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Danger to Life Insurance Companies of Asset Default - C-1 Risk

by Faye S. Albert

The life insurance industry has been under more and more pressure to reduce margins in life insurance contracts. And we have seen these margins go down. Each source of profit in life insurance contracts has been identified to the consumer separately, and competition has appeared in each major area, mortality, interest credited and expense allowance. At the same time, life insurance company managements are reviewing their financial positions and options more carefully. Statutory results are used to check for solvency requirements but have been replaced largely in financial analysis with GAAP. Annual profit or loss figures drive company plans. Quarterly and even monthly progress of results versus plans are monitored. The most efficient use of capital is an increasing concern for these managements, and identification of an appropriate level of capital to be in business is a logical outcome. More attention has been given to directing capital to alternative businesses where the return could be higher. Emphasis on operating results has worked to drive down reserve cushions.

These developments have been a source of concern to regulators whose charge is to assure the solvency of individual life insurance companies.

As a result, state regulators have been looking to the actuarial profession for help to make sure life insurers remain solvent.

Attention has been focused on identification of reserve standards, so

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After the Crash: Statistical Implications

by Aaron Tenenbein

The events of Monday, October 19, 1987, during which the Dow Jones Industrial Average dropped over 500 points, has dramatically changed the world. That day, which is sometimes referred to as Black Monday, the crash of 1987, and often even less complimentary terms, charted the general outlook towards investments. I will try to put the effects of Black Monday into a statistical perspective. It is useful to consider what assumptions and underlying statistical methods were used to analyze investments before Black Monday, and how the assumptions are likely to change as a result of the events of Black Monday.

Distribution of Returns

In many investment analyses, including portfolio selection methods and the determination of the value of options, it is assumed that the rate of return has a lognormal distribution. This implies the following: let R be the rate of return on an equity investment over a given period of time.

Then the natural logarithm of $1 + R$ has a normal distribution. This assumption has some properties which make it amenable for approximating the actual distribution of equity returns, namely:

1. The minimum value of R is -1 . This corresponds to a 100% loss in the investment which is the lowest value which R can take.

2. If the individual returns over a given number of n periods have independent lognormal distributions, then the return over the entire single time frame of n periods also has a lognormal distribution. This is not true for many distributions.

3. The lognormal distribution allows for increased skewness for investments which have a high coefficient of variation (the ratio of the standard deviation to the mean). This implies that the skewness increases as the volatility of the instrument increases.

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a lognormal distribution. The results of Black Monday may have two effects on this pricing methodology. First, if the lognormal distribution is still valid, the option values can be adjusted to take into account the higher volatility of the equities upon which the options are based. Second, if the lognormal distribution is not valid, then the value of the option should be determined under other distributions which may fit the data more effectively.

Summary

It is too soon to forecast the statistical implications of the crash of 1987. However, it is clear that a change has taken place and only time will determine how lasting the effect of this change will be.

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C-1 Risk Cont'd.

cash-flow payments out will be anticipated reasonably and will be accommodated by cash coming in. Fluctuations in the value of assets due to changes in interest rates and changes in demand for insurance company contracts has been one part of the focus: the C-3 risk. A more obvious aspect of this concern is, how will the quality of assets be taken into consideration in setting a proper level of surplus for a life insurance company? The C-1 risk deals with the problem of nonperforming assets.

This article relies on data in the C-1 Risk Task Force Report prepared for the Committee on Valuation and Related Areas; the purpose of the article is to summarize those results and conclusions. Please refer to the full report for supporting data.

The major investment vehicle for insurance companies has been bonds, and performance on corporate bonds has been studied since the turn of the century. By looking at this type of asset where most historical information is available, conclusions will be suggested that may be applicable more generally.

Review of the aggregate results shows there has been a radical reduction in the percentage of outstanding bonds going into default after 1940. It is hard to attribute this change to anything except a dramatic change in the financial environment, that is, drastic decrease in default levels after

1945 are the result of a more stable economy. The U.S. government has learned to provide economic adjustments to help the economy steer a more level course.

The incidence of default can be forecast at the time of issue by risk class. Classes have been set up and differences in the probability of default for different classes successfully recognized over the years by a few different systems. Furthermore, changes in the rating of particular bonds appear to properly reclassify these instruments into categories that will give similar default experience. There has been a lot of discussion about junk bonds and how these are different from the kinds of investments available in the past. In the late 1920s, bonds below investment grade constituted about 20% of the issues. However, probably because of the default experience from the 1930s, there were fewer issues in that category until lately. The recent economic climate and particularly the experience for the last 40 years seem to have made investors bolder and willing to take more of a gamble on the bonds' principal for a greater return. Re-rating an existing bond reclassifies the probability of its performance based on updated information. A newly issued "junk" bond can have the same classification as a downward rated existing issue. There is every reason to expect these two bonds to subsequently exhibit the same probability of default. To the extent that existing statutory provisions adequately mark insurance company surplus for lower quality assets through the mandatory securities valuation reserve, the same should conceptually take care of junk bonds.

How bad is an insurance company hurt by a bond default? Of the total loss in value at the time of default, about two-thirds of that loss existed at the beginning of the year before default actually happened. This must be based on the market being informed of what was coming. Further, after default, many bonds returned to good standing, and there is an average recovered, about 60% of their original value, though results differ and depend on the individual security. Providing surplus for defaults, though, seems less of a problem if only 40% of the asset value is permanently lost rather than 100%. And what was the final financial return for bonds that eventually went into default? The yield was less than prom-

ised, but usually the principal was intact by final settlement. Only issues in the 1920s showed a small negative return, that being .003.

Though diversification is considered important in portfolio management, it does not appear that diversification helps modify the loss results on investment bonds. This can partly be explained because default rates in the major industries are correlated with each other and with the total market, and there isn't a particular difference in returns within major industry divisions. The period during which the investment was made is more important in the default results than the particular industry. This harkens back to the idea that the economic conditions are more predictive of default experience than any other factor. In a stable economy, there are not a large number of defaults. In an unstable economy, default rates soar.

The Task Force suggests that the risk to insurance companies of defaults on junk bonds does not justify setting required surplus levels higher than currently exist. This categorical statement is pretty strong and needs to be watched. However, as long as default rates on total bonds are less than 1.5%, it does not appear imprudent.

Faye S. Albert is a Consultant for life insurance companies in Miami, Florida. She was a member of the C-1 Risk Task Force and moderated a session on that topic at the 1987 New York spring meeting.

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