Credit Risk Research
Private Placement Bonds and Commercial Mortgage Loans

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Summary

The Society of Actuaries, with the co-operation of the American Council of Life Insurance, is sponsoring a Credit Risk Research Study to investigate the credit risk experience of insurance company investments.

This study has three broad goals:

(1) To establish a common, rigorous methodology for defining "credit risk events" and for calculating their costs.

(2) To produce two separate 1986-1989 intercompany experience studies of the credit risk losses - one for private placement bonds; one for commercial mortgage loans.

(3) To establish an ongoing process to collect similar intercompany experience data for the 1990 experience year and forward with appropriate refinements in methodology and data specifications.

Traditionally, asset default studies have looked at either the incidence of default (number of defaults) or losses of par value. In the SOA/ACLI 1986-1989 studies, the losses associated with credit risk events are determined by comparing at the time of the event (e.g., default, restructure, foreclosure) the then present value of the remaining cash flows of the original investment to the present value of the cash flows ultimately to be received. Loss experience will be analyzed for different characteristics of exposure, including, for example, time since issue and quality rating.

It is anticipated that all data for the 1986-1989 studies will be submitted by the end of 1990 and that an analysis of results will be available for presentation by the end of March 1991.

Society of Actuaries in Cooperation with the American Council of Life Insurance

Résumé

Recherche sur le Risque de Prêt Bons de Placement Privés et Prêts Hypothécaires Commerciaux

La Société des Actuaires, en coopération avec le Conseil Américain d'Assurance sur la Vie parraine actuellement une Etude de Recherche sur le Risque de Prêt afin d'enquêter sur les résultats passés, en matière de risque de prêt, pour les placements effectués par les compagnies d'assurance.

Cette étude à trois objectifs généraux:

(1) Etablir une méthodologie rigoureuse et commune pour définir des "cas de risque de prêt" et pour calculer leurs coûts.

(2) Produire deux études séparées d'expérience inter-entreprises 1986-1989 de pertes de risque de prêt - l'une pour les bons de placement privés; l'autre pour les prêts hypothécaires commerciaux.

(3) Etablir un processus continu pour rassembler des données d'expérience inter-entreprises similaires pour l'année d'expérience 1990 et au-delà avec des améliorations de méthodologie et de spécifications de données appropriées.

Traditionnellement, les études de défaillance d'actifs se sont intéressées soit à la fréquence des défaillances (nombre de défaillances) ou aux pertes du montant nominal. Dans les études 1986-1989 de SOA/ACLI, les pertes associées aux cas de risque de prêt sont déterminées en comparant à la date de l'événement (ex: défaillance, restructuration, forclusion) la valeur actuelle à cette date des cash-flows restants du placement original et la valeur actuelle des cash-flows à recevoir à la fin. L'expérience de perte sera analysée du point de vue des différentes caractéristiques de risque, y compris par exemple, la durée depuis l'émission et l'évaluation de qualité.

Il est prévu que toutes les données pour les études 1986-1989 seront soumises d'ici à fin 1990 et qu'une analyse des résultats sera disponible pour présentation fin mars 1991.

INTRODUCTION

The Society of Actuaries, with the co-operation of the American Council of Life Insurance, is sponsoring a Credit Risk Research Study to investigate the credit risk experience of insurance company investments. From the beginning, it has been anticipated that such an effort would be co-sponsored and co-managed by a group comprised of actuaries and investment professionals.

The study establishes a common definition for credit risk events and a common actuarial methodology for quantifying the cost of credit risk events incurred over given units of time. The study identifies asset characteristics believed to influence credit risk. It then develops a process for gathering and evaluating intercompany credit risk data according to these characteristics, using the proposed definition and cost quantification methodology. Ultimately, these credit risk and associated cost data will be gathered and presented in periodic reports in a manner similar to Society of Actuaries Experience Studies for mortality and morbidity.

For the initial phase of this study to be manageable and productive, it will focus on private placement bonds and commercial mortgage loans. Private placement bonds and commercial mortgage loans represent a significant portion of the fixed income securities owned by life insurance companies. In spite of these large holdings, there does not appear to be any published, direct data from which the credit risk can be assessed for these securities.

Although there have been numerous studies performed on the asset default experience of public bonds, these studies do not provide information that is directly transferable to the study of private placements and commercial mortgages. Analysis to date suggests that the incidence and behavior of the credit risk for private placements and commercial mortgages is different from public bonds. Private placements and commercial mortgages are generally illiquid, are restructured prior to default much more frequently than public bonds, and typically have more covenants and/or collateral designed to control the risk of default better than public bonds. In addition, studies on public bonds often omit the disclosure of critical definitions and assumptions, use inconsistent methodologies for evaluating the default experience and have generally not included the total cost of default. For example, the costs of restructuring prior to default are often ignored (largely due to lack of accessible data), and the economic value of the original scheduled payments relative to market yields available at restructure, sale or final settlement is not taken into account.

Also, current insurance company accounting information is not an adequate source of credit risk data. Companies use different definitions of credit

risk and different accounting conventions for recording default losses. Neither statutory nor GAAP accounting data provide a complete quantification of the cost associated with credit risk.

A.   Why a Credit Risk Research Study Needs to be Initiated

It is important to initiate a study now because the insurance business has changed, both in the products it sells and in the way it invests. For a major portion of the insurance industry's business, investment risk, especially credit risk, may be the dominant risk.

Not only have the products and investment strategies changed, the investment environment also has changed. Insurance companies and other financial institutions have been developing the means to operate in this new environment. The 1980s have witnessed the development of sophisticated interest rate modelling and cash flow matching techniques. Prudent application of these techniques, together with well designed products and investments, can mitigate the losses due to cash flow deviations resulting from volatile interest rates.

Since 1980, real interest rates have been higher and much more volatile than they were in the past. This makes debt service more difficult and the economic value of missed payments more costly. Hostile takeovers and leveraged buyouts (LBOs) have weakened many corporate balance sheets. High yield bonds have proliferated and have increasingly found their way into insurance company portfolios. Real estate markets in many geographic areas have been overbuilt and remain soft, resulting in historically high levels of delinquencies and foreclosures on mortgage loans.

Thus, credit risk is arguably the primary risk facing insurance companies with respect to their vast liabilities supporting investment-oriented products. A comprehensive credit risk cost data base does not now exist to show the full extent of current cost levels and the variability in these cost levels by asset type, credit rating, age of asset, etc. The result is that it is difficult to manage this risk most effectively. This can lead to difficulties in pricing, reserving and setting of surplus standards. Indeed, the NAIC has shown its concern about this issue by its re-examination of the methodology behind the Mandatory Securities Valuation Reserve (MSVR). It is important, therefore, that this study begin producing useful information quickly.

The project will proceed along two paths - one prospective and one retrospective. The longer term goal of the project is to design an ongoing process for collecting and analyzing credit risk information

routinely and consistently. To facilitate the development of this prospective study, and to provide useful information about the recent credit risk experience of the life insurance industry, a study of the calendar years 1986-1989 will also be performed. This historical study is explained in more detail in the following section.

B.   Expected Benefits of Ongoing Credit Risk Experience Studies

The benefits of collecting and reporting credit risk data are far-reaching. With these data in hand, the industry at large - regulators, companies and consumers - can:

1.   gain a greater and fuller conceptual understanding of credit risk;

2.   develop a benchmark of reliable information useful in assessing the relative value of alternative fixed income asset classes and of assets in various credit rating categories, which would be useful in making portfolio management decisions and in establishing credit ratings;

3.   obtain a greater understanding of the character of credit risk, which will lead to rationally established reserve standards and more informed pricing decisions and evaluations of surplus adequacy; and

4.   monitor experience year-by-year to determine if the industry's losses from credit risk are improving or deteriorating.

The goals of the 1986-1989 Credit Risk Study are:

1. to produce meaningful credit risk information from currently existing data;

2. to assess the readiness of companies to participate in an ongoing intercompany credit risk experience study;

3. to gain experience in the design and implementation of an intercompany credit risk study; and

4. to generate further interest and support for ongoing credit risk studies within the actuarial and investment communities.

To perform the historical study, the nature and scope of currently available data needed to be assessed. Each member of the Society of Actuaries Credit Risk Project Oversight Group (POG) discussed the availability of data with investment professionals in their respective companies. Once data availability was determined, the following components of the study were developed:

o   Definition of Credit Risk Events

o   Loss Calculation Methodology

o   Development of Exposure

o   Credit Risk Event Data

o   Means for collecting, compiling and analyzing the data

o   Expected Output, including identification of various risk factors by which the loss experience could be broken down

Each of these components is discussed in detail below.

A. Definition of Credit Risk Events

The occurrence of any of the following will be considered a Credit Risk Event:

1. Failure (other than for known non-credit-related reasons, such as administrative problems) to make payments of interest or principal under the terms of the contract; also, for private

placement bonds, Chapter 7 or Chapter 11 bankruptcy of borrower;

2.   Modification of the principal or interest terms where the lender agrees to new terms to avoid expected future losses from failure to pay interest and/or principal under the terms of the contract; and

3.   Sale of the investment before maturity because of concerns about deteriorated credit, if the purpose of the sale is to avoid expected future losses from failure to pay interest and/or principal under the terms of the contract.

The incurral date of the Credit Risk Event is the earliest of the date of the first missed payment, the date of modification of the principal or interest terms, date of sale or the bankruptcy filing date.

The loss calculation date is the earliest of the date of the first missed payment, the date of modification or the date of sale; i.e., in the case of bankruptcy prior to default, rather than being the bankruptcy filing date, the loss calculation date is the date of the first missed payment, or if earlier, the date of modification or the date of sale of the asset.

Note that the opportunity cost associated with the call of an asset in a low interest rate environment is excluded as a credit risk loss because the call is an exercise of the borrower's right and is therefore not credit related.

There was common agreement that these three definitions represent credit risk events. However, there is still the issue of how to determine when one of the definitions has been met. Also, with respect to modifications and sales, how does one compute the value of the remaining originally scheduled cash flows and any restructuring of these cash flows; e.g., what interest rate? what probability rates of actual payment?

To assure the integrity of the credit risk data, the POG decided that a standardized methodology, which would be applied by a central compiler, was needed. For this to work, companies would need to submit data on all sales and modifications. This would be the preferred approach, provided the amount of data associated with this approach is manageable and that the participating companies are able to provide the required data items. While the POG would like to capture all restructures and sales, the practicality of the situation is that credit risk events that are clearly identified as such are more important to the study than economic conditions or the

exercise of certain contractual rights.

Through more indepth discussions, it was determined that companies would not be able to provide the required data for every sale and restructure for a historical study. Therefore, for the historical study, companies will be asked to submit data only for those modifications, sales and other events that they have determined are credit risk related.

For the ongoing study, it is anticipated that data on all modifications and sales will be requested. The oversight committee will develop the standardized methodology for determining which modifications and sales represent credit risk events.

B.   Loss Calculation Methodology

Traditionally, asset default studies have looked at either the incidence of default (number of defaults) or losses of par value. It has been determined that losses of par value alone do not appropriately account for credit risk losses because the market value of the investment at the time of loss and the lost interest are not accounted for. Therefore, it is proposed that the losses associated with credit risk events be determined by comparing the present value of the remaining cash flows of the original investment to the cash flows of the new investment at the time of the asset exchange, e.g., restructure, foreclosure.

To compute the loss for each investment that meets one of the definitions of a credit risk event during the calendar years 1986 through 1989, all information known about those events as of the reporting date of the data request, July 1, 1990, will be used.

The development of the applicable interest rates used to determine the outstanding economic value of the original asset and any modification will be a critical component of the project. The ultimate quantification of the losses will depend upon the interest rates used to calculate the present value of the cash flows.

There are several alternatives for developing these interest rates. The alternative that was selected is to use weekly average Treasury rates, varying by term of maturity, as the base. Then, a margin calculated to reflect the spread for Private Placement Bond and Commercial Mortgage Loan investment rates over Treasurys will be added to the base rate. This margin is to reflect the average commitment or reinvestment rates relative to Treasurys for all the companies participating in the study. Ideally, these margins vary by the calendar week during which the credit risk event occurred, by remaining duration and by quality rating (comparable methodology

will apply to Canadian bonds and mortgages included in the study).
To the extent possible, the resulting rates will be compared to ACLI
data for reasonableness.

C.   Development of Exposure

The exposure base represents the total holdings for those
investments included in the study during the study period. Since
the study period is the calendar years 1986 through 1989, the
exposure data must allow for the calculation of the holdings to be
used as the exposure base for each year of the study period. Thus,
the inventory of holdings begins with December 31, 1985 and extends
to December 31, 1989. Year ends were selected to facilitate data
collection using Schedules B and D of annual statements.

The major issue associated with the exposure was the list of
investment risk characteristics to be analyzed. There was general
agreement that quality was a key predictive characteristic.
Unfortunately, not all of the companies could provide quality at
issue for all the holdings to be included in the exposure base.
Therefore, an alternative was needed.

For Private Placement Bonds, it was determined that each company
would submit, along with each year end's exposure data, an estimate
of the distribution of the most recent quality evaluation of their
holdings. For example, the XYZ Insurance Company might submit the
following for holdings as of 12/31/YY:

o	15% rated AAA
o	25% rated AA
o	20% rated A
o	20% rated BBB
o	15% rated BB
o	5% rated B
o	0% rated < B

where these rating categories were generally consistent with Moody's
or S&P type bond ratings. Since the most recent quality ratings
will be available for those investments that are identified as
credit risk events, it will be possible to develop at least a modest
relationship between most recent quality rating and credit risk
experience.

For commercial mortgages, the discussion centered on surrogates for
quality such as loan-to-value ratios, interest-coverage ratios,
yield spreads relative to Treasurys at issue, financial strength of
borrower, management ability, and credit income or enhancements.
Many felt that these characteristics were important predictors of

quality concerns. If these data could be gathered for the exposures and the credit risk events, relationships could be developed between loss rates and these surrogate quality identifiers.

The availability of other exposure characteristics varied by company. Therefore, a minimum set of data was identified which would be required for the historical study.

In addition to the minimum data sets companies are being asked to provide as much of the data detailed in the instruction sets as possible for all years. By getting as much as possible now, the data base for the ongoing study will be easier to develop.

D.   Credit Risk Event Data

Data associated with credit risk events can be split into two general categories; data needed to relate the event to its investment characteristics in accordance with the exposure base and data needed to calculate the cost of the event. The data needed to relate the event to the exposure base are essentially the same as for the exposure base itself.

To calculate the actual cost of each credit risk event, the following additional information will be needed:

1.   remaining scheduled cash flows (dollars and dates) of the original investment, on or after the loss calculation date defined above; and

2.   actual cash flows (dollars and dates) received from the loss calculation date to the report date of July 1, 1990; and

3.   expected cash flows (dollars and dates) from all new or restructured fixed income investments received in connection with the original investment, from the report date to the new expected maturity dates of such investments; and

4.   market values or expected cash flows (dollars and dates) for all non-fixed income assets received in exchange for the original investment and still held as of the report date; and

5.   actual or estimated direct, "out-of-pocket" expenses associated with the credit risk event.

The market values associated with equity type assets, such as property, may be hard to estimate. Companies will provide their own current estimates. It is expected that the data will be revised for future study years as either better estimates or actual results

become available.

E.   Compilation and Analysis of the Data

After a discussion of the various approaches to the compilation and analysis of the data, the consensus of the actuaries and investment professionals was to use a central compiler. Data specifications have been prepared and MIB, Inc. has been selected as the central compiler for this project. MIB is well known within the insurance industry and has worked closely with the SOA for many years on mortality and morbidity experience studies. While MIB will be involved in the data processing, the actuaries and investment professionals will specify the types of analyses, comparisons and output for the study.

F.   Output

The output will present the compiled data in summarized form split between Private Placement Bonds and Commercial Mortgage Loans. Loss rates will be developed for the different categories of the exposure, including, for example, length of time since issue, and Canadian or U.S. investment.

Data will be presented as the aggregate of all the companies' submissions. Results will be presented to each individual participating company on the following basis: all companies, that individual company, and all companies except that individual company if requested.

Reporting ratios by company would show the range of company portfolio characteristics by quality, industry, maturity, location, etc., as long as the identities of individual companies can not be ascertained. This data could be useful in assessing the homogeneity or diversity of insurance company portfolios. However, the confidentiality of individual company data has the highest priority.