **Exhibit 11.**

Exhibit 11 illustrates the average two year loss reserve development for the study group over four of the years prior

to insolvency (this information was accumulated from the five year historical exhibit in the annual statement filed with regulators). **Exhibit 11** gives us a look at the information available to analysts at that time. As a group, there was significant adverse development of loss reserves during this period (undoubtedly the reason for Best's conclusion that these insolvencies were the result of reserve deficiencies). As illustrated in **Exhibit 14**, the two year loss reserve development exceeded the norms established by Best for more than 35% of the companies in each of the five years preceding insolvency and for more than 80% of the companies in the year prior to insolvency. Although this is not conclusive evidence that reserves held by those companies were deficient at those points in time, it certainly would have given anyone analyzing the financial condition of the companies cause for concern, particularly when considered in conjunction with higher than normal reserve to surplus ratios (as noted above).

Exhibits 12 and 13 provide additional insight into the leverage position of the companies being studied. Exhibit 12 displays the results of the net leverage test for the study group in the years just preceding insolvency. For virtually every year under study, the group exceeded industry averages and either exceeded or were in the upper end of accepted norms. As illustrated in **Exhibits 14 and 15**, a significant number (ranging from 32% to 86%) of the companies studied exceeded the

established norms and industry averages for this ratio during the five year period preceding insolvency. As one might expect, this is consistent with the analysis displayed in **Exhibit 9** which illustrates the average reserve to surplus ratio for the study group. This seems to provide further evidence that the study group was over-leveraged, which, when combined with the variability inherent in the underlying loss reserves (as demonstrated by the historical loss reserve development of the group), made this a very vulnerable group of companies.

As one might expect, the average gross leverage ratios of the study group, as displayed in **Exhibit 13**, also clearly demonstrate the excess leverage of this particular group of companies when compared to acceptable norms and industry averages. It is not surprising to see that the gross leverage position of the companies which were characterized as failing due to reinsurance problems far exceeds that of the other companies in the study group. The extremely high gross leverage ratios as compared to both the industry average and the acceptable norms should have been fair warning of the potential for solvency problems for these companies. The significant increase in the gross leverage of these companies in the last three years of operations could be an indicator of underlying operational and profitability problems which, in the

short term, were being addressed through the increased use of reinsurance. These relationships, at a minimum, provide sufficient cause for additional investigation and analysis of the companies and the reinsurers being relied upon.

Based on the this retrospective analysis of these four basic financial ratios, it is easy to see how one could conclude that many of the studied companies were facing financial difficulties well before they ultimately failed. A large percentage of these companies had leverage ratios (reserve/surplus, net leverage and gross leverage) in excess of both established norms and industry averages. The high degree of leverage increased the companies' exposure to inadequacies in product pricing and loss reserves at the very time when there was clear evidence that loss reserves had been understated during the recent past (as indicated in the development to PHS and two year development to PHS ratios).

SUMMARY

Solvency evaluation can be a difficult and time-consuming task. Indications of exposure to insolvency, however, which are present in ratios and other measures, are often not difficult to develop and may assist in focusing evaluation

efforts. Recent studies have suggested that certain exposure areas have been the principal causes of past insolvencies. In addition, some of the exposure areas have not been well-recognized in the past and deserve close attention in solvency evaluations. The past provides other lessons for the future; we do well to consider these lessons in evaluating property/casualty insurance company solvency. Information to perform evaluations is widely available and can be used to identify companies with the greatest exposure to insolvency. The analyses necessary to identify companies with significant insolvency exposure based upon operations to date is generally not too difficult for certain major causes of past insolvencies like loss reserve deficiencies and reinsurance failures. The indications in these cases will generally be clear.

The most fundamental aspect of solvency evaluation involves specifying the objective of the evaluation. Given the difficulties and limitations present in any evaluation, as well as the significant amount of work involved, a definition and understanding of the goal prior to undertaking the evaluation is critical. Often, this amounts to defining the relationship that exists with the company being evaluated. A company entering into a long term reinsurance contract, for example, has a more difficult evaluation task than exists when the relationship time horizon is shorter. In the end, solvency

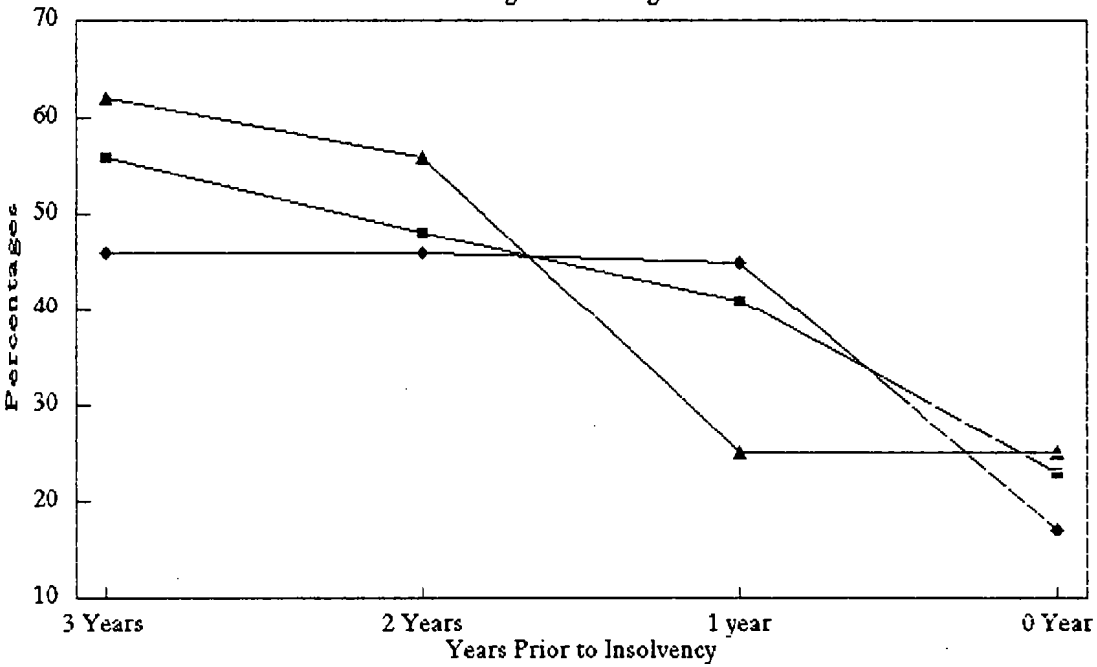
evaluation is most effective when the efforts are focused on the areas presenting the greatest exposures, when the nature and duration of the relationship is properly considered, and when the task and its limitations are approached realistically.

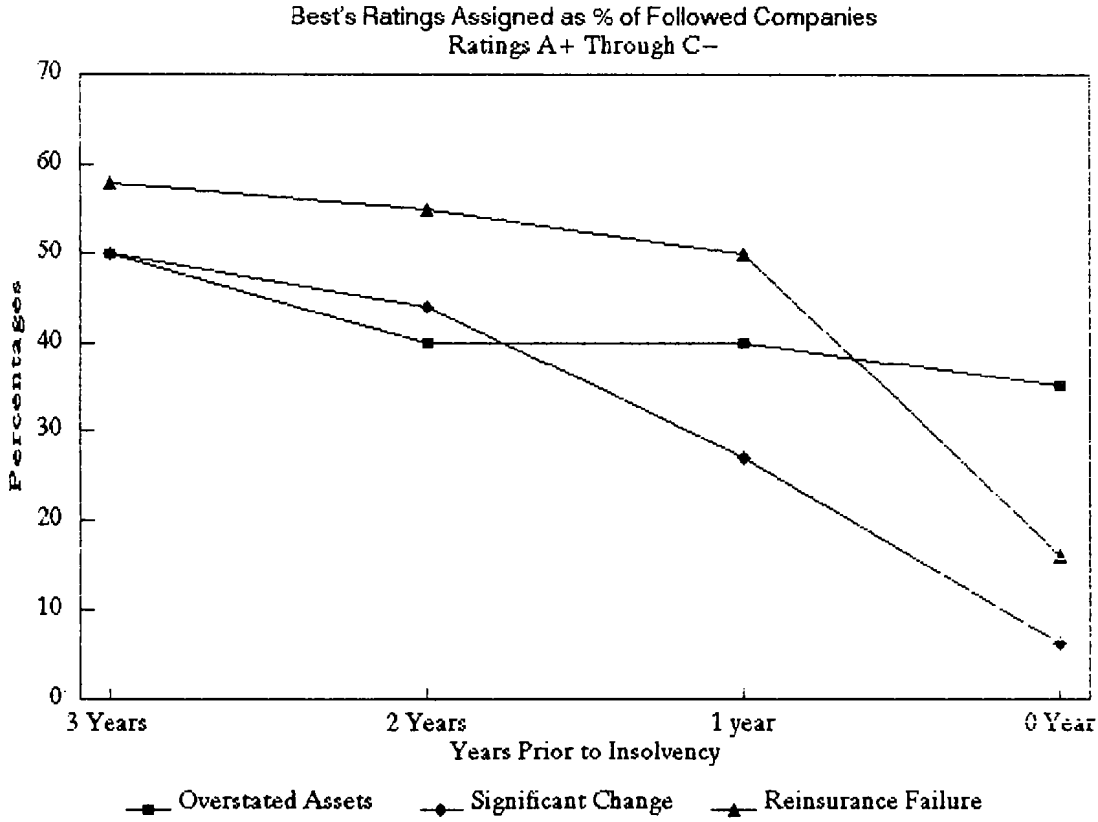
Solvency evaluation can never be precise because all evaluations involve at least some predictions of the future, often based upon actions which have not yet occurred. Solvency evaluation will not, therefore, provide a guaranty from losses due to insurer insolvency. Properly performed, however, solvency evaluation will help to minimize insolvency losses through identification of high exposure situations to avoid and through early detection of those situations which are unavoidable.

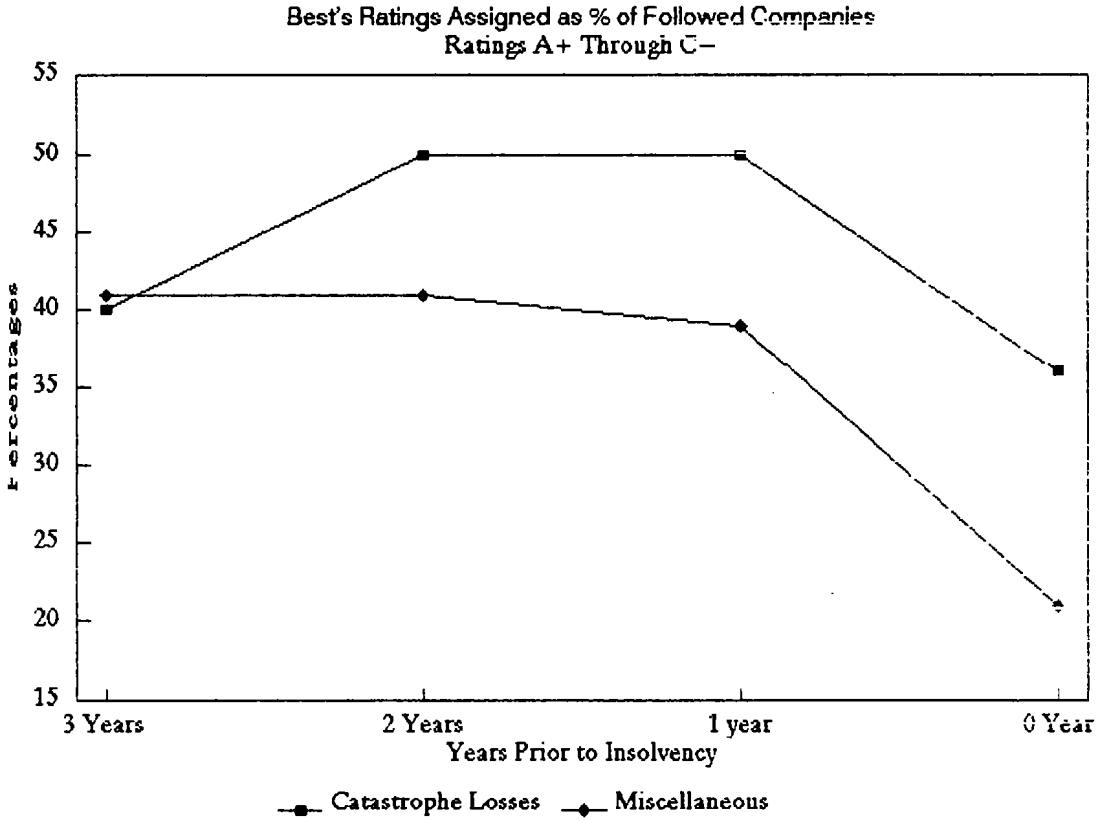
Best's Ratings By Cause of Insolvency Assigned in Years Prior to Insolvency

Cause / Ratings	Prior to Insolvency 3 Years	2 Years	1 Year	Year of Insolvency
Deficient Loss Reserves / Inadequate Pricing:				
A's, B's, C's	36	31	6	3
Other (N/A's)	28	34	39	51
Not Followed	22	21	20	20
Totals	86	86	86	86
Rapid Growth:				
A's, B's, C's	25	26	26	10
Other (N/A's)	29	31	32	49
Not Followed	10	7	6	5
Totals	64	64	64	64
Alleged Fraud:				
A's, B's, C's	8	10	5	5
Other (N/A's)	5	8	15	15
Not Followed	17	12	10	10
Totals	30	30	30	30
Overstated Assets:				
A's, B's, C's	12	10	10	9
Other (N/A's)	12	15	15	17
Not Followed	6	5	5	4
Totals	30	30	30	30
Significant Change in Business:				
A's, B's, C's	8	7	4	1
Other (N/A's)	8	9	11	16
Not Followed	8	9	11	16
Totals	26	26	26	26
Reinsurance Failure:				
A's, B's, C's	11	11	10	3
Other (N/A's)	8	9	11	16
Not Followed	2	1	1	2
Totals	21	21	21	21
Catastrophe Losses:				
A's, B's, C's	4	5	5	4
Other (N/A's)	6	5	5	7
Not Followed	7	7	7	6
Totals	17	17	17	17
Miscellaneous:				
A's, B's, C's	7	7	7	4
Other (N/A's)	10	10	11	15
Not Followed	11	11	10	9
Totals	28	28	28	28

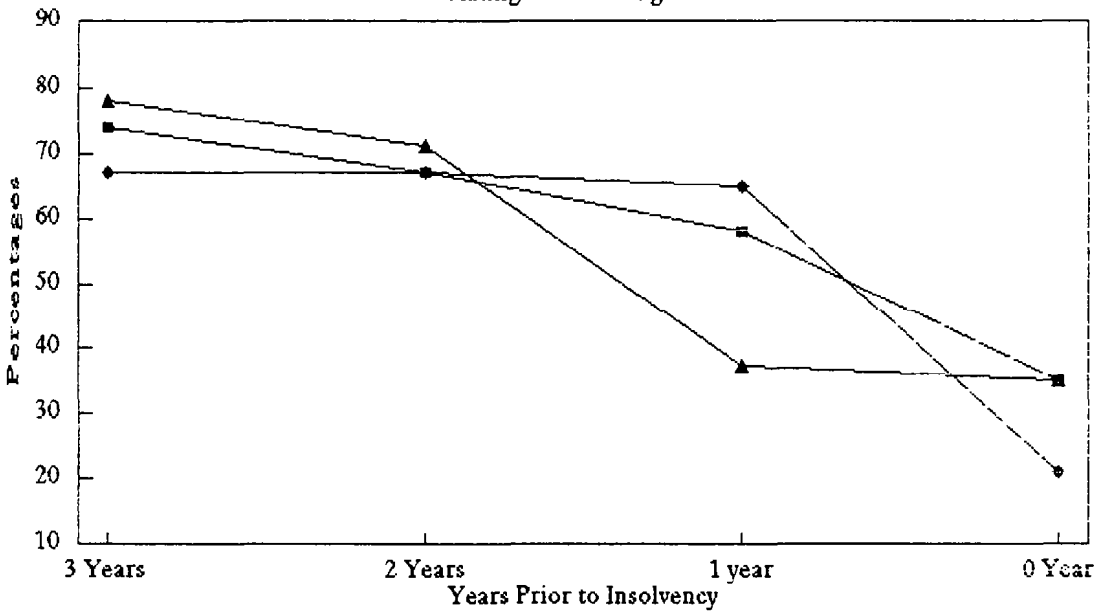
Best's Ratings Assigned as % of Followed Companies
Ratings A+ Through C–




Best's Ratings Assigned as % of Followed Companies
Ratings A+ Through C–
70
60
50
40
30
20
10
0
Percentages
3 Years
2 Years
1 year
0 Year
Years Prior to Insolvency
Overstated Assets
Significant Change
Reinsurance Failure

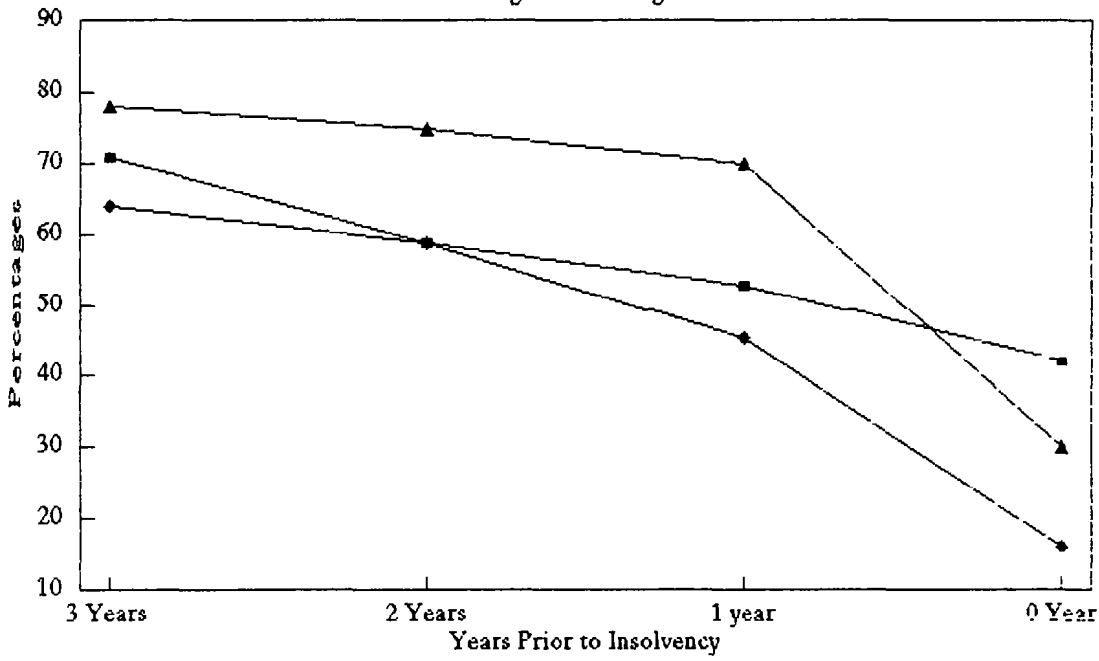

Best's Ratings Assigned as % of Followed Companies
Ratings A+ Through C–
55
50
45
40
35
30
25
20
15
Percentages
3 Years
2 Years
1 year
0 Year
Years Prior to Insolvency
Catastrophe Losses
Miscellaneous

Weighted* Best's Ratings Assigned as % of Followed Companies
Ratings A+ Through C–



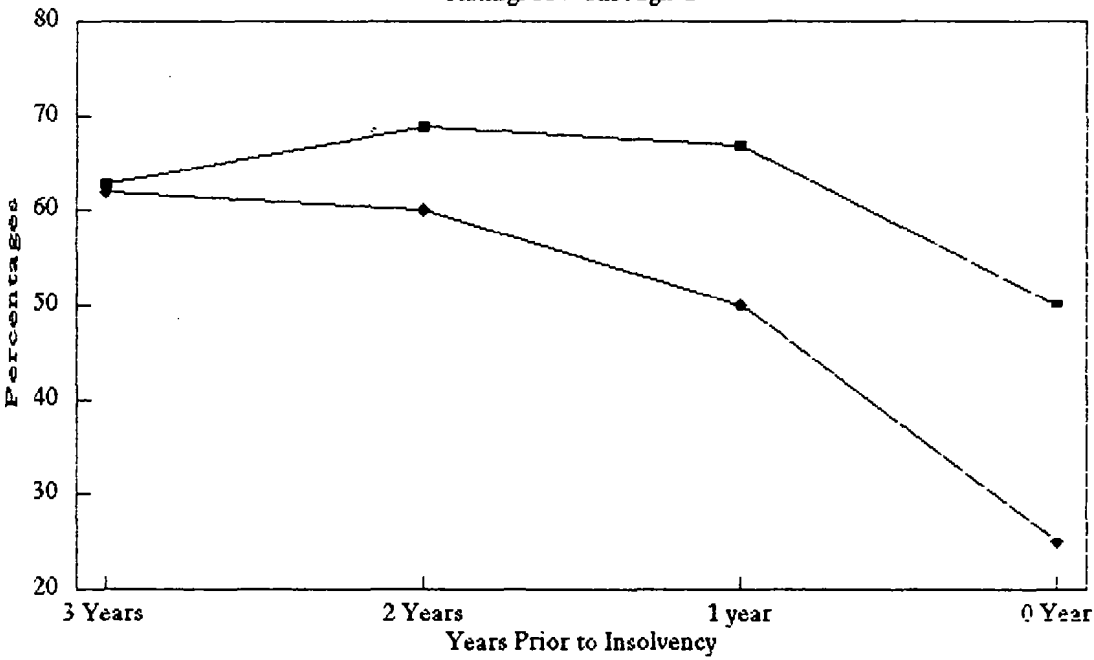
* Weighting calculated by valuing A ratings as 3, B ratings as 2, and C ratings as 1, all as a percentage of total ratings given.

Weighted* Best's Ratings Assigned as % of Followed Companies
Ratings A+ Through C−



* Weighting calculated by valuing A ratings as 3, B ratings as 2, and C ratings as 1, all as a percentage of total ratings given.

Weighted* Best's Ratings Assigned as % of Followed Companies
Ratings A+ Through C–



* Weighting calculated by valuing A ratings as 3, B ratings as 2, and C ratings as 1, all as a percentage of total ratings given.

Ratio of Best's Alphabet Ratings to Total Ratings Given By Calendar Year

Calendar Year	Number of Insolvencies	Prior to Insolvency 3 Years	2 Years	1 Year	Year of Insolvency
1969	6	25%	25%	25%	0%
1970	11	50%	37%	25%	14%
1971	14	50%	50%	40%	27%
1972	4	0%	0%	0%	0%
1973	7	0%	0%	33%	33%
1974	9	40%	33%	50%	17%
1975	29	61%	60%	59%	45%
1976	8	29%	43%	43%	29%
1977	9	75%	50%	50%	25%
1978	7	60%	50%	25%	25%
1979	10	33%	43%	43%	29%
1980	5	100%	100%	0%	0%
1981	9	67%	67%	67%	50%
1982	8	50%	50%	40%	40%
1983	11	40%	29%	29%	29%
1984	26	59%	56%	58%	42%
1985	49	74%	69%	57%	16%
1986	25	71%	75%	40%	11%
1987	19	36%	18%	0%	0%
1988	35	38%	25%	25%	19%
1989	39	24%	25%	21%	0%
1990	32	29%	29%	29%	11%

Exhibit 9
Reserve to Surplus Ratios

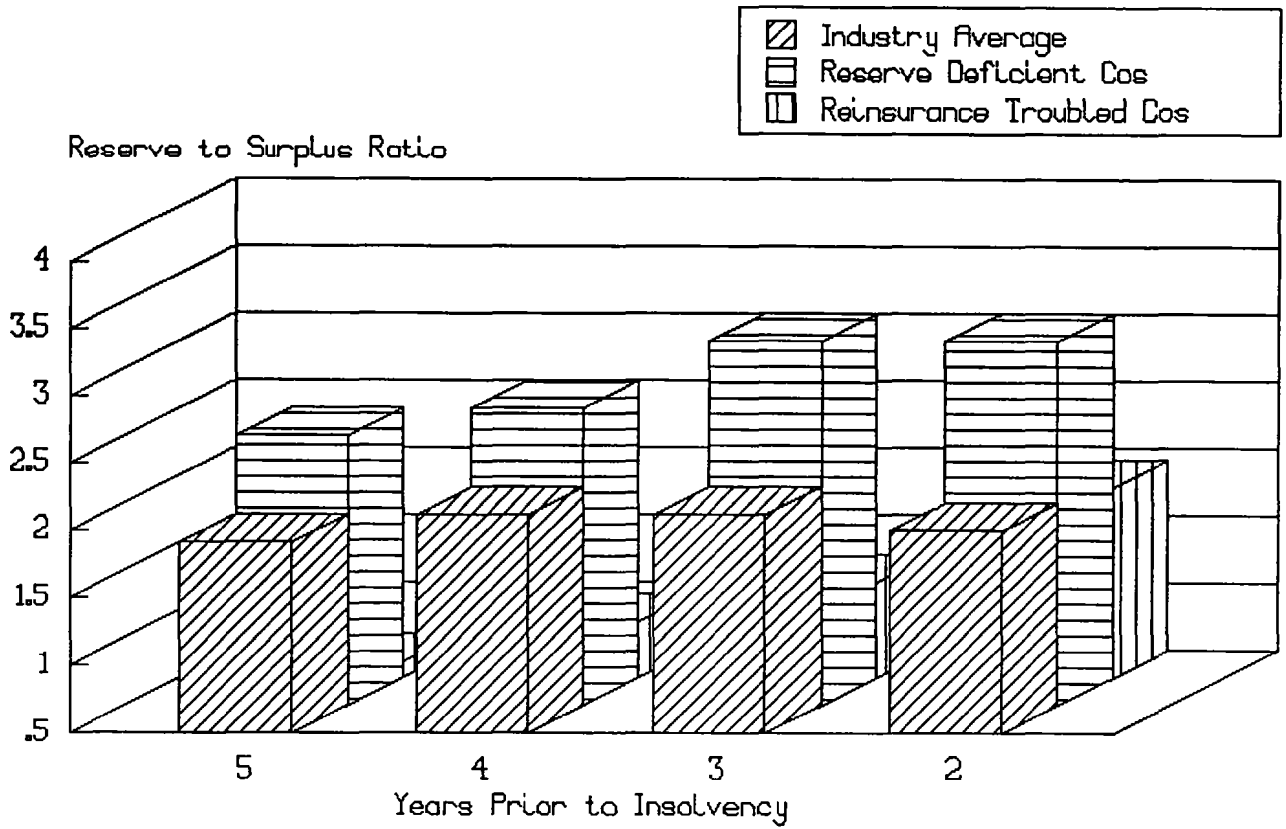


Exhibit 10
Reserve Development to Surplus Ratio

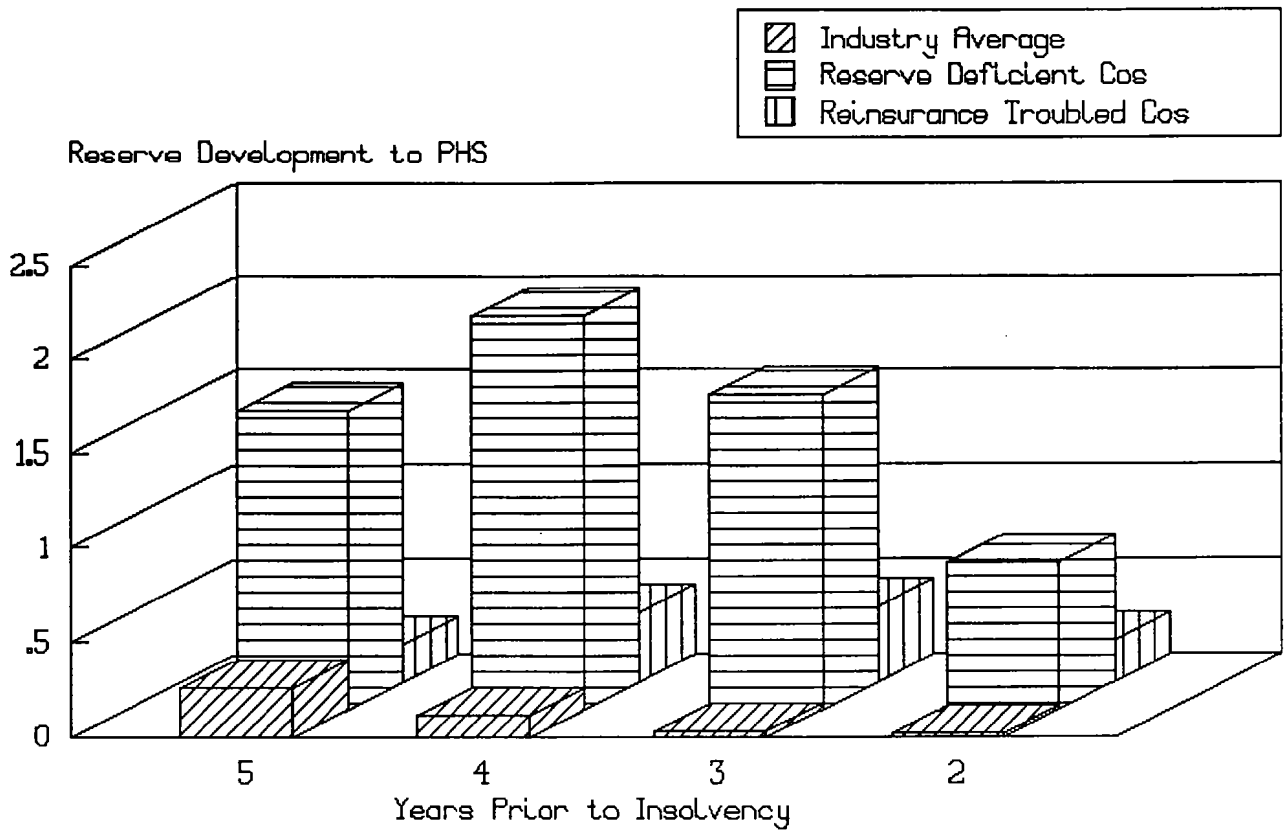


Exhibit 11
Two Year Reserve Development to Surplus

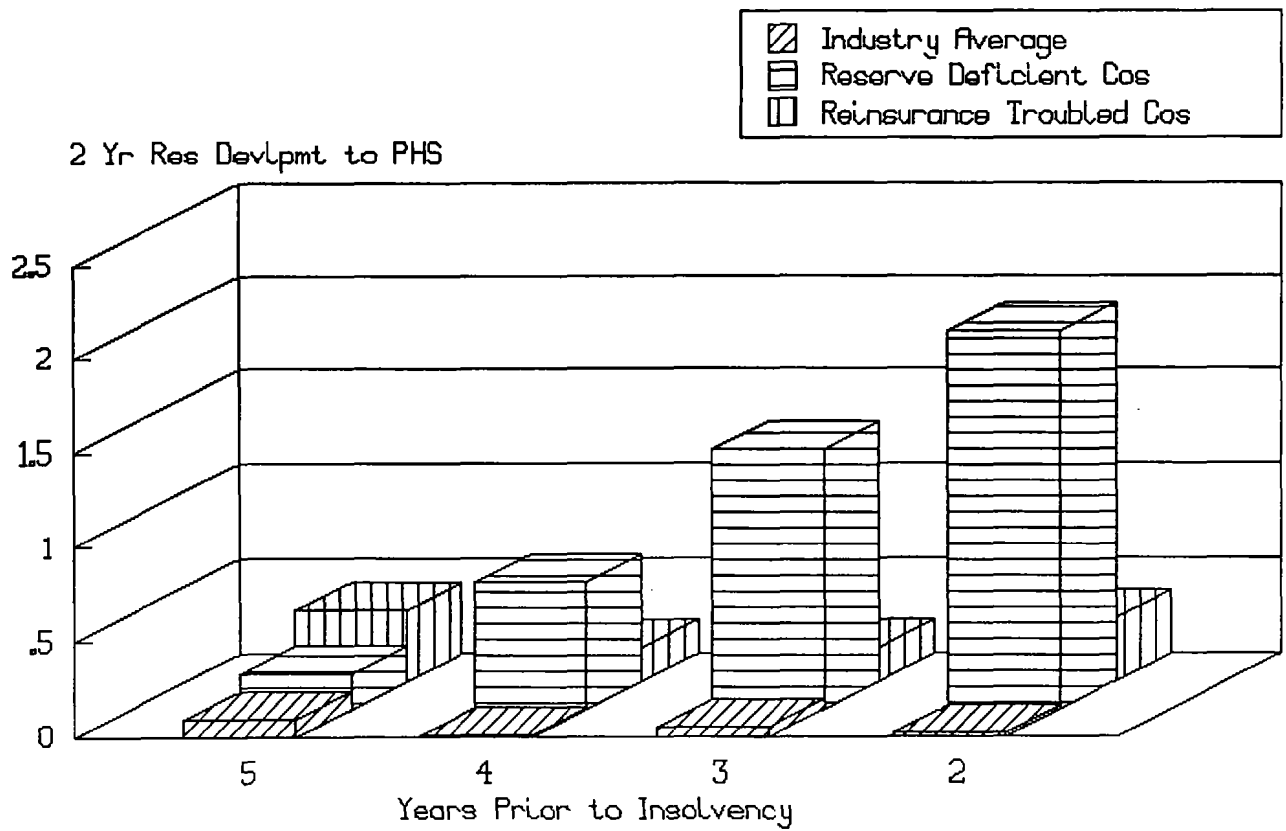


Exhibit 12
Net Leverage Ratio

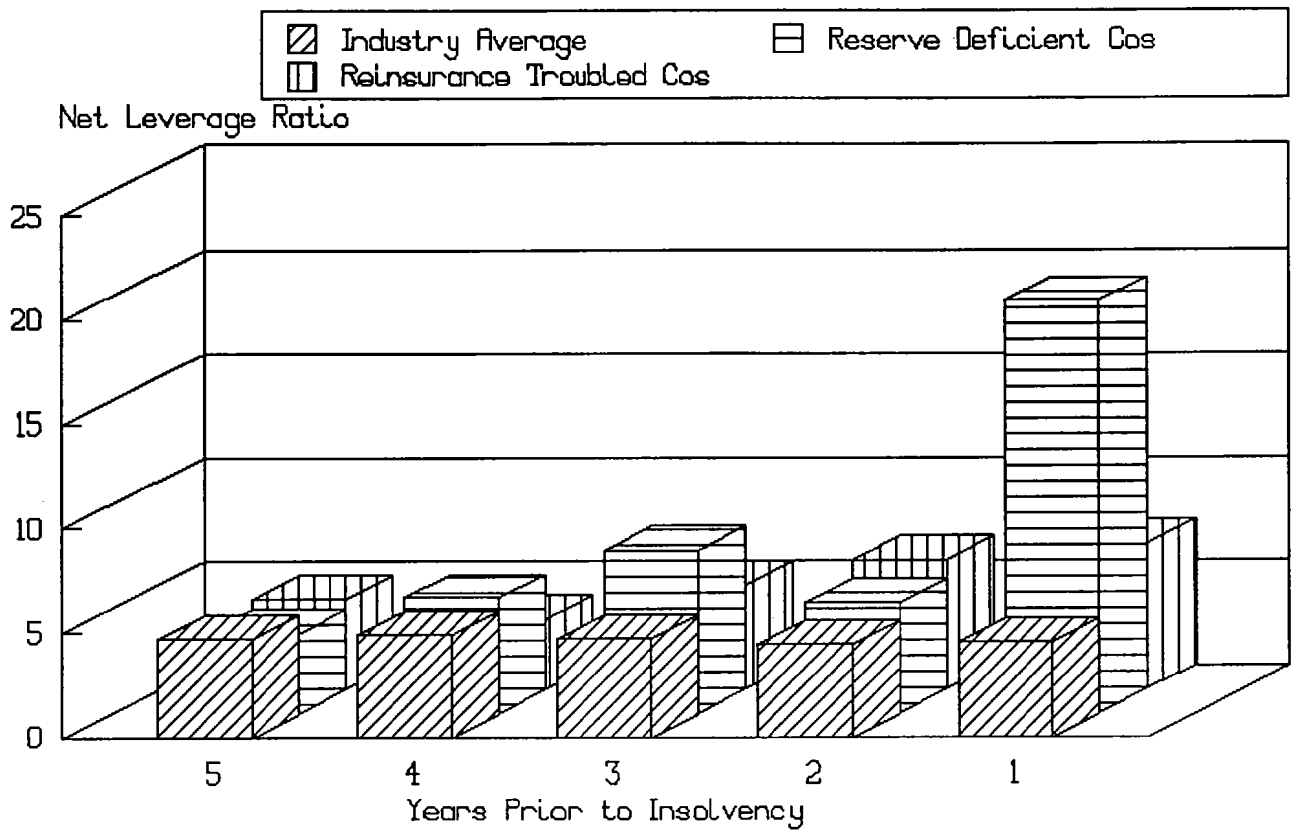


Exhibit 13
Gross Leverage Ratio

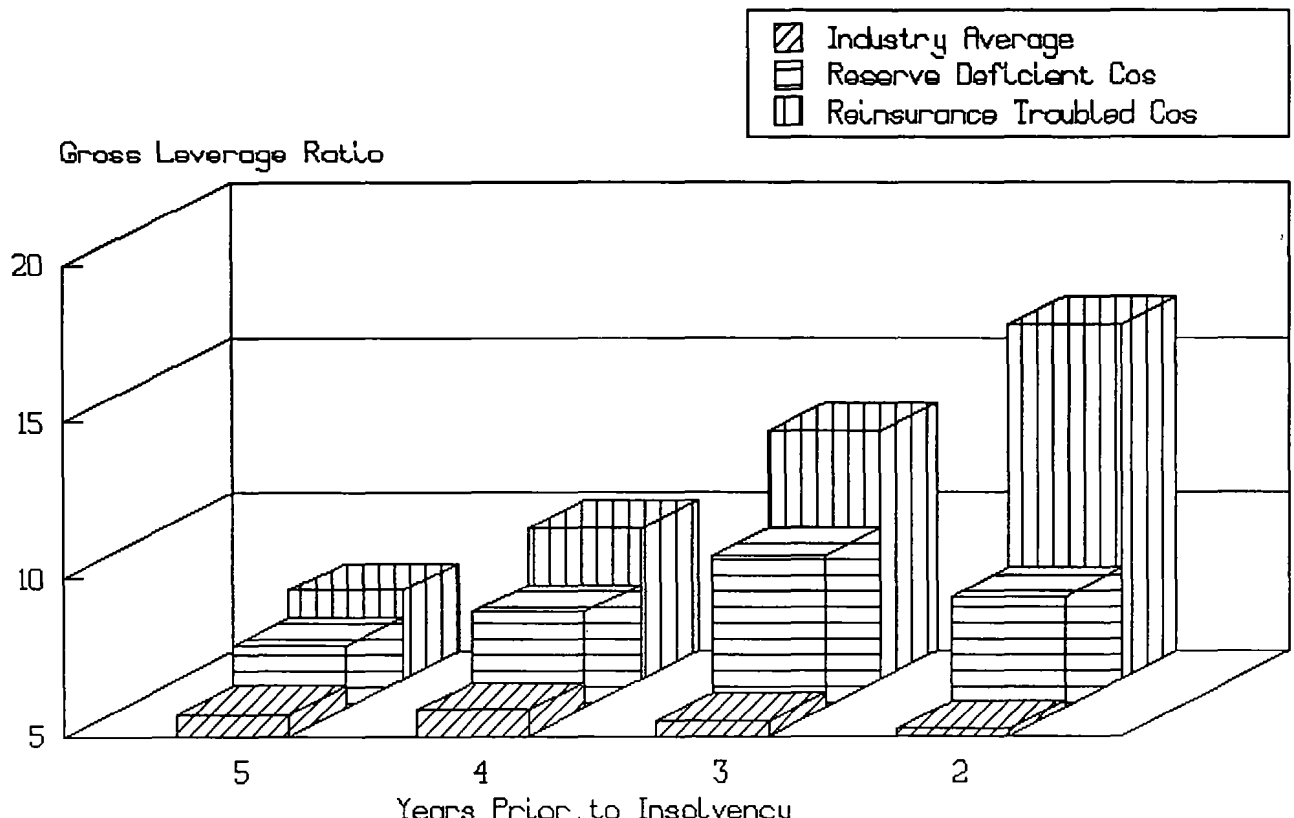


Exhibit 14
Ratios Exceeding Established Norms

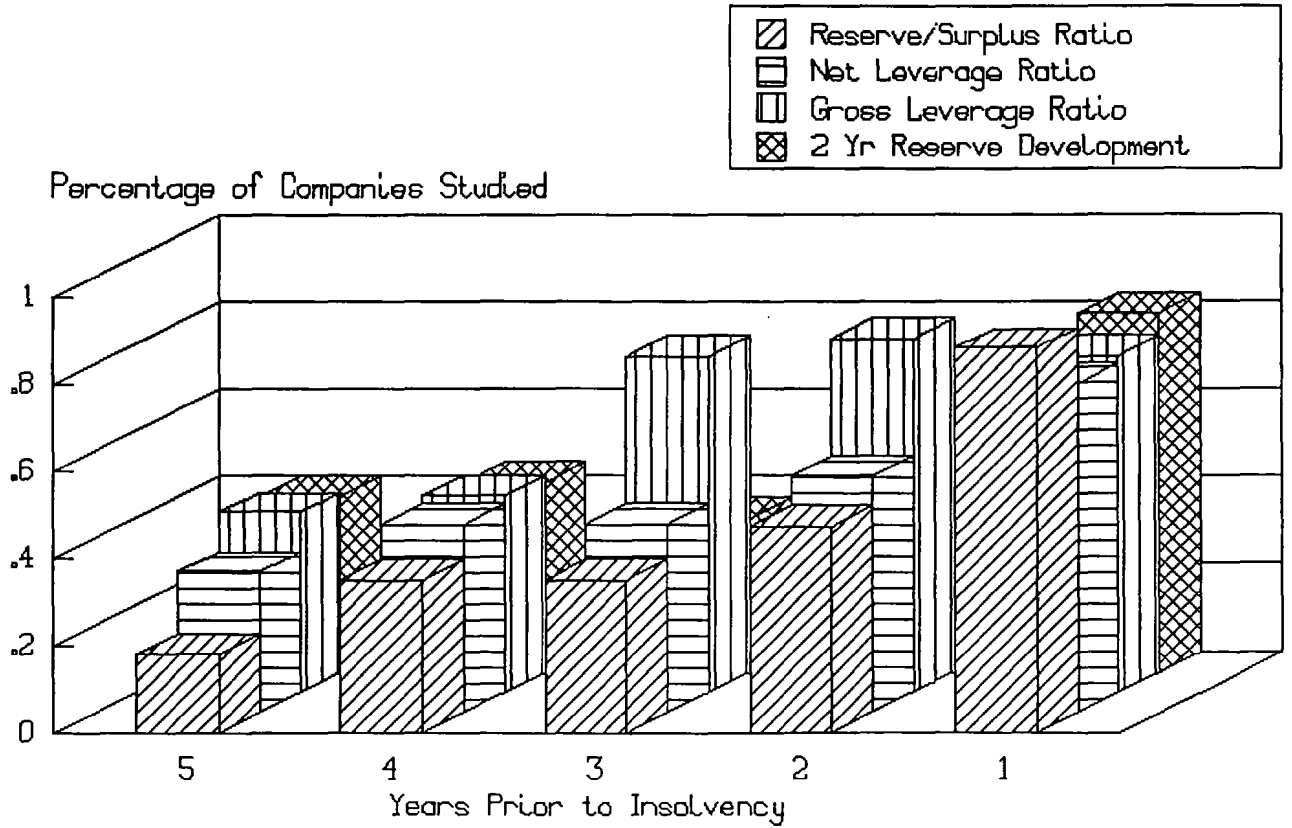
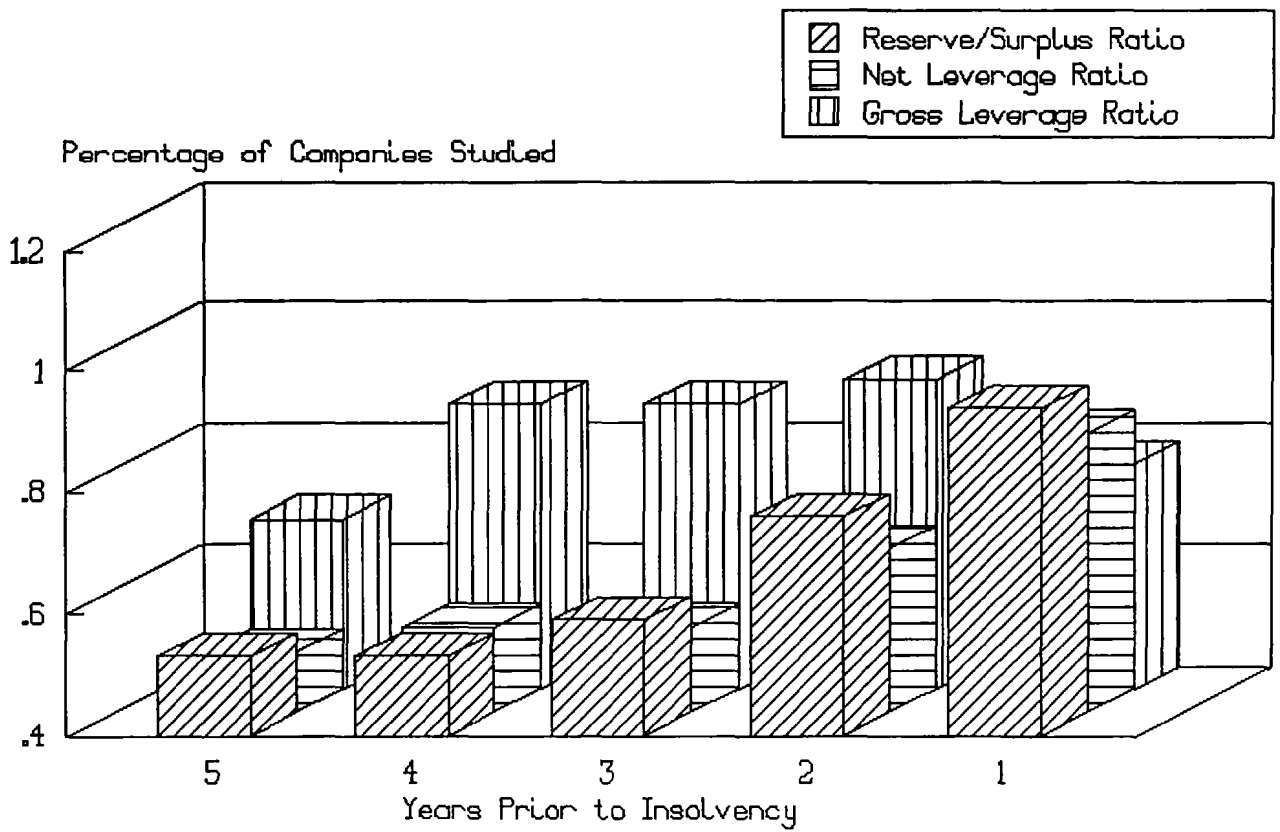


Exhibit 15
Ratios Exceeding Industry Averages



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