1986-98 Credit Risk Loss

Experience Study:

Private Placement Bonds

by the

Private Placement Committee

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I. EXECUTIVE SUMMARY

The 1986-98 Credit Risk Loss Experience Study represents a continuation of the 1986-94 study analyzing credit loss experience by institutional investors on private placement bonds. This continuing study is being conducted under the auspices of the Society of Actuaries and involves nineteen institutional investors altogether, but between seven and fifteen in any given year, which accounted for between 25% and 44% of outstanding life insurance company private placement bond holdings during the study period.[1] The study measures incidence rates, loss severities and economic loss rates associated with credit risk events for privately placed debt during the years 1986-98. Private placement loss experience is broken down along a variety of dimensions, such as by year of funding, bond rating, etc., and is compared to loss experience for publicly issued bonds. In addition to the final report, institutions that contributed data to the study receive confidential reports comparing their experience against the aggregate experience. New contributors are welcome to join in the study.

Although the years 1986-98 arguably include a complete economic cycle, the period includes only a single major credit downturn and care must be used in interpreting and using the results. The study is not meant as a prediction of future loss experience on private placements.

The body of the report provides the complete background, results and analysis. This Executive Summary summarizes the main results, which include:

- Economic loss rates more than doubled between the periods 1986-90 and 1991-92 and then dropped to low levels in 1993-98.
- Over the period studied, private placements with internal credit ratings that equate to AAA/Aaa through BB/Ba at the start of each year had loss experience similar to publicly issued bonds. Although such assets experienced greater incidence or default rates, they had better loss severities than public bonds on average, leaving loss rates about the same.
- Private placements with a most recent quality rating of B or riskier offered superior experience relative to public bonds with respect to all of incidence or default rates, loss severities, and economic loss rates.
- Contributors' internal credit ratings of placements and NAIC[2] ratings are complementary and credible in that each type of rating has incremental predictive power for loss rates. Moreover, loss experience by both types of ratings tracks the well-documented experience of publicly issued bonds.
- Loss severities for individual credit events are widely distributed and hard to predict but, on average, loss severities for senior debt are smaller than subordinated debt severities.
- Restructurings appear to carry lower loss severities than defaults on average.

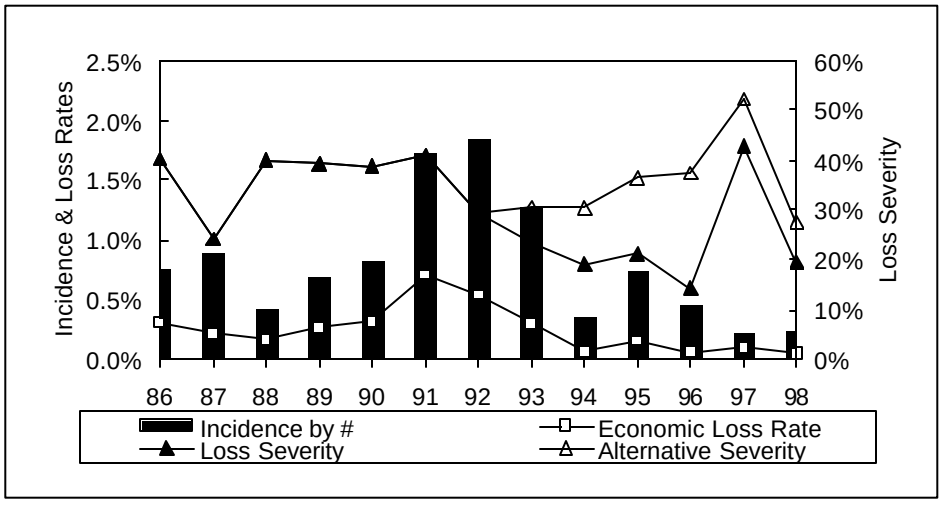
[1] The percentages consider only general account assets, and are based on data compiled and estimated by the American Council of Life Insurers ("ACLI").

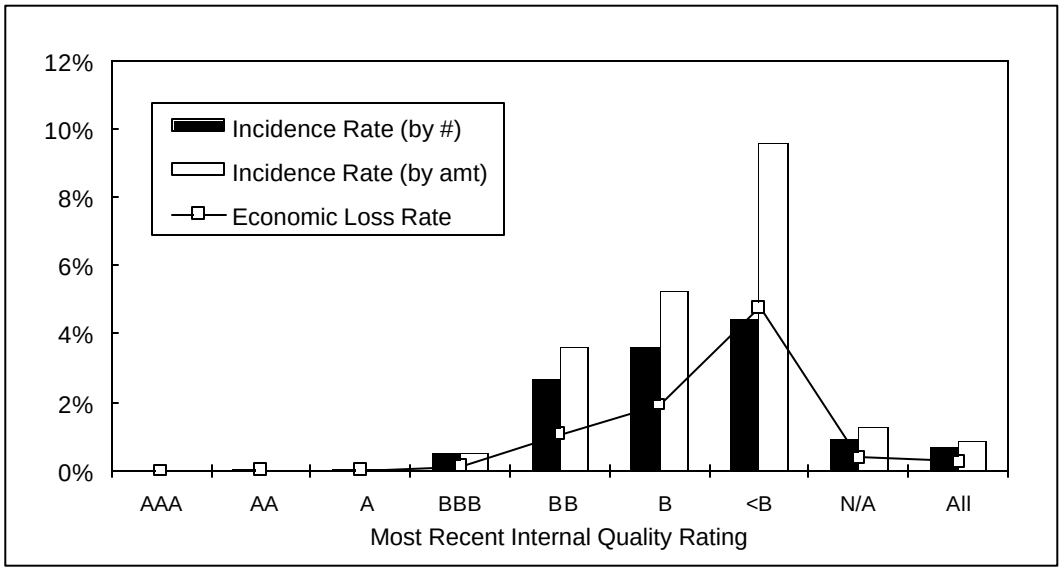
[2] National Association of Insurance Commissioners.

- Variations in incidence rates by the number of years since asset funding (issuance) strongly imply a seasoning effect. Incidence rates are low during the first year or two after issuance, then rise, and then drop back after seven or eight years have elapsed since issuance. The seasoning effect is stronger for below investment grade placements (those rated riskier than BBB/Baa) and remains even after controls are implemented for the effect of the business cycle on loss rates.
- Bonds with higher coupon interest rates tend to have higher incidence rates, even controlling for ratings.
- There is little evidence that crisis-at-maturity is an important factor in explaining the timing of losses, but some indications from the 1986-94 study that the discipline of amortization may be important in reducing losses.
- Although the period analyzed in this study covers roughly a full credit cycle, implications for credit risk experience during a typical credit cycle depend very much on views about the relative proportions of recession and normal years in a typical cycle and about the severity of the downturn.
- Fears of a few years ago that below-investment-grade private placements posed extraordinary portfolio risk appear to be overstated in that, in fact, the performance of such assets was better than the performance of similarly rated public bonds.
- In this edition of this ongoing study, migration rates for internal and NAIC credit ratings of assets are tabulated for the first time, and the relative predictive power of different kinds of ratings is examined. Results suggest that where opinions differ about the credit quality of an asset, on average the more pessimistic opinion is more likely to be correct.

The remainder of this executive summary offers somewhat more detail. Readers are encouraged to see the full body of the report to learn additional results and insights and to understand the methods as well as the limiting factors of the analysis.

The period 1986-98 witnessed both good and bad times economically. Several industrial sectors were distressed during 1986-89 but overall economic growth was positive. A period of widespread debt distress began in late 1989 and public bond market finance became increasingly difficult to obtain, especially for below investment grade issuers. Widespread asset quality problems at commercial banks limited credit availability from that source as well. A general economic recession occurred in late 1990 and early 1991 and public bond





default rates hit post Great Depression highs. Recovery from the recession during 1992-94 was slower than usual and investors remained cautious about extending credit. During the mid-to-late 1990s the economy grew rapidly and credit availability improved, although selected industrial sectors were distressed from time to time. Bond default rates were low due to the combination of an exuberant economy and investor caution during the early-to-middle 1990s.

On the whole, private placement loss experience tracked economic conditions. Incidence and loss rates fluctuated during 1986-89, but beginning in 1990 both measures began to grow, as depicted in the graph. Incidence rates, the primary driver of economic loss rates, more than doubled from 1990 to 1991 and then fell back to very low levels later in the 1990s. Reported loss severities fell after 1992 and averaged 31% over the whole period, but sensitivity analysis indicates that severities may not have fallen as much after 1992 as the solid-triangle line on the chart on the preceding page indicates vis-à-vis the "alternative severity" line (see Section IV for details).

Other key results and observations from the body of the study include the following:

- The typical asset in contributors' portfolios continues to be a traditional private placement, that is, a dollar denominated, non-Rule 144A, investment grade senior debt instrument from a U.S. issuer. However, there is a trend toward more asset-backed securities.
- As would be expected, losses on speculative-grade bonds are more likely than on highly rated bonds. Average incidence and economic loss rates for placements with an investment grade rating are low, but rise steeply for below-investment-grade assets. Loss severities are somewhat higher on below-investment-grade credit risk events (CREs), at least partly because most subordinated placements are rated below investment grade. Controlling for subordination, severities are significantly higher only for assets rated <B.
- This study compares results for private placements to results of studies of default and loss

experience for publicly issued bonds. The motivations behind the comparison are:

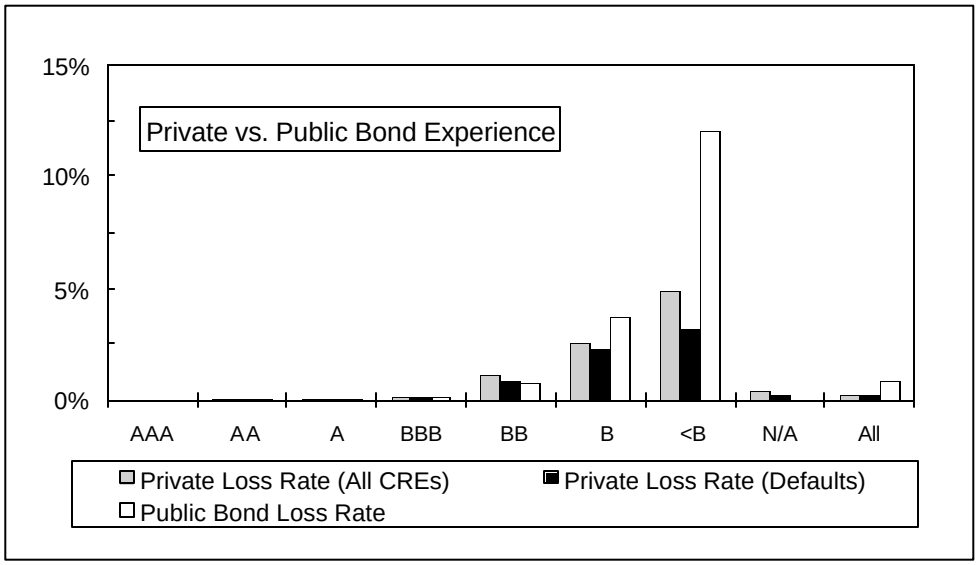
- public bond studies have been the foundation, to date, of most investors' intuition about corporate credit risk;
- the sense that private placements offer additional protection to investors;
- regulatory and rating agency treatments of private placements have been modeled on public bond experience; to the extent that private placement experience differs, information about it would be a useful input into regulatory and rating agency processes.

Private and Public Economic Loss Rate Estimates (basis pts)

Basis	Economic Loss		Difference
	Public	Private	
Aggregate unadjusted	82 bps	26 bps	56 bps
Public estimated based on private sample quality distribution	47	26	21
Private estimated based on public sample quality distribution	82	57	25

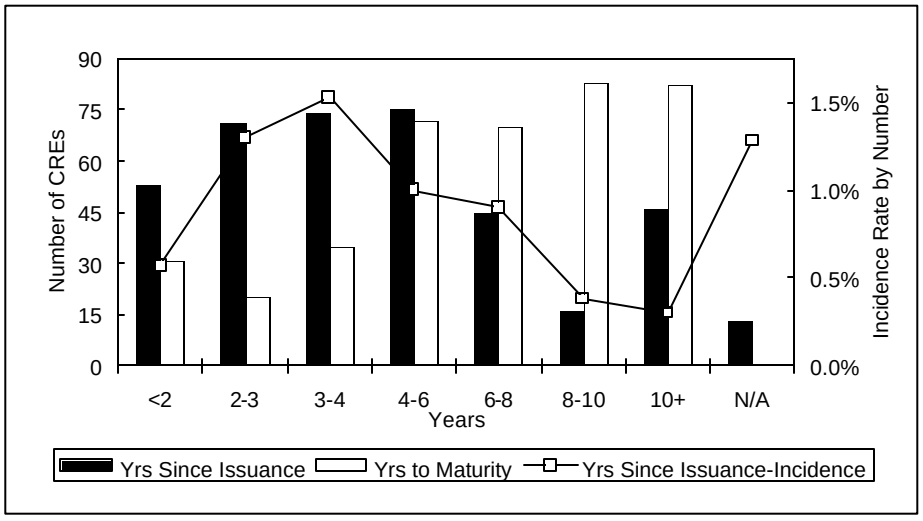
Highlights from the comparison between private and public bond experience include:

- Public bonds lost an average of 82 basis points annually during 1986-98 through defaults while private placements lost 26 basis points annually on defaults, restructurings, and distress sales taken together. Even adjusting for differences in portfolio quality distribution between the public and private bond universes, private placements' economic loss rates were better by 21 to 25 basis points depending on the measure used.
- The better overall loss experience is partly due to better average loss severities,



which are between 31% and 35% for privates and are around 60% for public bonds. However, better severities are not the whole story. For assets with start-of-year internal ratings the equivalent of investment grade, incidence rates are higher on privates but severities are lower, making overall private and public loss experience similar. For assets with internal ratings the equivalent of below investment grade, especially for those rated B and below, both incidence rates and severities are better for privates, leading to substantially better average loss rates.

- Variations in loss rates across ratings are driven largely by variations in incidence rates. Patterns of incidence rates are similar to the loss rate patterns in the chart below.
- Loss severities are sensitive to priority (or seniority) in bankruptcy. Higher-priority bonds had significantly lower loss severities on average than lower-priority bonds.
- Overall, private economic loss rates are lower than public bond loss rates in each year of the study. Additionally, overall private placement incidence rates are lower than public default rates in the majority of years, as reported by both Moody's and Standard & Poor's. The superior economic loss results are partly due to relatively higher average quality of contributors' private placement portfolios compared to the



public bond universe, but even compensating for this difference the performance of private placements is better overall.

- About half of CREs occur for assets, which were originated during the last half of the 1980's and over 80% of CREs occur within seven years of the funding date. There is strong evidence of seasoning effects even after accounting for effects of the economic cycle.
- Of the 689 CREs in the study, defaults were the most frequent CRE type (464 CREs), followed by restructurings (184 CREs), distress sales (30 CREs) and unreported (11 CREs). Average loss severities for defaults and distress sales were 38% and 29%, respectively, but the average severity for restructurings was only 21%. Some

restructurings may have later ended in defaults not captured in the study's data (which would cause severities for restructurings to be understated). However, on average, the effort involved in restructurings appears to be worth the cost.

In summary, the 1986-98 Credit Risk Loss Experience Study presents data for private placements, which the investment community can use to better understand the risks of investing in this asset class relative to other asset classes. This study presents a quantitative and statistical framework, which both actuaries and investment professionals can understand and utilize. The Society of Actuaries welcomes input and participation from the investment community.

II. INTRODUCTION

A. Background

This is a report on the study of credit risk experience of private placement bonds from 1986 through 1998. It covers new data gathered for 1995 through 1998 and incorporates updates of the previously reported 1986-94 experience. As such, it is self-contained, with no need on the part of the reader to refer to prior reports.[1] Each report also differs from previous ones in the inclusion of new analyses as warranted.

The report consists of five main parts: this Introduction; the Analysis and Commentary, which deals with the significant findings of the study including a comparison of the Private Placement credit risk experience developed by the study to the experience under Public Bonds; the Cross Tabulation section, which presents results relative to certain combinations of parameters or characteristics; the Data Summaries, which present the detailed results of the study in aggregate and in relation to various selected parameters or characteristics; and finally a set of Appendices setting out the technical aspects of the study methodology and of the validation of the data, the limitations the user should bear in mind in using the results of the study, and a more in-depth commentary than is given in this introduction about the economic landscape before and during the study's observation period.

The original 1986-89 study of the credit risk event (CRE) loss experience of insurance company commercial mortgage loans and private placement bonds represented the first phase of an ongoing study of the economic loss resulting from credit risk events (see Appendix I for the definition of CREs). This study was initiated by the Society of Actuaries (SOA) in cooperation with the American Council of Life Insurers (ACLI), representing a joint effort of actuaries and investment professionals. Since the 1986-89 study, there have been two additional reports, on private placements only, extending the experience through 1994. The current report is a fourth report of experience, extending it through 1998.

Private placement bonds represent a significant portion of fixed-income securities owned by life insurance companies. According to the ACLI's 1999 Life Insurance Fact Book, such assets represented 18% of life insurance companies' general account invested assets as of December 31, 1998, the last year of the current study. In spite of substantial holdings, there is no published, industry-wide, direct data from which default loss experience or, more importantly, the economic loss from credit risk events related to these securities can be assessed. Consequently, a disciplined study of insurance company private placement bonds is important. An ongoing study is essential to:

- provide information of value in the portfolio management process,
- provide the basis for making informed choices about the setting of assumptions as to future credit risk losses for liability valuations and for asset acquisition strategies,

[1] The only exception is an 'amortization' effect discussed in the last report (under the cross tabulation between number of years to maturity and earliest quality rating, pp. 64-73) but omitted from the current report.

- build a credible longitudinal data base that allows the study of the behavior of these asset classes and the correlation of credit risk to environmental and asset specific variables,

- provide reasonable assumptions for the setting or revision of asset valuation reserves and risk-based capital standards.

The suggestion has been made that private placements are sufficiently similar to publicly traded bonds that the value added by studying the former is limited. The evidence suggests otherwise (please see "comparison with public bond experience" in the Analysis section of this report).

The insurance business has changed and continues to do so, both with respect to the types of products sold and the types of investments made. The economic environment also has been transformed and provides substantial investment challenges. In the 1980's, real interest rates were much higher and more volatile than they were previously as inflation and later the fear of inflation plagued the economy. This interest rate environment made debt service more difficult for borrowers and the economic value of missed payments more costly to lenders. It is important to keep in mind that a significant number of loans that form the basis of this study were made in this economic environment.

Economic conditions during the observation period

To understand better the credit risk events of 1986 through 1998, the reader may find it helpful to review the economic conditions and their impact on asset defaults. Not only was the structure of the economy changing at a rapid pace, but inflation or fear of inflation, high interest rates, the rolling recession, changes in the tax law and demographics all combined during the 1980's to impact default rates. These trends culminated in the recession and debt shake-out of the beginning of the 1990's, followed by a long period of sustained growth. Appendix II, to which the interested reader is referred, describes the economic landscape shortly before and during the observation period covered by the study.

Assessment of credit risk

Credit risk is one of the risks now facing life insurance companies with respect to the vast liabilities created by investment-oriented products. Moreover, insurance companies are not the only entities subject to credit risk events. Banks, pension funds, and commercial credit companies encounter many of the same problems. With corporate treasurers ever more sophisticated in searching out the lowest possible cost of funds, the margins of all lending institutions are under pressure. In this environment the enhanced understanding and accurate assessment of credit risk become prized skills for investment professionals and actuaries alike. The Society of Actuaries believes that the maintenance of a unique database of the kind that the present study represents allows both those groups to enhance their understanding of credit risk behavior in ways simply unavailable otherwise.

While economic cycles are not easily identifiable and repetitive, the Private Placement Committee believes that we now have covered a full economic cycle in this study. Although some relationships have become evident as more experience has been added, the Committee still anticipates that the ongoing study, providing results over an even longer period of time, will be better able to identify or clarify such implications and provide information of significant value.

B. Goals of the 1986-98 Study

Having met the goals of the 1986-89 study[2], the Society of Actuaries concluded that it is desirable to transform the study into an ongoing experience study. Investment professionals and contributors concurred. The goals of the ongoing study on Private Placements are to:

a) compile a reliable, accurate data base of credit risk events and associated exposures, on a "cash to cash" basis;

b) continue to develop and refine the design of the study and the definition of the data to be collected;

c) provide information about the incidence and severity of credit risk events and the economic loss resulting from them;

d) perform analyses and develop insights into the behavior of private placement credit risk in relation to various parameters and environmental variables;

e) stimulate further thinking and research into credit risk behavior.[3]

C. Data Contributors

In all, 19 companies have contributed some data to the four phases of the study so far. Eleven companies contributed to the 1986-89 experience; ten companies contributed to the 1990-92 experience (one did so retroactively); fifteen companies contributed to the 1993-94 experience; and seven companies contributed to the 1995-98 experience. The Society of Actuaries thanks all of these companies for their admirable efforts in supporting the private placement bond study.

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[2] The goals of that study were (1) to assess the feasibility of a major experience study of this kind and the readiness of companies to support it, (2) to generate interest and support for the ongoing study, and (3) to provide information about the credit risk experience of private placements (and commercial mortgages) over the study period.

[3] In this regard, the Society of Actuaries notes that the company-specific data are the property of the contributing companies while the aggregate data are the property of the Society and cannot be disclosed. However, the Society is prepared to consider research proposals based on the data, so long as the processing is handled by the Society. Any such proposal must be submitted to the Asset Risk Committee, and must be approved by the Society and by the data contributors.

Eight of the eleven companies that contributed data for the 1986-89 period did so for the entire period while the other three did so only for the last two years (1988 and 1989). All ten contributors to the 1990-92 experience provided data for the entire period, and eight of them were also contributors to the 1986-89 period. All but one of the fifteen contributors to the 1993-94 experience provided data for both years, and nine of them were also contributors to the experience of some of the prior years. All seven of the contributors to the 1995-98 experience provided data for the entire period, and they all were also contributors to the experience of some of the prior years. Only four companies had a continuous contribution of data for all years of the study to date. Nevertheless, while data continuity by contributor is not perfect, it is on the whole reasonable. The companies that have contributed data to the four phases of the study to date are:

Contributing Companies
Private Placement Bonds

Company	1986-89	1990-92	1993-94	1995-98
Aetna	v	v		
AFLAC			v	
Aid Association for Lutherans			v	v
Great-West Life		v	v	v
John Hancock	v	v	v	
Lincoln National			v	
Lutheran Brotherhood		v	v	
Metropolitan	v	v		
Nationwide	v	v	v	v
New England Life	v			
New York Life			v	
Principal Financial	v	v	v	v
Providian			v	
Prudential	v	v	v	v
ReliaStar	v		v	
SAFECO	v	v	v	
Sun Life	v			
TIAA	v	v	v	v
Woodmen Accident & Life			v	v

In contributing data to the 1990-92 period, one company retroactively contributed data for part of the earlier period. Some contributors to the 1993-94 period also contributed retroactively to various degrees. In addition, the earlier period data of the study were also revised to reflect updated information submitted by contributors to the prior studies.

The total outstanding principal at each year-end in the 1986-98 study is summarized in the following table. By way of comparison, the table also shows the aggregate amount of Private Placements in life insurers' general accounts. Finally, the table shows by year the number of Credit Risk Events in the study along with the exposure associated with them.

YEAR	TOTAL OUTSTANDING PRIVATE PLACEMENT PRINCIPAL AT YEAR END (Billions)			PRIVATE PLACEMENT CRE DURING YEAR	
	Private Placement Study	**Life Insurance Industry General Accounts***	**%**	**Number**	**Outstanding Principal at time of CRE (Millions)**
1985	$49.4	$147.5	34%		
1986	$51.8	$153.4	34%	52	$384.3
1987	$58.8	$155.1	38%	57	$469.3
1988	$66.7	$172.9	39%	35	$263.2
1989	$70.9	$195.0	36%	43	$475.5
1990	$88.6	$201.8	44%	50	$683.9
1991	$90.7	$215.1	42%	140	$1,700.2
1992	$90.4	$223.8	40%	106	$1,831.8
1993	$93.7	$235.8	40%	82	$1,134.5
1994	$99.0	$244.8	40%	29	$366.3
1995	$73.8	$256.4	29%	35	$502.1
1996	$76.0	$280.9	27%	24	$334.6
1997	$76.8	$304.3	25%	19	$174.6
1998	$84.0	$336.0	25%	17	$188.8
1986 - 98				**689**	**$8,509.1**

*Source: ACLI Life Insurance Fact Books, General Account Bond Distribution

The reader may notice that the outstanding principals shown in the table do not agree with the aggregate exposures for the corresponding years in the data summaries section. The explanation is that the exposures in the data summaries section are computed in accordance with the formulae in Appendix I and represent average amounts exposed to credit risk during the calendar year, while the figures in the table above are year-end statistics.

D. Basic Model

The model used for the study was the so-called incidence-and-severity model. The study is therefore more like a morbidity study than a mortality study. The underlying concepts are defined in Appendix I. In general, incidence[4] refers to the number of times that an event occurs over a given time period out of all possible occurrences (that is, the probability of occurrence of the event - in the present case a CRE) while severity describes the loss sustained given that the CRE has occurred. Multiplying incidence by severity gives the economic loss per unit exposed. Economic loss is conveniently thought of as the loss in basis points of contractually promised investment return, as a consequence of CREs.

The definition of CRE is broad, capturing all losses from credit risk, with the sole exception of loss from sale after rating deterioration (a "downgrade") that is not so severe as to put the bond on the brink of default. It thus encompasses default, failure to pay, sale to avoid default, restructuring to avoid default and bankruptcy.

For readers familiar with insurance models, the conceptual framework for this study was that of disability insurance. There is a parallel between the life cycle of a disability policy and the life cycle of a bond. Just as a disability policy is underwritten at issue, a bond is underwritten at origination. A policy holder may or may not become disabled while the policy is in force. Likewise, a bond may or may not become impaired. Once disabled, a person may remain disabled long enough to receive disability benefits, or become fully recovered before any benefit becomes payable, or die after a period of disablement. Similarly, once impaired, a bond may remain "ill" and pay off at a lesser rate, or return to a healthy status and pay off at its original rate, or terminate in default.

For disability insurance, various risk factors are used to calculate a premium that is deemed to be commensurate with the risk assumed. For a bond, various risk factors are also taken into account in determining a basis point spread over treasuries at which the bond rate is set. Just as experience studies on disabilities can help calibrate the associated risk factors, experience studies on credit risk can serve the same purpose.

By collecting a sufficient amount of experience, the study attempts to calculate incidence rates, economic losses, loss severities and portfolio losses and to analyze their relationship to observable risk factors. The intent of the study is to follow the outflow of cash in the form of a loan until repayment is completed, "cash to cash" or "cradle to grave." Various characteristics can be investigated to determine their relationships to problem investments and to quantify their impacts on credit losses over the life cycle of the investments.[5]

[4] Incidence may be measured two ways: by number of bonds and by dollar amount of bonds exposed. Both are computed in the present study.

[5] The only exception is an 'amortization' effect discussed in the last report (under the Cross Tabulation section between number of years to maturity and earliest quality rating, pp. 64-73) but omitted from the current report.

E. Appendix - Technical Description of Methodology

The Appendix to this report gives the definition of credit risk event, the definitions of date of credit risk event and of date of loss calculation, a summary of the calculation methodology and the data validation procedures used in the study. The summary of the calculation methodology gives detail on the interest rate methodology and the calculation of economic loss, exposure and the loss statistics.

The Appendix also contains a description of the data validation procedures used to ensure, to the best of the Society's ability, that the final "scrubbed" data used to compile the results of the study were of the best quality that could be achieved. Ultimately, however, the Society must rely on the contributors for the accuracy of the data.

F. Revisions to Prior Studies

The current study continues to follow the revised discounting methodology used in the last two reports, which cover the experience through 1994. The attention of the reader is drawn to the fact that the interest rates used to discount the cash flows on CREs (both original and revised) have been refined since the original study. That study used a single rate of discount based on the remaining term of the cash flows (original and revised) and on an overall average assumed spread for all Private Placements varying only by date of occurrence of the CRE. In the current study as in the last study, that spread is varied also on the basis of quality rating at the date of the CRE (for revised cash flows) and original quality rating (for original cash flows) and the discounting of each cash flow element is done at the spot rate applicable to the date of occurrence of that particular element.

The results presented in this study for experience years 1986-94 differ from the last report for three reasons:

1) the updating of cash-flow data by contributors on previously reported CREs,
2) the reporting of CRE and exposure data for prior periods not previously reported by contributors
3) the cleaning up of miscellaneous data problems since the last study.

These changes had almost no impact on results for the experience years of the first study (1986-89) and a small impact on results for the experience years of the second study (1990-92). However, the 1993-94 incidence rate has increased due to a 90% increase in the dollars of CREs in 1993. Offsetting this somewhat was a decline in the loss severity in both 1993 and 1994, but the economic loss for 1993-94 still increased by 20%, from 0.15% to 0.18%. The analysis of why the 1993-94 numbers changed from the previous study is provided in section G of the Analysis and Commentary section of this report.

Experience Years	Incidence Rate by Amount		Loss Severity		Economic Loss	
	Previous Study	Current Study	Previous Study	Current Study	Previous Study	Current Study
1986-89	0.68%	0.68%	35.1%	35.2%	0.24%	0.24%
1990-92	1.58%	1.51%	34.1%	35.5%	0.54%	0.54%
1993-94	0.47%	0.79%	31.6%	22.4%	0.15%	0.18%

G. Limitations of the 1986-98 Study

Although the Private Placement Committee believes the 1986-98 study makes a significant contribution to a better understanding of the economic loss resulting from credit risk events, the study has limitations that should be noted to minimize possible misinterpretation and misuse of the results.

The limitations are listed in Appendix III. The two key limitations that the Private Placement Committee wishes to draw attention to are as follows:

1) Although the Committee devoted extensive and meticulous attention to the "scrubbing" of the data to ensure that they are as clean and reliable as possible, ultimately the quality of the data depends on the contributors and is thus beyond the control of the Committee and of the Society of Actuaries.

2) In particular, the data field that caused the most concern was the original quality rating. In too many cases the information was missing and had to be inferred by a backtracking method that gives rise to the 'earliest' quality rating. The backtracking method is reasonable and carefully undertaken but still potentially hazardous. For that reason, the Committee does not recommend blindly equating the earliest quality rating to the original quality rating at issue. Although the Committee believes the earliest quality rating is a reasonable proxy for rating at issue, certainly it is a noisy proxy.

Notwithstanding the limitations of the study, the Private Placement Committee believes that the results are reliable overall and constitute a meaningful addition to the understanding of the behavior of credit risk with respect to Private Placements.

H. Use of the Results

The data and data processing limitations identified in Appendix III suggest that the results of this study need to be interpreted and used with great care. One should not over-rely on the absolute magnitude of these results. They inevitably reflect market and economic conditions of the period in question. Even though the study now encompasses a full economic cycle, much of the value of the 1986-98 study lies in assessing the relative significance of identifiable risk factors. The approach of the study is an empirical one through the pooling of intercompany data using consistent definitions.

While not directly displayed in the interest of confidentiality, the variability of results by company suggests that material differences may exist in company risk tolerance standards and perhaps risk assessments. The large variability of results by year for the same company is not surprising for a low-incidence, potentially high-severity occurrence.

For those involved in product pricing, reserving and setting investment risk margins, the trends and patterns of the results can provide a basis for comparison with assumptions currently being used, keeping in mind of course the variability of these results. Ultimately, it is anticipated that detailed results by asset type and asset characteristic will be useful in models in a manner similar to how companies often use the intercompany mortality and morbidity data.

For those involved in developing and managing investment portfolios, the trends and patterns can assist in providing a better understanding of how various asset characteristics impact risk and, ultimately, how to set risk premiums.

For the Private Placement Committee (supported by the Research Committee), the trends and patterns observed frequently suggest new perspectives for analysis and new insights, as well as more efficient ways of collecting data in future. If there is sufficient interest and demand for it, additional types of data elements may be included in the study. The Committee is pleased to receive comments, suggestions or feedback on any aspect of its work and on the study.

I. Future Plans

The Private Placement Committee continues to strive for an annual data collection cycle, and updated reports in a more timely manner, subject to co-operation from contributing companies. Those reports will not only present the new and updated previous experience but will also contain analyses of various aspects and characteristics that the Committee and/or the contributing companies find of interest. Currently, the Committee is in the process of planning for the collection of data for 1999 through 2001.

The value of future studies will depend in large measure on the willingness of companies active in the private placement market to participate by sharing their data. The larger, more representative the database, the more reliable and valuable the results. The Private Placement Committee and the Asset Risk Committee wish to express their gratitude and appreciation to the participants in the current study and strongly encourage participation by companies not yet doing so.

Extra benefits of participation include early feedback on the participant's own experience and its comparison to the experience of all participants as well as the indirect systems and data audit obtained through the data scrubbing efforts of the study.

III. ANALYSIS AND COMMENTARY

A. Introduction

This section presents and discusses the major results of the study and also compares the credit risk experience of private placements to that of publicly issued corporate bonds. There is some (but not complete) overlap between the results presented in this section and those appearing in sections IV and V. Section V features limited text but detailed tables and charts giving breakdowns of experience by year and other variables of interest (for example, experience by NAIC rating and year). Section IV includes some cross tabulations and analysis, with particular attention to effects of bond seasoning on credit losses and the relationship between coupon interest rates and credit risk event (CRE) rates. Results appearing *only* in sections IV and V include credit risk experience by original coupon rate and years to maturity. Where there is overlap, the most detailed tables usually appear in sections IV and V.

The main statistics reported in this study, the definitions of which are summarized in Table 1, differ somewhat from the default and recovery rate statistics that are familiar from studies of default and loss on publicly issued corporate bonds. Such studies typically compute default rates as the number of bonds (or bond issuers) appearing in a given cell that default over some period of time, divided by the total number in the cell. For example, a cell might include all A-rated bonds outstanding at the beginning of 1985. Loss severity rates (loss-given-default) are typically the weighted-average difference between the post-default trading prices and the face values of defaulted bonds, perhaps with something added for lost interest. Because trading price data are often unavailable, it is rarely possible to compute default and severity rates for the exact same set of public bond defaults. This places some limitations on the computation and interpretation of overall economic loss rates for public bonds. Such loss rates typically are estimated by multiplying default rates and some average severity rate.

In this study, individual bond loss severities are the difference between the net present value of the pre- and post-CRE contract cash flows, divided by the principal outstanding at the time of the CRE (and with an adjustment for market vs. book value differences; see Appendix I).[1] Severities are available for *every* CRE, making it possible to compute consistent economic loss rates for any subsample and to partition the loss into incidence and loss severity components. Incidence rates reported in this study are conceptually similar to weighted-average one-year default rates on public bonds, but CREs include certain restructurings and sales of distressed assets, so the definition is broader than a pure default rate.

As described in subsection D below, results largely represent experience for traditional or non-Rule 144A private placements.

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[1] Such statistics are economically similar to public bond loss severities if the market for distressed public bonds is very efficient and if risk premiums demanded in that market are similar to those in other markets. In that case, the post-default bond trading prices may be viewed as estimates of the discounted value of recoverable cash flows. Efficiency of the distressed debt market and risk premiums therein are open questions.

Table 1 - Brief Definitions of Primary Statistics (see Appendix I for details)

Statistic	Definition	Comments
Incidence Rate By Number	Number of assets experiencing CREs divided by number exposed (roughly, the latter is the sum of the number in the cell at the start of each year; see Appendix 1 for handling of maturities and originations within the year).	Like an average of one-year default rates, but CREs include restructurings and distress sales as well as defaults.
Incidence Rate By Amount	Outstanding principal of assets experiencing CREs, divided by total principal exposed (roughly, the latter is the sum of the principal outstanding for the cell).	Similar to incidence by number, but based on dollar amounts.
Loss Severity	The sum of dollar economic losses on assets experiencing CREs divided by the sum of principal outstanding on those assets. Economic losses for each CRE are measured as the difference in net present values of original and revised contract cash flows, multiplied by the ratio of principal outstanding to the present value of original cash flows. The latter ratio is applied in order to place economic loss on a book-value basis.	Sometimes called the loss-given-default rate. Same as (1- recovery rate).
Economic Loss Rate	The product of loss severity and incidence rate by amount for a cell. Equivalently, the sum of dollar economic losses for a cell divided by total principal exposed in the cell.	The average annual percentage loss resulting from CREs in the cell being analyzed.

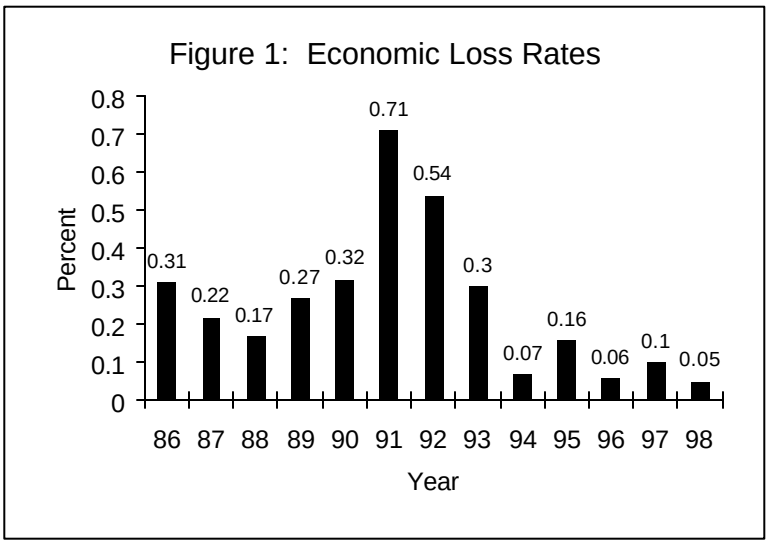
A cell can be any subset of the data, for example all A-rated assets, or the aggregate sample. See Appendix I for the full definition of a CRE and for definitions of the statistics.

B. Notable Changes in Results in Comparison to the 1986-94 Study

Relative to the 1986-94 Credit Risk Loss Experience Study: Private Placement Bonds, this study features four additional years of experience data (1995-98) and revisions to data for experience years 1986-94, especially CRE-related data. Revisions stem from receipt of updated cash flow information for some CREs as well as additional cleaning of the data completed since the last round of the study. In general, material changes in overall results from one round of the study to the next are associated far more with the addition of new years of data and with changes in the mix of contributors than with revisions of previously contributed data.[2]

[2] Results in this report differ from those in the 1986-94 study mainly for the years 1993-94. Incidence, severity, and loss rates in those years are affected by revisions to some previously reported CRE cash flows and by some newly reported CREs.

As shown in Figure 1 and discussed further below, economic loss rates in 1995-98 were much smaller than in earlier years, reflecting both lower incidence rates and lower loss severities. The new years of experience highlight the large differences in losses during recession and non-recession periods and suggest that different readers may wish to interpret results differently. It is clear that estimated average loss rates over a full credit cycle depend very much on the severity of debt distress during the downturn phase and on the proportions of downturn and good years in the cycle. The larger the number of good years relative to downturn years in any given sample, the lower the average estimated incidence and loss rates are likely to be.



Thus, although we present average incidence and economic loss rates for the full sample period 1986-98, these are likely to be representative only of experience during credit cycles of similar duration and amplitude. Readers believing that the average credit cycle (or the next one) will have a smaller or larger proportion of downturn years may calculate alternative average rates by, for example, omitting selected experience years from calculations. The data summary tables in Section V present sufficiently detailed information by year to support calculation of accurate weighted average rates for any combination of years.

The average loss severity was about one-third smaller during the years 1993-98 than during 1986-92 (22 versus 35 percent). Possible reasons for the change include changes in the fractions of CREs that are subordinated or that are restructurings instead of defaults, a better macroeconomic environment, and a change in reporting practices by contributing insurance companies. All of these explanations appear to have some merit, but circumstantial evidence implies that a change in reporting practices is most important: In the later period, some contributors appear to have a greater propensity to report CREs that are associated with technical defaults by the borrower. In many such cases, the borrower is not in major distress and loss severities are relatively small. The possible change in reporting practice is a legitimate change in interpretation of the CRE definition given in Appendix I. The change does not materially affect the economic loss rates shown in Figure 1 nor most other results of the study, but does potentially affect time patterns of reported incidence rates and severities. This issue is discussed in more detail in subsection G below.

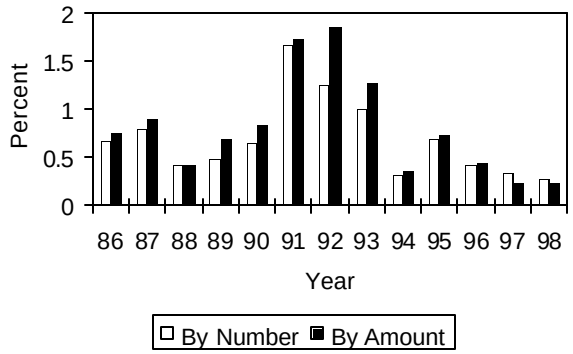
Additional years of data and more extensive reporting by contributors has made it possible to paint a more detailed picture of the portfolio assets studied here (subsection D).

The increased popularity of credit risk modeling has led to a greater focus on credit ratings and their properties. To support such modeling activity, this edition of the study presents rating transition matrices for contributors' internal ratings and for NAIC ratings, an assessment of the extent to which different entities rating the same asset at about the same time agree or disagree, and some analysis of the implications of disagreements (subsections L and M).

C. Aggregate Private Placement Experience Over Time

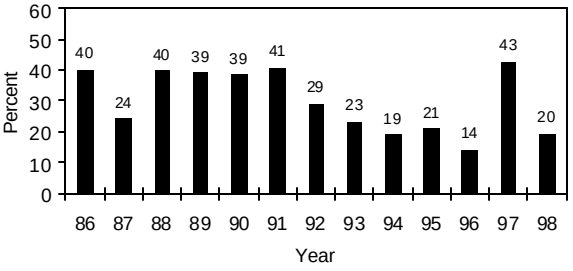
The economic loss rate on the aggregate sample private placement portfolio during 1991-92 was more than double that during 1986-90 and more than five times the rate for 1993-98. Annual percentage loss rates appear in Figure 1 (in 1986, for example, the aggregate of participating company portfolios lost about 31 cents per $100 invested, or 0.31 percent, or 31 basis points). The simple average of these annual rates is 0.26 percent for 1986-90, 0.62 percent for 1991-92, and 0.12 percent for 1993-98. Over all years, the loss rate averaged 0.27 percent. A peak in loss rates in the early 1990s is to be expected given the recession that occurred and the large volume of defaults in corporate debt markets generally.

Figure 2. CRE Incidence Rates



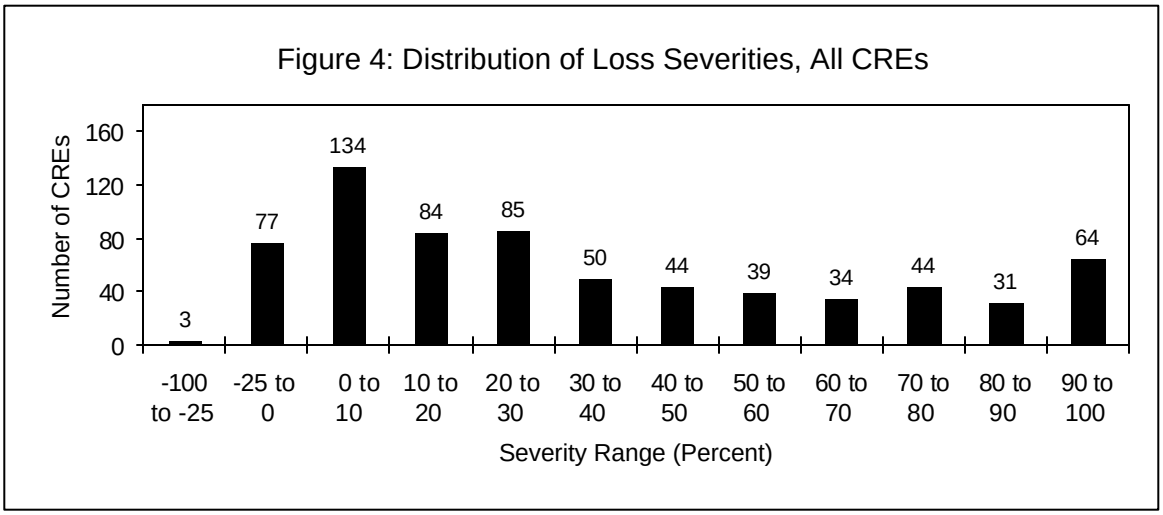
Economic loss rates rose in 1991-92 because incidence rates rose, not because loss severities were substantially worse than in earlier years. Figure 2 displays incidence rates computed both as the number of assets experiencing Credit Risk Events (CREs) relative to the total number exposed and as the dollar volume experiencing CREs relative to the total amount exposed. Incidence by dollar amount is higher than that by number in most years (though often not by much), indicating that assets experiencing CREs had larger than average dollar amounts outstanding. Incidence rates approximately doubled in 1991-92 by both measures and then fell back.

Figure 3: Loss Severities



The average loss severity over all years (cents lost per dollar of assets experiencing CREs) was 31 percent, but average severities appear to have changed sometime around 1992. As shown in Figure 3, annual average severities were close to 40 percent during most of the years 1986-92, averaging 35 percent for those years, but fell sharply thereafter. During 1993-98 severities averaged only 22 percent. However, as discussed further below, the lower average severities in later years may partly be due to a change in reporting practices.

Severities for individual bonds are rather dispersed. As shown in Figure 4, which displays the distribution for all CREs, they are fairly widely distributed. Experience with private placements in this regard is rather similar to public bond experience, as public bond severities are also widely distributed.[3] However, the significant fraction of negative severities displayed in Figure 4 is atypical of public bonds (80 of 689 assets experiencing CREs had recoveries greater than 100



percent and thus these CREs yielded gains, though most such gains were small). The present value of post-CRE private placement cash flows can exceed the pre-CRE present value mainly because the post-CRE coupon rate, amount to be repaid, or amortization schedule differ from pre-CRE values. For example, after a workout or restructuring many of the revised cash flows for an asset might occur earlier than the originally scheduled cash flows and, after discounting, the revised cash flows might therefore have a larger net present value than the original cash flows (especially if the discount rates are similar and the total nominal amount of the revised cash flows is not too much smaller than the nominal total of original cash flows). Although some negative severities may be due to data errors, those CREs having negative severities were audited especially closely, and thus in general such CREs likely did result in a genuine economic gain to the investor.[4]

[3] See "Corporate Bond Defaults and Default Rates 1970-94," *Moody's Investors Service*, January 1995.

[4] We dropped from the study one 1987 CRE that was very large in terms of amount outstanding at the time of the CRE and that involved a moderate gain to the investor (loss severity about -10 percent); this CRE was also omitted from most computations in previous rounds of the study.

D. Characteristics of the Aggregate Private Placement Portfolio

This subsection provides some descriptive statistics that may be useful as background for interpreting results. Collection of most of the variables began with the 1990-92 update or the 1995-98 update, so it is only with this edition of the study that data are beginning to be sufficient to support meaningful summary statistics. All the percentages in this subsection refer to numbers of exposed assets (not dollars). Unless otherwise noted, percentages are of the reported values only (observations with unreported values of the given variable are omitted from calculations).

To summarize, the typical asset in contributors' portfolios continues to be a traditional private placement: dollar denominated, non-Rule 144A, investment-grade senior straight debt from a U.S. issuer.

About 95 percent of assets are acquired at origination (rather than in the secondary market) with no trend in that value. Over 99 percent of assets are denominated in dollars, and 85 to 90 percent are from U.S. issuers. Somewhat surprisingly, the share of U.S. issuers actually increased during 1995-98, with European and Canadian issuers' shares falling (on average, the latter represented 9 and 3 percent of assets, respectively).

Figure 5. Asset Types

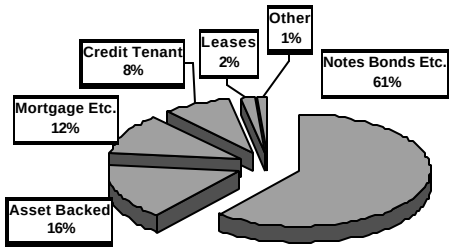
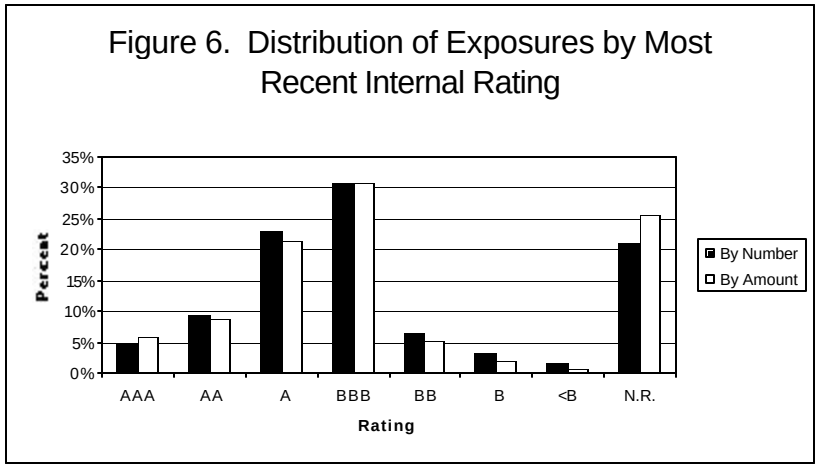


Figure 5 displays the distribution of asset types during 1995-98 when all years are equally weighted. The trend during those years (trends not shown in Figure 5) was toward more asset-backed securities (which increased from 12 percent of the total in 1995 to 20 percent in 1998) while conventional mortgage bonds and equipment trust securities ("Mortgage Etc." in Figure 5) fell from 14 percent of the total in 1995 to 9 percent in 1998. The share of straight debt (notes, bonds, and debentures) stayed about the same and the shares of leases and credit-tenant loans each fell a little. Bank-like term loans and lines of credit appear in the "other" category and are probably under-reported relative to their actual share. More years of reporting of this variable will be needed before loss rates can be measured. Use of proceeds was generally reported as "unknown" and, where reported, was "general corporate purposes."

Private placements continue to be predominantly long-term, fixed-rate investments. The median original years to maturity and the median average life were 12 and 8.6 years, respectively, for the whole period 1986-98. 87 percent carried fixed interest rates and 12 percent variable rates, with a sprinkling of zero-coupon instruments. Less than 3 percent of assets reportedly had equity kickers (such as warrants or convertibility features). There was a modest trend toward shorter maturities: During 1986-89, median original maturities were 15 and 9.4 years, respectively, whereas during 1993-98 medians were 11 and 8 years, respectively.

Rule 144A, which facilitates trading of qualifying placements among institutional investors, was adopted by the SEC in April 1990, but the number of outstanding 144A issues was not significant during the early 1990s. As time passed and the market developed, two kinds of 144A securities became common: 1) Those with registration rights, which tend to be similar to publicly issued bonds, are marketed to public-market investors, and which routinely are registered by the issuer, usually during the first year after issuance; and 2) Those with language in their documentation that facilitates trading using the 144A exemption, but without registration rights. By year-end 1995, 144As with registration rights amounted to 7 percent of contributors' private placement assets, falling to 5 percent by 1998, whereas 144As without rights rose from 6 to 12 percent of assets during those years. This disparity of trend may reflect an increasing administrative tendency on the part of insurance companies to place 144As with registration rights into their public-bond portfolios immediately upon acquisition. 144A status was reported as unknown for about one-quarter of assets, so the fraction with 144A features was probably a bit higher than implied by the statistics just cited.[5]

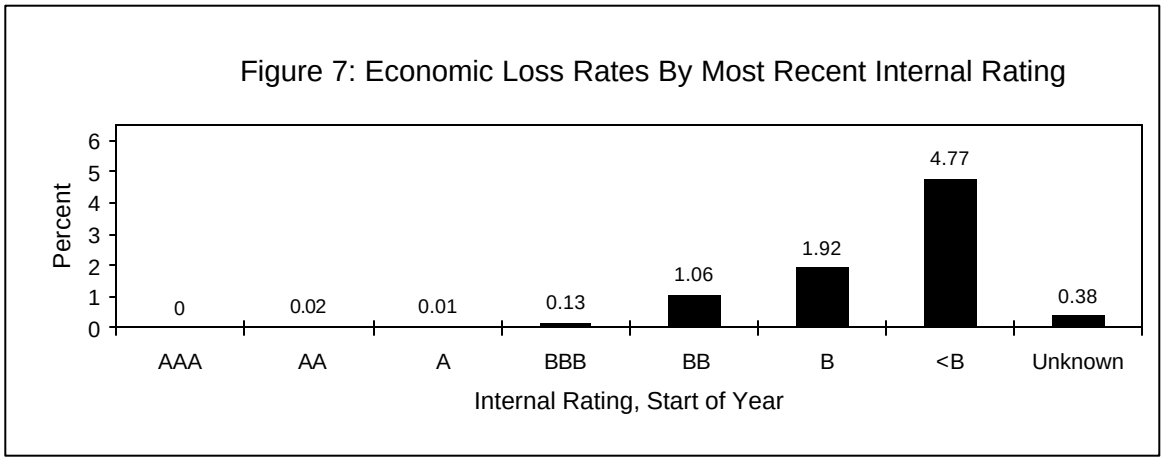
Figure 6. Distribution of Exposures by Most Recent Internal Rating



Based on contributors' most recent internal ratings, their private placement portfolios are predominantly investment-grade, as shown in Figure 6 for all the year-ends 1986-98. Omitting amounts in the N.R. (not reported) category, 86 percent of exposures by number and 90 percent by amount are rated BBB or better. As discussed below, results for the NR category are similar to results overall, implying little bias from the existence of a substantial volume of unrated private placements.

Overall during 1990-98, about 20 to 30 percent of private exposures were subordinated (with the remainder senior) and half to two-thirds were unsecured. These fractions are hard to measure with confidence because secured and senior status often are unreported, especially for earlier years. Moreover, changes in the types of assets appearing in portfolios influence the average economic seniority of contributing companies' portfolio assets (for example, seniority of asset-backed securities is determined largely by tranche position, not by conventional subordination).

[5] 144A status is unknown for most CREs. No CREs were reported to be 144As with registration rights, and only three were reported as other 144As. More years of data are needed before inferences can be made about the relationship between 144A status and credit incidence and loss rates.



E. Experience By the Investor's Most Recent Internal Credit Risk Rating

Table 2. Experience By Most Recent Internal Rating (percent)

Rating	Incidence Rate		Loss Severity	Economic Loss Rate
	By Number	By Amount		
AAA	n.c. %	n.c. %	n.c. %	n.c. %
AA	0.03	0.02	75	0.02
A	0.07	0.06	17	0.01
BBB	0.50	0.52	25	0.13
BB	2.68	3.64	29	1.06
B	3.63	5.23	37	1.92
<B	4.44	9.59	50	4.77
Unknown	0.92	1.25	31	0.38
All	0.71	0.85	31	0.27

n.c. means no CREs

Losses are more likely on speculative-grade bonds than on highly-rated bonds. Although the major rating agencies rarely rated private placements until the early 1990s, most sample placements were rated by the National Association of Insurance Commissioners' (NAIC) Securities Valuation Office (SVO). Most insurance companies participating in this study also routinely produced internal ratings of private placements in their portfolio. The latter ratings were reported on a scale comparable to S&P's and Moody's.

Experience by most recent internal rating (that is, rating as of the start of each year) is summarized in Table 2 and Figure 7. Average incidence and economic loss rates were low for assets with the equivalent of investment-grade ratings (AAA through BBB) during the period 1986-98 but rose steeply in the speculative grades. Severities are between 25 and 50 percent except for the AA and A ratings, where the number of CREs is small and the averages likely are noisy. There is some apparent tendency for below-investment-grade assets to experience larger severities, which may occur because severities are larger for subordinated debt and such debt tends to be rated below investment grade (an examination of average severities by grade for senior debt alone revealed higher severities only for the <B grade). The effect of seniority on

severities is discussed in the next subsection (under the subtitle "Loss Severities").

F. Comparison With Public Bond Experience

This study's comparison of private placement experience with that for publicly issued corporate bonds has four motivations (no public-market government or agency issues are included in this study's calculations). First, studies of public bond defaults have influenced most people's intuition about corporate debt credit risk, perhaps due to the lack of information about other assets. Public bond experience thus provides a useful benchmark. Second, although private placements are similar to public bonds in some respects (generally fixed-rate and often fairly long term to maturity, for example), privates are widely viewed as offering additional protections and value to investors. Although this study does not pretend to provide a complete analysis of sources of incremental value, some light is shed on the subject. Third, recent regulatory and rating agency treatment of private placements (such as risk-based capital requirements) has been based largely on public bond default experience. To the extent that private placement experience differs, a comparison may be a useful input. Finally, the analysis supports an assessment of the credibility of internal ratings of private placements. This issue is not wholly separable from the rest because, for example, a lower default rate on private placements for a given rating might be attributed to overly conservative ratings of privates by investors or to superior structuring and management relative to public bonds.

Summary of Comparative Loss Rates

It is helpful to set the tone by presenting some overall results before turning to details because a number of technical factors complicate the analysis. Table 3 presents various estimates of public bond and private placement economic loss rates (drawn or computed from entries in Tables 4 and 5 below). During 1986-98, publicly issued corporate bonds rated AAA-CCC lost an average of about 82 basis points (bps) or 0.82 percent annually through default whereas sample private placements

Table 3. Various Estimates of Private and Public Economic Loss (basis points)

Basis	Economic Loss		Difference
	Public	Private	
Aggregate unadjusted	82 bps	26 bps	56 bps
Public estimated based on private sample quality distribution	49	26	23
Private estimated based on public sample quality distribution	82	57	25
Memo: Private estimated based on public sample quality distribution, public estimated using private loss severity	42	57	-15

lost about 26 bps annually. Part of this substantial difference is due to portfolio quality differences---more sample privates than publics were in the investment grades. The second row of Table 3 shows the estimated loss rate for a portfolio of public bonds with the same start-of-year rating distribution as the private sample (49 bps), whereas the third row shows the estimated private loss rate for a portfolio of privates with the same rating distribution as publics (57 bps). The public-private loss difference is not the same in these two cases because estimated default rates differ by rating across the two markets, but in each case the public loss rate is larger.[6]

The better overall loss experience of privates is partly due to their better average loss severity, which is around 31 percent, whereas the average public loss severity is around 60 percent. In row 4 of Table 3, the private loss estimate is on the same basis as row 3 but the public estimate is based on an assumed loss severity of 31 percent. This reduces the public loss rate to 42 bps, smaller than the private rate. The reasons for differences in loss experience are discussed in more detail below---better severities are not the whole story.

On the whole, the statistics in Table 3 probably understate the superior loss experience of privates relative to publics. There are many reasons to question the comparability of the estimates, but perhaps the most important is that experience of some publicly issued bonds rated below CCC is not included in the public loss estimates whereas the private estimates include all sample bonds. Very low-rated bonds have relatively high loss rates and, as discussed below, default rates on such bonds may be higher in the public than in the private market. Thus, the estimates may understate losses on all publicly issued bonds.

Background for the Analysis of Default Rates

This study's incidence rate by number statistics are calculated in a manner that makes them comparable to public bond one-year default rates (see Table 1), but a number of technical problems must be addressed to achieve a clean comparison. Most public bond default studies analyze defaults aggregated by *issuer*, whereas this study analyzes incidence at the level of individual *assets* on contributing company balance sheets. The distinction is relevant only for incidence rates by number---statistics on incidence by amount, loss severity and economic loss are invariant to the level of aggregation. For maximum comparability, incidence rates by number for private placements on an issuer basis are shown below.[7] Because one company contributed

[6] Loss rate differences in rows 2-4 of Table 3 are not precisely estimates of the difference per dollar invested. In rows 3 and 4, the statistics are based on distributions of numbers of issuers, not dollar volumes outstanding, so any cross-market differences in the rating distributions of dollars versus numbers outstanding would alter market-portfolio loss differences. Unfortunately, dollars outstanding by rating is not available for public bonds. In row 2, the private statistic is effectively dollar-volume-weighted because it is this study's standard economic loss statistic, whereas the public statistic is based on number of issuers. If public bonds behave the same way as private placements (incidence by amount is higher than incidence by number), then row 2 would tend to understate the differences in loss experience between the two markets whereas results in rows 3 and 4 would not be subject to this source of bias.

[7] Although issuers are not identified by name in this study's data, each asset is identified by a Private Placement Number (PPN) or CUSIP number. These identifiers are structured similarly (both are assigned by the CUSIP Service Bureau), with the first six characters identifying the issuer. Thus, assets can be aggregated by issuer across company portfolios at each year-end.

data for a few years in a manner that did not allow identification of issuers, however, that company's data for those years was not included in this part of the analysis.

Moreover, CREs include restructurings and asset sales done to avoid or minimize (further) losses whereas public bond studies focus purely on defaults. Such a focus is practical, as negotiated restructurings are rarely seen in the public market and credit-related sales would be impossible to track.[8] The approach taken here is to present incidence statistics for privates both with and without restructurings and asset sales---the two sets of results should bracket the "true" comparable values.[9]

For comparison with private incidence rates, one-year average default rates computed from data from S&P and Moody's are presented. To promote comparability, default rate "calculator" software available from the two rating agencies was used to compute public bond statistics for the same time period covered by this study (1986-98) and, where relevant, various sub-periods. Included in the data underlying the statistics are all non-sovereign corporate bonds for all industries and regions in the respective rating agencies' data bases.[10,11] Throughout Section IV, if public bond default or loss rates are not broken out by rating agency, the numbers are based on a simple arithmetic average of Moody's and S&P's default rates for the given grade and/or year.

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[8] Although distressed exchanges do occur in the public market, they are relatively infrequent and often different in character from private placement restructurings.

[9] On the surface, only identical events should be compared, but a primary reason for private placement restructurings and sales is that a default would be likely in their absence, and such a default would be more costly to the investor than the restructuring or sale. Restructurings are rare in the public market because they are infeasible when bonds are held by more than a few investors. *If* restructurings were feasible, public default and loss severity rates would likely be lower, as some defaults could be prevented through restructuring. Similarly, some investors prefer to sell to distressed debt specialists rather than maintain the staff to handle workouts themselves. Failure to include the losses such investors incur might bias the private estimates. Thus, results are presented both ways.

[10] The rating agency all-corporate default rates by year shown in Table 4 differ slightly from those shown in previous editions of this study because of minor changes by the rating agencies in their methods and data bases.

[11] Two additional technical problems involve the definitions of exposure and of an issuer rating. With respect to exposure, in this study an asset is generally treated as fully exposed to loss only if it is on the books at both the beginning and end of a year (a half unit of exposure is assigned if it is on the books at either the beginning or end). Public bond studies typically consider only presence on the books at the start of a year, so the latter method was used in conducting this section's exercise. In addition to altering exposure numbers somewhat, four CREs were dropped from the analysis in this section because they occurred during the calendar year of funding of an asset and thus would not have been captured in a typical public bond study. With regard to rating, in their studies the rating agencies use "issuer" ratings that correspond to ratings on senior debt. If none of an issuer's senior debt is rated, the agencies usually infer such a rating by adding one or two notches to the rating of the issuer's subordinated debt (for example, an A-sub rating translates into an A issuer rating). We do not have enough information about seniority of placements to replicate the agencies' method. Moreover, in this study's data, internal ratings of the same issue can differ across investors. For this section's analysis only, where a given issuer had placements outstanding with different ratings, we used the better rating unless the difference was more than one full grade, in which case a value of 'unknown' was assigned.

Table 4 - Experience At the Asset and Issuer Levels

	A: Private Placement Statistics			B: Private Placement Statistics			C: Public Bond Statistics			
	By Asset, All CRE Types			By Issuer All CRE Types						
							Default Rate		Average Loss Rate*	
Year	Number of CREs	Incidence By Number	Economic Loss Rate	Number of CREs	Incidence By Number	Economic Loss Rate	S&P	Moody's	S&P	Moody
86	41	0.59%	0.34%	31	0.85%	0.34%	1.82%	1.91%	1.09%	1.15%
87	56	0.87	0.25	37	1.07	0.25	1.03	1.51	0.62	0.91
88	30	0.39	0.14	22	0.57	0.14	1.59	1.32	0.95	0.79
89	40	0.51	0.25	33	0.81	0.25	1.66	2.45	1.00	1.47
90	50	0.66	0.32	35	0.98	0.32	2.72	3.56	1.63	2.14
91	139	1.66	0.70	92	2.30	0.70	3.17	3.34	1.90	2.00
92	105	1.24	0.53	77	2.09	0.53	1.26	1.35	0.76	0.81
93	81	0.97	0.29	55	1.52	0.29	0.51	0.97	0.31	0.58
94	29	0.32	0.07	20	0.54	0.07	0.55	0.58	0.33	0.35
95	35	0.69	0.16	18	0.81	0.16	0.94	1.08	0.57	0.65
96	24	0.43	0.06	19	0.75	0.06	0.48	0.54	0.29	0.32
97	19	0.33	0.10	9	0.35	0.10	0.61	0.68	0.36	0.41
98	17	0.28	0.05	12	0.47	0.05	1.28	1.26	0.77	0.76
All	666	0.71	0.26	460	1.06	0.26	1.25	1.48	0.75	0.89

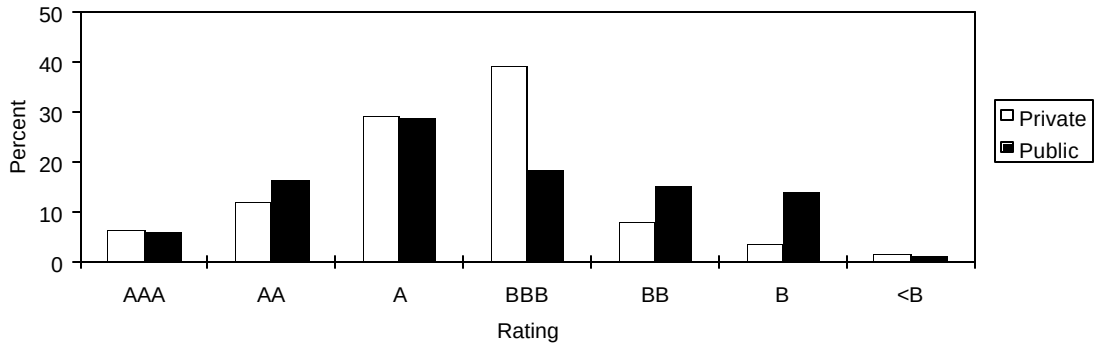
The total number of CREs in Panel A is 666 rather than 689 because certain company-years of data were omitted from this part of the analysis due to problems of issuer identification, as noted more fully in the text. * Public bond average loss rate estimated as S&P or Moody's default rate times an assumed 60% loss severity.

Results for incidence rates and economic loss

Panels A and B of Table 4 compare annual private placement incidence rates on an individual asset basis and on an issuer basis. The results in Panel A are not quite the same as those shown elsewhere for the reasons noted above. In every year, issuer incidence rates are larger than the by-asset rates, although the general pattern of incidence rates more than doubling in 1991-92 still appears (simple averages are 1986-90 0.85 percent; 1991-92 2.20 percent; 1993-98 0.74 percent). Consolidation to the issuer level resulted in fewer issuer-level CREs than asset-level CREs in each year, but the number of issuers with exposure was reduced proportionately more relative to the number of assets exposed. Economic loss rates are the same in the two panels because, as noted, they are invariant to the choice of asset vs. issuer level of analysis.

Panel C of Table 4 shows public bond default rates derived from S&P's and Moody's default rate calculators and an estimate of associated economic loss rates. The latter were computed by multiplying the agency default rates by an assumed constant public bond loss severity of 60

Figure 8. Distributions of Numbers of Privates and Publics by Rating



percent, which is very close to the overall average severity reported in a recent study by Altman.[12]

Estimated private placement economic loss rates are lower than public rates in every year and on average, and Panel B private incidence rates are lower than the average of Moody's and S&P's default rates in all but three years (Panel A incidence rates are lower in all but one year).

In comparing private and public incidence rates, it is important to note that the quality distribution of private placements across ratings differs substantially from the distribution in the public market, as shown in Figure 8.[13] Proportions are similar for assets rated A and above, but there are proportionately more BBB-rated privates versus more BB and B-rated publics. Because default rates are higher on the latter, private placements naturally should have a lower incidence rate than publicly issued bonds on average. An examination of rates by rating category is therefore helpful.

Incidence and loss rates by most recent internal rating for privates and agency ratings for publics appear in panel A of Table 5. These are weighted-average one-year rates averaged over 1986-98. Panel 1 (the first three columns of Table 5 after the "Most Recent Rating" column) shows private placement statistics when all CREs are included, Panel 2 such statistics when only private defaults are included, and Panel 3 shows public bond default and loss rates. Private incidence rates are of course smaller when only defaults are included, and proportionately rather substantially so (by about one-third). Loss rates are only somewhat smaller, however, because the restructurings that are omitted from Panel 2 have lower average severities than private defaults (discussed further below).

[12] Average loss severities on publicly issued bonds vary from year to year, so the time variation in economic loss rates on publicly issued bonds may be larger than shown in Table 4. Altman's study is Altman, Edward I., "Altman Report on Defaults and Returns for High Yield Bonds" (New York: Salomon Smith Barney U.S. Corporate Bond Research), January 23, 2002.

[13] The public distribution is the fraction of rated obligors in each Moody's/S&P grade, using combined data for both agencies for 1986-98, taken from output of Moody's and S&P's default rate calculator software.

Table 5 - Public vs. Private Experience In Detail

Most Recent Rating	1: Private Placement Statistics By Issuer, All CRE Types			2: Private Placement Statistics By Issuer, Defaults Only			3: Public Bond Statistics Default Rate		Avg. Loss Rate*	
	Number of CREs	Incidence By Number	Economic Loss Rate	Number of CREs	Incidence By Number	Economic Loss Rate	S&P	Moody's	S&P	Moody
				Panel A: All Years						
AAA	0	n.c.%	n.c.%	0	n.c.%	n.c.%	0.00%	0.00%	0.00%	0.00%
AA	3	0.08	0.02	2	0.05	0.01	0.00	0.04	0.00	0.02
A	19	0.20	0.02	12	0.13	0.01	0.02	0.00	0.01	0.00
BBB	89	0.67	0.15	62	0.47	0.13	0.25	0.14	0.15	0.08
BB	103	3.50	1.11	63	2.14	0.84	0.95	1.49	0.57	0.89
B	70	5.29	2.53	54	4.08	2.24	5.56	6.52	3.34	3.91
<B	37	5.33	4.85	27	3.89	3.17	25.00	18.24	15.00	10.94
Unknown	139	1.42	0.40	89	0.91	0.26	n.a.	n.a.	n.a.	n.a.
All	460	1.06	0.26	309	0.71	0.19	1.25	1.48	0.75	0.89
				Panel B: 1986-89						
AAA	0	n.c.%	n.c.%	0	n.c.%	n.c.%	0.00%	0.00%	0.00%	0.00%
AA	1	0.07	0.01	1	0.07	0.01	0.00	0.16	0.00	0.10
A	3	0.11	0.01	3	0.11	0.01	0.05	0.00	0.03	0.00
BBB	27	0.66	0.36	25	0.61	0.36	0.23	0.47	0.14	0.28
BB	16	2.51	1.08	14	2.20	0.98	0.86	2.25	0.52	1.35
B	20	4.99	1.20	15	3.74	1.13	4.44	8.06	2.66	4.84
<B	10	5.78	2.80	9	5.20	2.57	19.59	26.83	11.75	16.10
Unknown	46	0.90	0.26	37	0.73	0.18	n.a.	n.a.	n.a.	n.a.
All	123	0.82	0.24	104	0.69	0.21	1.53	1.80	0.92	1.08
				Panel C: 1990-92						
AAA	0	n.c.%	n.c.%	0	n.c.%	n.c.%	0.00%	0.00%	0.00%	0.00%
AA	2	0.17	0.05	1	0.09	0.03	0.00	0.00	0.00	0.00
A	9	0.37	0.03	6	0.25	0.03	0.00	0.00	0.00	0.00
BBB	34	1.10	0.26	24	0.78	0.19	0.45	0.09	0.27	0.06
BB	52	5.68	2.31	31	3.39	1.67	2.29	3.08	1.37	1.85
B	32	7.05	3.93	26	5.73	3.23	11.10	13.83	6.66	8.30
<B	14	6.90	8.71	9	4.43	5.51	31.91	38.94	19.15	23.36
Unknown	61	2.66	0.70	29	1.27	0.39	n.a.	n.a.	n.a.	n.a.
All	204	1.81	0.53	126	1.12	0.35	2.37	2.77	1.42	1.66
				Panel D: 1993-98						
AAA	0	n.c.%	n.c.%	0	n.c.%	n.c.%	0.00%	0.00%	0.00%	0.00%
AA	0	n.c.	n.c.	0	n.c.	n.c.	0.00	0.00	0.00	0.00
A	7	0.16	0.01	3	0.07	0.01	0.02	0.00	0.01	0.00
BBB	28	0.46	0.05	13	0.21	0.04	0.20	0.03	0.12	0.02
BB	35	2.51	0.25	18	1.29	0.18	0.58	0.39	0.35	0.23
B	18	3.84	1.96	13	2.77	1.97	3.93	3.48	2.36	2.09
<B	13	4.09	3.66	9	2.83	2.24	20.13	14.11	12.08	8.47
Unknown	32	1.33	0.24	23	0.96	0.20	n.a.	n.a.	n.a.	n.a.
All	133	0.77	0.12	79	0.46	0.10	0.77	0.87	0.46	0.52

n.c. means no CREs for that rating. n.a. means not applicable for public bonds. * Public bond average loss rates estimated as corresponding default rate times 60% loss severity.

Private placement incidence rates are higher than public bond default rates for all but the B and <B grades. Comparing Panels 2 and 3 of Panel A, for the investment grades the incidence rate differences are in the range 0.01 to 0.33 percentage points, which is absolutely rather small but proportionately substantial. For the BB category, the private placement default rate is about one percentage point higher than that computed from the S&P study but 0.65 percentage points higher than that from Moody's study (in general, differences between Moody's and S&P default rates for grades that are commonly thought to be similar make interpretation difficult). The private default rate is 1.48 to 2.44 percentage points lower for B, and 15 to 21 percentage points less for bonds rated less than B.[14]

Although incidence rates are higher, better severities make private placement economic loss rates about the same as public bond economic losses in the investment grades and BB (the far right column in Table 5 reports estimated public bond loss rates, calculated as the agency default rate times an average loss severity of 60 percent). Again focusing on Panels 2 and 3, private economic loss rates are much better for assets rated B or riskier.

Panels B though D of Table 5 compare public and private experience by most recent internal rating for three subperiods: 1986-89, 1990-92, and 1993-98. Because public bond loss rates peaked in 1990-91, whereas private loss rates peaked in 1991-92, we chose to include 1990 in the middle (high-loss) period to achieve better comparability across the two markets. Patterns of relative public bond and private placement loss rates in the lower panels are qualitatively rather similar to those in Panel A, with loss rates similar through BB and better in the private market for assets rated B and riskier.

Do Public and Private Default Rates Differ, and Why?

It is difficult to assess the statistical significance of the differences. If default is viewed as a

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[14] The next-to-last row of Panel A in Table 5 reports statistics for sample private placements for which no internal rating was reported. These account for 25 percent of private exposure units. Incidence and loss rates for the unknown-rating pool are somewhat higher than the overall average (in which they are included), so their credit quality distribution must be somewhat more concentrated in the below-investment grades than the remainder of the sample. The unknown-rating pool was not included in Figure 8, which therefore slightly understates the proportion of all privates that is below investment grade. Omission of the unknown category does not bias the comparisons in the second through fourth rows of Table 3, however.

That some internal ratings of privates were not reported has different implications for public-private comparisons than the omission of unrated and especially very low-rated bonds from public-market statistics. The unknown-rating privates are included in overall loss experience values, so such values are representative of all private experience to the extent the portfolios of the companies contributing to this study form a representative sample. However, the omission of some low-rated bonds from the public statistics in effect imparts a bias. In panel 3 of Table 5, the S&P-based default rate of 21.83 percent for bonds rated <B apparently includes only CCC-rated public bonds---those rated CC and C are not included in S&P's study. Even if CC and C default rates are no worse than CCC rates, the omission of CC and C bonds means the overall average loss rate is biased downward as an estimate of experience for *all* public bonds. In contrast, the Moody's default rates include Ca and C-rated obligors.

binary random variable that is distributed identically within each rating class, most of the differences in private and public default rates are statistically significant in that they exceed two standard deviations, but Moody's and S&P's results also differ significantly by this criterion. Thus interpretation is difficult, and the identical-distribution assumption is likely unrealistic in any case, especially for the lower ratings (a BB- differs significantly in default probability from a BB+).

There appear to be four major possible explanations for private default rates higher than public in the better rating categories and lower in the riskiest rating categories. First, private-market investors may expend more resources in monitoring and intervening with very risky borrowers and reap a reward in the form of lower incidence and loss rates. This is consistent with much anecdotal evidence about the differing behavior of private placement and public bond market investors.

Second, the internal rating systems at participating insurance companies may not be pure default ratings, but rather may focus on expected loss (that is, expected loss severities may affect internal ratings of placements).[15] If this is the case, it is to be expected that default rates by grade would be higher in the private market but economic loss rates would be about the same, as shown in Table 5 for grades down through BB. Differences are substantial for the lower ratings, however, so an explanation of differences that focuses on rating definitions alone is not adequate.

Third, participating companies may be fairly accurate in their original ratings of issuers but be slower than the major rating agencies to update their ratings as a borrower's condition deteriorates. Public bonds would therefore be more likely to spend some time rated B or below before defaulting whereas privates would be relatively more likely to jump from a higher rating directly into default. This could explain why incidence rates are higher in the private market for grades AAA though BB but lower for the riskier grades.

Fourth, even if participating companies focus their ratings on expected losses, they may simply be somewhat more conservative than the rating agencies with respect to the assets they rate B and below. By placing relatively more not-terribly-risky assets in the B and below categories, incidence rates in those grades would be reduced (but this should also tend to reduce incidence rates in the safer grades, which is somewhat inconsistent with the results).[16]

On the whole, the results support the credibility of private placement investors' internal ratings (where the major rating agencies set the standard for credibility). As seen in public bond

[15] Moody's bond ratings are said to incorporate loss severity considerations whereas S&P's do not. However, issuer ratings are the basis for both agencies' default rate studies, and such ratings are meant to be representative of the credit quality of a generic senior unsecured obligation of the issuer.

[16] A possible technical reason for the pattern of results, our practice of assigning the better rating to an issuer when ratings of different assets of that issuer differ by a single full grade, appears not to be a significant factor. When the lower of the two ratings is assigned, default rates fall by 0 to 0.2 percentage points for ratings through BB, and rise by similar amounts for B and below.

Table 6 - Loss Severities, Publics and Privates (percent)

Subsample	Publicly Issued Bonds	Private Placements		
		All CREs	Restructures Only	Defaults Only
Whole Sample (1986-98):	59 %	31% (35)	21% (23)	38% (44)
1991-98 Only	55	29 (35)	20 (22)	36 (45)
By Priority (1991-98 only)				
Senior	47	27 (33)	22 (22)	31 (47)
Subordinated	63	45 (45)	32 (32)	54 (54)
Not reported (all yrs)	n.a.	32 (33)	24 (24)	37 (37)

Numbers in parentheses are discussed in subsection G below. Results by priority are available only for experience years 1991-98 (the priority of placements was not collected for the 1985-89 exposure year-ends) and priority was often not reported even when requested. Thus, results in some cells are based on as few as two dozen CREs. Public bond statistics in the lower panel are also for 1991-98 only. The last row combines 1991-98 CREs for which priority was not reported with all CREs from 1986-90.

experience, average incidence and loss rates increase for each stepdown in rating, and more rapidly for stepdowns in the lower grades.[17]

Loss Severity

Table 6 presents average severities on public bond defaults for 1986-98 as well as average severities on privates.[18] (This subsection refers to the numbers in larger type in Table 6. Numbers in parentheses are discussed in subsection G.) The statistics for publicly issued bonds must be interpreted with special care because they cover only those bonds for which adequate post-default trading price information was available, not all defaulted bonds. It is not known whether this selection mechanism imparts a bias, or whether the post-default trading prices on which public bond severity calculations are based are in fact good estimates of recoverable cash flows. In the absence of a sample selection bias, prices should be good estimates of the present value of recoverable cash flows *if* discount rates are similar across capital markets and markets are reasonably efficient.

Overall, public bond severities averaged 59 percent during 1986-98 whereas private placement severities averaged 31 percent, a striking difference of 28 percentage points. When only private placement defaults are considered, the average severity rises to 38 percent, still a difference of 21

[17] Although incidence rates are similar for the B and <B categories in Table 5, in Table 3, which is based on this study's full panel of data, the step-up in incidence and loss rates from B to <B is substantial.

[18] Average severities on publicly issued bonds are computed from data in Altman, *op cit.*

percentage points. These results are not far from average severities reported in a 1991 ACLI study for the period 1976-89.[19]

The statistics for severity by priority that appear in the lower panel of Table 6 must be interpreted with some care because they cover only experience years 1991-98 and only those private placement CREs for which seniority of the asset could be determined. Seniority was not collected for the 1985-89 exposure year-ends, and was not always reported for 1991-98 CREs. The "not reported" row covers all CREs from all of 1986-98 for which seniority was not reported.

Bonds with higher priority in bankruptcy have significantly lower loss severities on average in the public market, with senior public bond default severities averaging 47 percent versus 63 percent for subordinated instruments. Senior private placements show a similar advantage, with severities of 27 percent versus 45 percent for subordinated privates. Both priority classes of private debt have lower severities than the corresponding class of public debt, by about 20 percentage points. When attention is restricted to private defaults alone, senior and subordinated severities still differ by 23 percentage points (31 vs. 54 percent). Severities on restructurings alone are much less than those for defaults, and the difference between severities for senior and subordinated instruments is about 10 percentage points.

Somewhat surprisingly, the secured status of a placement appears to have little impact on loss severities. For example, where secured status is known, defaults of senior secured versus senior unsecured placements have average severities of 28 and 29 percent, respectively (not shown in the table). For restructurings, the analogous numbers are 24 and 19 percent respectively (restructurings of secured placements have higher severities!?). These surprising results may simply reflect statistical noise (numbers of CREs in each cell are not large, ranging from 25 to 55). It may also be that, because of the wide variety of collateral types and values, "secured" is not a category that is well-enough defined to support meaningful results. Although the most recent data request asked for information about the nature of collateral, the volume of CREs for which such information is available is not yet large enough to support inferences.

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[19] Cabanilla, Nathaniel B., "Publicly Issued Bonds and Private Placements Held by Life Insurance Companies: Trends in Holdings, Measures of Credit Risk, Losses and Defaults," in *Investment Topics* (Washington, DC: American Council of Life Insurance, Investment Research Department), mimeo, February 1991. To estimate loss severities, the ACLI study used differences in par and statement values of NAIC No-rated assets (which are "in or near default") on the balance sheet at each year-end, separately for private placements and publicly issued bonds. Thus, the ACLI estimates are based on accounting values set by insurance companies according to NAIC guidelines, in contrast to this study's use of discounted cash flows. This study also attributes the severity for a CRE only to the year the CRE occurred, whereas the same CREs likely appear in multiple years in the ACLI study's calculations. The ACLI study finds public bond severities of 68 percent for 1989 alone (compare to Altman's (op. cit.) estimate of 64 percent for that year) and 43 percent for private placements (this study estimates a 39 percent severity for CREs that occurred in 1989 (see section V). For the whole period 1976-89, the ACLI study finds average severities of 49 percent and 33 percent for publicly issued bonds and private placements, respectively. These estimates are quite a bit better than Altman's for publicly issued bonds, but similar to this study's estimates for private placements.

Where is the Incremental Value?

There are many reasons why private placements might offer investors incremental value relative to publicly issued bonds. Examples include higher interest rate spreads for a given degree of credit risk, lower loss severity rates, lower default or incidence rates for similarly rated assets, or other factors related to portfolio management. Of course, any such value is not free, as private placements are said to involve greater administrative costs than publics and are generally less liquid.

This study sheds light only on loss-related sources of value. The statistics in Table 3 imply that better loss severities are the primary source of value, but Table 5 shows the situation is more complicated. Average severities are better in the private market (Tables 2 and 6) and incidence or default rates are also better for assets rated B and below, though they are worse for BB and above. The most dramatic difference in loss rates occurs in the <B category and is due mostly to a difference in incidence rates. In the investment grades, however, the better severities on privates approximately offset their higher default rates, leaving economic loss rates about equal.

At first glance, it therefore appears that better overall economic loss experience is a substantial source of value for below investment grade privates but not for those in the investment grades. However, the comparisons are based on average one-year default rates, not ratings at acquisition. Since many originally investment grade bonds that end up in default first migrate to the junk grades, and loss experience is better there, better loss experience probably offers some incremental value for all private placements.

The evidence accords well with anecdotal evidence on pricing, which holds that investment-grade privates carry spreads above those on similarly-rated public bonds whereas lower-rated privates carry lower spreads, especially for the B category. It appears that better loss experience makes such spreads possible.[20]

G. Implications for the Time Pattern of Incidence and Severity Rates of a Possible Change in Interpretation of "Credit Risk Event"

As shown in Figure 3, average loss severities dropped significantly in the years after 1992, from a 1986-92 average of 35 percent to 22 percent during 1993-98. Three explanations for the apparent shift in regime immediately come to mind:

- The credit distress of the early 1990s gave many investors new expertise in handling distressed assets, improving their ability to limit loss severities.
- The more benign credit environment of the middle 1990s, and better conditions in markets for the assets of distressed firms, may have tended to make losses smaller than in earlier

[20] The anecdotes are in turn consistent with comparative spreads produced using an earlier version of this study's data. See Carey, Mark S., and Warren Luckner, "Spreads on Privately Placed Bonds 1985-89: A Note," working paper, Society of Actuaries and Federal Reserve Board, April 1994.

years.
- More restrictive underwriting standards after the problems of the early 1990s may have reduced loss severities in addition to reducing CRE incidence rates.

If there are no other explanations for the change, then these would be the main explanations for the change. In that case, the implications for the relative value of private placements generally and over the business cycle are potentially quite important because the same pattern is not observed in the public market. Loss severities on defaulted publicly issued bonds improved somewhat during 1993-98, to an overall average of 55 percent from a 1986-92 average of 60 percent (see Altman, op. cit.). However, only subordinated public debt severities improved, by about six percentage points, while senior public debt severities were unchanged. Thus, in the absence of other explanations for the time pattern of private placement severities, it would appear that private severities improved markedly relative to those in the public market.

However, changes in the character of CRE assets and perhaps in contributors' reporting practices also may be partly responsible for the change in time pattern:
- The seniority of CRE assets changed somewhat. To improve our ability to assess the change in seniority, for this subsection's analysis alone, reported information on seniority was supplemented with information in the CUSIP directory, where available. As a fraction of all CREs, those known to be subordinated amounted to 10 percent during 1993-98 but 16 percent during 1986-92, which would tend to reduce average severities in the later period.[21] In contrast, in the later period, 28 percent were secured versus 22 percent in the earlier period. To get an idea of the materiality of the change, multiply the 6 percentage point change in the share subordinated by the 18 percentage point difference in average severity for senior versus subordinated CREs shown in Table 6. This yields an implied reduction in overall average severity of about 1 percentage point, not enough to explain the drop in average private placement loss severities in the 1990s. (These statistics should be interpreted with caution because, even with our best efforts, seniority is unknown for many CREs.)
- The mix of types of CREs changed, but not too much. Restructurings were only about 5 percentage points higher and defaults about 5 percentage points less as fractions of all CREs during 1993-98. Restructurings tend to involve smaller severities on average, but again the expected impact on overall average severity is only about 1 percentage point.
- A change in reporting practices may have influenced the time pattern of average severities while having little effect on economic loss rates. The remainder of this subsection explores this possibility.

As described in Appendix I, section D, information about CREs reported by contributing companies is inspected closely for accuracy and consistency. Possible discrepancies are resolved through dialog with contributors wherever possible. Although the definition of "credit risk event" given in Appendix I is unchanged since the 1986-89 Credit Risk Loss Experience Study,

[21] Percentages subordinated of 10 and 16 percent are for all CREs. Of those CREs for which severity is known, the percentages are 13 and 31, respectively.

some contributors may have adopted a more inclusive interpretation of the definition when constructing their 1993-98 data submissions than they used in constructing previous submissions. This possibility became apparent from dialog with contributors and from inspection of SEC filings for borrowers experiencing CREs, where available. For example, more likely to be reported as CREs during 1993-98 were relatively minor restructurings associated with covenant violations, or payment defaults that were rapidly cured. Such CREs tend to have low loss severities and often involve gains to the investor because fees and increased interest payments are received.

In part, any change of interpretation may represent a greater sensitivity to credit events due to contributors' experience with this study. The change may also be due in part to the more benign credit environment of the middle 1990s. In earlier years, the volume of credit events involving significant losses was large and, given resource constraints, contributors may have chosen to focus more on large-loss CREs and less on events with low severities.

Both earlier and more recent interpretations and reporting practices are entirely legitimate and are consistent with the CRE definition given in Appendix I. The distinction between CREs and other events is not a sharp one and judgment must be used in deciding what to report.

The possible change in reporting does not have much effect on economic loss rates: It tends to increase average incidence rates while also reducing average loss severities. Moreover, sensitivity tests revealed that most results of the study are not qualitatively affected. For example, patterns of incidence and loss rates by most recent rating are not much affected. In contrast, a change in reporting practices could have a material impact on patterns of incidence and severity over time and on overall average loss severity.

Measuring the extent of the change in interpretation of "CRE" with precision is desirable because that would shed light on the extent to which the explanations given in the three bullet points at the beginning of this subsection are material. Precise measurement is not possible because of the limited nature of the information that is contributed, but based on inspection of samples of CREs and dialog with contributors, two sensitivity-test exercises were conducted to shed light on the magnitude of any change in reporting.

First, the possible change of interpretation of "CRE" appears to have occurred only at three contributing companies, so we examined results when those companies are omitted. Specifically, average private placement loss severities were calculated only for the companies that contributed during most years of the study, but omitting the three (which left four companies in the calculations). Strikingly, while the average loss severity for 1986-92 for these four companies was 37 percent, near the 35 percent full-sample value, the severity for 1993-98 was 45 percent (compared to 22 percent for the full sample). Thus, this sensitivity analysis seems to imply that a change in reporting practices may more than explain the change in average severities. However, only a bit more than 100 CREs were included in this exercise, so small-sample noise is a concern.

Second, the CREs reported by the three contributing companies were adjusted in an attempt to make 1993-98 CRE reporting comparable to that for 1986-92. Fifty-one 1993-98 CREs that might not have been reported as CREs during 1986-92 were eliminated from calculations.[22]

In Table 6, the numbers in parentheses in small type report average severities after removal of the 51 CREs. The overall effect is material, with the full-sample mean loss severity rising to 35 percent. The impact on average severities is greater for defaults than for restructurings. The general character of the impact of seniority on loss severity remains the same, but the advantage of senior over subordinated debt is reduced somewhat, especially for defaults.

Table 7 reports averages of this study's four loss statistics by year, with and without the 51 CREs. The effect of the 51 CREs on the time pattern of loss severities is substantial: When they are included, annual average severities during 1993-98 are usually in the range 14 to 23 percent, whereas without them the averages are usually in the range 28 to 37 percent. The overall exposure-weighted average for 1993-98 is 22 percent when the 51 CREs are included and 34 percent when they are not, and 34 percent is very close to the overall exposure-weighted average for 1986-92 of 35 percent. Thus, this sensitivity analysis implies that a change in reporting practices *may* have been responsible for the entire change in severities over time (but does not prove that reporting practices are the cause).

In contrast to the effect on severities, economic loss rates are almost unaffected by inclusion or exclusion of the 51 CREs, both overall and from year to year, as shown in the last two columns of Table 7. Even though average severities are increased by dropping the 51 CREs, incidence rates are reduced such that there is no net effect on economic loss rates.

Two contrasting interpretations of the time pattern of loss experience are consistent with the results: 1) Full-panel results imply that, following the 1990-92 period of debt distress, incidence rates dropped back to levels somewhat better than those of 1986-89 and loss severities dropped by about one-third; or 2) Results of sensitivity analysis imply that loss severities stayed about the same on average after 1992, but incidence rates dropped to very low levels. In both cases,

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[22] The criteria use to select the 51 CREs were crude because detailed circumstances of each CRE are not reported. For example, at one company, all failure-to-pay CREs with severities less than 10 percent were eliminated. At another company, almost all restructure CREs were eliminated (all such CREs had reported severities less than 1 percent). SEC filings of borrowers for which CREs were reported by the three companies were examined in order to gain insight into the character of the CREs. Though such filings are often not available, and when available are often not definitive, on the whole there were clear indications that many reported CREs represented minor restructurings associated with covenant violations. Reviews of CREs during preparation of earlier editions of this study found such CREs to be relatively infrequent.

Such crude elimination criteria probably eliminated some CREs that *would* have been reported had they occurred during 1986-92, not just those that would not have been reported for earlier editions of this study. However, any over-elimination does not appear to be extreme because, even after dropping the 51 CREs, the relative frequency of CREs with individual loss severities below ten percent is higher at the three companies for 1993-98 than during 1986-92.

Table 7. Experience With and Without 51 CREs Possibly Representing Change of Interpretation of Definition of CRE (percent)

Year	Incidence Rate				Loss Severity		Economic Loss Rate	
	By Number		By Amount					
	All CREs	Drop 51	All CREs	Drop 51	All CREs	Drop 51	All CREs	Drop 51
1986	0.67	0.67	0.76	0.76	40.25	40.25	0.31	0.31
1987	0.79	0.79	0.89	0.89	24.27	24.27	0.22	0.22
1988	0.42	0.42	0.43	0.43	39.94	39.94	0.17	0.17
1989	0.49	0.49	0.69	0.69	39.19	39.19	0.27	0.27
1990	0.66	0.66	0.83	0.83	38.79	38.79	0.32	0.32
1991	1.67	1.67	1.73	1.73	40.88	40.88	0.71	0.71
1992	1.26	1.26	1.84	1.84	29.31	29.31	0.54	0.54
1993	0.99	0.87	1.28	0.98	23.42	30.67	0.30	0.30
1994	0.32	0.28	0.36	0.24	19.19	30.42	0.07	0.07
1995	0.69	0.42	0.74	0.44	21.22	36.47	0.16	0.16
1996	0.43	0.23	0.45	0.18	14.26	37.43	0.06	0.07
1997	0.33	0.30	0.23	0.19	42.79	52.17	0.10	0.10
1998	0.28	0.11	0.24	0.10	19.50	27.53	0.05	0.03
Avg	0.71	0.66	0.85	0.76	31.25	35.03	0.27	0.26

n.c. means no CREs

economic loss rates dropped to levels that were low relative to 1986-89.

The truth probably lies somewhere between the two cases. The interpretation of "credit risk event" embedded in recent reporting by some companies contributing to this study probably did change in recent years, but perhaps not enough to require dropping as many as 51 CREs to achieve comparability over time. Thus, average loss severities probably did improve after 1992, albeit more modestly than implied by Figure 3, and perhaps to some extent because of a change in average seniority of CRE assets. Conversely, incidence rates probably improved even more than implied by Figure 2. Any change in private placement severities may well have been similar to the change in severities for publicly issued bonds, but we cannot measure the time pattern for private placements precisely enough to be able to draw firm conclusions.

Fortunately, the issue of comparability of reporting does not appear to be material to other results in this study. As noted, dropping the 51 CREs from the calculations leading to Table 5 leaves the qualitative pattern of other results unchanged. For example, changes in incidence rates and severities associated with dropping the 51 CREs are spread fairly evenly across rating grades, leaving the general pattern of results in Table 5 unchanged.

H. Experience By Earliest Internal Rating

For the current edition of this (ongoing) study, it is unfortunately not possible to produce multiyear cumulative average default rates similar to those reported by Moody's and S&P, nor is it possible to produce cumulative mortality rates similar to those of Altman, although it may be possible to do so in future editions.[23] Some information about loss rates by rating at private placement issuance is available now, however. Figure 9 shows the distribution of sample placements by earliest internal rating. "Earliest rating" is a proxy for rating at private placement issuance but is not a precise measure of it. Participating companies were asked to report their internal rating at acquisition for each asset, but for those unable to report rating at acquisition, the most recent internal rating as of the earliest year-end it was reported was used. For example, if data for an asset were reported for the years 1985-93, with ratings reported for the year-ends 1986 and thereafter but no rating at acquisition, the earliest rating variable was set to the 1986 value of the most recent rating variable. About half of earliest rating values are inferred in this manner, with the remainder being the reported rating at acquisition. For the full sample, the distribution of earliest ratings is very similar to that of most recent ratings. Because very few private placements have ratings <B at origination, results for that grade may

Figure 9: Distribution of Privates by Earliest Rating

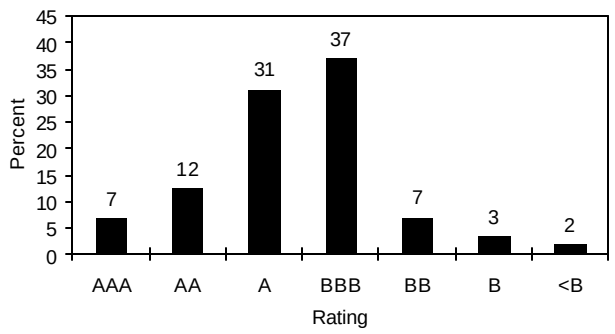


Figure 10. Incidence Rates By Earliest Rating

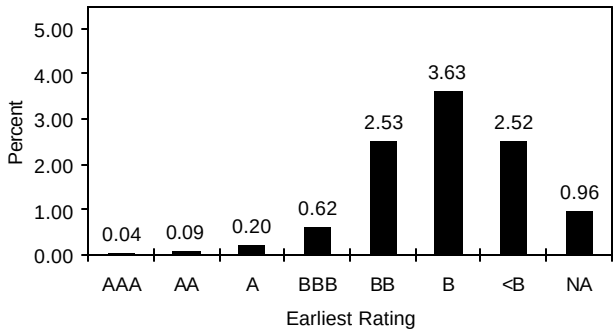
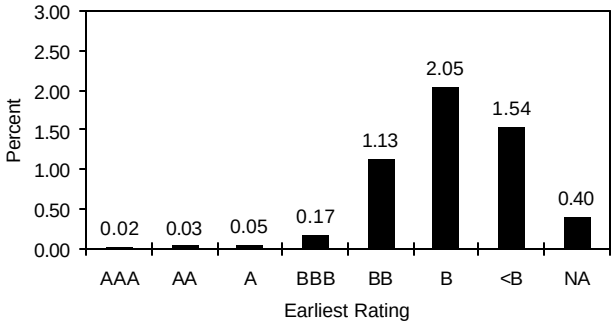


Figure 11: Economic Loss Rates by Earliest Rating



[23] See Altman, Edward I., "Measuring Corporate Bond Mortality and Performance," *Journal of Finance* September, 1989, pp. 909-22. The reported data must be linked across years for individual assets in a manner not required for other results. Such linking is a time-consuming project that is unfinished.

mainly reflect the experience of privates for which the date of our earliest rating information was at least a year or two after origination. Thus, earliest-rating results for the less risky grades may somewhat understate losses relative to rates that would be revealed if at-origination ratings were universally available.

Figures 10 and 11 show incidence rates (by number) and economic loss rates by earliest rating, respectively. The loss rates are higher than those in Figure 7 (most recent rating) for the investment grades, but are about the same for the BB and B grades. These are average one-year rates as usual, but default for an individual bond that occurs during a span of years after acquisition will be associated with its rating at acquisition, not just with the most recent rating at the start of each year. Somewhat higher loss rates are thus natural for the investment grades, as such assets typically do not default within a year of being rated investment grade. Instead, they transition through the lower grades, raising the loss rates by most recent rating of those grades on the way through (in this case, especially the <B rate).

Section IV contains cross tabulations that provide economic loss rates for various secondary factors within each earliest internal rating. The secondary factors shown include years since funding, years to maturity and original coupon rate.

Table 8 - NAIC Rating Schemes and Concordance

Ratings Through 1989	Meaning	Ratings 1990 and After	Rating Agency Equivalent	Concordance Rating	Included in Concordance Category
Yes	Primarily investment grade	1 2	AAA,AA,A BBB	Investment Grade	Yes, 1, 2
No*	Non-investment grade, average quality	3	BB	Below investment grade--High	No*, 3
No**	Non-investment grade, below average quality	4 5	B <B	Below investment grade--low	No**,4,5
No	In or near default	6	Default	At or near default	No,6

I. Experience by NAIC Rating

The NAIC SVO rated most private placements throughout this study's sample period, but on two different scales, as shown in Table 8. A concordance between the two scales, also shown in the table, was judgmentally developed so that results for the full sample could be shown on a common scale. Such results for economic loss by most recent NAIC rating (that is, the rating at the start of the experience year) appear in Figure 12. Unsurprisingly, loss rates rise as the rating worsens.

Figure 12: Economic Loss by Most Recent NAIC Rating, Concordance Scale, 1986-92

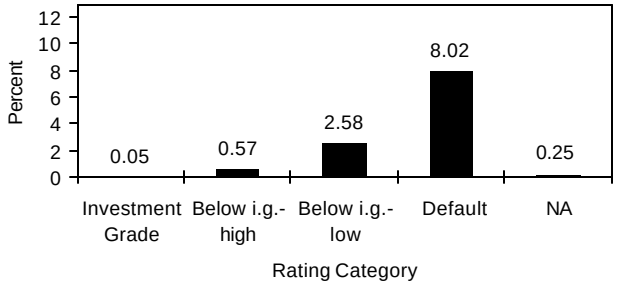


Figure 13: Private vs. Public Incidence Rates, Most Recent NAIC Ratings

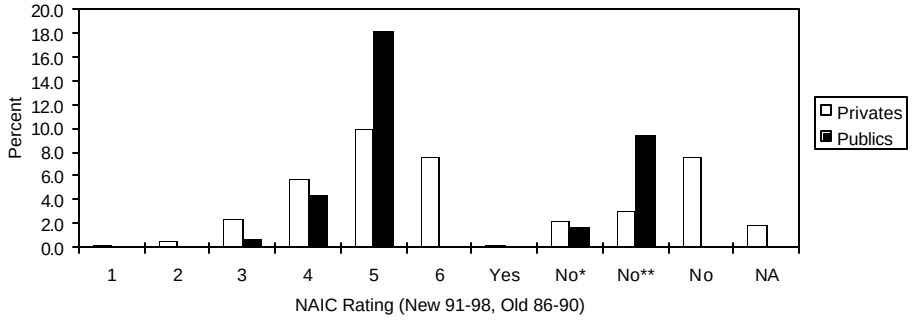


Figure 13 shows incidence rates by number for the old and new NAIC scales separately along with public bond default rates for comparable agency grades and time periods. The incidence rates were computed in the same manner as those in Table 5 (for example, private calculations were on an issuer, not an asset basis), but those for the old NAIC scale include only the years 1986-90 whereas those for the new scale include only experience years 1991-98. (Experience year 1990 must be analyzed on the old scale because the year-end 1989 NAIC rating is used as

Table 9 - Incidence, Severity and Loss by Old and New Most Recent NAIC Ratings (percent)

Experience Years	Rating	Incidence Rate		Loss Severity	Economic Loss	Comparable Incidence	
		By Number	By Amount			Private	Public
91-98	1	0.11%	0.08%	18%	0.02%	0.18%	0.01%
	2	0.34	0.37	19	0.07	0.49	0.12
	3	1.60	2.16	25	0.55	2.39	0.73
	4	4.39	6.94	29	2.04	5.74	4.44
	5	9.24	15.71	31	4.85	9.93	18.11
	6	6.67	18.67	43	8.11	7.57	n.d.
86-90	Yes	0.19	0.19	43	0.08	0.27	0.10
	No*	1.61	1.75	37	0.64	2.27	1.67
	No**	2.71	4.97	37	1.83	2.99	9.38
	No	6.11	14.54	53	7.77	7.57	n.d.
All	NA	1.11	0.78	32	0.25	1.92	n.d.
	All	0.71	0.85	31	0.27	1.06	n.d

Note: Statistics for ratings 1-6 are for 1991-98 experience years only. Yes through No are for 1986-90 years. NA and All are for all years. n.d. indicates no data for cell.

the start-year-1990 rating.)

Results for the new NAIC scale, shown in the left half of Figure 13, are qualitatively similar to results for most recent internal ratings reported earlier. As in Table 5, private and public incidence rates are fairly similar for the investment grades. In Table 9, NAIC-3 assets' rate (2.4 percent) is higher than the public rate (0.73 percent), but the comparison period is limited to 1991-98, thus capturing virtually all of the private placement market's most severe distress while omitting the 1990 year of public bond market distress. For NAIC 5 (<B), private incidence rates are less than in the public market as before (no public-market comparison is available for NAIC 6 assets). This study's most recent internal rating scale and new NAIC rating scale were both designed to be comparable to public scales---the identity of the institutions producing the rating is the main difference among the three---so perhaps it is unremarkable that investors, the NAIC and the rating agencies all appear to be arriving at about the same assessments of credit quality on average. Still the results lend credibility to both the NAIC scale and investors' internal ratings, although it should again be noted that the left half of Figure 13 is based solely on the 1991-98 experience years and thus tends to overstate private incidence rates relative to public bond default rates.

The right half of Figure 13 focuses on the old NAIC scale and experience years 1986-90. Here public ratings AAA-BBB were assumed equivalent to Yes, BB to No*, and B and <B to No**. The story is basically the same---incidence rates for comparable NAIC and public ratings are similar except for the very risky grades, where private incidence rates are better.

Detailed results by year specific to the pertinent NAIC scale for each year appear in Appendix IV. Summary statistics are given in Table 9, along with the comparable public and private incidence rates that are also plotted in Figure 13 (private comparable incidence differs from incidence rates by number primarily because calculations were on an issuer basis --- see subsection F above).

J. Time Patterns of Credit Risk Event Occurrence

The reader is referred to the cross tabs in section IV and associated results in Appendix IV, which offer deeper analysis of time patterns of credit risk events than appears in this subsection. Figures 14 through 17 show the distributions of sample credit risk events and corresponding incidence rates by number by the year of funding and the number of years since funding, respectively. Incidence rates must be interpreted with caution here because the pool of assets for each cell is incomplete in some cases---for example, the data set does not include all participating company assets funded in 1983, but only those that were still outstanding at some point in the 1986-98 period. In addition, the timing of the 1990-92 recession obviously has some effect on these statistics.

As shown in Figure 14, about half of all CREs occurred for assets originated during the last half of the 1980s. The corresponding distribution of incidence rates in Figure 15 is generally similar, but the rise of late-1980s incidence rates relative to earlier rates is more pronounced and rates for 1988-90 are unusually high, which is unsurprising given the timing of the recession.

Figure 16 shows the distribution of CREs by the number of years since funding; corresponding incidence rates appear in Figure 17. Again the distributions are broadly similar, with the great majority of CREs (about 80 percent) occurring within 7 years of the funding date.

It is difficult to draw firm conclusions from Figures 14-17. On the one hand, the typical private placement has an average life of seven years or so and features some amortization of principal. Thus it is natural that most CREs occur within a few years of issuance and that many CREs in the sample are associated with assets issued between 1985 and 1990. For earlier cohorts of assets, a significant fraction of CREs likely occurred before this study's sample period began, whereas many issued in the 1990s may have experienced CREs after 1998. Although the shape of the distributions of incidence rates by years since funding may partly result from the confluence of historically large issuance during the mid-to-late 1980s and a recession during the early 1990s, the crosstab analyses in Section IV shows a mortality effect even after controlling for the 1990-92 recession.

Figure 14: Distribution of CREs by Year of Funding

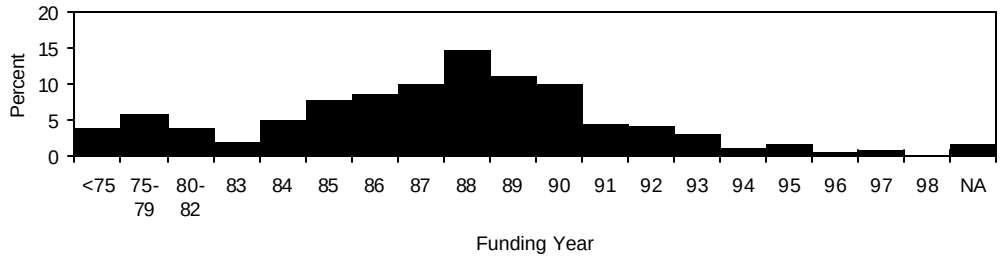


Figure 15: Incidence Rates by Number by Year of Funding

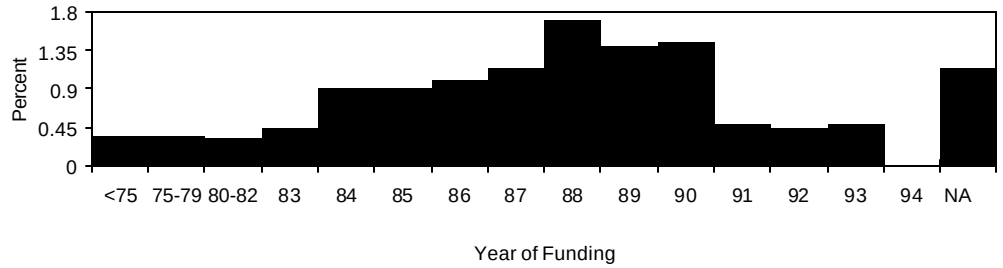


Figure 16: Distribution of CREs by Years Since Funding

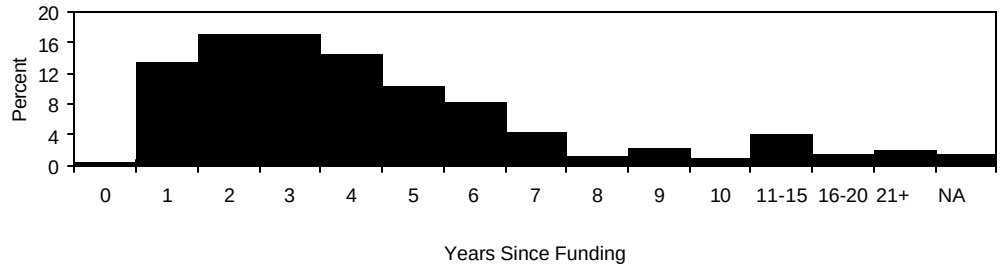


Figure 17: Incidence Rates by Number By Years Since Funding

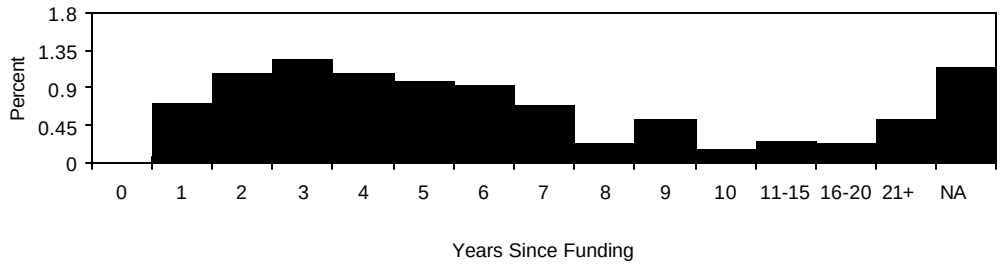


Table 10 - Experience by CRE Type and Year (percent)

	Economic Loss				Loss Severity			
Year	Sales	Restructures	Defaults	Unknown	Sales	Restructures	Defaults	Unknown
86	0.05%	0.03%	0.23%	n.c.%	71.85%	21.07%	42.12%	n.c.%
87	0.00	0.04	0.18	-0.01	58.35	19.97	32.53	-7.46
88	n.c.	0.00	0.17	n.c.	n.c.	20.66	40.51	n.c.
89	0.00	0.03	0.24	0.00	15.26	43.21	39.97	8.37
90	n.c.	0.07	0.25	0.01	n.c.	23.88	54.08	7.59
91	0.03	0.12	0.56	0.00	72.56	19.83	50.74	100.00
92	0.01	0.28	0.25	n.c.	20.22	24.24	39.48	n.c.
93	0.00	0.07	0.23	0.00	-1.98	18.68	26.76	-4.10
94	0.00	0.00	0.07	n.c.	1.77	6.25	23.07	n.c.
95	0.00	0.03	0.12	n.c.	7.90	28.36	20.43	n.c.
96	0.00	0.02	0.04	n.c.	3.85	8.53	23.20	n.c.
97	0.01	0.00	0.09	n.c.	33.95	-2.04	54.42	n.c.
98	n.c.	0.02	0.03	n.c.	n.c.	10.08	40.32	n.c.
All	0.01	0.06	0.20	0.00	28.90	20.89	37.92	0.98
	Incidence By Number				Incidence By Amount			
Year	Sales	Restructures	Defaults	Unknown	Sales	Restructures	Defaults	Unknown
86	0.05%	0.10%	0.52%	n.c.%	0.07%	0.16%	0.53%	n.c.%
87	0.01	0.10	0.64	0.04	0.00	0.20	0.57	0.12
88	n.c.	0.04	0.38	n.c.	n.c.	0.01	0.41	n.c.
89	0.01	0.02	0.44	0.02	0.01	0.06	0.61	0.01
90	n.c.	0.21	0.41	0.04	n.c.	0.30	0.45	0.08
91	0.07	0.35	1.23	0.02	0.05	0.59	1.10	0.00
92	0.09	0.66	0.50	n.c.	0.07	1.14	0.63	n.c.
93	0.04	0.30	0.64	0.01	0.04	0.36	0.87	0.00
94	0.01	0.07	0.24	n.c.	0.03	0.04	0.28	n.c.
95	0.04	0.12	0.53	n.c.	0.03	0.12	0.60	n.c.
96	0.02	0.20	0.21	n.c.	0.03	0.24	0.18	n.c.
97	0.05	0.03	0.24	n.c.	0.02	0.04	0.17	n.c.
98	n.c.	0.21	0.06	n.c.	n.c.	0.16	0.07	n.c.
All	0.03	0.19	0.48	0.01	0.03	0.29	0.52	0.01

n.c. means no CREs in cell.

K. Experience By Type of Credit Risk Event

In this study, the definition of CRE includes restructurings and asset sales motivated by the investor's desire to avoid or minimize possible losses. Most studies of credit risk experience, especially those focusing on publicly issued bonds, consider only defaults.[24] Table 10 displays

[24] Negotiated restructurings are rarely seen in the public bond market and thus their inclusion in public bond default studies would not materially alter results.

incidence, severity, and loss rates by year for four types of credit risk event: defaults, restructurings, sales, and unknown. Defaults include both borrower bankruptcies and failures to pay as scheduled.[25] Denominators for incidence and loss measures include all exposure for a year, so entries within a year sum to the aggregate incidence and loss rates shown in Figures 1 and 2 (apart from rounding error). Of the 689 CREs in the study, defaults are the most frequent variety (464), with restructurings next (184) and few sales (30) or unreported types (11). Relative incidence rates in Table 10 reflect these relative frequencies. Time patterns differ somewhat across types, however. Incidence for defaults more than doubles in 1991 and then drops back, whereas restructurings peak in 1992, and relative to other years sales are high in both 1991-92. These relative proportions and time patterns must be interpreted with some caution, however, as inspection of the data reveals the possibility of systematic reporting errors in a few years for a few companies.[26]

Table10a - Incidence By CRE Type and Year, Possible Reporting Errors Removed (percent)

		Incidence By Number		
Year	Sales	Restructures	Defaults	Unknown
86	0.08%	0.17%	0.47%	n.c.%
87	n.c.	0.16	0.47	0.07
88	n.c.	0.04	0.34	n.c.
89	0.02	0.04	0.41	0.04
90	n.c.	0.30	0.57	0.06
91	0.10	0.45	1.43	0.03
92	0.17	0.37	0.71	n.c.
93	0.04	0.34	0.69	0.01
94	0.01	0.06	0.27	n.c.
95	0.04	0.11	0.56	n.c.
96	0.02	0.20	0.24	n.c.
97	0.06	0.02	0.21	n.c.
98	n.c.	0.07	0.07	n.c.
All	0.04	0.18	0.50	0.02

n.c. means no CREs in cell.

When data for the companies and experience years for which reporting errors appear possible are removed, the large jump in restructurings in 1992 disappears, as shown in Table 10a. Restructurings peak in 1991 and fall back just like defaults. However, the relative frequency of restructurings over all years is about the same---defaults are about 3 times more likely.[27] In other respects results are very robust to this change in the data. It is important to note that this possible reporting problem does not affect any other results in the study, and that there is no question that the affected CREs were in fact CREs, just a question as to their type.

[25] Although it would be possible to report results separately for bankruptcies and failures to pay, inspection of the data gives a strong impression that some participating companies did not distinguish the two types of event in their reporting.

[26] Some companies consistently reported a far lower or higher fraction of restructurings than the norm. For example, some classified all CREs as "Failure to Pay." Although such reporting may accurately reflect a policy of avoiding restructurings, if there is misclassification the relative frequencies of defaults and restructurings may be misrepresented.

[27] When the suspect CREs are removed, defaults number 360, restructurings 131, sales 29, and unknown types still number 11.

Especially interesting are loss severities by CRE type, shown in the upper right panel of Table 10 and Figure 18 (severities are not shown in Table 10a because they are very similar to those in Table 10). Average severities for asset sales are about halfway between those for defaults and restructurings. It is sensible that severities on restructurings are smaller because there might be little incentive to go to the trouble of restructuring if severities were on average similar to those for defaults. However, the ultimate fate of the restructurings may or may not be known, and further deterioration of the borrower's condition after a restructuring might lead to increased losses. Companies that continue to contribute data are asked to (and frequently do) report revisions to cash flows for CREs from earlier data contributions, which may arise because of events following a restructuring. However, such reporting does not include a description of any such events, and there is no updating of CRE cash flows by companies that drop out of the study, so the study's data may not capture post-CRE deterioration of some assets received in workouts. Thus, the measured average severity of 21 percent may understate ultimate severities somewhat.

Figure 18. Average Severities By CRE Type

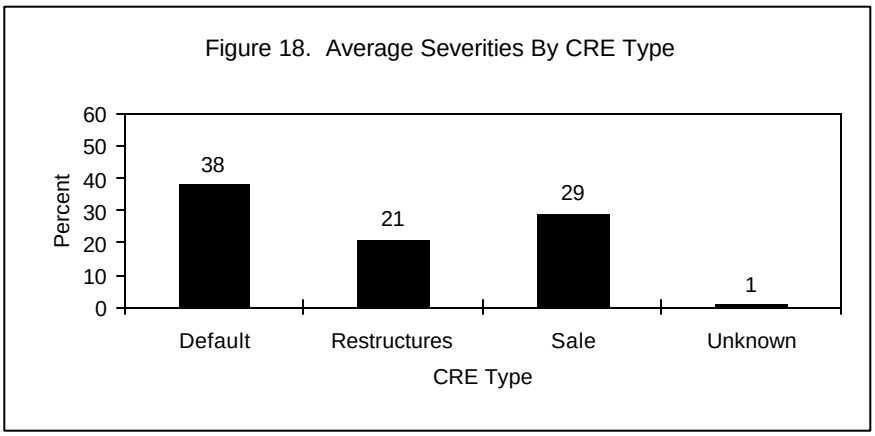


Table 11 reports results by CRE type and most recent internal rating. Severities appear a bit better in the investment grades with the exception of restructurings, and incidence rates generally increase as rating worsens, paralleling the aggregate results. However, the incidence rate for restructurings peaks at either the BB or B rating, depending on whether incidence is measured by number or amount, whereas rates for sales and defaults peak at the <B category. Although restructurings are relatively frequent for the B and <B categories, it may be that they are most frequent for BB because the prospects of such credits are still good enough to warrant a restructuring.

Table 11 - Experience by CRE Type and Most Recent Rating (percent)

		Economic Loss				Loss Severity		
Rating	Sales	Restructures	Defaults	Unknown	Sales	Restructures	Defaults	Unknown
AAA	n.c.%	n.c.%	n.c.%	n.c.%	n.c.%	n.c.%	n.c.%	n.c.%
AA	n.c.	0.01	0.01	n.c.	n.c.	89	68	n.c.
A	0.00	0.00	0.01	n.c.	4	1	21	n.c.
BBB	0.00	0.02	0.11	0.00	4	18	30	-8
BB	0.02	0.21	0.82	n.c.	19	14	40	n.c.
B	0.07	0.28	1.56	n.c.	49	15	50	n.c.
<B	0.38	0.79	3.60	n.c.	62	46	50	n.c.
Unknown	0.01	0.13	0.24	0.00	44	25	36	9
All	0.01	0.06	0.20	0.00	29	21	38	1
		Incidence By Number				Incidence By Amount		
Rating	Sales	Restructures	Defaults	Unknown	Sales	Restructures	Defaults	Unknown
AAA	n.c.%	n.c.%	n.c.%	n.c.%	n.c.%	n.c.%	n.c.%	n.c.%
AA	n.c.	0.01	0.02	n.c.	n.c.	0.01	0.02	n.c.
A	0.01	0.00	0.05	n.c.	0.01	0.00	0.05	n.c.
BBB	0.02	0.10	0.37	0.01	0.02	0.10	0.38	0.02
BB	0.08	0.93	1.67	n.c.	0.12	1.48	2.05	n.c.
B	0.17	0.77	2.69	n.c.	0.14	1.95	3.14	n.c.
<B	0.41	0.61	3.41	n.c.	0.61	1.74	7.24	n.c.
Unknown	0.03	0.31	0.53	0.04	0.03	0.54	0.66	0.03
All	0.03	0.19	0.48	0.01	0.03	0.30	0.51	0.01

n.c. means no CREs in cell.

L. Rating Transitions

Over the past few years, portfolio credit risk models and debt-pricing models that use rating transition matrices as key inputs have become increasingly popular. The credit ratings that are used are often the investor's internal rating of the asset or borrower, such as the "most recent rating" variable in this study. Insurance company internal databases may not readily support measuring how such ratings migrate over time, so many companies use the rating migration or transition matrices published by Moody's or S&P for modeling purposes. However, an open question is the similarity of internal rating migrations to agency rating migration patterns.

In this study's data, it is usually possible to track most recent internal rating values for a given asset from one year-end to the next. Thus, most recent internal rating transition matrices can be constructed.

At the outset, the reader should be aware that the Committee views this subsection as a presentation of preliminary and partial results. More work on this subject is planned in the future. Moreover, results should be interpreted with caution because data problems may bias the

results in unknown ways. For example, as described further below, private placements exit the exposure database at a rate much higher than implied by the percentage maturing in each year. Such exits may represent sales or prepayments, but may also occur because of changes in the asset ID numbers by which assets are tracked from one year-end to the next. If ID changes are routinely associated with changes in ratings, the true migration rates will differ from the results presented here. Moreover, no doubt there are instances of miscoded ratings for individual assets in individual years, which would cause spurious migrations. The Committee has used common sense and rules of thumb in an attempt to detect and exclude from analysis systematic miscodings, but no doubt some errors remain.

Table 12 displays average most recent internal rating migration patterns over one-year horizons. For example, the first row of the table gives the percentage of all assets rated the internal equivalent of AAA/Aaa at the previous year-end that fall in each grade at the end of the year. Averaging over all the study years 1986-98, 67.92 percent are still AAA/Aaa, 1.20 percent were downgraded to BBB, and so on. None "migrated" to the state of having experienced a CRE during the one-year horizon period. However, 23.39 percent were N.R. (not rated) by the end of the year, meaning no year-end rating value was reported. Table 13 presents migration rates when all observations that are N.R. at the end of the year are excluded.

Tables 14 and 15 display one-year migration rates for Moody's ratings, with withdrawn ratings (WR) included and excluded, respectively. In principle, WR observations are similar to the NR observations that are excluded in Table 13. The Moody's rating migrations are average rates for the years 1986-98, computed using Moody's Credit Risk Calculator software.[28] Although there are some differences in the off-diagonal patterns displayed in Tables 12 and 13 versus Tables 14 and 15, the primary differences are smaller percentages on the diagonal in Tables 12 versus Table 14 (on the diagonals, the rating is the same at the end of the year as at the beginning) and correspondingly larger percentages in the N.R. category in Table 12. In contrast, percentages on the diagonals of Tables 13 and 15 are generally quite similar.

Table 12: Most Recent Internal Rating Migration Rates (percent)

Rating	to:								
From:	AAA	AA	A	BBB	BB	B	<B	CRE	N.R.
AAA	67.92	4.13	3.17	1.20	0.11	0.07	0.02	0.00	23.39
AA	0.84	66.31	6.43	1.00	0.17	0.17	0.03	0.03	25.01
A	0.29	1.56	68.95	5.73	0.45	0.22	0.08	0.07	22.64
BBB	0.12	0.78	4.46	68.72	2.61	0.65	0.48	0.50	21.70
BB	0.15	0.27	0.77	8.41	60.12	3.04	0.79	2.64	23.80
B	0.10	0.20	0.95	3.43	5.22	57.84	1.59	3.60	27.07
<B	0.51	0.13	1.41	1.66	2.36	7.67	49.07	3.71	33.48

[28] The Moody's exercise included data for firms with Moody's long-term debt ratings that are in all nations and sectors, except Sovereigns.

Table 13: Most Recent Internal Rating Migration Rates, N.R. Excluded (percent)

Rating From:	to: AAA	AA	A	BBB	BB	B	<B	CRE
AAA	88.65	5.39	4.14	1.56	0.14	0.09	0.03	0.00
AA	1.13	88.43	8.58	1.33	0.22	0.22	0.04	0.04
A	0.37	2.02	89.14	7.41	0.58	0.28	0.11	0.09
BBB	0.15	0.99	5.69	87.76	3.33	0.83	0.61	0.64
BB	0.20	0.35	1.01	11.04	78.90	4.00	1.03	3.47
B	0.14	0.28	1.30	4.70	7.16	79.30	2.19	4.93
<B	0.77	0.19	2.11	2.50	3.55	11.53	73.78	5.57

Table 14: Moody's Rating Migration Rates (percent)

Rating From:	to: Aaa	Aa	A	Baa	Ba	B	Caa-C	Default	WR
Aaa	85.50	10.03	0.18	0.00	0.05	0.00	0.00	0.00	4.24
Aa	0.87	85.08	9.18	0.32	0.10	0.02	0.00	0.05	4.38
A	0.05	1.94	87.08	5.39	0.70	0.20	0.01	0.00	4.63
Baa	0.04	0.29	5.07	82.62	4.94	1.00	0.05	0.17	5.82
Ba	0.02	0.03	0.55	4.49	75.75	7.24	0.58	1.50	9.84
B	0.02	0.06	0.20	0.71	5.98	73.33	2.69	6.99	10.01
Caa-C	0.00	0.00	0.00	1.40	2.12	6.53	55.24	23.04	11.68

Table 15: Moody's Rating Migration Rates, Withdrawn Ratings (WR) Excluded (percent)

Rating From:	to: Aaa	Aa	A	Baa	Ba	B	Caa-C	Default
Aaa	89.21	10.55	0.19	0.00	0.05	0.00	0.00	0.00
Aa	0.91	88.93	9.65	0.34	0.11	0.02	0.00	0.05
A	0.05	2.02	91.32	5.65	0.73	0.21	0.01	0.00
Baa	0.04	0.32	5.39	87.69	5.25	1.08	0.05	0.19
Ba	0.02	0.03	0.61	5.00	84.01	8.03	0.64	1.66
B	0.02	0.06	0.22	0.79	6.66	81.43	3.01	7.82
Caa-C	0.00	0.00	0.00	1.54	2.34	7.71	62.27	26.14

Table 16: Estimated Allocation of N.R. Category in Table 12 (percent)

Rating From:	Breakout of N.R. category Matured	Payoff?	Unknown
AAA	6.78	15.97	0.63
AA	7.98	16.45	0.59
A	6.72	14.82	1.10
BBB	4.95	16.14	0.61
BB	4.90	18.55	0.35
B	3.93	22.66	0.47
<B	5.30	26.45	1.73

The reasons for the larger percentage of most recent internal ratings migrating to N.R. are not entirely clear but may be related to the fact that Moody's migration studies use issuer ratings whereas this study's most recent internal rating data are maintained at the asset level.[29] In Moody's and S&P's data, an issuer migrates to "WR" (withdrawn rating) status mainly when it pays off *all* its rated debt (or sometimes when it ceases to provide information to the rating agency). In contrast, in this study, no year-end rating may be available because the *asset* has matured or has been paid off early, because its identifying number was changed, or because for some reason the year-end internal rating was not included in the data contribution. Table 16 sheds light on the relative frequency of such events, breaking down the percentages in the "N.R." column of Table 12 into three component parts:

1) Those for which N.R. status occurs in the year of maturity ("Matured").
2) Those for which there is a zero balance outstanding at the end of the year in which N.R. status occurs. These most likely were paid off early or sold, although some may be cases where the asset was transferred out of the general account or the PPN was changed, interfering with our ability to track the asset through time (thus the "?" in the "Payoff?" column heading in Table 16).
3) The year-end outstanding balance was positive, but no internal rating was reported (the "Unknown" column in Table 16).

The great majority of issuers that pay off an asset probably continue to have other placements outstanding. Thus, if Table 12 were done at the issuer level and for the entire universe of private placements, the fraction of ratings migrating to N.R. would be much smaller. A crude way of adjusting Table 12 to be on a basis more comparable to Table 14 is to distribute most of the percentage in the N.R. column for each row across the row in proportions similar to the percentages in the non-N.R. columns. This amounts to interpolating between Tables 12 and 13. Doing this by eye yields an impression that revised percentages on the diagonal of Table 12 would be only a bit smaller than those for Moody's ratings. Alternatively, if it is convenient to exclude NR and WR cases from analysis, one can simply use Table 13.

Though such adjustments make the use of agency rating migration matrices in credit models applied to private placements seem more palatable, the off-diagonal elements of Tables 12 and 13 differ from those in Tables 14 and 15. Most recent internal ratings appear to have a larger probability of multiple-grade rating jumps for the investment-grade internal ratings, which may be important for some modeling applications.

[29] The exact nature of the internal ratings reported by contributors is not known. They might be borrower ratings or ratings of individual assets (which are influenced by the structure and seniority of the asset as well as by the creditworthiness of the borrower).

Table 17: NAIC Rating Migration Rates (percent)

Rating from:	to: 1	2	3	4	5	6	CRE	N.R.
1	73.08	5.66	0.28	0.12	0.05	0.07	0.10	20.65
2	4.81	71.83	2.91	0.31	0.18	0.24	0.30	19.42
3	1.30	9.18	57.22	5.92	1.03	0.42	1.67	23.27
4	1.86	1.72	8.21	50.31	5.44	2.00	4.25	26.21
5	0.70	1.79	1.10	6.48	44.57	5.38	8.67	31.31
6	0.12	0.12	0.00	1.40	4.19	42.96	5.70	45.52

Table 18: NAIC Rating Migration Rates, N.R. Excluded (percent)

Rating from:	to: 1	2	3	4	5	6	CRE
1	92.10	7.13	0.35	0.15	0.06	0.09	0.13
2	5.97	89.15	3.61	0.38	0.22	0.29	0.38
3	1.70	11.96	74.57	7.71	1.34	0.54	2.18
4	2.52	2.33	11.13	68.18	7.37	2.72	5.76
5	1.02	2.61	1.60	9.43	64.88	7.84	12.63
6	0.21	0.21	0.00	2.56	7.69	78.85	10.47

Tables 17 and 18 display rating migration patterns for NAIC ratings, with and without N.R. cases, respectively. The underlying data are limited to the period 1991-98 (in earlier years only ratings on the old NAIC scale are available). The chance of multiple-grade NAIC-rating improvements appears to be somewhat larger than for multiple-grade deteriorations in rating, but this may simply reflect the time period covered (the recession ended in 1991 and the economy improved thereafter). The breakdown of the N.R. percentage (not shown in tables) is a bit different than in Table 16, with similar fractions maturing but somewhat more moving to N.R. for unknown reasons and somewhat less because of an apparent asset payoff or sale.

M. Rating Disagreements and Relative Predictive Power

Credit ratings are opinions about credit quality. Differences of opinion are to be expected. As ratings are used more heavily and receive more attention, the frequency of differences of opinion is of some interest, as is the relative predictive power of different kinds of ratings for credit events and losses.

Like the previous subsection, the Committee views the results in this subsection as preliminary and incomplete. More results and analysis may appear in future editions of this study. Moreover, results should be interpreted with caution because data problems may affect the results. For this subsection, the most important possible data problems probably would be associated with miscoded or unreported most recent internal ratings and NAIC ratings. If there is any tendency for miscoded ratings or unreported ratings to be associated with assets with volatile or very uncertain credit quality, that might tend to bias the results of this subsection in unknown

ways.

Most assets in this study carry two ratings at each year-end, a most recent year-end internal rating and a most recent year-end NAIC rating. Although the scales are different, for experience years 1991 and later, the two kinds of ratings can be compared using the concordance scale shown in the middle panel of Table 8 because most recent internal ratings are reported on the major rating agency scales. (In this subsection, NAIC grades 5 and 6 are lumped together into concordance grade 5.) Table 19 displays the frequency of differences between most recent internal and most recent NAIC ratings of each magnitude. The extent of agreement is remarkable, with full agreement for 78 percent of the number of assets and a difference of opinion of one grade or less for 98 percent of the number of assets. However, such agreement is perhaps to be expected given that 86 percent of exposed assets are the internal equivalent of investment grade and such low-risk assets fall into the first two grades on the concordance scale.

Table 19. Frequency of Most Recent Internal Versus NAIC SVO Rating Disagreements, 1991 and later (percent).

Number of Grades Different	Marginal Frequency	Cumulative Frequency
0	78	78
1	20	98
2	2	99
3	0	100
4	0	100

Table 20. Frequency of Most Recent Internal Rating Disagreements Across Insurance Companies, All Years (percent).

Number of Grades Different	Marginal Frequency	Cumulative Frequency
0	66	66
1	27	92
2	6	98
3	1	99.7
4 or 5	0.3	100

Table 20 reports frequencies of disagreement across insurance companies about most recent internal ratings of the same asset (assets were matched across companies by PPN, yielding about 20,000 comparable pairs of ratings). Disagreements are more common than in Table 19, but the rating scale is more fine-grained, with four investment grades available.

Disagreements about most recent internal ratings are somewhat more frequent for very safe and very risky assets. For example, 75 percent of pairs of assets that one contributor rates the internal equivalent of BBB are also BBB at the other contributor, but for AAA and B assets the percentages are 41 and 35, respectively. Table 21 displays the percentages of all pairs of assets with each possible combination of most recent internal ratings (the rows identify an arbitrary left side of a pair and the columns an arbitrary right side).

Some disagreements in Tables 19 through 21 may arise not because of any substantive disagreements, but because the schedules on which ratings are reviewed and updated are not

Table 21. Rating Disagreements by Quality: Percentage of All Pairs Having Specified "Left-Side" Most Recent Internal Rating That Have Specified "Right-Side" Most Recent Internal Rating

Left Company	Right Company Rating						
Rating	1	2	3	4	5	6	7
1	1.81	1.06	1.13	0.39	0.04	0.01	0.00
2	1.06	5.47	2.73	0.95	0.05	0.01	0.01
3	1.13	2.73	21.99	6.01	0.29	0.07	0.07
4	0.39	0.95	6.01	32.71	2.70	0.57	0.11
5	0.04	0.05	0.29	2.70	2.52	0.72	0.15
6	0.01	0.01	0.07	0.57	0.72	0.81	0.11
7	0.00	0.01	0.07	0.11	0.15	0.11	0.31

Entries in table sum to 100 percent.

synchronized across insurance companies or between insurance companies and the NAIC. For example, one company might update a rating just before year-end and another just after-year end.

Table 22. Mean Internal Rating Disagreement By Company (number of grades different than peers)

Company	Mean Disagreement
1	-1.73
2	-0.08
3	-0.05
4	-0.21
5	-0.03
6	-0.10
7	-0.03
8	0.08
9	0.14
10	0.06
11	0.15
12	0.13
13	0.10
14	0.20
15	0.14
16	0.49

Although disagreements about individual most recent internal ratings are fairly common, contributing companies generally agree about the credit quality of assets on average. Table 22 displays mean disagreements about most recent internal ratings for each insurance company for assets that are common with any other company (a few companies are omitted because only a small number of their assets appear on the books at other companies). Companies more optimistic than their peers on average have negative means. Most companies are in close agreement with peers on average, with one glaring exception. Company 1 is more optimistic than peers about common assets by almost one-and-three-quarter full grades. Its optimism is economically material: When grades are mapped into default probabilities and capital allocations, the mean difference is more than one percentage point of

default probability and four percentage points of capital allocation (not shown in tables).[30] Average disagreements are also small when most recent internal ratings and most recent NAIC ratings are compared, again with the one exception (not shown in tables).

The relative predictive power of internal and NAIC ratings is of some interest. The two kinds of ratings are produced differently and are intended for different purposes. Results described earlier make clear that both are predictive of loss, but where there is disagreement, is one kind of rating more informative than the other?

Table 23 displays results from a logistic regression in which the dependent variable has a value of 1 if a CRE occurred in the experience year for the observation and a value of zero otherwise. The explanatory variables are a series of indicator variables for the combination of most recent ratings assigned by the NAIC and the insurance company, using the concordance scale shown in the middle panel of Table 8. In essence, the regression splits the data into cells corresponding to each possible combination of most recent internal rating and most recent NAIC rating and measures the likelihood of a CRE for each cell. Incidence rates by number are shown in the fourth column of Table 23. The focus of this analysis is on cases of disagreement. For example, if at the prior year-end an asset is rated 1 by the NAIC but 3 by the insurance company, are incidence and loss rates over the following year similar to those of assets rated 1 by both the NAIC and the company? If such rates are higher, the implication is that the internal rating has incremental predictive power because the internal rating 3 is riskier than the NAIC rating 1. The fifth column of Table 23 summarizes the results of comparisons, with "internal" appearing where the most recent internal rating is more consistent with incidence rates and "NAIC" rating where the most recent NAIC rating is more in line. A "Y" appears if the difference in regression coefficients is statistically significant. For example, assets rated the equivalent of 1 by both the contributing company and the NAIC have an incidence rate of 0.03 percent, whereas the incidence rate is 4.93 percent if the NAIC rating is 1 and the internal rating is 3 on the concordance scale. Thus, the riskier internal rating correctly predicts that incidence rates are higher for the given assets, and the difference between the logistic regression coefficients corresponding to the 4.93 and 0.03 percent incidence rates is statistically significant.

[30] The large difference suggests the possibility of reporting error. If such error is responsible, it does not materially affect other results of this study because the unusual company is among the smaller contributors and its assets do not form a large fraction of all exposures.

Table 23. Predictive Ability of Different Kinds of Ratings

Rating NAIC	Internal	Regression Coefficient	Incidence By Number	Significance-Who's right	Economic Loss Rate	Number Exposed	Number of #CREs
5	1	NA					
5	2	-1.56	19.39	Y-NAIC	8.02	83	16
5	3	-2.56	8.39	---NAIC	4.27	155	13
5	4	-1.95	14.74	Y-NAIC	7.33	238	35
5	5	-3.22	4.62		6.28	542	25
4	1	-3.87	2.27	---internal	0.88	44	1
4	2	-3.00	5.22	---NAIC	0.55	268	14
4	3	-2.58	7.99	Y-NAIC	2.72	451	36
4	4	-3.60	3.02		1.65	596	18
4	5	-3.35	3.81	---NAIC	1.58	53	2
3	1	NA					
3	2	-4.52	1.18	---internal	0.10	1018	12
3	3	-3.91	2.19		0.81	1645	36
3	4	-3.63	2.95	---internal	0.84	237	7
3	5	-1.34	24.39	Y-internal	22.33	21	5
2	1	-6.76	0.13	---internal	0.00	2378	3
2	2	-5.92	0.29		0.08	11931	35
2	3	-4.48	1.24	Y-internal	0.23	807	10
2	4	-5.00	0.73	---internal	0.01	137	1
2	5	NA					
1	1	-8.38	0.03		0.01	15899	4
1	2	-5.83	0.32	Y-internal	0.03	2483	8
1	3	-3.08	4.93	Y-internal	0.63	102	5
1	4	-3.00	5.41	Y-internal	1.32	37	2
1	5	NA					

NA (not applicable) appears in two rows because the number of observations associated with the specified most recent internal and NAIC ratings was small and the number of CREs zero.

A glance at the fifth column of Table 23 reveals an interesting pattern: Although incidence rates are somewhat more frequently consistent with most recent internal ratings than with NAIC ratings, the preponderance of the incremental predictive power of most recent internal ratings occurs when the NAIC is optimistic and the insurance company is pessimistic. In contrast, the NAIC rating is most likely to have incremental predictive power when the insurance company is relatively optimistic and the NAIC relatively pessimistic. Indeed, where the NAIC is very pessimistic (grade 5), insurance company optimism is associated with substantially *higher* incidence rates than when both the most recent internal and the most recent NAIC ratings are 5. However, a glance at the sixth column reveals a mixed pattern of economic loss rates for assets rated 5 by the NAIC.

A mirror-image exercise was conducted in which the internal rating was used as the baseline (not shown in the table). For example, instead of comparing the 4.93 percent incidence rate for NAIC=1, internal=3 assets with NAIC=1, internal=1 assets, the baseline is NAIC=3, internal=3 assets, which have an incidence rate of 2.19 percent. Here NAIC optimism is associated with incidence rates even higher than in the case when both parties agree that assets should be rated 3 (but the difference is not statistically significant). In this alternative exercise, the overall pattern again implies that the more pessimistic party is more correct, although NAIC ratings are somewhat more frequently "correct" than internal ratings than in the exercise shown in Table 23.

Results in Table 23 should be interpreted with some caution because the number of exposures that are associated with some rows is small. Moreover, even though most recent internal ratings and most recent NAIC ratings are measured as of year-end, it is possible that instances of large differences in ratings arise because one rating was downgraded or upgraded just before year-end and the other was changed just after year-end. Bearing all the caveats in mind, the results imply that an insurance company might be able to improve its loss experience by more closely monitoring assets rated as being quite risky by the NAIC but not so risky by the insurance company. It is less clear that the NAIC could profit from information about insurance companies' most recent internal ratings. Even if the NAIC had timely access to such internal ratings, its use of the ratings might influence internal rating decisions and reduce their value both to the NAIC and the insurance company.

N. Principal Findings

In a business where basis points matter, people with different purposes may disagree about the importance of differences in the performance of asset classes even when confronted with the same statistics. When the uncertainties are taken into account, though, a number of findings stand out:

- Over the sample period studied, private placements with most recent internal ratings the equivalent of investment grade and BB have loss experience similar to publics in spite of worse incidence or default rates because of better loss severities on private placements.

- Relative to publicly issued bonds, private placements with most recent internal ratings the equivalent of B and riskier offer superior experience with respect to all of incidence, severity and economic loss.

- Although the period analyzed in this study covers roughly a full credit cycle, implications for credit risk experience during a "typical" credit cycle depend very much on one's views about the relative proportions of recession and normal years in a "typical" cycle and about the severity of the downturn.

- In the early 1990s, various groups expressed fears that below investment grade private placements carried extraordinary portfolio risks and many insurance companies reduced

their investment activity in this market segment. But in fact below investment grade private placements did not perform unusually worse than other corporate debt during the credit market upheavals of the early 1990s (loss rates were smaller than on similarly rated public bonds). Thus, it appears the fears were overstated.

- Internal credit risk ratings of participating companies and NAIC ratings are credible in that experience by rating tracks that in the public markets. Although insurance companies fairly frequently disagree with the NAIC and with each other about ratings of individual placements, on average the disagreements are small. Where there is disagreement, the more pessimistic rating appears to have more predictive power for incidence rates, suggesting that investors be attentive to ratings assigned by others even when they disagree with such ratings.

- Individual CRE loss severities are widely distributed and thus hard to predict, as in the public market. However, severities for senior debt are systematically better than for subordinated debt, whether the CRE is a default or a restructuring.

- Restructurings appear to carry lower severities on average than defaults.

- The typical life cycle of CREs has the great majority occurring during the first seven years after issuance, and especially during the first three or four years, in line with average lives and typical amortization schedules for privates.

- Evidence of cyclical variations in loss severities is mixed.

On the whole, the picture is one of an orderly market that tracks the public bond market rather closely in performance once differences in asset characteristics are taken into account, except that private placement investors manage to elicit substantially better performance from their low-rated borrowers.

IV. CROSS TABULATION

A. Introduction

So far in this report we have looked at one risk factor at a time by experience year but not two factors at a time unless the second factor happens to be the experience year. It was not until the last update of our study that we undertook a cross tabulation for the first time. We have 13 years of data now versus 9 years of data then, but many cells in the two-dimensional arrays still do not have enough CREs to support definitive conclusions.

This interest in cross tabulation stems from the potential correlation between risk factors. Credit risk may seem to be driven by one factor while being actually driven by another, an underlying factor with which it happens to be correlated. We are liable to misconstrue results by failing to make such connections. So as we study one factor at a time, we should 'control' the other factors, not disregard them. One way to do so is by cross tabulation. The questions it will help answer include:

- Is the coupon effect the quality-rating effect in disguise?
- Is the seasoning effect the economic-cycle effect in disguise?

We will discuss three cross tabulations involving the following pairs of variables:

1.	the original coupon rate	by the earliest quality rating
2.	the number of years since funding	by the earliest quality rating
3.	the funding year	by the experience year

Two of the three cross tabulations involve the earliest quality rating, which is an imperfect proxy for the original issue rating. It is defined to be the original issue rating in the instances when it is available. Otherwise, it is defined to be the historical rating that we can trace back year by year to the bond's point of first entry into the study. As such, it is only as historical as a data contributor's participation in the study.

The first cross tabulation explores the coupon effect. The second explores the seasoning effect. The third also explores the seasoning effect, but with an adjustment for economic conditions. Our analysis has led to two fairly compelling conclusions. **First, there is a coupon effect, which persists even after segregating by the earliest quality rating. Second, there is a seasoning effect, which persists even after normalizing for economic conditions.**

As we discuss each cross tabulation, we will state the objective, suggest a hypothesis with an economic rationale, analyze the four key statistics in turn, cite a corroborative study if available, and state the caveats where appropriate. The key charts and tables for each of subsections B, C and D appear within each subsection. Some auxiliary charts and tables not discussed in the text appear in Appendix IV.

A Note on the Graphs and Tables

In the interest of full disclosure, Appendix IV displays not only the four key statistics, which consist of ratios between CRE data and exposure data, but also the five aggregate values that make up the numerators and denominators of these ratios. The relation between the four ratios on one hand and the five aggregate values on the other are summarized schematically in the following table.

		4 Key Statistics as Ratios of Aggregate Values			
5 Aggregate Values		Incidence Rate by Number	Incidence Rate by Amount	Loss Severity	Economic Loss Rate
1	# of CREs	# of CREs			
2	# of Exposure	# of Exposure			
3	$ of Loss			$ of Loss	$ of Loss
4	$ of CRE		$ of CRE	$ of CRE	
5	$ of Exposure		$ of Exposure		$ of Exposure

The graphs often appear in sets of four, one for each key statistic. These four statistics are plotted in two granularities by quality rating and by coupon rate as summarized below and schematically presented in the next chart:

- By quality, a 2-way breakdown between Investment Grade (I.G.) and Below Investment Grade (B.I.G.)
- By quality, a 4-way breakdown by AAA-A, BBB, BB, and <BB
- By coupon, a 4-way breakdown in '2%' intervals (6-9%, 9-11%, 11-13%, and 13+%)
- By coupon, an 8-way breakdown in '1%' intervals (8-9%, 9-10%, etc.)

Earliest Quality Rating			Coupon Range in %							
Division:		Broad	6-9		9-11		11-13		13+	
	Broad	Fine	6-8	8-9	9-10	10-11	11-12	12-13	13-14	14+
Total	I.G.	AAA-A								
		BBB								
	B.I.G.	BB								
		<BB								
	NA									

The 'Total' results for all quality ratings combined do not necessarily interpolate between Investment Grade and Below Investment Grade for two reasons:

1. The Total includes the Not Available category. As such, it is a three-way average, not a two-way average just between Investment Grade and Below Investment Grade.

2. Investment Grade and Below Investment Grade may be distributed differently. For example, in the cross tabulation between the original coupon rate and the earliest quality

rating, Below Investment Grade is weighted towards high coupons while Investment Grade is weighted towards low coupons. So both incidence rates can be horizontal as a function of the coupon rate while the Total can still slope upwards.

In grouping data into cells, we can strive for either (1) an even distribution of calibration points or (2) an even distribution of CREs among the resultant cells. We have done the former on the coupon rate but the latter on the number of years since issuance. Thus, the coupon range is evenly spaced (in largely 1% or 2% intervals) while the seasoning is unevenly spaced (in a finer grouping of early years and a broader grouping of later years).

Because the number of CREs is indicative of the credibility of a cell, we have displayed the cell-specific number of CREs in the tables below most cross-tabulation graphs. The larger cells are more stable but at the same time more liable to gloss over nuances. This tradeoff between stability and nuances is the reason behind the dual granularities in our cell definition.

As far as fitting a curve to the data points is concerned, we generally favor interpolation through a smoother array of data points at low granularity but regression through a more scattered array of data points at high granularity. The dual granularities facilitate two viewpoints, i.e., low granularity to capture the underlying trend more tellingly and high granularity to display the not-to-be-overlooked vicissitudes more tellingly.

B. Original Coupon Rate by Earliest Quality Rating

The first cross tabulation, between coupon rate and earliest rating, examines whether the coupon rate is a risk factor in its own right, i.e., independently of the rating. In other words, is there a 'pure' coupon effect? The fact that the incidence of CREs is positively correlated with the coupon rate irrespective of ratings is inconclusive. After all, other things being equal, the higher the coupon the lower the quality. So what purports to be a coupon factor may turn out to be nothing but the quality-rating factor in disguise.

Nevertheless, there is an economic argument for a pure coupon effect. A debt service is more onerous to the borrower at 13% than at 7%. This is because a higher coupon requires more income to service. It therefore stands to reason that a bond with a higher coupon may be more prone to credit risk over time than another issued at the same rating but with a lower coupon in a lower interest-rate environment at time of issue.

Analysis of the Four Statistics

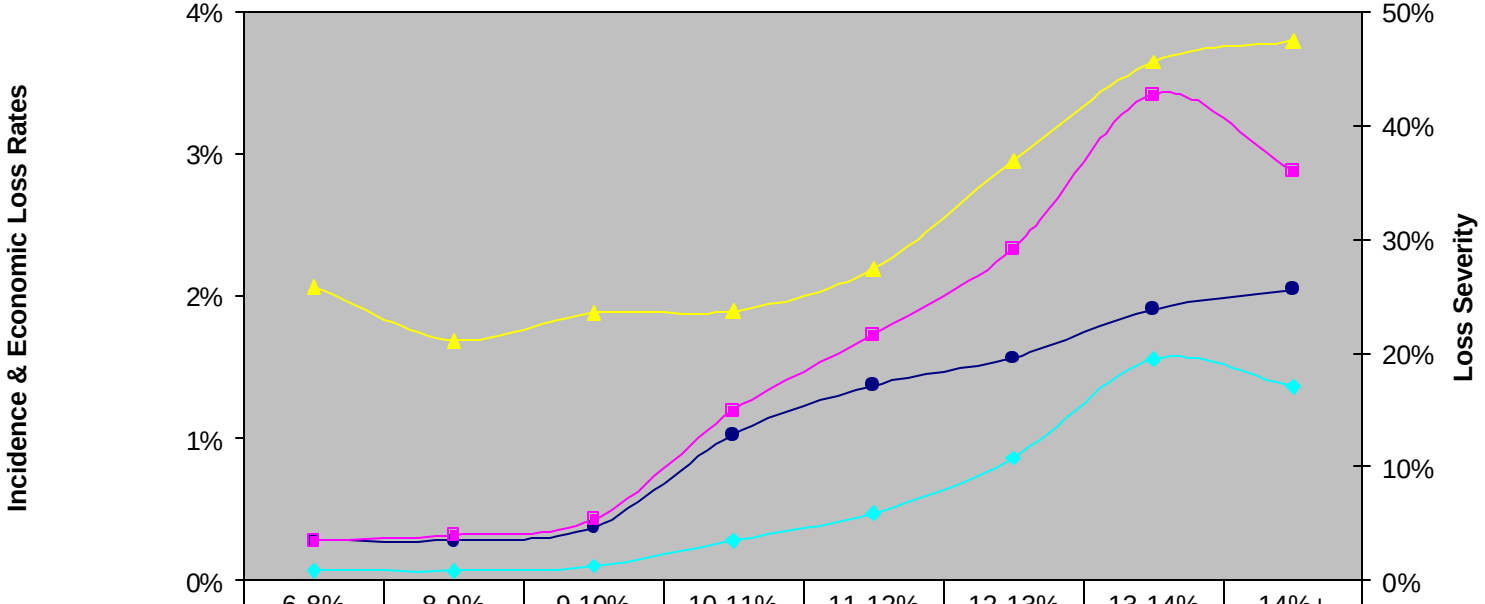
One way to isolate the coupon effect from the quality-rating factor is to show how the experience varies by coupon while the rating is held constant. Before we do so, we first merge two of the smaller cells, the 6-7% and the 7-8%, into a single cell for greater stability. We further exclude all cells under 6% to remove what may be a preponderance of discount or accrual bonds at this end, where the very low coupon in and of itself may not capture the entire debt service. (For this reason, the coupon effect is a nomenclature adopted for ease of reference only; it is better called the debt-service effect.)

After such a consolidation of some cells and elimination of others, the streamlined tabulation results in the following behavioral pattern across the coupon range. All four key statistics are invariant across the three leftmost cells (6-8%, 8-9% and 9-10%), relatively invariant across the two rightmost cells (13-14% and 14+%), but monotonically increasing across the 5 middle cells (9-10%, 10-11%, 11-12%, 12-13% and 13-14%).

Next, we make a minimal, first-order division by quality, just between Investment Grade (AAA, AA, A, and BBB) and Below Investment Grade (BB and below). Such bisection is enough to make the statistics 'noisier'. We can no longer make a blanket statement on all four statistics. In fact, we cannot pass a smooth curve through the noisiest statistic, the loss severity. While we can still pass a smooth curve through the data points of the other three statistics, each curve as a function of the coupon rate is now only generally increasing instead of strictly increasing.

Nevertheless, if we conserve the overall number of 'buckets' from single-tabulation to cross-tabulation by merging adjacent coupon cells to compensate for the bisection by rating, three of the four loss statistics reemerge as largely monotonically increasing functions of the coupon rate. This is true of Investment and Below Investment Grades. In either case, if we compare the highest coupon range (13+%) to the lowest (6-9%), the 2:1 to 4:1 ratio with respect to incidence and economic loss rate is significant.

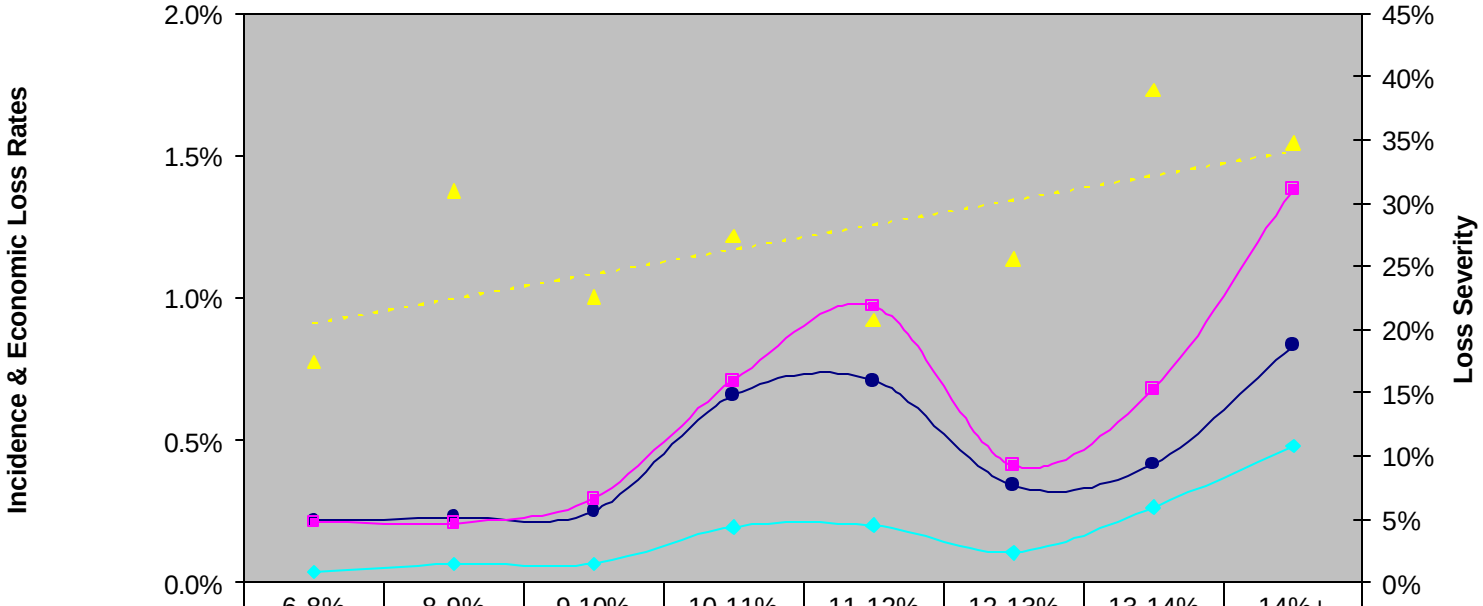
Incidence by #, Incidence by $, Economic Loss Rate, and Loss Severity
By Coupon Rate
Earliest Quality Rating: Investment Grade, Below Investment Grade & Not Available



	6-8%	8-9%	9-10%	10-11%	11-12%	12-13%	13-14%	14%+
# of CREs	48	50	78	147	86	85	71	95
Incid by #	0.28%	0.28%	0.37%	1.02%	1.37%	1.57%	1.91%	2.05%
Incid by $	0.28%	0.32%	0.43%	1.20%	1.73%	2.33%	3.42%	2.88%
Econ Loss	0.07%	0.07%	0.10%	0.28%	0.47%	0.86%	1.56%	1.37%
Loss Sev	26%	21%	24%	24%	27%	37%	46%	47%

Coupon Rate

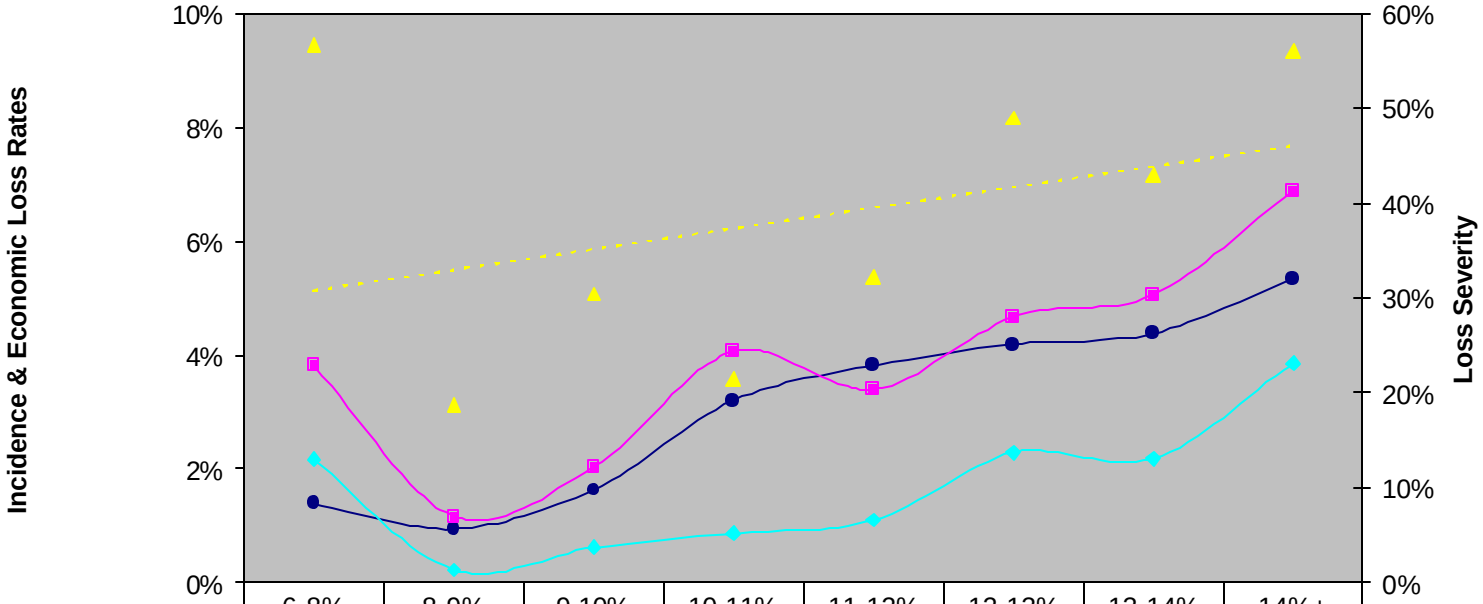
Incidence by #, Incidence by $, Economic Loss Rate, and Loss Severity
By Coupon Rate
Earliest Quality Rating: Investment Grade



	6-8%	8-9%	9-10%	10-11%	11-12%	12-13%	13-14%	14%+
# of CREs	31	31	39	63	25	11	9	23
Incid by #	0.22%	0.23%	0.25%	0.66%	0.71%	0.34%	0.42%	0.83%
Incid by $	0.21%	0.21%	0.30%	0.71%	0.97%	0.41%	0.68%	1.38%
Econ Loss	0.04%	0.06%	0.07%	0.19%	0.20%	0.11%	0.27%	0.48%
Loss Sev	17%	31%	23%	27%	21%	26%	39%	35%

Coupon Rate

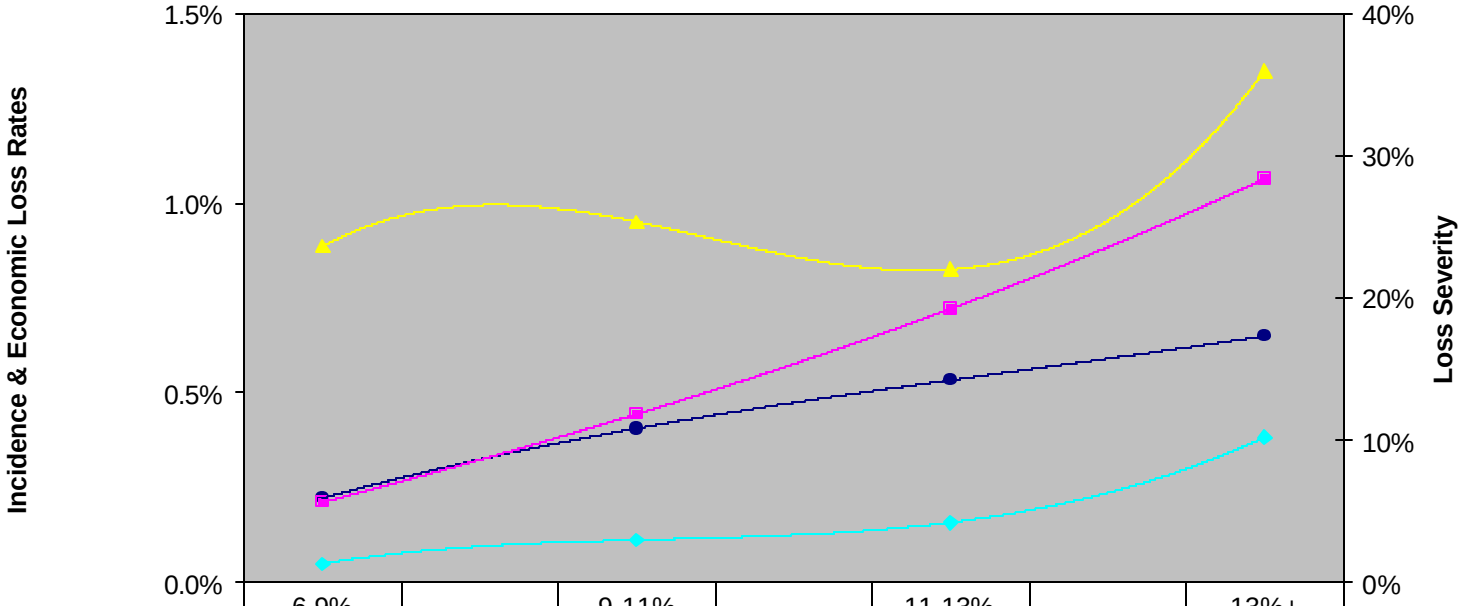
Incidence by #, Incidence by $, Economic Loss Rate, and Loss Severity
By Coupon Rate
Earliest Quality Rating: Below Investment Grade



	6-8%	8-9%	9-10%	10-11%	11-12%	12-13%	13-14%	14%+
# of CREs	14	11	23	64	42	39	30	45
Incid by #	1.39%	0.94%	1.63%	3.20%	3.81%	4.18%	4.38%	5.34%
Incid by $	3.81%	1.17%	2.03%	4.06%	3.40%	4.67%	5.05%	6.89%
Econ Loss	2.16%	0.22%	0.62%	0.87%	1.10%	2.29%	2.17%	3.85%
Loss Sev	57%	19%	30%	21%	32%	49%	43%	56%

Coupon Rate

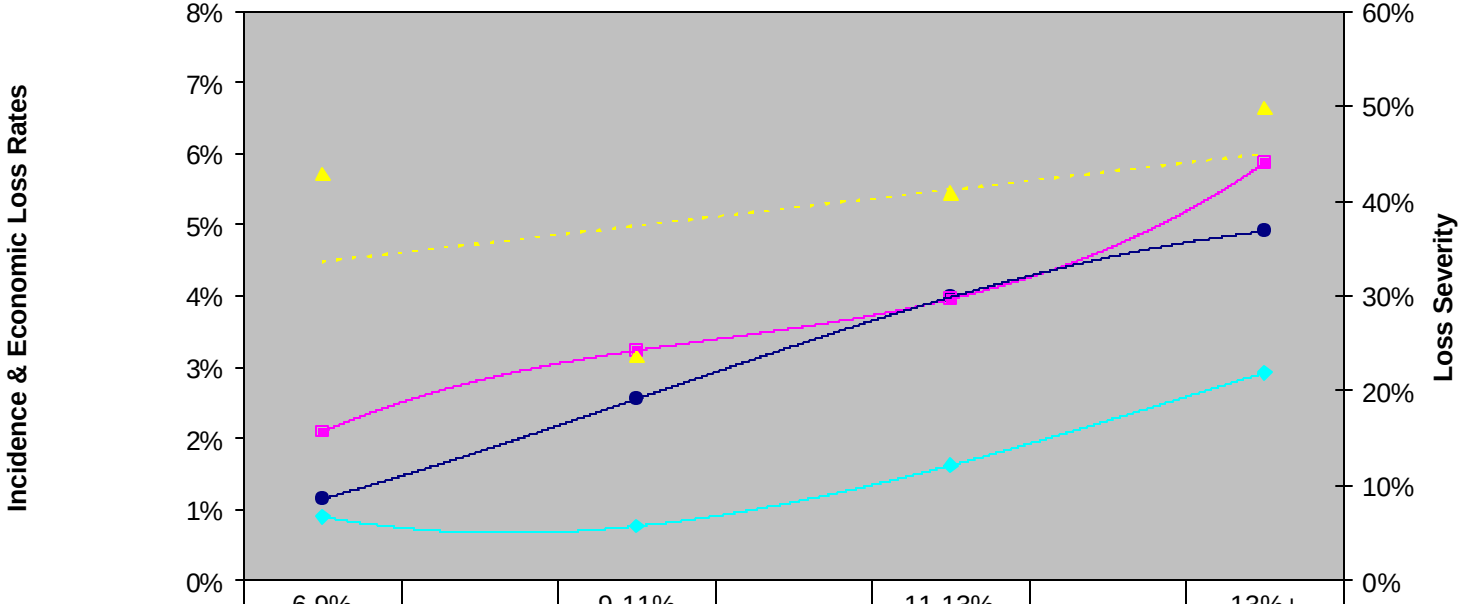
Incidence by #, Incidence by $, Economic Loss Rate, and Loss Severity
By Coupon Rate
Earliest Quality Rating: Investment Grade



	6-9%		9-11%		11-13%		13%+
# of CREs	62		102		36		32
Incid by #	0.22%		0.41%		0.53%		0.65%
Incid by $	0.21%		0.44%		0.72%		1.06%
Econ Loss	0.05%		0.11%		0.16%		0.38%
Loss Sev	24%		25%		22%		36%

Coupon Rate

Incidence by #, Incidence by $, Economic Loss Rate, and Loss Severity
By Coupon Rate
Earliest Quality Rating: Below Investment Grade



	6-9%		9-11%		11-13%		13%+
# of CREs	25		87		81		75
Incid by #	1.15%		2.55%		3.98%		4.91%
Incid by $	2.09%		3.23%		3.96%		5.87%
Econ Loss	0.90%		0.77%		1.62%		2.92%
Loss Sev	43%		24%		41%		50%

Coupon Rate

Even though a further division to the individual-rating level will result in even sparser cells, it is incumbent upon us to do so because the mere classification between Investment Grade and Below Investment Grade is far too broad to produce truly homogenous cells by quality. So we minimally subdivide Investment Grade between AAA-A combined and BBB alone. We also minimally subdivide Below Investment Grade between BB alone and all below BB.

Among these four classes, the BB manifests the strongest positive correlation between each of three statistics and the coupon rate. The three are the two incidence rates and the economic loss rate. Furthermore, the positive correlation is evenly sustained through a wide coupon range, from 8% to 14%, tailing off slightly only at the two ends of the spectrum outside this range.

The AAA-A class exhibits a coupon effect only at the high end of the coupon range. As the coupon rate increases, the incidence rates and economic loss rate remain essentially flat until 12% or 13%, whereupon they all rise steadily. The rise is significant within the context of the generally low level of incidence rates and economic loss rate for the AAA-A class but not so vis-a-vis the vicissitudes exhibited in the lower-rating classes.

The BBB class begins to exhibit the coupon effect at the crossover from single digits to double digits, namely, at 10%. Beyond this inflection point at 10%, the two incidence rates flatten or even fall off slightly as a function of the coupon rate. The economic loss rate, on the other hand, transitions more smoothly at 10% and rises steadily beyond 10%.

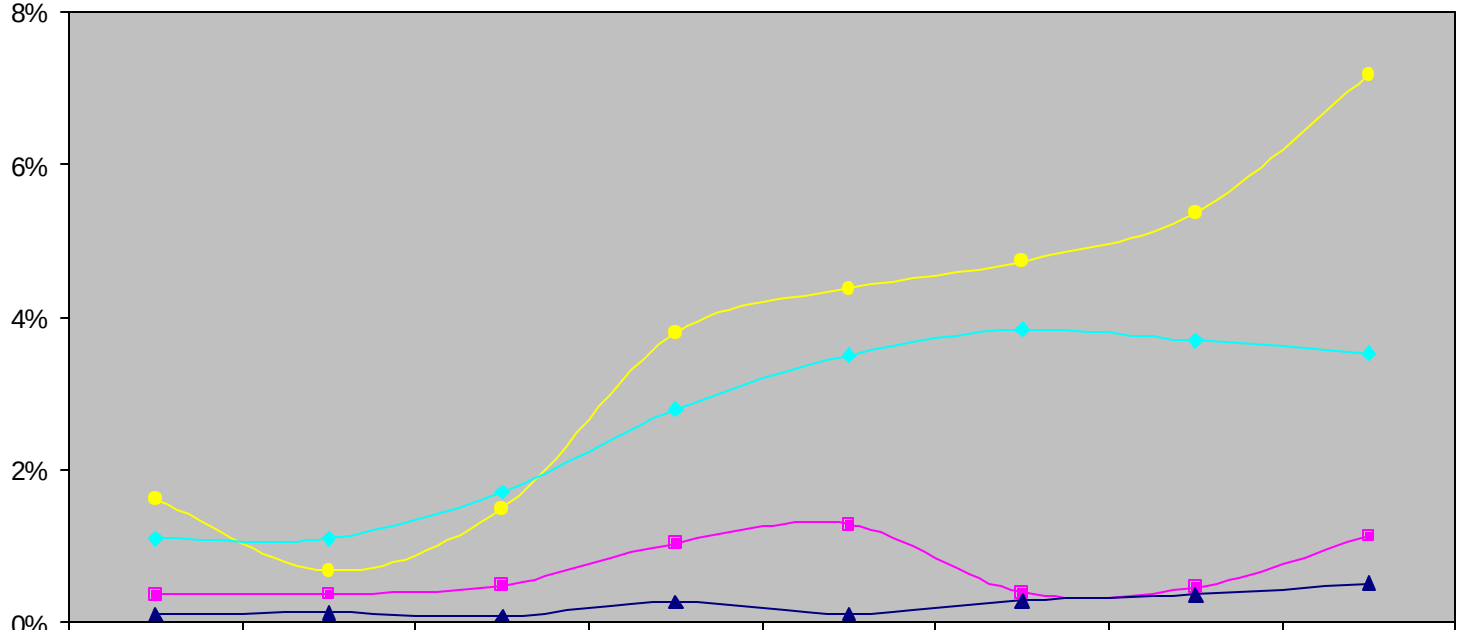
Finally, the class of bonds rated B or below defies a simple characterization of any of the four statistics. None are well correlated with the coupon rate except perhaps for the incidence rate by number. The difficulty may emanate from the fact that such low-quality bonds by definition should not 'reside' at the low end of the coupon range. So, at this rating, the cells on the far left of the coupon range may be too sparse to be credible.

Two Interpretations

The coupon effect lends itself to two interpretations, which are not mutually exclusive. One is the coupon effect as a 'second-order' quality effect. The other is the debt-service effect, which we have characterized as a pure coupon effect.

The fact that the loss statistics are positively sloping within the same quality rating does suggest that the coupon effect is not entirely a latent quality effect. However, to the extent that subtle quality distinctions within the same rating do give rise to a coupon differential, a residual quality effect may not be completely separable from the coupon effect. After all, quality is continuous while ratings are discrete. Bonds with the same rating are not all alike. Rating agencies recognize this by subdividing Baa into Baa1, Baa2, and Baa3 (Moody's) and BBB into BBB+, BBB, and BBB- (S&P). The private-placement market may be efficient enough to make similar quality distinctions through the coupon rate.

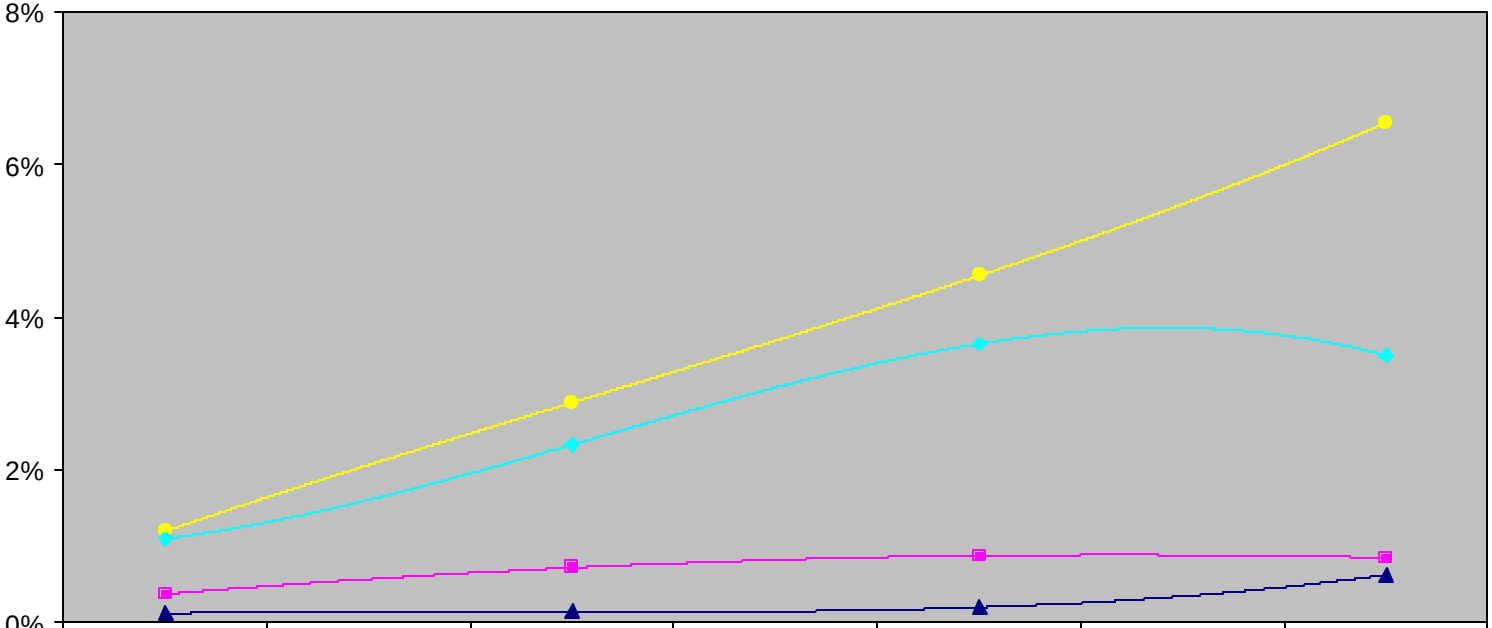
Incidence by Number
By Coupon Rate &
Earliest Quality Rating (AAA-A, BBB, BB, and B & Below)



	6-8%	8-9%	9-10%	10-11%	11-12%	12-13%	13-14%	14%+
<BB	1.62%	0.68%	1.50%	3.79%	4.38%	4.74%	5.37%	7.18%
BB	1.11%	1.10%	1.72%	2.79%	3.51%	3.84%	3.69%	3.53%
BBB	0.37%	0.38%	0.49%	1.05%	1.29%	0.39%	0.47%	1.14%
AAA-A	0.11%	0.13%	0.09%	0.27%	0.12%	0.29%	0.37%	0.52%

Coupon Rate

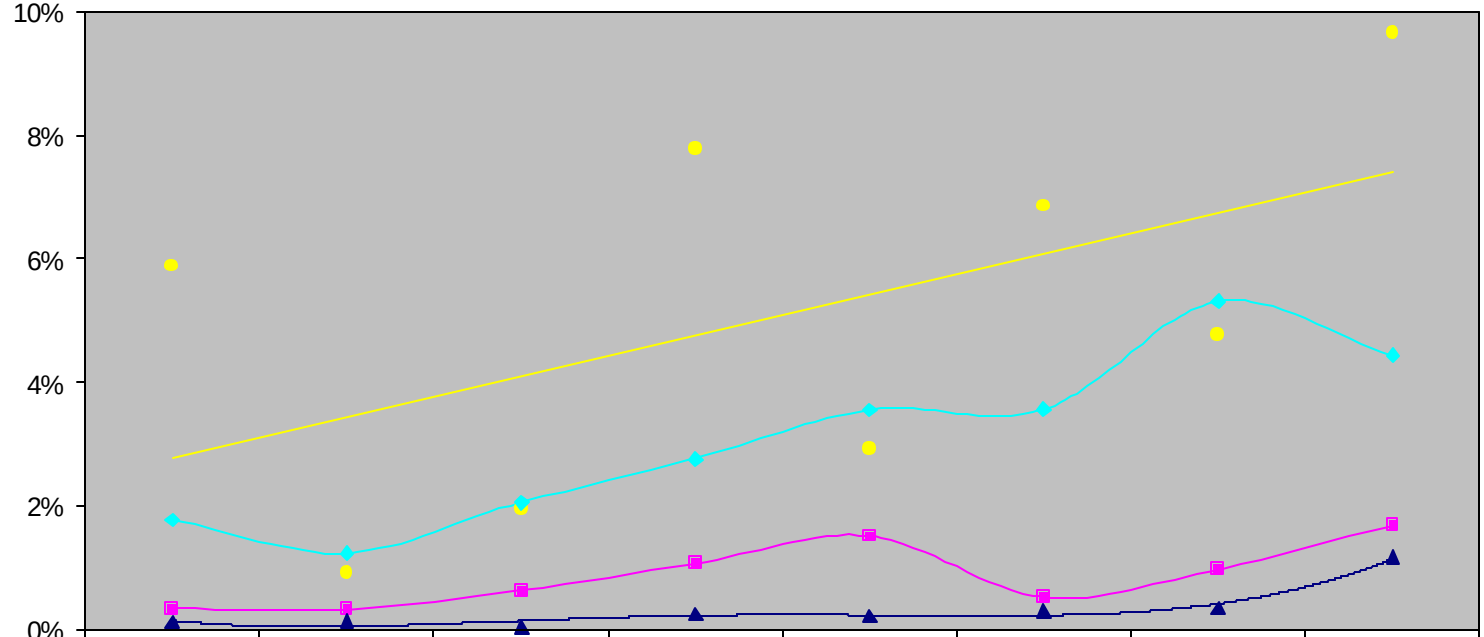
Incidence by Number
By Coupon Rate &
Earliest Quality Rating (AAA-A, BBB, BB, and B & Below)



	6-9%		9-11%		11-13%		13%+
<BB	1.20%		2.89%		4.55%		6.55%
BB	1.10%		2.33%		3.65%		3.50%
BBB	0.38%		0.73%		0.88%		0.85%
AAA-A	0.12%		0.15%		0.20%		0.63%

Coupon Rate

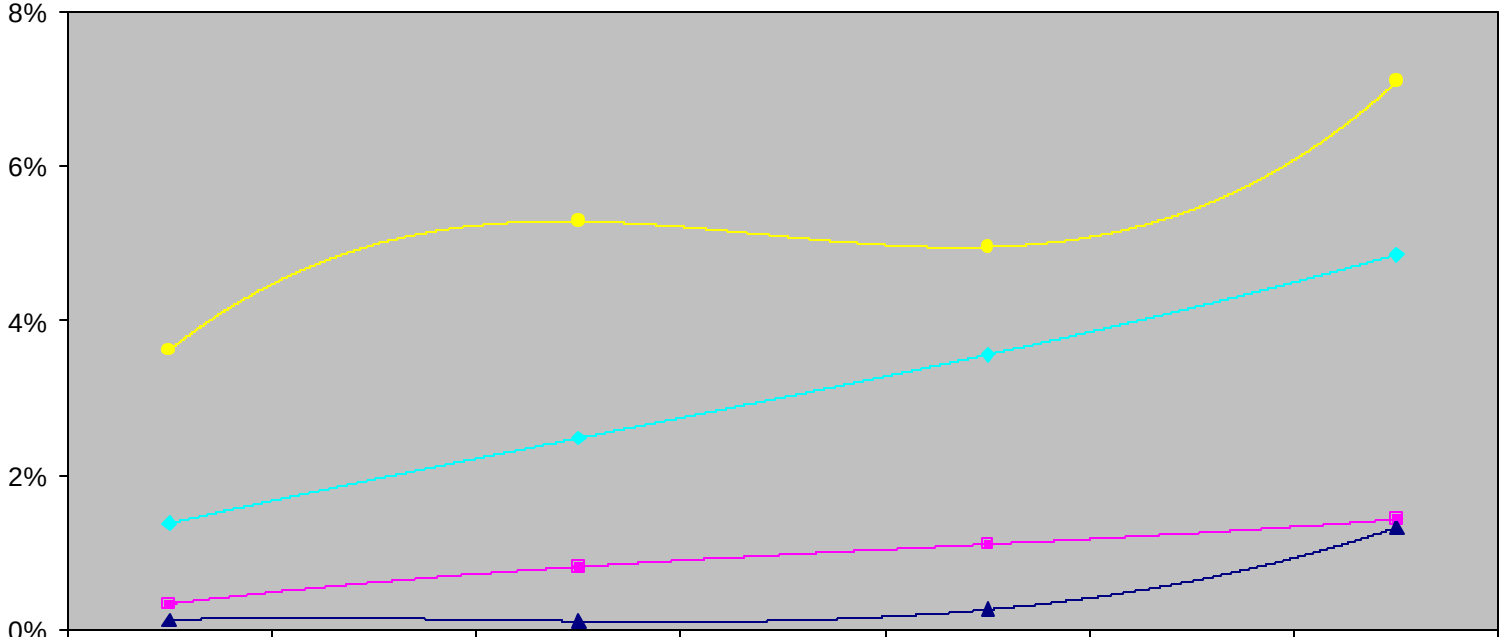
Incidence by Amount
By Coupon Rate &
Earliest Quality Rating (AAA-A, BBB, BB, and B & Below)



	6-8%	8-9%	9-10%	10-11%	11-12%	12-13%	13-14%	14%+
<BB	5.88%	0.92%	1.96%	7.77%	2.92%	6.85%	4.76%	9.66%
BB	1.77%	1.24%	2.06%	2.76%	3.56%	3.56%	5.31%	4.43%
BBB	0.34%	0.33%	0.63%	1.07%	1.52%	0.52%	0.98%	1.69%
AAA-A	0.13%	0.13%	0.05%	0.25%	0.22%	0.30%	0.35%	1.17%

Coupon Rate

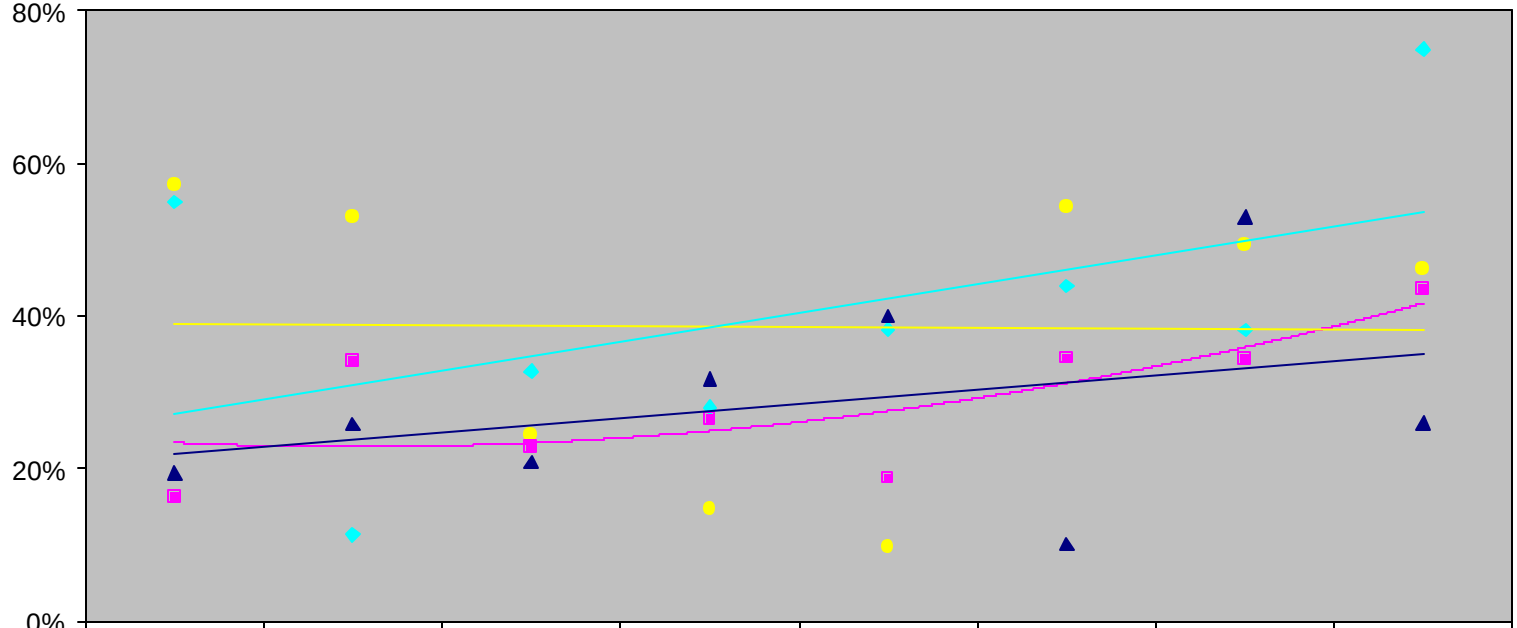
Incidence by Amount
By Coupon Rate &
Earliest Quality Rating (AAA-A, BBB, BB, and B & Below)



	6-9%		9-11%		11-13%		13%+
<BB	3.62%		5.28%		4.95%		7.09%
BB	1.38%		2.48%		3.56%		4.85%
BBB	0.33%		0.81%		1.11%		1.43%
AAA-A	0.13%		0.11%		0.26%		1.32%

Coupon Rate

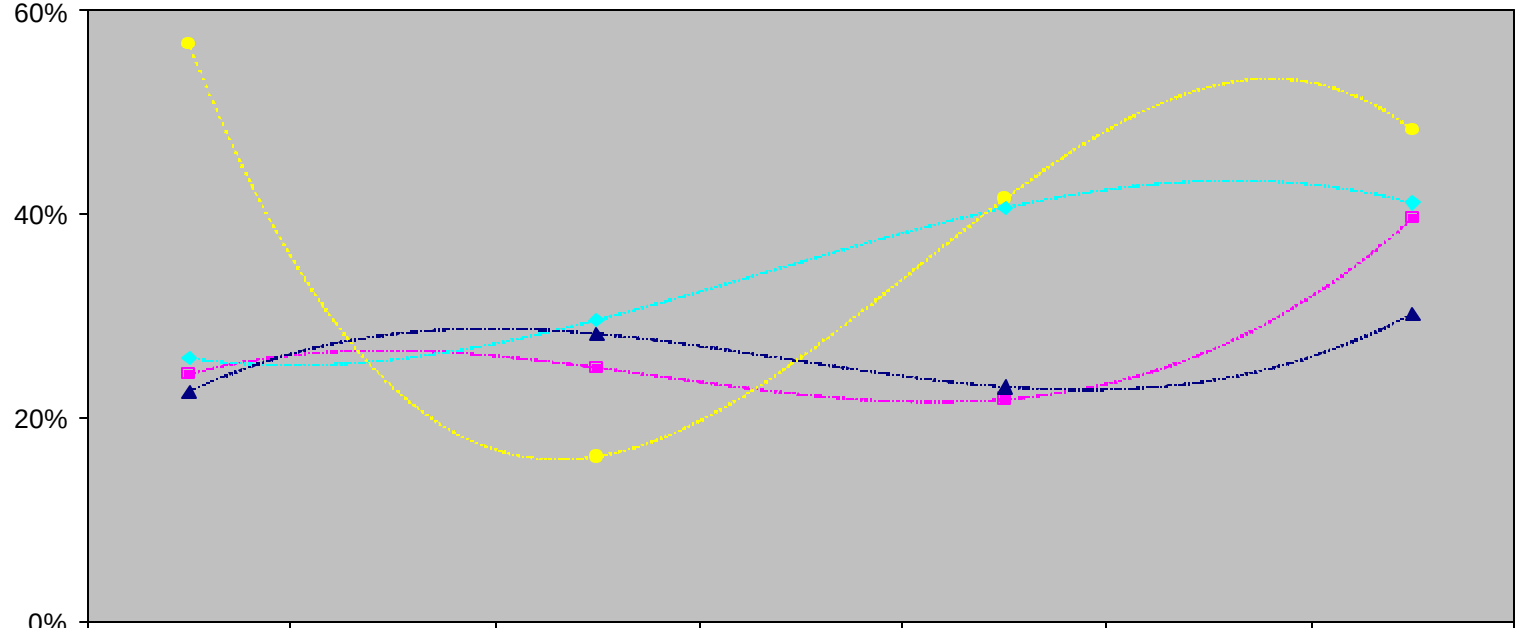
Loss Severity
By Coupon Rate &
Earliest Quality Rating (AAA-A, BBB, BB, and B & Below)



	6-8%	8-9%	9-10%	10-11%	11-12%	12-13%	13-14%	14%+
<BB	57%	53%	24%	15%	10%	54%	49%	46%
BB	55%	11%	33%	28%	38%	44%	38%	75%
BBB	16%	34%	23%	27%	19%	35%	34%	43%
AAA-A	19%	26%	21%	32%	40%	10%	53%	26%

Coupon Rate

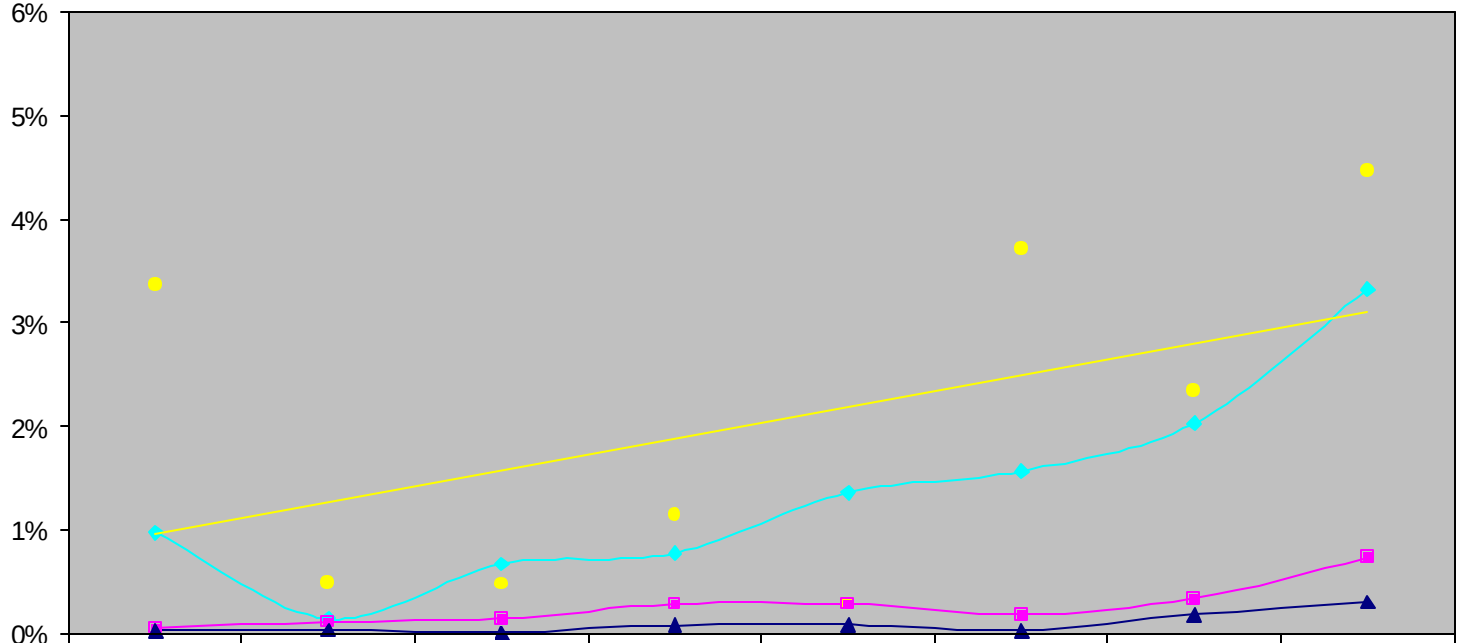
Loss Severity
By Coupon Rate &
Earliest Quality Rating (AAA-A, BBB, BB, and B & Below)



	6-9%		9-11%		11-13%		13%+
<BB	57%		16%		41%		48%
BB	26%		30%		41%		41%
BBB	24%		25%		22%		40%
AAA-A	23%		28%		23%		30%

Coupon Rate

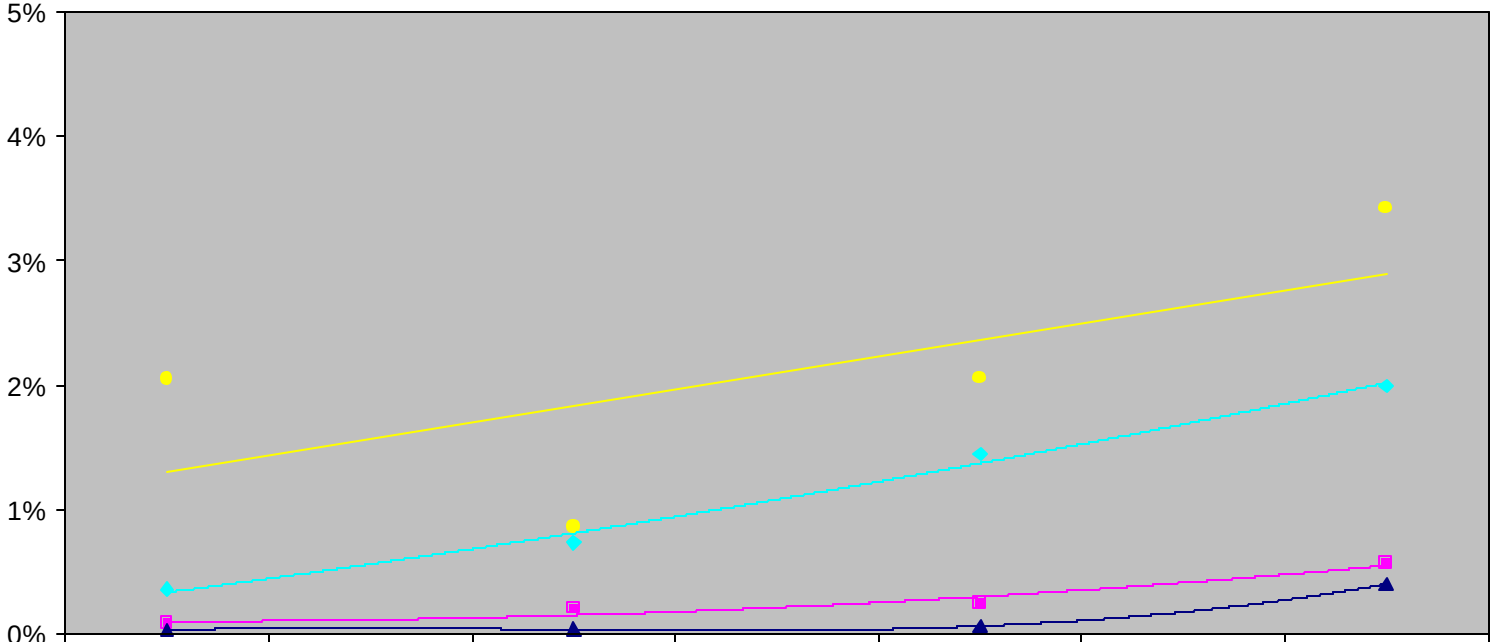
Economic Loss Rate as % of Exposure
By Coupon Rate &
Earliest Quality Rating (AAA-A, BBB, BB, and B & Below)



	6-8%	8-9%	9-10%	10-11%	11-12%	12-13%	13-14%	14%+
<BB	3.37%	0.48%	0.48%	1.14%	0.29%	3.71%	2.34%	4.46%
BB	0.97%	0.14%	0.67%	0.77%	1.36%	1.57%	2.03%	3.32%
BBB	0.06%	0.11%	0.14%	0.28%	0.28%	0.18%	0.34%	0.73%
AAA-A	0.02%	0.03%	0.01%	0.08%	0.09%	0.03%	0.19%	0.30%

Coupon Rate

Economic Loss Rate as % of Exposure
By Coupon Rate &
Earliest Quality Rating (AAA-A, BBB, BB, and B & Below)



	6-9%		9-11%		11-13%		13%+
<BB	2.05%		0.86%		2.05%		3.42%
BB	0.36%		0.73%		1.44%		1.99%
BBB	0.08%		0.20%		0.24%		0.57%
AAA-A	0.03%		0.03%		0.06%		0.40%

Coupon Rate

Nevertheless, there is more to the coupon effect than a second-order quality effect. Otherwise, we would see a smooth escalation in credit risk and no 'inversion' between high coupons of one rating and low coupons of a lower rating. But inversion we do see. In fact, our results show that a high-coupon AAA-A bond exceeds a low-coupon BBB bond in both incidence rates and economic loss rate. Even more so, a high-coupon BB bond exceeds a low-coupon <BB bond in incidence rates and economic loss rate. So, in the extreme, a big enough coupon differential can overcome a small rating differential.

Corroboration

A study to corroborate the coupon effect is hard to find. So we may have hit upon a facet that has not been widely studied. For any kind of independent confirmation we have to turn to the commercial-mortgage portion of our own 1986-89 Study[1]. In that study, we saw the same phenomenon - the higher the mortgage rate the greater the incidence of CREs as well as the economic loss rate.

Unlike bonds, commercial mortgages until recent years were not quality-rated and therefore much less differentiated in spread among concurrently originated loans[2]. So even if we assume part of the coupon variation to be an implicit quality differentiation, the clear and distinct interest-rate effect we observed on mortgages is hard to attribute entirely to the quality-rating effect.

A Caveat Regarding the Data

Here we study the relationship between the coupon rate for an asset as reported *for the given experience year* relative to the earliest quality rating. Because private placements often include material covenants, a bond that was high-quality at issuance but deteriorated thereafter might have its coupon rate revised upward with the deterioration. This might account for some of the inversion mentioned above.

[1] Transactions, Society of Actuaries, 1993-94 Reports, *1986-1989 Credit Risk Event Loss Experience: Commercial Mortgage Loans and Private Placement Bonds*, pp. 219-221

[2] Commercial-mortgage pricing might be sensitive to fundamental credit quality even if, administratively, insurance companies did not produce internal quality ratings. Nevertheless, the absence of a rigorous quality-rating system may have contributed to a smaller dispersion in credit spread compared to bonds.

C. Number of Years since Funding by Earliest Quality Rating

The cross tabulation between number of years since funding and earliest quality rating examines how the seasoning effect, which seems to hold for all quality ratings combined, manifests itself at the individual quality rating level.

The seasoning effect on the incidence rates as well as the economic loss rate seems to define three periods with a fairly smooth transition from one period to the next:

- The first period, lasting about a year, is the select period (as in select-and-ultimate mortality). This may just be a reflection of the underwriting effect. That is to say, private placements do not go bad shortly after receiving a clean bill of health at issue.

- The second period, over the next 5-6 years, is an intense weeding-out period peaking generally around year 3, when weaker private placements are most severely tested.

- The third and last period, beyond 6 or 7 years after issue, is the survival-of-the-fittest period. This is the steady state over which the hardy survivors seem to experience a lower incidence of CREs.

This pattern of going up-and-down through three phases instead of up-and-level through two makes this seasoning effect categorically different from an underwriting effect, or a select-and-ultimate effect, or a pure aging effect.

(It is tempting to reach the same conclusion from other studies by merely observing the tailing off of CREs over time since funding, as in our graph on the number of CREs by duration. This would not be a fair conclusion because the aggregate exposure itself also tails off by duration. In this study, we draw our conclusion more rigorously by observing the ratio between CREs and exposure, i.e., the incidence rate by duration.)

Analysis of the Four Statistics

In reviewing the 4 statistics one at a time, first in the two-way division between Investment Grade and Below Investment Grade, and then in the 4-way division among AAA-A, BBB, BB and <BB, we ask the following questions systematically:

1. Does the statistic fit the general pattern of rising to a peak and falling back?
2. At what point (or in what year since origination) does it rise to a peak?
3. Is the peak significant to the point of 3-4 times as high as the valley or asymptote?

In other words, we ask, 'Does it peak? When does it peak? And how high does it peak?'

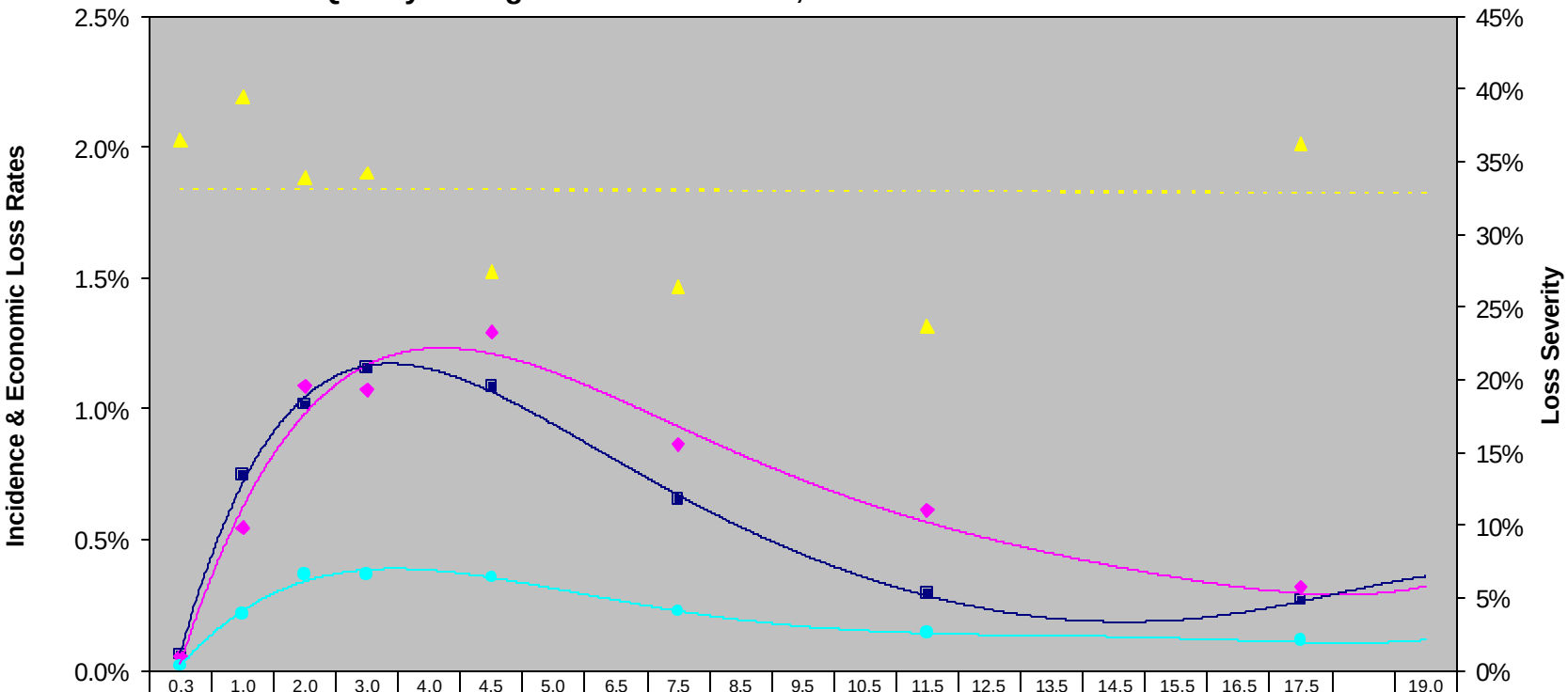
Of the four statistics, the one that best fits the pattern of rising to a peak and receding to a steady state is the incidence rate by number. The incidence rate by amount and the economic loss rate present the second best fit to this escalation-recession pattern. The loss severity does not fit this or any pattern at all.

For the incidence rate by number, the pattern fits Below Investment Grade very well (rising to a sharp peak in year 3) and Investment Grade reasonably well (rising to a milder peak in years 4-5). The same can essentially be said of the two divisions of Below Investment Grade, namely, BB and >BB, as well as the two divisions of Investment Grade, namely, BBB and AAA-A, especially when they are graphically 'blown up' to their own scales.

For the incidence rate by amount and the economic loss rate, similar observations can be made though not as emphatically. The one exception to this general pattern is the <BB category, where the rather erratic loss severity has played havoc on the economic loss rate.

Overall, the pattern seems to hold within broad quality rating classes with respect to the two incidence rates and the economic loss rate but not the loss severity. In general, the lower the credit quality the sooner and more intense this middle 'weeding-out' period.

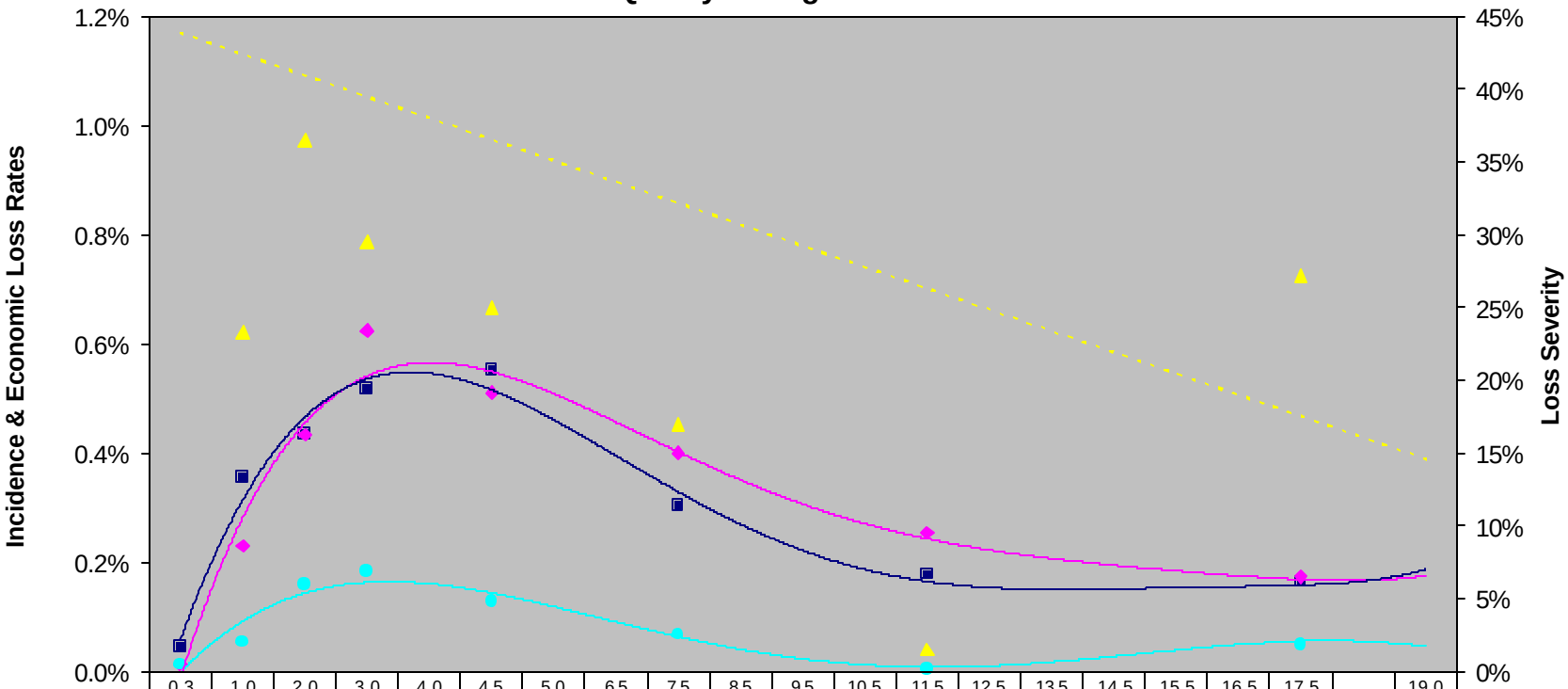
Incidence by #, Incidence by $, Economic Loss Rate, and Loss Severity
By Years Since Funding
Earliest Quality Rating: Investment Grade, Below Investment Grade & Not Available



	0.3	1.0	2.0	3.0	4.0	4.5	5.0	6.5	7.5	8.5	9.5	10.5	11.5	12.5	13.5	14.5	15.5	16.5	17.5		19.0
# of CREs	4	94	119	118		173			113				29						31		
Incid by #	0.06%	0.74%	1.02%	1.16%		1.09%			0.65%				0.30%				0		0.27%		0
Incid by $	0.05%	0.55%	1.09%	1.07%		1.29%			0.86%				0.61%				0		0.32%		0
Econ Loss	0.02%	0.22%	0.37%	0.37%		0.36%			0.23%				0.15%				0		0.12%		0
Loss Sev	36%	39%	34%	34%		27%			26%				24%				0		36%		0

Years Since Funding

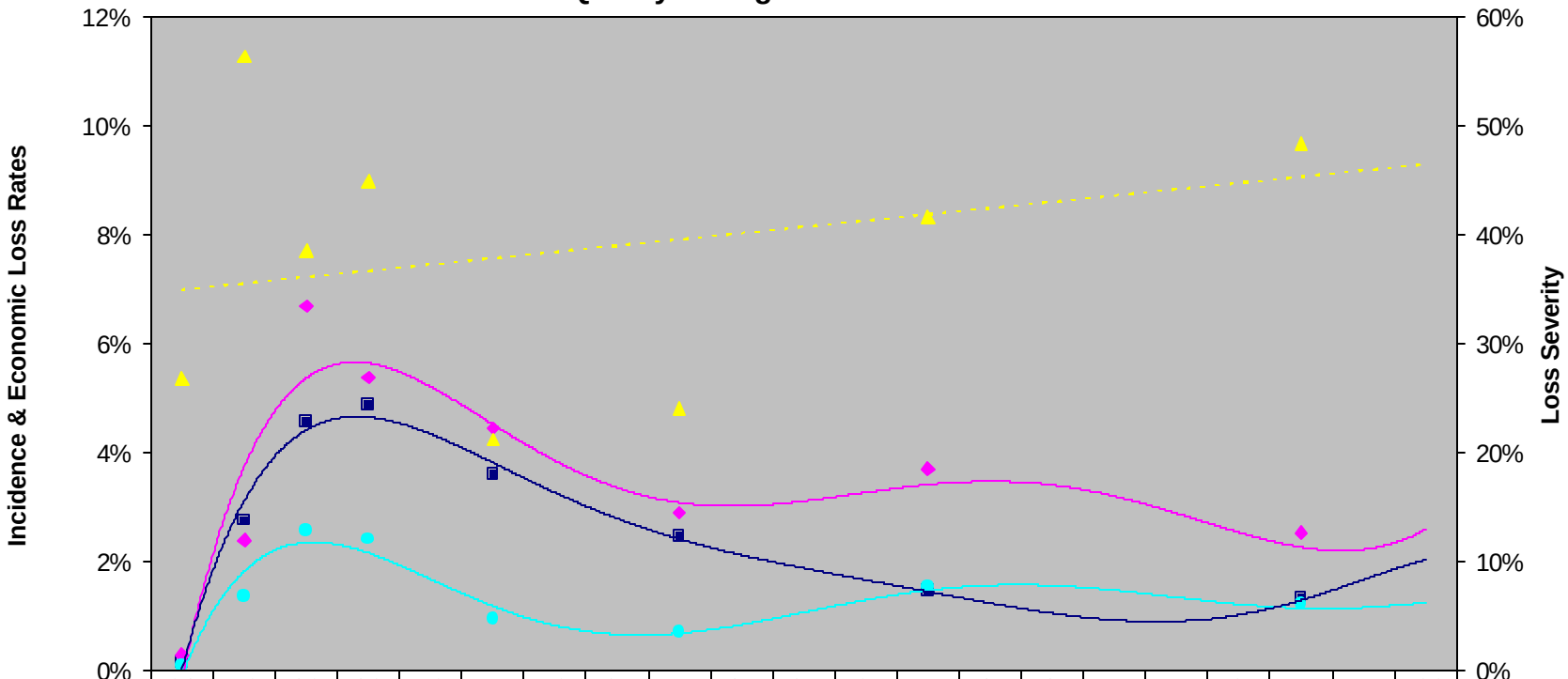
Incidence by #, Incidence by $, Economic Loss Rate, and Loss Severity
By Years Since Funding
Earliest Quality Rating: Investment Grade



	0.3	1.0	2.0	3.0	4.0	4.5	5.0	6.5	7.5	8.5	9.5	10.5	11.5	12.5	13.5	14.5	15.5	16.5	17.5		19.0
# of CREs	2	31	36	38		64			38				12						14		
Incid by #	0.04%	0.36%	0.44%	0.52%		0.55%			0.30%				0.18%				0		0.16%		0
Incid by $	0.01%	0.23%	0.43%	0.62%		0.51%			0.40%				0.25%				0		0.17%		0
Econ Loss	0.01%	0.05%	0.16%	0.18%		0.13%			0.07%				0.00%				0		0.05%		0
Loss Sev	100%	23%	36%	29%		25%			17%				2%				0		27%		0

Years Since Funding

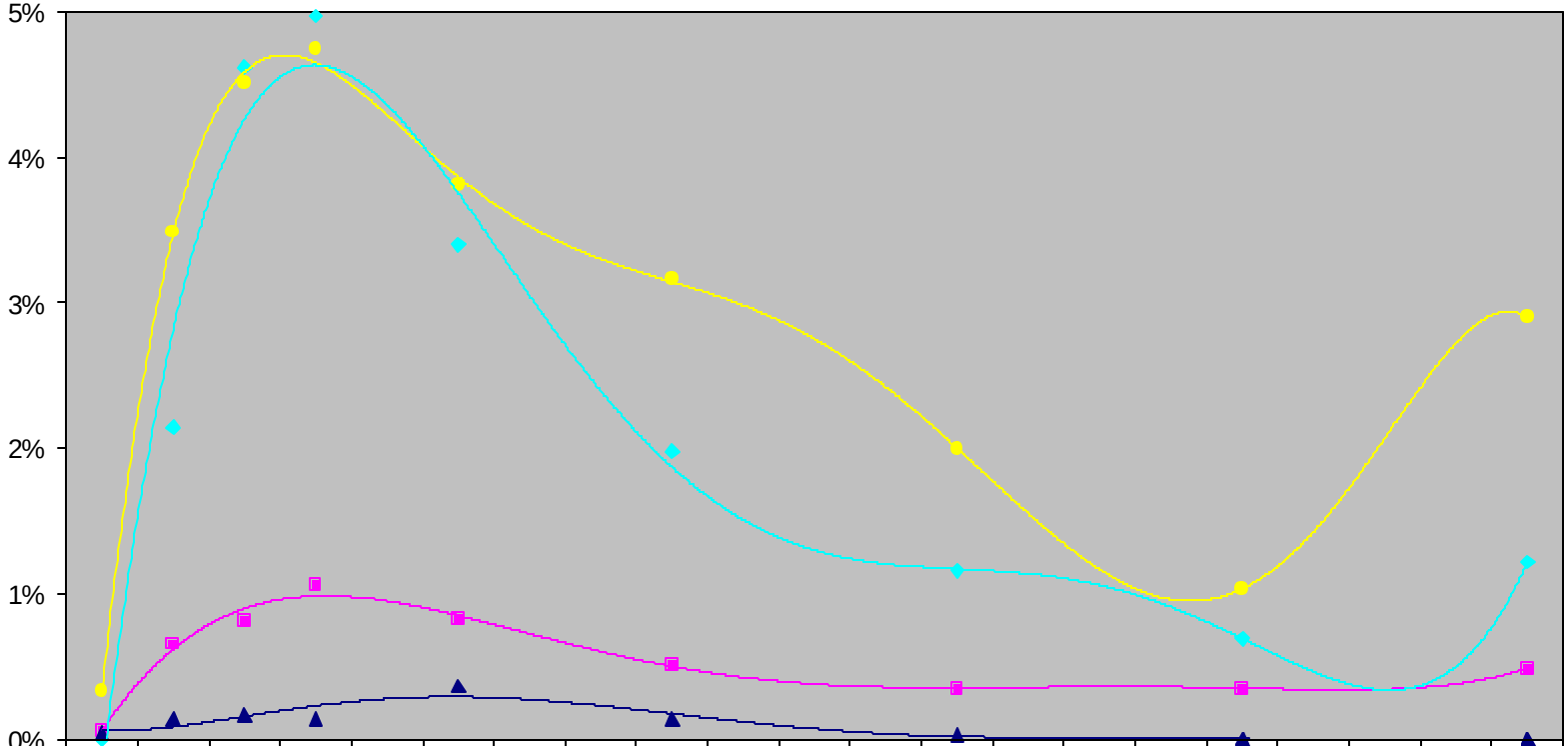
Incidence by #, Incidence by $, Economic Loss Rate, and Loss Severity
By Years Since Funding
Earliest Quality Rating: Below Investment Grade



	0.3	1.0	2.0	3.0	4.0	4.5	5.0	6.5	7.5	8.5	9.5	10.5	11.5	12.5	13.5	14.5	15.5	16.5	17.5		19.0
# of CREs	1	40	59	51		56			43				14						12		
Incid by #	0.13%	2.75%	4.57%	4.87%		3.58%			2.45%				1.46%				0		1.33%		0
Incid by $	0.27%	2.38%	6.68%	5.37%		4.44%			2.89%				3.69%				0		2.52%		0
Econ Loss	0.07%	1.34%	2.57%	2.40%		0.94%			0.69%				1.53%				0		1.22%		0
Loss Sev	27%	56%	38%	45%		21%			24%				42%				0		48%		0

Years Since Funding

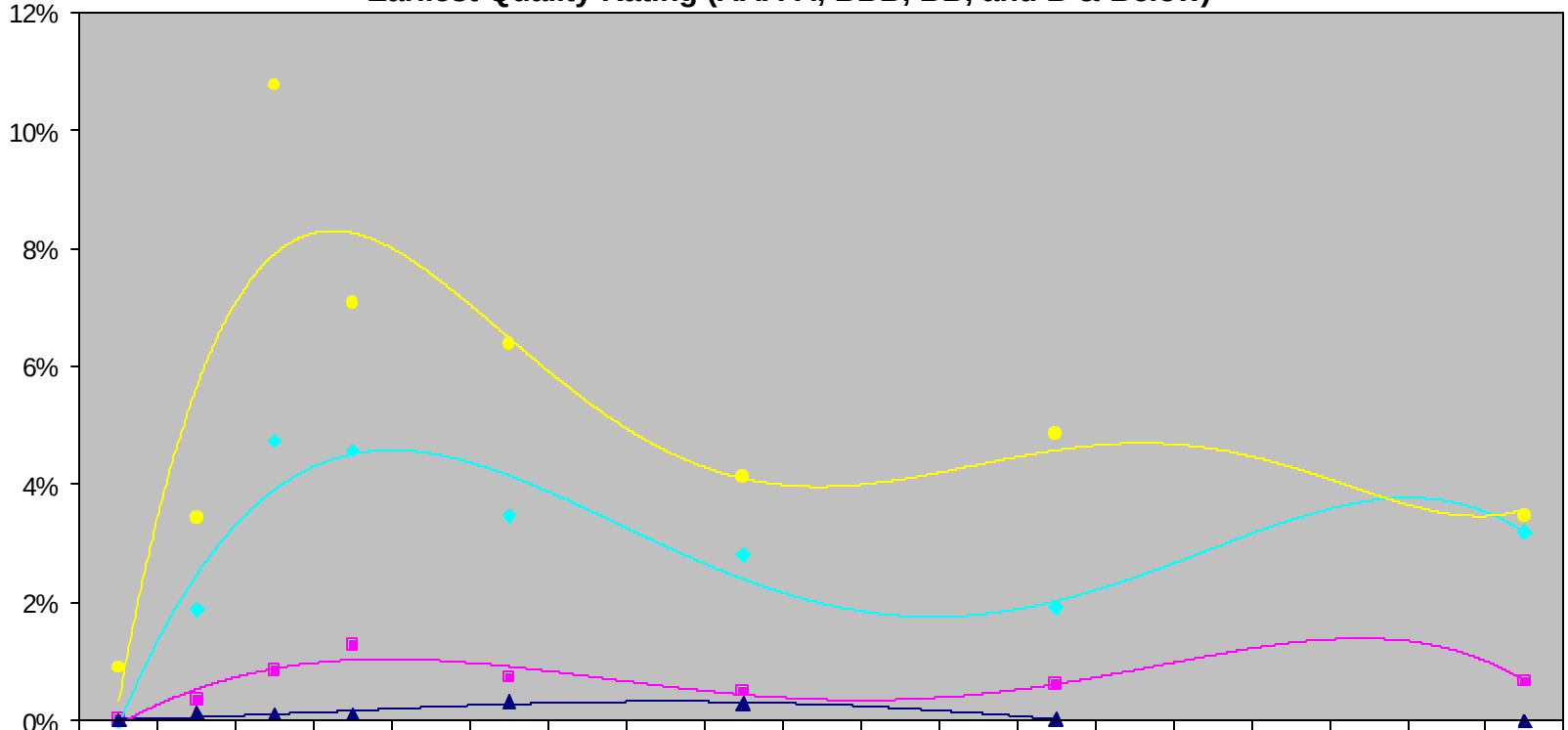
Incidence by Number
By Years Since Funding &
Earliest Quality Rating (AAA-A, BBB, BB, and B & Below)



	0.3	1.0	2.0	3.0	4.0	4.5	5.0	6.5	7.5	8.5	9.5	10.5	11.5	12.5	13.5	14.5	15.5	16.5	17.5		19.0
<BB	0.33%	3.48%	4.51%	4.75%		3.81%			3.16%				1.99%				1.03%				2.90%
BB	0.00%	2.14%	4.62%	4.97%		3.40%			1.98%				1.16%				0.69%				1.22%
BBB	0.05%	0.66%	0.81%	1.06%		0.82%			0.51%				0.35%				0.35%				0.49%
AAA-A	0.04%	0.14%	0.17%	0.14%		0.37%			0.14%				0.03%				0.00%				0.00%

Years Since Funding

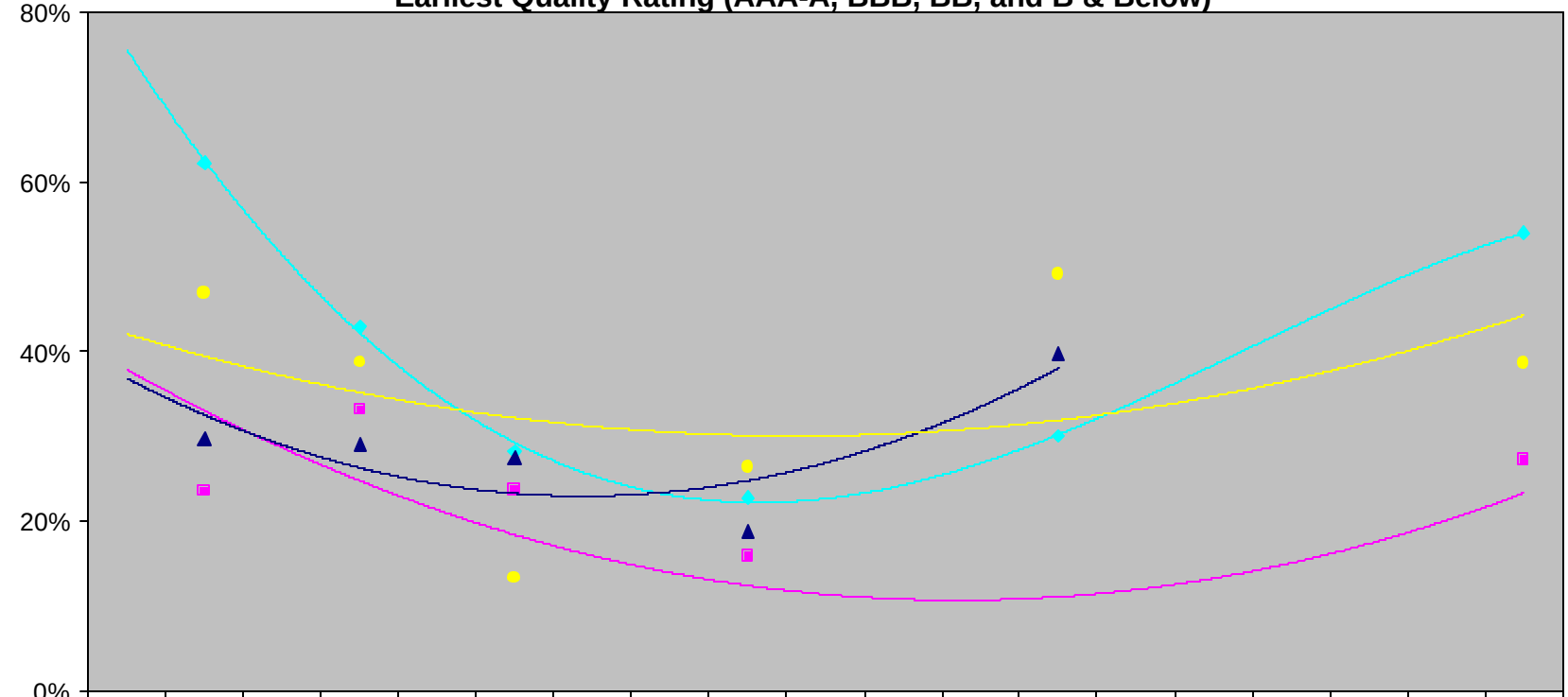
Incidence by Amount
By Years Since Funding &
Earliest Quality Rating (AAA-A, BBB, BB, and B & Below)



	0.3	1.0	2.0	3.0	4.0	4.5	5.0	6.5	7.5	8.5	9.5	10.5	11.5	12.5	13.5	14.5	15.5	16.5	17.5
<BB	0.91%	3.45%	10.78%	7.07%		6.39%			4.12%				4.86%	0	0	0	0	0	3.48%
BB	0.00%	1.88%	4.75%	4.58%		3.48%			2.81%				1.92%						3.20%
BBB	0.02%	0.37%	0.86%	1.29%		0.74%			0.50%				0.61%						0.67%
AAA-A	0.01%	0.12%	0.10%	0.11%		0.33%			0.30%				0.03%						0.00%

Years Since Funding

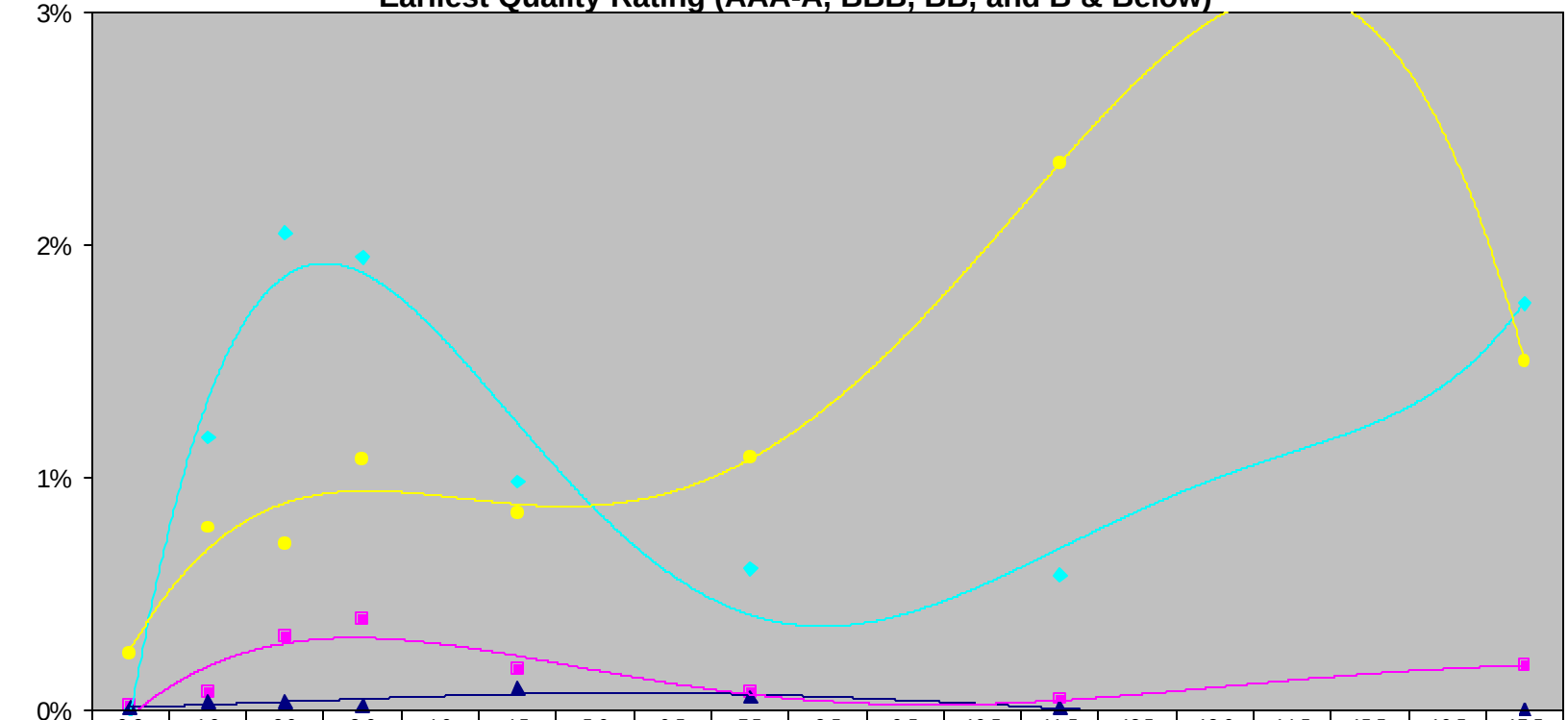
Loss Severity
By Years Since Funding &
Earliest Quality Rating (AAA-A, BBB, BB, and B & Below)



	0.3	1.0	2.0	3.0	4.0	4.5	5.0	6.5	7.5	8.5	9.5	10.5	11.5	12.5	13.5	14.5	15.5	16.5	17.5
<BB		47%		39%		13%			26%				49%						39%
BB		62%		43%		28%			23%				30%						54%
BBB		24%		33%		24%			16%				-1%						27%
AAA-A		30%		29%		27%			19%				40%						

Years Since Funding

Economic Loss Rate as % of Exposure
By Years Since Funding &
Earliest Quality Rating (AAA-A, BBB, BB, and B & Below)



	0.3	1.0	2.0	3.0	4.0	4.5	5.0	6.5	7.5	8.5	9.5	10.5	11.5	12.5	13.0	14.5	15.5	16.5	17.5
<BB	0.24%	0.78%	0.71%	1.08%		0.85%			1.08%				2.35%						1.50%
BB	0.00%	1.17%	2.05%	1.95%		0.98%			0.61%				0.58%			0			1.75%
BBB	0.02%	0.08%	0.31%	0.39%		0.17%			0.07%				0.05%			0			0.19%
AAA-A	0.01%	0.03%	0.04%	0.02%		0.09%			0.06%				0.01%						0.00%

Years Since Funding

Corroboration

For a comparative study of seasoning effects, we turn to the Altman Report on Defaults for High Yield Bonds: Review of 2001 and Outlook for 2002, by Michael T. Kender and Gabriella Petrucci. It tracks the 1971-2001 mortality rates and mortality losses[3] (Figures 21 and 22 in the Report) by original bond rating and by the number of years since issue.

This public-bond study differs from our private-placement study in the following ways:
1. It uses the actual original ratings without resorting to the earliest rating as a proxy.
2. It has enough data to isolate the CCC and B rating classes by themselves.
3. It tracks the experience for 10 years after origination, not for 20+ years as we do.

As a precursor to a review of the mortality rate by duration, let us graph two related and analogous tables for a side-by-side comparison: the number of defaults by year from issuance from the Altman Report (Figure 15) and the number of CREs by years since funding from our report. The remarkable alignment between public corporate bonds and private placements in 'timing of defaults' paves the way for the ensuing discussion.

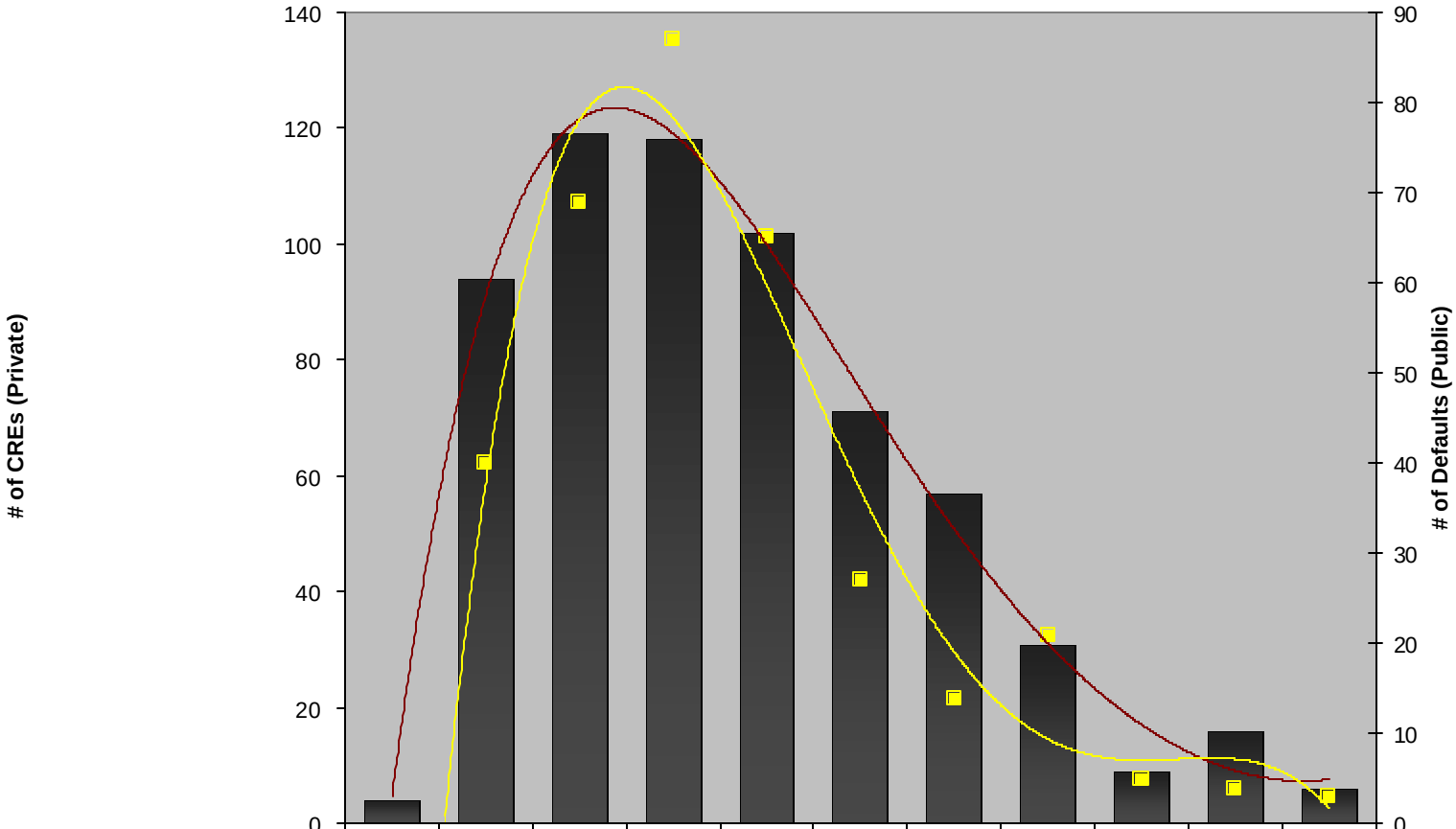
In a set of four graphs labeled 'Public Corporates 1971-2001: Original Rating', we have plotted the Altman mortality rates and mortality losses for original ratings of BBB, BB, B and CCC (omitting the rather sparse AAA-A, from which only the two-year underwriting effect can be inferred). There are four graphs because both mortality rates and mortality losses are plotted in an ungraduated version and a graduated version. The ungraduated version is in single-year intervals as reported, while the graduated version is by in two-year intervals (by averaging adjacent years) to smooth out the statistical fluctuation.

The graduated version unmasks a seasoning effect obscured by the idiosyncrasies of the ungraduated version. The effect bears many similarities to private placements:
1. The lower the quality the stronger the seasoning effect.
2. The peaking coincides with private placements. The CCC peaks at year 2 while the B peaks at year 3. The BB, as in private placements, also peaks at year 3. The BBB does not peak as such but 'plateaus' over a range in years centered at year 4.
3. The peaking is to the same degree of significance as in private placements. The CCC and B peak sharply. If the BB and BBB do not peak as much as they do among private placements, the timeline here also goes out only 10 years, not 20 years, thereby potentially obliterating a further tail-off.

[3] The mortality rate is analogous to the incidence rate by amount, while the mortality loss is analogous to the economic loss.

The one anomaly is the BB in year 9. It does not fit the up-and-down pattern. Even more anomalous is the BB's higher mortality rate in the 9th year than the lower-quality B and CCC in the same year. If the BB's mortality were to come between BBB and B in the 9th year, as it rightfully should by quality, the up-and-down pattern as a function of seasoning would be restored.

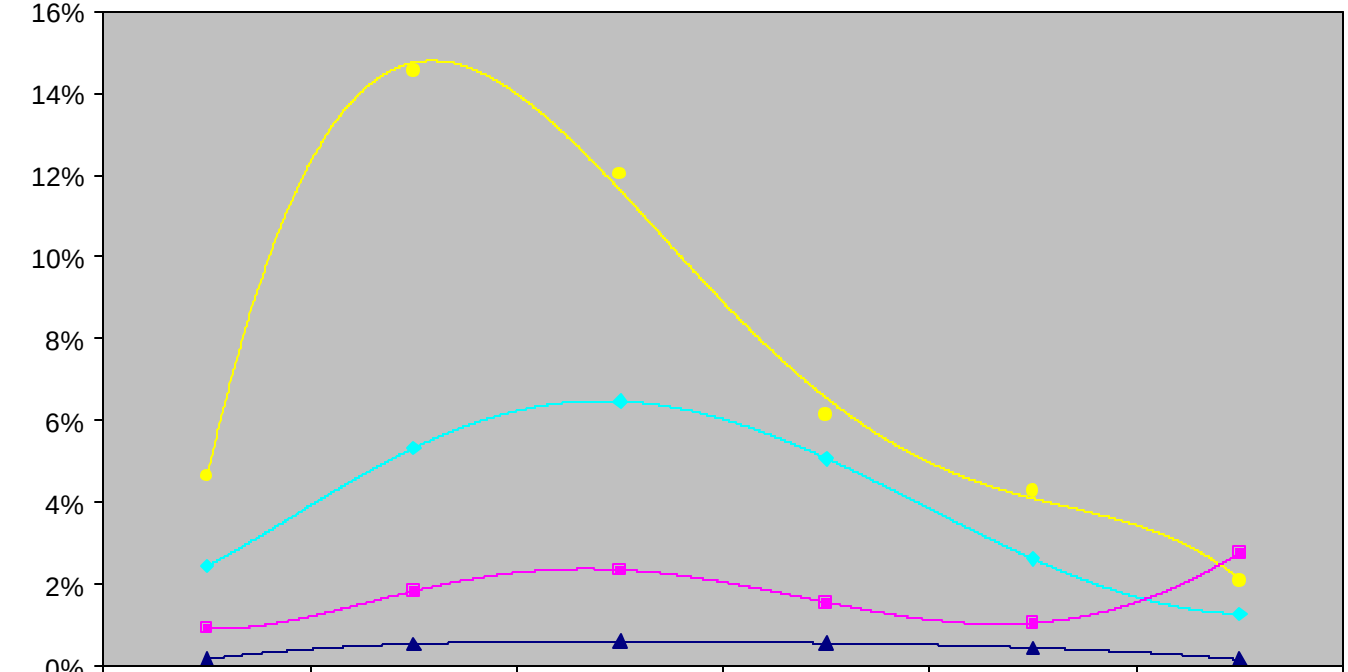
of CRE or Defaults by Year from Issuance
Private Placements from SOA Study vs High-Yield Public Corporates from Altman Report



	0	1	2	3	4	5	6	7	8	9	10
Private Placements - SOA	4	94	119	118	102	71	57	31	9	16	6
High-Yield Publics - Altman		40	69	87	65	27	14	21	5	4	3

Year from Issuance

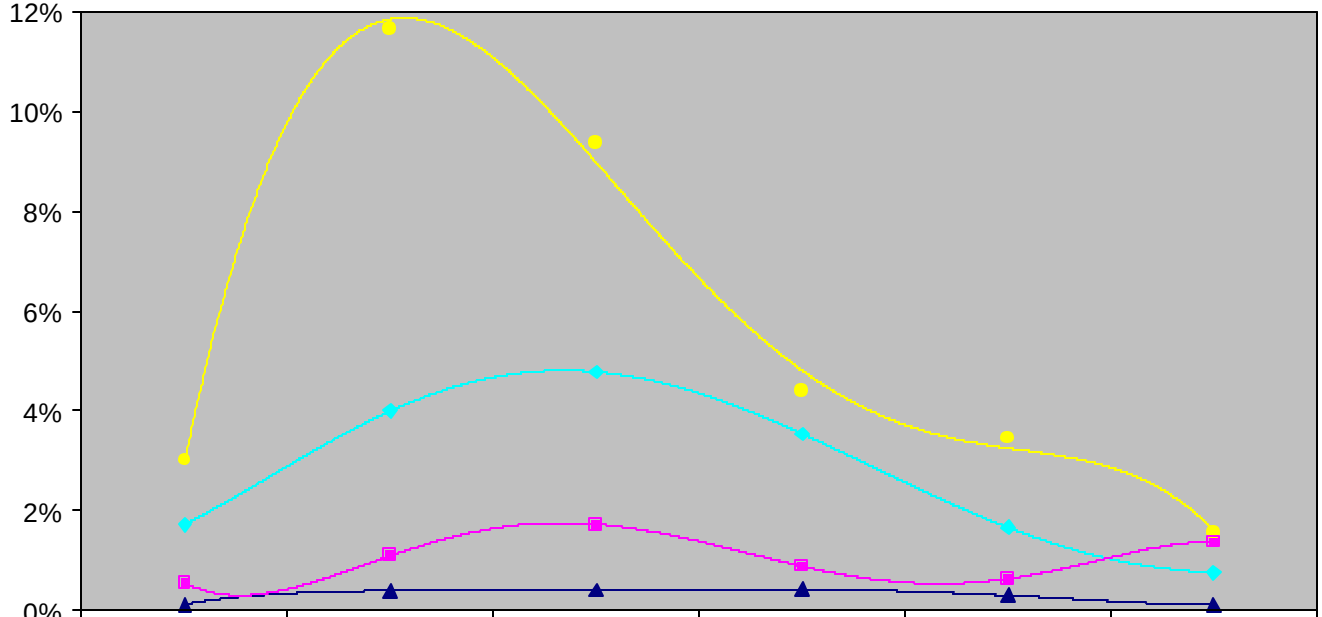
Mortality Rates (Graduated by Averaging over 2 Years)
Public Corporate Bonds by Original Rating 1971-2001 - Altman Report



	0.5	1.5	3.0	5.0	7.0	9.0
CCC	4.65%	14.55%	12.03%	6.16%	4.30%	2.09%
B	2.45%	5.33%	6.48%	5.08%	2.63%	1.28%
BB	0.94%	1.84%	2.36%	1.57%	1.06%	2.77%
BBB	0.18%	0.55%	0.62%	0.57%	0.46%	0.17%

Years Since Issue

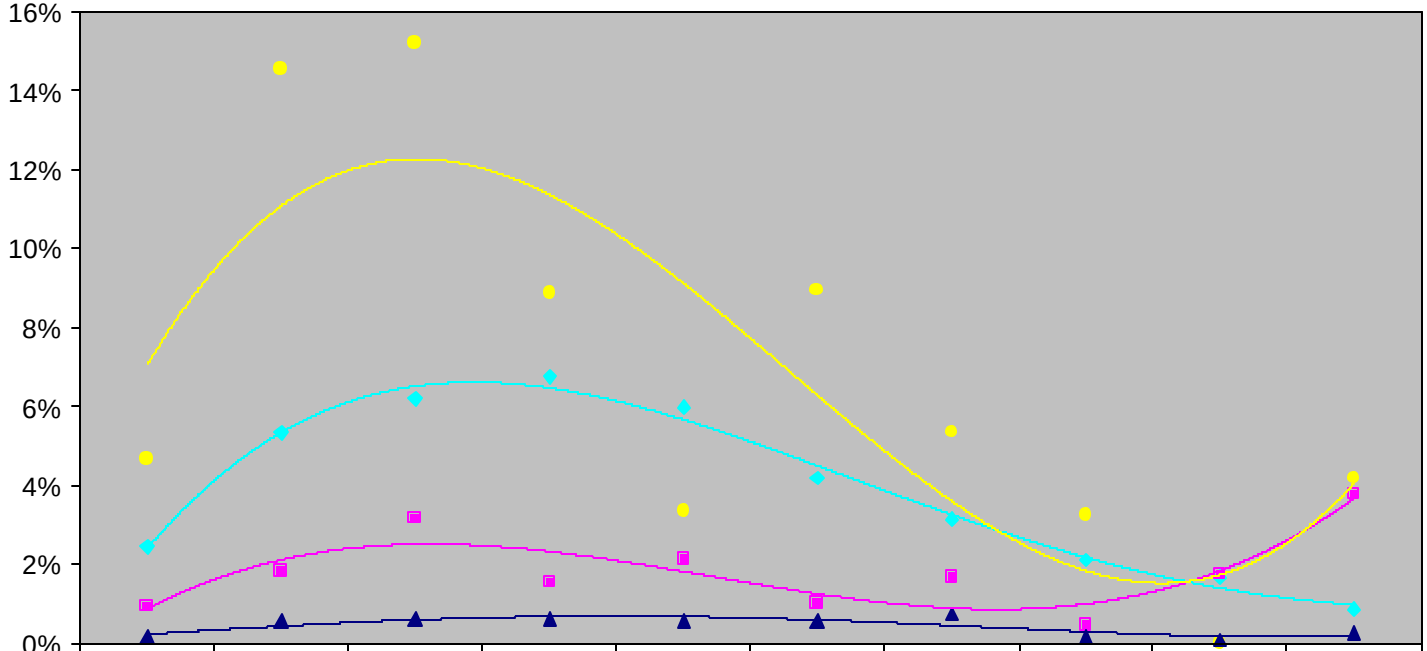
Mortality Losses (Graduated by Averaging over 2 Years)
Public Corporate Bonds by Original Rating 1971-2001 - Altman Report



	0.5	1.5	3.0	5.0	7.0	9.0
CCC	3.02%	11.64%	9.38%	4.40%	3.46%	1.56%
B	1.73%	4.00%	4.78%	3.54%	1.67%	0.77%
BB	0.55%	1.10%	1.73%	0.89%	0.64%	1.38%
BBB	0.13%	0.40%	0.41%	0.43%	0.31%	0.12%

Years Since Issue

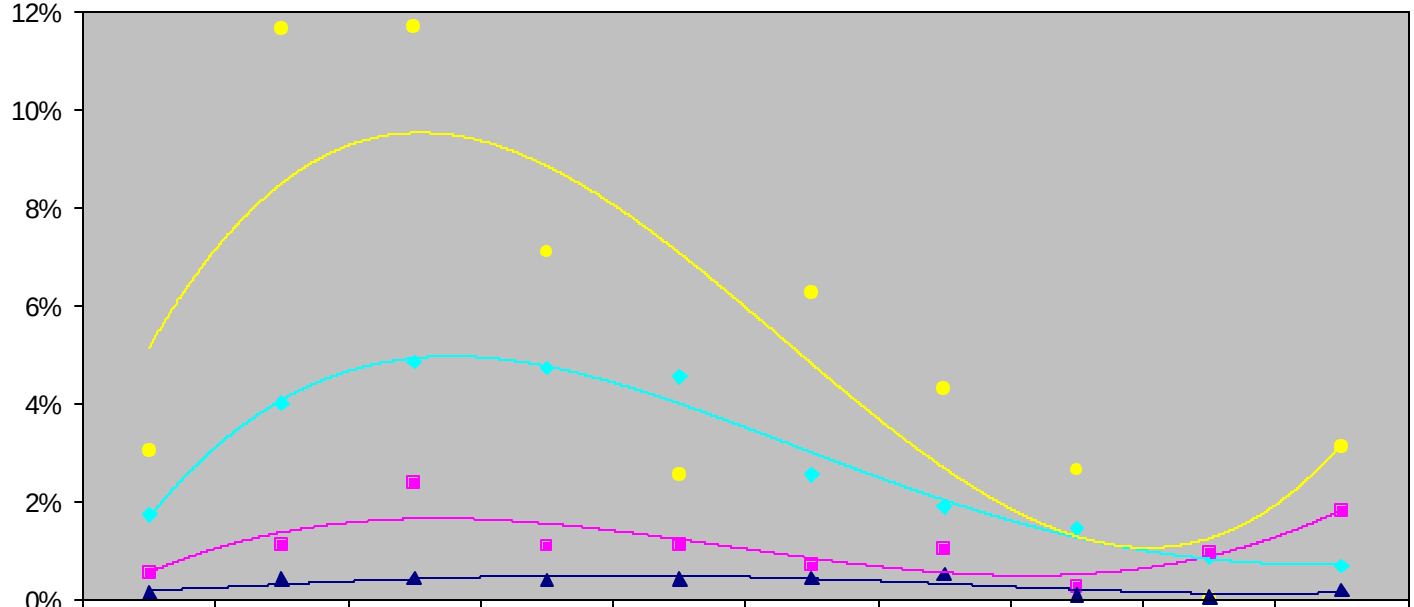
Mortality Rates (Year by Year Ungraduated)
Public Corporate Bonds by Original Rating 1971-2001 - Altman Report



	0.5	1.5	2.5	3.5	4.5	5.5	6.5	7.5	8.5	9.5
CCC	4.65%	14.55%	15.20%	8.86%	3.36%	8.95%	5.35%	3.25%	0.00%	4.18%
B	2.45%	5.33%	6.20%	6.75%	5.97%	4.19%	3.14%	2.11%	1.68%	0.87%
BB	0.94%	1.84%	3.17%	1.55%	2.12%	1.01%	1.67%	0.45%	1.76%	3.78%
BBB	0.18%	0.55%	0.60%	0.63%	0.56%	0.58%	0.74%	0.17%	0.09%	0.25%

Years Since Issue

Mortality Losses (Year by Year Ungraduated)
Public Corporate Bonds by Original Rating 1971-2001 - Altman Report



	0.5	1.5	2.5	3.5	4.5	5.5	6.5	7.5	8.5	9.5
CCC	3.02%	11.64%	11.67%	7.09%	2.53%	6.26%	4.28%	2.64%	0.00%	3.12%
B	1.73%	4.00%	4.84%	4.72%	4.54%	2.54%	1.89%	1.44%	0.87%	0.67%
BB	0.55%	1.10%	2.37%	1.09%	1.10%	0.68%	1.03%	0.25%	0.95%	1.80%
BBB	0.13%	0.40%	0.43%	0.39%	0.42%	0.43%	0.51%	0.10%	0.06%	0.18%

Years Since Issue

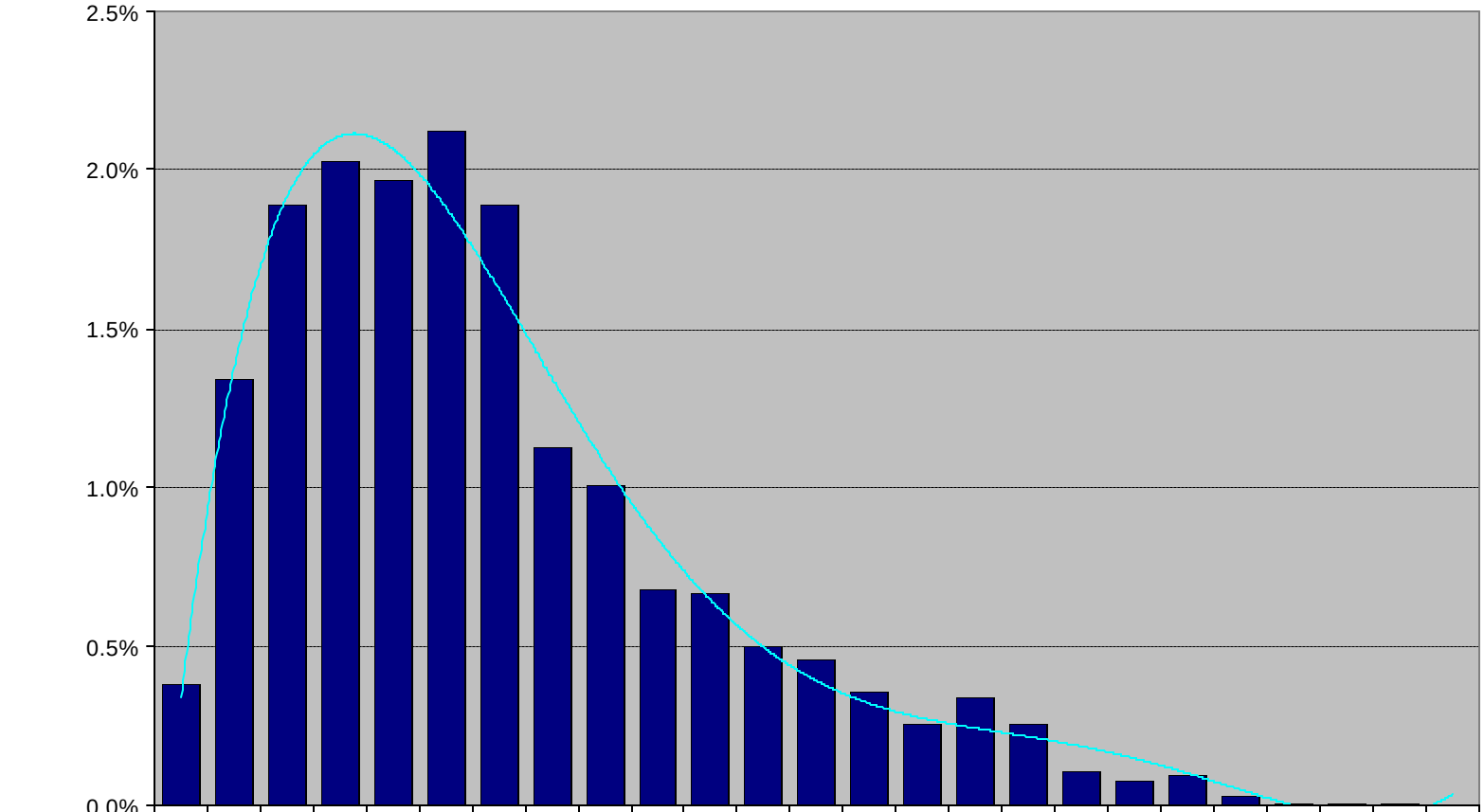
We mention in passing that the commercial-mortgage portion of our own 1986-89 study also uncovered a three-stage seasoning effect very similar to that of private placements. We did not publish the result back then in part because we did not have a technique for isolating the impact that the real-estate recession must have had on the seasoning effect.

Finally, we have reproduced a graph from yet another study, which is published in Real Estate Finance in Spring of 1999, under the title of 'Commercial Mortgage Defaults: An Update' by Esaki, L'Heureux, and Snyderman. The study tracks defaults through 1997 among commercial mortgages originated from 1972 through 1991 by 8 large insurance companies. We have fitted a curve to the article's Exhibit 7: Average Timing of Defaults (as a % of original balance) by the number of years since origination.

Exhibit 7's default rate is almost comparable to our incidence rate but not quite because it is a percentage of the original balance as opposed to the remaining balance. Still the underwriting effect lasting two years is evident. However, if normalized for an outstanding balance declining over time with amortization, the default rate as a function of the remaining balance should come down more gradually than depicted in Exhibit 7.

All in all, while the subject may not have received enough press, it is quite remarkable that commercial mortgages, public corporate bonds, and private-placement bonds all exhibit very much the same kind of seasoning pattern.

Average Timing of Defaults (as a % of Original Balance)
Exhibit 7 of 1972-97 Study of 8 Insurance Companies' Commercial Mortgages
by Esaki, L'Heureux & Snyderman



	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Default Rate	0.38	1.34	1.89	2.03	1.97	2.12	1.89	1.13	1.01	0.68	0.67	0.50	0.46	0.36	0.26	0.34	0.26	0.11	0.08	0.10	0.03	0.01	0.01	0.01	0.00

Years Since Origination

D. Funding Year by Experience Year (Seasoning Effect Adjusted for Business Cycles)

Just as we tried to isolate the pure coupon effect in the cross tabulation between coupon rate and earliest quality rating, we now try to isolate the 'pure' seasoning effect in a cross tabulation between experience year and funding year. We define the number of years since funding as the discrete variable of experience year minus funding year. So, in a two-dimensional array between experience year and funding year, we just need to 'roll up' the cells diagonally in order to aggregate them by the number of years since issue.

The Economic Factor

Looking at the seasoning effect by quality as we have just done is interesting but not as natural as looking at the coupon effect by quality as we did in the first cross tabulation. If there is a second factor to isolate from the seasoning effect, it is the economic-cycle factor, not the quality-rating factor. This is because the apparent weeding-out period in the seasoning effect can be exacerbated in bad years and ameliorated in good years. So it is possible that a bad recession at just the 'right' time, so to speak, is the culprit and the only reason for the perceived 'bump' in the seasoning effect.

The inception of our study in the wake of the Drexel Burnham era is such that the good and bad years (economically speaking) may not have exactly offset each other in leaving their marks on the pure seasoning effect. Our study began in 1986, shortly after the surge in the high-yield issuance in 1983 and shortly before the surge in bond defaults in 1990-91. It is possible that a disproportionate amount of our 'exposure', especially Below Investment Grade, was just reaching its third and fourth years since issuance when the recession hit its stride in precipitating massive credit events. So what we perceive to be the bump in the seasoning effect may be nothing more than the recession in disguise. In other words, it may well be no more than the artifact of a bulge in low-grade issuance followed a bulge in nonperformance precipitated by a severe economic downturn.

Right off the bat, the hypothesis of misconstruing the economic cycle as the seasoning effect faces some counter arguments. First, the seasoning effect as we have observed is not unique to Below Investment Grade albeit much weaker in Investment Grade; and any seasoning effect on Investment Grade is by definition not directly attributable to a bulge in the issuance of Below Investment Grade. Second, the Altman Report shows similar seasoning patterns over 1971-2001, a much more extensive period than the Drexel Burnham era. Nevertheless, it is good to develop an independent and conclusive way of 'filtering' out the economic cycle to examine the pure seasoning effect.

Methodology For Filtering Out the Economic Cycle

Our method of filtering out the economic cycle is predicated upon a model presupposing that the economic factor and the seasoning factor are multiplicatively linked. By way of example, whatever the 'normal' seasoning pattern is, in a year that is twice as bad as normal, the

seasoning pattern will simply be 'lifted' by a factor of two. In other words, the economic environment (boom or bust) in any year is assumed to have the same multiplier effect on each funding-year cell for the experience year in question. So the expected incidence rate for that cell is raised or lowered by the same multiplicative factor as any other funding-year cell in that experience year.

The steps for deriving the normalized incidence rate by number are outlined below.

- We assume the cell-by-cell incidence rate in a two-dimensional array of experience year by funding year is the product of two factors: a seasoning factor as a function of the experience year minus the funding year, and an economic factor as a function of the experience year alone.

- We further define the economic factor to be the ratio between the incidence rate specific to that experience year and the 13-year average incidence rate from 1986 through 1998, the entire history of our study to date.

- Then, cell by cell in this two-dimensional array, we normalize for economic variation by experience year by 'taking out' the economic cycle. This we do by dividing the actual incidence rate for each cell by the ratio between the incidence rate specific to that experience year and the 13-year average incidence rate. After this division, all the funding-year cells that 'belong' to the same experience year will average to the same incidence rate as the corresponding cells for any other experience year.

- After artificially stabilizing the economic environment from experience year to experience year, we diagonally 'roll up' all cells that share the 'index' of the experience year minus the funding year, i.e., the number of years since issue.

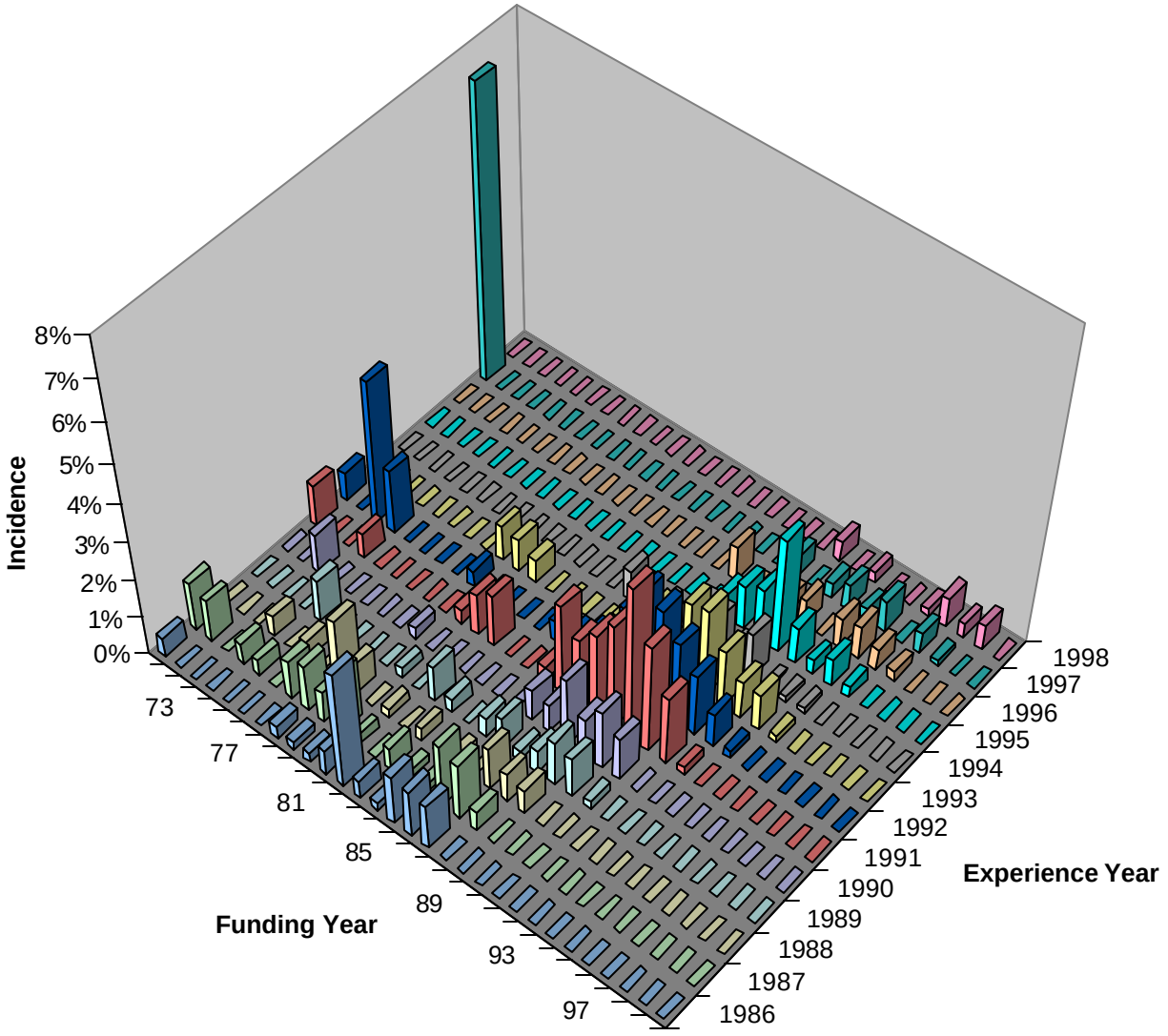
- In this manner, the diagonal mapping of this two-dimensional array to a single dimension produces an array of normalized or economically adjusted incidence rates as a function of a single variable, namely, the number of years since issue.

- At this point, with the economic cycle already removed, we are left with a normalized function, to which we can make further refinements such as the consolidation of sparse cells, interpolation, graduation, and so on.

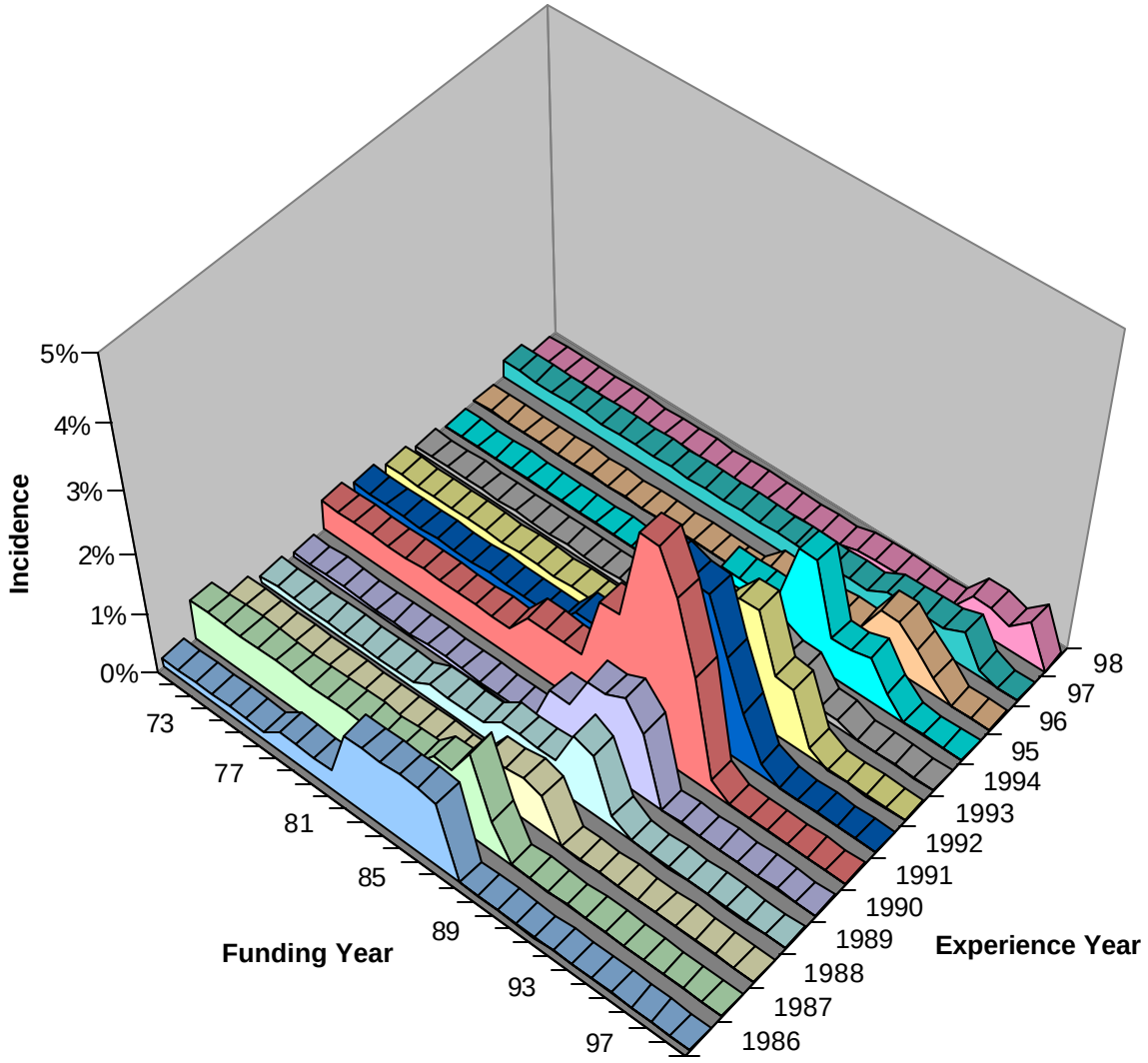
The above steps are schematically illustrated in a sequence of four three-dimensional charts with the subheading of 'By Funding Year & Experience Year' and the headings of:
1. Ungraduated Incidence Rate by #
2. Graduated Incidence Rate by #
3. Graduated & Normalized Incidence Rate by #
4. Graduated, Normalized & Diagonally Averaged Incidence Rate by #

(The longitudinal graduation shown in the two intermediate graphs is for ease of viewing only and not an integral part of the normalization process.)

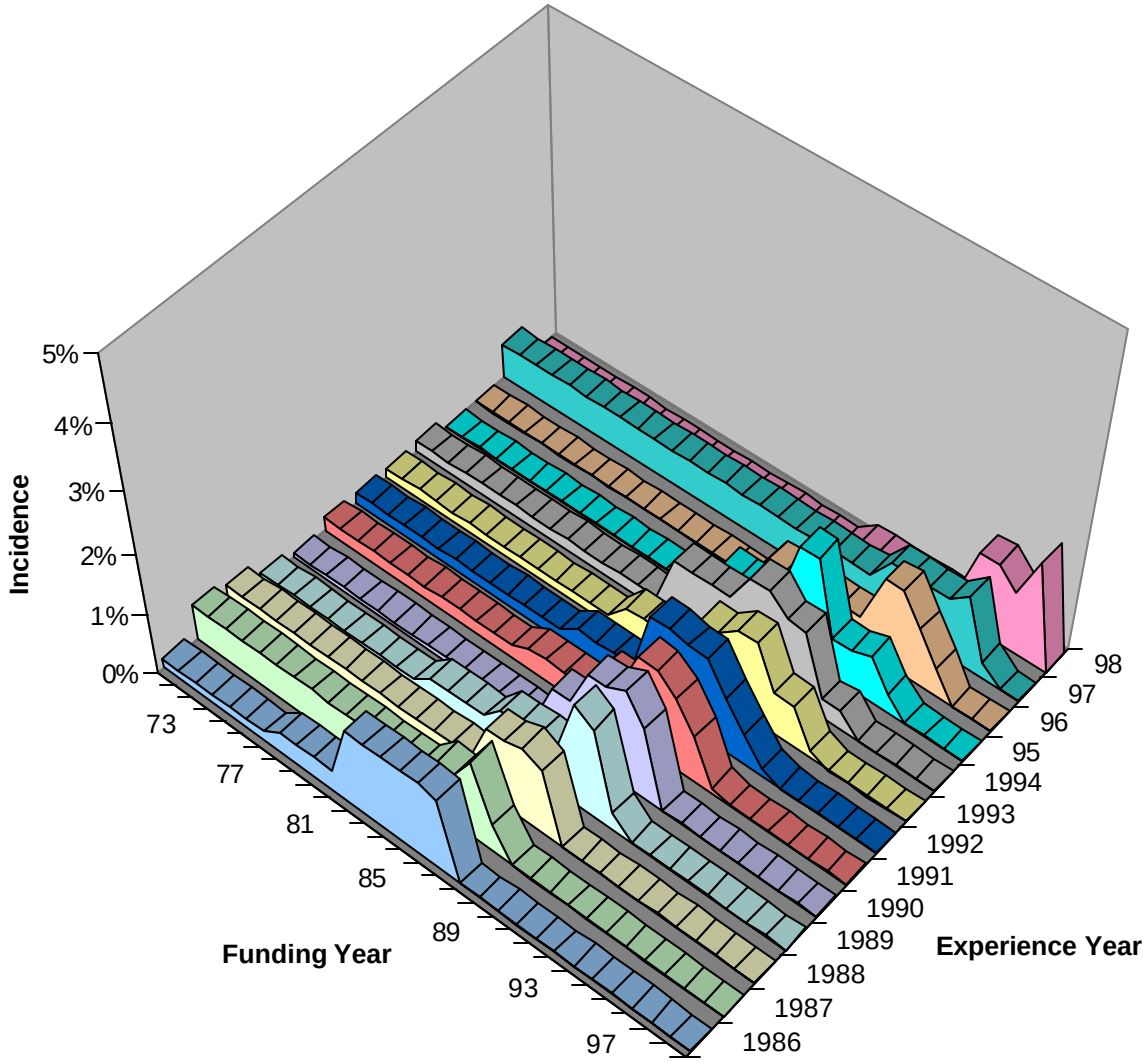
Ungraduated Incidence Rate by #
By Funding Year & Experience year



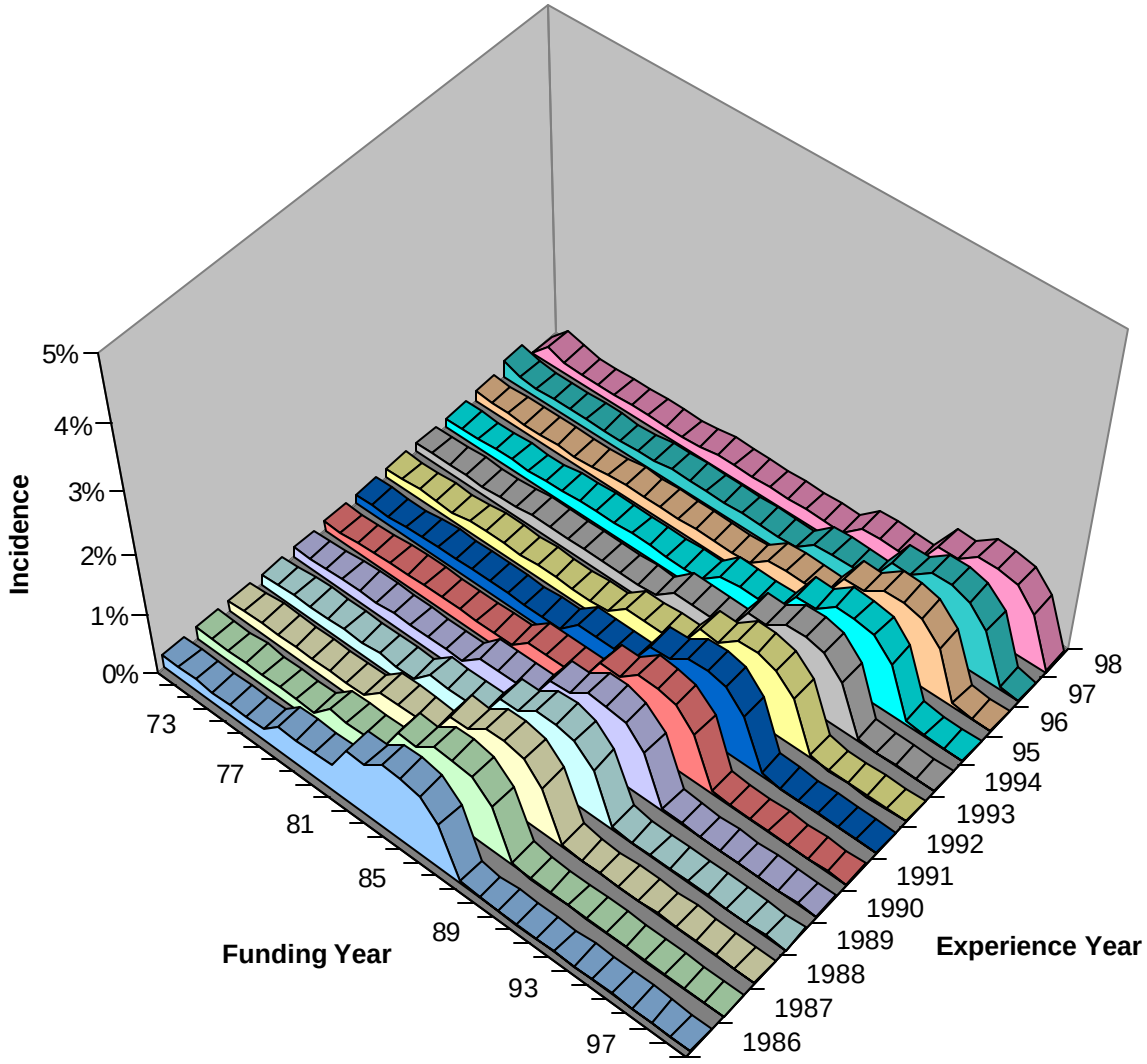
Graduated Incidence Rate by #
by Funding Year & Experience Year



Graduated & Normalized Incidence Rate by #
By Funding Year & Experience Year



Graduated, Normalized & Diagonally Averaged Incidence Rate by #
By Funding Year & Experience Year



After 'normalizing' the incidence rate by number, we normalize the incidence rate by amount analogously. We bypass any normalization of the loss severity because the economic impact on loss severity is far from clear. Finally, we normalize the economic loss rate by the same ratio as in normalizing the incidence rate by amount. So the economic loss rate will remain the product between the incidence rate by amount and the loss severity.

The results of this process are captured in a graph with the subtitle 'By Years Since Funding (Normalized for Economic Cycles). For the two incidence rates, the general pattern of rising to a peak and falling to a steady state remains unchanged. The same is true of the economic loss rate. Overall, this analysis seems to affirm the presence of a pure seasoning effect. In a side-by-side comparison with the unnormalized seasoning effect, the normalized seasoning effect turns out to be only slightly flattened.

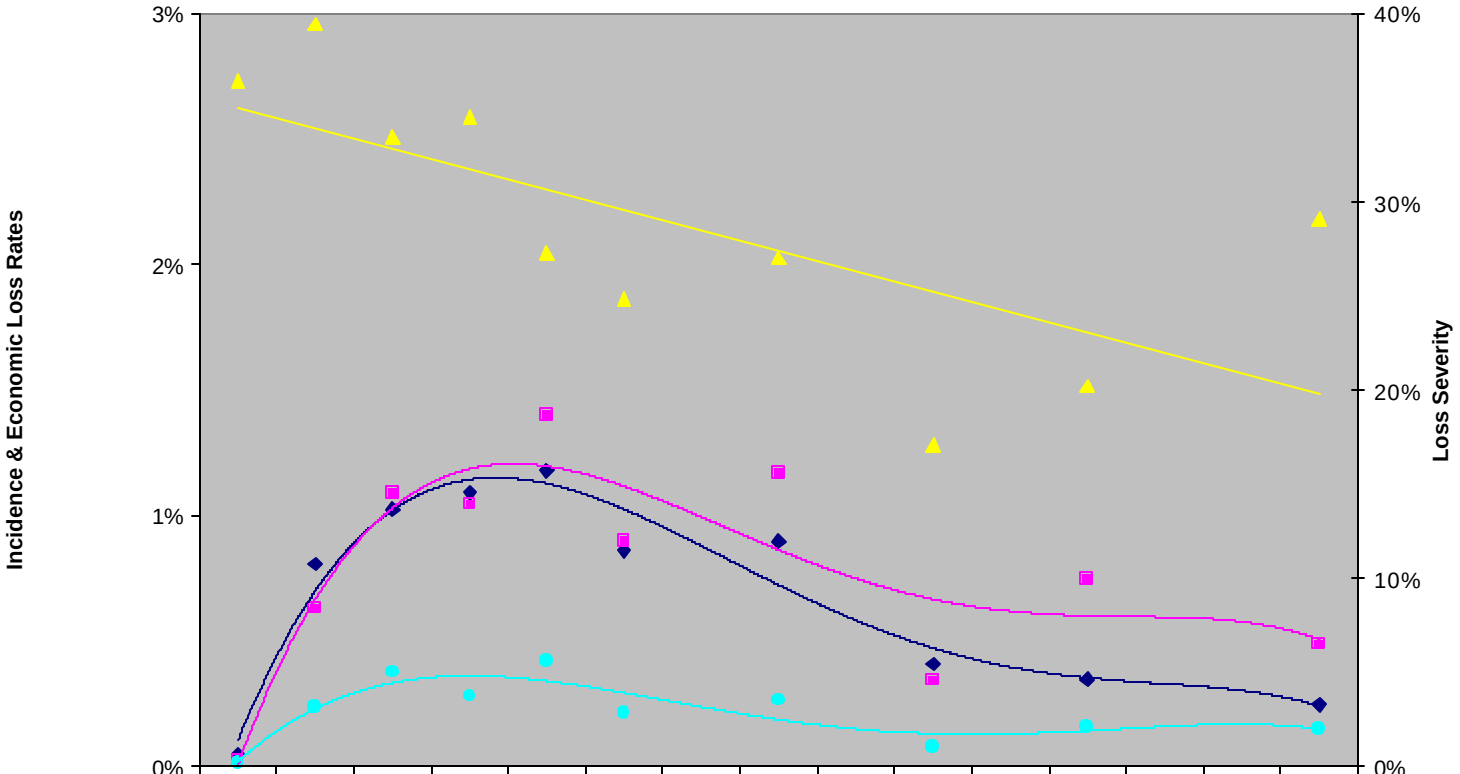
A Caveat

There is one caveat to acknowledge here. It has to do with regime changes. It is possible that the Below Investment Grade bonds issued since the Drexel Burnham era are categorically different from their earlier counterparts. If so, these two cohorts may have different seasoning effects that need to be studied independently.

In that case, our study began too late to capture the older cohort's early experience years and too recently to include the younger cohort's later experience years. In other words, our seasoning effect may be tantamount to be the splicing together of the seasoning effects of two cohorts in a disjoint manner, the left side from the younger cohort and the right side from the older cohort.

If this lack of homogeneity is a shortcoming, there is no immediate remedy. Only the collection of more years of data from the recent cohort will give us the continuity we need.

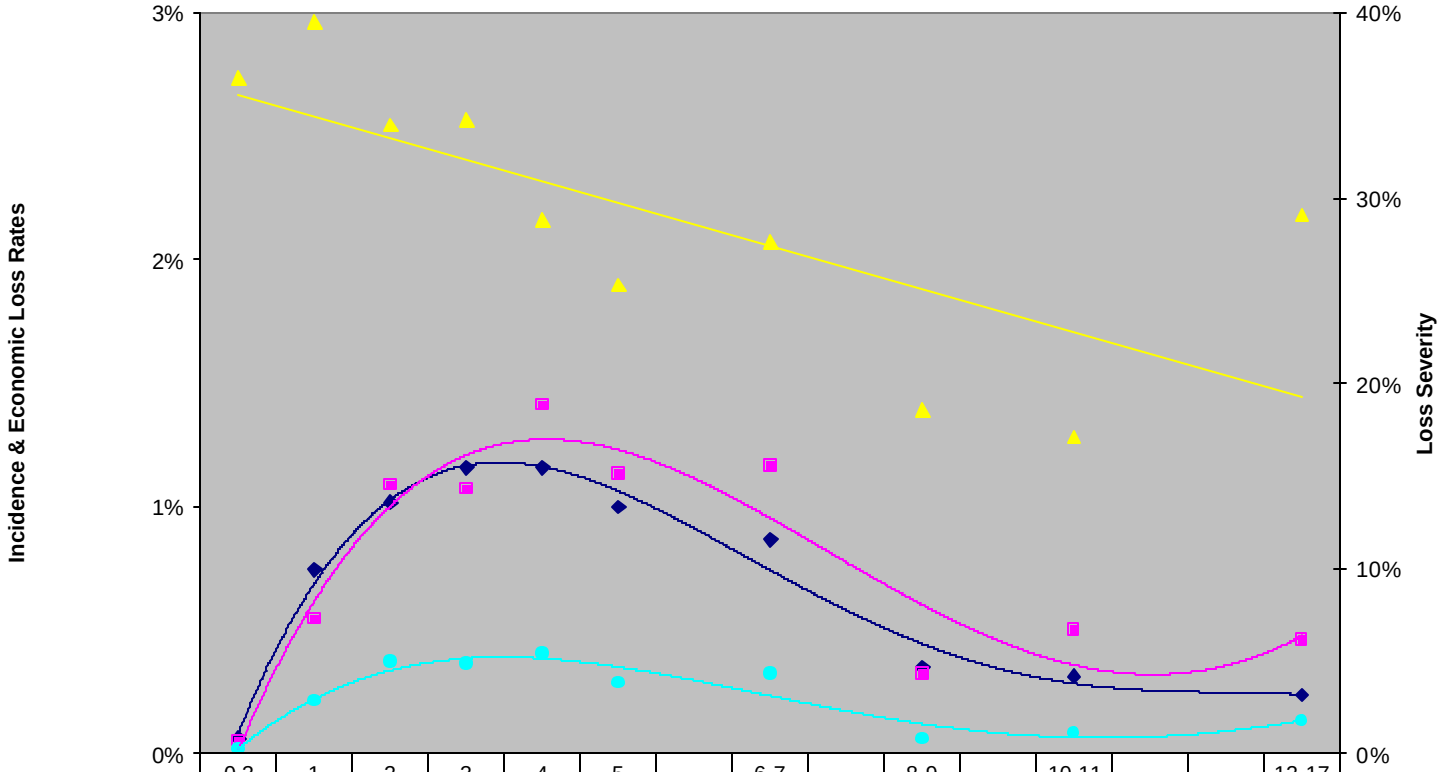
Incidence Rate by #, Incidence Rate by $, Economic Loss Rate, and Loss Severity By Years Since Funding (Normalized for Economic Cycles)



	0.3	1	2	3	4	5		6-7		8-9		10-11			12-17
# of CREs	4	94	119	118	102	71		88		25		17			22
◆ Incid by #	0.05%	0.81%	1.03%	1.09%	1.18%	0.86%		0.90%		0.41%		0.35%			0.25%
■ Incid by $	0.03%	0.63%	1.09%	1.05%	1.40%	0.90%		1.17%		0.35%		0.75%			0.49%
● Econ Loss	0.01%	0.24%	0.38%	0.28%	0.42%	0.21%		0.27%		0.08%		0.16%			0.15%
▲ Loss Severity	36%	39%	33%	34%	27%	25%		27%		17%		20%			29%

Years Since Funding

Incidence Rate by #, Incidence Rate by $, Economic Loss Rate, and Loss Severity By Years Since Funding (Not Normalized for Economic Cycles)



	0.3	1	2	3	4	5		6-7		8-9		10-11			12-17
# of CREs	4	94	119	118	102	71		88		25		17			22
◆ Incid by #	0.06%	0.74%	1.02%	1.16%	1.16%	1.00%		0.87%		0.35%		0.32%			0.24%
■ Incid by $	0.05%	0.55%	1.09%	1.07%	1.41%	1.13%		1.16%		0.32%		0.50%			0.46%
● Econ Loss	0.02%	0.22%	0.37%	0.37%	0.41%	0.29%		0.32%		0.06%		0.09%			0.13%
▲ Loss Severity	36%	39%	34%	34%	29%	25%		28%		19%		17%			29%

Years Since Funding

E. Recapitulation

In summary, the following are salient points of this Section.

- There is a pure coupon effect separate and distinct from the credit-quality effect. For the same earliest quality rating, a higher coupon gives rise to a higher incidence of CREs. In general, the lower the quality the stronger the coupon effect. Up to and including BB bonds, the lower the quality the more statistically credible the result.

- A seasoning effect consisting of three phases holds across earliest quality ratings. As the underwriting effect wears off, the incidence rate and economic loss rate both rise to a peak before declining to a steady state. In general, the lower the quality the stronger the seasoning effect. Up to and including BB bonds, the lower the quality the more statistically credible the result.

- The seasoning effect remains basically intact notwithstanding an adjustment for the economic cycle. So the seasoning effect does not seem to be the economic effect in disguise even though the former may have been somewhat accentuated by the latter in the recession of the early 1990s.

- As mentioned before, the sparse cells created by cross tabulations are particularly susceptible to certain drawbacks inherent in the four key statistics:

Key Statistic	Potential Drawback
Incidence rate by number	Distortion due to multiple issues by the same issuer
Incidence rate by amount	Distortion due to significant disparity in bond size
Loss severity	Significant statistical dispersion
Economic loss rate	Bond-size disparity and statistical dispersion

- In interpreting the results, we have relied more on the incidence rate by number because it is the most stable of the four statistics. This statistic is by no means foolproof. However, any attempt to circumvent its inherent drawback by measuring the incidence rate by issuer rather than by issue will have to overcome the hurdle of (1) multiple ratings and (2) multiple coupons for different issues by the same issuer.

A. Using the Data Summaries

This section of the report presents

- the **aggregate experience** by calendar year,
- the **loss-severity distribution** among CREs, and
- the experience by selected characteristics as **single-analysis variables**:

1. *Most Recent Quality Rating*
2. *Earliest Quality Rating*
3. *NAIC Rating*
4. *Coupon Rate*
5. *Funding Year*
6. *Years Since Funding*
7. *Years to Maturity*

For the experience in aggregate and by each variable, detailed data for the four loss statistics (Incidence Rate by Number, Incidence Rate by Amount, Loss Severity and Economic Loss Rate) are calculated. In each case, there is a one-page narrative of highlights and data notes followed by a single graph depicting the four loss statistics. The loss-severity distribution is analyzed by CRE Type, Seniority and Study Period in a one-page narrative followed by three graphs. To facilitate using the graphs, the underlying data are tabulated underneath each graph. Each reader is likely to find different items of interest and alternative interpretations of the data.

More detailed breakdowns of results for each single-analysis variable appear in Appendix IV.

Formatting Notes on Charts for the Aggregate Experience

- The graph shows the four statistics for each of the thirteen years in the 1986-98 study period.
- The left scale of the graph measures Incidence and Economic Loss Rates, while the right scale measures Loss Severity.
- A solid line linking data points is indicative of a trend line, while a dotted line is indicative of statistical fluctuation.
- The solid colored areas indicate average results over thirteen years for each of the four statistics.
- The Economic Loss Rate is expressed as a percentage of total principal exposed.
- The number of CREs by cell is provided with the data to convey relative statistical credibility (but is not shown in the graph).

Formatting Notes on Charts for the Loss-Severity Distribution

- The first graph shows the weighted average Loss Severity by CRE Type, Seniority, Study Period and Overall.
- + / - one standard deviation is indicated by the light and dark shaded bars around the weighted average value.
- Stacked bars are used to show the frequency distribution in the two graphs depicting Loss Severity by CRE Type and Seniority.
- The loss-severity distribution is captured in 10% ranges that are left-inclusive rather than right-inclusive, as denoted by [0%,10%), for example.

Formatting Notes on Charts for the Single-Analysis Variables

- Same as for the Aggregate Experience graph, the left scale of each graph measures Incidence and Economic Loss Rates, while the right scale measures Loss Severity.
- For the first three variables shown above (Most Recent Quality Rating, Earliest Quality Rating and NAIC Rating), a line graph is used for Loss Severity and bar graphs are used for Incidence Rates; the Economic Loss Rate is indicated by a single square marker overlaid onto the bar graphs.
- For the other variables, line graphs are used for all of the loss statistics, complemented by single markers for Total and N/A (not available) categories; a linear regression trend line is also fitted to the Loss Severity data.
- When data points suggest some kind of a trend line, they are linked by a solid line; otherwise, they are linked by a dotted line.
- The Economic Loss Rate is expressed as a percentage of total principal exposed.
- The number of CREs by cell is provided with the data to convey relative statistical credibility (but is not shown in the graph)

B. Private Placement 1986-98: Aggregate Experience

Highlights

- The economic loss rate over all 13 years was 0.27%. The 0.27% is equal to average incidence by amount of 0.85% times the average loss severity of 31%.

- The economic loss rate in 1991-92 in the wake of a recession is ~3.5 times the average economic loss rate of the other years.

- The higher economic loss rate in 1991-92 is due to high incidence, not high loss severity, for which there is no discernible time trend.

- The incidence by dollar amount exceeds the incidence by number almost every year, suggesting that CREs have generally higher average amounts outstanding.

- The loss severity is widely dispersed from CRE to CRE, with senior debt faring better than subordinated debt and restructures faring better than defaults and other types of CREs.

- The loss severity was ~40% in each of the first 6 years except 1987 but ~20% in each of the last 6 years except 1997. See discussion in the Analysis & Commentary section about possible reasons for smaller loss severity in recent years.

Data Notes

- The results exclude an early technical CRE, whose face amount was big enough to distort the aggregate incidence rate and loss severity but whose nominal loss was small enough to leave the aggregate economic loss intact.

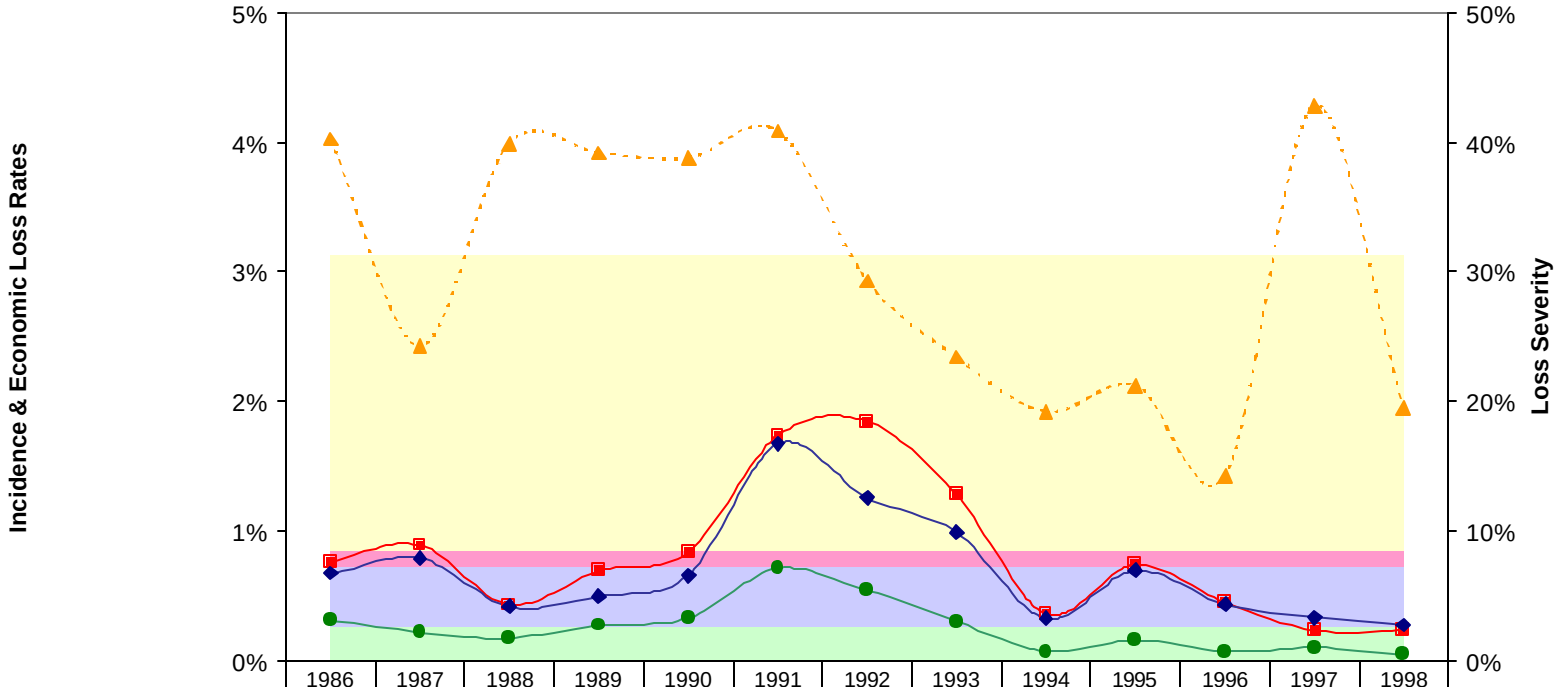
- 4 out of the 19 participating companies contributed data for all years of the 1986-98 study period. In all,

  11 companies contributed to the 1986-89 period,
  10 companies contributed to the 1990-92 period,
  15 companies contributed to the 1993-94 period, and
  7 companies contributed to the 1995-98 period.

- See general limitations of the study listed in Appendix III.

- See detailed discussion of aggregate experience in Section III: Analysis and Commentary.

Incidence Rate by #, Incidence Rate by $, Economic Loss Rate, and Loss Severity By Year 1986-98



	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Avg Loss Sev	31%	31%	31%	31%	31%	31%	31%	31%	31%	31%	31%	31%	31%
Avg Incid $	0.85%	0.85%	0.85%	0.85%	0.85%	0.85%	0.85%	0.85%	0.85%	0.85%	0.85%	0.85%	0.85%
Avg Incid #	0.71%	0.71%	0.71%	0.71%	0.71%	0.71%	0.71%	0.71%	0.71%	0.71%	0.71%	0.71%	0.71%
Avg Econ Loss	0.27%	0.27%	0.27%	0.27%	0.27%	0.27%	0.27%	0.27%	0.27%	0.27%	0.27%	0.27%	0.27%
Incid $	0.76%	0.89%	0.43%	0.69%	0.83%	1.73%	1.84%	1.28%	0.36%	0.74%	0.45%	0.23%	0.24%
Incid #	0.67%	0.79%	0.42%	0.49%	0.66%	1.67%	1.26%	0.99%	0.32%	0.69%	0.43%	0.33%	0.28%
Econ Loss	0.31%	0.22%	0.17%	0.27%	0.32%	0.71%	0.54%	0.30%	0.07%	0.16%	0.06%	0.10%	0.05%
Loss Sev	40%	24%	40%	39%	39%	41%	29%	23%	19%	21%	14%	43%	19%
# of CREs	52	57	35	43	50	140	106	82	29	35	24	19	17

C. Private Placement 1986-98: Loss-Severity Distribution

Highlights

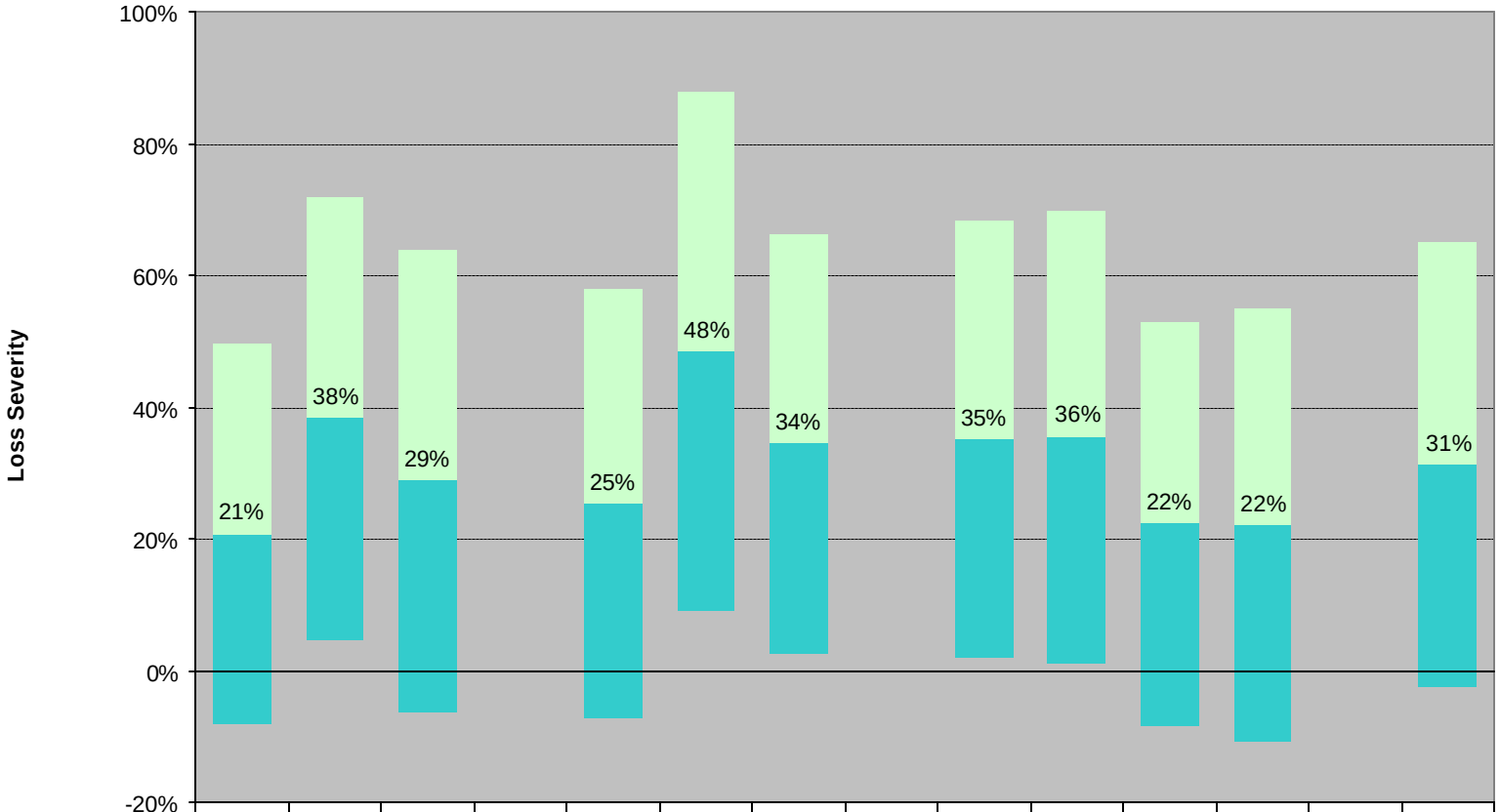
- The loss severity among CREs is widely dispersed, with a significant number near 100% and a significant number near 0% including some cases of gains or negative losses.
- The overall loss-severity distribution has a median of 25%, an arithmetic average of 34%, and a weighted average of 31% (32% if all gains or negative losses are excluded).
- The standard deviation of 34% is higher than the 26% among public corporate bonds as reported in one study[1].
- CRE type and debt seniority are two factors with a bearing on loss severity.
- By CRE type, defaults exhibit a higher average loss severity than restructures (38% versus 21%). Restructures account for a higher percentage of less severe losses such as a loss severity of <20%.
- By seniority, subordinated debt exhibits a higher average loss severity than senior debt (48% compared to 25%). It accounts for a higher percentage of more severe losses such as a severity of >70%.
- Of the four study periods, the two recent ones (1993-94 and 1995-98) have a lower loss severity but the same standard deviation as the two early ones (1986-89 and 1990-92).

Data Notes

- See the Appendix on the discounted-cashflow method of loss calculation and how it differs from the market-based loss assessment generally used in default studies on public bonds.
- Each CRE's cashflow was individually reviewed for internal consistency and reasonableness.
- The seniority indicator is underreported in the data submission but augmented by the CUSIP directory. For this Section, assets with missing seniority were matched by PPN to the CUSIP directory and assigned seniority accordingly. Note that some analyses of seniority in Section III are based only on contributed data and are limited to the period 1991-98 (seniority variables were not collected in earlier years), whereas in this Section, CREs for earlier years are included in the analysis where CUSIP directory indicators were available.

[1] Michael T. Kender and Gabriella Petrucci, *Altman Report on Defaults and Returns for High Yield Bonds: Review of 2001 and Outlook for 2002*, p.14, Figure 12

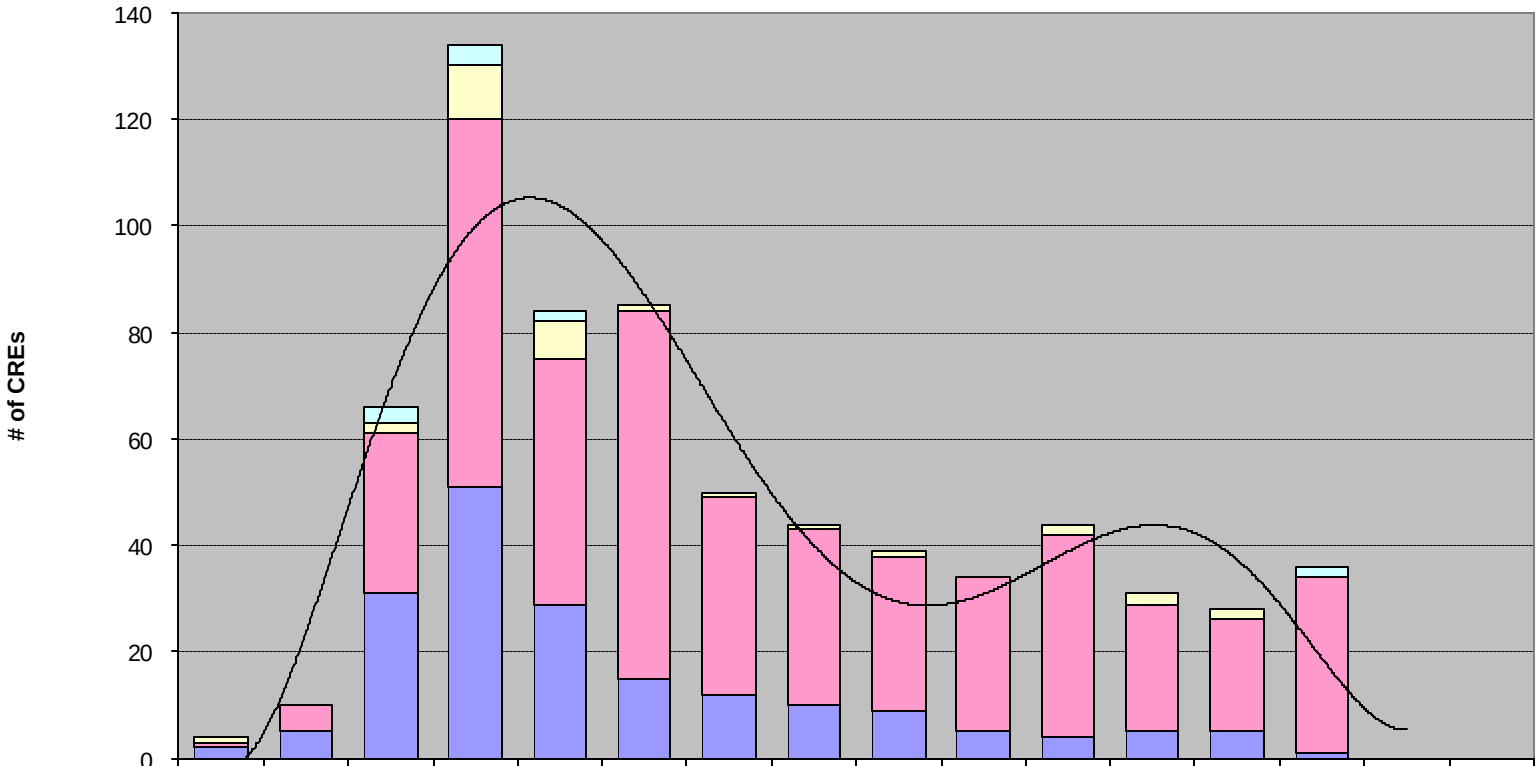
Loss-Severity Dispersion (Weighted Average +/- Standard Deviation)
By CRE Type, by Seniority & by Study Period



	Restruc	Default	Distress Sale		Senior	Subord.	Unknown		86-89	90-92	93-94	95-98		Overall
Weighted m + s	50%	72%	64%		58%	88%	66%		68%	70%	53%	55%		65%
Weighted m	21%	38%	29%		25%	48%	34%		35%	36%	22%	22%		31%
Weighted m - s	-8%	5%	-6%		-7%	9%	3%		2%	1%	-8%	-11%		-3%

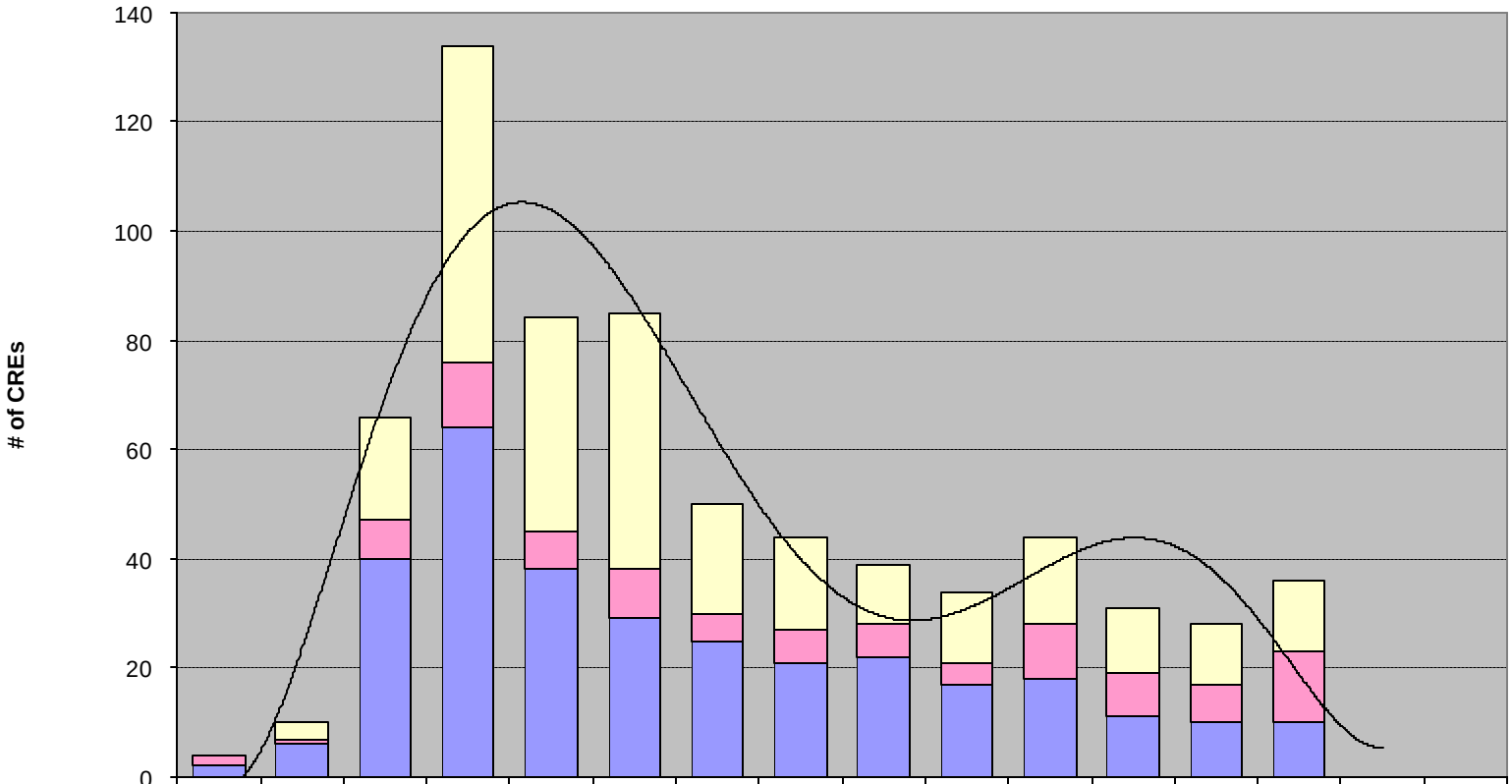
CRE Type - Seniority - Study Period

Frequency Distribution of Loss Severity of CREs (By CRE Type)



	<-20	[-20,-10)	[-10,0)	[0,10)	[10,20)	[20,30)	[30,40)	[40,50)	[50,60)	[60,70)	[70,80)	[80,90)	[90,100)	100	>100	Total
Unknown	-	-	3	4	2	-	-	-	-	-	-	-	-	2	-	11
Sale	1	-	2	10	7	1	1	1	1	-	2	2	2	-	-	30
Default	1	5	30	69	46	69	37	33	29	29	38	24	21	33	-	464
Restruc	2	5	31	51	29	15	12	10	9	5	4	5	5	1	-	184
Total																689
All CREs (#)	4	10	66	134	84	85	50	44	39	34	44	31	28	36	-	
All CREs (%)	1%	1%	10%	19%	12%	12%	7%	6%	6%	5%	6%	4%	4%	5%	0%	

Frequency Distribution of Loss Severity of CREs (By Seniority)



	<-20	[-20,-10)	[-10,0)	[0,10)	[10,20)	[20,30)	[30,40)	[40,50)	[50,60)	[60,70)	[70,80)	[80,90)	[90,100)	100	>100	Total
Unknown	-	3	19	58	39	47	20	17	11	13	16	12	11	13	-	279
Subord.	2	1	7	12	7	9	5	6	6	4	10	8	7	13	-	97
Senior	2	6	40	64	38	29	25	21	22	17	18	11	10	10	-	313
Total																689
All CREs (#)	4	10	66	134	84	85	50	44	39	34	44	31	28	36	-	
All CREs (%)	1%	1%	10%	19%	12%	12%	7%	6%	6%	5%	6%	4%	4%	5%	0%	

Loss Severity in Mostly 10% Bands

D. Private Placement 1986-98: Most Recent Quality Rating

Highlights

- Incidence rates and economic loss rates by rating are as expected. Both rise with lower quality and are significantly higher for speculative grades than for investment grades.

- The loss severity also rises with lower quality ratings (25% for BBB, 29% for BB, 37% for B, and 50% for <B), but here rating at least partly captures effects of subordination since riskier-rated placements are more likely to be subordinated.

- Incidence and loss statistics are somewhat larger for the N/A (ratings-not-available) category than for all private placements at large, but severities are similar. This suggests that placements in the N/A category were a bit riskier than average but, on the other hand, the volume in N/A peaked during the years with the highest loss rates, so on the whole placements in the N/A category may have been similar to the overall pool.

- By calendar year, the economic loss rate is relatively stable for investment grades but significantly higher in 1991-92 for speculative grades.

- All AAA-A cells are too sparsely populated with CREs to be statistically credible.

- See discussion in Section III: Analysis and Commentary.

Data Notes

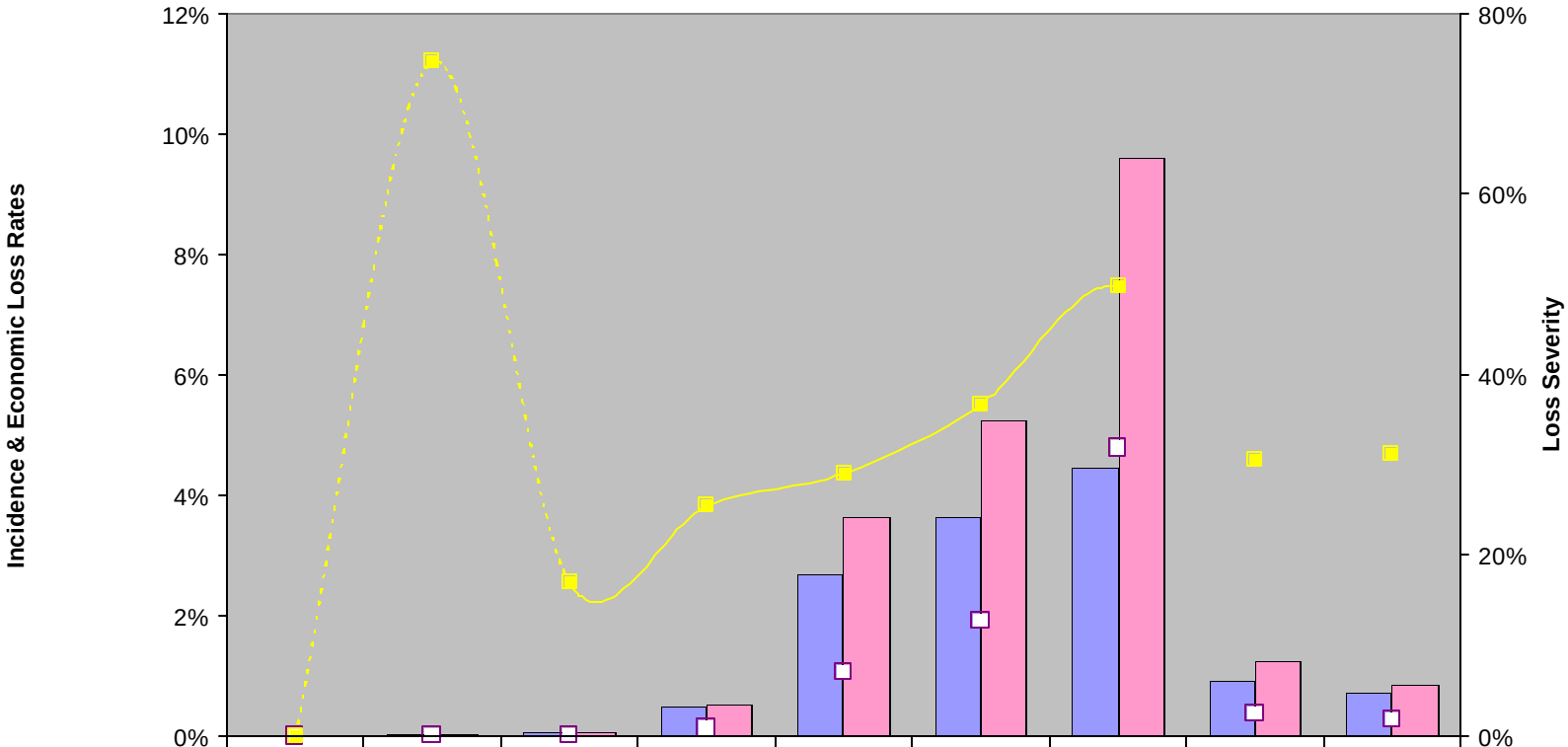
- See Data Notes under Aggregate Experience.

- The quality ratings are based on participating companies' own internal ratings mapped to a scale comparable to S&P and Moody's.

- The distribution of placements across reported quality ratings is fairly constant over time.

- Until the last 3 years (1996-98) of the study period, the study's database included a significant amount of unreported or unreliably reported quality ratings that had to be relegated to the N/A category.

Incidence Rate by #, Incidence Rate by $, Economic Loss Rate, and Loss Severity By Most Recent Quality Rating



	AAA	AA	A	BBB	BB	B	<B	N/A	Total
Incid by #	0.00%	0.03%	0.07%	0.50%	2.68%	3.63%	4.44%	0.92%	0.71%
Incid by $	0.00%	0.02%	0.06%	0.52%	3.64%	5.23%	9.59%	1.25%	0.85%
Econ Loss	0.00%	0.02%	0.01%	0.13%	1.06%	1.92%	4.77%	0.38%	0.27%
Loss Sev	0%	75%	17%	25%	29%	37%	50%	31%	31%
# of CREs	-	3	15	148	164	108	65	186	689

Most Recent Quality Rating

E. Private Placement 1986-98: Earliest Quality Rating

Highlights

- As with the results by the most recent rating, the incidence rates and economic loss rates rise with lower quality ratings but not as steeply and not without exception.

- The pattern of loss severity increasing with lower quality ratings is not quite as robust as for Most Recent Ratings (26% for AAA-BBB, 36% for BB-B, and 42% for <B). The pattern may be due to a greater frequency of subordinated debt among lower grades at issue.

- Incidence and loss statistics are again somewhat higher for the N/A (ratings-not-available) category and all private placements at large. See the Highlights for Most Recent Quality Rating.

- By calendar year, the economic loss is relatively stable for investment grades but significantly higher in 1991-92 for speculative grades.

- The economic loss rate by Earliest Quality Rating is higher than the economic loss rate by Most Recent Quality Rating in investment grades but lower in speculative grades. This is to be expected because most assets originated as investment grade migrate to speculative grade before onset of a CRE.

Data Notes

- See Data Notes under Aggregate Experience and Most Recent Quality Rating.

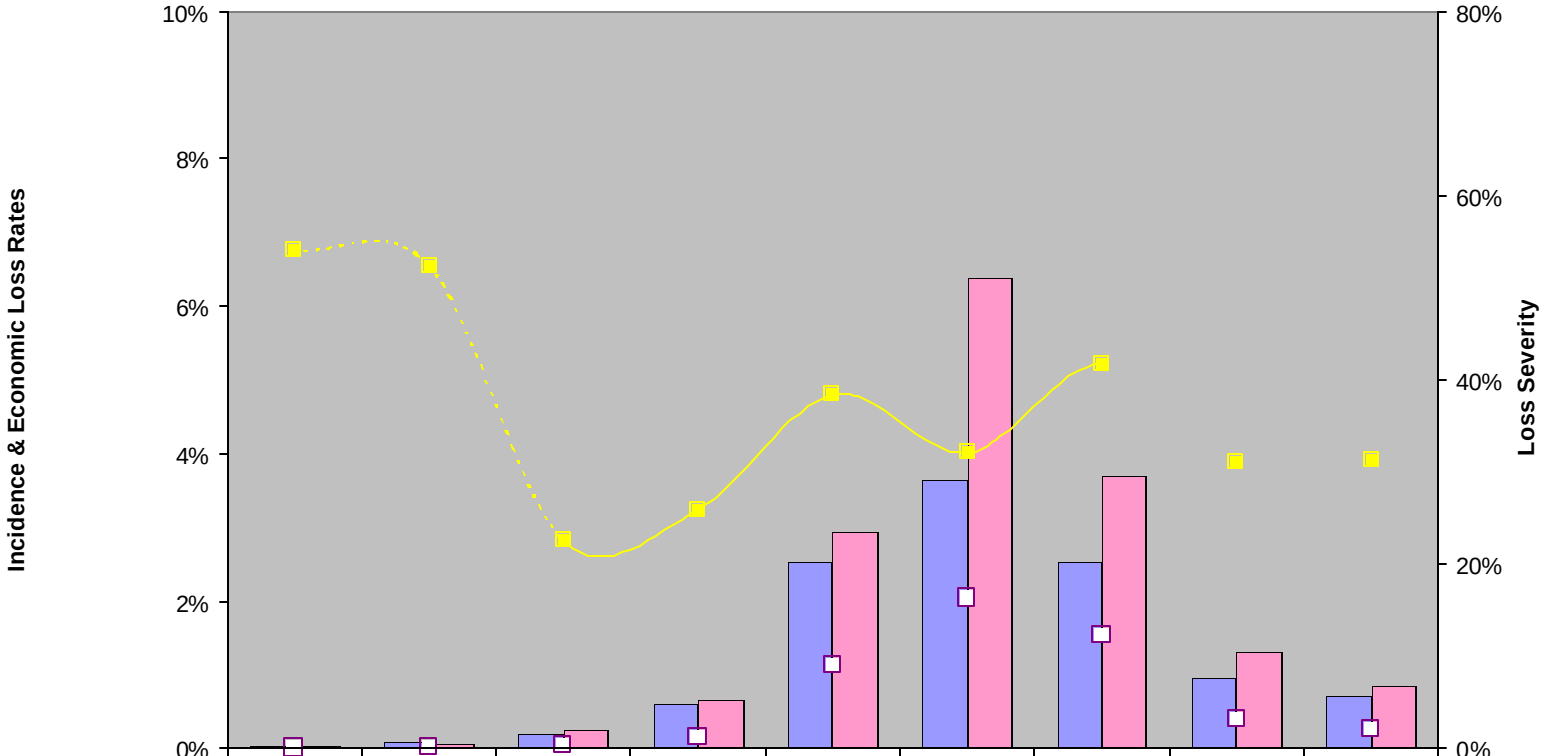
- The Earliest Quality Rating is a proxy for the rating at issue, derived from reported values of the 'rating at acquisition' and 'most recent quality rating', as of the end of each contribution year, according to the following algorithm:

  1. Use 'rating at acquisition' if available, or take the earliest one if reported more than once.
  2. Use 'most recent quality rating' for the earliest contribution year if (1) above is not available.
  3. If neither of (1) or (2) above is available, default to N/A for the 'earliest quality rating.'

- All AAA-A cells are too sparsely populated by CREs to be statistically credible.

- See discussion in Section III: Analysis and Commentary. Also see the cross-tabulation analysis as it relates to the Earliest Quality Rating in Section IV.

Incidence Rate by #, Incidence Rate by $, Economic Loss Rate, and Loss Severity By Earliest Quality Rating



	AAA	AA	A	BBB	BB	B	<B	N/A	Total
Incid by #	0.04%	0.09%	0.20%	0.62%	2.53%	3.63%	2.52%	0.96%	0.71%
Incid by $	0.03%	0.05%	0.24%	0.66%	2.95%	6.37%	3.69%	1.30%	0.85%
Econ Loss	0.02%	0.03%	0.05%	0.17%	1.13%	2.05%	1.54%	0.40%	0.27%
Loss Sev	54%	52%	23%	26%	38%	32%	42%	31%	31%
# of CREs	2	9	48	181	142	99	38	170	689

Earliest Quality Rating

F. Private Placement 1986-98: NAIC Rating

Highlights

- The NAIC rating scale changed in 1990, from the 4-way breakdown of Yes-No*-No**-No to the 6-way breakdown of 1-2-3-4-5-6 in descending order by credit quality. See Section III: Analysis and Commentary, Table 9, for results specific to each scale. Comments in these Highlights address the current scale only.

- As a function of the NAIC rating in descending order by quality, the incidence rate by number rises exponentially from 1 through 5 before reversing slightly between 5 and 6, while the incidence rate by amount rises exponentially from 1 through 5 before easing up between 5 and 6.

- The loss severity also rises with declining quality but not as steeply overall and not as steadily from notch to notch unless we combine 1 with 2 and 4 with 5:

NAIC 1-2	19%
NAIC 3	25%
NAIC 4-5	31%
NAIC 6	45%

- The trend line on the incidence rate by amount, multiplied by the trend line on the loss severity, produces a trend line on the economic loss rate that rises steeply and continuously throughout the NAIC rating scale of 1 to 6.

Data Notes

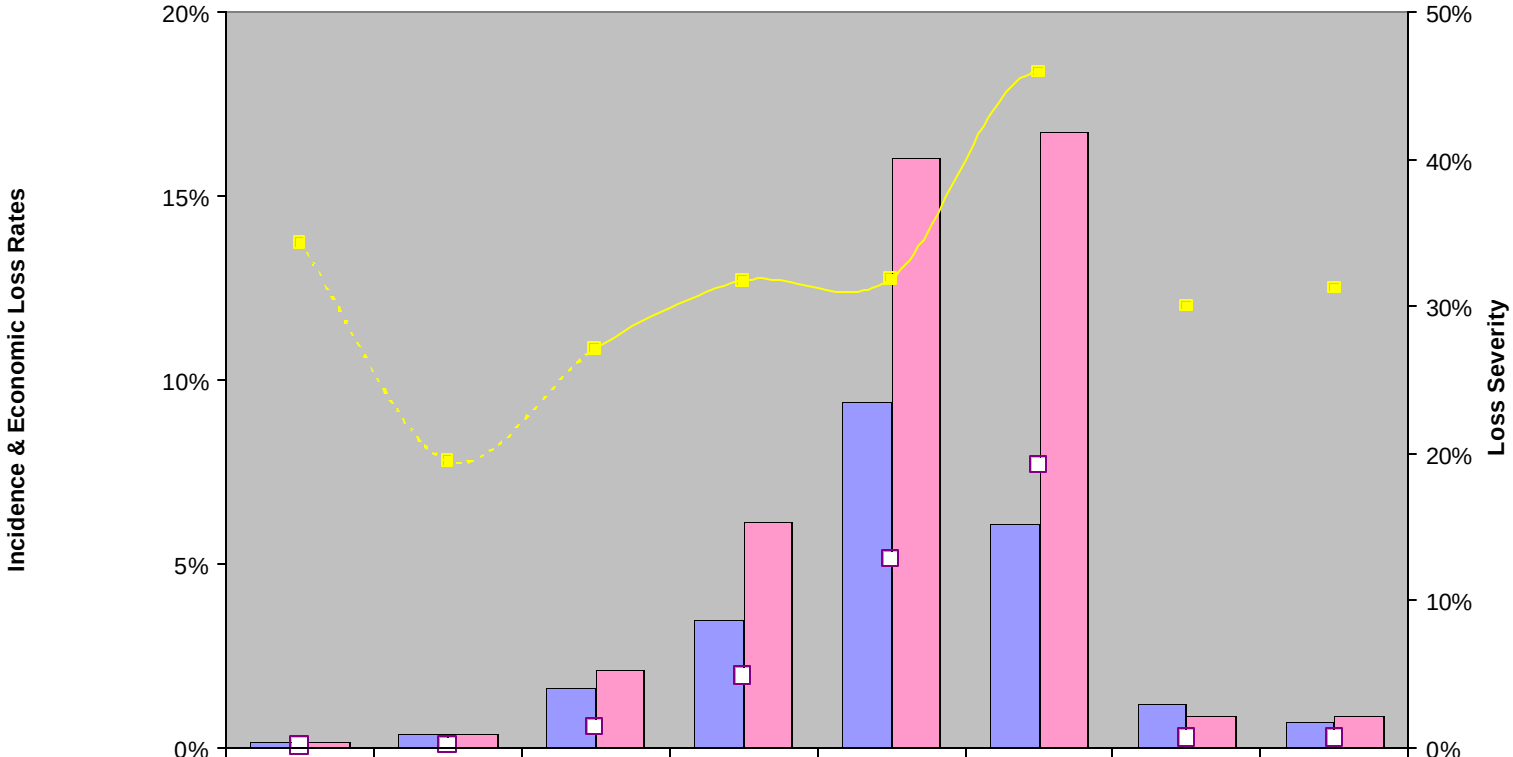
- The NAIC rating in question is as of the year-end prior to each exposure year in question.

- The NAIC rating scale changed as of year-end 1990. Ratings on the two scales were converted to a single uniform scale according to the following table.

	Original NAIC Scale	Current NAIC Scale
Investment Grade	Yes	1 & 2
Below Investment Grade (High)	No*	3
Below Investment Grade (Low)	No**	4 & 5
At or Near Default	No	6

- See discussion in Section III: Analysis and Commentary.

Incidence Rate by #, Incidence Rate by $, Economic Loss Rate, and Loss Severity By NAIC Rating



	1 (Yes)	2	3 (No*)	4 (No**)	5	6 (No)	N/A	Total
Incid by #	0.15%	0.36%	1.61%	3.48%	9.41%	6.06%	1.19%	0.71%
Incid by $	0.13%	0.38%	2.09%	6.15%	16.05%	16.73%	0.87%	0.85%
Econ Loss	0.04%	0.07%	0.57%	1.95%	5.11%	7.68%	0.26%	0.27%
Loss Sev	34%	19%	27%	32%	32%	46%	30%	31%
# of CREs	83	71	89	153	90	80	123	689

NAIC Rating

G. Private Placement 1986-98: Coupon Rate

Highlights

- An analysis by coupon rate has to normalize for the quality rating because of the correlation between credit spread and quality rating. This is done in the Cross Tabulation section, which shows that a high coupon, even after normalizing for the credit rating, is still associated with a higher incidence rate of credit events and a higher economic loss rate.

- Ignoring the quality rating, the coupon rate on a standalone basis seems to be positively correlated with each of the four loss statistics between 9% and 14%:

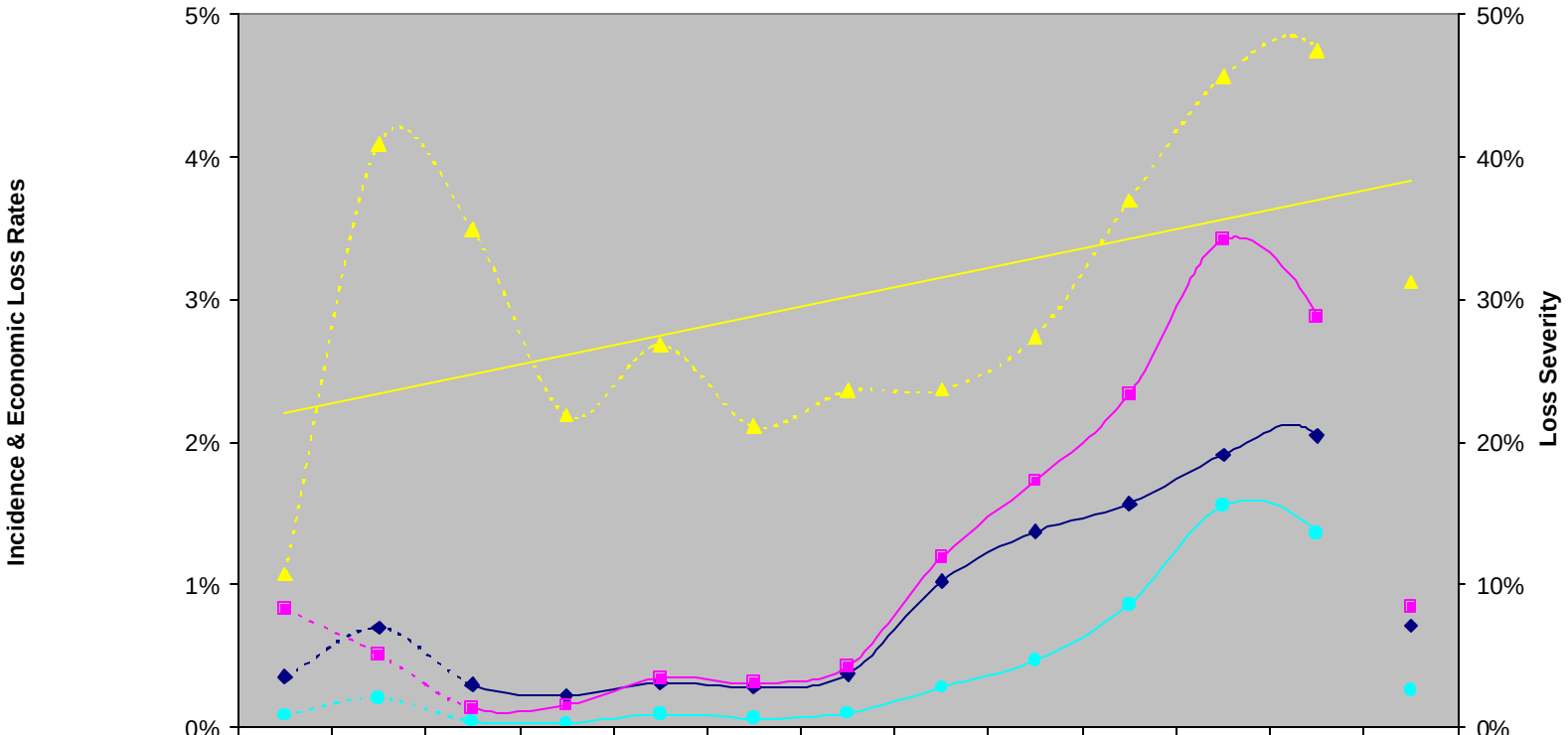
	Coupon Range in %				
	9-10	10-11	11-12	12-13	13-14
Loss Statistic			%		
Incidence by #	0.37	1.02	1.37	1.57	1.91
Incidence by $	0.43	1.20	1.73	2.33	3.42
Loss Severity	24	24	27	37	46
Economic Loss	0.10	0.28	0.46	0.86	1.56

- The coupon effect dissipates above 14%. It also flattens below 9% and indeed reverses itself below 5%. However, it is worth noting that low coupons on accrual bonds may not be indicative of the entire debt service load and thus may not be fully indicative of risk.

Data Notes

- See Section IV on Cross Tabulation.

Incidence Rate by #, Incidence Rate by $, Economic Loss Rate, and Loss Severity By Coupon Rate



	0%	0-5%	5-6%	6-7%	7-8%	8-9%	9-10%	10-11%	11-12%	12-13%	13-14%	14%+	TOTAL
Incid by #	0.36%	0.70%	0.30%	0.22%	0.32%	0.28%	0.37%	1.02%	1.37%	1.57%	1.91%	2.05%	0.71%
Incid by $	0.83%	0.51%	0.13%	0.16%	0.35%	0.32%	0.43%	1.20%	1.73%	2.33%	3.42%	2.88%	0.85%
Econ Loss	0.09%	0.21%	0.05%	0.04%	0.09%	0.07%	0.10%	0.28%	0.47%	0.86%	1.56%	1.37%	0.26%
Loss Sev	11%	41%	35%	22%	27%	21%	24%	24%	27%	37%	46%	47%	31%
# of CREs	8	10	7	15	33	50	78	147	86	85	71	95	685

Coupon Rate

H. Private Placement 1986-98: Funding Year

Highlights

- Among all issue years grouped in 3-year bins, the 1987-89 cohort exhibits the highest incidence rates and economic loss rates. This is followed by the preceding cohort of 1984-86 issues and by the subsequent cohort of 1990-92 issues.

- While the underwriting standards in those years may be a contributing factor to the 'bulge' in incidence and loss rates, the 1990-91 recession and any seasoning effect may also have had their impact.

- Sorting out the interaction between the latter effects is the subject of the cross tabulation between funding year and experience year.

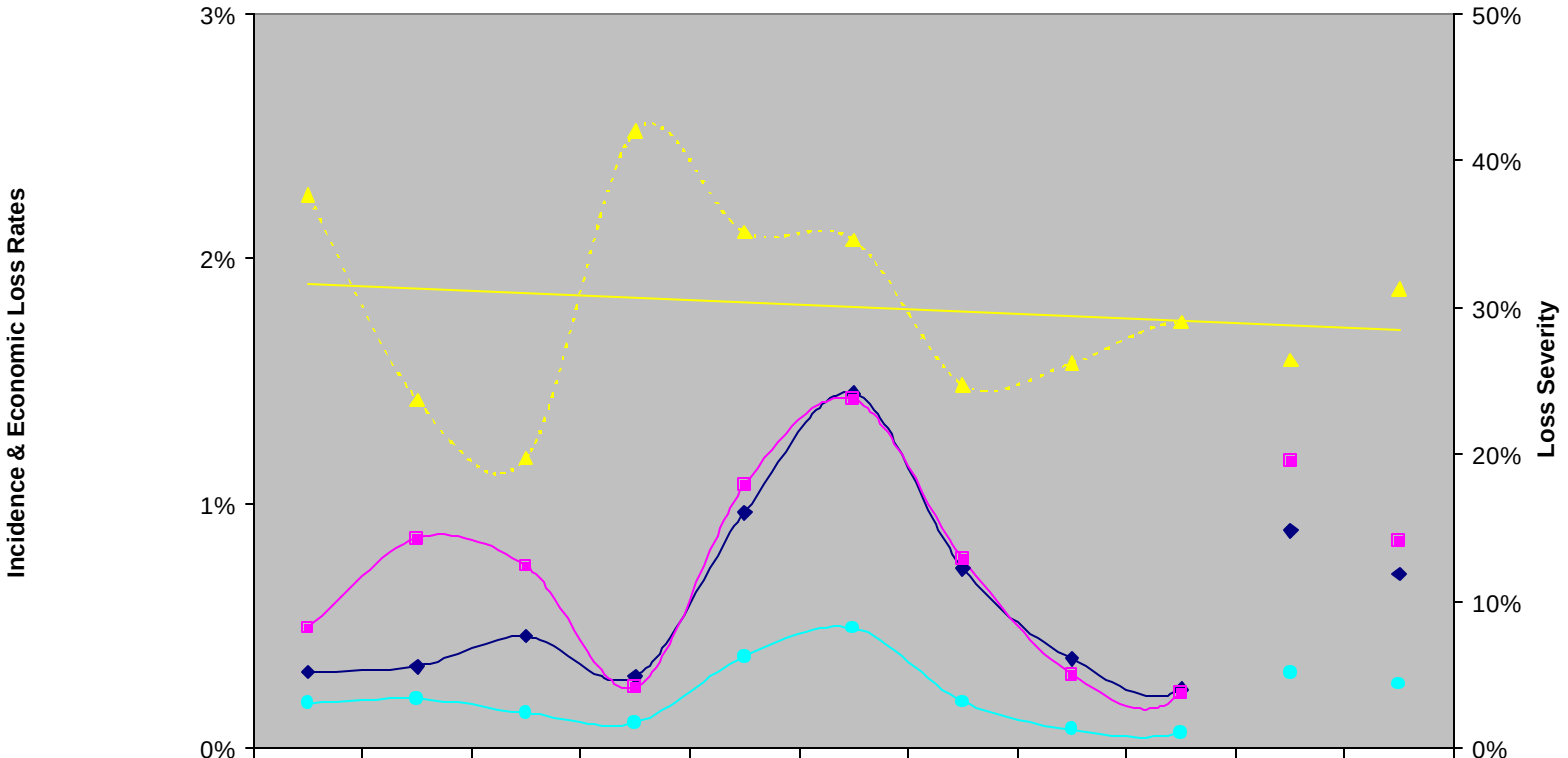
Data Notes

- When multiple funding years are reported for the same asset in different exposure years, the earliest reported funding year is used.

- Many individual year cells have limited credibility due to a low number of CREs.

- See discussion in Section III: Analysis and Commentary. Also see the cross tabulation between funding year and experience year in Section IV.

Incidence Rate by #, Incidence Rate by $, Economic Loss Rate, and Loss Severity By Funding Year



	Pre-75	75-77	78-80	81-83	84-86	87-89	90-92	93-95	96-98	N/A	Total
Incid by #	0.31%	0.34%	0.46%	0.29%	0.96%	1.45%	0.73%	0.37%	0.24%	0.89%	0.71%
Incid by $	0.49%	0.86%	0.75%	0.25%	1.07%	1.42%	0.78%	0.30%	0.23%	1.18%	0.85%
Econ Loss	0.19%	0.20%	0.15%	0.11%	0.38%	0.49%	0.19%	0.08%	0.07%	0.31%	0.27%
Loss Sev	38%	24%	20%	42%	35%	35%	25%	26%	29%	26%	31%
# of CREs	27	20	38	23	147	247	129	40	10	8	689

Funding Year

I. Private Placement 1986-98: Years Since Funding

Highlights

- For a detailed companion analysis, see Section IV for two cross tabulations devoted to the seasoning effect: (1) Years Since Funding by Earliest Quality Rating and (2) Funding Year by Experience Year.

- There seems to be an underwriting effect, which wears off within a 'select' period of a year or two after funding.

- The select period is followed by a 'weeding out' middle period, from year 2 through year 6 or 7, when the incidence and economic loss rates hover at a relatively high level.

- There seems to be a 'tailing off' period from year 8 on, when the incidence and economic loss rates both subside to a lower level.

- Loss severity declines with years since funding perhaps because amortization of principal and inflation tend to increase the borrower's assets relative to the size of the placement.

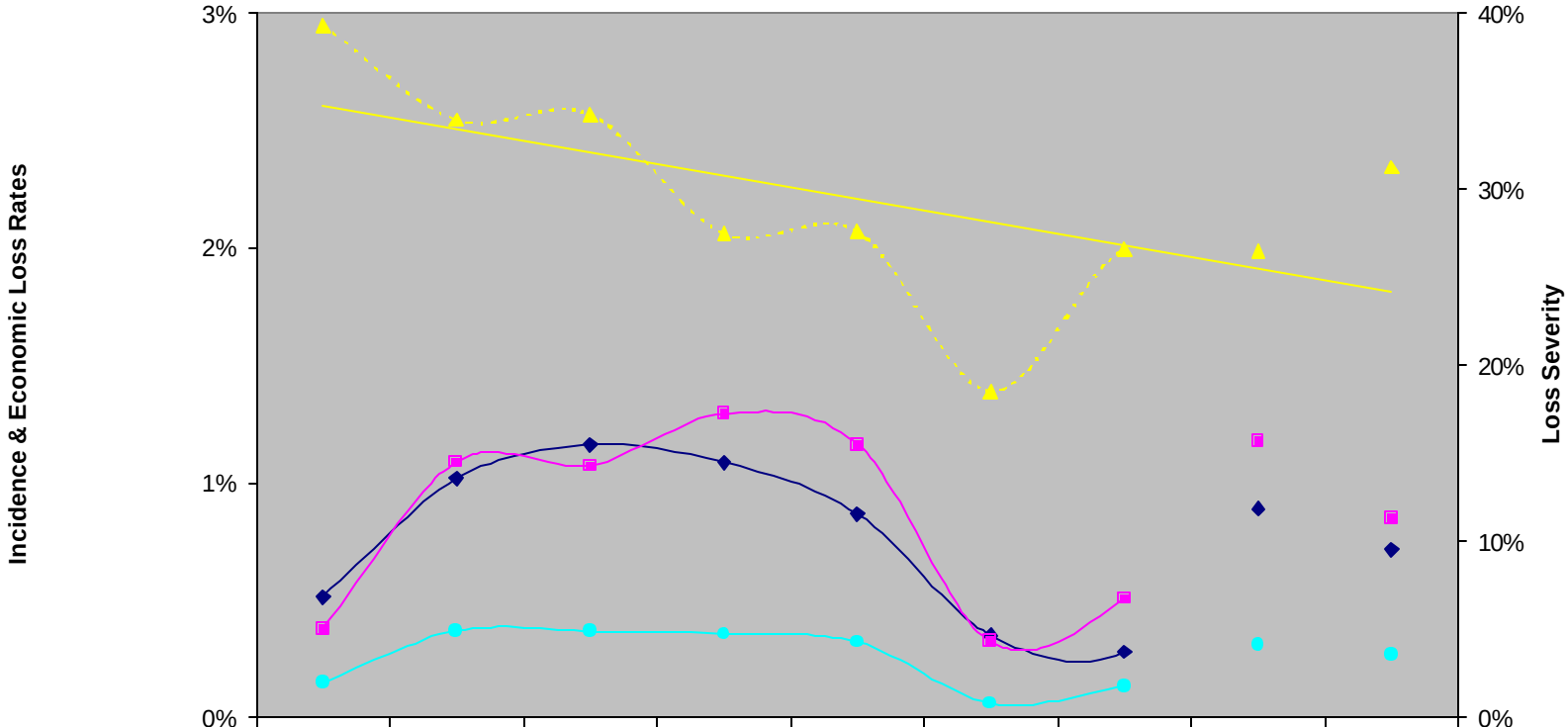
Data Notes

- This variable is defined as the current experience year minus the funding year. As such, it is a discrete variable rather than a continuous variable.

- Many individual year cells have limited credibility due to a low number of CREs in the cell.

- See discussion in Section III: Analysis and Commentary. Also see Section IV for the cross tabulation on Years since Funding by Earliest Quality Rating as well as Funding Year by Experience Year.

Incidence Rate by #, Incidence Rate by $, Economic Loss Rate, and Loss Severity By Years Since Funding



	0-2 Yrs	2-3 Yrs	3-4 Yrs	4-6 Yrs	6-8 Yrs	8-10 Yrs	10+ Yrs	N/A	Total
Incid by #	0.51%	1.02%	1.16%	1.09%	0.87%	0.35%	0.28%	0.89%	0.71%
Incid by $	0.38%	1.09%	1.07%	1.29%	1.16%	0.32%	0.51%	1.18%	0.85%
Econ Loss	0.15%	0.37%	0.37%	0.36%	0.32%	0.06%	0.13%	0.31%	0.27%
Loss Sev	39%	34%	34%	27%	28%	19%	27%	26%	31%
# of CREs	98	119	118	173	88	25	60	8	689

Years Since Funding

J. Private Placement 1986-98: Years to Maturity

Highlights

- Like public bonds in recent years[2] but unlike public bonds in early years[3], private placements do not exhibit a maturity crisis in that the incidence of CREs seems independent of the years to maturity.

- So while there seems to be a coupon effect on credit risk, there does not seem to be a principal-repayment effect.

- Possible explanations include improved cashflow management through amortizing debt or staggering maturity dates as well as ease of refinancing through new issuance. While interest payments are not deferrable, principal payments can be rolled over.

Data Notes

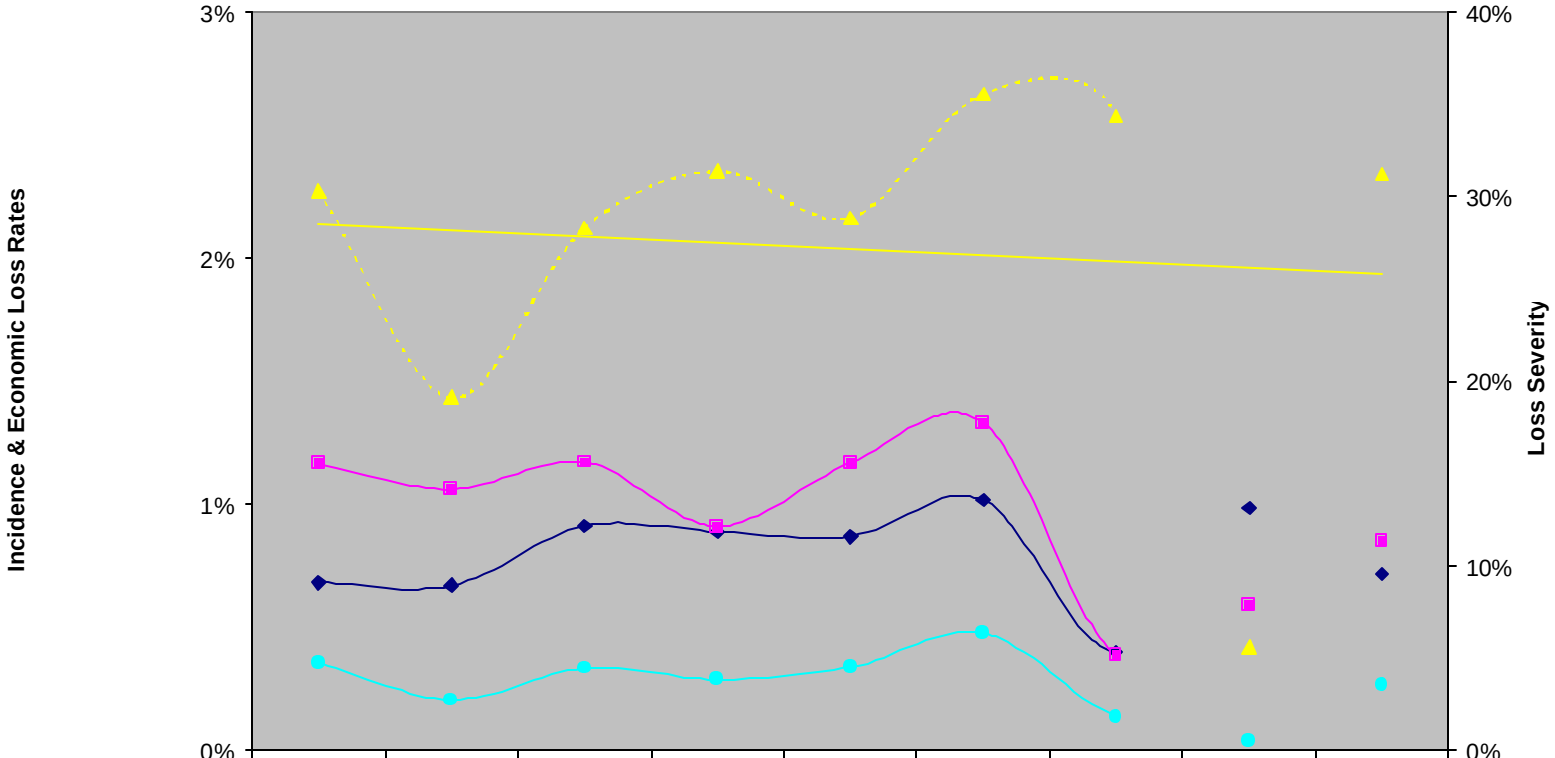
- This variable is defined to be the year of maturity minus the current experience year.

- Many individual year cells have limited credibility due to the low number of CREs in the cell.

[2] Edward I. Altman and Vellore M. Kishore, *Defaults and Returns on High Yield Bonds: Analysis Through 1997*, p.6.

[3] Ramon E. Johnson, *Term Structures of Corporate Bond Yields as a Function of Risk Default*, Journal of Finance, 24 (1967), pp. 313-50.

Incidence Rate by #, Incidence Rate by $, Economic Loss Rate, and Loss Severity By Years to Maturity



	0-2 Yrs	2-3 Yrs	3-4 Yrs	4-6 Yrs	6-8 Yrs	8-10 Yrs	10+ Yrs	N/A	Total
Incid by #	0.68%	0.67%	0.91%	0.89%	0.87%	1.02%	0.40%	0.98%	0.71%
Incid by $	1.16%	1.06%	1.17%	0.91%	1.17%	1.33%	0.39%	0.59%	0.85%
Econ Loss	0.35%	0.20%	0.33%	0.28%	0.34%	0.47%	0.13%	0.03%	0.27%
Loss Sev	30%	19%	28%	31%	29%	36%	34%	6%	31%
# of CREs	63	46	66	134	127	131	120	2	689

Years to Maturity

A. Definition of Credit Risk Event

In general, any failure (other than for known non-credit-related reasons, such as administrative problems) to pay interest or principal under the terms of the investment contract is considered a credit risk event. Specifically, the occurrence of any of the following is considered a credit risk event:

a) modification of the principal or interest payment terms where the lender agrees to new terms to avoid or minimize possible losses from failure to pay interest or principal under the terms of the contract;

b) Chapter 7 or 11 bankruptcy of the borrower;

c) sale of the investment before maturity because of concerns about deteriorated credit, if the purpose of the sale is to avoid or minimize possible losses from failure to pay interest or principal under the terms of the contract; and

d) any other event, such as complete default, that results in failure to make payments of interest or principal under the terms of the contract.

The opportunity cost associated with the call or contractually allowed prepayment of an asset in a low interest rate environment is excluded as a credit risk loss because the call or prepayment is an exercise of the borrower's right and is therefore not credit-related. However, the opportunity cost associated with a restructuring or a default in a low interest rate environment is considered a credit risk loss.

B. Date of Credit Risk Event and Loss Calculation Date

The credit risk event is considered to have occurred on the earliest of the date of the first missed payment, the date of modification of the principal or interest terms, the date of the sale or the date of bankruptcy filing.

The loss calculation date is the earliest of the date of the first missed payment, the date of modification or the date of sale; for example, 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.

In practice, there is significant room for interpretation in setting a loss calculation date. In order to rationalize the various interpretations of the data contributors, loss calculation dates, bankruptcy dates and payment dates are all assumed to occur on the first of the month.

C. Actuarial Methodology

1. Basic Model

The actuarial model used as a basis to formulate this study is the incidence and severity model. It is described in the Section II D.

2. Definitions

a) *Incidence*

Incidence of an event is generally defined as the number of actual occurrences of that event out of the total possible number of occurrences, in a given time interval. For credit risk, incidence can be measured either by number of assets or by $ volume. It is the number ($ volume) of assets experiencing a CRE in a given year (the unit of time interval used for the study) divided by the total number ($ volume) of assets exposed. The measurement can be made for the entire data base or by any predefined component thereof, referred to as a "cell".

b) *Economic Loss and Loss Severity*

Loss severity with respect to a particular asset is defined as the loss actually sustained, given the occurrence of a CRE, as a proportion of the maximum possible loss on that asset. The maximum possible loss is calculated as the present value, on the CRE date, of originally scheduled cash flows still remaining. The "recovery rate" or "salvage rate" is the present value on the CRE date, of the revised cash flows the investor received (and expects to receive in future) on the CRE, divided by the maximum loss. The severity is then one minus the salvage rate.

Economic loss on that particular asset is defined as its exposure, that is its carrying value or book value at the time of the CRE, multiplied by the loss severity.

Present values are calculated using interest rates described in section C5 of this Appendix.

For a group of assets each of which experienced a CRE, the economic loss is the sum of the asset by asset economic losses, while the loss severity is that sum divided by the sum of the corresponding exposures.

c) *Economic Loss per unit of Exposure*

Economic loss per unit of exposure is defined as the total economic loss in respect of those assets in the cell that experience a CRE, divided by the book value (outstanding principal) of all assets exposed in the cell (for precise description of how to calculate the exposure, please refer to section C6).

Equivalently, the economic loss per unit of exposure may be expressed as the product of the loss severity rate and the incidence rate by amount for the cell.

It may be interpreted (after multiplying by 10,000) as the cost, in basis points, of credit risk in the particular year. In other words, it is the reduction of investment yield on the exposed assets, compared to their contractually promised yield.

3. Loss Statistics

Consistent with the model, the following loss statistics are calculated.

a) *Incidence rate by number, $IR^{No.}$*

$$IR^{No.} = \frac{\text{Number of credit risk events (CRE) in cell}}{\text{Total number of exposure units in cell}}$$

b) *Incidence rate by amount, IR^{Amt}*

$$IR^{Amt} = \frac{\text{Amount of CRE Exposure in cell}}{\text{Total amount of Exposure in cell}}$$

c) *Loss Severity, LS*

$$LS = \frac{\text{Economic Loss for cell}}{\text{Amount of CRE Exposure in cell}}$$

d) *Economic Loss per unit of Exposure, EL/E*

$$EL / E = \frac{\text{Economic Loss for cell}}{\text{Total amount of Exposure in cell}}$$

4. Calculation of Economic Loss

Traditionally, asset default studies have looked at either the incidence of default (number of defaults) or losses of par value. Studies considering only losses of par value do not accurately account for all lost cash flows, costs of collection or restructure or for the time value of money. In this study, the measure of loss resulting from a credit risk event is based on comparing, at the loss calculation date, the present value of the remaining cash flows of the original investment to the present value of the

cash flows that result from the credit risk event. This measure provides a single-point estimate of the losses based on the information available up to the calculation date. The economic loss needs to be recalculated whenever the cash flow changes.

The Economic Loss for credit risk event I, EL^{CRE_I}, is given by

$$EL^{CRE_I} = OP^{CRE_I}_{PYE}\left(\frac{PV^{OCF\ CRE_I}_{loss\ calc\ date} - PV^{RCF\ CRE_I}_{loss\ calc\ date}}{PV^{OCF\ CRE_I}_{loss\ calc\ date}}\right)$$

where $OP^{CRE_I}_{PYE}$ = outstanding principal for credit risk event I at the year end (or more recent date if available) immediately preceding the loss calculation date

$PV^{OCF\ CRE_I}_{loss\ calc\ date}$ = present value of the original contractual cash flows for investment subject to credit risk event I, at the loss calculation date

$PV^{RCF\ CRE_I}_{loss\ calc\ date}$ = present value of the revised cash flows (net of event expenses) for credit risk event I at the loss calculation date

Note:

i) $PV^{OCF\ CRE_I}_{loss\ calc\ date}$ = $OCF_1 v_1^{t_1}$ + $OCF_j v_j^{t_j}$ +...+ $OCF_n v_n^{t_n}$ (1),

where $v_j = \frac{1}{\left(1+\frac{i_j^{(2)}}{2}\right)^2}$, and t_j=(number of months from loss calc date to date j)/12;

$i_j^{(2)}$ is determined as indicated in section C5 below (assuming nominal annual rates convertible semiannually)

date j = date of payment of j^{th} payment

OCF_j = j^{th} original cash flow

n = number of original contractual cash flows on or after the loss calculation date

$$PV^{RCF\ CRE_1}_{loss\ calc\ date} = RCF_1\, v_1^{(date\ 1 - loss\ calc\ date)/365} + RCF_j\, v_j^{(date\ j - loss\ calc\ date)/365} + \ldots + RCF_k\, v_k^{(date\ k - loss\ calc\ date)/365} \quad (2)$$

RCF_j = j^{th} revised cash flow (net of credit risk event expenses)

k = number of revised cash flows on or after the loss calculation date

ii) The v_j in equation (2) are usually different from the v_j in equation (1) because a different $i_j^{(2)}$ is usually used for the revised cash flows (RCF).

iii) If only the year of the loss is given, July 1 is assumed; if only the year and month are given, the 15th of the month is assumed.

iv) If the loss calculation date is between payments, the calculation begins with the next payment.

5. Interest Rates Used for Discounting Cash Flows.

The determination of the interest rates to use to calculate the present values is a critical component because the ultimate quantification of the economic loss depends upon the interest rates used. There are several alternatives for developing these interest rates. The following summarizes the approach used.

For bonds, three issues to consider are: should spread vary by maturity? by quality? or by date of CRE? Based on the data provided by ACLI for spreads at issue, it was determined that for this study the spreads should vary only by quality and time period, and that the spread for AAA, AA and A bonds should be the same. Thus, the interest methodology used in this study includes the following components:

a) the treasury spot yield curve as the base;

b) the spreads listed in the following table for the indicated rating and period combinations:

SPREAD IN BASIS POINTS[1]

From	Through	AAA-A	BBB	BB	B and below
1986:Q1	1987:Q3	135	175	325	400
1987:Q4	1989:Q1	135	175	275	325
1989:Q2	1991:Q3	135	175	325	400
1991:Q4	1994:Q4	120	155	350	575
1995:Q1	1996:Q2	100	150	350	575
1996:Q3	1998:Q2	100	150	300	400
1998:Q3	1998:Q4	160	225	375	575

c) discounting original cash flows using spreads based on the quality rating at issue[2];

d) discounting revised cash flows using spreads based on the quality rating immediately after the credit event; where not available that rating was assumed to be "B and below"[3]; and

e) each element of the original and revised cash flows was discounted using the spot yield corresponding to its term, that is the period from the CRE date to the date of occurrence of the particular cash flow element.

6. Calculation of Exposure

The exposure base represents the total holdings for those investments included in the study during the study period. Using year-end values facilitates data collection from Schedule D of annual statements.

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1 There was insufficient data for developing a reasonable spread estimate for classes below B.

2 165 basis points was used when original quality rating was not available from 1986:Q1 through 1993:Q4. Thereafter, 150 basis points was used.

3 Since spreads for classes below B can normally be expected to be larger than those for B, there may be a slight underestimation of loss caused by this methodology. It is not thought to be material.

The calculation of exposure is based on either OP_j, the outstanding principal at year-end j, or OP_{CRE}, the outstanding principal at the time of the credit risk event, as follows:

a) *Assets that are <u>not</u> credit risk events*

I) Assets in both year-end j-1 and year-end j exposure data files

$$Exposure_{Year\ j} = (OP_{j-1} + OP_j)/2$$

ii) Assets only in year-end j-1 exposure data file (e.g., maturity)

$$Exposure_{Year\ j} = OP_{j-1}/2$$

iii) Assets only in year-end j exposure data file (e.g., new acquisition during year)

$$Exposure_{Year\ j} = OP_j/2$$

b) *Assets that incurred a credit risk event during year j*

If OP_{CRE} is known, $Exposure_{Year\ j} = OP_{CRE}$

Otherwise, $Exposure_{Year\ j} = OP_{j-1}$

c) *Assets that incurred a credit risk event prior to year j and are in year-end j-1 and/or year-end j exposure data file*

$$Exposure_{Year\ j} = 0$$

Aggregate exposure is the sum of the exposure for the individual assets. Exposure by number of assets is calculated using the same principles.

D. Data Validation

When data was received from a contributor, a number of audits were instituted to validate the various exposure, cash flow and characteristic files. The initial review of an exposure file consisted of an edit check to verify that the input for data elements of each record were within a specified set of validity parameters.

For example, outstanding principal amounts were required to be non-negative and less than one billion dollars. Various other checks verified that data elements were reasonable. While not sufficient enough to pick up all errors, the process often pointed out systematic problems with the data. Sometimes the explanations were as simple as coding mistakes, incorrect record lengths, wrong justification within a field or improper positioning of information as laid out by the data specifications. In fact, the data often was there, but the format of the fields required some reworking to standardize the information. All files were edited in this fashion.

As each file was edited, questions were asked of the data contributors when appropriate. A record of the solutions to these problems was created, in part to verify with the companies what changes were made. The original data submissions were saved and duplicate files were used for processing. This practice is standard operating procedure for SoA experience studies to maintain the integrity of company data and to be able to reconstruct what modifications were made.

The second review was to check the internal consistency of the exposure records from year to year. "Mismatches" or differences in data elements, on an asset by asset basis among consecutive years, were identified and referred to the appropriate companies for clarification.

The next data check was commonly referred to as the "exits and entrances" screen. Exposure files were compared on a year to year basis to ensure that bonds that matured during a given year did not show up in the year-end file. Also, assets that were designated as CREs during the year of observation were flagged for removal from the year-end exposure base. Bonds that disappeared from the data base without explanation were investigated. Some of these bonds were combined with others, transferred to subsidiaries or paid off early. New bonds were checked to confirm that they were originated in the given year of exposure. Again, all changes to the data were approved by the respective companies.

Another check was to tally key totals such as number of bonds and outstanding principal. Companies were asked if these values agreed with their submissions on a year to year basis.

Summary proportions were calculated to show the amount of principal outstanding for a given year-end as a percentage of the corresponding total of all private placements held by the contributor, as reported in the annual statement. This screen served as an alert to any under-reporting in a data contribution.

Also, the original and revised cash flow files were printed out to determine if the information could be interpreted from its electronic form and if it appeared to be providing reasonable responses to the data request. Glaring errors such as unmatched (unpaired) original and revised cash flow files for a given CRE asset, and loss dates outside the study period were caught during this review. Companies were asked to make corrections where appropriate.

A data quality check known as a "DQ6" was used to examine in depth the original and revised cash flow files. This multipurpose tool includes the ratio of the present value of the original cash flows, discounted at the stated interest rate for a given asset, to the outstanding principal. That ratio theoretically should be approximately 1.00. The computer flagged those assets with ratios less than 0.85 or greater than 1.15.

Most CRE assets passed this screen. For those that did not, many contained errors in their coding such as missing balloon/bullet payments or wrong input. In that process, one CRE was excluded from the study.

The DQ6 also includes the present value of the original and revised cash flows as calculated for the determination of economic loss. Loss severities were calculated from these present values. The output of the DQ6 provided insight into the cash flow files. All negative values (indicating gains) were questioned and brought to the attention of the data contributors. In some cases, these assets had the correct information, but in others the cash flows needed to be modified. All negative loss severities and total write-offs received particular scrutiny. By cross-matching asset IDs on CREs, it was found in some cases that the data made sense in aggregate but not for each record separately. In those cases, each record was kept to preserve the correct number of assets - which impacts incidence - but the RCF data were made proportional and the loss severities identical.

During the data validation process, a series of packages were sent to each data contributor asking about specific assets. In some cases, the questions related to important information that appeared to be missing, cash flows that were out of line based on the DQ6 and questions about the inclusion of CREs with loss dates before 1986 or after 1998.

In responding, companies sometimes updated specific assets in their cash flow files with more currently available information. However, in most cases the changes to the data files were simply corrections.

Finally, the data was put through a series of logical screens and tests to verify whether it made sense, separately for exposures and CREs and then in juxtaposition. Any apparently anomalous situations so identified were queried and corrected, if necessary after consultation with the contributor.

Finally, external data sources were used for validating CRE severities. 10-K filings at the Securities and Exchange Commission were used to ascertain information about bankruptcies and restructures of publicly held companies. Sources from rating agencies, the National Association of Insurance Commissioners , and others were utilized when intractable cases were found. Credit events for assets held by two or more contributors to the study were examined with respect to each contributor's loss severity, and differences were analyzed. Some of these differences were the result of differing estimates of future revised cash flow streams.

APPENDIX II

Economic Conditions Over the 1986-98 Study Period

The economy of the United States saw dramatic changes in its structural components in the 1970's and 1980's. The manufacturing base, exemplified by the auto and steel sectors, began a long decline. The number of lower-paying and, for the most part, service type jobs rose dramatically. At the same time, there was a recognition that the U.S. economy was intertwined with those of our trading partners and affected by their economic conditions. Quality issues, cheap labor and trade restrictions also became important considerations.

After a short attempt to control prices under the Nixon administration, inflation accelerated into a major dilemma for the economy. The actions of the Federal Reserve in 1981 to attempt to gain control over inflation sent interest rates to their highest levels. In fact, the yield curve became inverted with short-term rates, as evidenced by the prime rate, going over 20 percent. Long-term rates also were affected and went up in response to the reduction of the money supply.

The tightening of the money supply also had a serious effect on the economy in general. A double dip recession in the early 1980's did give way to a long expansion period. Even so, during this time of growth, a series of economic downturns hit various segments of the economy and regions of the country starting about 1985. The oil and gas industry was among the first sectors to feel this change due in large part to an increase in a stable supply of lower cost foreign oil. The effect on the economies of the oil and gas producing states (West South Central and Mountain regions by ACLI definition) was significant and quite pronounced in terms of a decrease in real estate values and company profits. This boom and bust cycle in the oil and gas business is not uncommon, but the seriousness of this decline was much worse than expected.

As the recovery gained strength in the middle to latter 1980's, pockets of the economy suffered slowdowns affecting areas of the country differently. This "rolling recession", as it became known, seemed to hit the high tech companies as well as basic industries. Relatively high real (as well as nominal) interest rates exacerbated the situation. Nonetheless, on the whole the second half of the 1980's represented a long period of uninterrupted growth that proved fertile ground for lender optimism and the highly leveraged deal (the LBO and HLT era).

In 1990-91, there was a recession that lasted three-quarters and resulted in a 2.1% decline in real GDP, a steep loss given the short duration of the downturn. Credit deterioration persisted through mid-1992, reflecting typical lags between the credit cycle and business cycle. In the second half of 1992, improving economic conditions reduced the growth of new credit events. The continued corporate downsizing and very slow job growth were still factors with which to reckon. However, with interest rates reaching lower levels, inflation held in check and the economy transforming rapidly, investment opportunities opened up new challenges.

From the perspective of the debt and real estate markets, however, the matter was far different. This period saw the testing of overextended and frequently overleveraged balance sheets of many borrowers. The creation of debt, and particularly, debt associated with highly leveraged transactions during the 1980s was based on an assumption - unsustainable in hindsight - of ever increasing values, prices and cash flows in nominal dollar terms. As the economy slowed and expected cash flow assumptions on which leveraged deals were based became unrealizable, carrying costs of leveraged corporate and real estate debt often became unsustainable. Capital markets continued under pressure in the meanwhile, because of the heavy borrowing needs of the government and because of the increasing risk averseness of lenders, as losses rose. Regulatory pressure exacerbated this trend, reinforcing the flight to quality.

The recession of 1990-91, even if relatively short, intensified the pace of fundamental restructuring of corporate America. The buzzwords of the day included downsizing, reliquification of balance sheets, focus on core competencies and upgrading productivity. These efforts improved U.S. global competitiveness and export performance in due course. The recession reminded borrowers, whether mortgagors or corporations, that they could not count on continuous growth in values or volumes and borrowers found the carrying costs of debt more and more onerous to meet as profit margins came under pressure.

As the economic outlook improved and interest rates continued to slide in 1993, the junk bond market benefited. The 30-year treasury hit a 25-year low of 5.78% in mid-October, prompting record levels of prepayments and refinancings. The modest recovery was tempered by higher taxes, uncertain health care policies, defense-related cutbacks and floods in the Midwest. Additionally, the manufacturing sector continued to trim personnel, with most employment growth occurring in the services and financial sectors. Consumer confidence slid mid-year, which eliminated most of the gains associated with the presidential election. Real estate industry problems, while abating somewhat by year-end, remained at relatively high levels. Those conditions limited new investment opportunities, forcing many lenders into the securities debt markets to absorb cash flows.

In 1994, the economy grew strongly despite a sustained drop in spending by federal, state and local governments. The private sector was the engine of growth in the recovery. In order to keep growth at a modest pace and inflation under control, the Federal Reserve raised interest rates on several occasions during the year. As interest rates moved upward and ebbing inflation fears flattened the yield curve, the capital markets reacted as the spread between intermediate and 30-year Treasuries narrowed to as little as 5 basis points by year-end. The spread between short and long-term Treasuries also narrowed, but was still about 220 basis points at year-end.

Except for a momentary back-up during the Summer, interest rates across the yield curve headed in only one direction during 1995 – down. After flirting with a somewhat normal shape during the year, the yield curve again flattened by year-end with the spread between 3-month T-bills and the 30-year bond tightening to 88 basis points. There was a general consensus that the slowdown in 1995 was needed to reduce the risk of overheating after the strong performance of 1994, which brought the economy to a high rate of resource utilization.

Positive expectations about future interest rates carried over into 1996 until conflicting economic reports shifted market sentiment towards an almost certain Federal Reserve tightening. The bearish trend was reversed when further tightening did not occur and the November presidential election was over. Although interest rates declined by almost 60 basis points during the first two months of the fourth quarter, Federal Reserve Chairman Greenspan's warnings of the equity market's "irrational exuberance" increased uncertainty once again and by the end of the year about half the quarter's Treasury gains were erased. Public corporate spreads tightened from already historically aggressive levels during 1996 and private placement spreads followed suit, although more gradually.

Strong economic data in the first quarter of 1997 resulted in a 25 basis point increase in the Federal Funds rate and the market's growing expectation that additional tightening would follow set the tone for a 45 to 55 basis point increase in Treasury yields. Weak economic reports in the second quarter reversed this sentiment and Federal Reserve Chairman Greenspan's characterization of the economy as one of moderate growth with low inflation set the tone for additional Treasury rate declines early in the third quarter. The year ended with the long bond 72 basis points lower than where it began the year.

In the early part of 1998, supply was the predominant issue on investors' minds. Declining Treasury yields, which was a function of both increasing international demand and limited supply, drove a very strong corporate new issuance calendar. With absolute spreads still tight from historic perspectives, private placement spreads continued to follow the public lead, maintaining tight yield advantages to their public counterpart. The third quarter was noteworthy for the Russian currency devaluation in mid-August and growing concern over the Japanese banking system. Spreads in all credit markets increased dramatically with the riskiest asset classes, emerging markets and high yield, suffering the most. High yield spreads increased more than 270 basis points while investment grade spreads, including private placements, increased 30 to 75 basis points and approached levels last seen during the '90-'91 recession. The Federal Reserve moved to cut interest rates on three occasions starting in late September and a significant degree of calm returned to the financial markets.

The 1990s have been marked by a great deal of volatility in global financial markets and by significant achievements for global policy makers. One of the key lessons from the integration of capital markets has been that monetary conditions in a given country will be affected by developments elsewhere.

The global instability during 1995-1998 was characterized by a number of events, including a large number of currency crises (Mexican, Asian, Russian, Brazilian), substantial swings in exchange rates among the major currencies, run-ups in asset prices followed by pronounced asset price deflation, and banking crises in almost all regions of the world.

A particularly remarkable accomplishment during this period was establishment of broad price stability. Not only did inflation fall to the lowest levels in 40 years, but it came down for the most part across the industrial countries, and to some extent in the emerging market countries. Some of the forces at work that contributed to the decline in inflation expectations were increased competition, deregulation and the information revolution.

A financial crisis erupted in Southeast Asia in mid-1997 and the effects were felt throughout the global financial system, although it may have actually helped prolong the economic expansion in the U.S. as capital flows added liquidity to the U.S. bond and stock markets. The currency devaluation in Russia in August 1998, coming on the heels of the Asian crisis, contributed to a more risk averse position among financial investors. Liquidity concerns were also heightened in the Fall of 1998 with the near failure of the major hedge fund Long Term Capital Management. By this point the "flight to quality" was in full swing, along with a further tightening of credit.

For the most part, the U.S. economy avoided much of the instability that characterized the 1990s. The U.S. recession in 1990-91 was unusually mild and the subsequent expansion became the country's longest period of sustained growth on record. This growth was combined with high rates of job creation and low inflation.

Apart from the successful implementation of macroeconomic policies, Federal Reserve Chairman Alan Greenspan, in testimony before the U.S. Congress in 1997, attributed the exceptional performance to possible improvements in long-term economic efficiency and to temporary factors restraining inflation[1]:

- Technological advances appeared to have boosted productivity growth.
- A heightened sense of job insecurity held down wage demands.
- Changes in the health care industry curbed the growth in the cost of benefits.
- Increasing globalization enabled greater specialization, allowing comparative advantage to contain costs and enhance efficiency.
- A strong U.S. dollar restrained the rise in import prices and constrained the pricing power of import-competing firms.

The transformation of the economy since the 1990-91 recession is leading to different, more testing lending conditions. In a high real interest rate, stable price environment, compounded by increasing international competition and globalization, the leveraging of assets or balance sheets is a more hazardous exercise than in the past, because the nearly automatic increase year-by-year of asset values and interest coverage can no longer be taken for granted. Moreover, the global demand for capital is likely to keep that commodity expensive in real terms.

[1] IMF Survey, "Assessing the Strong U.S. Economic Performance", August 1997

The deleveraging of corporate balance sheets dramatically reduced the issuance of new non-financial corporate bonds. In addition, investments in new technology, particularly computer hardware and software, increased rapidly; but such investments tend to be financed out of cash flows because of their fast rate of obsolescence. Falling government budget deficits resulted in lower demand for funds and debt issuance by public issuers. The flow of funds has shifted substantially to financial issuers, as witnessed by the explosion of mortgage and asset-backed securities.

The impact on private placements arose not only from decreasing aggregate corporate demand for funds, but also from the increasing propensity of issuers to use 144A shelf-registration issues and other kinds of financing in lieu of private placement debt. For example, in many cases financing through an accommodative stock market appeared to be a more rational choice and is in harmony with the deleveraging trend.

Appendix III

Limitations of the 1986-98 Study

Limitations of the study are generally of two kinds: those concerned with the quality and completeness of the data collected and used and those concerning the sufficiency of the data for purposes of drawing valid conclusions about the behavior of credit risk.

Limitations include:

- Not all companies contributed data to all years of the study. In all, 19 companies have contributed data to the study. Only four have contributed all 13 years (1986-98).

- Seven companies contributed to the 1995-1998 portion of the study. Their collective contribution represented an estimated 25% to 29%, depending on the calendar year of exposure, of total general account private placement assets of the life insurance industry, as noted in Section II. This is materially lower than observed in the 1994 and prior study years, when the corresponding ratio was around 40% continuously since 1987. There is an increased risk, therefore, that the results of the study are less representative of underlying industry experience than in previous years.

- Companies determined that they could not necessarily provide the required data for every sale and restructure for the 1986-89 study; therefore, companies were asked to submit data only for those modifications, sales and other events that the company could determine were clearly credit related. (Note: Although this approach could have lead to significantly biased reporting for this period, a comparison, by ACLI staff, of private placement bonds submitted as credit risk events and company annual financial statements indicated that the reporting of the credit risk events seemed reasonable.)

  To a lesser extent the same was true of the 1990-94 submissions, but the quality of the data improved through greater effort by the contributors to ensure completeness. That is even more so for the 1995-1998 submissions, since all contributors were previous participants and thus had increased familiarity with the study and its methodology.

  Future data collection will continue to emphasize the need to report all assets that incurred changes from the originally contracted cash flows.

- Companies provided data to the 1986-89 study at different points in time; some companies updated their revised cash flow files with more current information as part of the data validation and correction process. As part of the 1990-92, 1993-94 and 1995-1998 data collection processes, companies were asked to provide updated information on all previous CRE cash flows. Undoubtedly, not all such updates were provided. In particular, companies that ceased to be contributors did not provide updates.

- A long "tail" exists before the final outcomes of many credit risk events are known with certainty; the results for 1986-1994 have been updated as additional information became available, and this process will continue in future studies.

- Results to date do not include an explicit analysis of the impact of external economic conditions, although some early indications are observed.

- Data for some characteristics were limited. For example, information on seniority and secured status of assets was collected only from 1990 onward, and some contributors did not code those fields for all years.

- Some data elements that were expected to have remained consistent from year to year appeared to vary somewhat; however, such deviations usually had reasonable explanations.

- This study does not attempt to measure the risk-reward tradeoff of investments.

- Although significant efforts were made to ensure the reasonableness and completeness of the contributed data (please see Appendix I, Section D), the results of the study are ultimately dependent on the nature and scope of the data submitted.

- An additional limitation is that the study was not originally designed to be able to aggregate, across companies or within companies, different bond issues from a single issuer, or different shares of the same issue. However, an attempt was made to effect such an aggregation, using asset IDs as the basis of aggregation. Further comment may be found in the Analysis section of the report.

- The relatively small number of Credit Risk Events makes it difficult to analyze results by some characteristics.

- Comprehensive asset identification number changes during 1989 for approximately half the companies in the study made it difficult to precisely assess the completeness of the data.

- Multiple funding dates and/or multiple maturity dates are sometimes associated with the same asset identification numbers.

- The study does not attempt to capture the gains or losses from non-debt securities even though private placement bonds, particularly those associated with leveraged buyouts, often include equity components which, on a portfolio basis, can provide substantial gains to offset losses; the study also does not attempt to capture gains or losses that result directly from calls or prepayments (e.g., prepayment penalties).

- While not a limitation of the study per se, the attention of the reader is drawn to the fact that the bulk of the experience has been contributed by companies that were and are continuous and substantial participants in the private placement market. They have developed considerable expertise in the origination, acquisition and tracking of private placements, and the management of the work-out of distressed or defaulted assets. It would be hazardous for a new entrant to the market, lacking their expertise and resources, to expect to achieve similar or better credit loss results.

Finally, it is perhaps most important to note that a primary purpose of the 1986-89 study was to learn how to better conduct such a study. It was anticipated that much of the data described would be difficult, if not impossible, to gather, but it was expected that the experience of going through the procedures necessary to gather data for 1986-89 would identify changes necessary to conduct such a study on an ongoing basis (e.g. the type of data and procedural changes needed to gather the data). In general, this hypothesis was confirmed and many data contributors now have enhanced capabilities and management information systems to respond to internal as well as external inquiries on private placement bonds and commercial mortgage loans. It is clear from the 1990-98 data submissions that ongoing data contributors have managed to overcome or mitigate many of the initially encountered problems. In particular, the quality rating information seems to be materially better than in the 1986-89 study.

Despite the many difficulties associated with recapturing historical data, contributing companies perceived that there was an important need to develop a process for obtaining relevant loss data on an ongoing basis. Without the efforts of these companies, a study of 1986-98 data would not have been possible.

Appendix IV

Loss Severity
CRE Type
Debt Seniority

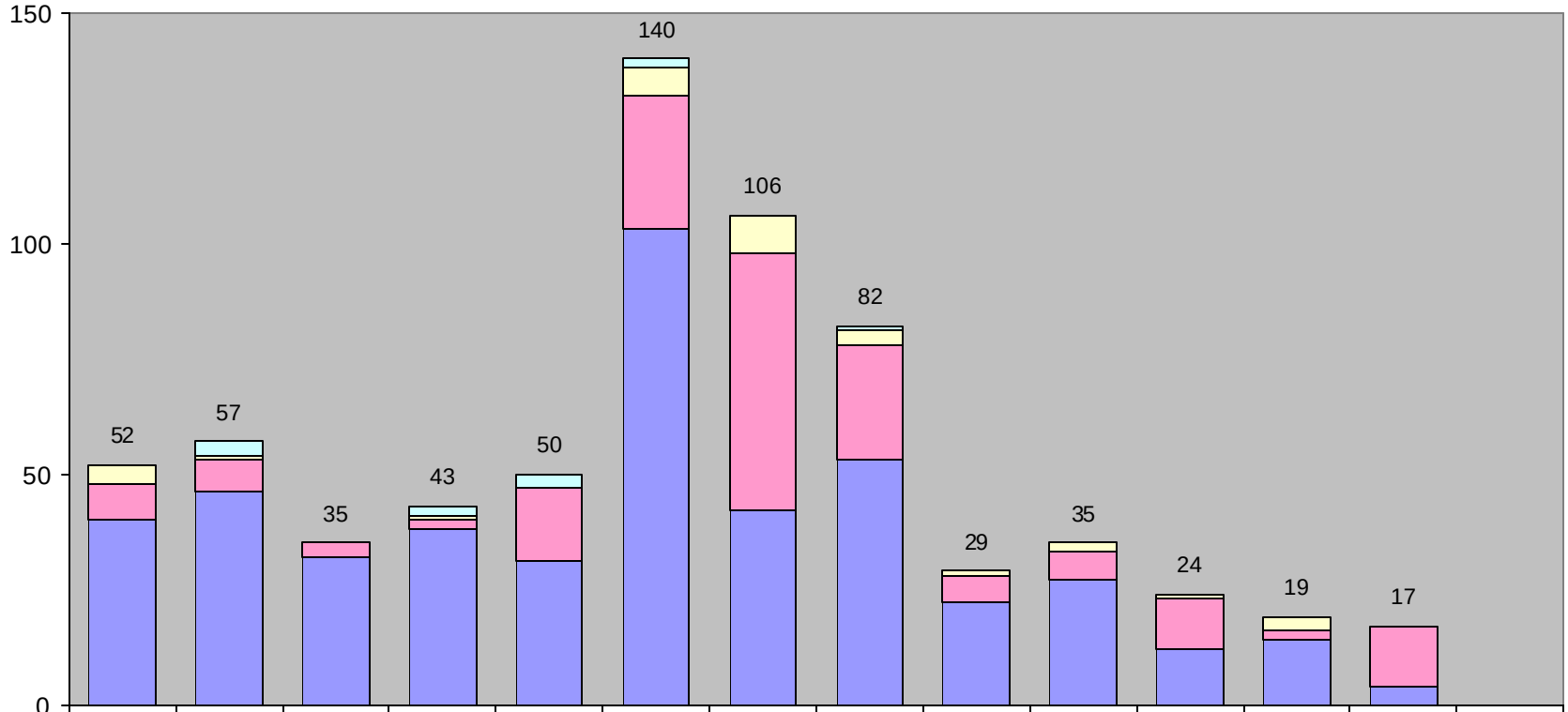
Single Tabulation
Most Recent Quality Rating
Earliest Quality Rating
Most Recent NAIC Rating
Coupon Rate
Funding Year
Years Since Funding
Years to Maturity

Cross Tabulation
Coupon Rate by Earliest Quality Rating
Years Since Funding by Earliest Quality
Funding Year by Experience Year

Rating-Transition Probabilities
Comparing Private Placements & Public Corporate Bonds
Comparing Internal Quality Ratings & NAIC Rating

Loss Severity by CRE Type

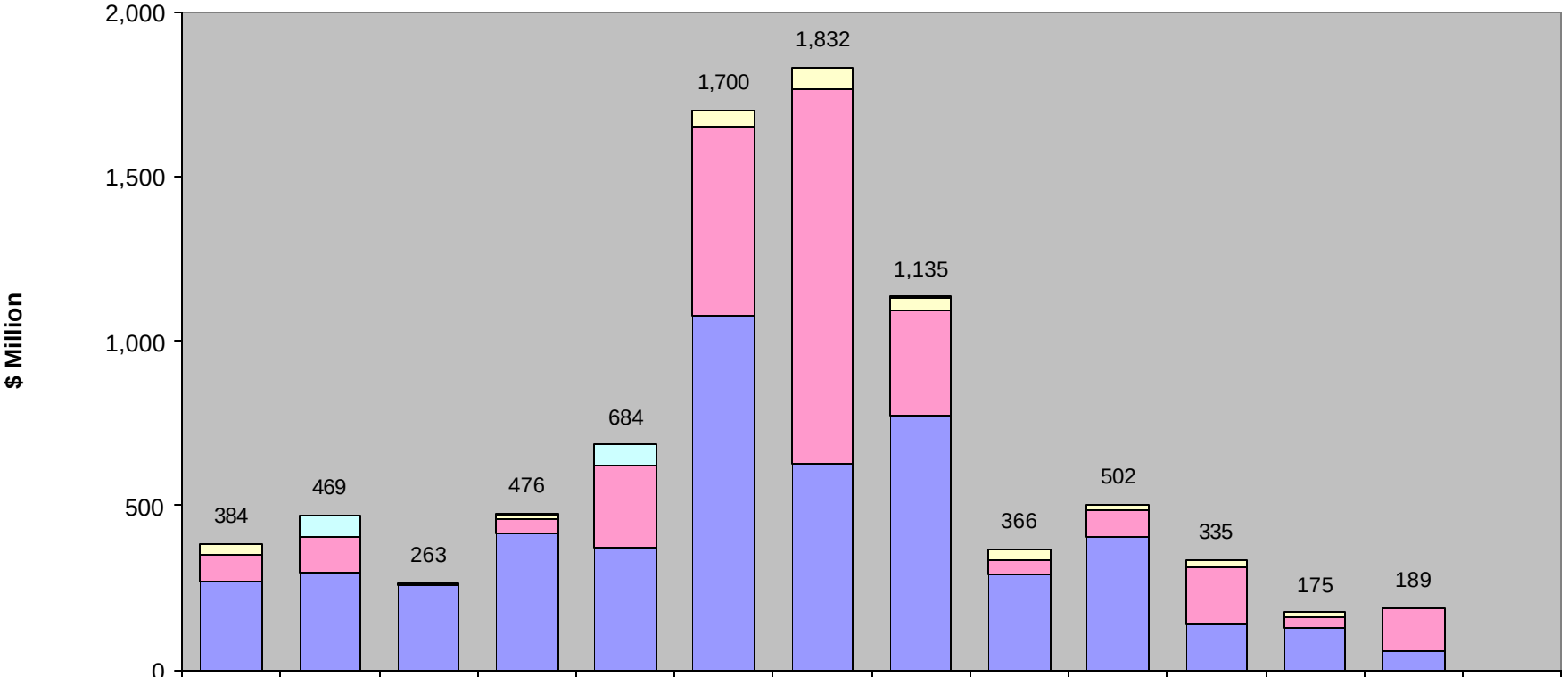
of Credit-Risk Events
By CRE Type



	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Total
Unknown		3		2	3	2		1						11
Sale	4	1		1		6	8	3	1	2	1	3		30
Restruc	8	7	3	2	16	29	56	25	6	6	11	2	13	184
Default	40	46	32	38	31	103	42	53	22	27	12	14	4	464
Grand Total	52	57	35	43	50	140	106	82	29	35	24	19	17	689

Experience Year

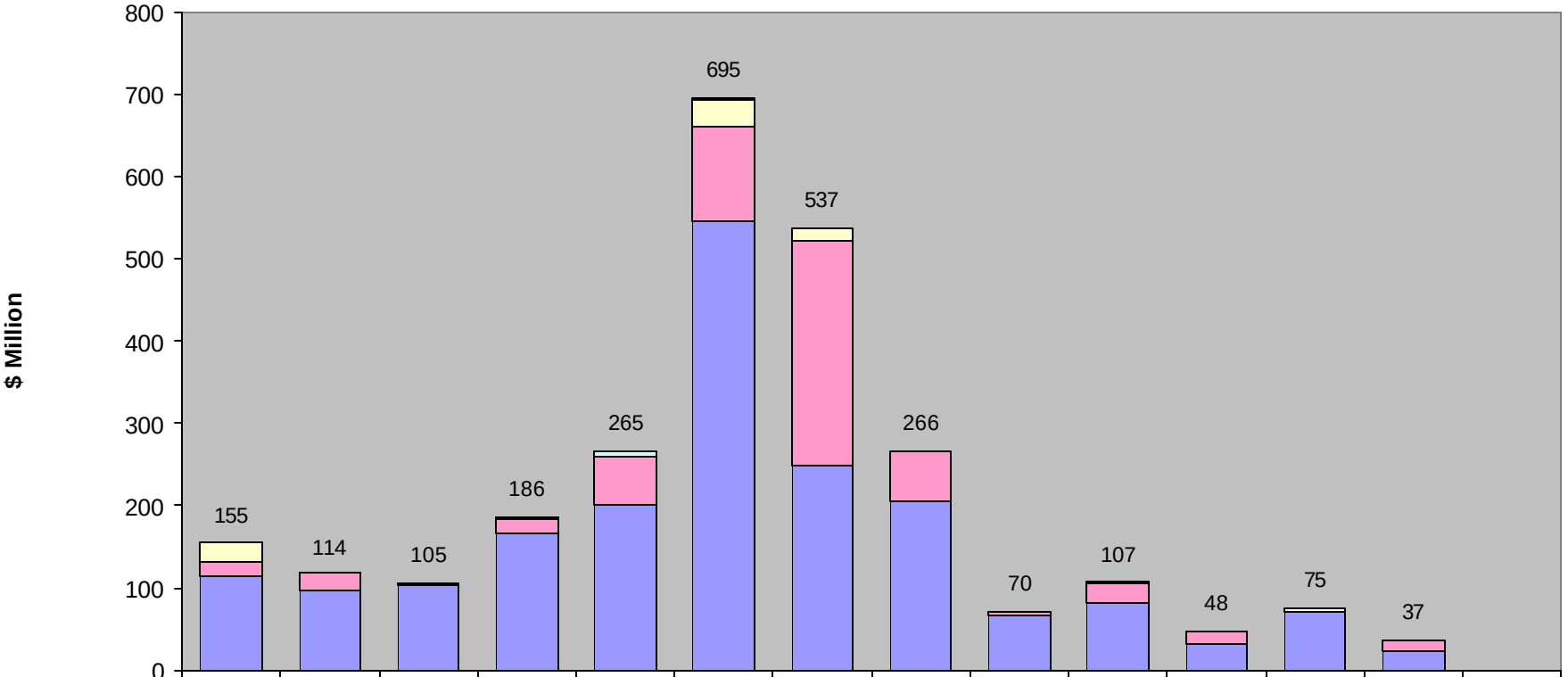
$ of Exposure Associated with Credit-Risk Events
By CRE Type



	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Total
Unknown		66		8	64	1		3						141
Sale	34	2		10		47	69	38	31	18	20	16		284
Restruc	82	103	8	40	248	577	1,136	323	46	79	178	30	130	2,978
Default	269	299	256	417	372	1,075	627	771	290	405	137	129	59	5,107
Grand Total	384	469	263	476	684	1,700	1,832	1,135	366	502	335	175	189	8,509

Experience Year

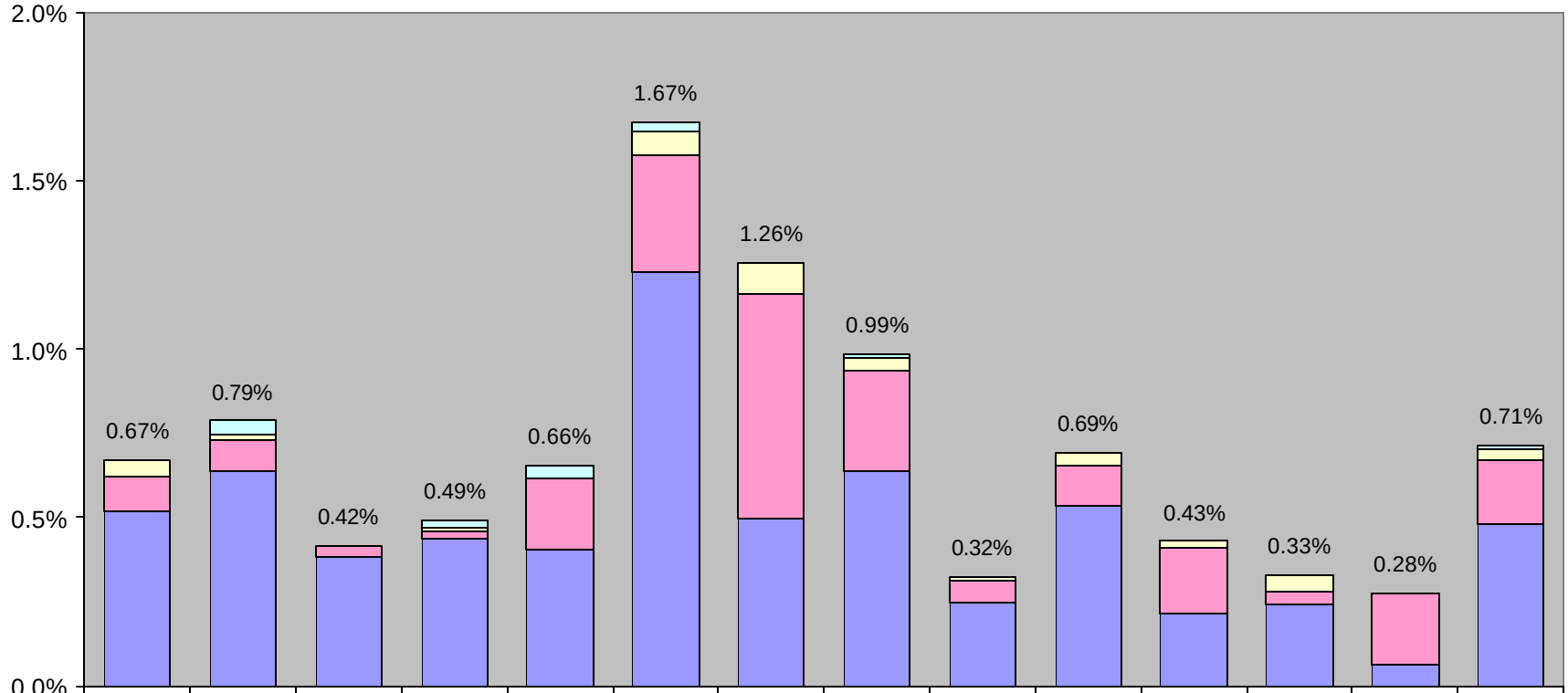
Economic Loss from Credit-Risk Events
By CRE Type



	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Total
Unknown		-5		1	5	1		0						1
Sale	24	1		2		34	14	-1	1	1	1	5		82
Restruc	17	21	2	17	59	114	275	60	3	22	15	-1	13	619
Default	113	97	104	167	201	546	248	206	67	83	32	70	24	1,957
Grand Total	155	114	105	186	265	695	537	266	70	107	48	75	37	2,659

Experience Year

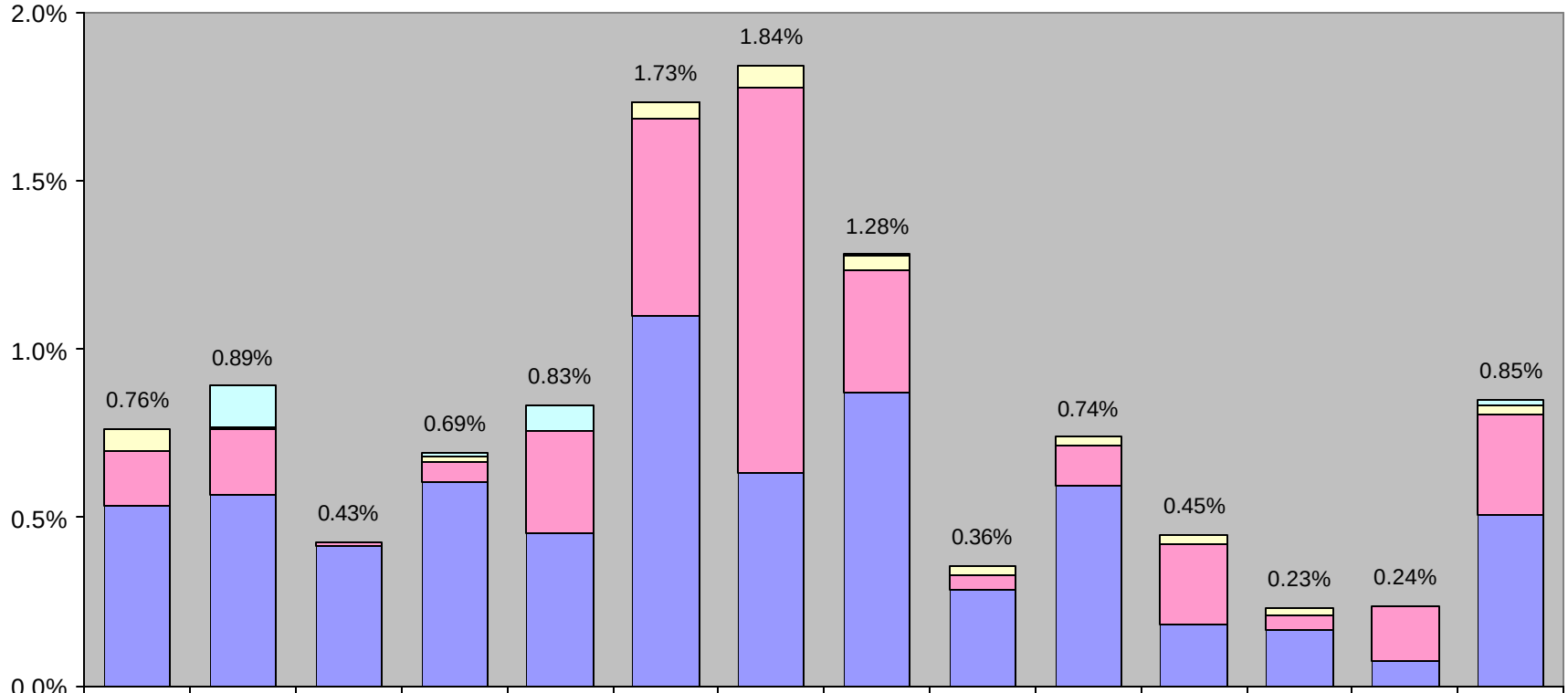
Incidence Rate by Number
By CRE Type



	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Total
Unknown		0.04%		0.02%	0.04%	0.02%		0.01%						0.01%
Sale	0.05%	0.01%		0.01%		0.07%	0.09%	0.04%	0.01%	0.04%	0.02%	0.05%		0.03%
Restruc	0.10%	0.10%	0.04%	0.02%	0.21%	0.35%	0.66%	0.30%	0.07%	0.12%	0.20%	0.03%	0.21%	0.19%
Default	0.52%	0.64%	0.38%	0.44%	0.41%	1.23%	0.50%	0.64%	0.24%	0.53%	0.21%	0.24%	0.06%	0.48%
Total	0.67%	0.79%	0.42%	0.49%	0.66%	1.67%	1.26%	0.99%	0.32%	0.69%	0.43%	0.33%	0.28%	0.71%

Experience Year

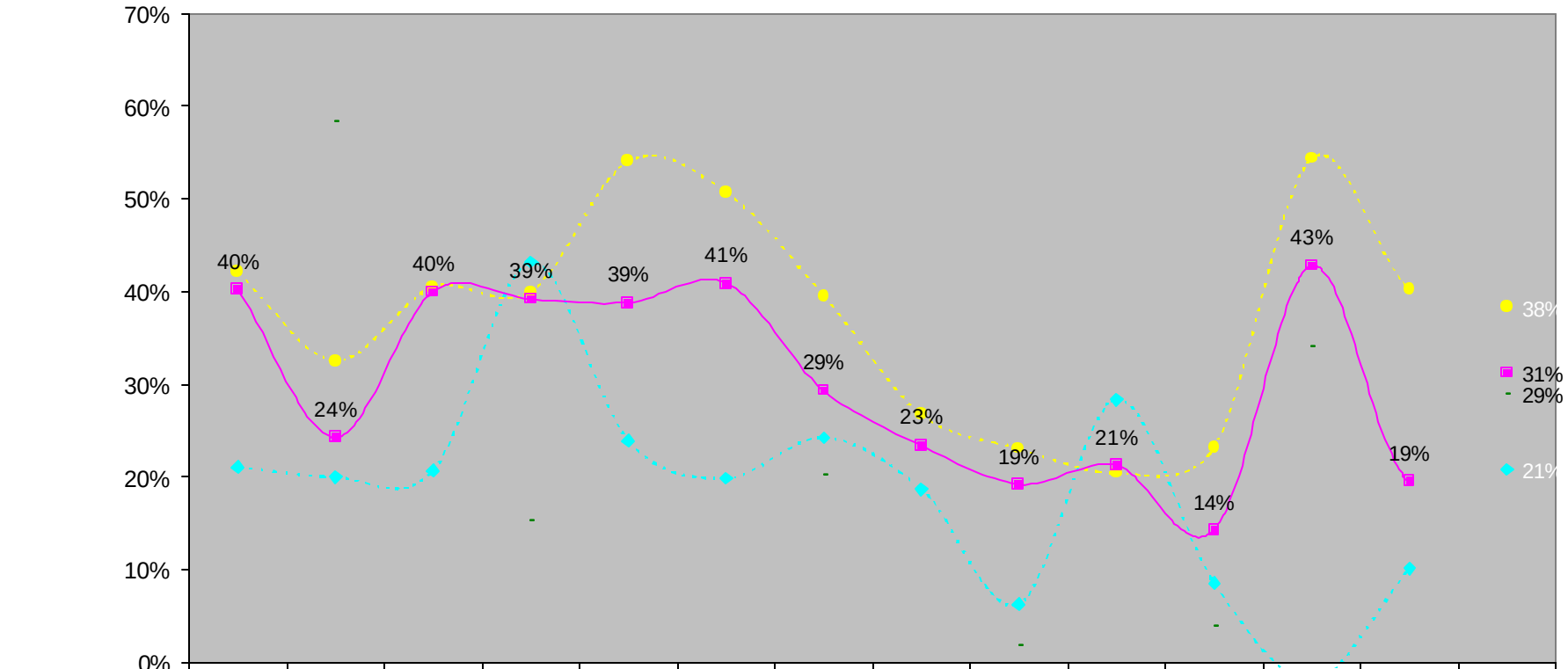
Incidence Rate by Amount
By CRE Type



	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Total
Unknown		0.12%		0.01%	0.08%	0.00%		0.00%						0.01%
Sale	0.07%	0.00%		0.01%		0.05%	0.07%	0.04%	0.03%	0.03%	0.03%	0.02%		0.03%
Restruc	0.16%	0.20%	0.01%	0.06%	0.30%	0.59%	1.14%	0.36%	0.04%	0.12%	0.24%	0.04%	0.16%	0.30%
Default	0.53%	0.57%	0.41%	0.61%	0.45%	1.10%	0.63%	0.87%	0.28%	0.60%	0.18%	0.17%	0.07%	0.51%
Total	0.76%	0.89%	0.43%	0.69%	0.83%	1.73%	1.84%	1.28%	0.36%	0.74%	0.45%	0.23%	0.24%	0.85%

Experience Year

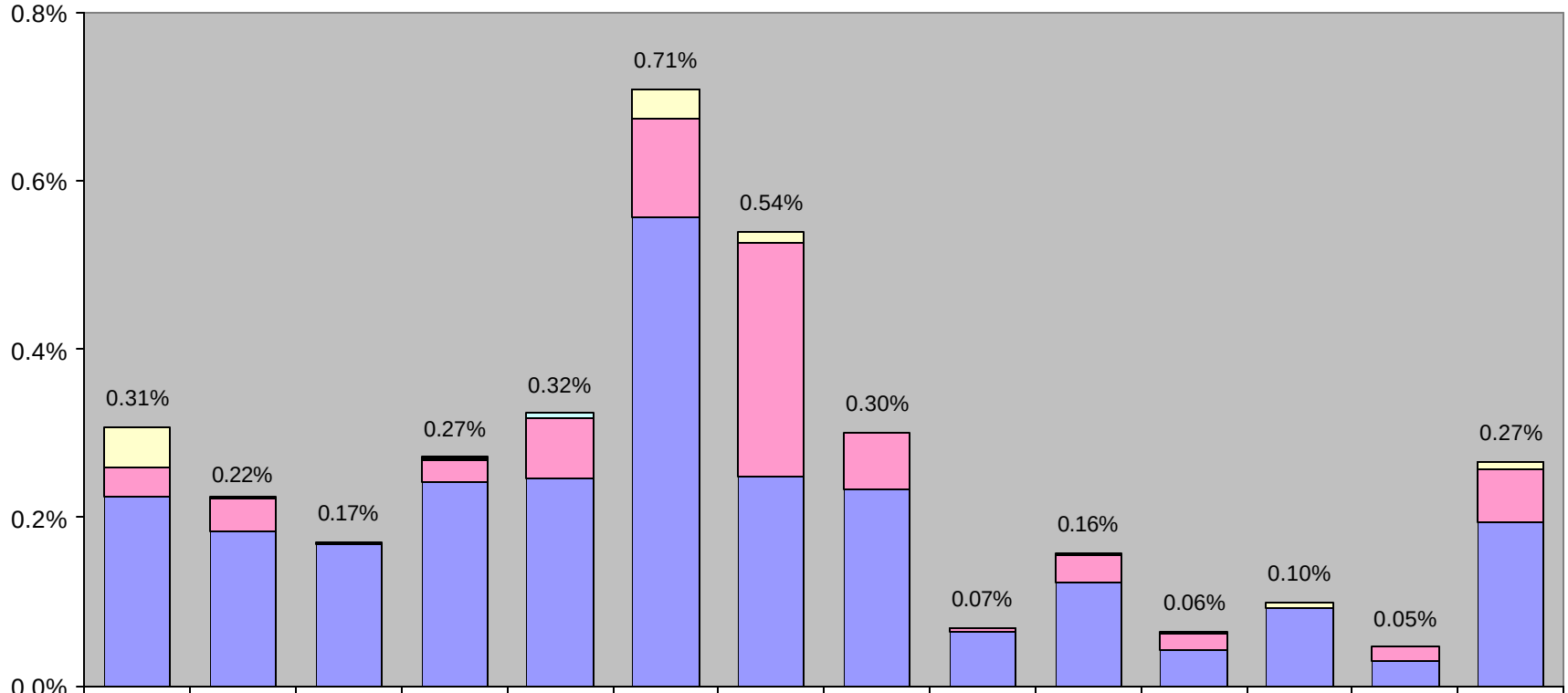
Loss Severity
By CRE Type



	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Total
Unknown		-7%		8%	8%	100%		-4%						1%
Sale	72%	58%		15%		73%	20%	-2%	2%	8%	4%	34%		29%
Restruc	21%	20%	21%	43%	24%	20%	24%	19%	6%	28%	9%	-2%	10%	21%
Default	42%	33%	41%	40%	54%	51%	39%	27%	23%	20%	23%	54%	40%	38%
Total	40%	24%	40%	39%	39%	41%	29%	23%	19%	21%	14%	43%	19%	31%

Experience Year

Economic Loss Rate as % of Exposure
By CRE Type

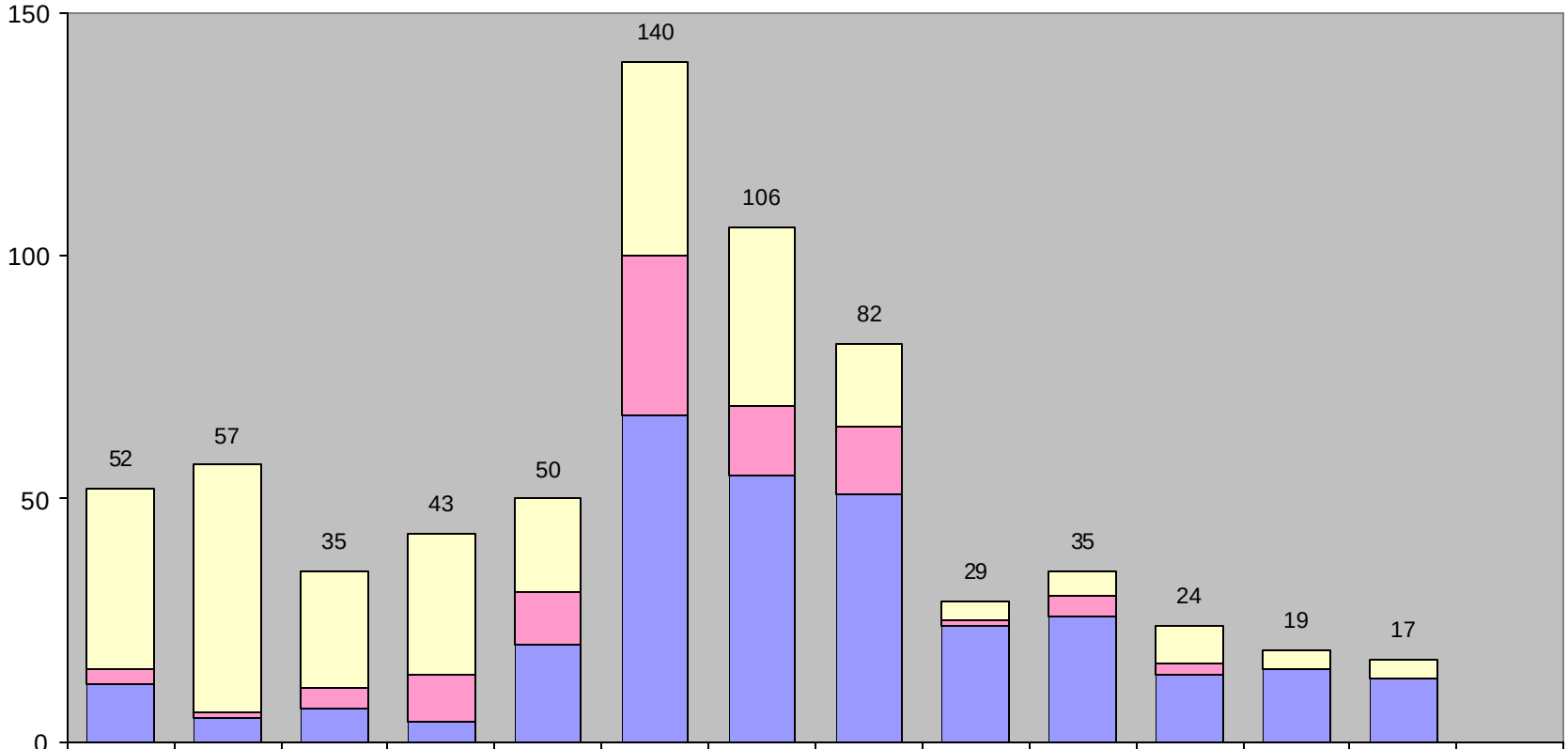


	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Total
Unknown		-0.01%		0.00%	0.01%	0.00%		0.00%						0.00%
Sale	0.05%	0.00%		0.00%		0.03%	0.01%	0.00%	0.00%	0.00%	0.00%	0.01%		0.01%
Restruc	0.03%	0.04%	0.00%	0.03%	0.07%	0.12%	0.28%	0.07%	0.00%	0.03%	0.02%	0.00%	0.02%	0.06%
Default	0.23%	0.18%	0.17%	0.24%	0.25%	0.56%	0.25%	0.23%	0.07%	0.12%	0.04%	0.09%	0.03%	0.20%
Total	0.31%	0.22%	0.17%	0.27%	0.32%	0.71%	0.54%	0.30%	0.07%	0.16%	0.06%	0.10%	0.05%	0.27%

Experience Year

Loss Severity by Debt Seniority

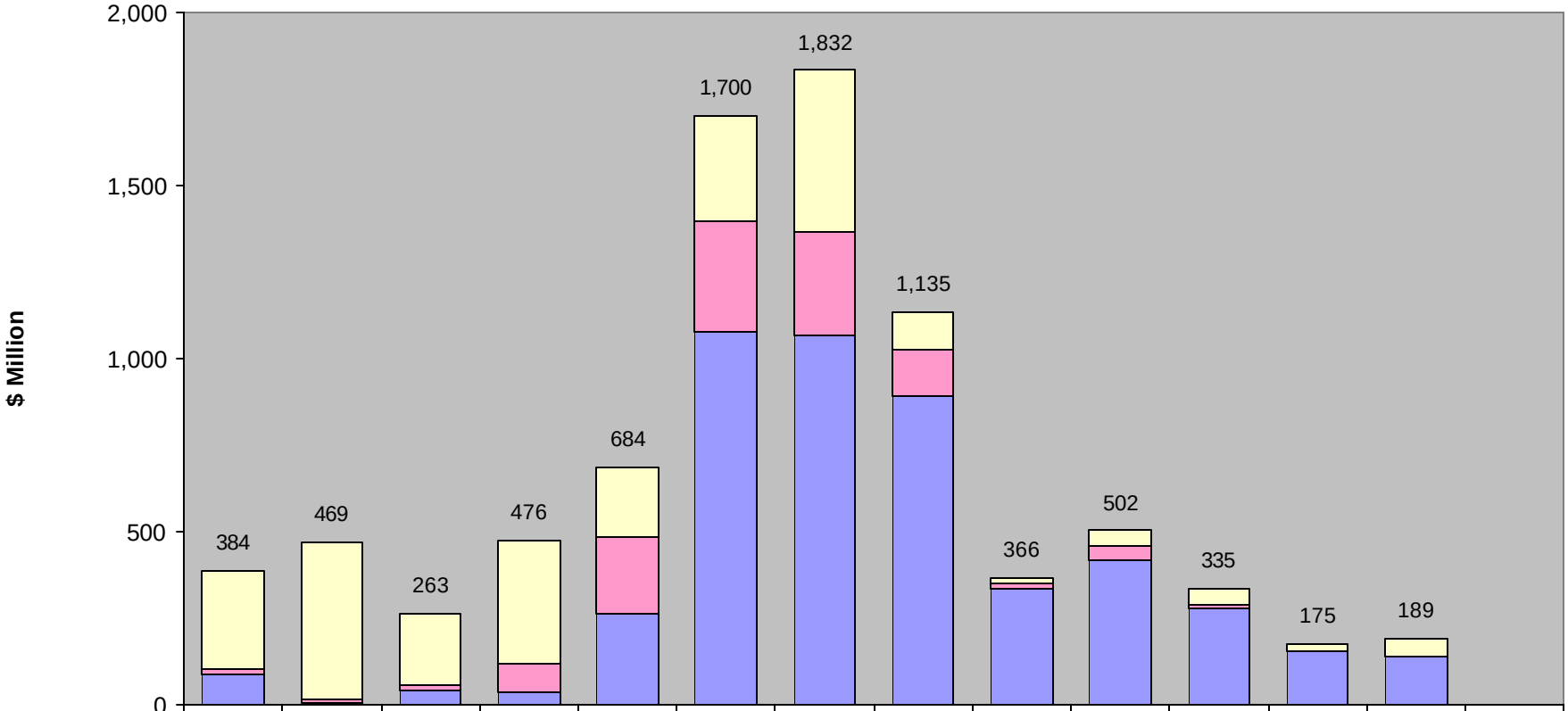
of Credit-Risk Events
By Seniority



	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Total
Unknown	37	51	24	29	19	40	37	17	4	5	8	4	4	279
Subord.	3	1	4	10	11	33	14	14	1	4	2			97
Senior	12	5	7	4	20	67	55	51	24	26	14	15	13	313
Grand Total	52	57	35	43	50	140	106	82	29	35	24	19	17	689

Experience Year

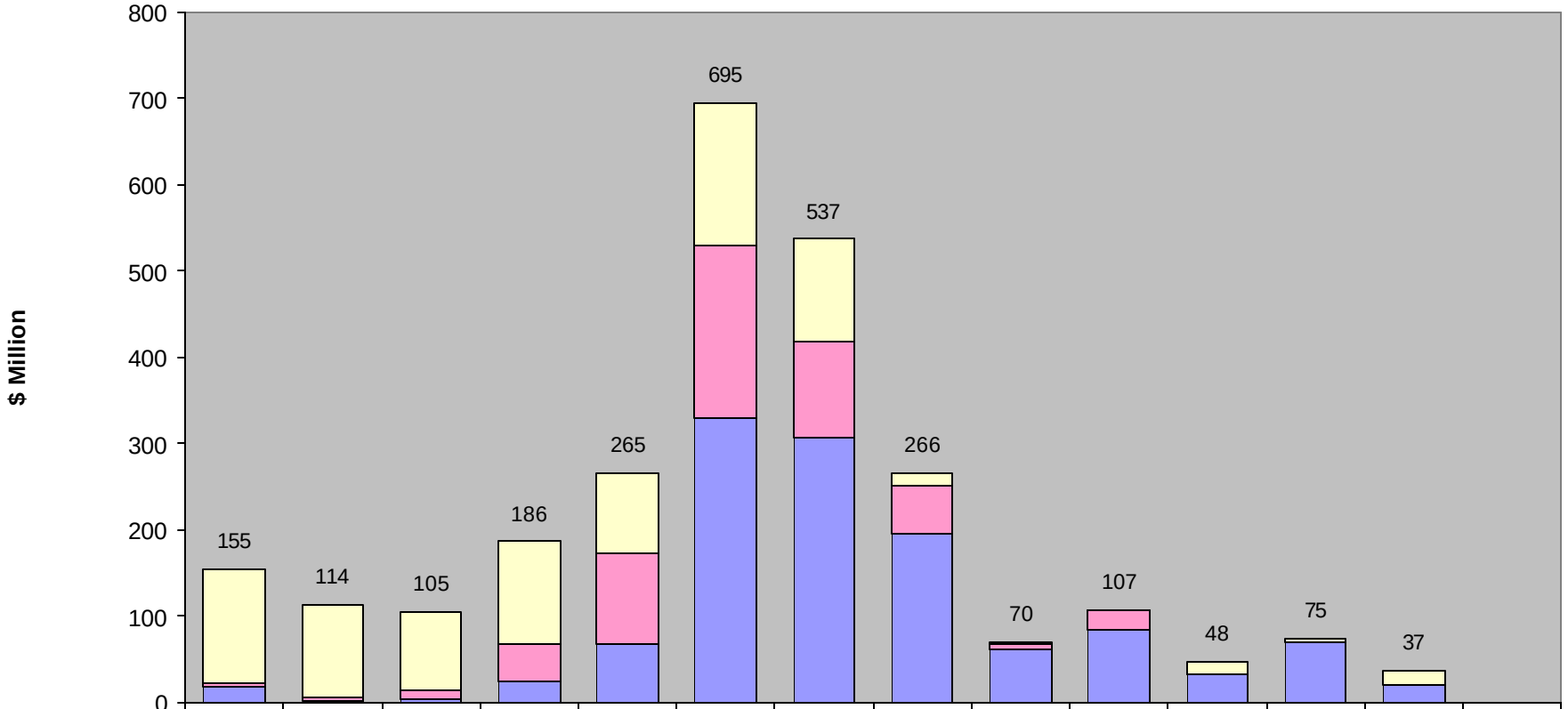
$ of Exposure Associated with Credit-Risk Events
By Seniority



	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Total
Unknown	284	455	210	357	199	305	466	110	16	45	47	21	52	2,566
Subord.	13	8	16	83	222	318	299	131	14	41	9			1,155
Senior	87	6	38	36	263	1,077	1,067	893	336	416	278	154	137	4,788
Grand Total	384	469	263	476	684	1,700	1,832	1,135	366	502	335	175	189	8,509

Experience Year

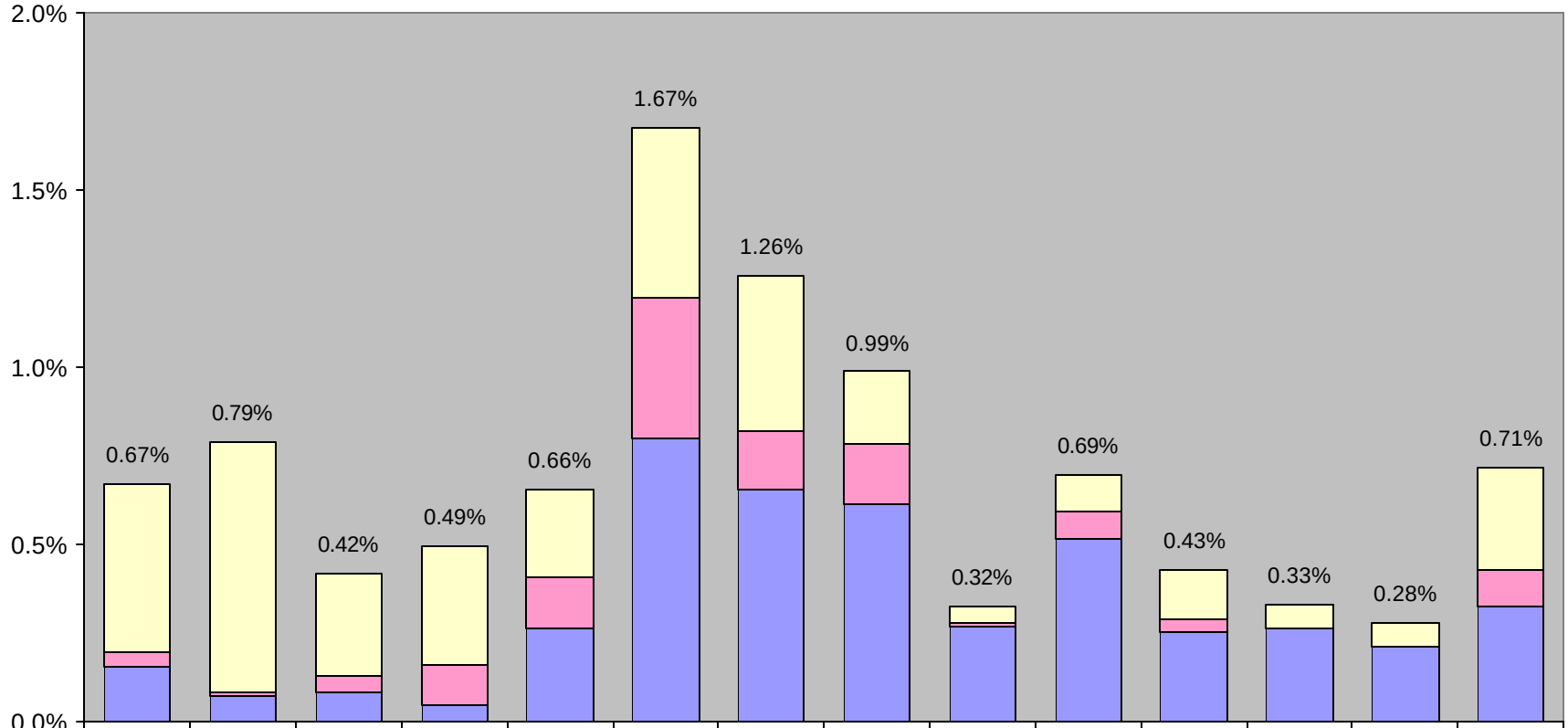
Economic Loss from Credit-Risk Events
By Seniority



	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Total
Unknown	132	109	92	118	93	166	119	14	4	0	15	5	17	885
Subord.	4	3	10	44	105	199	112	56	4	23	0			559
Senior	18	3	3	24	67	330	306	196	62	83	32	70	20	1,215
Grand Total	155	114	105	186	265	695	537	266	70	107	48	75	37	2,659

Experience Year

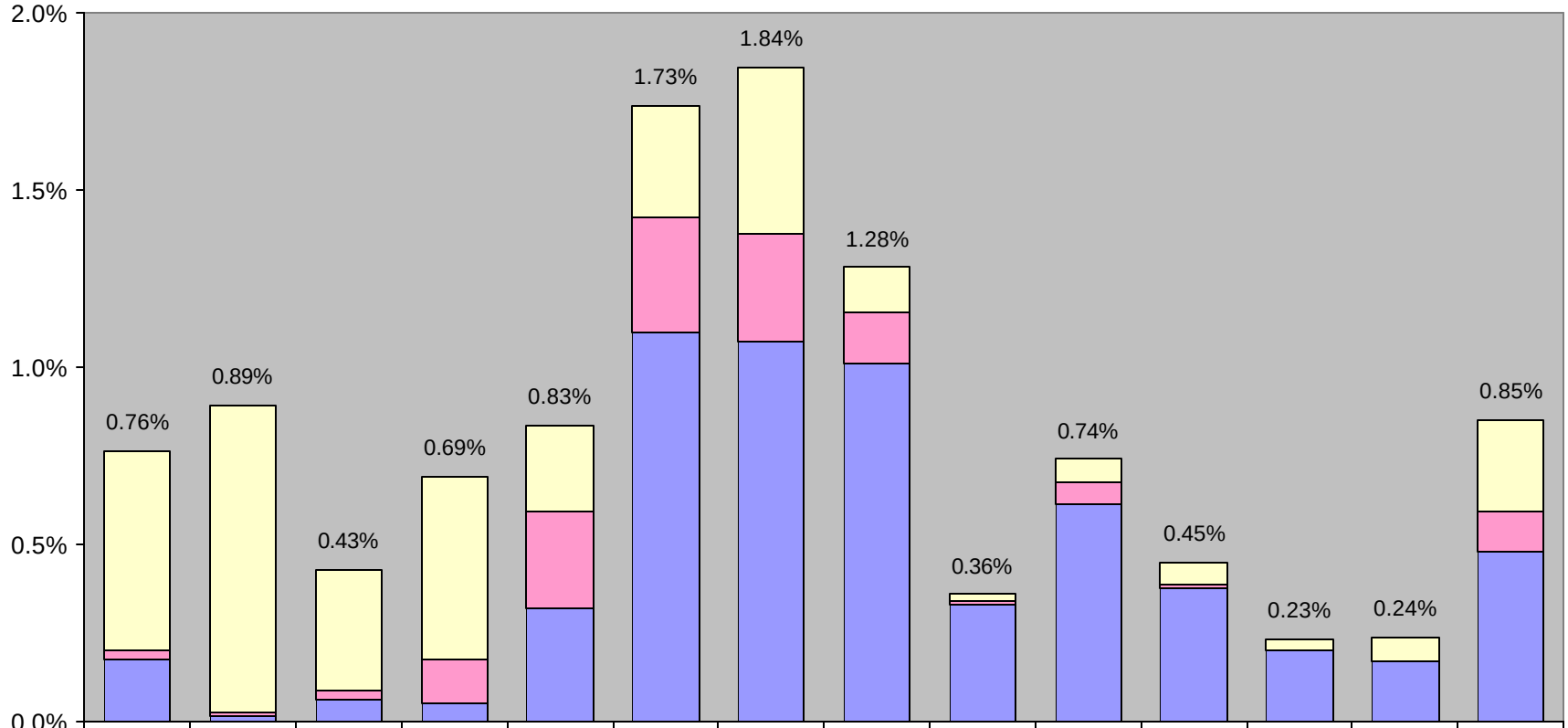
Incidence Rate by Number
By Seniority



	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Total
Unknown	0.48%	0.70%	0.29%	0.33%	0.25%	0.48%	0.44%	0.20%	0.04%	0.10%	0.14%	0.07%	0.06%	0.29%
Subord.	0.04%	0.01%	0.05%	0.11%	0.14%	0.39%	0.17%	0.17%	0.01%	0.08%	0.04%			0.10%
Senior	0.16%	0.07%	0.08%	0.05%	0.26%	0.80%	0.65%	0.61%	0.27%	0.52%	0.25%	0.26%	0.21%	0.32%
Total	0.67%	0.79%	0.42%	0.49%	0.66%	1.67%	1.26%	0.99%	0.32%	0.69%	0.43%	0.33%	0.28%	0.71%

Experience Year

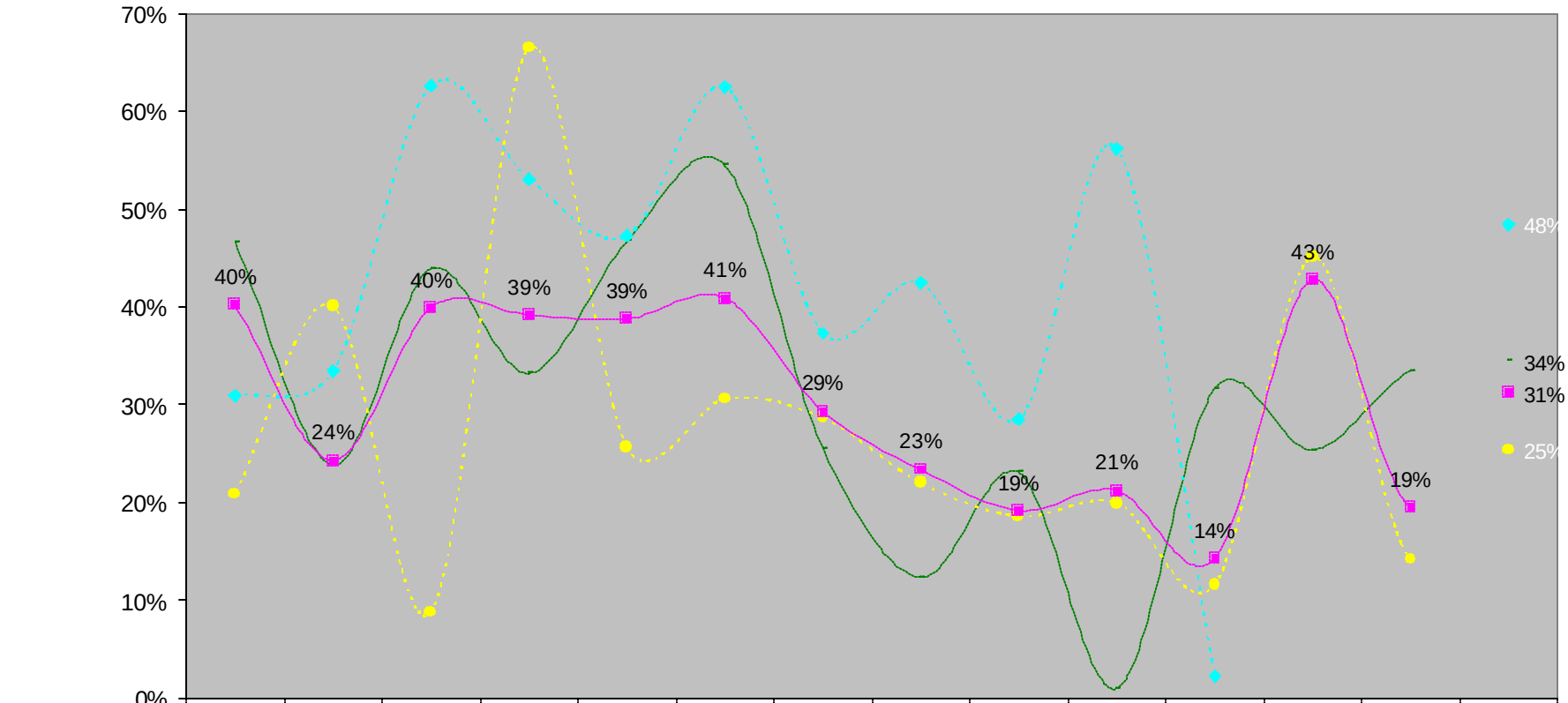
Incidence Rate by Amount
By Seniority



	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Total
Unknown	0.56%	0.86%	0.34%	0.52%	0.24%	0.31%	0.47%	0.12%	0.02%	0.07%	0.06%	0.03%	0.06%	0.26%
Subord.	0.03%	0.02%	0.03%	0.12%	0.27%	0.32%	0.30%	0.15%	0.01%	0.06%	0.01%			0.12%
Senior	0.17%	0.01%	0.06%	0.05%	0.32%	1.10%	1.07%	1.01%	0.33%	0.61%	0.37%	0.20%	0.17%	0.48%
Total	0.76%	0.89%	0.43%	0.69%	0.83%	1.73%	1.84%	1.28%	0.36%	0.74%	0.45%	0.23%	0.24%	0.85%

Experience Year

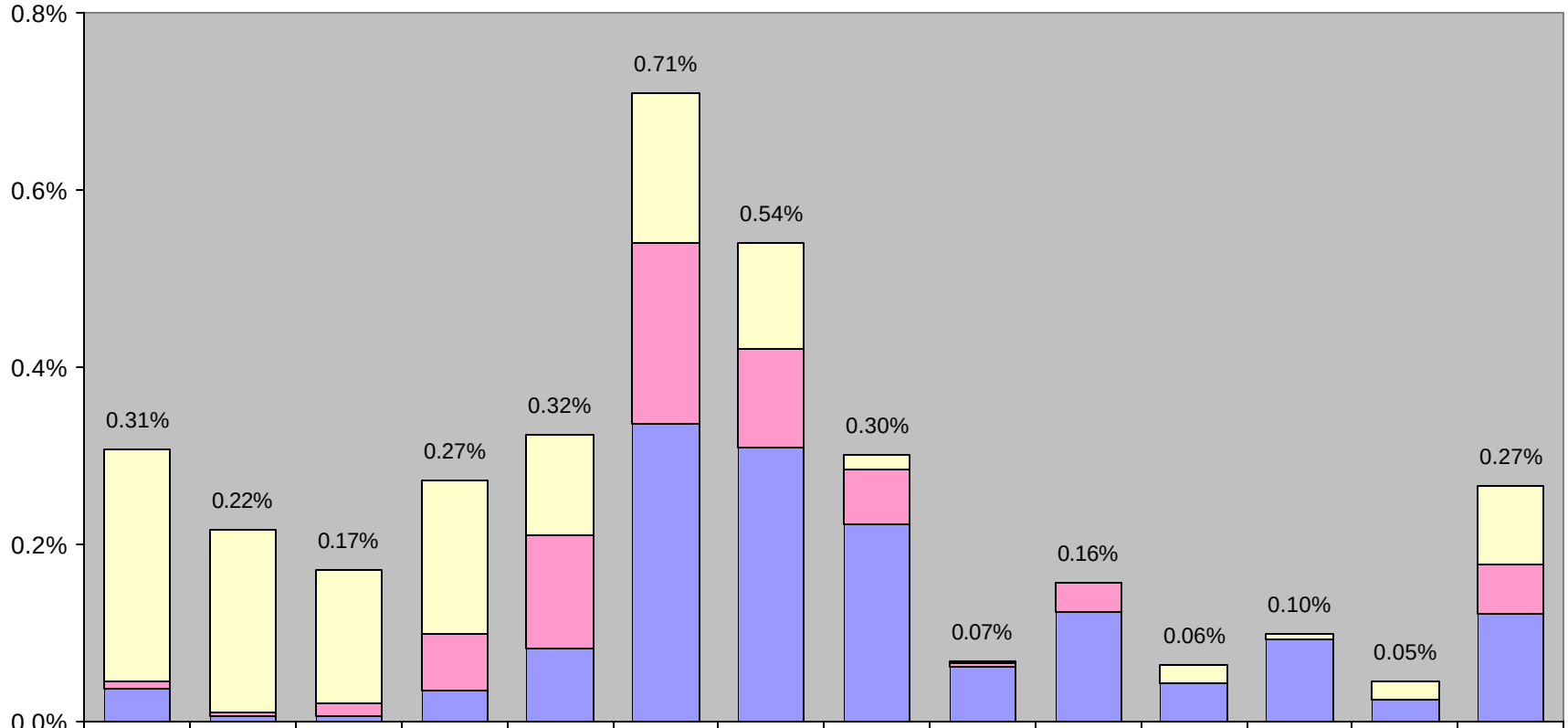
Loss Severity
By Seniority



	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Total
Unknown	47%	24%	44%	33%	47%	54%	26%	12%	23%	1%	32%	25%	33%	34%
Subord.	31%	33%	63%	53%	47%	62%	37%	43%	28%	56%	2%			48%
Senior	21%	40%	9%	67%	26%	31%	29%	22%	19%	20%	12%	45%	14%	25%
Total	40%	24%	40%	39%	39%	41%	29%	23%	19%	21%	14%	43%	19%	31%

Experience Year

Economic Loss Rate as % of Exposure
By Seniority

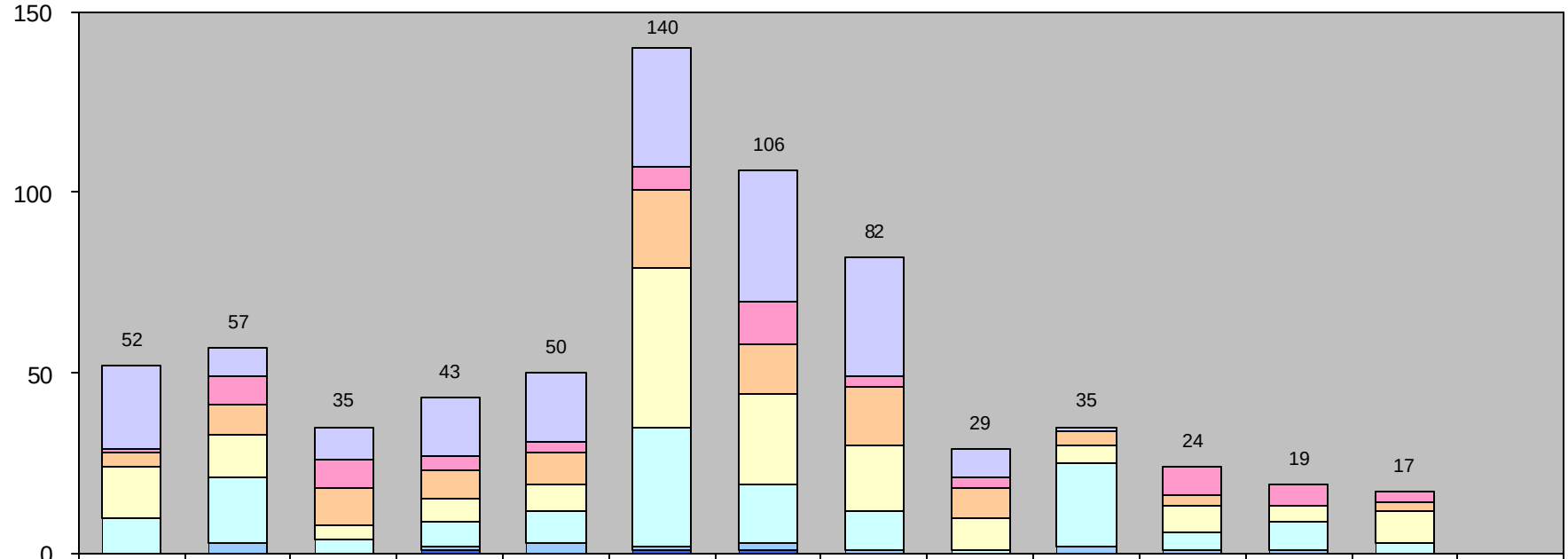


	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Total
Unknown	0.26%	0.21%	0.15%	0.17%	0.11%	0.17%	0.12%	0.02%	0.00%	0.00%	0.02%	0.01%	0.02%	0.09%
Subord.	0.01%	0.01%	0.02%	0.06%	0.13%	0.20%	0.11%	0.06%	0.00%	0.03%	0.00%			0.06%
Senior	0.04%	0.00%	0.01%	0.03%	0.08%	0.34%	0.31%	0.22%	0.06%	0.12%	0.04%	0.09%	0.02%	0.12%
Total	0.31%	0.22%	0.17%	0.27%	0.32%	0.71%	0.54%	0.30%	0.07%	0.16%	0.06%	0.10%	0.05%	0.27%

Experience Year

Most Recent Quality Rating

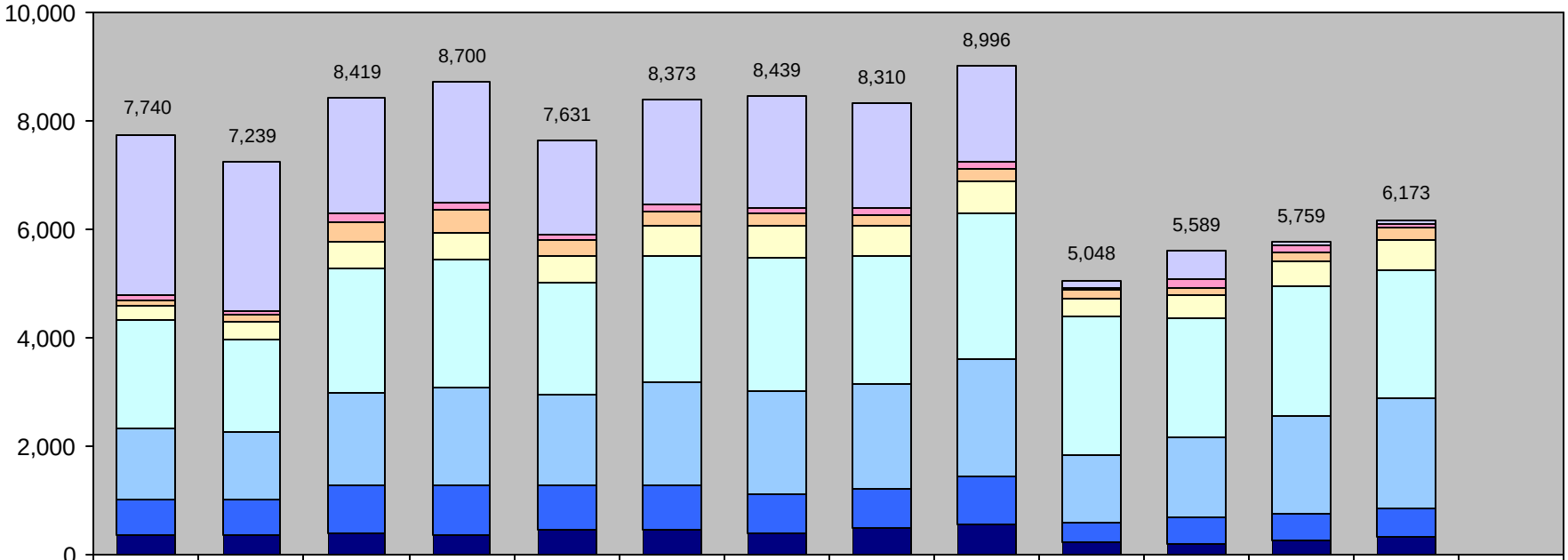
of Credit-Risk Events
By Most Recent Quality Rating



	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Total
N/A	23	8	9	16	19	33	36	33	8	1	-	-	-	186
<B	1	8	8	4	3	6	12	3	3	-	8	6	3	65
B	4	8	10	8	9	22	14	16	8	4	3	-	2	108
BB	14	12	4	6	7	44	25	18	9	5	7	4	9	164
BBB	10	18	4	7	9	33	16	11	1	23	5	8	3	148
A	-	3	-	1	3	1	2	1	-	2	1	1	-	15
AA	-	-	-	1	-	1	1	-	-	-	-	-	-	3
AAA	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	52	57	35	43	50	140	106	82	29	35	24	19	17	689

Experience Year

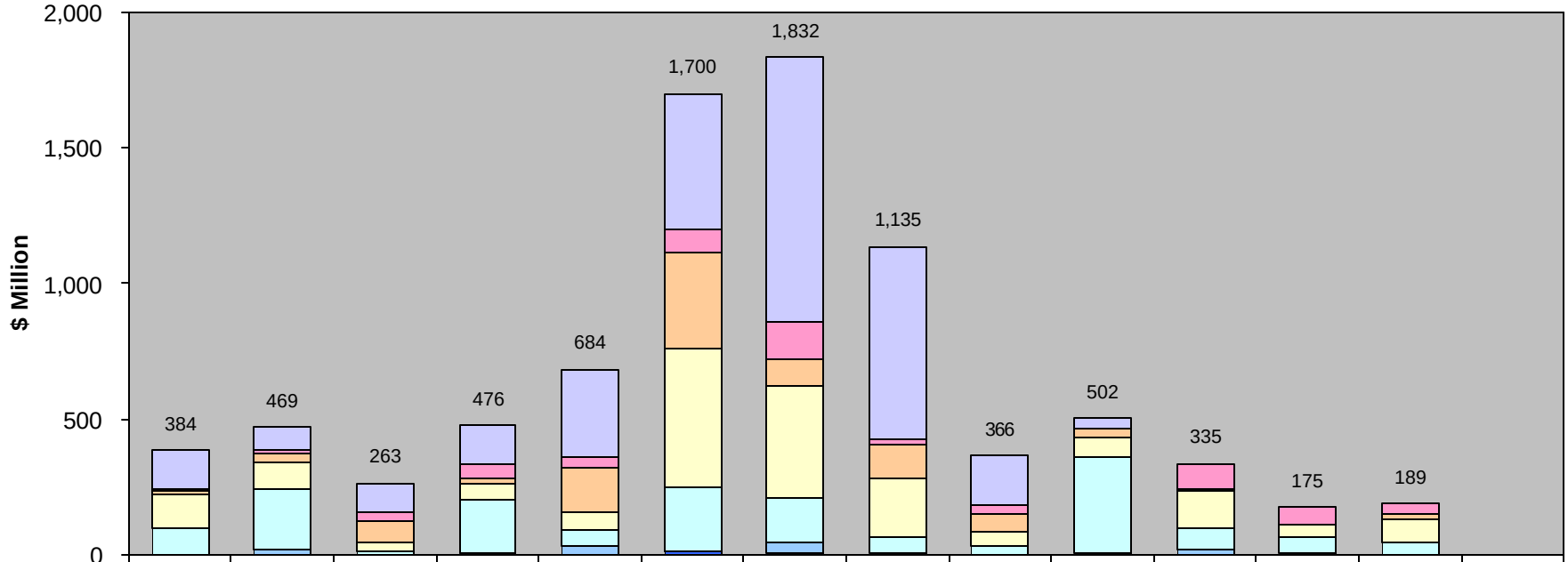
Exposure in # of Assets
By Most Recent Quality Rating



	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Total
N/A	2,952	2,739	2,145	2,218	1,737	1,927	2,054	1,912	1,740	122	503	52	94	20,192
<B	101	95	146	136	104	116	112	128	137	45	161	135	53	1,465
B	88	125	362	424	277	261	229	229	247	158	153	184	243	2,977
BB	290	325	485	500	514	573	572	537	586	332	428	455	525	6,119
BBB	1,973	1,688	2,311	2,332	2,046	2,316	2,458	2,359	2,675	2,563	2,188	2,373	2,374	29,653
A	1,335	1,250	1,689	1,814	1,663	1,899	1,908	1,927	2,188	1,234	1,485	1,801	2,029	22,218
AA	652	680	895	908	829	832	727	722	871	375	485	513	532	9,018
AAA	351	339	388	369	463	452	382	498	555	221	187	248	324	4,773
Total	7,740	7,239	8,419	8,700	7,631	8,373	8,439	8,310	8,996	5,048	5,589	5,759	6,173	96,413

Experience Year

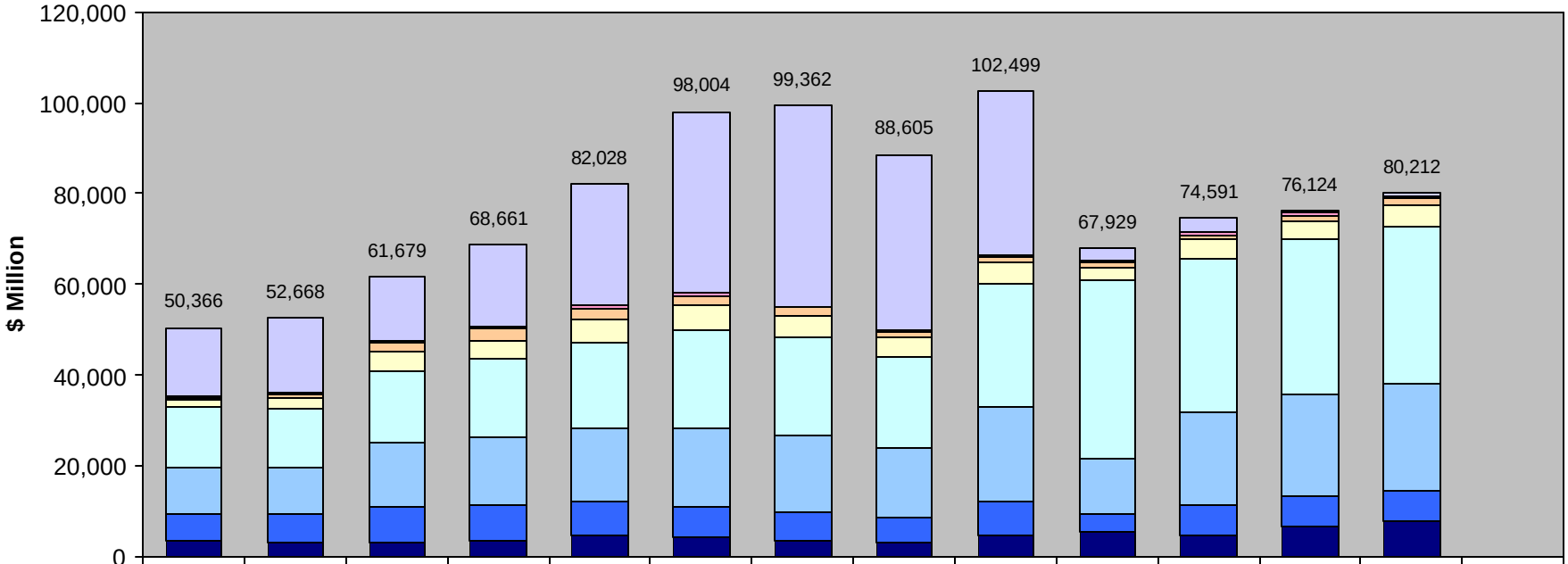
$ of Exposure Associated with Credit-Risk Events
By Most Recent Quality Rating



	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Total
N/A	144	80	105	142	321	502	974	711	183	40	-	-	-	3,205
<B	1	13	32	49	42	86	137	16	35	-	91	63	42	607
B	14	36	78	24	164	353	99	122	62	31	11	-	17	1,012
BB	128	98	39	58	65	514	410	218	56	73	135	47	88	1,929
BBB	97	223	10	194	61	230	166	63	31	349	78	60	43	1,603
A	-	19	-	4	30	5	40	3	-	8	20	5	-	134
AA	-	-	-	4	-	10	6	-	-	-	-	-	-	20
AAA	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	384	469	263	476	684	1,700	1,832	1,135	366	502	335	175	189	8,509

Experience Year

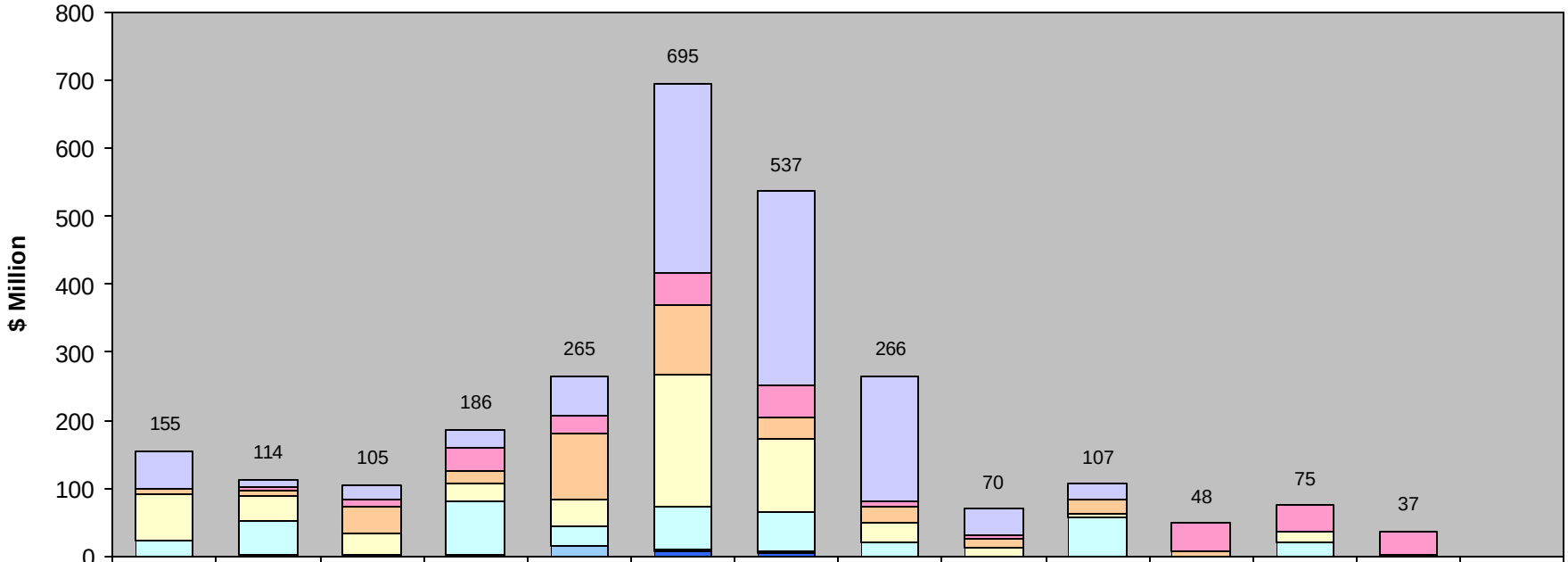
Exposure in $ of Assets
By Most Recent Quality Rating



	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Total
N/A	14,901	16,458	13,975	17,863	26,766	40,026	44,123	38,683	36,229	2,776	3,194	427	848	256,269
<B	436	345	496	696	600	477	360	369	444	157	842	651	450	6,326
B	348	893	2,133	2,685	2,355	2,242	1,781	1,345	1,185	1,341	723	1,004	1,317	19,352
BB	1,899	2,461	4,200	3,863	4,957	5,539	4,964	4,029	4,661	2,921	4,360	4,233	4,871	52,958
BBB	13,086	12,939	15,826	17,135	19,183	21,406	21,511	20,318	27,028	39,057	33,614	34,219	34,680	310,002
A	10,137	9,994	14,055	15,075	15,932	17,307	16,949	15,128	20,804	12,329	20,328	22,176	23,681	213,896
AA	6,224	6,579	8,001	7,978	7,413	6,840	6,211	5,453	7,391	4,083	6,654	6,761	6,545	86,134
AAA	3,336	2,997	2,992	3,366	4,821	4,165	3,463	3,279	4,757	5,267	4,876	6,653	7,820	57,793
Total	50,366	52,668	61,679	68,661	82,028	98,004	99,362	88,605	102,499	67,929	74,591	76,124	80,212	1,002,729

Experience Year

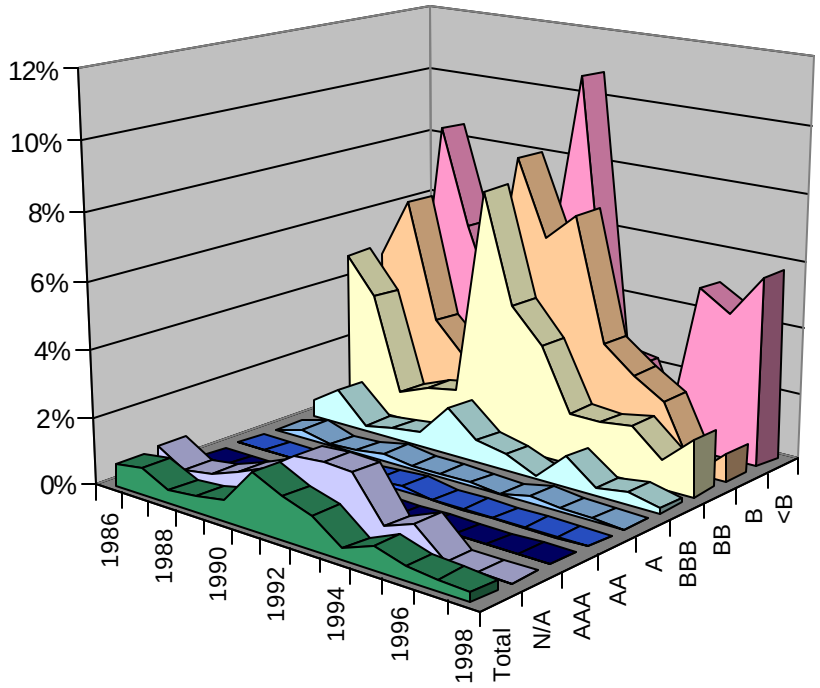
Economic Loss from Credit-Risk Events
By Most Recent Quality Rating



	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Total
N/A	54.2	11.9	21.4	26.5	58.9	278.3	284.4	184.9	38.0	21.9				980.4
<B	0.6	4.9	10.1	36.1	24.6	47.7	49.2	6.4	7.2		42.9	38.3	34.0	302.0
B	8.7	9.1	41.1	18.6	97.1	102.2	29.8	25.8	11.1	21.9	6.3		(0.2)	371.3
BB	66.6	35.8	30.2	25.8	39.7	192.4	107.2	29.1	13.5	4.8	(2.4)	16.8	0.5	560.0
BBB	24.6	49.0	2.4	78.6	30.0	65.1	59.1	19.3	0.5	57.4	0.1	19.3	2.5	407.9
A		3.2		(1.0)	15.0	1.8	1.7	0.3		0.6	0.8	0.3		22.7
AA				1.8		7.5	5.4							14.7
AAA														-
Total	154.7	113.9	105.1	186.3	265.3	695.0	536.8	265.7	70.3	106.5	47.7	74.7	36.8	2,659.0

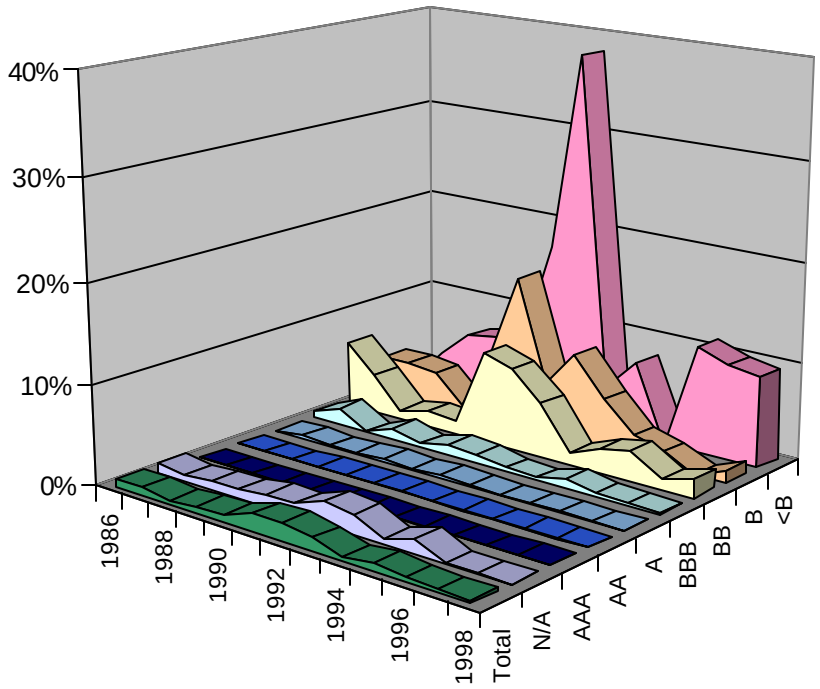
Experience Year

Incidence Rate by Number
By Year by Most Recent Quality Rating



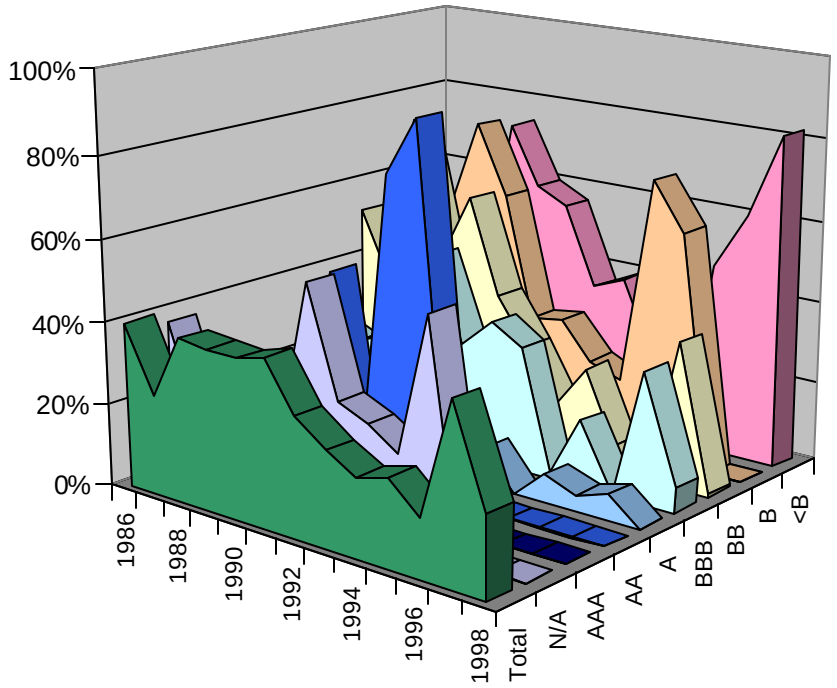
	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Total	0.67%	0.79%	0.42%	0.49%	0.66%	1.67%	1.26%	0.99%	0.32%	0.69%	0.43%	0.33%	0.28%
N/A	0.78%	0.29%	0.42%	0.72%	1.09%	1.71%	1.75%	1.73%	0.46%	0.82%			
AAA													
AA				0.11%		0.12%	0.14%						
A		0.24%		0.06%	0.18%	0.05%	0.10%	0.05%		0.16%	0.07%	0.06%	
BBB	0.51%	1.07%	0.17%	0.30%	0.44%	1.42%	0.65%	0.47%	0.04%	0.90%	0.23%	0.34%	0.13%
BB	4.84%	3.69%	0.83%	1.20%	1.36%	7.69%	4.37%	3.36%	1.54%	1.51%	1.64%	0.88%	1.71%
B	4.57%	6.40%	2.76%	1.89%	3.25%	8.43%	6.13%	7.00%	3.25%	2.53%	1.96%		0.82%
<B	1.00%	8.47%	5.48%	2.95%	2.88%	5.19%	10.76%	2.34%	2.20%		4.98%	4.44%	5.71%

Incidence Rate by Amount
By Year by Most Recent Quality Rating



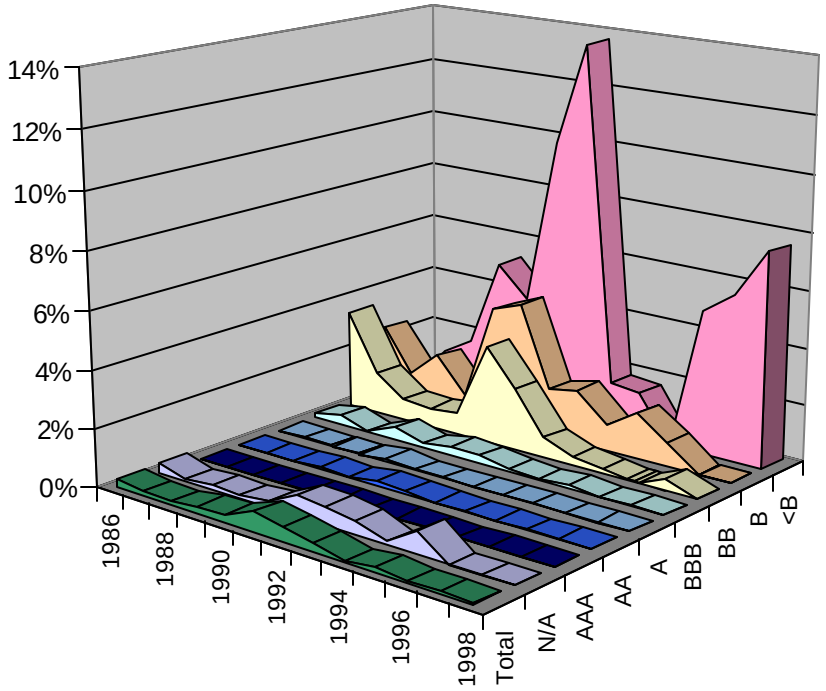
	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Total	0.76%	0.89%	0.43%	0.69%	0.83%	1.73%	1.84%	1.28%	0.36%	0.74%	0.45%	0.23%	0.24%
N/A	0.97%	0.49%	0.75%	0.80%	1.20%	1.25%	2.21%	1.84%	0.51%	1.44%			
AAA													
AA				0.05%		0.15%	0.10%						
A		0.19%		0.03%	0.19%	0.03%	0.24%	0.02%		0.07%	0.10%	0.02%	
BBB	0.74%	1.72%	0.06%	1.13%	0.32%	1.08%	0.77%	0.31%	0.11%	0.89%	0.23%	0.18%	0.12%
BB	6.74%	3.99%	0.92%	1.51%	1.32%	9.28%	8.25%	5.42%	1.20%	2.50%	3.11%	1.10%	1.81%
B	3.91%	4.00%	3.64%	0.91%	6.98%	15.74%	5.56%	9.11%	5.24%	2.35%	1.49%		1.27%
<B	0.31%	3.80%	6.45%	7.04%	6.94%	18.04%	38.11%	4.40%	7.78%		10.80%	9.64%	9.24%

Loss Severity
By Year by Most Recent Quality Rating



	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Total	40%	24%	40%	39%	39%	41%	29%	23%	19%	21%	14%	43%	19%
N/A	38%	15%	20%	19%	18%	55%	29%	26%	21%	55%			
AAA													
AA				49%	0%	75%	89%						
A		17%		-24%	50%	35%	4%	9%		7%	4%	6%	
BBB	25%	22%	25%	41%	49%	28%	36%	31%	2%	16%	0%	32%	6%
BB	52%	37%	78%	44%	61%	37%	26%	13%	24%	7%	-2%	36%	1%
B	64%	25%	53%	76%	59%	29%	30%	21%	18%	70%	58%		-1%
<B	47%	38%	32%	74%	59%	55%	36%	39%	21%		47%	61%	82%

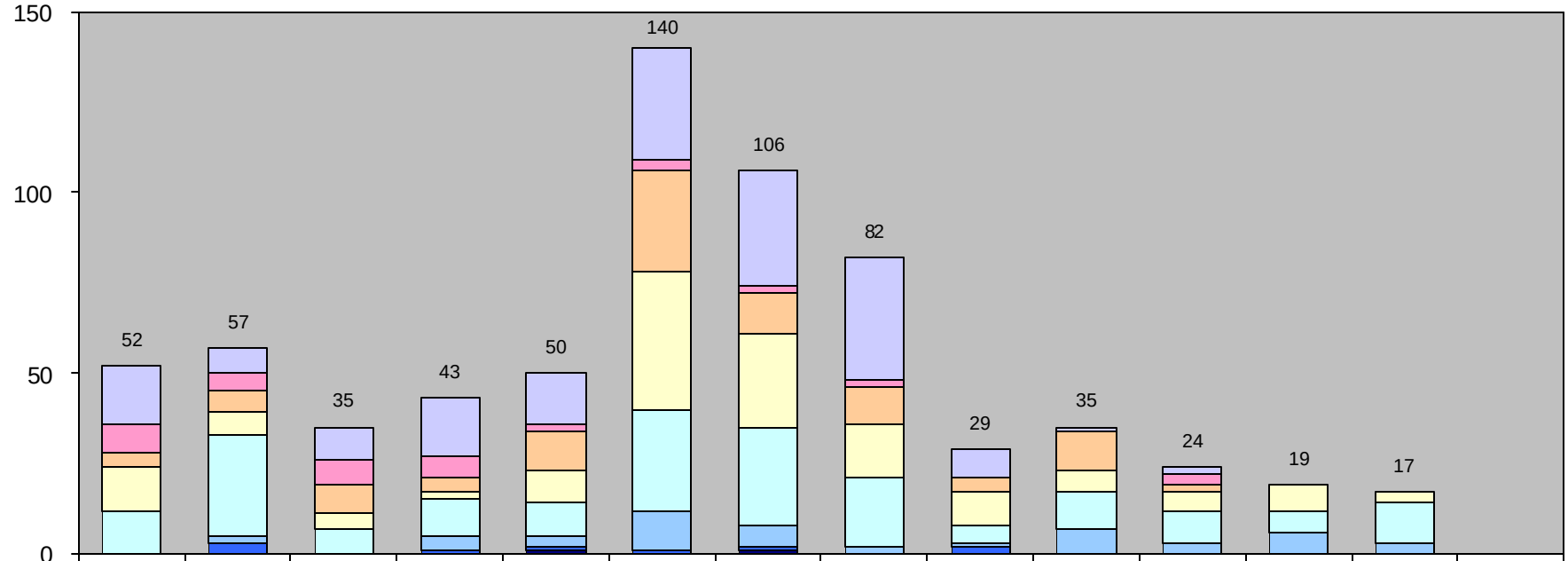
Economic Loss Rate as % of Exposure
By Year by Most Recent Quality Rating



	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Total	0.31%	0.22%	0.17%	0.27%	0.32%	0.71%	0.54%	0.30%	0.07%	0.16%	0.06%	0.10%	0.05%
N/A	0.36%	0.07%	0.15%	0.15%	0.22%	0.70%	0.64%	0.48%	0.10%	0.79%			
AAA													
AA				0.02%		0.11%	0.09%						
A		0.03%		-0.01%	0.09%	0.01%	0.01%	0.00%		0.00%	0.00%	0.00%	
BBB	0.19%	0.38%	0.02%	0.46%	0.16%	0.30%	0.27%	0.09%	0.00%	0.15%	0.00%	0.06%	0.01%
BB	3.51%	1.46%	0.72%	0.67%	0.80%	3.47%	2.16%	0.72%	0.29%	0.16%	-0.05%	0.40%	0.01%
B	2.50%	1.01%	1.92%	0.69%	4.12%	4.56%	1.67%	1.92%	0.94%	1.63%	0.87%		-0.02%
<B	0.14%	1.42%	2.03%	5.18%	4.11%	9.99%	13.64%	1.72%	1.62%		5.10%	5.88%	7.56%

Earliest Quality Rating

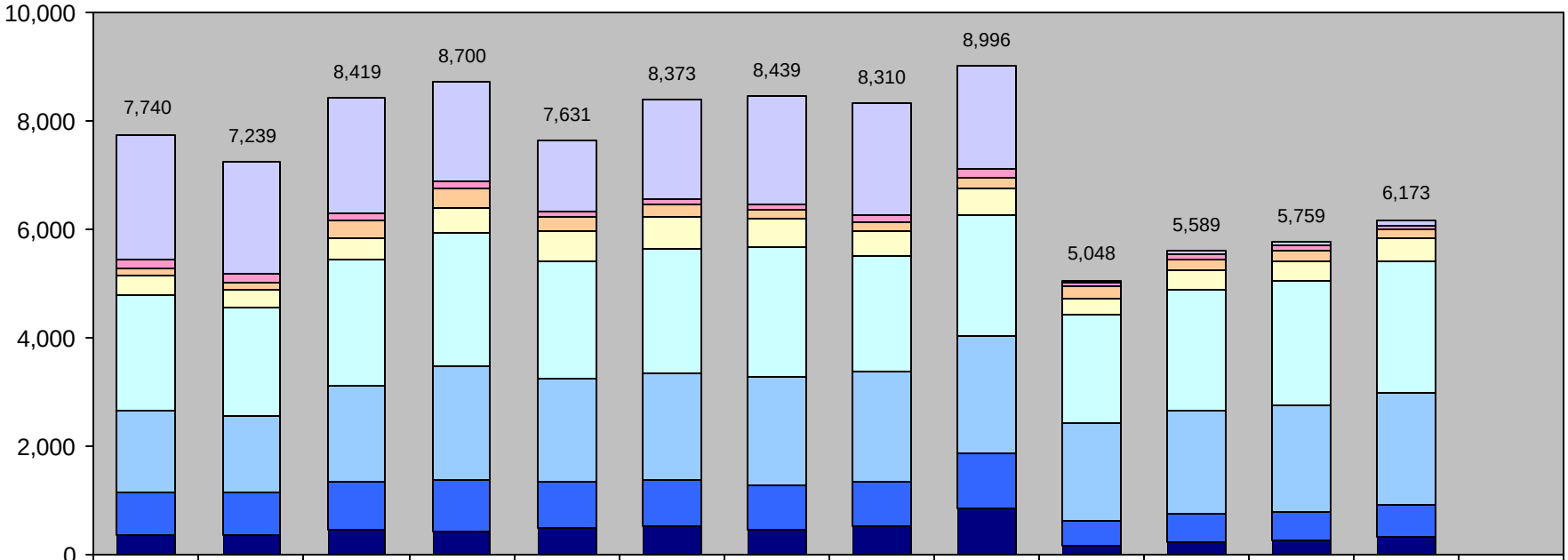
of Credit-Risk Events
By Earliest Quality Rating



	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Total
N/A	16	7	9	16	14	31	32	34	8	1	2	-	-	170
<B	8	5	7	6	2	3	2	2	-	-	3	-	-	38
B	4	6	8	4	11	28	11	10	4	11	2	-	-	99
BB	12	6	4	2	9	38	26	15	9	6	5	7	3	142
BBB	12	28	7	10	9	28	27	19	5	10	9	6	11	181
A	-	2	-	4	3	11	6	2	1	7	3	6	3	48
AA	-	3	-	1	1	1	1	-	2	-	-	-	-	9
AAA	-	-	-	-	1	-	1	-	-	-	-	-	-	2
Total	52	57	35	43	50	140	106	82	29	35	24	19	17	689

Experience Year

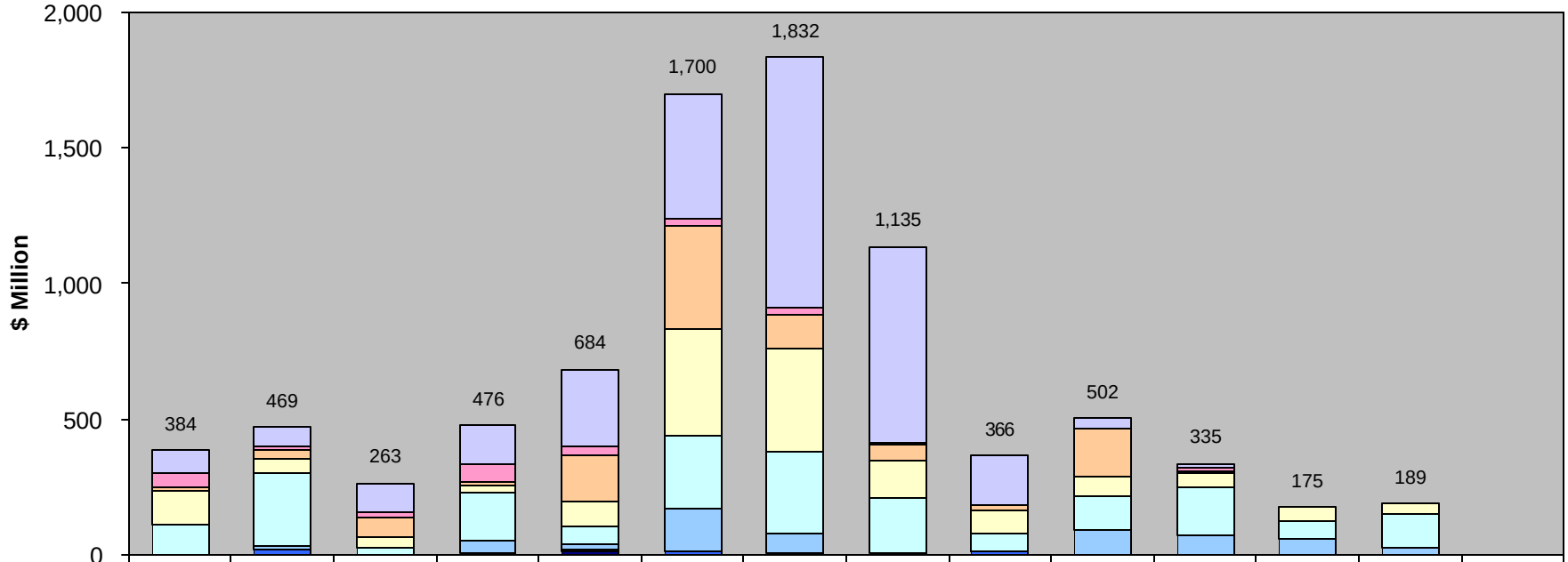
Exposure in # of Assets
By Earliest Quality Rating



	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Total
N/A	2,317	2,062	2,136	1,828	1,306	1,809	1,972	2,043	1,903	48	58	66	111	17,657
<B	162	149	140	127	106	102	122	149	150	68	81	86	66	1,505
B	130	138	302	354	251	231	170	168	201	204	206	195	177	2,725
BB	345	345	398	459	564	602	523	448	473	319	350	366	425	5,614
BBB	2,138	1,987	2,327	2,476	2,176	2,288	2,390	2,136	2,248	2,002	2,241	2,302	2,416	29,124
A	1,496	1,404	1,764	2,095	1,887	1,983	2,004	2,033	2,158	1,774	1,920	1,965	2,078	24,559
AA	779	785	908	924	848	849	805	815	1,006	461	523	530	570	9,800
AAA	375	370	445	438	494	511	454	520	858	175	211	251	332	5,430
Total	7,740	7,239	8,419	8,700	7,631	8,373	8,439	8,310	8,996	5,048	5,589	5,759	6,173	96,413

Experience Year

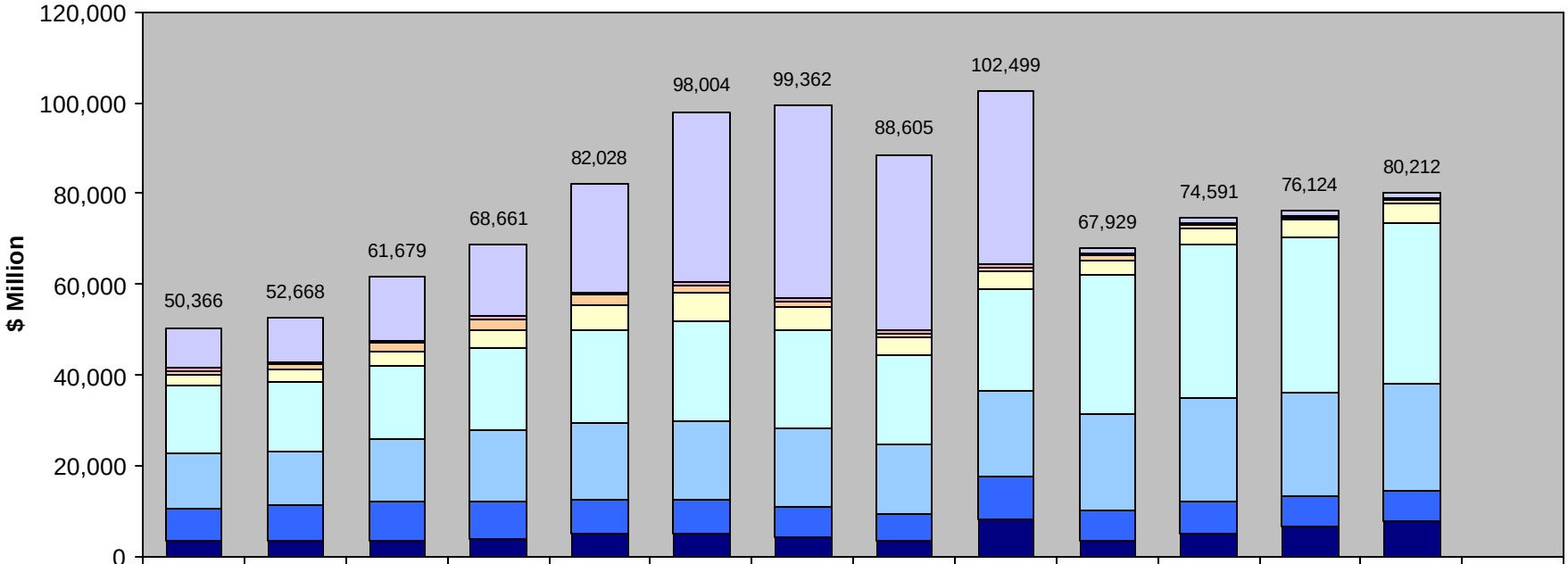
$ of Exposure Associated with Credit-Risk Events
By Earliest Quality Rating



	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Total
N/A	84	72	105	142	284	459	925	724	183	40	16	-	-	3,034
<B	53	13	23	66	32	31	26	4	-	-	12	-	-	260
B	14	32	69	13	174	382	118	62	19	173	7	-	-	1,064
BB	126	50	37	24	88	391	385	134	86	72	52	51	37	1,532
BBB	108	272	28	180	66	270	302	206	63	124	180	67	130	1,995
A	-	12	-	47	20	158	68	4	5	93	68	57	23	554
AA	-	18	-	4	5	10	6	-	10	-	-	-	-	53
AAA	-	-	-	-	15	-	3	-	-	-	-	-	-	18
Total	384	469	263	476	684	1,700	1,832	1,135	366	502	335	175	189	8,509

Experience Year

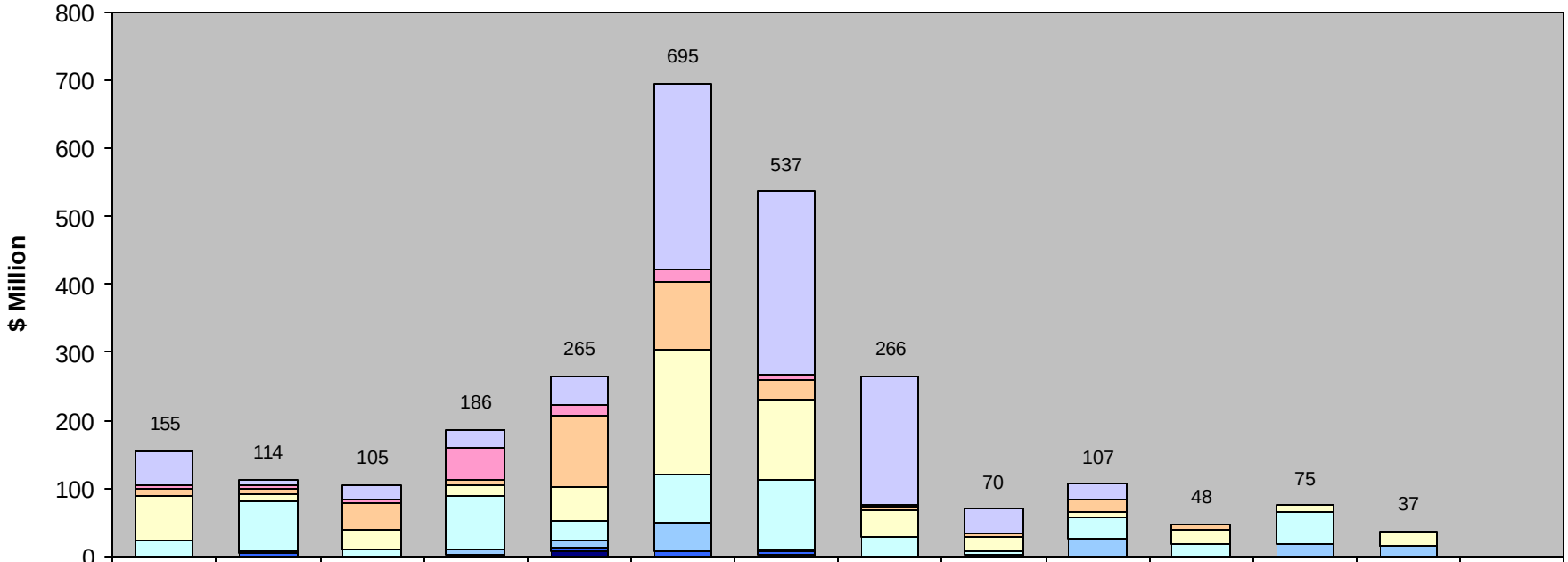
Exposure in $ of Assets
By Earliest Quality Rating



	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Total
N/A	8,775	9,787	13,957	15,676	23,652	37,606	42,525	38,695	38,014	1,099	1,060	909	1,304	233,059
<B	715	619	546	577	639	476	469	614	632	367	436	475	466	7,030
B	673	1,098	1,967	2,407	2,191	1,965	1,338	1,018	972	1,100	780	610	570	16,689
BB	2,452	2,683	3,132	3,922	5,609	6,117	5,095	3,886	3,897	3,396	3,570	3,834	4,317	51,910
BBB	15,082	15,418	16,198	18,032	20,437	21,896	21,745	19,478	22,557	30,438	33,860	34,028	35,295	304,465
A	11,877	11,836	13,646	15,707	16,781	17,490	17,383	15,393	18,674	21,357	22,562	22,834	23,604	229,145
AA	7,325	7,826	8,692	8,523	7,718	7,307	6,668	6,198	9,615	6,843	7,350	6,843	6,818	97,727
AAA	3,467	3,400	3,542	3,818	5,000	5,146	4,140	3,322	8,139	3,329	4,973	6,591	7,837	62,705
Total	50,366	52,668	61,679	68,661	82,028	98,004	99,362	88,605	102,499	67,929	74,591	76,124	80,212	1,002,729

Experience Year

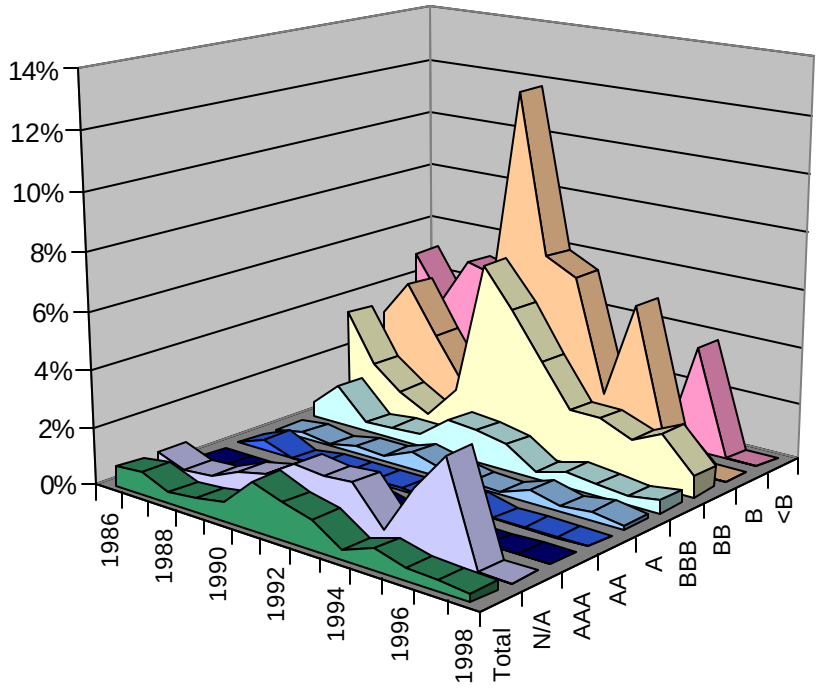
Economic Loss from Credit-Risk Events
By Earliest Quality Rating



	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Total
N/A	49.8	9.2	21.4	26.5	43.4	271.9	269.1	189.9	38.0	21.9	0.3			941.3
<B	6.7	4.7	6.6	46.0	14.6	18.7	8.2	1.3			1.5			108.3
B	8.7	8.0	39.4	10.3	106.7	99.2	29.7	7.5	5.3	20.5	6.1			341.4
BB	65.9	11.6	27.3	15.4	47.5	185.6	116.5	38.1	20.3	6.3	22.1	10.2	21.2	588.1
BBB	23.5	72.3	10.5	78.7	30.4	70.4	102.1	28.4	3.8	32.0	17.4	47.0	1.4	517.8
A		2.1		7.7	10.6	41.8	4.6	0.5	(0.2)	26.0	0.4	17.5	14.1	125.0
AA		6.0		1.8	3.8	7.5	5.4		3.2					27.7
AAA					8.2		1.2							9.5
Total	154.7	113.9	105.1	186.3	265.3	695.0	536.8	265.7	70.3	106.5	47.7	74.7	36.8	2,659.0

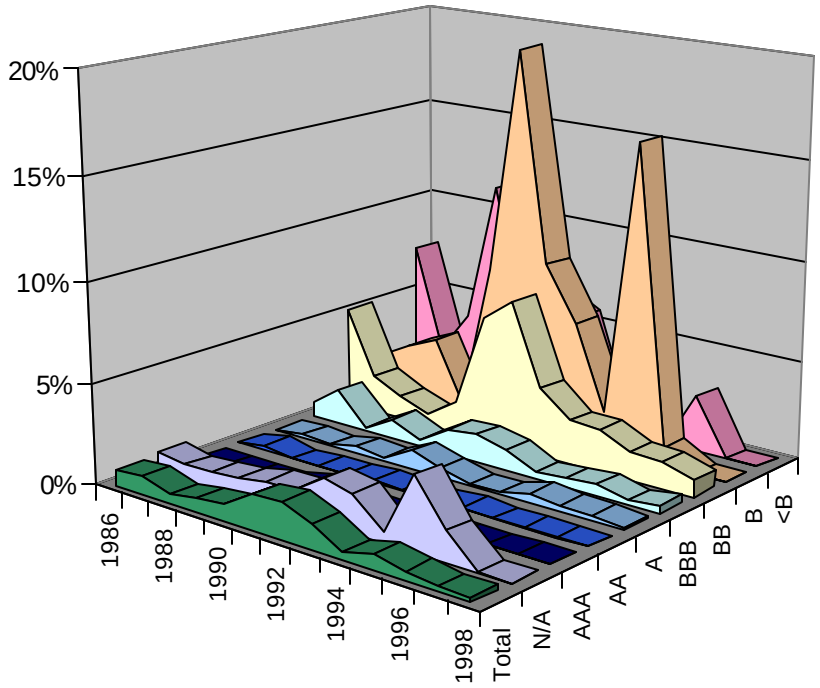
Experience Year

Incidence Rate by Number
By Year by Earliest Quality Rating



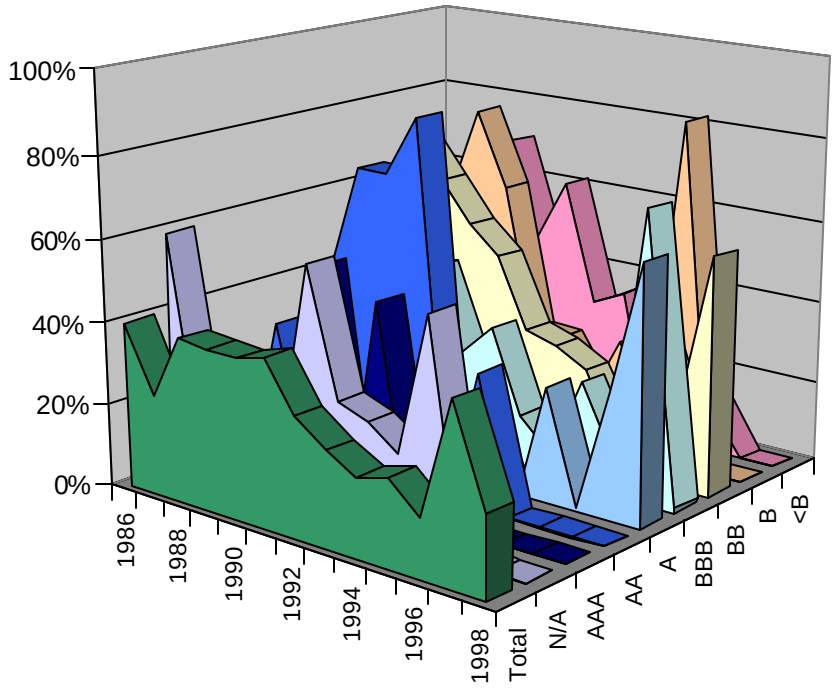
	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Total	0.67%	0.79%	0.42%	0.49%	0.66%	1.67%	1.26%	0.99%	0.32%	0.69%	0.43%	0.33%	0.28%
N/A	0.69%	0.34%	0.42%	0.88%	1.07%	1.71%	1.62%	1.66%	0.42%	2.08%	3.45%		
AAA					0.20%		0.22%						
AA		0.38%		0.11%	0.12%	0.12%	0.12%		0.20%				
A		0.14%		0.19%	0.16%	0.55%	0.30%	0.10%	0.05%	0.39%	0.16%	0.31%	0.14%
BBB	0.56%	1.41%	0.30%	0.40%	0.41%	1.22%	1.13%	0.89%	0.22%	0.50%	0.40%	0.26%	0.46%
BB	3.48%	1.74%	1.01%	0.44%	1.60%	6.32%	4.97%	3.35%	1.90%	1.88%	1.43%	1.91%	0.71%
B	3.09%	4.35%	2.65%	1.13%	4.38%	12.12%	6.49%	5.95%	2.00%	5.39%	0.97%		
<B	4.95%	3.36%	5.02%	4.72%	1.89%	2.96%	1.64%	1.35%			3.70%		

Incidence Rate by Amount
By Year by Earliest Quality Rating



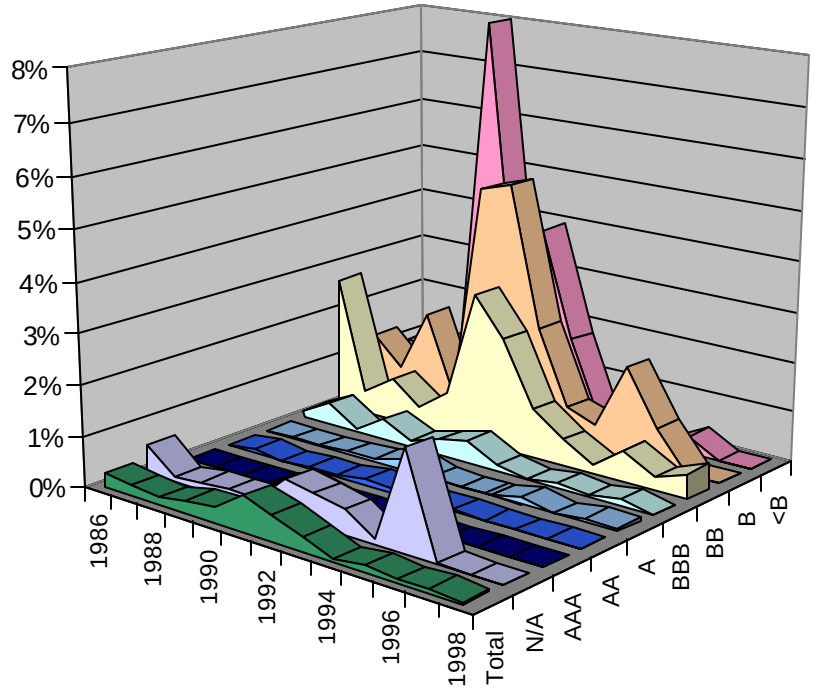
	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Total	0.76%	0.89%	0.43%	0.69%	0.83%	1.73%	1.84%	1.28%	0.36%	0.74%	0.45%	0.23%	0.24%
N/A	0.96%	0.74%	0.75%	0.91%	1.20%	1.22%	2.17%	1.87%	0.48%	3.64%	1.48%		
AAA					0.30%		0.06%						
AA		0.24%		0.04%	0.06%	0.14%	0.09%		0.10%				
A		0.10%		0.30%	0.12%	0.90%	0.39%	0.03%	0.03%	0.43%	0.30%	0.25%	0.10%
BBB	0.72%	1.76%	0.18%	1.00%	0.32%	1.24%	1.39%	1.06%	0.28%	0.41%	0.53%	0.20%	0.37%
BB	5.12%	1.85%	1.18%	0.61%	1.56%	6.39%	7.56%	3.46%	2.21%	2.13%	1.45%	1.33%	0.85%
B	2.02%	2.87%	3.52%	0.54%	7.96%	19.42%	8.85%	6.10%	1.96%	15.76%	0.92%		
<B	7.35%	2.16%	4.29%	11.44%	4.95%	6.42%	5.55%	0.61%			2.85%		

Loss Severity
By Year by Earliest Quality Rating



	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Total	40%	24%	40%	39%	39%	41%	29%	23%	19%	21%	14%	43%	19%
N/A	59%	13%	20%	19%	15%	59%	29%	26%	21%	55%	2%		
AAA					55%		49%						
AA		33%		49%	75%	75%	89%		33%				
A		17%		17%	53%	26%	7%	12%	-5%	28%	1%	31%	62%
BBB	22%	27%	37%	44%	46%	26%	34%	14%	6%	26%	10%	70%	1%
BB	52%	23%	74%	64%	54%	47%	30%	28%	24%	9%	43%	20%	58%
B	64%	25%	57%	79%	61%	26%	25%	12%	28%	12%	85%		
<B	13%	35%	28%	70%	46%	61%	32%	36%			12%		

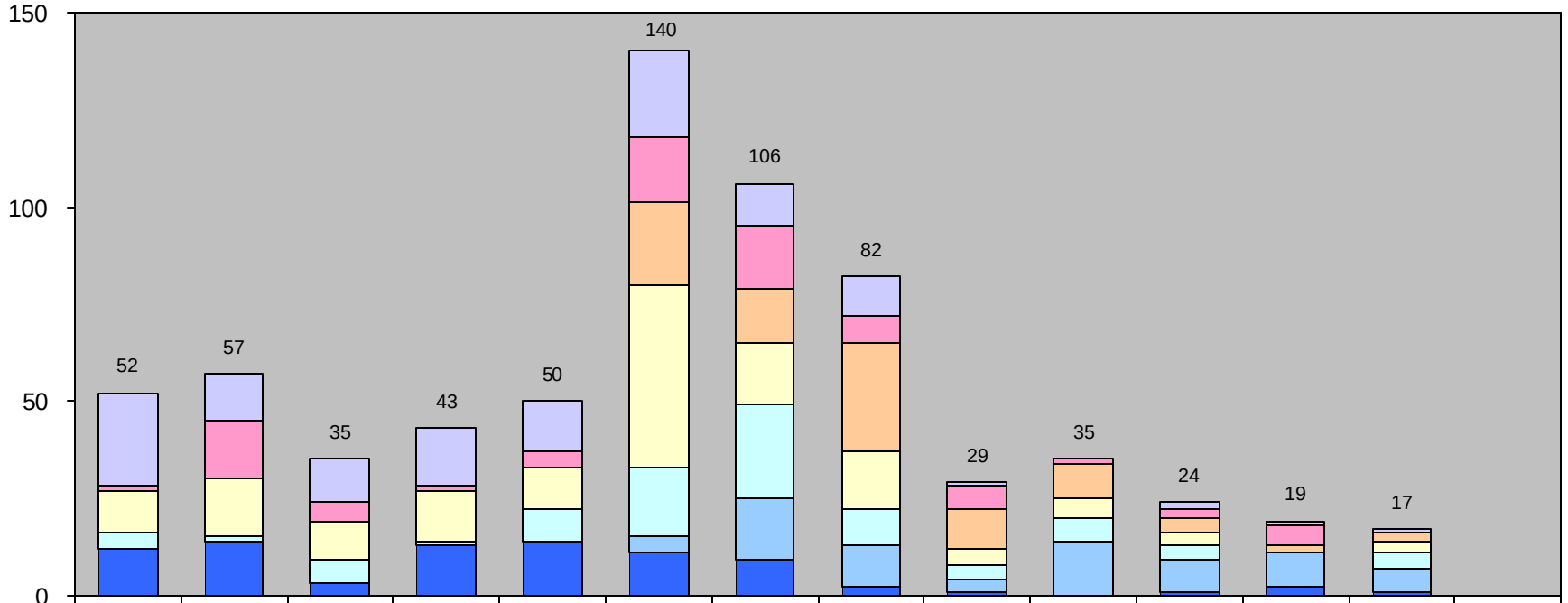
Economic Loss Rate as % of Exposure
By Year by Earliest Quality Rating



	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Total	0.31%	0.22%	0.17%	0.27%	0.32%	0.71%	0.54%	0.30%	0.07%	0.16%	0.06%	0.10%	0.05%
N/A	0.57%	0.09%	0.15%	0.17%	0.18%	0.72%	0.63%	0.49%	0.10%	1.99%	0.03%		
AAA					0.16%		0.03%						
AA		0.08%		0.02%	0.05%	0.10%	0.08%		0.03%				
A		0.02%		0.05%	0.06%	0.24%	0.03%	0.00%	0.00%	0.12%	0.00%	0.08%	0.06%
BBB	0.16%	0.47%	0.06%	0.44%	0.15%	0.32%	0.47%	0.15%	0.02%	0.10%	0.05%	0.14%	0.00%
BB	2.69%	0.43%	0.87%	0.39%	0.85%	3.03%	2.29%	0.98%	0.52%	0.18%	0.62%	0.27%	0.49%
B	1.29%	0.73%	2.00%	0.43%	4.87%	5.05%	2.22%	0.74%	0.55%	1.87%	0.78%		
<B	0.94%	0.75%	1.21%	7.97%	2.29%	3.92%	1.75%	0.22%			0.34%		

Most Recent NAIC Rating

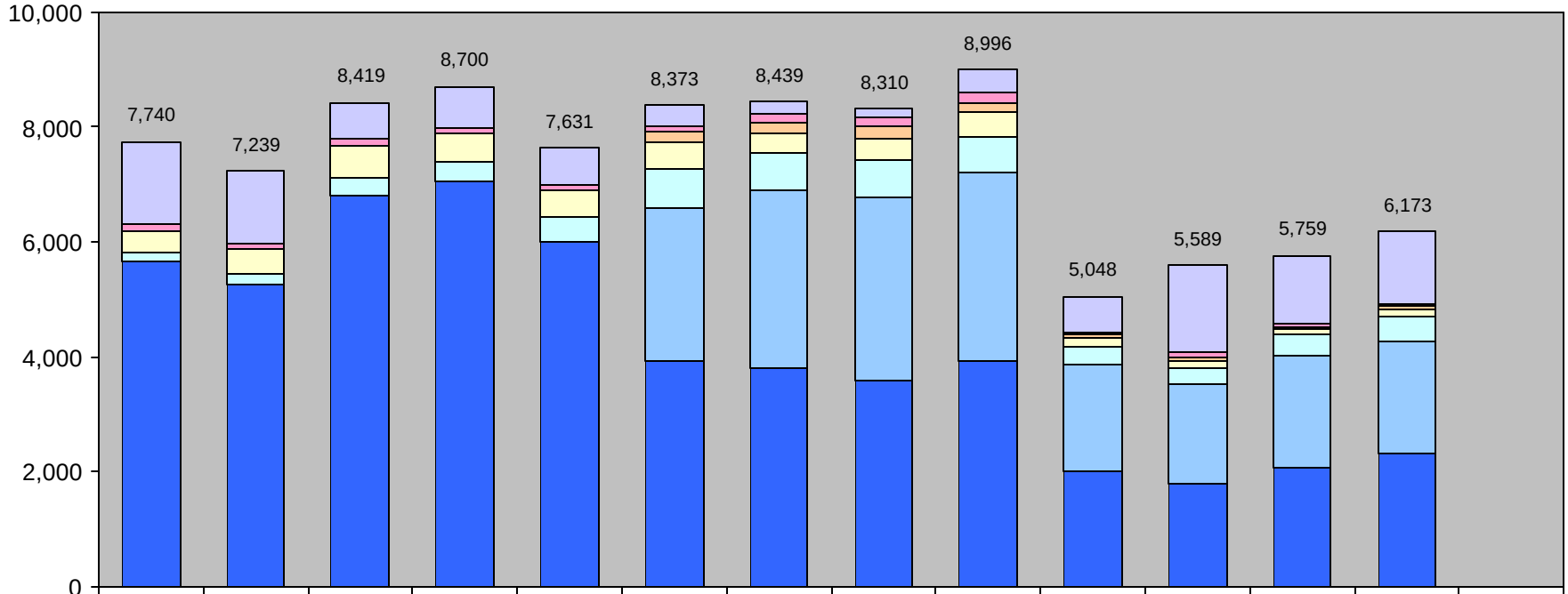
of Credit-Risk Events
By NAIC Rating



	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Total
N/A	24	12	11	15	13	22	11	10	1	-	2	1	1	123
6 (No)	1	15	5	1	4	17	16	7	6	1	2	5	-	80
5						21	14	28	10	9	4	2	2	90
4 (No**)	11	15	10	13	11	47	16	15	4	5	3	-	3	153
3 (No*)	4	1	6	1	8	18	24	9	4	6	4	-	4	89
2						4	16	11	3	14	8	9	6	71
1 (Yes)	12	14	3	13	14	11	9	2	1	-	1	2	1	83
Total	52	57	35	43	50	140	106	82	29	35	24	19	17	689

Experience Year

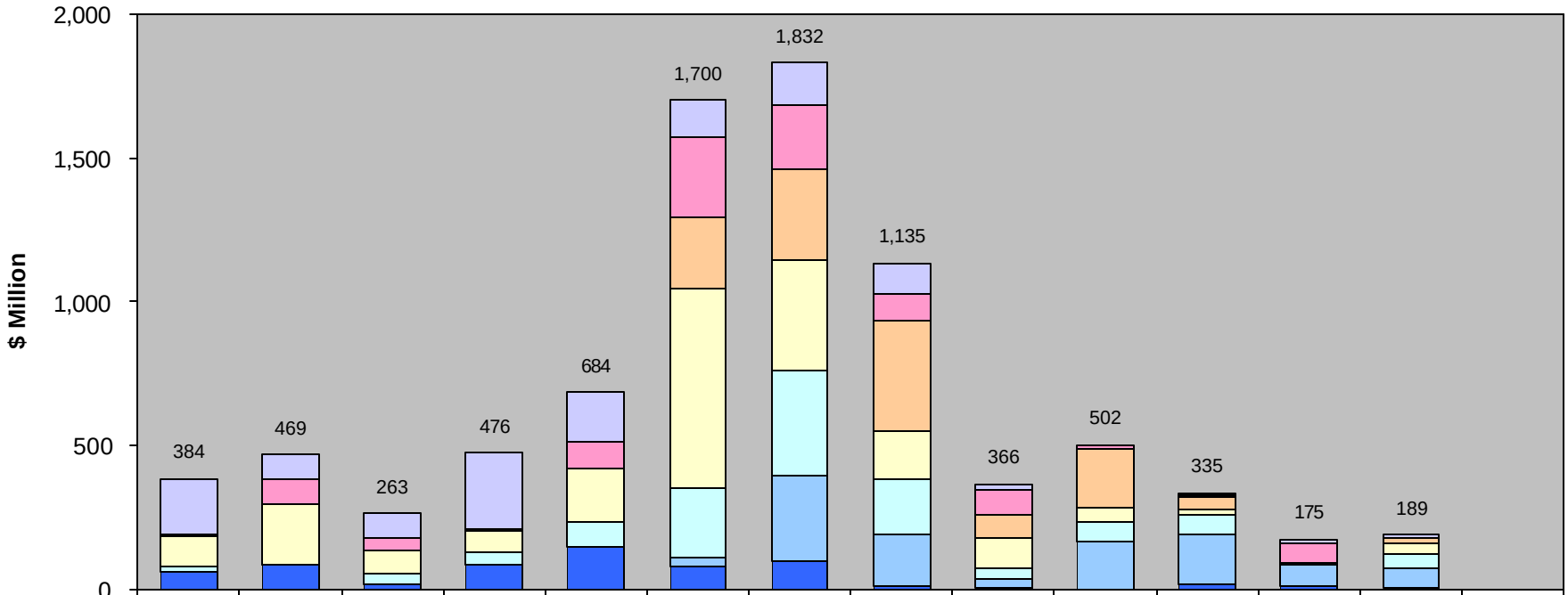
Exposure in # of Assets
By NAIC Rating



	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Total
N/A	1,436	1,270	628	726	638	354	215	129	395	636	1,522	1,169	1,244	10,360
6 (No)	106	107	111	93	86	98	140	170	170	30	90	68	53	1,320
5						192	183	211	177	52	50	52	41	957
4 (No**)	384	429	555	482	483	446	360	383	419	143	112	87	121	4,401
3 (No*)	169	186	326	347	441	685	661	650	642	327	296	380	437	5,543
2						2,665	3,083	3,184	3,274	1,858	1,740	1,938	1,967	19,707
1 (Yes)	5,645	5,248	6,800	7,052	5,984	3,935	3,799	3,586	3,921	2,003	1,780	2,066	2,311	54,127
Total	7,740	7,239	8,419	8,700	7,631	8,373	8,439	8,310	8,996	5,048	5,589	5,759	6,173	96,413

Experience Year

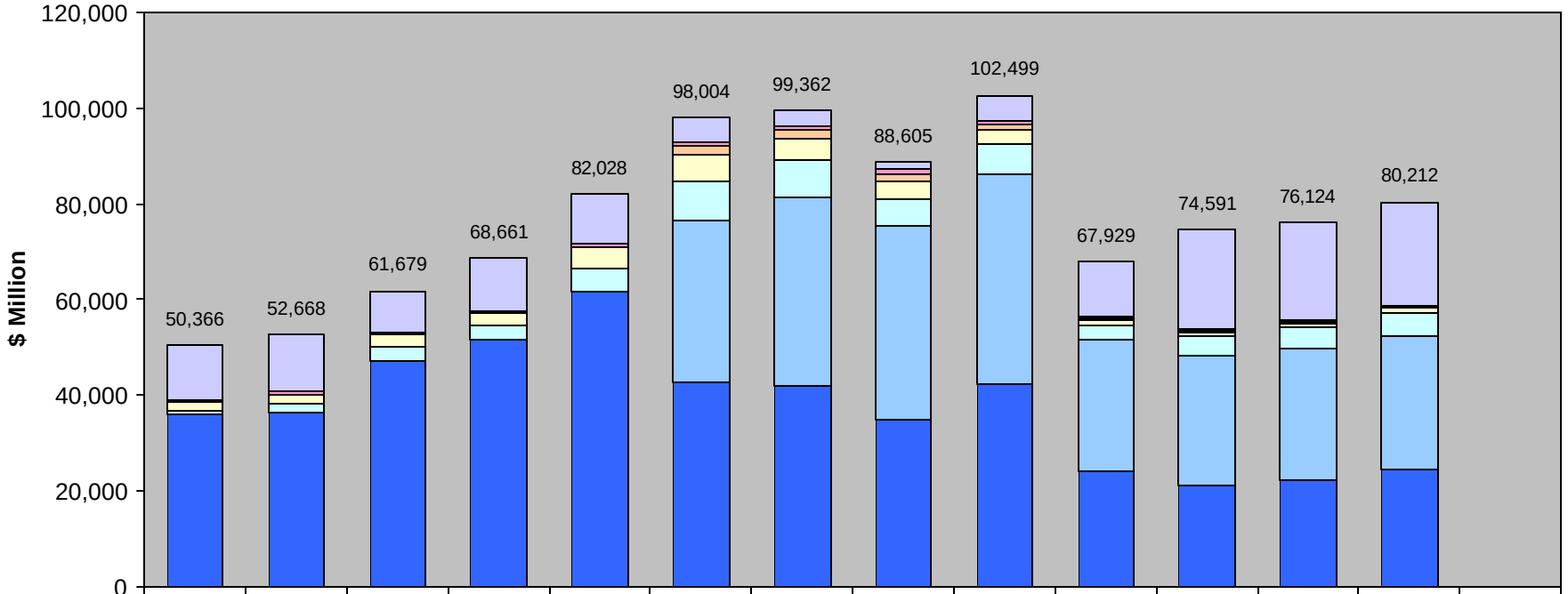
$ of Exposure Associated with Credit-Risk Events
By NAIC Rating



	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Total
N/A	195	85	81	266	169	130	151	110	23	-	7	17	9	1,244
6 (No)	6	88	44	4	98	280	222	92	85	15	8	68	-	1,010
5	-	-	-	-	-	244	312	379	81	202	43	6	22	1,288
4 (No**)	104	207	80	79	185	694	389	169	106	50	19	-	37	2,118
3 (No*)	16	3	37	40	83	244	365	194	35	68	67	-	46	1,198
2	-	-	-	-	-	34	296	179	33	168	171	73	68	1,021
1 (Yes)	63	85	20	86	149	77	97	11	3	-	20	11	8	630
Total	384	469	263	476	684	1,700	1,832	1,135	366	502	335	175	189	8,509

Experience Year

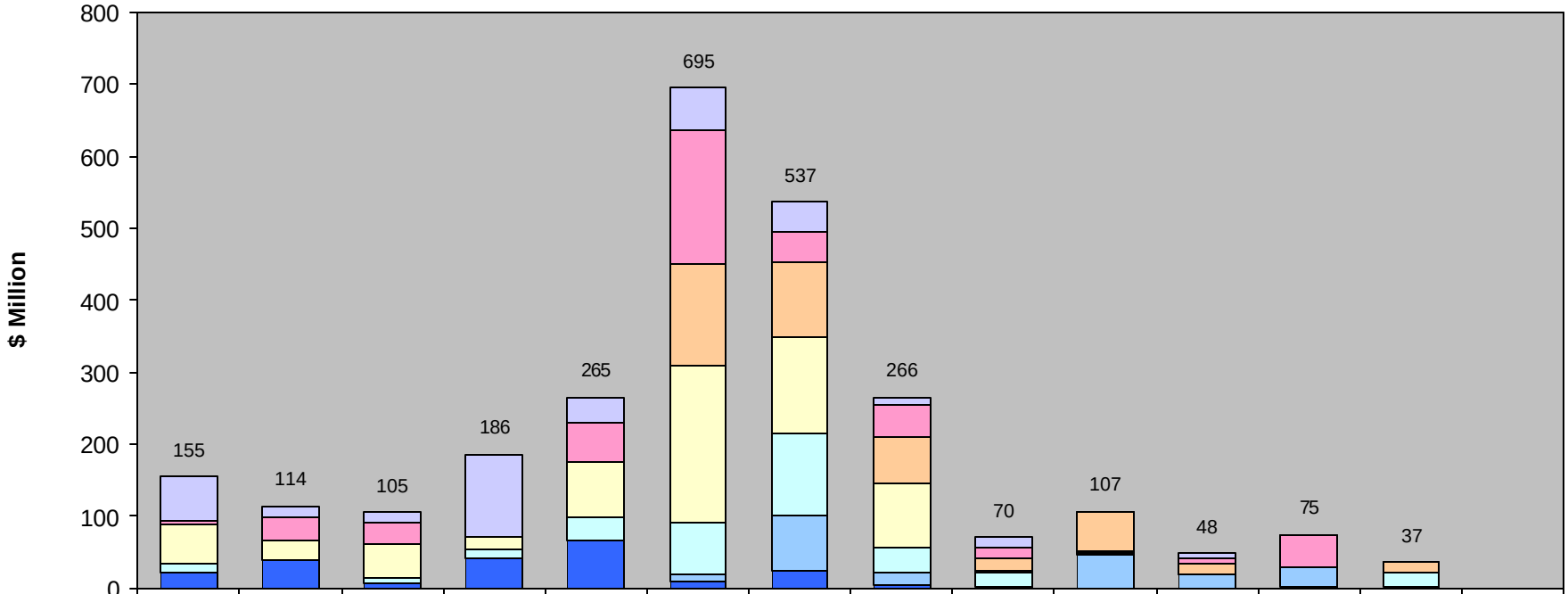
Exposure in $ of Assets
By NAIC Rating



	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Total
N/A	11,291	12,052	8,448	11,304	10,458	5,080	3,051	1,495	5,423	11,698	20,861	20,594	21,651	143,404
6 (No)	518	395	353	236	541	708	815	828	636	73	431	309	193	6,035
5						2,066	1,854	1,752	1,194	512	216	215	220	8,029
4 (No**)	1,806	2,181	2,833	2,716	4,585	5,480	4,582	3,502	2,869	951	848	921	1,172	34,447
3 (No*)	872	1,681	2,907	2,778	4,843	8,175	7,597	5,808	6,290	3,252	4,106	4,312	4,768	57,390
2						33,998	39,710	40,380	44,004	27,185	27,133	27,529	27,641	267,580
1 (Yes)	35,879	36,359	47,136	51,626	61,602	42,496	41,753	34,840	42,083	24,259	20,997	22,245	24,568	485,844
Total	50,366	52,668	61,679	68,661	82,028	98,004	99,362	88,605	102,499	67,929	74,591	76,124	80,212	1,002,729

Experience Year

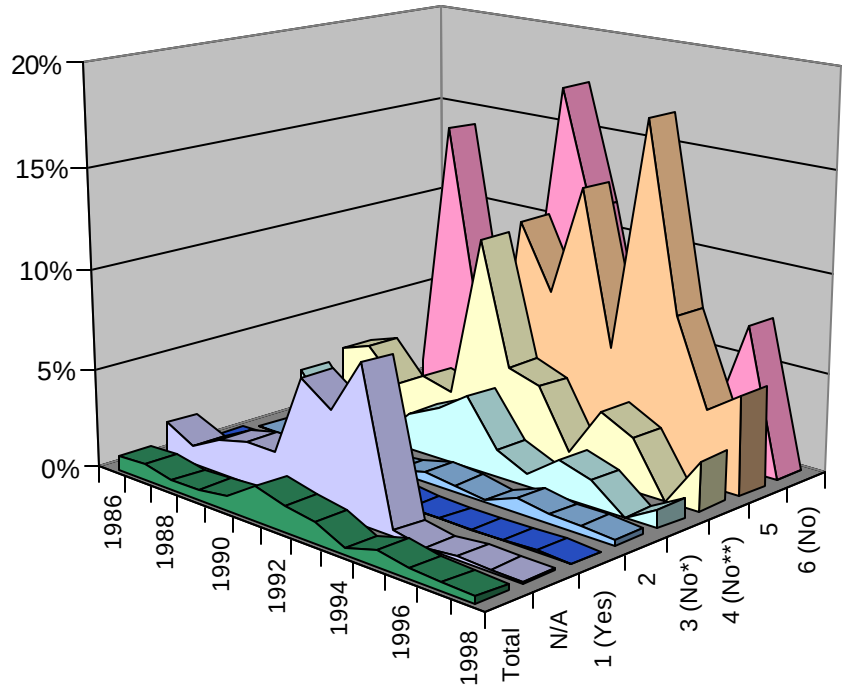
Economic Loss from Credit-Risk Events
By NAIC Rating



	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Total
N/A	62.0	14.5	14.3	114.5	36.4	58.9	42.7	9.9	13.4	-	6.1	0.4	0.7	373.6
6 (No)	3.3	34.2	29.3	1.8	53.3	185.3	42.6	45.3	15.7	1.7	6.7	44.3	-	463.5
5	-	-	-	-	-	141.3	103.8	64.7	16.5	53.2	15.9	0.8	14.1	410.3
4 (No**)	54.5	26.8	47.9	15.0	77.7	219.4	133.3	89.5	4.2	2.9	1.0	-	(0.2)	671.9
3 (No*)	12.2	(0.1)	7.1	13.9	32.5	70.6	112.8	33.6	18.3	3.2	(0.1)	-	20.7	324.7
2	-	-	-	-	-	9.5	77.3	19.1	2.4	45.6	17.4	26.6	0.9	198.8
1 (Yes)	22.7	38.5	6.6	41.2	65.3	10.1	24.2	3.7	(0.1)	-	0.8	2.6	0.7	216.2
Total	154.7	113.9	105.1	186.3	265.3	695.0	536.8	265.7	70.3	106.6	47.7	74.7	36.8	2,659.0

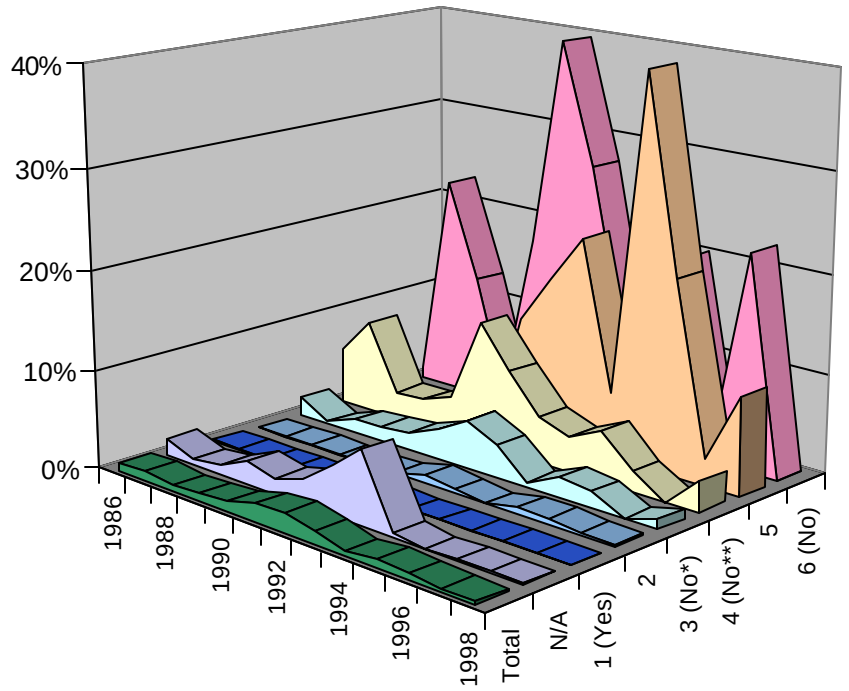
Experience Year

Incidence Rate by Number
By Year by NAIC Rating



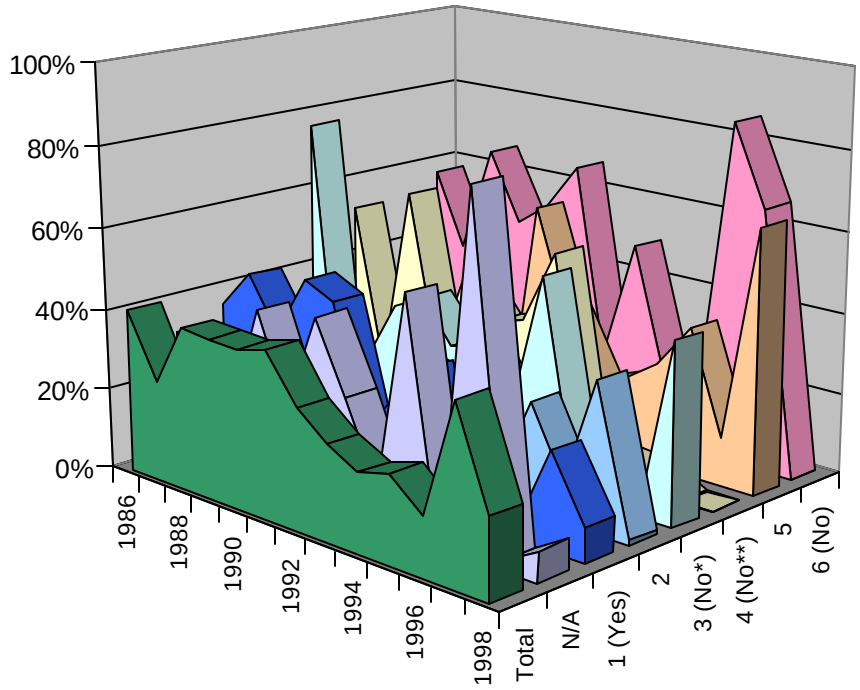
	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Total	0.67%	0.79%	0.42%	0.49%	0.66%	1.67%	1.26%	0.99%	0.32%	0.69%	0.43%	0.33%	0.28%
N/A	1.67%	0.95%	1.75%	2.07%	2.04%	6.21%	5.12%	7.78%	0.25%		0.13%	0.09%	0.08%
1 (Yes)	0.21%	0.27%	0.04%	0.18%	0.23%	0.28%	0.24%	0.06%	0.03%		0.06%	0.10%	0.04%
2						0.15%	0.52%	0.35%	0.09%	0.75%	0.46%	0.46%	0.31%
3 (No*)	2.37%	0.54%	1.84%	0.29%	1.81%	2.63%	3.63%	1.39%	0.62%	1.83%	1.35%		0.92%
4 (No**)	2.86%	3.50%	1.80%	2.70%	2.28%	10.55%	4.45%	3.92%	0.96%	3.50%	2.69%		2.48%
5						10.97%	7.67%	13.27%	5.65%	17.31%	8.00%	3.85%	4.94%
6 (No)	0.94%	14.08%	4.52%	1.08%	4.65%	17.35%	11.43%	4.13%	3.54%	3.39%	2.22%	7.35%	

Incidence Rate by Amount
By Year by NAIC Rating



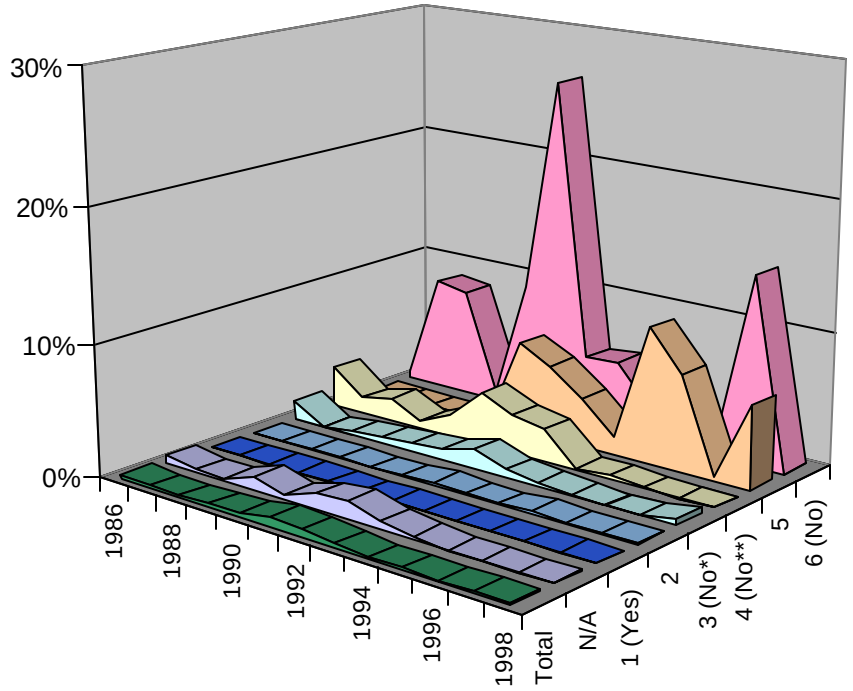
	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Total	0.76%	0.89%	0.43%	0.69%	0.83%	1.73%	1.84%	1.28%	0.36%	0.74%	0.45%	0.23%	0.24%
N/A	1.73%	0.71%	0.96%	2.36%	1.61%	2.55%	4.94%	7.38%	0.43%		0.03%	0.08%	0.04%
1 (Yes)	0.18%	0.23%	0.04%	0.17%	0.24%	0.18%	0.23%	0.03%	0.01%		0.10%	0.05%	0.03%
2						0.10%	0.75%	0.44%	0.08%	0.62%	0.63%	0.26%	0.24%
3 (No*)	1.82%	0.19%	1.27%	1.44%	1.72%	2.98%	4.80%	3.35%	0.56%	2.08%	1.62%		0.97%
4 (No**)	5.78%	9.49%	2.83%	2.92%	4.04%	12.66%	8.49%	4.82%	3.68%	5.24%	2.20%		3.13%
5						11.79%	16.83%	21.63%	6.75%	39.53%	19.81%	2.89%	9.87%
6 (No)	1.11%	22.37%	12.58%	1.57%	18.14%	39.48%	27.23%	11.15%	13.40%	19.98%	1.84%	21.96%	

Loss Severity
By Year by NAIC Rating



	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Total	40%	24%	40%	39%	39%	41%	29%	23%	19%	21%	14%	43%	19%
N/A	32%	17%	18%	43%	22%	45%	28%	9%	57%		85%	2%	7%
1 (Yes)	36%	45%	33%	48%	44%	13%	25%	34%	-4%		4%	24%	9%
2						28%	26%	11%	7%	27%	10%	37%	1%
3 (No*)	76%	-3%	19%	35%	39%	29%	31%	17%	52%	5%	0%		45%
4 (No**)	52%	13%	60%	19%	42%	32%	34%	53%	4%	6%	5%		-1%
5						58%	33%	17%	20%	26%	37%	12%	65%
6 (No)	57%	39%	66%	49%	54%	66%	19%	49%	18%	12%	85%	65%	

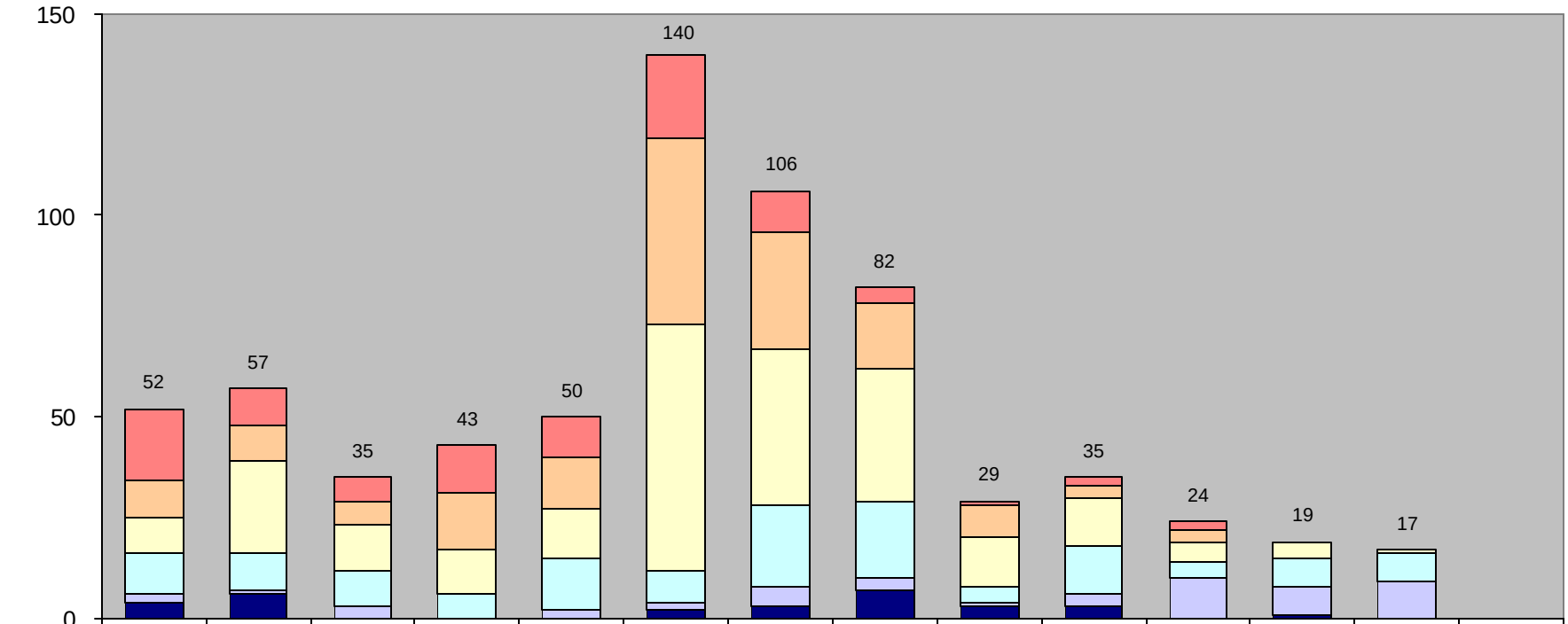
Economic Loss Rate as % of Exposure
By Year by NAIC Rating



	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Total	0.31%	0.22%	0.17%	0.27%	0.32%	0.71%	0.54%	0.30%	0.07%	0.16%	0.06%	0.10%	0.05%
N/A	0.55%	0.12%	0.17%	1.01%	0.35%	1.16%	1.40%	0.66%	0.25%		0.03%	0.00%	0.00%
1 (Yes)	0.06%	0.11%	0.01%	0.08%	0.11%	0.02%	0.06%	0.01%	0.00%		0.00%	0.01%	0.00%
2						0.03%	0.19%	0.05%	0.01%	0.17%	0.06%	0.10%	0.00%
3 (No*)	1.39%	-0.01%	0.24%	0.50%	0.67%	0.86%	1.48%	0.58%	0.29%	0.10%	0.00%		0.43%
4 (No**)	3.02%	1.23%	1.69%	0.55%	1.70%	4.00%	2.91%	2.56%	0.15%	0.30%	0.11%		-0.02%
5						6.84%	5.60%	3.69%	1.38%	10.39%	7.37%	0.35%	6.43%
6 (No)	0.64%	8.66%	8.29%	0.77%	9.87%	26.17%	5.23%	5.47%	2.46%	2.32%	1.56%	14.34%	

Coupon Rate

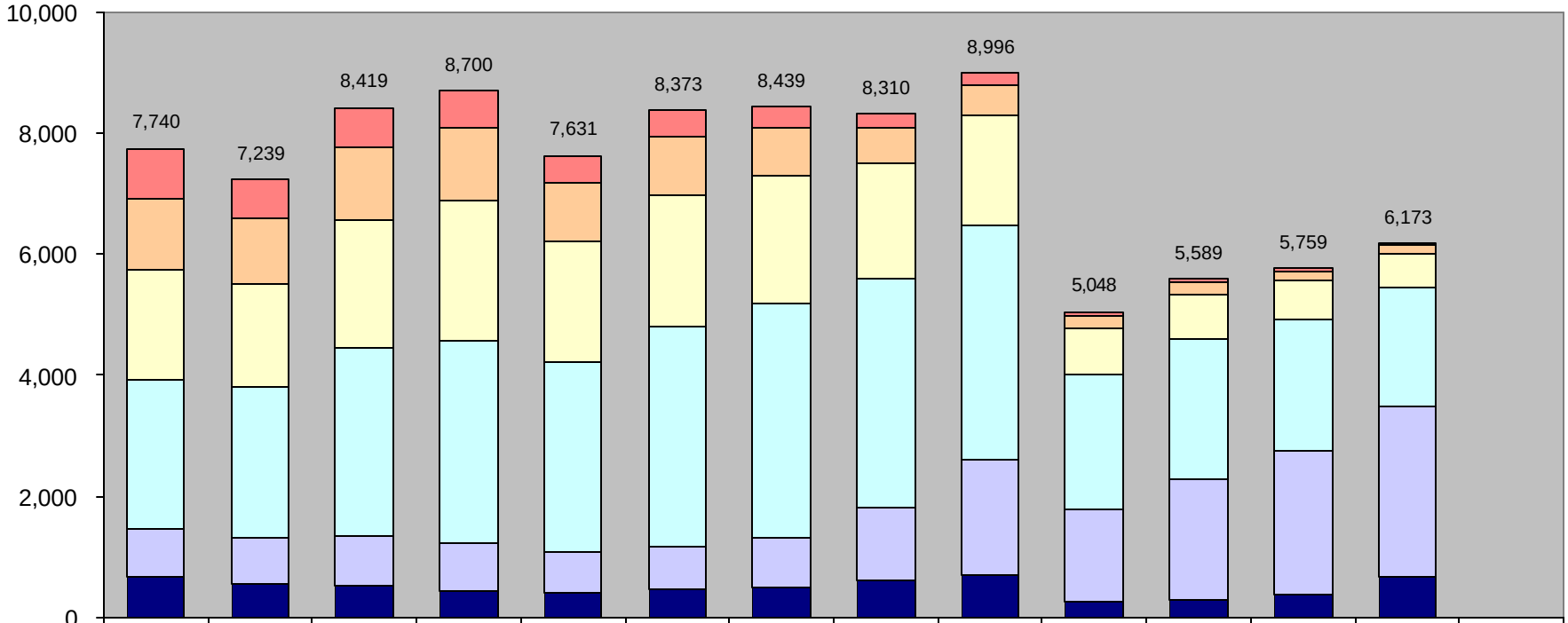
of Credt-Risk Events
By Coupon Rate



	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Total
14%+	18	9	6	12	10	21	10	4	1	2	2	-	-	95
12-14%	9	9	6	14	13	46	29	16	8	3	3	-	-	156
10-12%	9	23	11	11	12	61	39	33	12	12	5	4	1	233
8-10%	10	9	9	6	13	8	20	19	4	12	4	7	7	128
6-8%	2	1	3	-	2	2	5	3	1	3	10	7	9	48
0-6%	4	6	-	-	-	2	3	7	3	3	-	1	-	29
Total	52	57	35	43	50	140	106	82	29	35	24	19	17	689

Experience Year

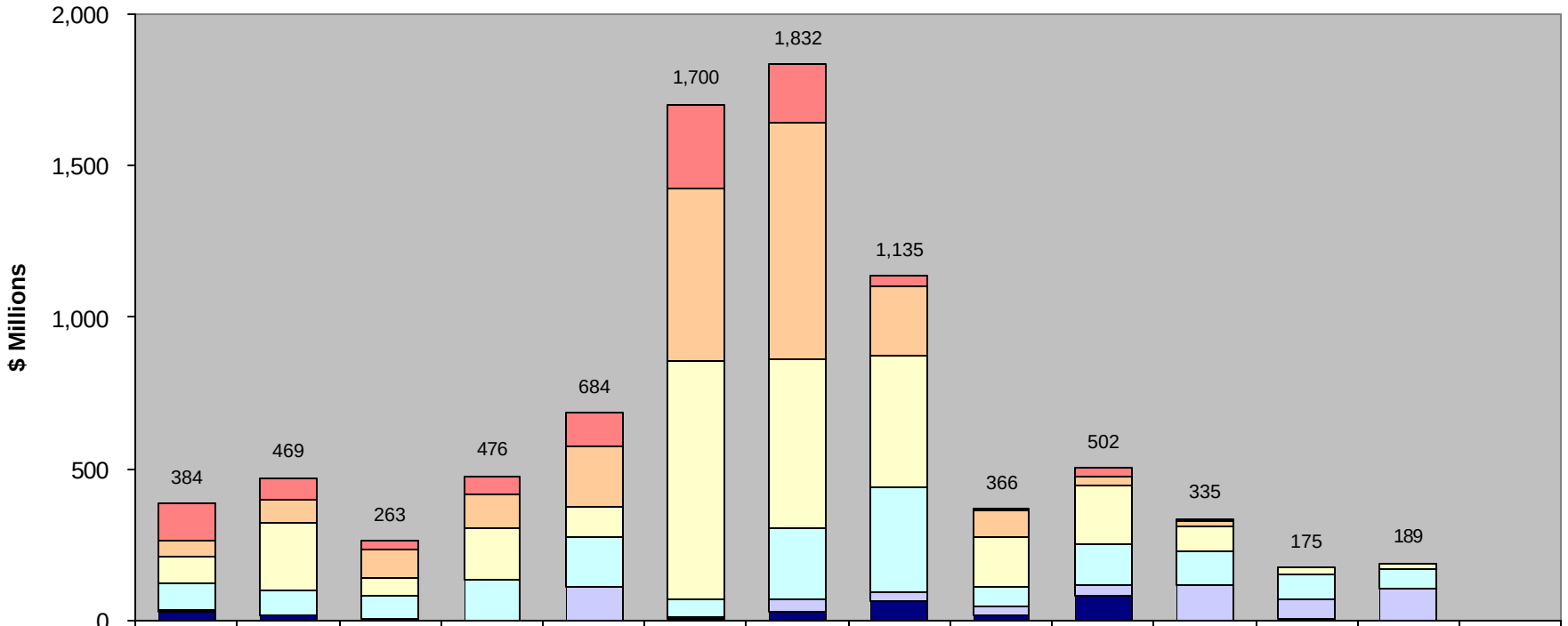
Exposure in # of Assets
By Coupon Rate



	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Total
14%+	822	662	647	610	464	435	351	234	199	74	64	47	34	4,641
12-14%	1,162	1,069	1,225	1,214	969	956	807	590	500	200	184	151	126	9,150
10-12%	1,839	1,700	2,111	2,319	1,971	2,164	2,099	1,907	1,822	756	730	648	555	20,618
8-10%	2,467	2,509	3,089	3,337	3,154	3,652	3,878	3,771	3,874	2,235	2,324	2,167	1,983	38,437
6-8%	796	749	820	790	676	700	827	1,208	1,918	1,516	1,991	2,366	2,798	17,153
0-6%	654	551	529	432	398	467	479	602	684	269	297	381	677	6,415
Total	7,740	7,239	8,419	8,700	7,631	8,373	8,439	8,310	8,996	5,048	5,589	5,759	6,173	96,413

Experience Year

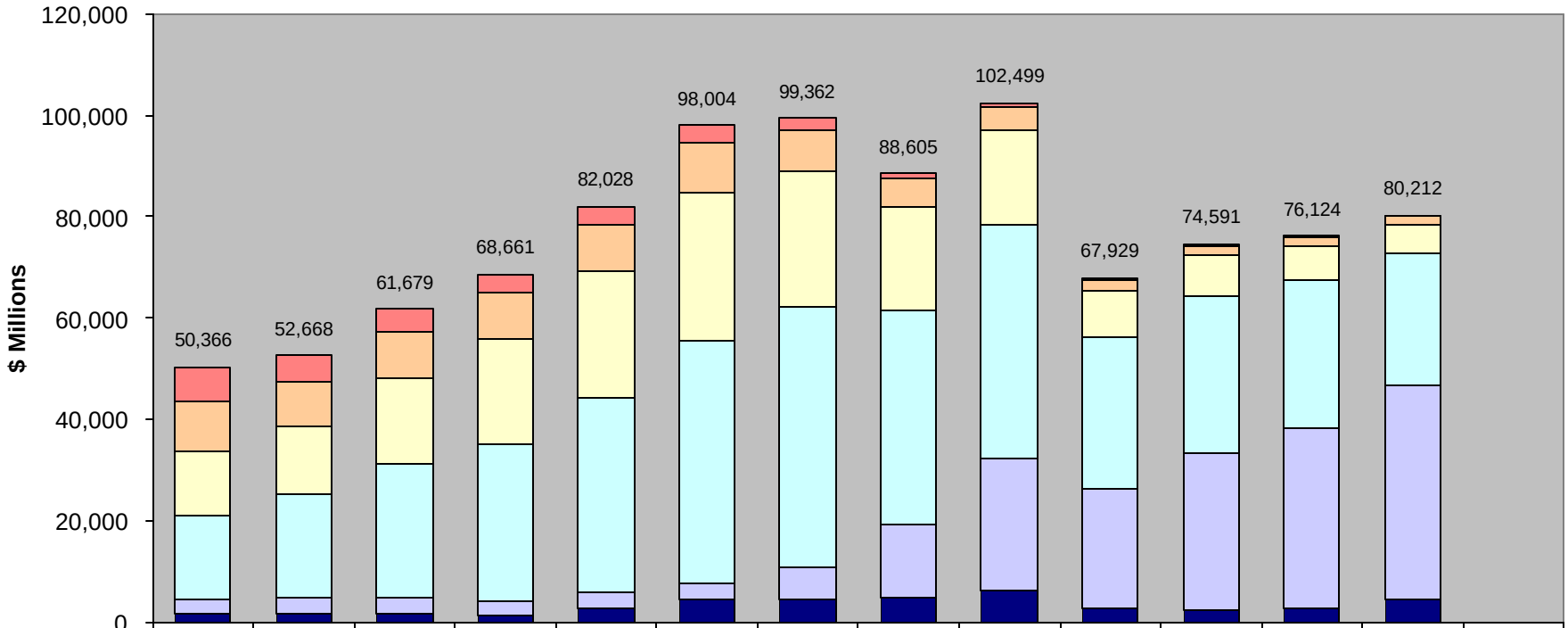
$ of Exposure Associated with Credt-Risk Events
By Coupon Rate



	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Total
14%+	119	73	30	58	108	275	191	34	5	31	9	-	-	934
12-14%	53	75	95	113	201	571	781	228	84	24	17	-	-	2,243
10-12%	92	221	54	172	98	786	556	431	168	199	79	22	20	2,897
8-10%	87	82	78	132	164	60	236	350	62	132	116	83	66	1,647
6-8%	7	3	6	-	113	6	44	26	31	37	114	68	103	556
0-6%	26	15	-	-	-	2	25	65	17	80	-	2	-	232
Total	384	469	263	476	684	1,700	1,832	1,135	366	502	335	175	189	8,509

Experience Year

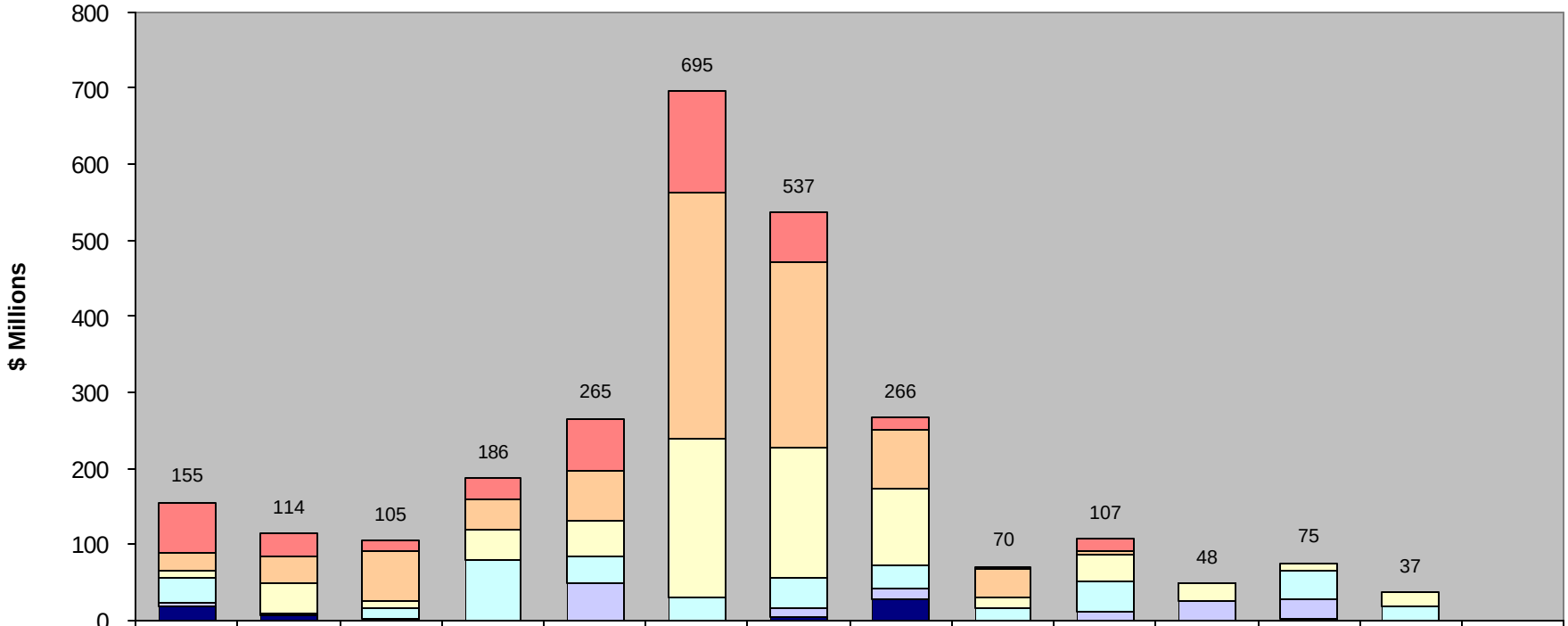
Exposure in $ of Assets
By Coupon Rate



	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Total
14%+	6,757	5,116	4,306	3,730	3,633	3,413	2,212	1,246	979	362	269	200	195	32,417
12-14%	9,881	9,039	9,389	9,146	9,129	9,822	8,017	5,336	4,416	2,307	2,059	1,872	1,587	82,000
10-12%	12,556	13,294	16,805	20,656	24,880	29,118	26,846	20,574	18,857	9,083	8,067	6,691	5,604	213,031
8-10%	16,685	20,472	26,248	30,890	38,509	48,032	51,346	42,158	45,834	29,807	30,928	28,965	26,118	435,993
6-8%	2,967	3,193	3,409	3,042	3,060	3,174	6,327	14,523	26,066	23,596	30,777	35,550	42,206	197,892
0-6%	1,519	1,554	1,522	1,197	2,817	4,444	4,614	4,768	6,346	2,774	2,491	2,846	4,503	41,397
Total	50,366	52,668	61,679	68,661	82,028	98,004	99,362	88,605	102,499	67,929	74,591	76,124	80,212	1,002,729

Experience Year

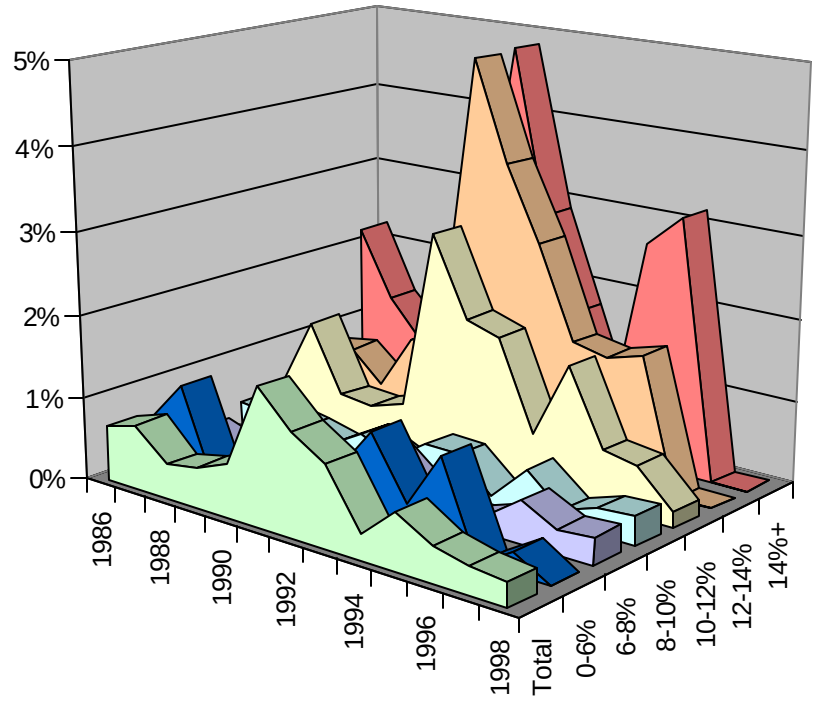
Economic Loss from Credit-Risk Events
By Coupon Rate



	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Total
14%+	66.2	30.9	14.6	27.8	69.7	133.8	66.3	15.5	2.1	15.1	0.7	-	-	442.8
12-14%	24.3	34.3	65.8	39.6	64.0	323.5	244.4	77.3	39.2	5.1	0.6	-	-	918.1
10-12%	9.4	40.9	8.2	40.6	46.9	208.9	170.4	100.5	13.5	36.2	22.7	10.0	19.9	728.2
8-10%	32.8	1.7	15.9	78.2	37.0	28.7	40.1	31.1	15.1	38.3	(1.5)	36.9	18.0	372.3
6-8%	4.6	0.1	0.7	-	47.8	0.3	12.1	14.2	0.5	11.8	25.3	27.1	(1.1)	143.3
0-6%	17.3	6.0	-	-	-	(0.2)	3.5	27.2	(0.1)	-	-	0.7	-	54.4
Total	154.7	113.9	105.1	186.3	265.3	695.0	536.8	265.7	70.3	106.5	47.7	74.7	36.8	2,659.0

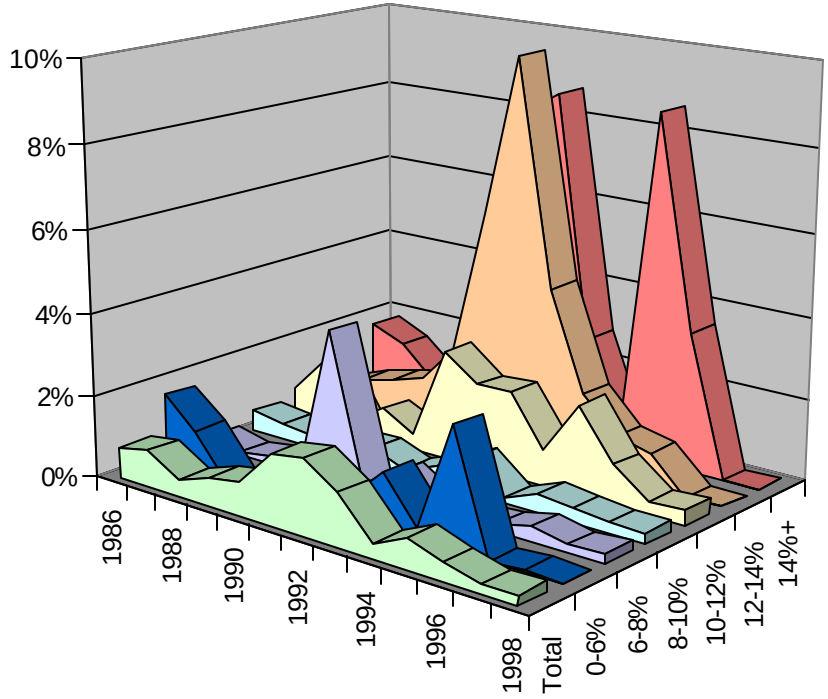
Experience Year

Incidence Rate by Number
By Year by Coupon Rate

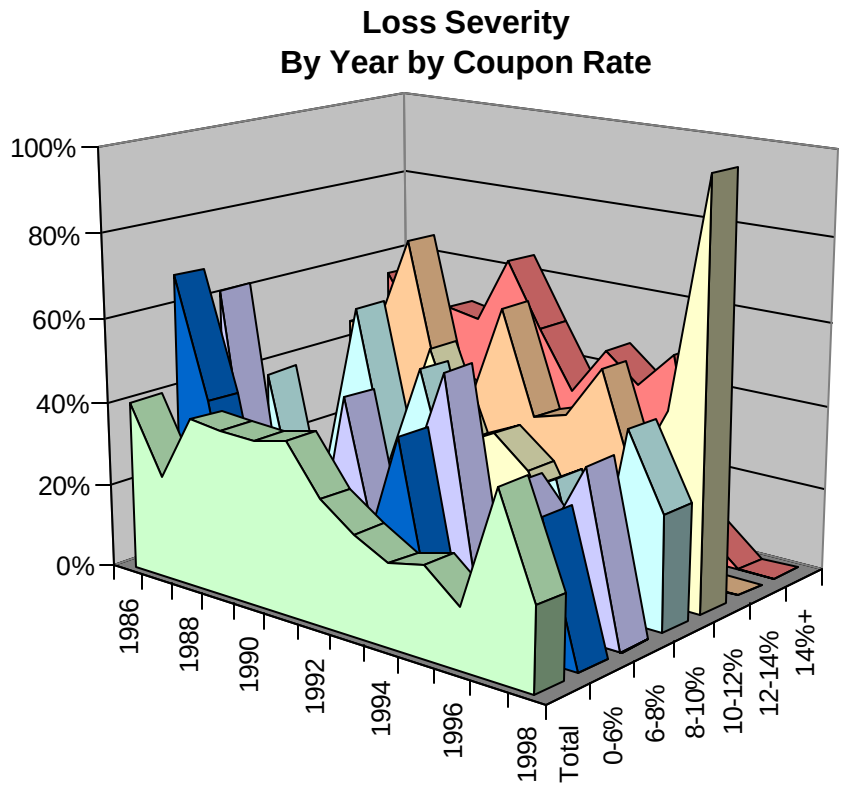


	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Total	0.67%	0.79%	0.42%	0.49%	0.66%	1.67%	1.26%	0.99%	0.32%	0.69%	0.43%	0.33%	0.28%
0-6%	0.61%	1.09%				0.43%	0.63%	1.16%	0.44%	1.12%		0.26%	
6-8%	0.25%	0.13%	0.37%		0.30%	0.29%	0.60%	0.25%	0.05%	0.20%	0.50%	0.30%	0.32%
8-10%	0.41%	0.36%	0.29%	0.18%	0.41%	0.22%	0.52%	0.50%	0.10%	0.54%	0.17%	0.32%	0.35%
10-12%	0.49%	1.35%	0.52%	0.47%	0.61%	2.82%	1.86%	1.73%	0.66%	1.59%	0.68%	0.62%	0.18%
12-14%	0.77%	0.84%	0.49%	1.15%	1.34%	4.81%	3.60%	2.71%	1.60%	1.50%	1.63%		
14%+	2.19%	1.36%	0.93%	1.97%	2.16%	4.83%	2.85%	1.71%	0.50%	2.72%	3.13%		

Incidence Rate by Amount
By Year by Coupon Rate

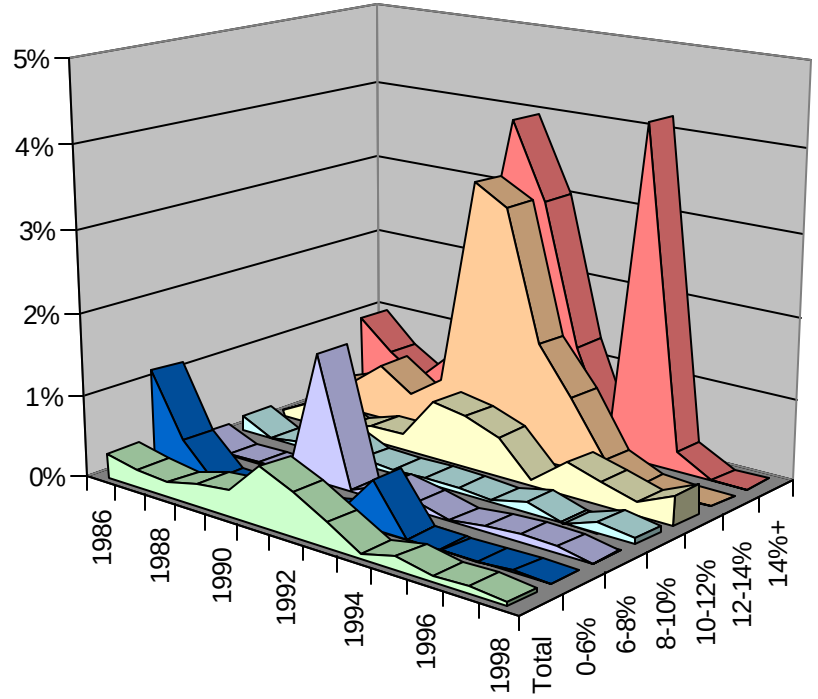


	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Total	0.76%	0.89%	0.43%	0.69%	0.83%	1.73%	1.84%	1.28%	0.36%	0.74%	0.45%	0.23%	0.24%
0-6%	1.68%	0.99%				0.06%	0.54%	1.36%	0.26%	2.88%		0.08%	
6-8%	0.25%	0.08%	0.17%		3.69%	0.18%	0.69%	0.18%	0.12%	0.16%	0.37%	0.19%	0.24%
8-10%	0.52%	0.40%	0.30%	0.43%	0.42%	0.12%	0.46%	0.83%	0.14%	0.44%	0.37%	0.29%	0.25%
10-12%	0.73%	1.66%	0.32%	0.83%	0.39%	2.70%	2.07%	2.10%	0.89%	2.19%	0.98%	0.33%	0.36%
12-14%	0.54%	0.83%	1.02%	1.24%	2.20%	5.82%	9.74%	4.28%	1.89%	1.04%	0.85%		
14%+	1.77%	1.43%	0.69%	1.56%	2.98%	8.06%	8.62%	2.69%	0.55%	8.56%	3.40%		



	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Total	40%	24%	40%	39%	39%	41%	29%	23%	19%	21%	14%	43%	19%
0-6%	68%	39%				-9%	14%	42%	-1%	0%		33%	
6-8%	62%	3%	11%		42%	6%	28%	54%	2%	32%	22%	40%	-1%
8-10%	38%	2%	20%	59%	23%	48%	17%	9%	24%	29%	-1%	45%	27%
10-12%	10%	18%	15%	24%	48%	27%	31%	23%	8%	18%	29%	45%	100%
12-14%	46%	46%	69%	35%	32%	57%	31%	34%	47%	21%	4%		
14%+	55%	42%	49%	48%	64%	49%	35%	46%	40%	49%	7%		

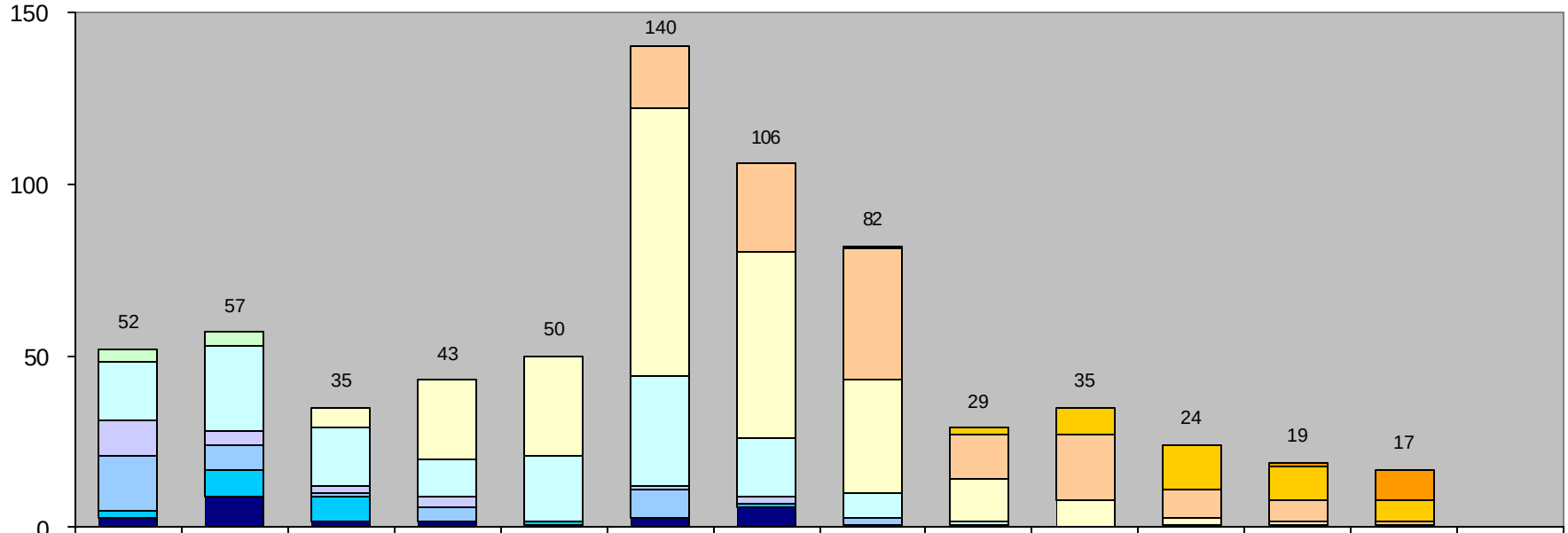
Economic Loss Rate as % of Exposure
By Year by Coupon Rate



	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Total	0.31%	0.22%	0.17%	0.27%	0.32%	0.71%	0.54%	0.30%	0.07%	0.16%	0.06%	0.10%	0.05%
0-6%	1.14%	0.39%				0.00%	0.08%	0.57%	0.00%	0.00%		0.02%	
6-8%	0.15%	0.00%	0.02%		1.56%	0.01%	0.19%	0.10%	0.00%	0.05%	0.08%	0.08%	0.00%
8-10%	0.20%	0.01%	0.06%	0.25%	0.10%	0.06%	0.08%	0.07%	0.03%	0.13%	0.00%	0.13%	0.07%
10-12%	0.07%	0.31%	0.05%	0.20%	0.19%	0.72%	0.63%	0.49%	0.07%	0.40%	0.28%	0.15%	0.36%
12-14%	0.25%	0.38%	0.70%	0.43%	0.70%	3.29%	3.05%	1.45%	0.89%	0.22%	0.03%		
14%+	0.98%	0.60%	0.34%	0.75%	1.92%	3.92%	3.00%	1.25%	0.22%	4.17%	0.24%		

Funding Year

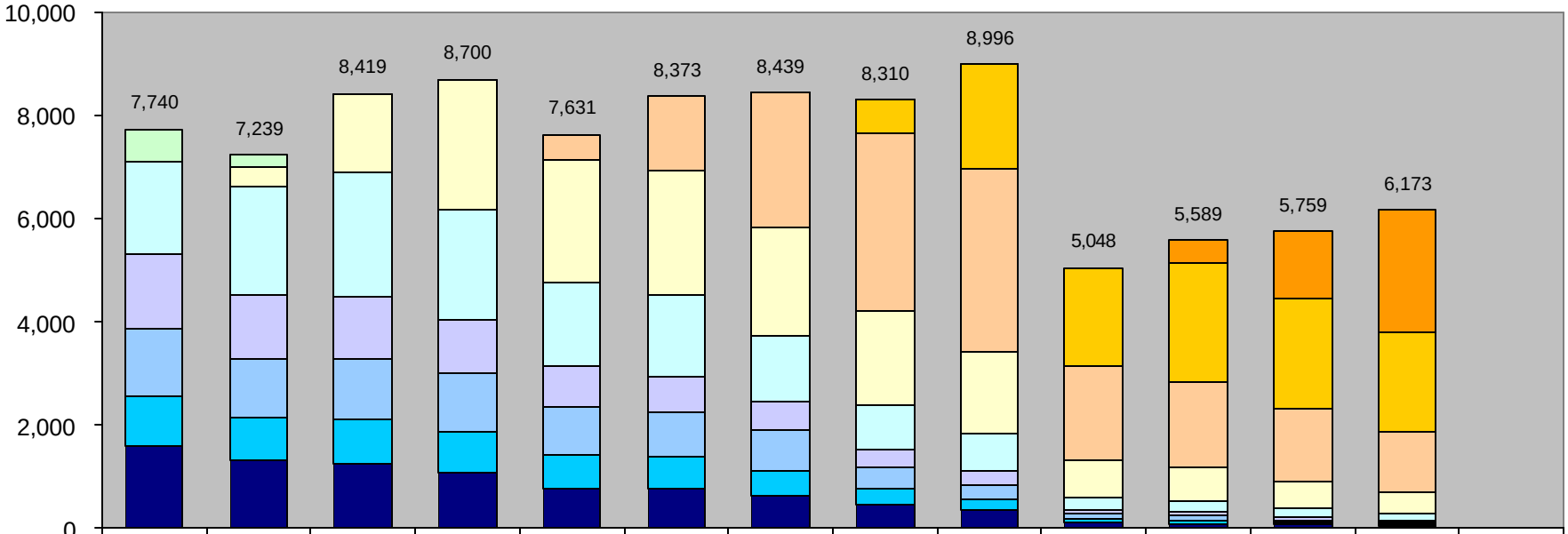
of Credit-Risk Events
By Funding Year & Experience Year



	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Total
N/A	4	4	-	-	-	-	-	-	-	-	-	-	-	8
96-98	-	-	-	-	-	-	-	-	-	-	-	1	9	10
93-95	-	-	-	-	-	-	-	1	2	8	13	10	6	40
90-92	-	-	-	-	-	18	26	38	13	19	8	6	1	129
87-89	-	-	6	23	29	78	54	33	12	8	2	1	1	247
84-86	17	25	17	11	19	32	17	7	1	-	1	-	-	147
81-83	10	4	2	3	-	1	2	-	1	-	-	-	-	23
78-80	16	7	1	4	-	8	-	2	-	-	-	-	-	38
75-77	2	8	7	-	1	-	1	1	-	-	-	-	-	20
< 75	3	9	2	2	1	3	6	-	-	-	-	1	-	27
Total	52	57	35	43	50	140	106	82	29	35	24	19	17	689

Experience Year

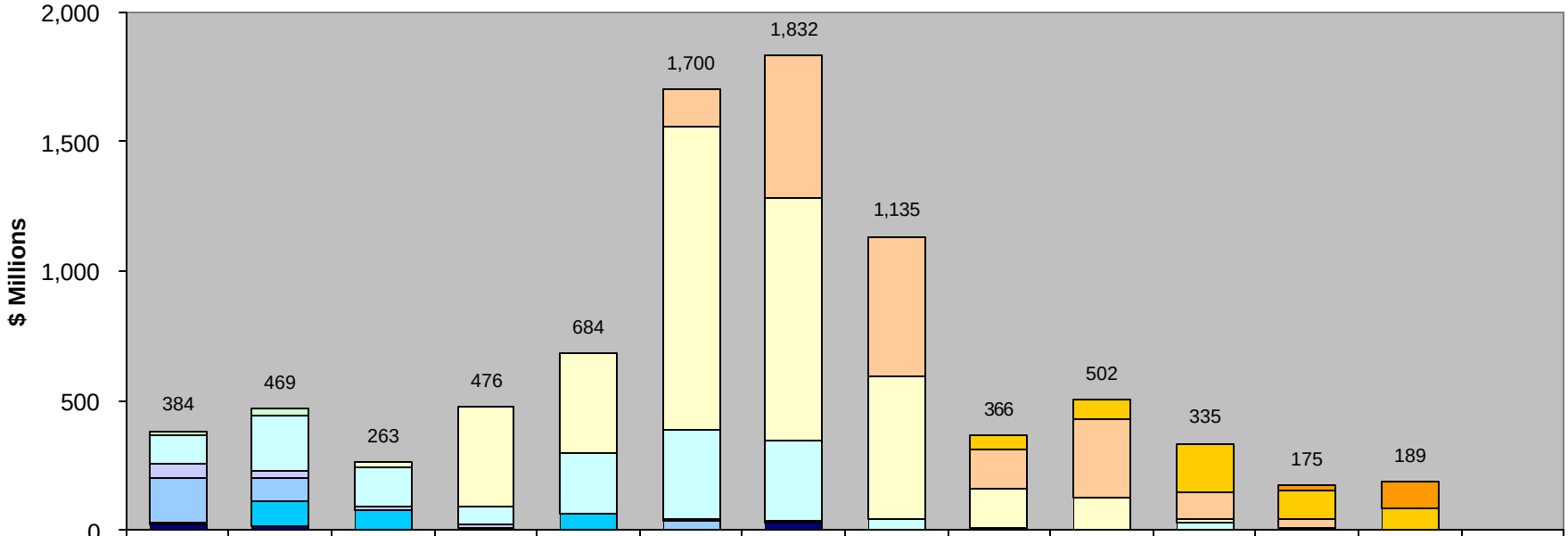
Exposure in # of Assets
By Funding Year & Experience Year



	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Total
N/A	634	230	12	4	-	-	3	10	8	1	1	-	-	900
96-98	-	-	-	-	-	-	-	-	-	-	439	1,309	2,378	4,125
93-95	-	-	-	-	-	-	-	648	2,021	1,899	2,299	2,123	1,925	10,913
90-92	-	-	-	-	481	1,439	2,593	3,446	3,551	1,815	1,665	1,407	1,160	17,556
87-89	-	390	1,502	2,516	2,385	2,420	2,121	1,804	1,576	718	651	531	421	17,032
84-86	1,798	2,105	2,420	2,150	1,621	1,570	1,248	870	711	247	221	166	128	15,252
81-83	1,429	1,222	1,191	1,025	790	700	560	355	275	83	75	57	43	7,802
78-80	1,306	1,145	1,190	1,136	914	866	781	391	278	92	78	59	41	8,274
75-77	974	828	841	785	654	616	504	307	227	76	62	39	27	5,938
< 75	1,600	1,320	1,264	1,086	788	762	631	482	351	120	101	71	50	8,623
Total	7,740	7,239	8,419	8,700	7,631	8,373	8,439	8,310	8,996	5,048	5,589	5,759	6,173	96,413

Experience Year

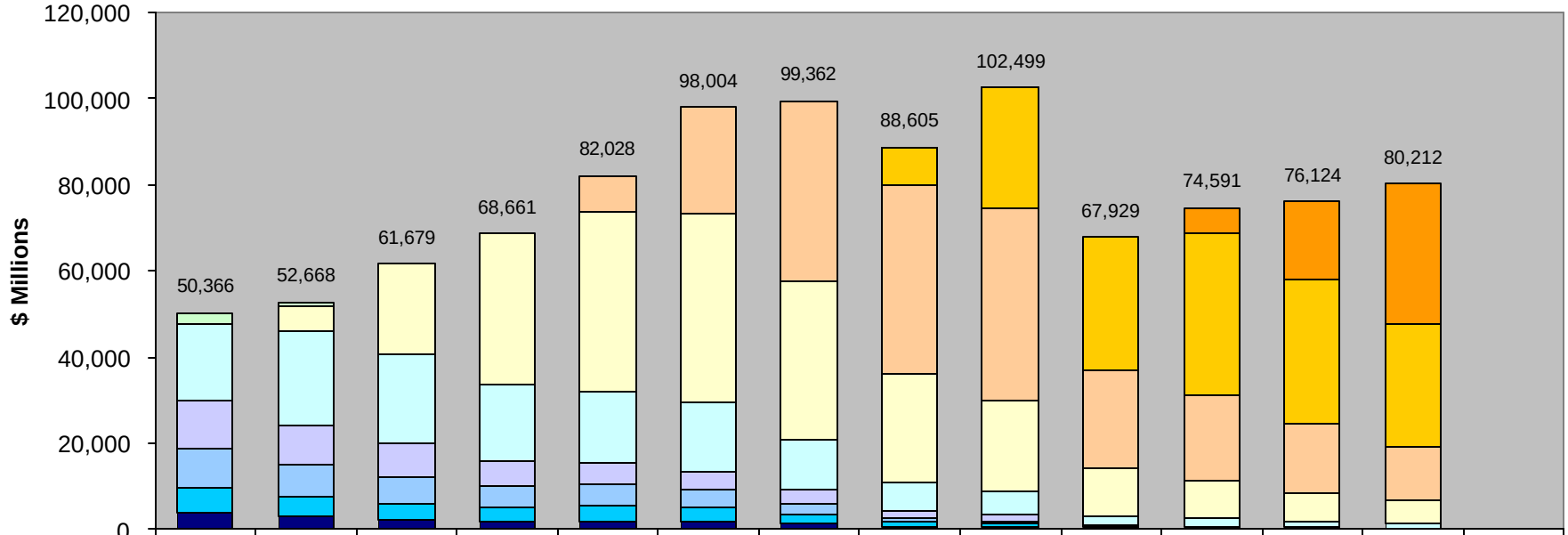
$ of Exposure Associated with Credit-Risk Events
By Funding Year & Experience Year



	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Total
N/A	18	23	-	-	-	-	-	-	-	-	-	-	-	42
96-98	-	-	-	-	-	-	-	-	-	-	-	23	106	129
93-95	-	-	-	-	-	-	-	5	54	75	187	107	78	505
90-92	-	-	-	-	-	141	547	534	153	298	106	36	4	1,820
87-89	-	-	20	384	387	1,172	935	552	150	129	12	6	1	3,748
84-86	108	218	148	69	229	339	310	42	4	-	30	-	-	1,497
81-83	58	24	14	12	-	8	6	-	5	-	-	-	-	128
78-80	172	93	2	10	-	33	-	1	-	-	-	-	-	311
75-77	3	95	76	-	65	-	3	1	-	-	-	-	-	243
< 75	25	16	3	1	3	6	32	-	-	-	-	2	-	88
Total	384	469	263	476	684	1,700	1,832	1,135	366	502	335	175	189	8,509

Experience Year

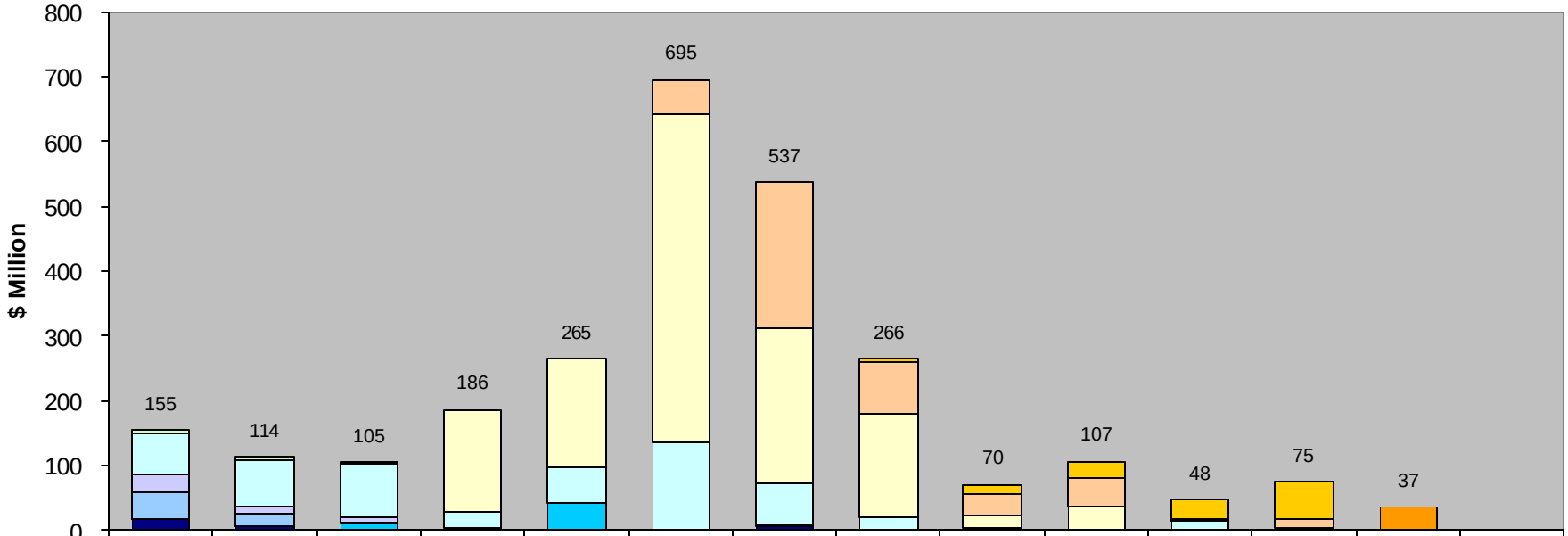
Exposure in $ of Assets
By Funding Year & Experience Year



	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Total
N/A	2,559	819	10	4	-	-	1	78	78	1	1	-	-	3,552
96-98	-	-	-	-	-	-	-	-	-	-	6,009	18,252	32,519	56,779
93-95	-	-	-	-	-	-	-	8,771	27,960	30,830	37,275	33,244	28,330	166,410
90-92	-	-	-	-	8,367	24,610	41,742	43,743	44,544	23,018	19,999	15,966	12,557	234,546
87-89	-	5,979	21,083	35,106	41,668	44,083	36,886	25,198	21,166	10,847	8,828	6,886	5,444	263,175
84-86	17,894	21,673	20,725	17,511	16,434	15,747	11,600	6,399	5,185	2,247	1,711	1,205	951	139,282
81-83	10,940	9,114	7,629	5,925	5,092	4,358	3,062	1,933	1,686	438	361	325	270	51,131
78-80	9,386	7,629	6,229	5,130	4,755	4,069	2,731	831	541	183	121	59	26	41,689
75-77	5,754	4,473	3,667	3,108	3,720	3,317	2,108	999	813	166	110	57	28	28,321
< 75	3,833	2,981	2,336	1,877	1,993	1,820	1,232	653	527	199	176	130	88	17,845
Total	50,366	52,668	61,679	68,661	82,028	98,004	99,362	88,605	102,499	67,929	74,591	76,124	80,212	1,002,729

Experience Year

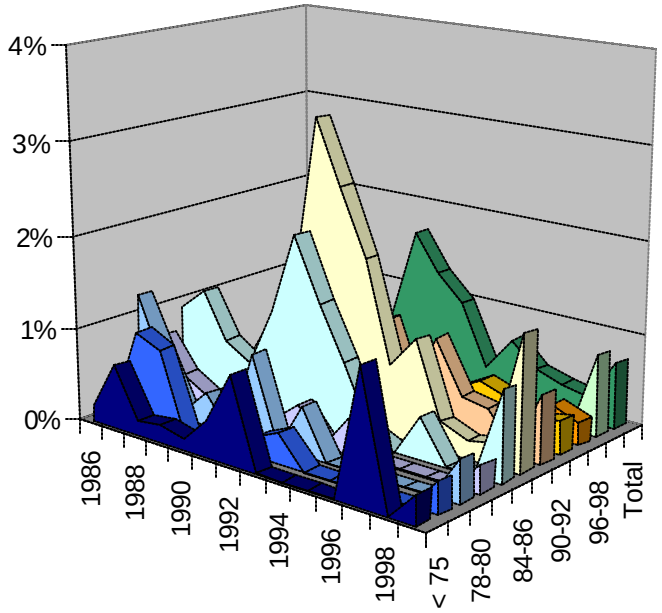
Economic Loss from Credit-Risk Events
By Funding Year & Experience Year



	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Total
N/A	5.1	5.9	-	-	-	-	-	-	-	-	-	-	-	11.0
96-98	-	-	-	-	-	-	-	-	-	-	-	(0.6)	38.0	37.4
93-95	-	-	-	-	-	-	-	5.0	13.9	25.1	31.1	58.4	(1.2)	132.3
90-92	-	-	-	-	-	53.3	225.3	81.8	33.8	43.2	1.6	11.6	0.0	450.6
87-89	-	-	2.5	157.0	168.6	506.4	239.4	159.4	19.4	38.2	0.5	4.6	0.0	1,296.1
84-86	63.0	70.0	83.4	24.3	54.1	132.6	63.4	19.4	1.0	-	14.4	-	-	525.6
81-83	27.9	11.1	5.7	4.6	-	2.0	0.4	-	2.1	-	-	-	-	53.8
78-80	41.2	19.2	0.1	0.4	-	0.4	-	0.1	-	-	-	-	-	61.4
75-77	0.2	1.5	13.1	-	42.4	-	0.3	(0.0)	-	-	-	-	-	57.5
< 75	17.3	6.2	0.3	0.0	0.2	0.4	8.1	-	-	-	-	0.7	-	33.2
Total	154.7	113.9	105.1	186.3	265.3	695.0	536.8	265.7	70.3	106.5	47.7	74.7	36.8	2,659.0

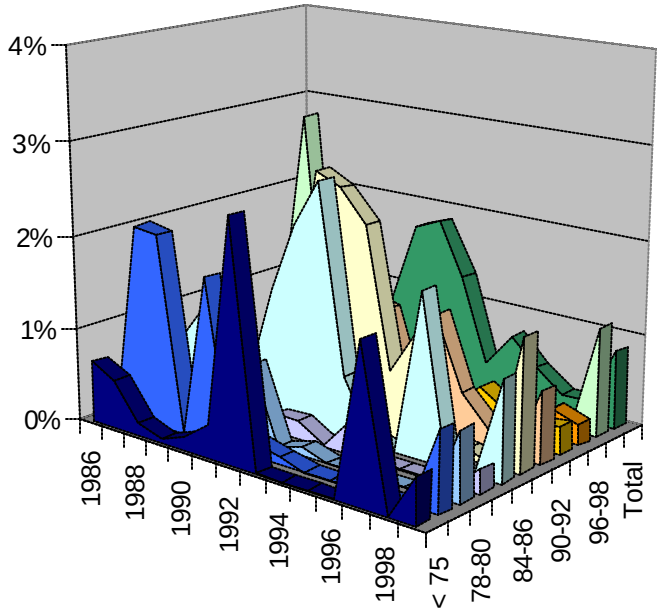
Experience Year

Incidence Rate by Number
By Experience Year & by Funding Year



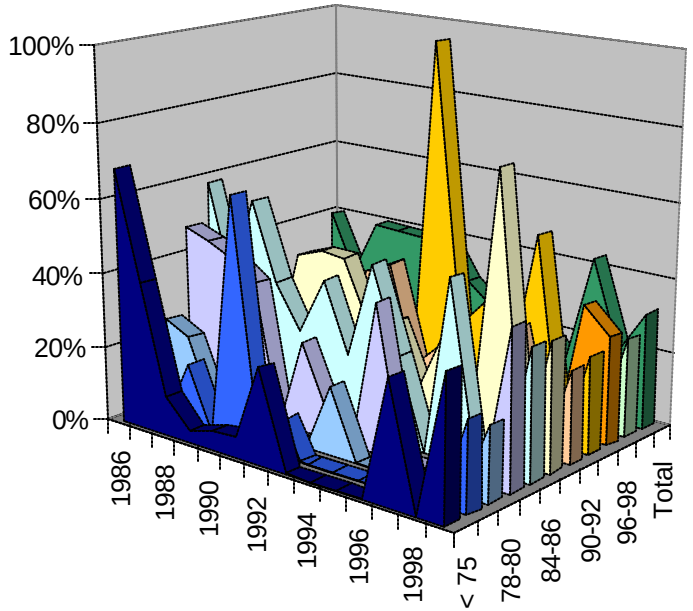
	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Total
< 75	0.19%	0.68%	0.16%	0.18%	0.13%	0.39%	0.95%					1.42%		0.31%
75-77	0.21%	0.97%	0.83%		0.15%		0.20%	0.33%						0.34%
78-80	1.23%	0.61%	0.08%	0.35%		0.92%		0.51%						0.46%
81-83	0.70%	0.33%	0.17%	0.29%		0.14%	0.36%		0.36%					0.29%
84-86	0.95%	1.19%	0.70%	0.51%	1.17%	2.04%	1.36%	0.80%	0.14%		0.45%			0.96%
87-89			0.40%	0.91%	1.22%	3.22%	2.55%	1.83%	0.76%	1.11%	0.31%	0.19%	0.24%	1.45%
90-92						1.25%	1.00%	1.10%	0.37%	1.05%	0.48%	0.43%	0.09%	0.73%
93-95								0.15%	0.10%	0.42%	0.57%	0.47%	0.31%	0.37%
96-98											0.00%	0.08%	0.38%	0.24%
N/A	0.63%	1.74%												0.89%
Total	0.67%	0.79%	0.42%	0.49%	0.66%	1.67%	1.26%	0.99%	0.32%	0.69%	0.43%	0.33%	0.28%	0.71%

Incidence Rate by Amount
By Experience Year & by Funding Year



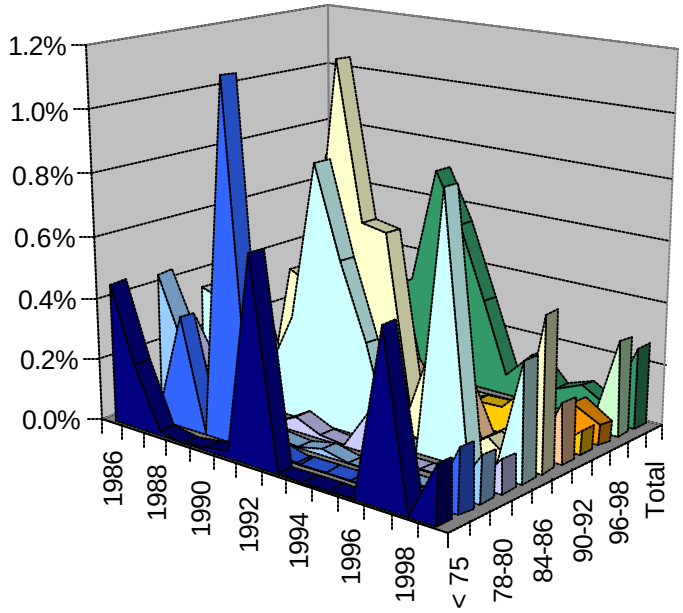
	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Total
< 75	0.66%	0.53%	0.13%	0.04%	0.15%	0.35%	2.57%					1.67%		0.49%
75-77	0.06%	2.12%	2.07%		1.75%		0.14%	0.08%						0.86%
78-80	1.83%	1.22%	0.04%	0.20%		0.81%		0.09%						0.75%
81-83	0.53%	0.27%	0.18%	0.21%		0.19%	0.19%		0.32%					0.25%
84-86	0.60%	1.01%	0.71%	0.39%	1.40%	2.16%	2.67%	0.65%	0.08%		1.77%			1.07%
87-89			0.10%	1.09%	0.93%	2.66%	2.53%	2.19%	0.71%	1.19%	0.13%	0.09%	0.02%	1.42%
90-92						0.57%	1.31%	1.22%	0.34%	1.29%	0.53%	0.23%	0.03%	0.78%
93-95								0.06%	0.19%	0.24%	0.50%	0.32%	0.27%	0.30%
96-98												0.13%	0.33%	0.23%
N/A	0.72%	2.85%												1.18%
Total	0.76%	0.89%	0.43%	0.69%	0.83%	1.73%	1.84%	1.28%	0.36%	0.74%	0.45%	0.23%	0.24%	0.85%

Loss Severity
By Experience Year & by Funding Year



	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Total
< 75	68%	39%	10%	3%	5%	6%	26%					33%		38%
75-77	6%	2%	17%		65%		10%	-5%						24%
78-80	24%	21%	3%	4%		1%		18%						20%
81-83	48%	45%	42%	37%		24%	6%		40%					42%
84-86	59%	32%	56%	35%	24%	39%	20%	46%	24%		48%			35%
87-89			12%	41%	44%	43%	26%	29%	13%	30%	4%	75%	2%	35%
90-92						38%	41%	15%	22%	14%	2%	32%	1%	25%
93-95								100%	26%	34%	17%	55%	-2%	26%
96-98												-3%	36%	29%
N/A	28%	25%												26%
Total	40%	24%	40%	39%	39%	41%	29%	23%	19%	21%	14%	43%	19%	31%

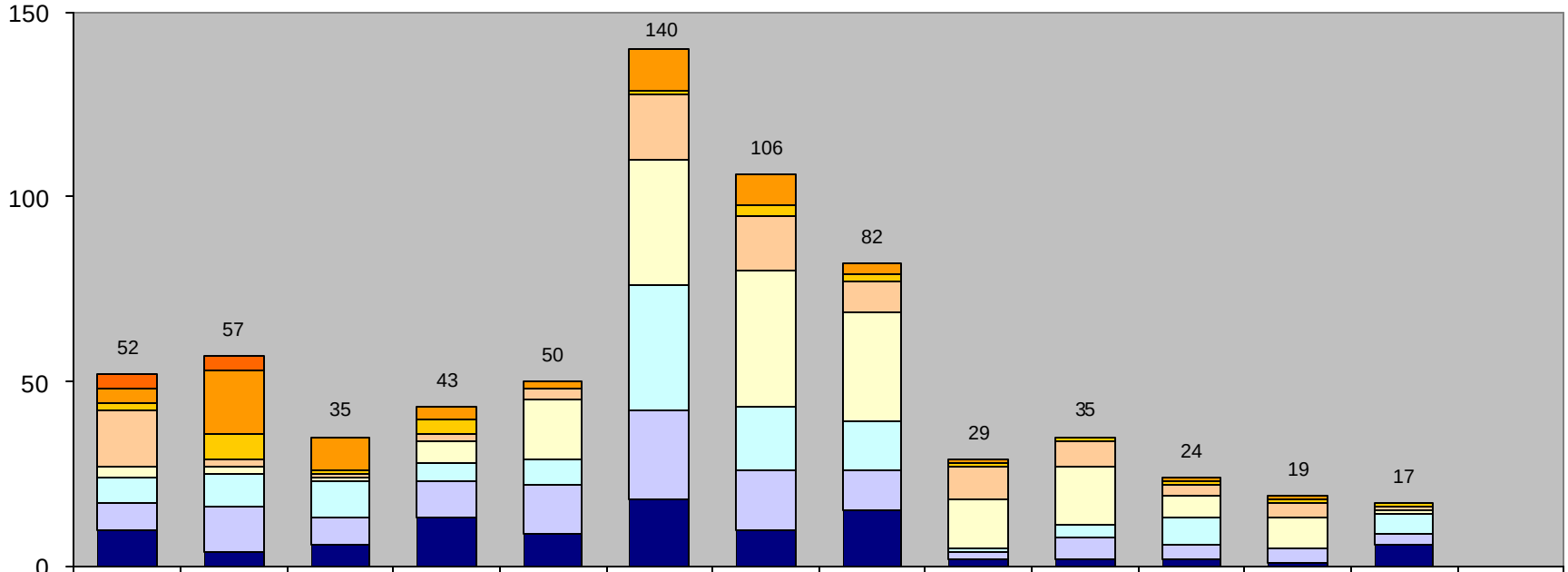
Economic Loss Rate as % of Exposure
By Experience Year & by Funding Year



	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Total
< 75	0.45%	0.21%	0.01%	0.00%	0.01%	0.02%	0.66%					0.54%		0.19%
75-77	0.00%	0.03%	0.36%		1.14%		0.01%	0.00%						0.20%
78-80	0.44%	0.25%	0.00%	0.01%		0.01%		0.02%						0.15%
81-83	0.26%	0.12%	0.08%	0.08%		0.05%	0.01%		0.13%					0.11%
84-86	0.35%	0.32%	0.40%	0.14%	0.33%	0.84%	0.55%	0.30%	0.02%		0.84%			0.38%
87-89			0.01%	0.45%	0.40%	1.15%	0.65%	0.63%	0.09%	0.35%	0.01%	0.07%	0.00%	0.49%
90-92						0.22%	0.54%	0.19%	0.08%	0.19%	0.01%	0.07%	0.00%	0.19%
93-95								0.06%	0.05%	0.08%	0.08%	0.18%	0.00%	0.08%
96-98												0.00%	0.12%	0.07%
N/A	0.20%	0.72%												0.31%
Total	0.31%	0.22%	0.17%	0.27%	0.32%	0.71%	0.54%	0.30%	0.07%	0.16%	0.06%	0.10%	0.05%	0.27%

Years Since Funding

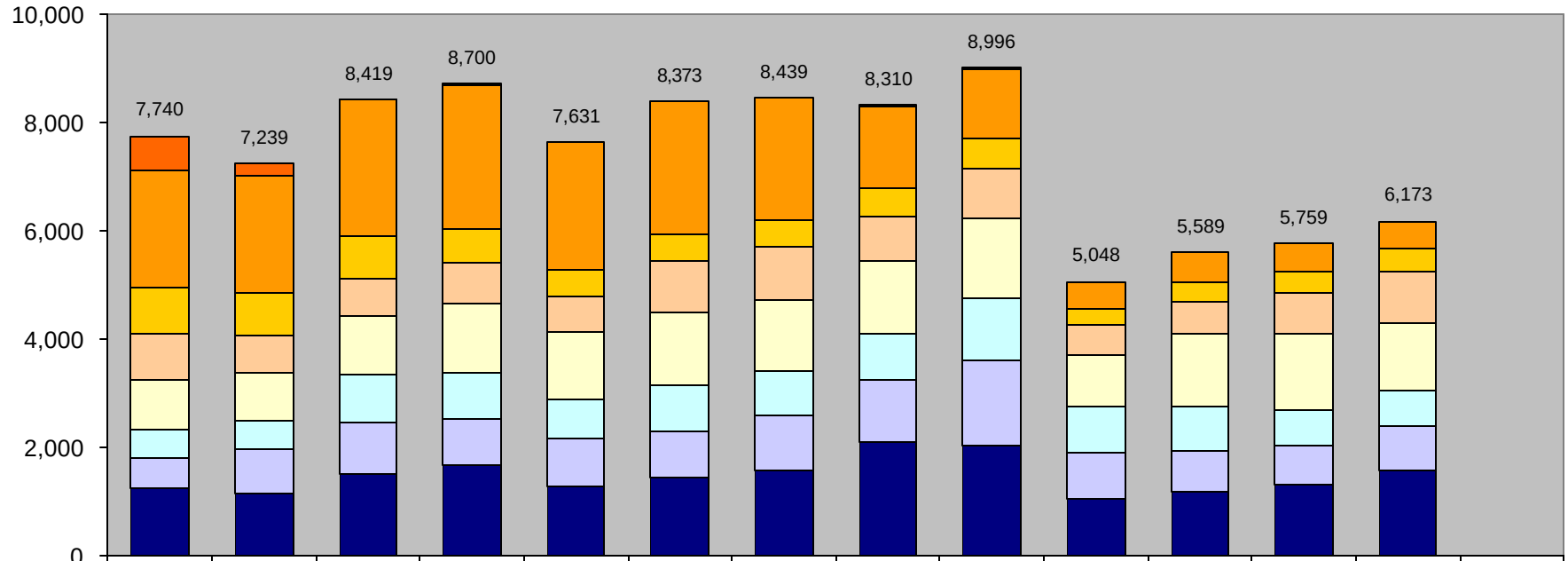
of Credit-Risk Events
By Years Since Funding



	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Total
N/A	4	4	-	-	-	-	-	-	-	-	-	-	-	8
10+ Yrs	4	17	9	3	2	11	8	3	1	-	1	1	-	60
8-10 Yrs	2	7	1	4	-	1	3	2	1	1	1	1	1	25
6-8 Yrs	15	2	1	2	3	18	15	8	9	7	3	4	1	88
4-6 Yrs	3	2	1	6	16	34	37	30	13	16	6	8	1	173
3-4 Yrs	7	9	10	5	7	34	17	13	1	3	7	-	5	118
2-3 Yrs	7	12	7	10	13	24	16	11	2	6	4	4	3	119
0-2 Yrs	10	4	6	13	9	18	10	15	2	2	2	1	6	98
Total	52	57	35	43	50	140	106	82	29	35	24	19	17	689

Experience Year

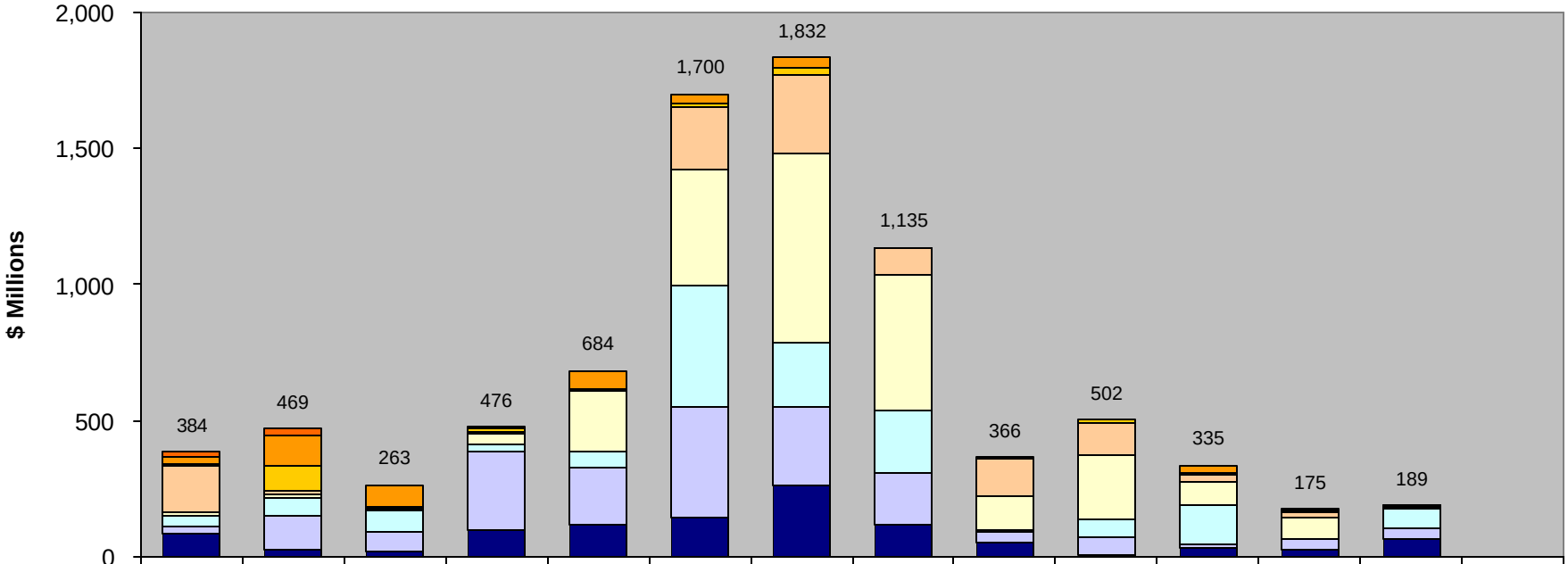
Exposure in # of Assets
By Years Since Funding



	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Total
N/A	634	230	12	4	-	-	3	10	8	1	1	-	-	900
10+ Yrs	2,153	2,148	2,497	2,682	2,355	2,427	2,240	1,534	1,277	486	536	501	514	21,347
8-10 Yrs	857	808	798	604	487	518	505	504	565	292	382	421	410	7,148
6-8 Yrs	870	684	700	745	678	926	978	822	920	557	576	741	946	10,141
4-6 Yrs	887	876	1,064	1,292	1,246	1,375	1,323	1,348	1,491	978	1,358	1,406	1,272	15,913
3-4 Yrs	542	542	908	858	718	841	798	867	1,139	837	820	651	653	10,173
2-3 Yrs	571	813	939	853	864	850	1,010	1,120	1,577	843	727	731	797	11,693
0-2 Yrs	1,227	1,140	1,502	1,664	1,284	1,439	1,583	2,107	2,021	1,057	1,190	1,309	1,581	19,100
Total	7,740	7,239	8,419	8,700	7,631	8,373	8,439	8,310	8,996	5,048	5,589	5,759	6,173	96,413

Experience Year

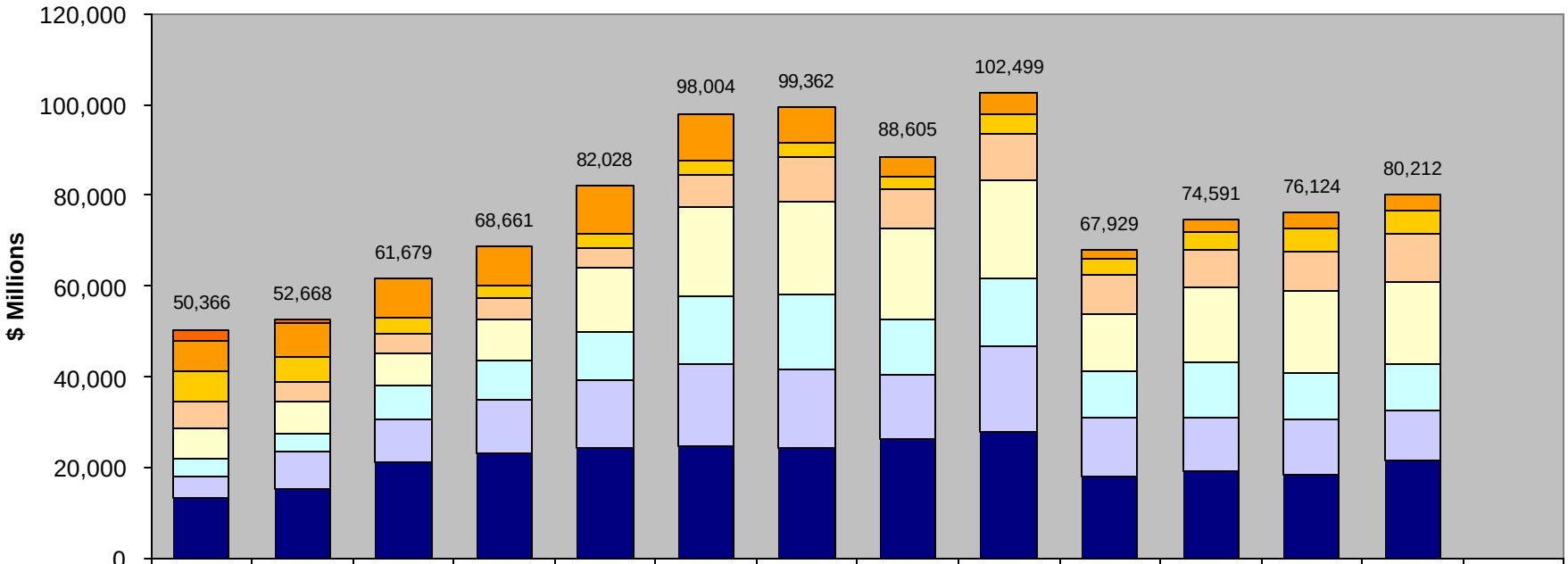
$ of Exposure Associated with Credit-Risk Events
By Years Since Funding



	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Total
N/A	18	23	-	-	-	-	-	-	-	-	-	-	-	42
10+ Yrs	27	111	79	3	68	40	38	2	5	-	30	2	-	405
8-10 Yrs	3	93	2	11	-	8	26	2	4	10	4	6	1	172
6-8 Yrs	170	15	4	9	7	228	287	96	132	119	24	21	4	1,114
4-6 Yrs	19	9	10	40	223	429	696	495	127	238	90	81	10	2,469
3-4 Yrs	40	66	75	29	57	448	239	235	7	60	141	-	68	1,464
2-3 Yrs	26	126	73	286	210	406	285	187	36	70	15	42	40	1,801
0-2 Yrs	82	26	20	98	120	141	262	117	54	5	30	23	66	1,043
Total	384	469	263	476	684	1,700	1,832	1,135	366	502	335	175	189	8,509

Experience Year

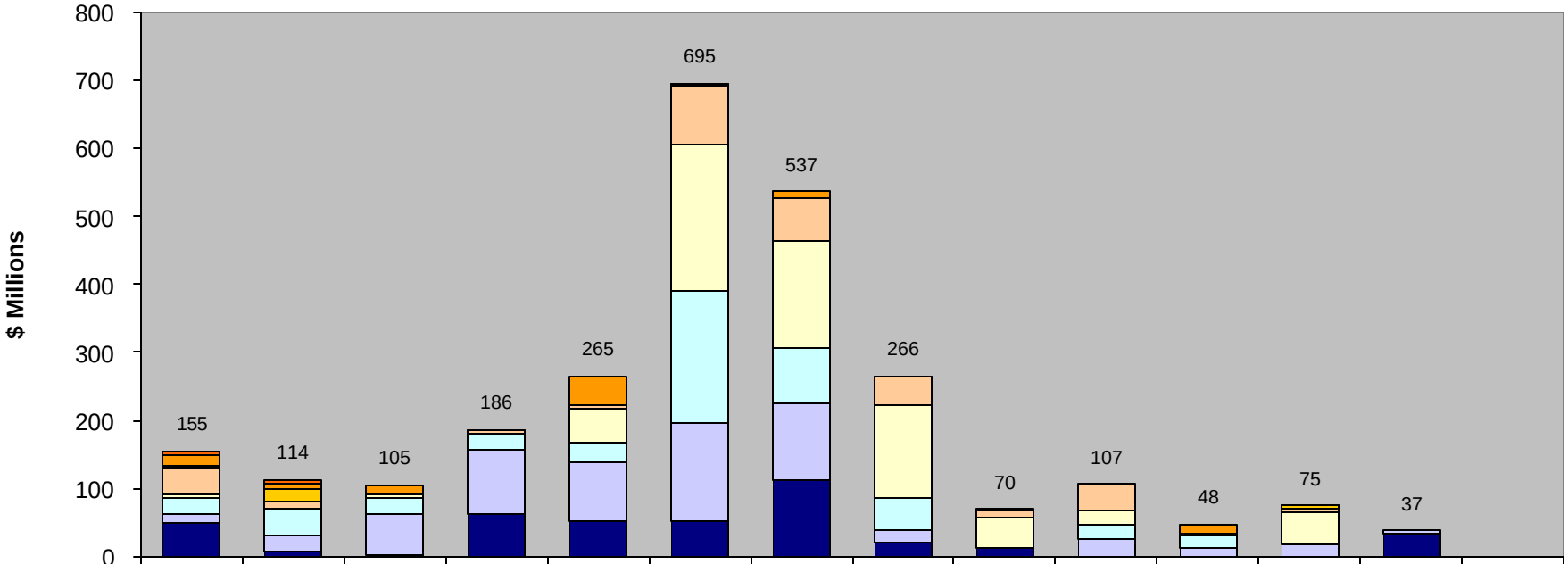
Exposure in $ of Assets
By Years Since Funding



	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Total
N/A	2,559	819	10	4	-	-	1	78	78	1	1	-	-	3,552
10+ Yrs	6,533	7,454	8,463	8,632	10,467	10,372	7,779	4,416	4,486	1,987	2,479	3,210	3,742	80,019
8-10 Yrs	6,736	5,396	3,769	2,674	3,021	3,192	3,150	2,742	4,265	3,481	4,051	5,452	5,008	52,938
6-8 Yrs	5,704	4,425	4,166	4,734	4,651	7,104	9,805	8,794	10,338	8,612	8,261	8,617	10,614	95,825
4-6 Yrs	6,651	6,922	6,987	9,199	13,855	19,569	20,628	20,060	21,784	12,705	16,515	17,904	18,070	190,847
3-4 Yrs	4,289	4,118	7,719	8,312	10,727	15,008	16,259	12,246	14,730	10,313	12,290	10,343	10,260	136,612
2-3 Yrs	4,743	8,444	9,482	11,718	14,893	18,149	17,235	14,095	18,858	12,949	11,645	12,346	10,991	165,549
0-2 Yrs	13,151	15,090	21,083	23,388	24,415	24,610	24,507	26,172	27,960	17,881	19,350	18,252	21,528	277,388
Total	50,366	52,668	61,679	68,661	82,028	98,004	99,362	88,605	102,499	67,929	74,591	76,124	80,212	1,002,729

Experience Year

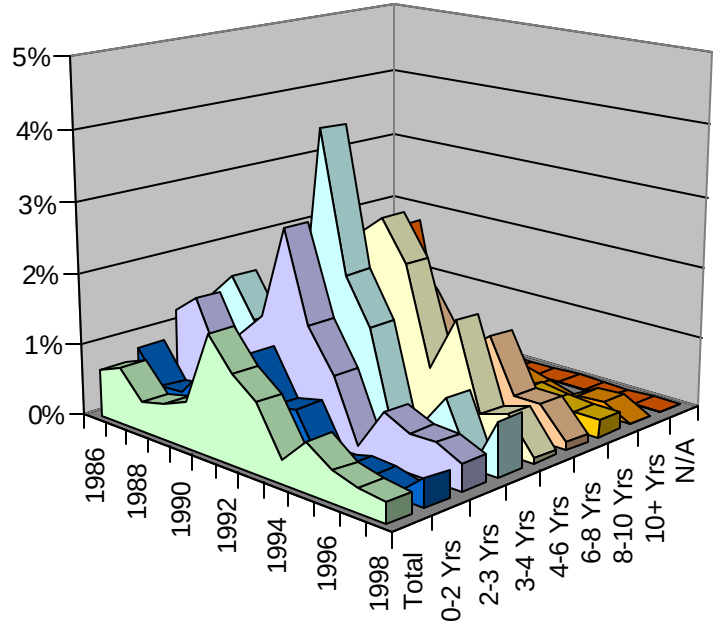
Economic Loss from Credit-Risk Events
By Years Since Funding



	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Total
N/A	5.1	5.9	-	-	-	-	-	-	-	-	-	-	-	11.0
10+ Yrs	17.0	7.7	13.5	(0.1)	42.6	0.8	8.7	0.1	2.1	-	14.4	0.7	-	107.6
8-10 Yrs	1.0	19.2	0.1	0.9	-	2.0	2.7	0.4	1.0	(0.3)	0.2	4.6	0.0	31.8
6-8 Yrs	40.6	11.0	0.8	4.1	4.6	87.8	60.8	43.5	9.9	38.5	0.6	5.2	0.0	307.5
4-6 Yrs	5.8	0.0	4.9	1.5	49.5	213.0	157.2	135.0	43.3	20.7	1.4	46.3	(0.1)	678.5
3-4 Yrs	22.1	38.3	24.0	22.8	29.7	194.7	82.1	48.4	-	22.5	17.6	-	(1.1)	501.2
2-3 Yrs	13.5	24.7	59.4	95.2	86.1	143.5	113.6	16.7	-	24.1	12.8	18.5	3.2	611.4
0-2 Yrs	49.5	7.0	2.5	61.8	52.8	53.3	111.6	21.7	13.9	1.0	0.7	(0.6)	34.8	409.9
Total	154.7	113.9	105.1	186.3	265.3	695.0	536.8	265.7	70.3	106.5	47.7	74.7	36.8	2,659.0

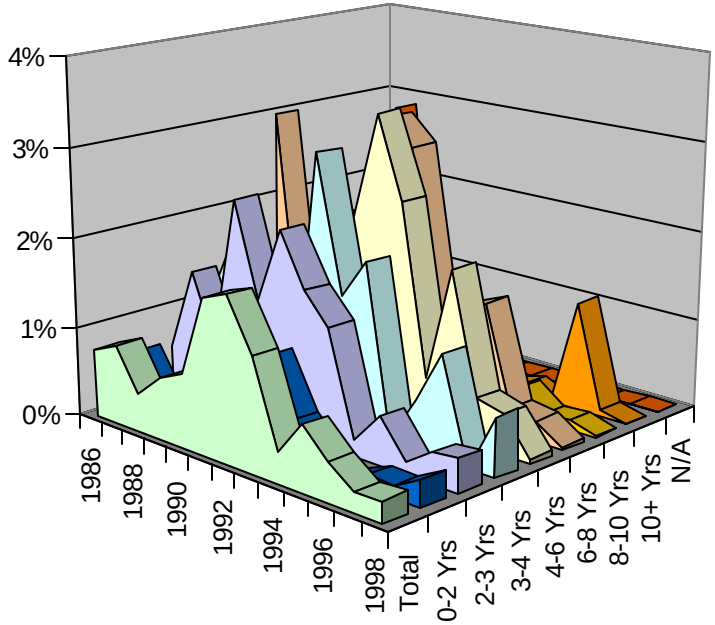
Experience Year

Incidence Rate by Number
By Year & by Number of Years Since Funding



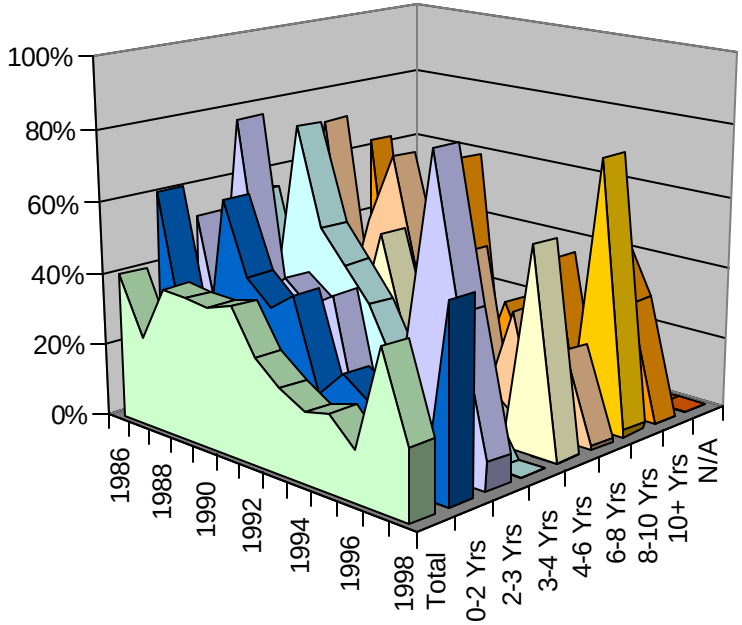
	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Total	0.67%	0.79%	0.42%	0.49%	0.66%	1.67%	1.26%	0.99%	0.32%	0.69%	0.43%	0.33%	0.28%
0-2 Yrs	0.82%	0.35%	0.40%	0.78%	0.70%	1.25%	0.63%	0.71%	0.10%	0.19%	0.17%	0.08%	0.38%
2-3 Yrs	1.23%	1.48%	0.75%	1.17%	1.50%	2.83%	1.58%	0.98%	0.13%	0.71%	0.55%	0.55%	0.38%
3-4 Yrs	1.29%	1.66%	1.10%	0.58%	0.97%	4.05%	2.13%	1.50%	0.09%	0.36%	0.85%		0.77%
4-6 Yrs	0.34%	0.23%	0.09%	0.46%	1.28%	2.47%	2.80%	2.23%	0.87%	1.64%	0.44%	0.57%	0.08%
6-8 Yrs	1.72%	0.29%	0.14%	0.27%	0.44%	1.94%	1.53%	0.97%	0.98%	1.26%	0.52%	0.54%	0.11%
8-10 Yrs	0.23%	0.87%	0.13%	0.66%		0.19%	0.59%	0.40%	0.18%	0.34%	0.26%	0.24%	0.24%
10+ Yrs	0.19%	0.79%	0.36%	0.11%	0.08%	0.45%	0.36%	0.20%	0.08%		0.19%	0.20%	
N/A	0.63%	1.74%											

Incidence Rate by Amount
By Year & by Number of Years Since Funding



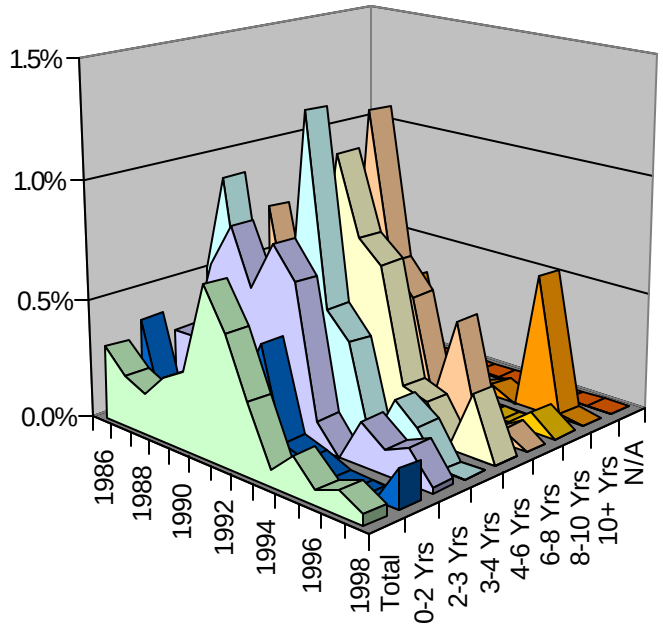
	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Total	0.76%	0.89%	0.43%	0.69%	0.83%	1.73%	1.84%	1.28%	0.36%	0.74%	0.45%	0.23%	0.24%
0-2 Yrs	0.62%	0.17%	0.10%	0.42%	0.49%	0.57%	1.07%	0.45%	0.19%	0.03%	0.16%	0.13%	0.30%
2-3 Yrs	0.55%	1.49%	0.77%	2.44%	1.41%	2.24%	1.65%	1.33%	0.19%	0.54%	0.13%	0.34%	0.37%
3-4 Yrs	0.92%	1.61%	0.97%	0.35%	0.53%	2.98%	1.47%	1.92%	0.05%	0.58%	1.15%		0.66%
4-6 Yrs	0.28%	0.14%	0.14%	0.43%	1.61%	2.19%	3.38%	2.47%	0.58%	1.87%	0.55%	0.45%	0.06%
6-8 Yrs	2.97%	0.34%	0.09%	0.18%	0.15%	3.21%	2.93%	1.09%	1.28%	1.38%	0.29%	0.24%	0.04%
8-10 Yrs	0.05%	1.72%	0.06%	0.42%		0.26%	0.82%	0.09%	0.10%	0.29%	0.09%	0.11%	0.02%
10+ Yrs	0.42%	1.48%	0.94%	0.04%	0.65%	0.38%	0.48%	0.03%	0.12%		1.22%	0.07%	
N/A	0.72%	2.85%											

Loss Severity
By Year & by Number of Years Since Funding



	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Total	40%	24%	40%	39%	39%	41%	29%	23%	19%	21%	14%	43%	19%
0-2 Yrs	61%	27%	12%	63%	44%	38%	43%	19%	26%	21%	2%	-3%	53%
2-3 Yrs	52%	20%	82%	33%	41%	35%	40%	9%	0%	35%	85%	45%	8%
3-4 Yrs	56%	58%	32%	79%	52%	43%	34%	21%	0%	38%	12%		-2%
4-6 Yrs	31%	0%	49%	4%	22%	50%	23%	27%	34%	9%	2%	57%	-1%
6-8 Yrs	24%	74%	23%	48%	68%	38%	21%	45%	8%	32%	3%	25%	1%
8-10 Yrs	30%	21%	3%	8%		24%	11%	15%	24%	-3%	5%	75%	2%
10+ Yrs	62%	7%	17%	-2%	63%	2%	23%	7%	40%		48%	33%	
N/A	28%	25%											

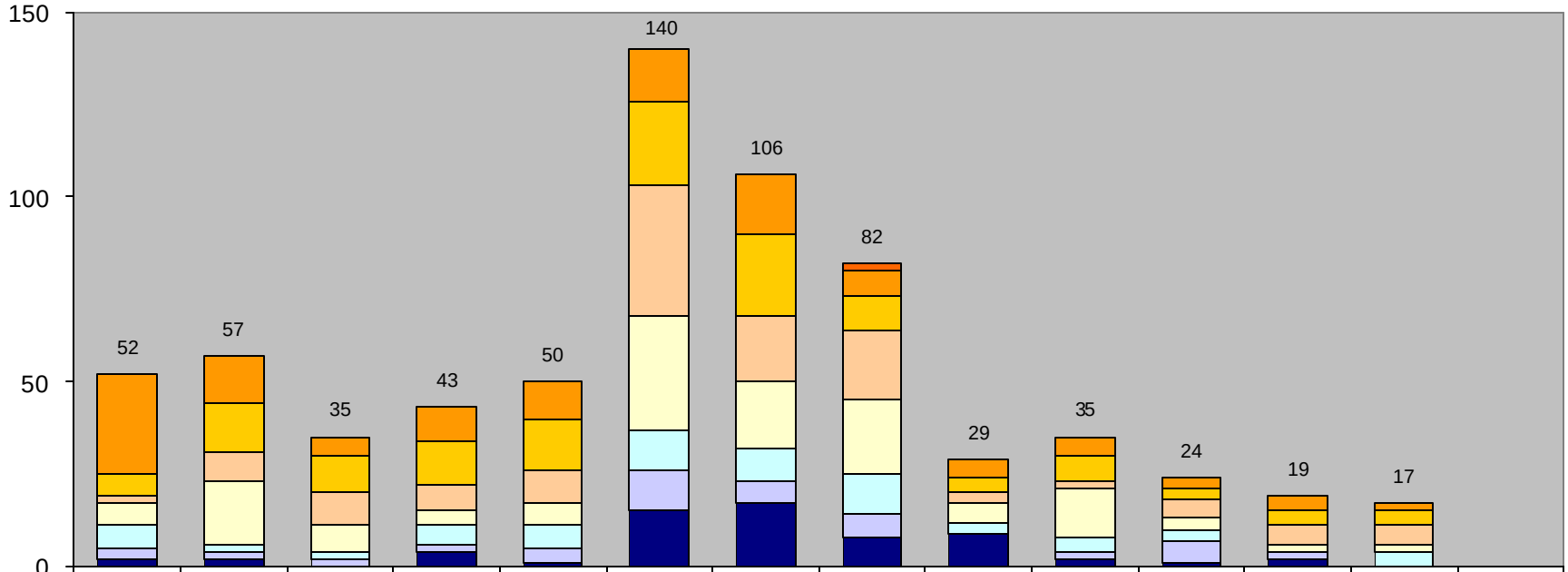
Economic Loss Rate as % of Exposure
By Year & by Number of Years Since Funding



	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Total	0.31%	0.22%	0.17%	0.27%	0.32%	0.71%	0.54%	0.30%	0.07%	0.16%	0.06%	0.10%	0.05%
0-2 Yrs	0.38%	0.05%	0.01%	0.26%	0.22%	0.22%	0.46%	0.08%	0.05%	0.01%	0.00%	0.00%	0.16%
2-3 Yrs	0.29%	0.29%	0.63%	0.81%	0.58%	0.79%	0.66%	0.12%	0.00%	0.19%	0.11%	0.15%	0.03%
3-4 Yrs	0.52%	0.93%	0.31%	0.27%	0.28%	1.30%	0.51%	0.40%	0.00%	0.22%	0.14%		-0.01%
4-6 Yrs	0.09%	0.00%	0.07%	0.02%	0.36%	1.09%	0.76%	0.67%	0.20%	0.16%	0.01%	0.26%	0.00%
6-8 Yrs	0.71%	0.25%	0.02%	0.09%	0.10%	1.24%	0.62%	0.49%	0.10%	0.45%	0.01%	0.06%	0.00%
8-10 Yrs	0.02%	0.36%	0.00%	0.03%		0.06%	0.09%	0.01%	0.02%	-0.01%	0.00%	0.08%	0.00%
10+ Yrs	0.26%	0.10%	0.16%	0.00%	0.41%	0.01%	0.11%	0.00%	0.05%		0.58%	0.02%	
N/A	0.20%	0.72%											

Years to Maturity

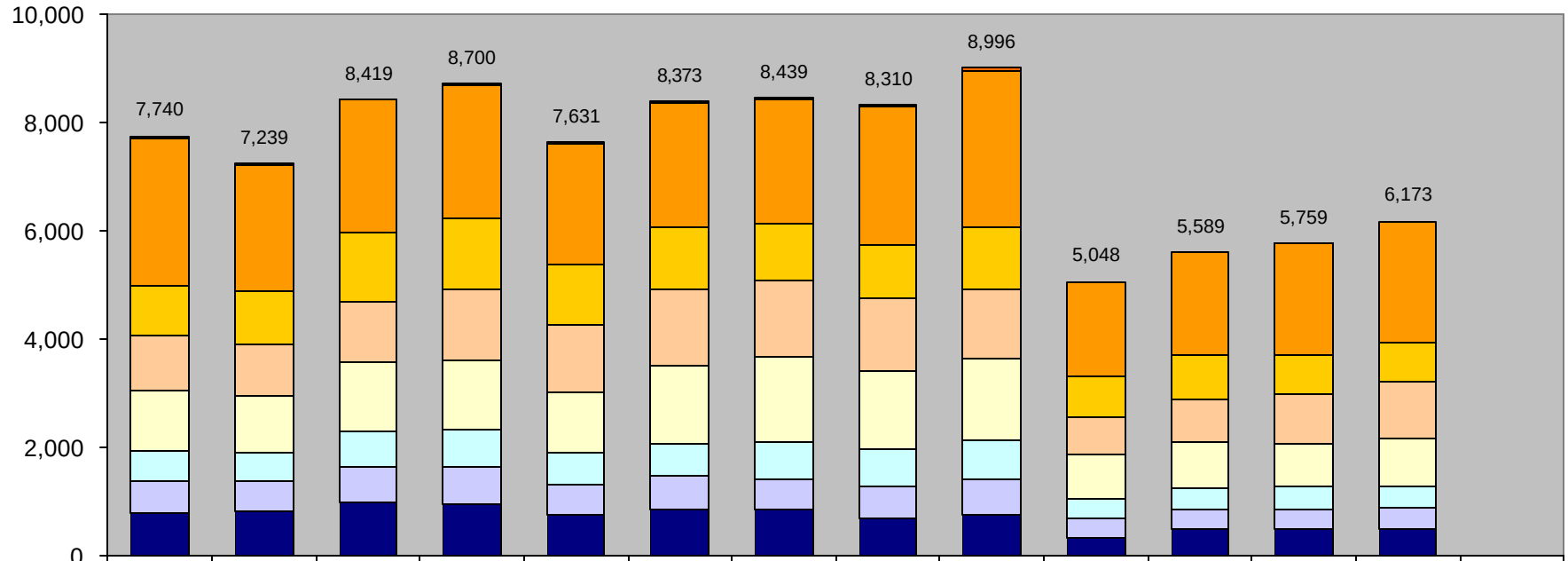
of Credt-Risk Events
By Years to Maturity



	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Total
N/A	-	-	-	-	-	-	-	2	-	-	-	-	-	2
10+ Yrs	27	13	5	9	10	14	16	7	5	5	3	4	2	120
8-10 Yrs	6	13	10	12	14	23	22	9	4	7	3	4	4	131
6-8 Yrs	2	8	9	7	9	35	18	19	3	2	5	5	5	127
4-6 Yrs	6	17	7	4	6	31	18	20	5	13	3	2	2	134
3-4 Yrs	6	2	2	5	6	11	9	11	3	4	3	-	4	66
2-3 Yrs	3	2	2	2	4	11	6	6	-	2	6	2	-	46
0-2 Yrs	2	2	-	4	1	15	17	8	9	2	1	2	-	63
Total	52	57	35	43	50	140	106	82	29	35	24	19	17	689

Experience Year

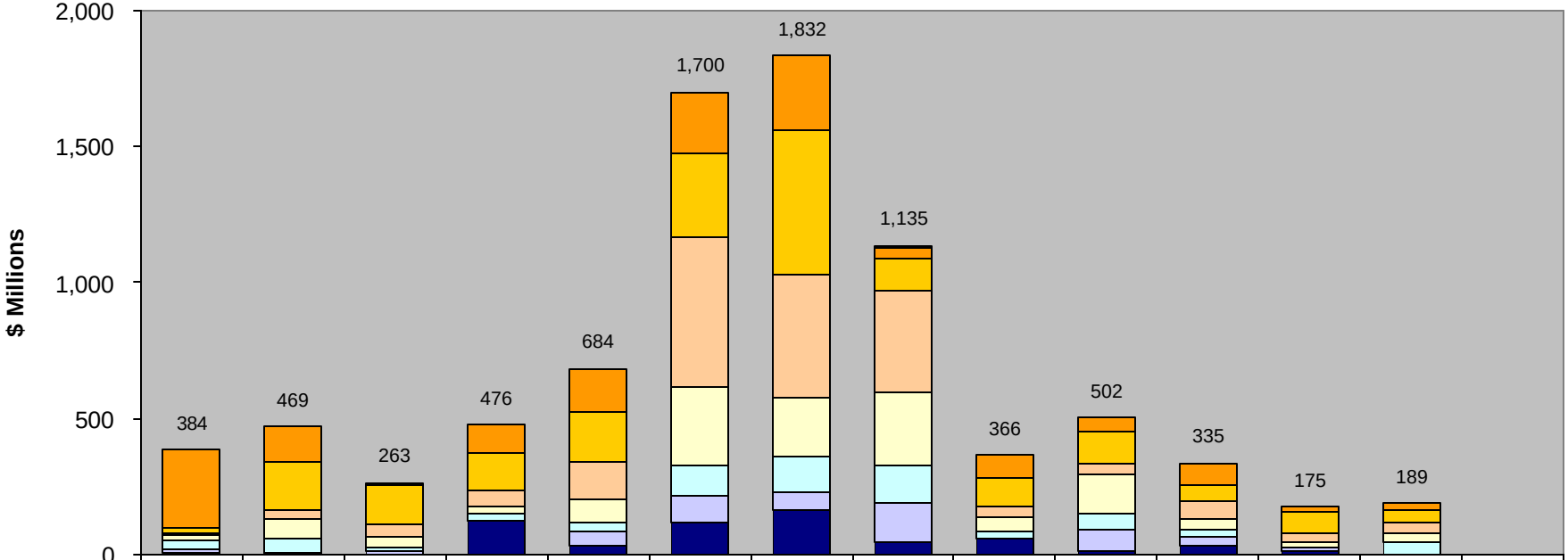
Exposure in # of Assets
By Years to Maturity



	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Total
N/A	31	20	10	7	25	22	19	23	41	-	1	3	5	204
10+ Yrs	2,714	2,349	2,442	2,469	2,222	2,299	2,305	2,553	2,888	1,734	1,878	2,052	2,249	30,152
8-10 Yrs	921	976	1,282	1,315	1,116	1,125	1,026	981	1,140	756	837	714	716	12,902
6-8 Yrs	1,041	956	1,106	1,309	1,270	1,427	1,415	1,344	1,307	699	793	935	1,029	14,628
4-6 Yrs	1,110	1,032	1,287	1,284	1,105	1,427	1,594	1,434	1,501	821	834	798	905	15,128
3-4 Yrs	554	548	668	682	580	595	685	702	702	356	388	413	387	7,258
2-3 Yrs	599	532	654	680	556	627	560	578	666	346	356	348	392	6,890
0-2 Yrs	772	829	973	955	757	854	837	697	752	337	504	497	491	9,253
Total	7,740	7,239	8,419	8,700	7,631	8,373	8,439	8,310	8,996	5,048	5,589	5,759	6,173	96,413

Experience Year

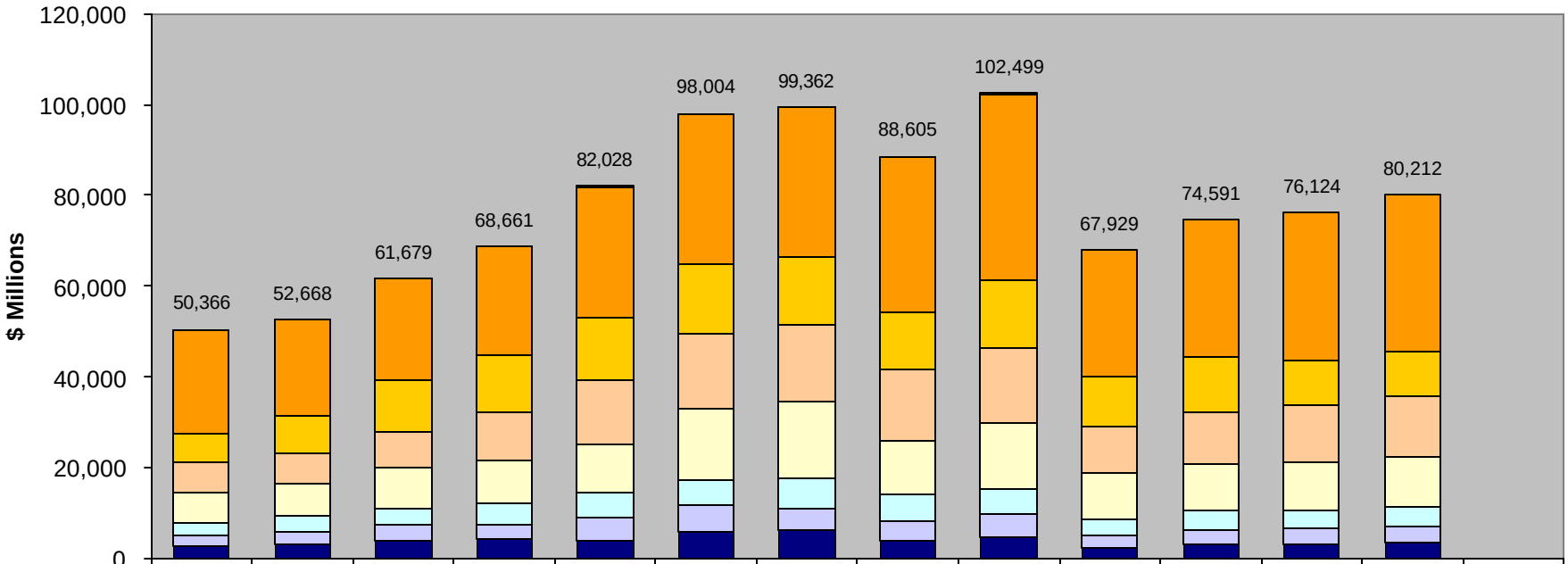
$ of Exposure Associated with Credt-Risk Events
By Years to Maturity



	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Total
N/A	-	-	-	-	-	-	-	6	-	-	-	-	-	6
10+ Yrs	283	126	11	101	158	228	275	41	84	50	82	18	28	1,485
8-10 Yrs	23	180	143	138	184	305	528	120	108	121	55	77	43	2,027
6-8 Yrs	6	34	41	64	138	551	450	372	38	35	68	33	41	1,871
4-6 Yrs	20	74	39	19	86	291	221	269	55	147	39	23	30	1,312
3-4 Yrs	36	49	18	27	34	110	126	139	23	60	24	-	47	694
2-3 Yrs	14	3	10	5	54	101	71	140	-	76	36	11	-	521
0-2 Yrs	3	3	-	121	30	114	161	47	58	13	30	13	-	594
Total	384	469	263	476	684	1,700	1,832	1,135	366	502	335	175	189	8,509

Experience Year

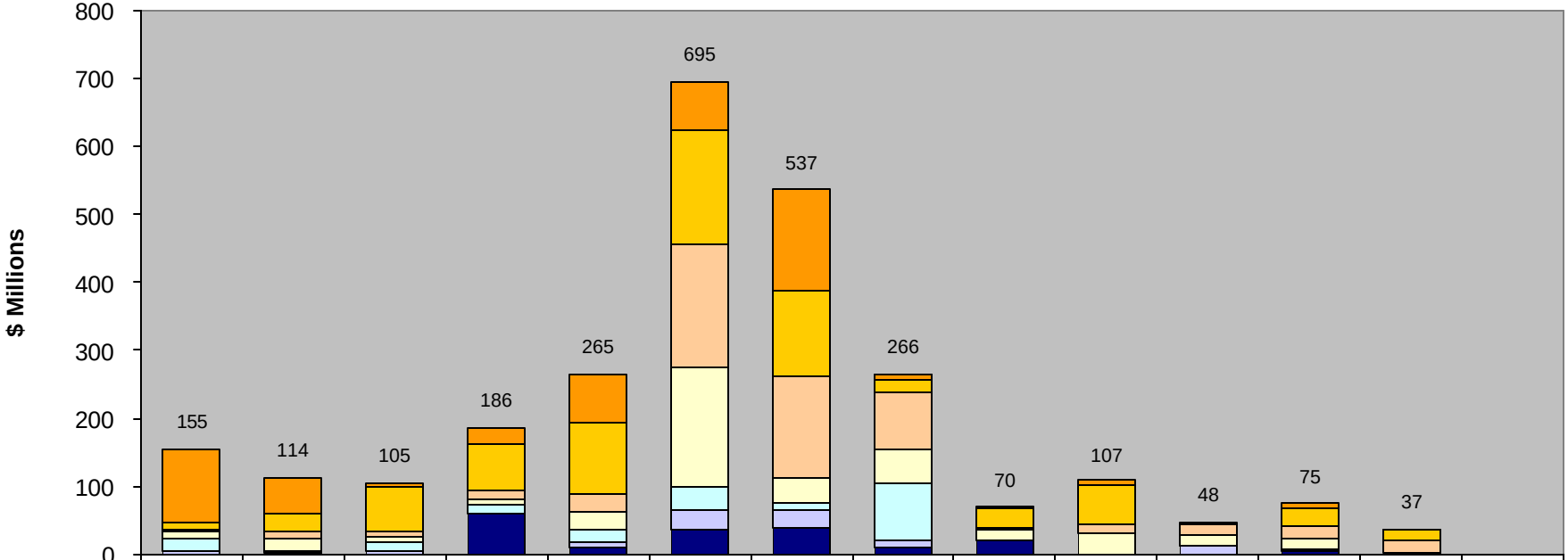
Exposure in $ of Assets
By Years to Maturity



	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Total
N/A	111	70	33	8	203	139	61	106	202	-	4	11	21	968
10+ Yrs	22,622	21,108	22,257	23,947	28,772	33,054	32,965	34,330	41,154	27,690	30,167	32,396	34,673	385,137
8-10 Yrs	6,448	8,222	11,282	12,357	13,889	15,196	14,691	12,613	14,851	11,054	12,045	9,874	9,818	152,341
6-8 Yrs	6,833	6,933	8,161	10,553	14,088	16,770	17,254	15,763	16,247	10,449	11,435	12,640	13,191	160,317
4-6 Yrs	6,539	6,964	9,087	9,544	10,660	15,711	16,625	11,832	14,873	10,280	10,433	10,580	11,302	144,428
3-4 Yrs	2,563	3,561	3,527	4,610	5,618	5,461	6,788	5,893	5,246	3,399	4,307	4,138	4,193	59,303
2-3 Yrs	2,433	2,572	3,560	3,463	4,764	5,940	4,646	4,252	5,388	2,616	2,941	3,200	3,404	49,178
0-2 Yrs	2,818	3,237	3,773	4,178	4,034	5,733	6,332	3,816	4,538	2,441	3,259	3,285	3,612	51,057
Total	50,366	52,668	61,679	68,661	82,028	98,004	99,362	88,605	102,499	67,929	74,591	76,124	80,212	1,002,729

Experience Year

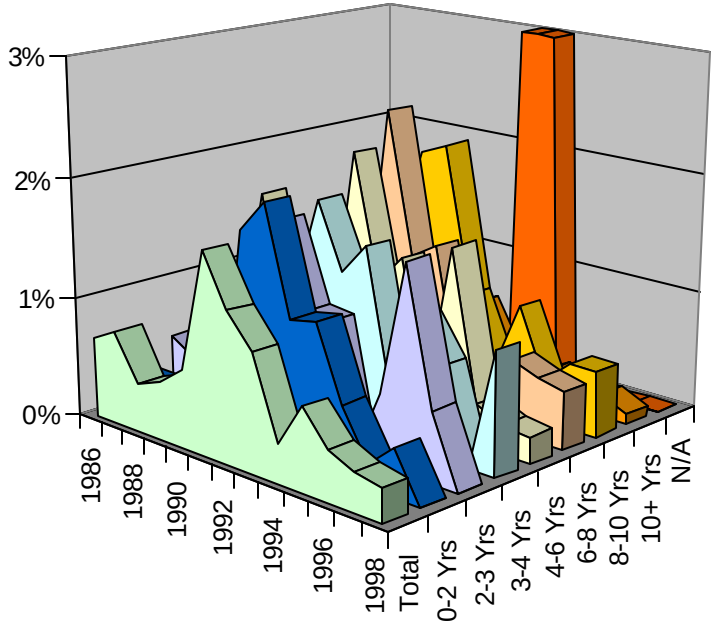
Economic Loss from Credt-Risk Events
By Years to Maturity



	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	Total
N/A	-	-	-	-	-	-	-	0.3	-	-	-	-	-	0.3
10+ Yrs	107.7	54.1	4.8	23.7	72.2	71.4	147.5	9.1	2.8	6.9	3.6	6.1	0.7	510.5
8-10 Yrs	10.2	26.5	67.2	69.3	104.9	168.1	128.8	18.0	29.3	56.5	0.3	27.5	14.5	721.1
6-8 Yrs	3.7	10.1	7.4	13.4	24.5	180.7	148.6	82.6	3.1	13.8	14.9	17.4	19.3	539.6
4-6 Yrs	8.9	19.4	8.7	7.3	28.6	174.7	35.0	51.3	15.5	30.9	15.2	16.4	(0.3)	411.6
3-4 Yrs	19.9	2.7	12.9	12.1	16.4	35.9	11.3	84.3	(0.1)	(2.1)	0.6	-	2.5	196.4
2-3 Yrs	3.8	1.0	4.2	0.1	9.6	28.3	27.2	9.4	-	0.6	12.5	2.6	-	99.4
0-2 Yrs	0.6	0.1	-	60.5	9.1	36.0	38.3	10.6	19.6	-	0.6	4.6	-	180.0
Total	154.7	113.9	105.1	186.3	265.3	695.0	536.8	265.7	70.3	106.5	47.7	74.7	36.8	2,659.0

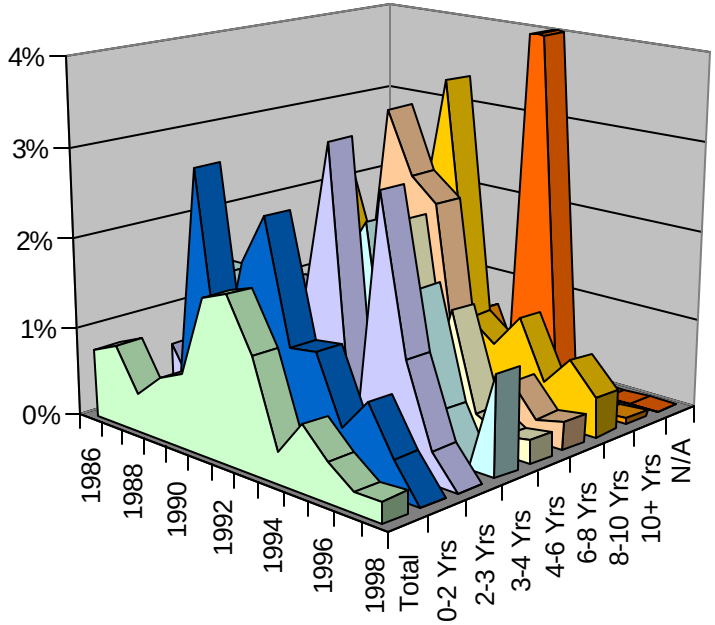
Experience Year

Incidence Rate by Number
By Year & by Number of Years to Maturity



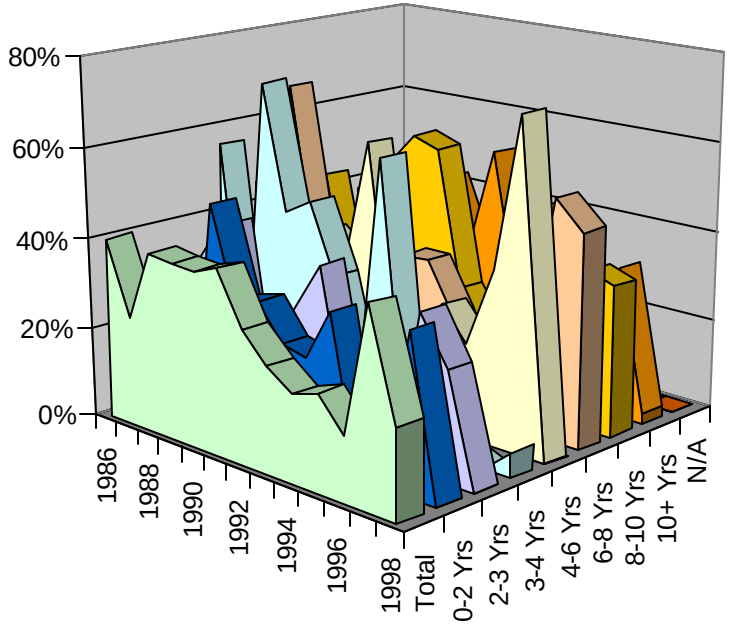
	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Total	0.67%	0.79%	0.42%	0.49%	0.66%	1.67%	1.26%	0.99%	0.32%	0.69%	0.43%	0.33%	0.28%
0-2 Yrs	0.26%	0.24%		0.42%	0.13%	1.76%	2.03%	1.15%	1.20%	0.59%	0.20%	0.40%	
2-3 Yrs	0.50%	0.38%	0.31%	0.29%	0.72%	1.76%	1.07%	1.04%		0.58%	1.69%	0.58%	
3-4 Yrs	1.08%	0.37%	0.30%	0.73%	1.03%	1.85%	1.31%	1.57%	0.43%	1.12%	0.77%		1.03%
4-6 Yrs	0.54%	1.65%	0.54%	0.31%	0.54%	2.17%	1.13%	1.39%	0.33%	1.58%	0.36%	0.25%	0.22%
6-8 Yrs	0.19%	0.84%	0.81%	0.53%	0.71%	2.45%	1.27%	1.41%	0.23%	0.29%	0.63%	0.53%	0.49%
8-10 Yrs	0.65%	1.33%	0.78%	0.91%	1.25%	2.05%	2.14%	0.92%	0.35%	0.93%	0.36%	0.56%	0.56%
10+ Yrs	0.99%	0.55%	0.20%	0.36%	0.45%	0.61%	0.69%	0.27%	0.17%	0.29%	0.16%	0.19%	0.09%
N/A								8.89%					

Incidence Rate by Amount
By Year & by Number of Years to Maturity



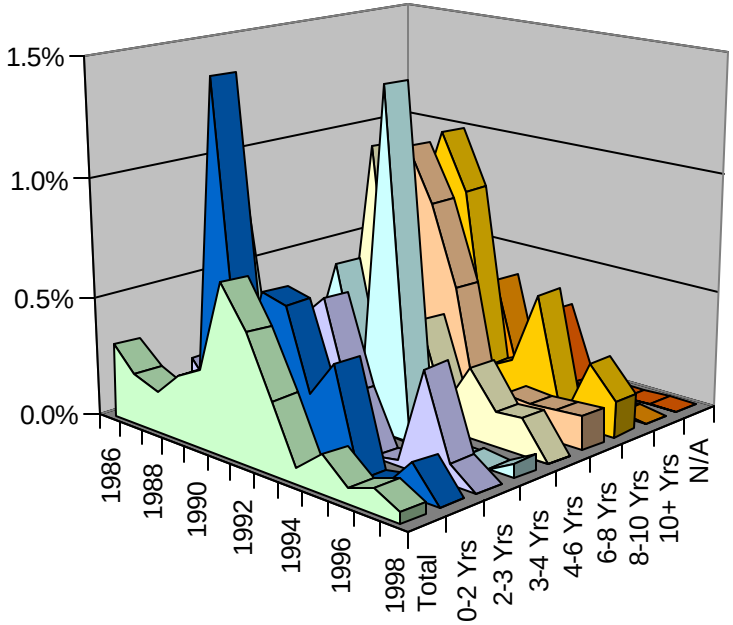
	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Total	0.76%	0.89%	0.43%	0.69%	0.83%	1.73%	1.84%	1.28%	0.36%	0.74%	0.45%	0.23%	0.24%
0-2 Yrs	0.10%	0.11%		2.89%	0.74%	2.00%	2.55%	1.23%	1.28%	0.55%	0.92%	0.41%	
2-3 Yrs	0.58%	0.11%	0.28%	0.16%	1.13%	1.69%	1.52%	3.29%		2.92%	1.23%	0.34%	
3-4 Yrs	1.39%	1.38%	0.51%	0.59%	0.61%	2.02%	1.86%	2.35%	0.45%	1.77%	0.55%		1.12%
4-6 Yrs	0.30%	1.06%	0.43%	0.20%	0.81%	1.85%	1.33%	2.28%	0.37%	1.43%	0.38%	0.21%	0.27%
6-8 Yrs	0.08%	0.48%	0.51%	0.60%	0.98%	3.29%	2.61%	2.36%	0.23%	0.34%	0.60%	0.26%	0.31%
8-10 Yrs	0.36%	2.19%	1.27%	1.11%	1.32%	2.01%	3.60%	0.96%	0.73%	1.09%	0.46%	0.78%	0.44%
10+ Yrs	1.25%	0.60%	0.05%	0.42%	0.55%	0.69%	0.83%	0.12%	0.20%	0.18%	0.27%	0.06%	0.08%
N/A								5.38%					

Loss Severity
By Year & by Number of Years to Maturity



	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Total	40%	24%	40%	39%	39%	41%	29%	23%	19%	21%	14%	43%	19%
0-2 Yrs	20%	3%		50%	30%	31%	24%	23%	34%	0%	2%	35%	
2-3 Yrs	27%	35%	42%	2%	18%	28%	39%	7%		1%	34%	24%	
3-4 Yrs	56%	6%	72%	44%	48%	33%	9%	61%	-1%	-4%	3%		5%
4-6 Yrs	45%	26%	22%	38%	33%	60%	16%	19%	28%	21%	39%	73%	-1%
6-8 Yrs	66%	30%	18%	21%	18%	33%	33%	22%	8%	39%	22%	53%	47%
8-10 Yrs	43%	15%	47%	50%	57%	55%	24%	15%	27%	47%	1%	36%	34%
10+ Yrs	38%	43%	42%	23%	46%	31%	54%	22%	3%	14%	4%	34%	2%
N/A								6%					

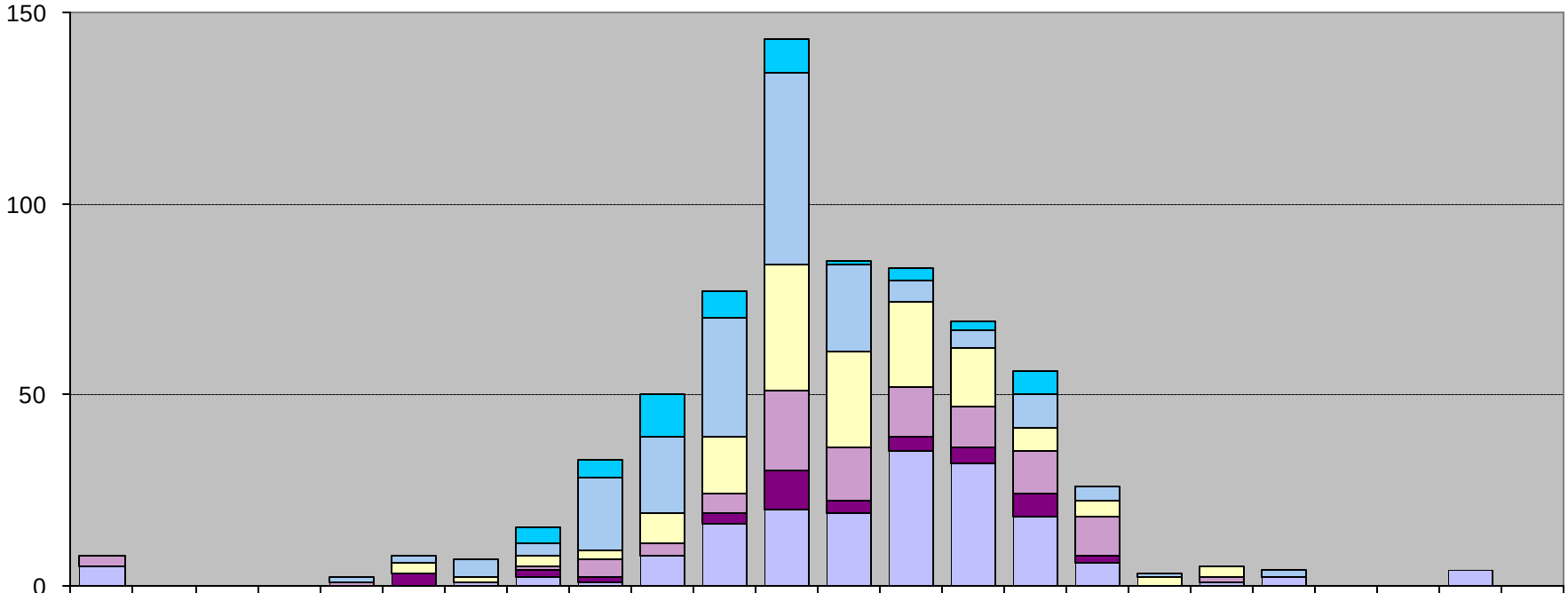
Economic Loss Rate as % of Exposure
By Year & by Number of Years to Maturity



	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Total	0.31%	0.22%	0.17%	0.27%	0.32%	0.71%	0.54%	0.30%	0.07%	0.16%	0.06%	0.10%	0.05%
0-2 Yrs	0.02%	0.00%		1.45%	0.22%	0.63%	0.60%	0.28%	0.43%	0.00%	0.02%	0.14%	
2-3 Yrs	0.15%	0.04%	0.12%	0.00%	0.20%	0.48%	0.59%	0.22%		0.02%	0.42%	0.08%	
3-4 Yrs	0.77%	0.08%	0.37%	0.26%	0.29%	0.66%	0.17%	1.43%	0.00%	-0.06%	0.01%		0.06%
4-6 Yrs	0.14%	0.28%	0.10%	0.08%	0.27%	1.11%	0.21%	0.43%	0.10%	0.30%	0.15%	0.15%	0.00%
6-8 Yrs	0.05%	0.15%	0.09%	0.13%	0.17%	1.08%	0.86%	0.52%	0.02%	0.13%	0.13%	0.14%	0.15%
8-10 Yrs	0.16%	0.32%	0.60%	0.56%	0.76%	1.11%	0.88%	0.14%	0.20%	0.51%	0.00%	0.28%	0.15%
10+ Yrs	0.48%	0.26%	0.02%	0.10%	0.25%	0.22%	0.45%	0.03%	0.01%	0.02%	0.01%	0.02%	0.00%
N/A								0.30%					

Cross Tabulation:
Coupon Rate
By Earliest Quality Rating

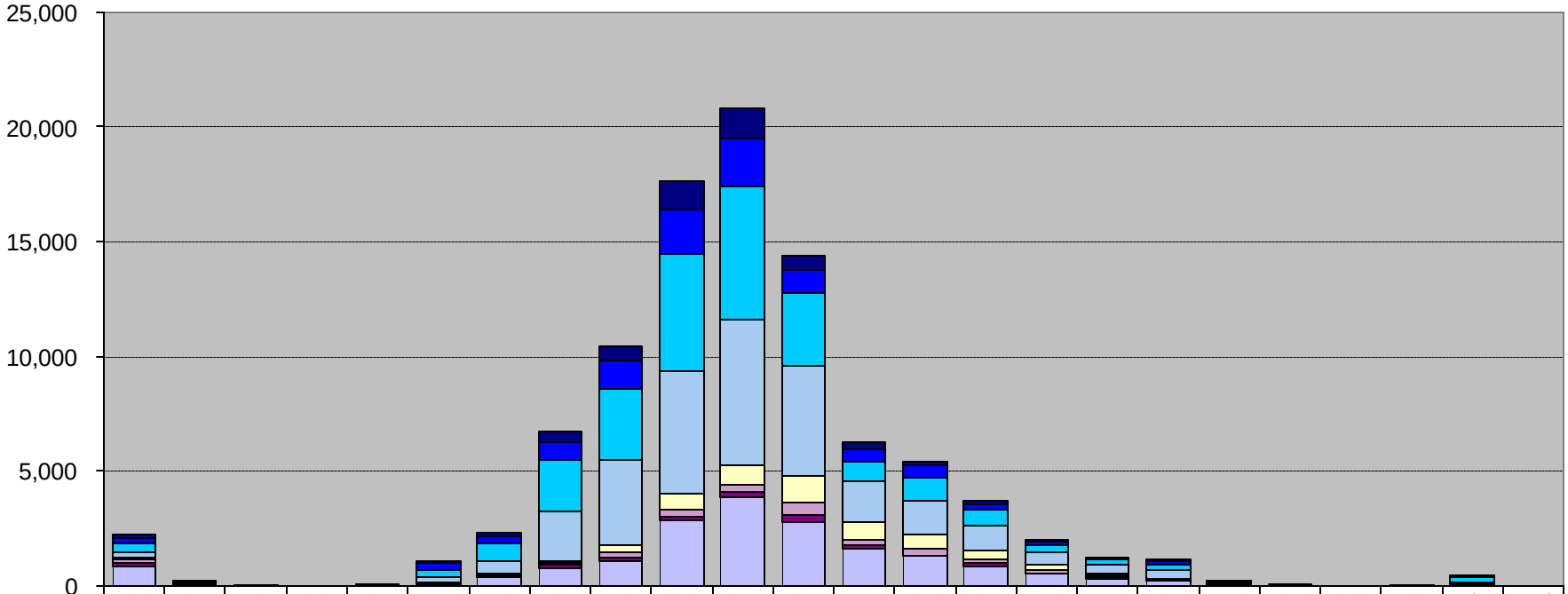
Number of CREs
By Coupon Rate & Earliest Quality Rating



	0	0-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19	19-20	>20	N/A	Total
AAA	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	2
AA	-	-	-	-	-	-	-	-	-	-	1	2	1	2	2	-	-	1	-	-	-	-	-	9
A	-	-	-	-	-	-	-	4	5	11	7	9	1	3	2	6	-	-	-	-	-	-	-	48
BBB	-	-	-	-	1	2	5	3	19	20	31	50	23	6	5	9	4	1	-	2	-	-	-	181
BB	-	-	-	-	-	3	1	3	2	8	15	33	25	22	15	6	4	2	3	-	-	-	-	142
B	3	-	-	-	1	-	-	1	5	3	5	21	14	13	11	11	10	-	1	-	-	-	-	99
<B	-	-	-	-	-	3	-	2	1	-	3	10	3	4	4	6	2	-	-	-	-	-	-	38
N/A	5	-	-	-	-	-	1	2	1	8	16	20	19	35	32	18	6	-	1	2	-	-	4	170
Total	8	-	-	-	2	8	7	15	33	50	78	147	86	85	71	56	26	4	5	4	-	-	4	689

Coupon Rate (%)

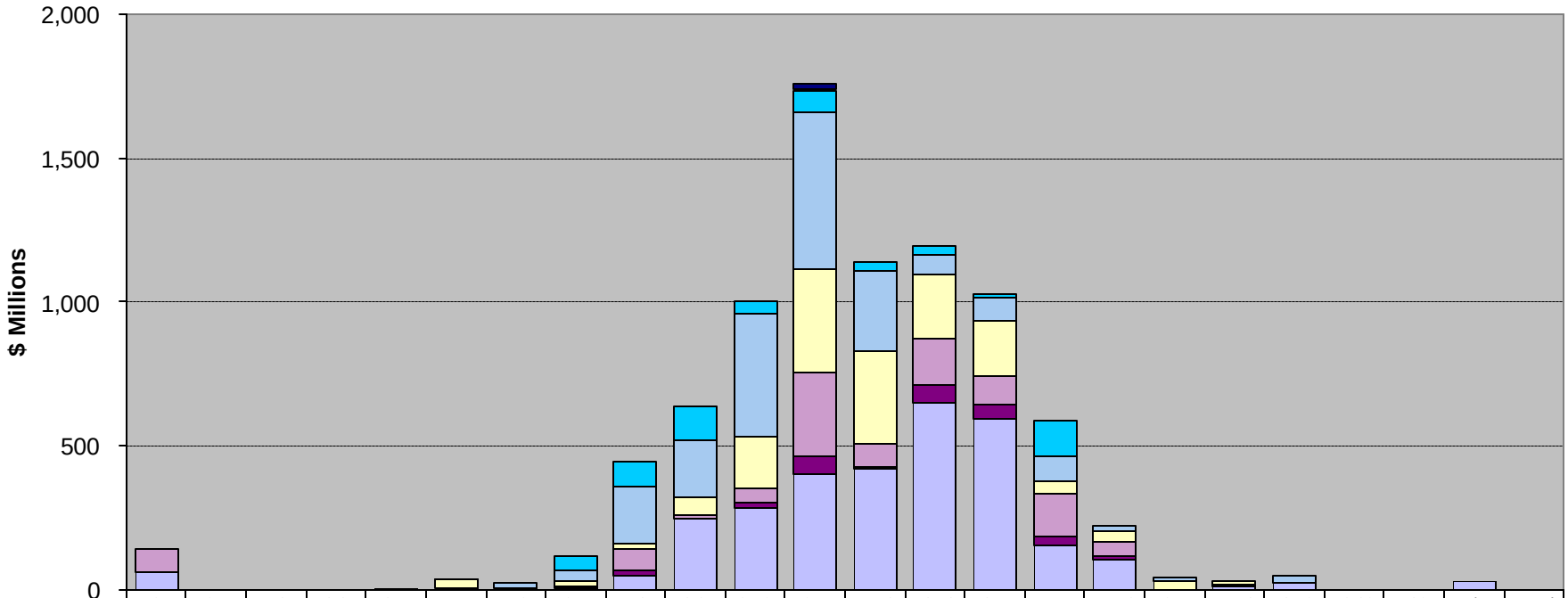
Exposure in
By Coupon Rate & Earliest Quality Rating



	0	0-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19	19-20	>20	N/A	Total
AAA	148	58	14	-	14	53	172	442	600	1,252	1,277	544	321	218	155	37	21	86	9	1	-	4	11	5,430
AA	223	86	2	10	7	293	332	787	1,270	1,964	2,150	1,022	510	472	241	140	50	100	12	2	8	22	102	9,800
A	427	28	9	5	10	341	722	2,229	3,048	5,091	5,770	3,203	909	1,006	694	322	209	257	57	16	4	-	207	24,559
BBB	195	15	3	4	14	216	536	2,174	3,719	5,285	6,346	4,783	1,784	1,528	1,075	567	349	369	82	34	3	5	43	29,124
BB	120	30	1	-	7	27	71	131	321	726	874	1,182	713	573	406	194	113	93	13	4	5	4	9	5,614
B	152	12	5	1	4	6	38	86	254	317	271	533	254	293	185	158	111	32	2	11	-	1	3	2,725
<B	116	13	5	5	3	6	64	105	113	125	264	284	135	66	95	52	44	2	4	3	-	1	4	1,505
N/A	853	12	2	3	13	97	380	772	1,106	2,875	3,853	2,797	1,647	1,274	873	502	289	193	51	4	1	-	65	17,657
Total	2,232	252	40	28	70	1,037	2,314	6,724	10,429	17,632	20,805	14,347	6,271	5,429	3,722	1,970	1,184	1,131	228	74	20	36	443	96,413

Coupon Rate (%)

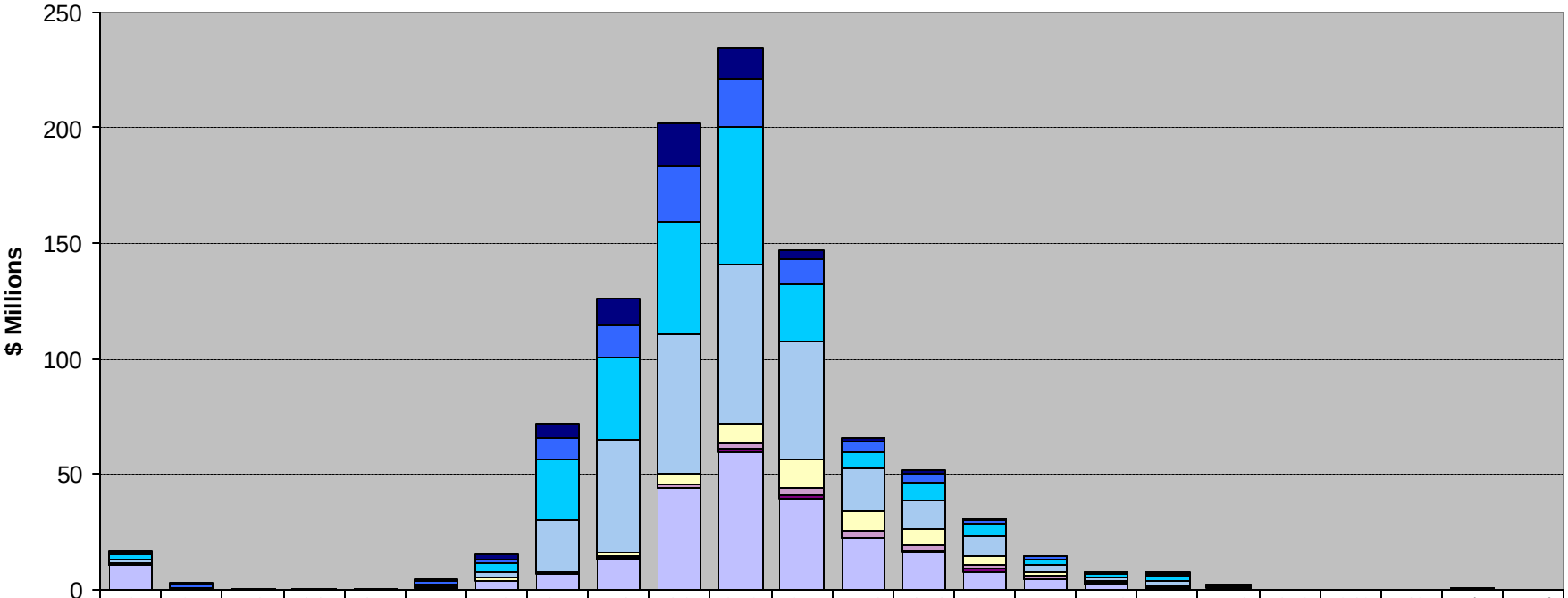
Exposure in $ Associated with CREs
By Coupon Rate & Earliest Quality Rating



	0	0-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19	19-20	>20	N/A	Total
AAA	-	-	-	-	-	-	-	-	-	-	-	18	-	-	-	-	-	-	-	-	-	-	-	18
AA	-	-	-	-	-	-	-	-	-	-	10	11	4	9	14	-	-	5	-	-	-	-	-	53
A	-	-	-	-	-	-	-	46	85	119	38	72	26	29	13	126	-	-	-	-	-	-	-	554
BBB	-	-	-	-	3	4	13	43	199	197	432	543	280	67	82	85	17	10	-	22	-	-	-	1,995
BB	-	-	-	-	-	28	7	15	15	61	178	359	325	225	191	44	37	29	17	-	-	-	-	1,532
B	80	-	-	-	2	-	-	2	75	13	51	294	82	160	101	149	53	-	3	-	-	-	-	1,064
<B	-	-	-	-	-	6	-	2	20	-	16	62	5	59	48	32	9	-	-	-	-	-	-	260
N/A	60	-	-	-	-	-	1	7	48	247	284	400	418	651	594	152	107	-	13	25	-	-	27	3,034
Total	140	-	-	-	5	39	20	115	442	637	1,009	1,758	1,140	1,201	1,042	588	222	45	33	46	-	-	27	8,509

Coupon Rate (%)

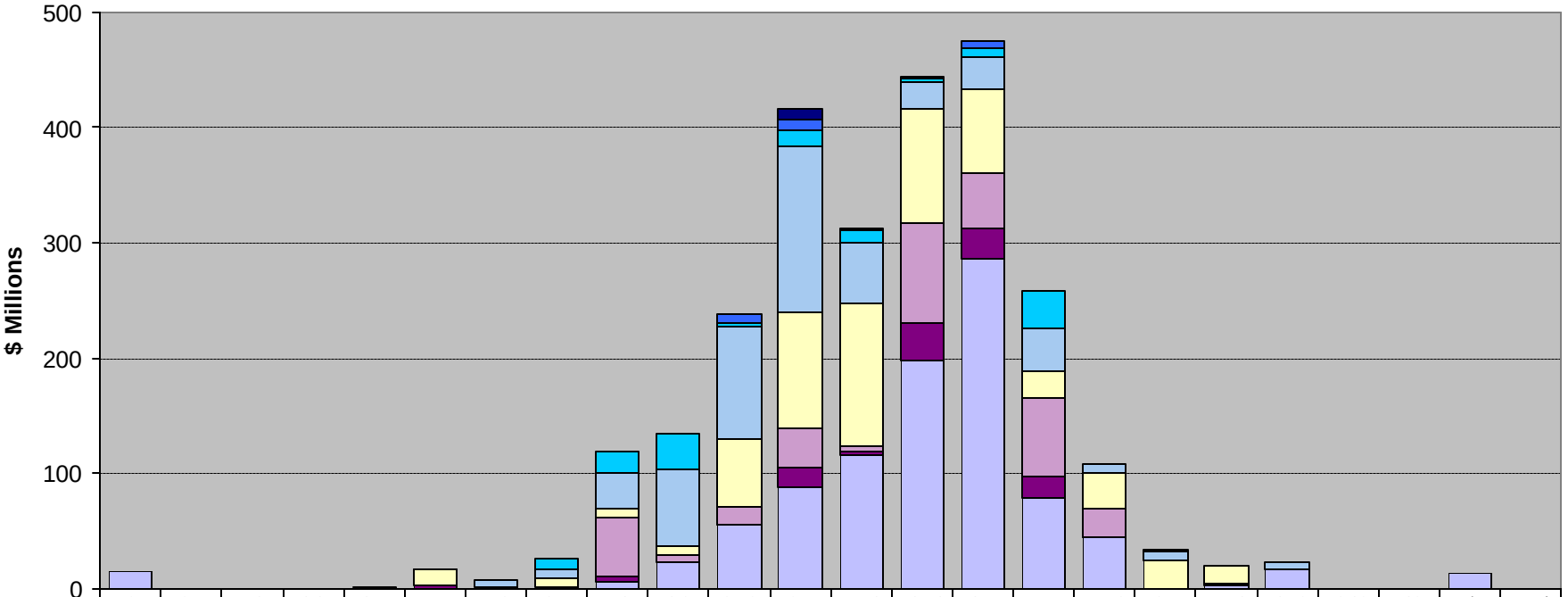
Exposure in $
By Coupon Rate & Earliest Quality Rating



	0	0-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19	19-20	>20	N/A	Total
AAA	0.6	0.9	0.2	-	0.1	0.5	1.8	5.9	11.9	18.0	13.5	4.4	1.7	1.0	0.8	0.2	0.2	0.7	0.3	0.0	-	0.0	0.0	62.7
AA	1.3	1.4	0.0	0.2	0.0	1.3	1.8	9.4	13.9	24.4	20.5	10.5	5.2	4.0	1.2	1.2	0.4	0.7	0.1	0.0	0.0	0.0	0.1	97.7
A	1.6	0.2	0.2	0.1	0.1	0.7	3.8	26.2	35.7	48.9	59.5	24.8	6.4	7.8	5.6	2.6	2.0	2.4	0.4	0.0	0.0	-	0.2	229.1
BBB	1.9	0.2	0.0	0.2	0.1	0.8	2.7	22.1	48.8	60.0	69.0	50.7	18.4	12.9	8.4	3.3	1.5	2.1	0.8	0.2	0.0	0.0	0.2	304.5
BB	0.5	0.1	0.0	-	0.0	0.1	1.0	0.4	1.4	4.9	8.7	13.0	9.1	6.3	3.6	1.2	0.8	0.6	0.2	0.0	0.0	0.0	0.0	51.9
B	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.7	1.1	2.2	2.9	2.6	2.6	2.0	1.2	0.6	0.2	0.0	0.0	-	0.0	0.0	16.7
<B	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.7	0.3	1.2	1.6	0.4	0.6	1.1	0.3	0.2	0.0	0.0	0.0	-	0.0	0.1	7.0
N/A	10.4	0.1	0.0	0.0	0.0	0.7	4.0	7.2	13.3	44.0	59.8	39.1	22.0	16.3	7.9	4.6	2.1	0.8	0.2	0.0	0.0	-	0.3	233.1
Total	16.8	2.9	0.5	0.5	0.4	4.2	15.1	71.5	126.4	201.6	234.4	147.1	65.9	51.5	30.5	14.7	7.7	7.4	2.1	0.3	0.0	0.1	1.0	1,002.7

Coupon Rate (%)

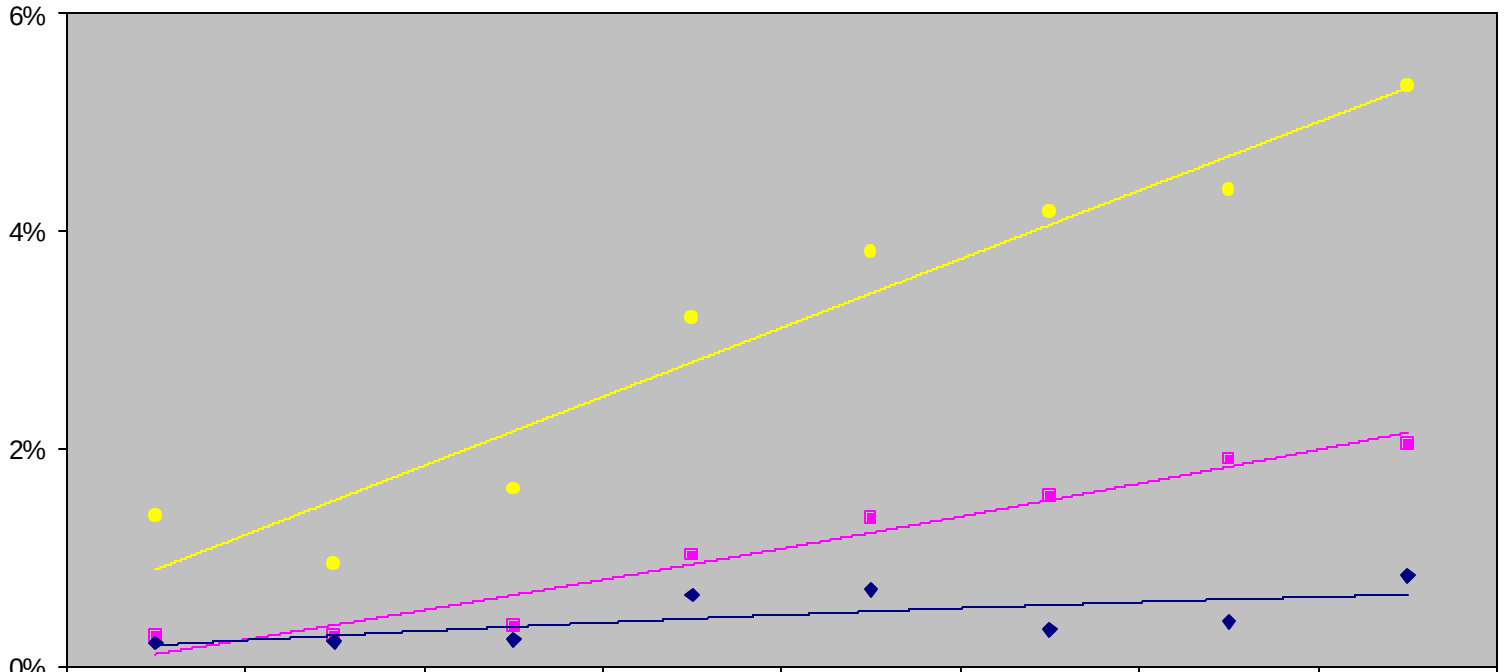
Economic Loss of CREs
By Coupon Rate & Earliest Quality Rating



	0	0-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19	19-20	>20	N/A	Total
AAA	-	-	-	-	-	-	-	-	-	-	-	9.5	-	-	-	-	-	-	-	-	-	-	-	9.5
AA	-	-	-	-	-	-	-	-	-	-	7.5	9.1	1.8	1.6	5.5	-	-	2.1	-	-	-	-	-	27.7
A	-	-	-	-	-	-	-	8.4	17.0	30.9	2.5	13.3	9.9	2.3	8.5	32.1	-	-	-	-	-	-	-	125.0
BBB	-	-	-	-	0.3	0.5	6.1	7.4	31.9	67.0	98.6	144.3	52.4	23.2	28.2	37.8	7.0	7.4	-	5.8	-	-	-	517.8
BB	-	-	-	-	-	13.0	1.0	8.6	8.1	6.9	58.2	100.7	124.3	99.1	72.9	23.6	31.5	24.3	15.8	-	-	-	-	588.1
B	-	-	-	-	0.8	-	-	(0.1)	50.5	6.8	16.0	34.5	5.0	87.0	47.3	67.7	23.7	-	2.1	-	-	-	-	341.4
<B	-	-	-	-	-	3.2	-	1.0	5.4	-	0.4	17.6	3.5	31.5	26.1	18.2	1.5	-	-	-	-	-	-	108.3
N/A	15.1	-	-	-	-	-	0.0	(0.2)	5.3	22.7	54.7	87.1	115.1	198.5	286.3	79.0	43.8	-	2.1	17.0	-	-	14.4	941.3
Total	15.1	-	-	-	1.1	16.7	7.1	25.1	118.2	134.4	237.9	416.1	312.1	443.2	474.8	258.5	107.5	33.9	20.1	22.8	-	-	14.4	2,659.0

Coupon Rate (%)

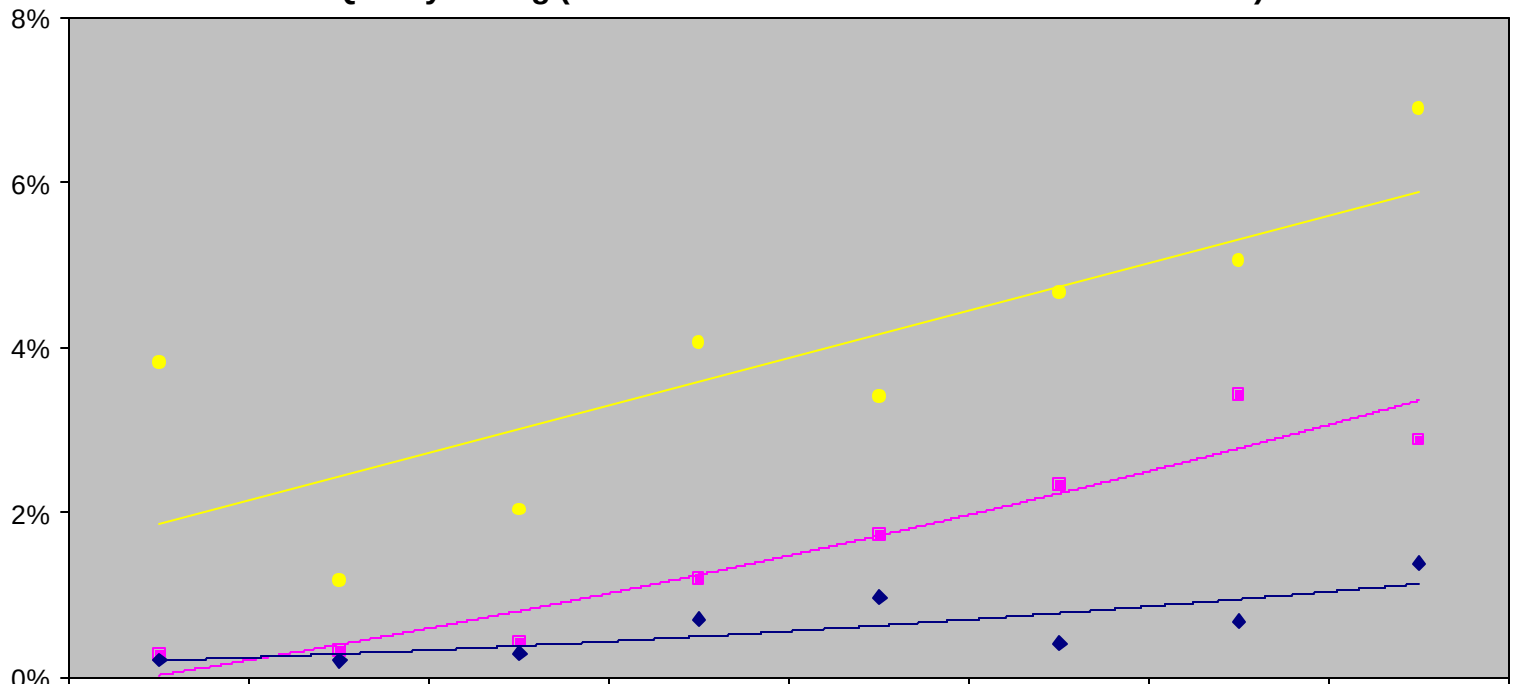
Incidence by Number
By Coupon Rate &
Earliest Quality Rating (Investment Grade & Below Investment Grade)



	6-8%	8-9%	9-10%	10-11%	11-12%	12-13%	13-14%	14%+
B.I.G.	1.39%	0.94%	1.63%	3.20%	3.81%	4.18%	4.38%	5.34%
Overall	0.28%	0.28%	0.37%	1.02%	1.37%	1.57%	1.91%	2.05%
I.G.	0.22%	0.23%	0.25%	0.66%	0.71%	0.34%	0.42%	0.83%

Coupon Rate

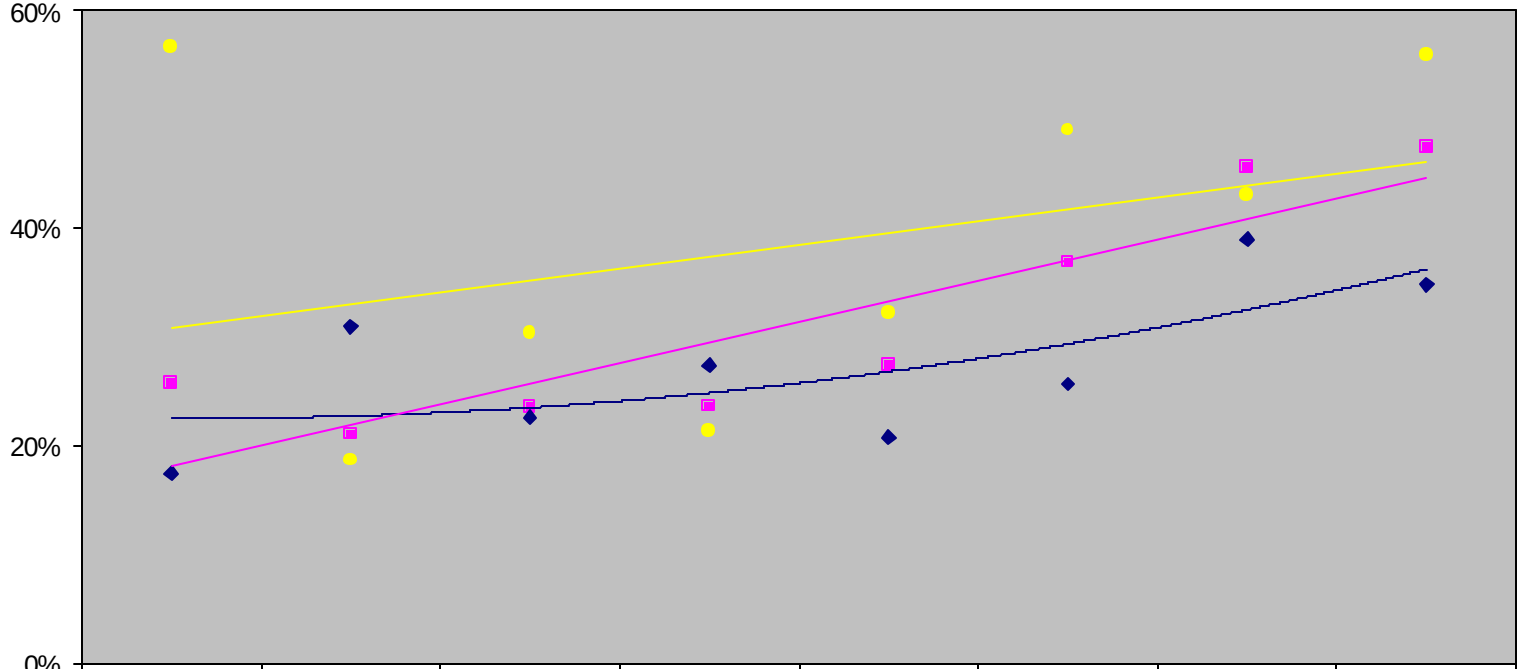
Incidence by Amount
By Coupon Rate &
Earliest Quality Rating (Investment Grade & Below Investment Grade)



	6-8%	8-9%	9-10%	10-11%	11-12%	12-13%	13-14%	14%+
B.I.G.	3.81%	1.17%	2.03%	4.06%	3.40%	4.67%	5.05%	6.89%
Overall	0.28%	0.32%	0.43%	1.20%	1.73%	2.33%	3.42%	2.88%
I.G.	0.21%	0.21%	0.30%	0.71%	0.97%	0.41%	0.68%	1.38%

Coupon Rate

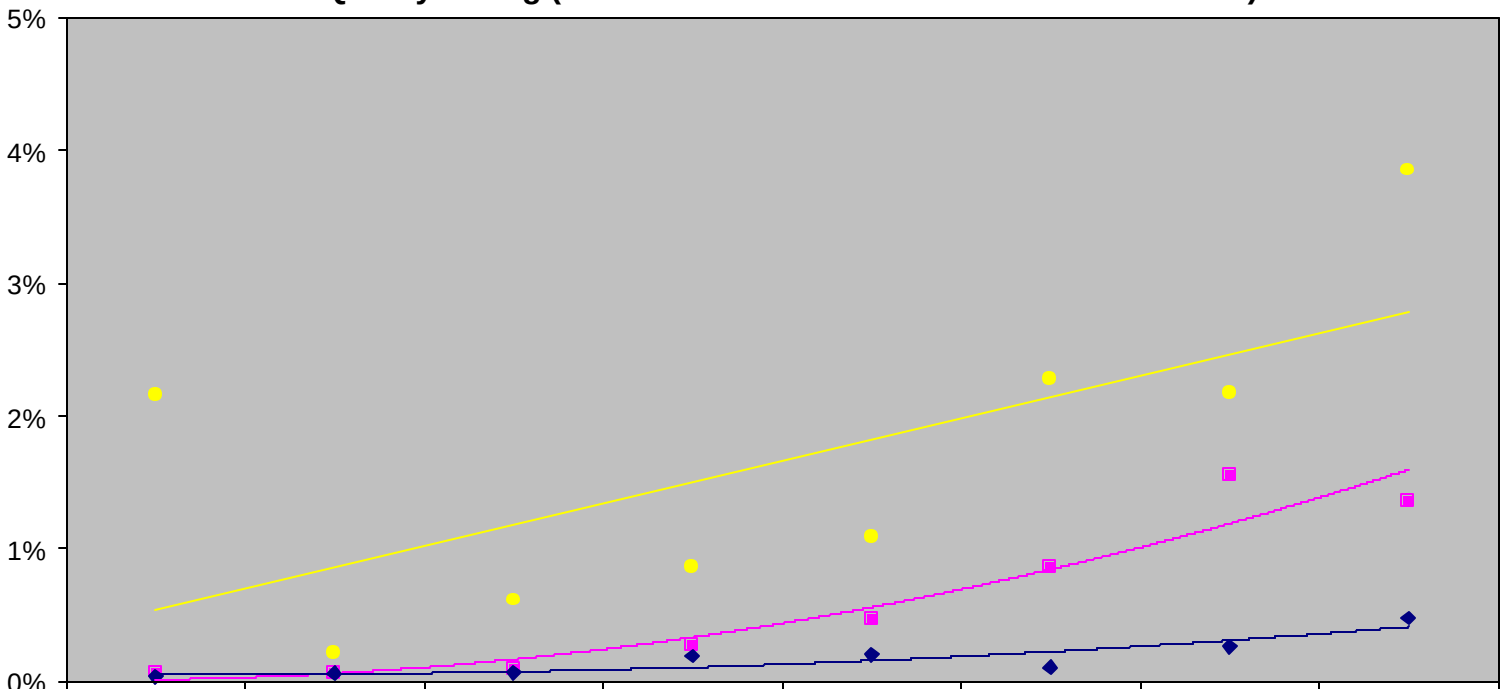
Loss Severity
By Coupon Rate &
Earliest Quality Rating (Investment Grade & Below Investment Grade)



	6-8%	8-9%	9-10%	10-11%	11-12%	12-13%	13-14%	14%+
B.I.G.	57%	19%	30%	21%	32%	49%	43%	56%
Overall	26%	21%	24%	24%	27%	37%	46%	47%
I.G.	17%	31%	23%	27%	21%	26%	39%	35%

Coupon Rate

Economic Loss Rate as % of Exposure
By Coupon Rate &
Earliest Quality Rating (Investment Grade & Below Investment Grade)

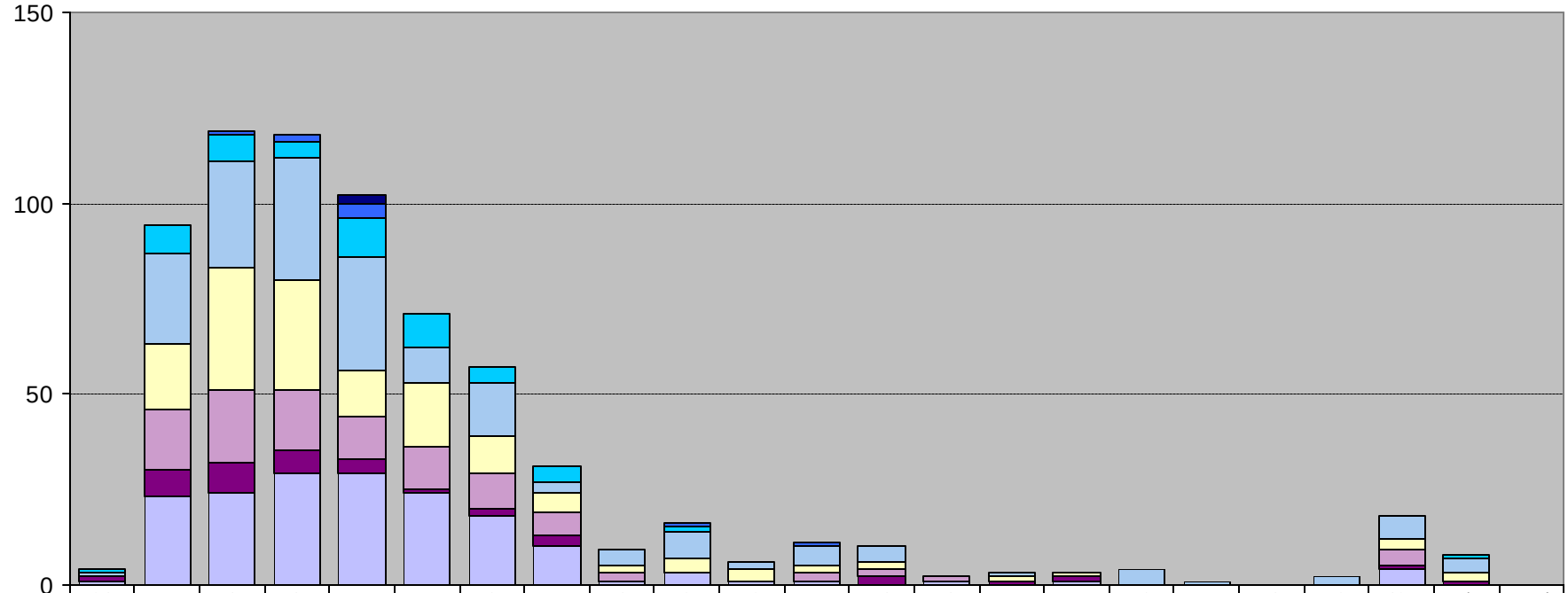


	6-8%	8-9%	9-10%	10-11%	11-12%	12-13%	13-14%	14%+
B.I.G.	2.16%	0.22%	0.62%	0.87%	1.10%	2.29%	2.17%	3.85%
Overall	0.07%	0.07%	0.10%	0.28%	0.47%	0.86%	1.56%	1.37%
I.G.	0.04%	0.06%	0.07%	0.19%	0.20%	0.11%	0.27%	0.48%

Coupon Rate

Cross Tabulation:
Years Since Funding
By Earliest Quality Rating

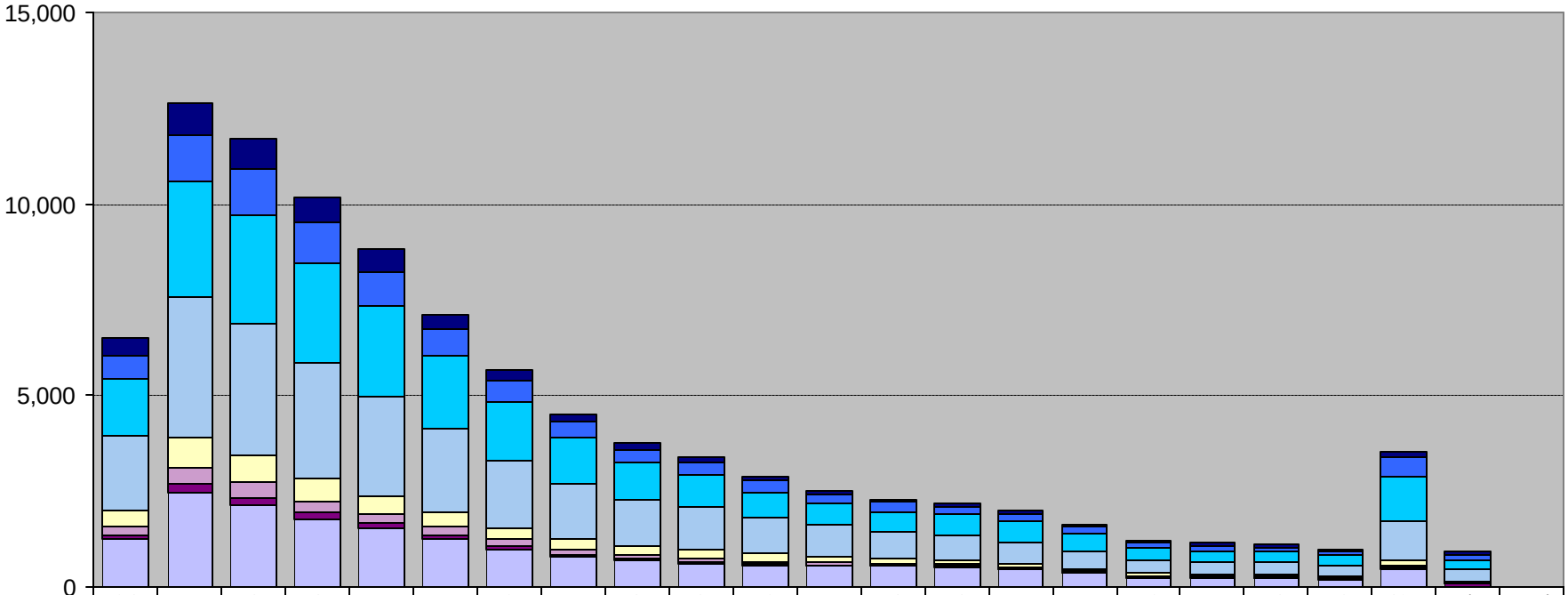
of CREs
By Years Since Funding & Earliest Quality Rating



	0.3	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20+	N/A	Total
AAA	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
AA	-	-	1	2	4	-	-	-	-	1	-	1	-	-	-	-	-	-	-	-	-	-	9
A	1	7	7	4	10	9	4	4	-	1	-	-	-	-	-	-	-	-	-	-	-	1	48
BBB	1	24	28	32	30	9	14	3	4	7	2	5	4	-	1	-	4	1	-	2	6	4	181
BB	-	17	32	29	12	17	10	5	2	4	3	2	2	-	1	1	-	-	-	-	3	2	142
B	-	16	19	16	11	11	9	6	2	-	-	2	2	1	-	-	-	-	-	-	4	-	99
<B	1	7	8	6	4	1	2	3	-	-	-	-	2	-	1	1	-	-	-	-	1	1	38
N/A	1	23	24	29	29	24	18	10	1	3	1	1	-	1	-	1	-	-	-	-	4	-	170
Total	4	94	119	118	102	71	57	31	9	16	6	11	10	2	3	3	4	1	-	2	18	8	689

Years Since Funding

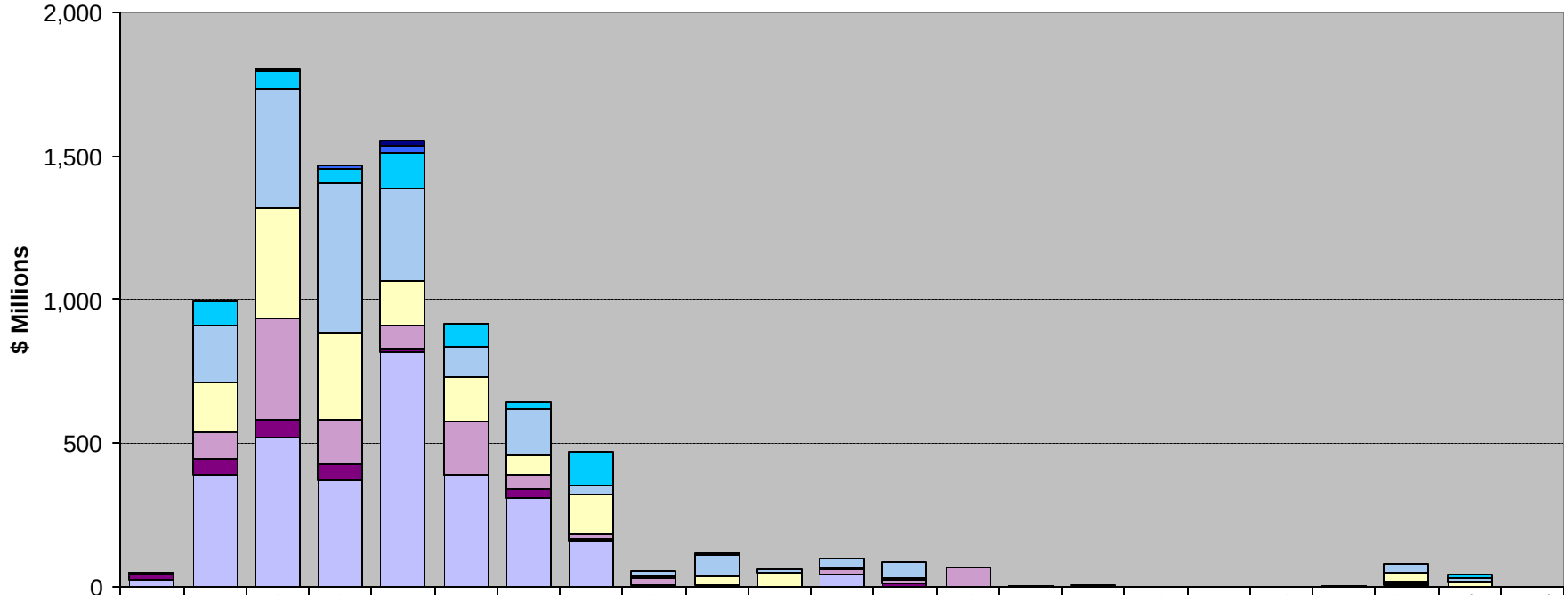
Exposure in
By Years Since Funding & Earliest Quality Rating



	0.3	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20+	N/A	Total
AAA	431	813	796	676	587	400	275	209	174	147	121	92	77	63	58	59	57	62	72	54	155	59	5,430
AA	624	1,232	1,215	1,058	881	657	521	401	351	324	291	242	238	221	226	186	156	148	120	94	480	140	9,800
A	1,513	3,026	2,817	2,593	2,389	1,932	1,540	1,231	974	816	652	556	515	547	524	435	304	279	274	246	1,176	224	24,559
BBB	1,909	3,659	3,443	3,026	2,588	2,153	1,760	1,436	1,202	1,128	959	823	709	647	561	467	361	323	331	302	1,010	331	29,124
BB	437	794	693	584	478	376	316	273	238	234	202	164	134	107	93	76	63	59	54	46	147	51	5,614
B	210	431	403	316	246	223	159	120	92	77	74	69	53	44	36	25	21	18	14	17	64	17	2,725
<B	96	230	196	148	125	115	95	66	52	38	33	26	26	29	33	18	19	25	28	24	27	63	1,505
N/A	1,263	2,436	2,130	1,774	1,520	1,246	971	772	685	620	555	539	525	502	439	353	242	229	212	178	454	17	17,657
Total	6,481	12,619	11,693	10,173	8,812	7,101	5,635	4,506	3,767	3,382	2,885	2,508	2,274	2,157	1,969	1,616	1,222	1,141	1,105	960	3,511	900	96,413

Years Since Funding

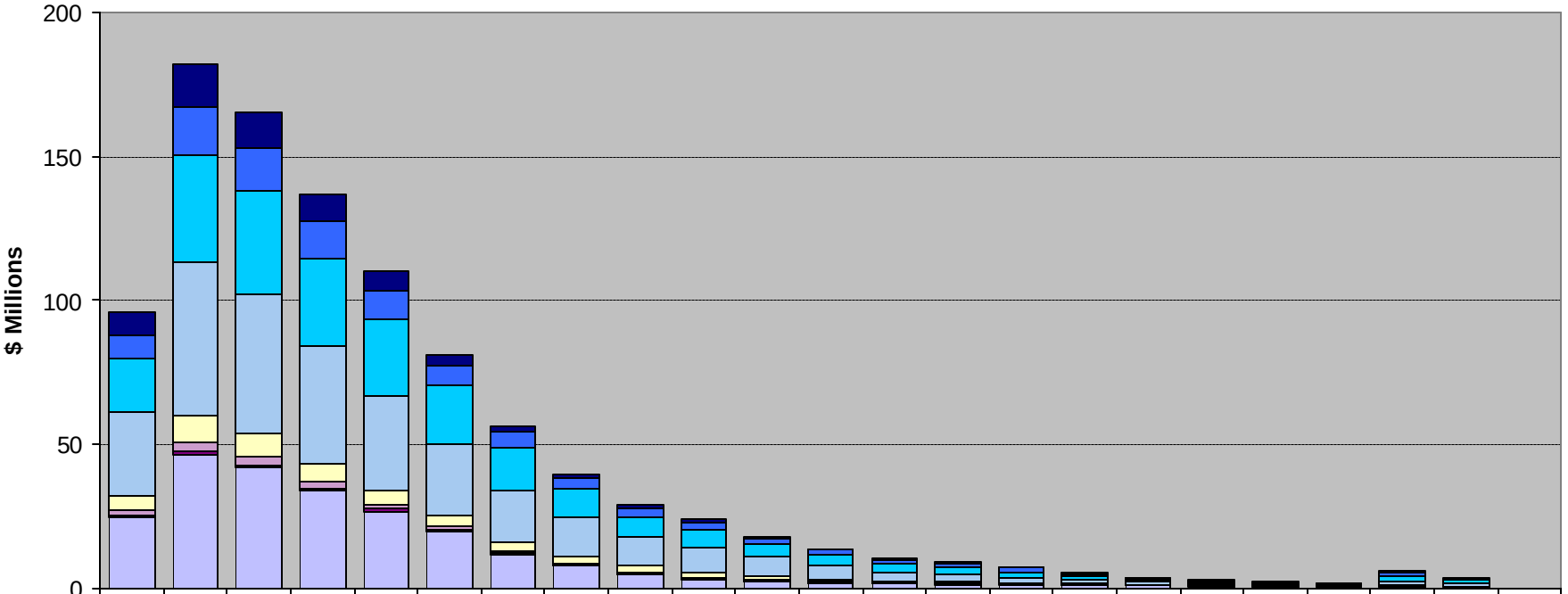
Exposure in $ Associated with CREs
By Years Since Funding & Earliest Quality Rating



	0.3	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20+	N/A	Total
AAA	-	-	-	-	18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	18
AA	-	-	9	9	25	-	-	-	-	4	-	5	-	-	-	-	-	-	-	-	-	-	53
A	3	85	57	48	126	78	25	121	-	1	-	-	-	-	-	-	-	-	-	-	-	10	554
BBB	5	194	418	525	320	103	161	30	17	75	9	26	59	-	3	-	2	0	-	5	28	15	1,995
BB	-	176	385	300	157	156	72	136	7	31	48	11	8	-	1	0	-	-	-	-	29	17	1,532
B	-	93	352	159	81	188	47	14	28	-	-	14	11	65	-	-	-	-	-	-	11	-	1,064
<B	20	58	59	55	13	1	31	6	-	-	-	-	10	-	2	1	-	-	-	-	4	1	260
N/A	22	386	520	368	816	387	310	161	3	6	2	44	-	0	-	3	-	-	-	-	5	-	3,034
Total	50	993	1,801	1,464	1,555	913	645	469	54	118	59	100	88	65	5	4	2	0	-	5	77	42	8,509

Years Since Funding

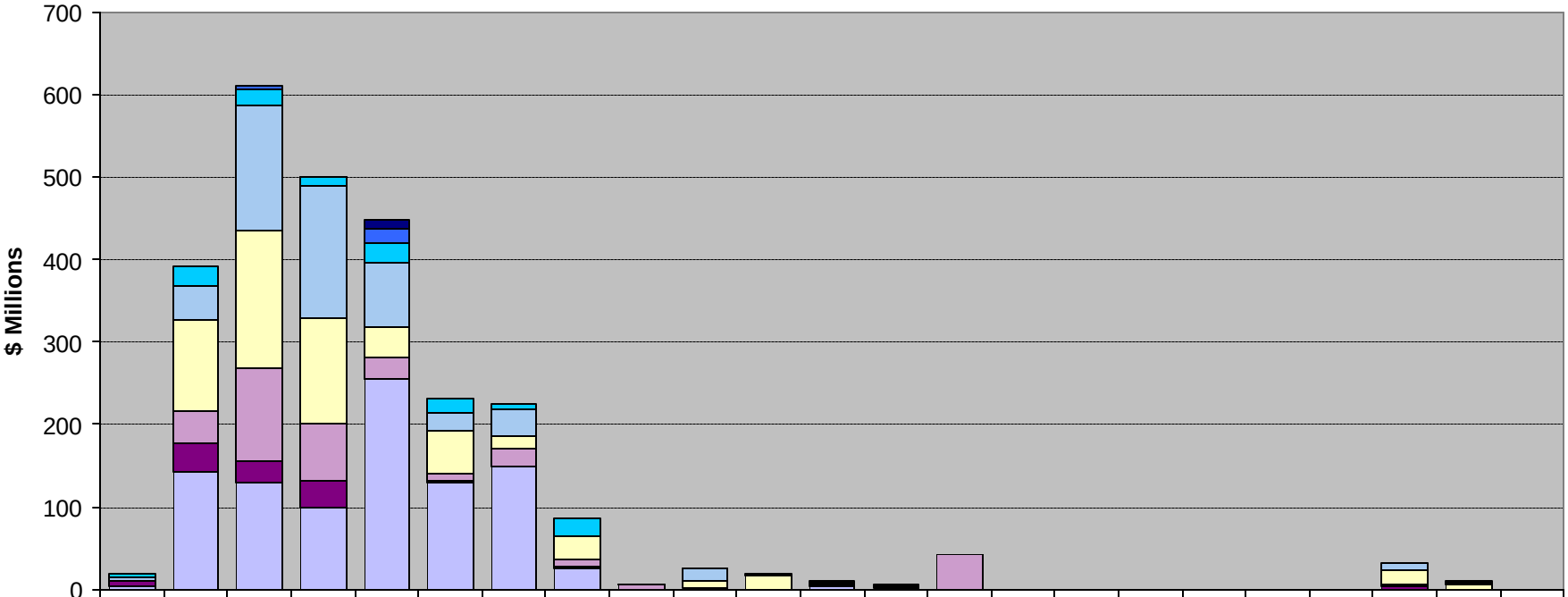
Exposure in $
By Years Since Funding & Earliest Quality Rating



	0.3	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20+	N/A	Total
AAA	7.8	14.7	12.4	9.1	6.5	3.5	1.7	1.4	1.1	1.0	0.8	0.5	0.4	0.3	0.2	0.2	0.2	0.1	0.2	0.1	0.3	0.3	62.7
AA	8.0	16.6	15.3	12.9	10.0	6.9	5.4	3.8	3.1	2.9	2.0	1.6	1.5	1.2	1.4	1.0	0.7	0.5	0.4	0.3	1.7	0.6	97.7
A	19.0	37.4	35.7	30.5	26.6	20.3	14.7	10.2	7.1	6.1	4.3	3.6	2.9	2.7	2.0	1.3	0.8	0.5	0.6	0.5	1.6	0.7	229.1
BBB	28.8	53.1	48.4	40.7	32.9	24.5	18.0	13.3	10.1	8.5	6.6	5.0	3.3	2.6	1.9	1.3	0.8	0.6	0.5	0.5	1.5	1.3	304.5
BB	5.1	9.3	8.1	6.6	5.1	3.8	3.1	2.5	2.1	1.7	1.3	0.9	0.5	0.4	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.2	51.9
B	1.8	3.3	2.8	2.2	1.6	1.5	0.9	0.6	0.5	0.3	0.3	0.3	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	16.7
<B	0.4	1.1	1.0	0.8	0.7	0.7	0.6	0.3	0.2	0.1	0.2	0.1	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	7.0
N/A	24.9	46.2	41.8	33.8	26.7	19.6	11.7	7.6	4.8	3.2	2.4	1.8	1.5	1.4	1.4	1.1	1.0	0.8	0.4	0.2	0.6	0.2	233.1
Total	95.8	181.6	165.5	136.6	110.1	80.8	56.1	39.8	29.0	23.9	17.9	13.8	10.4	8.9	7.4	5.3	3.7	2.7	2.2	1.8	6.0	3.6	1,002.7

Years Since Funding

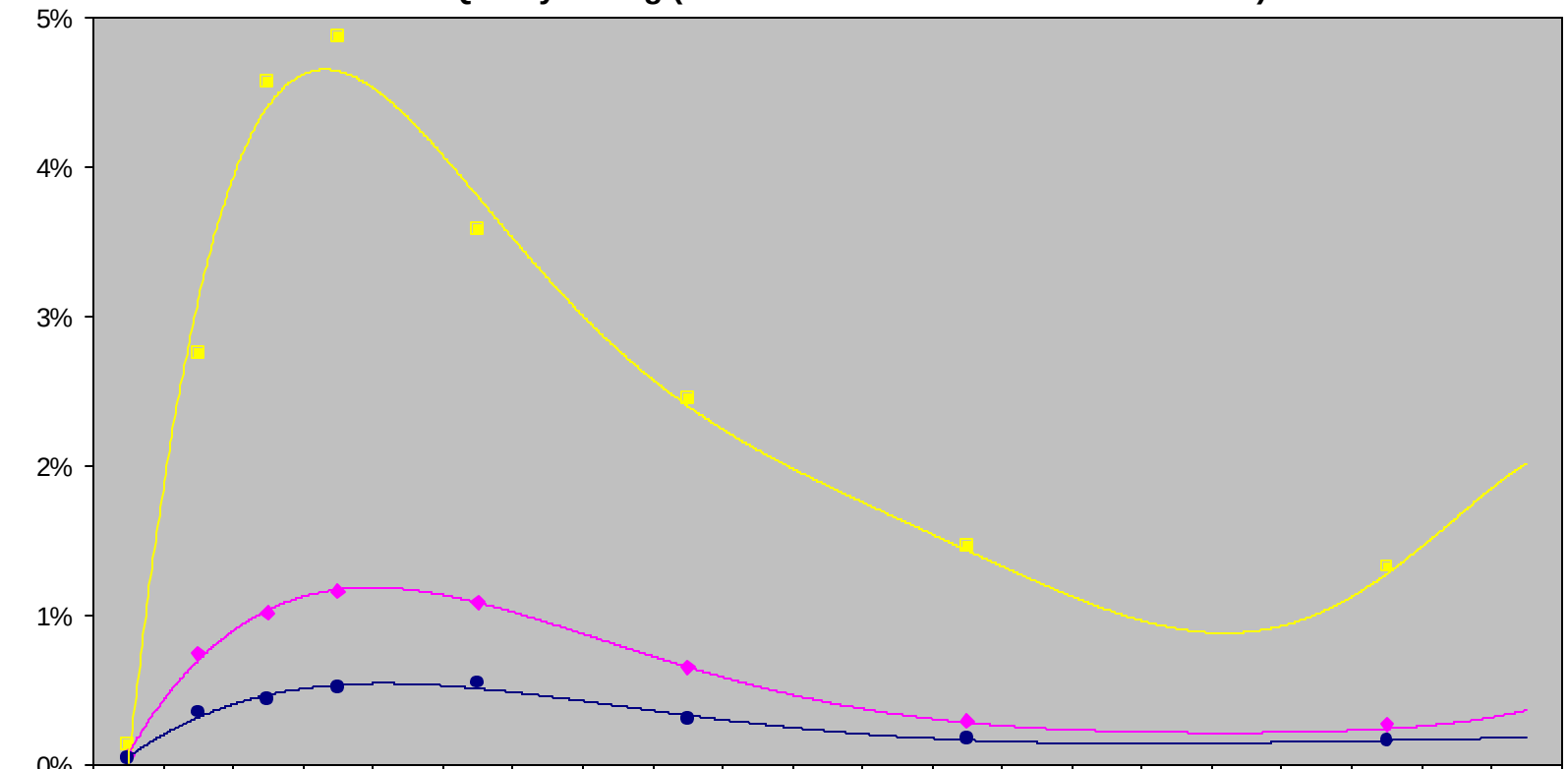
Economic Loss of CREs
By Years Since Funding & Earliest Quality Rating



	0.3	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20+	N/A	Total
AAA	-	-	-	-	9.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9.5
AA	-	-	4.8	1.2	18.5	-	-	-	-	1.0	-	2.1	-	-	-	-	-	-	-	-	-	-	27.7
A	3.0	23.2	19.8	10.1	23.6	16.0	5.9	21.4	-	0.0	-	-	-	-	-	-	-	-	-	-	2.0	125.0
BBB	5.0	42.0	152.1	160.2	76.8	23.3	31.2	(1.1)	0.6	14.3	1.8	(0.6)	(1.8)	-	0.2	-	0.2	0.1	-	0.4	9.6	3.6	517.8
BB	-	109.3	166.4	127.7	38.3	50.0	16.7	29.4	0.2	9.5	17.0	1.6	1.3	-	0.1	0.0	-	-	-	-	15.9	4.7	588.1
B	-	40.3	112.5	70.2	24.9	10.2	20.2	8.0	4.6	-	-	2.2	2.6	42.4	-	-	-	-	-	-	3.4	-	341.4
<B	5.4	34.3	27.2	32.6	1.5	0.9	(2.0)	2.4	-	-	-	-	2.1	-	(0.0)	0.0	-	-	-	-	3.2	0.7	108.3
N/A	4.9	142.6	128.6	99.2	254.6	130.6	150.0	25.4	0.7	0.9	(0.3)	3.3	-	0.3	-	0.3	-	-	-	-	0.3	-	941.3
Total	18.2	391.7	611.4	501.2	447.6	231.0	222.0	85.5	6.1	25.7	18.5	8.7	4.1	42.7	0.2	0.4	0.2	0.1	-	0.4	32.4	11.0	2,659.0

Years Since Funding

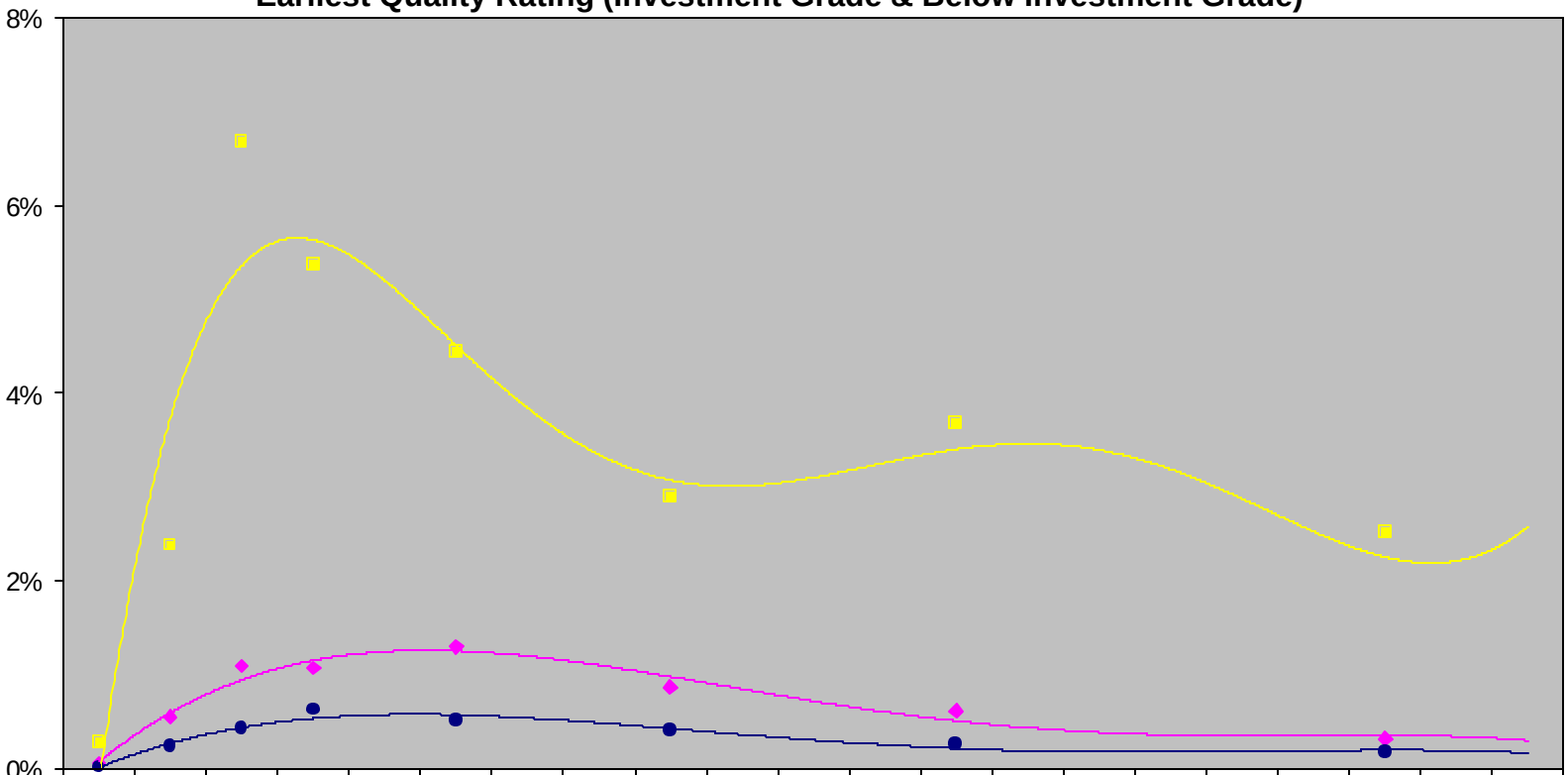
Incidence by Number
By Years Since Funding &
Earliest Quality Rating (Investment & Below Investment Grade)



	0.3	1.0	2.0	3.0	4.0	4.5	5.0	6.5	7.5	8.5	9.5	10.5	11.5	12.5	13.5	14.5	15.5	16.5	17.5		19.0
B.I.G	0.13%	2.75%	4.57%	4.87%		3.58%			2.45%				1.46%				0		1.33%		0
Overall	0.06%	0.74%	1.02%	1.16%		1.09%			0.65%				0.30%				0		0.27%		0
I.G.	0.04%	0.36%	0.44%	0.52%		0.55%			0.30%				0.18%				0		0.16%		0

Years Since Funding

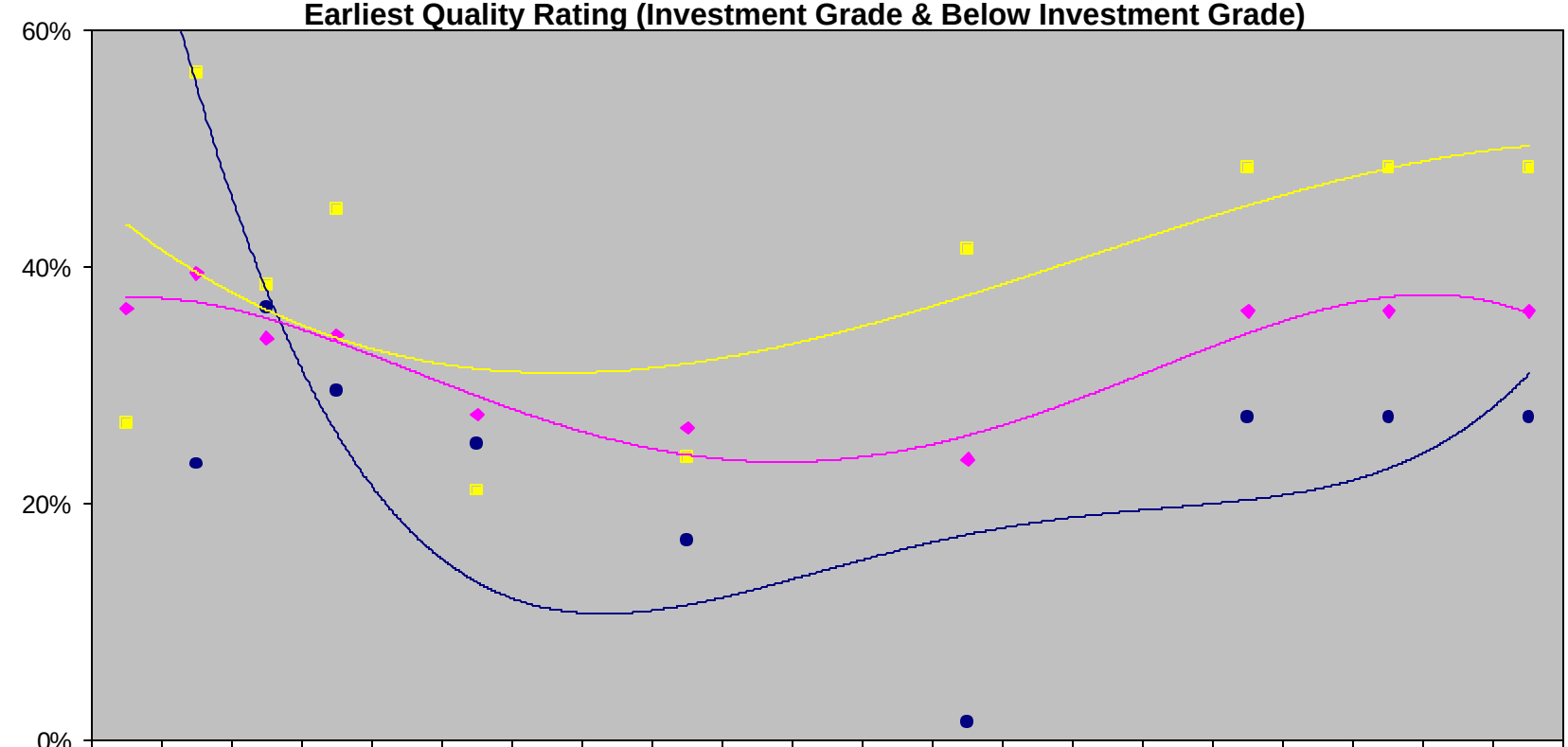
Incidence by Amount
By Years Since Funding &
Earliest Quality Rating (Investment Grade & Below Investment Grade)



	0.3	1.0	2.0	3.0	4.0	4.5	5.0	6.5	7.5	8.5	9.5	10.5	11.5	12.5	13.5	14.5	15.5	16.5	17.5		19.0
B.I.G.	0.27%	2.38%	6.68%	5.37%		4.44%			2.89%				3.69%				0		2.52%		0
Overall	0.05%	0.55%	1.09%	1.07%		1.29%			0.86%				0.61%				0		0.32%		0
I.G.	0.01%	0.23%	0.43%	0.62%		0.51%			0.40%				0.25%				0		0.17%		0

Years Since Funding

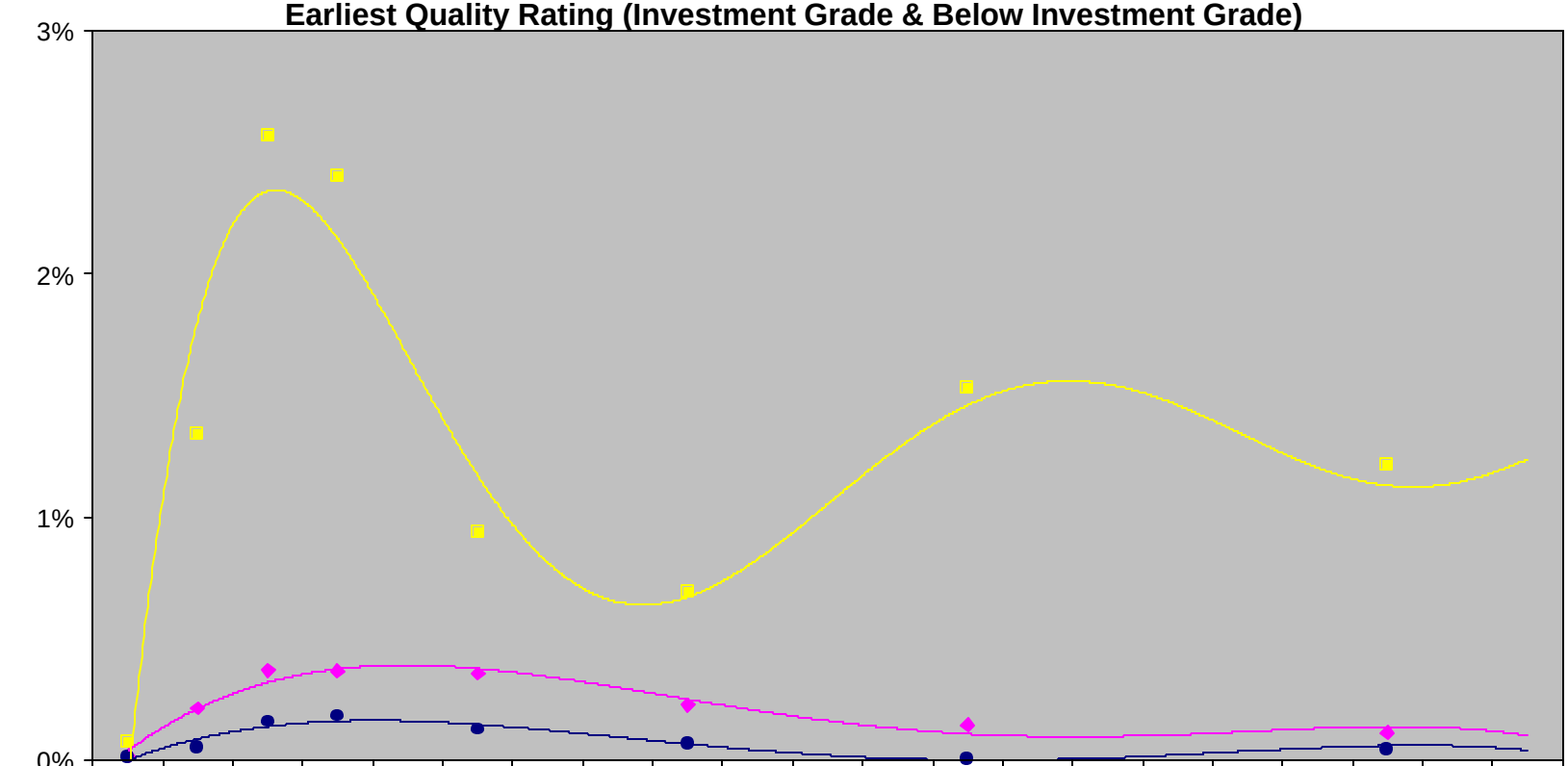
Loss Severity
By Years Since Funding &
Earliest Quality Rating (Investment Grade & Below Investment Grade)



	0.3	1.0	2.0	3.0	4.0	4.5	5.0	6.5	7.5	8.5	9.5	10.5	11.5	12.5	13.5	14.5	15.5	16.5	17.5		19.0
B.I.G.	27%	56%	38%	45%		21%			24%				42%				0		48%		0
Overall	36%	39%	34%	34%		27%			26%				24%				0		36%		0
I.G.	100%	23%	36%	29%		25%			17%				2%				0		27%		0

Years Since Funding

Economic Loss Rate as % of Exposure
By Years Since Funding &
Earliest Quality Rating (Investment Grade & Below Investment Grade)

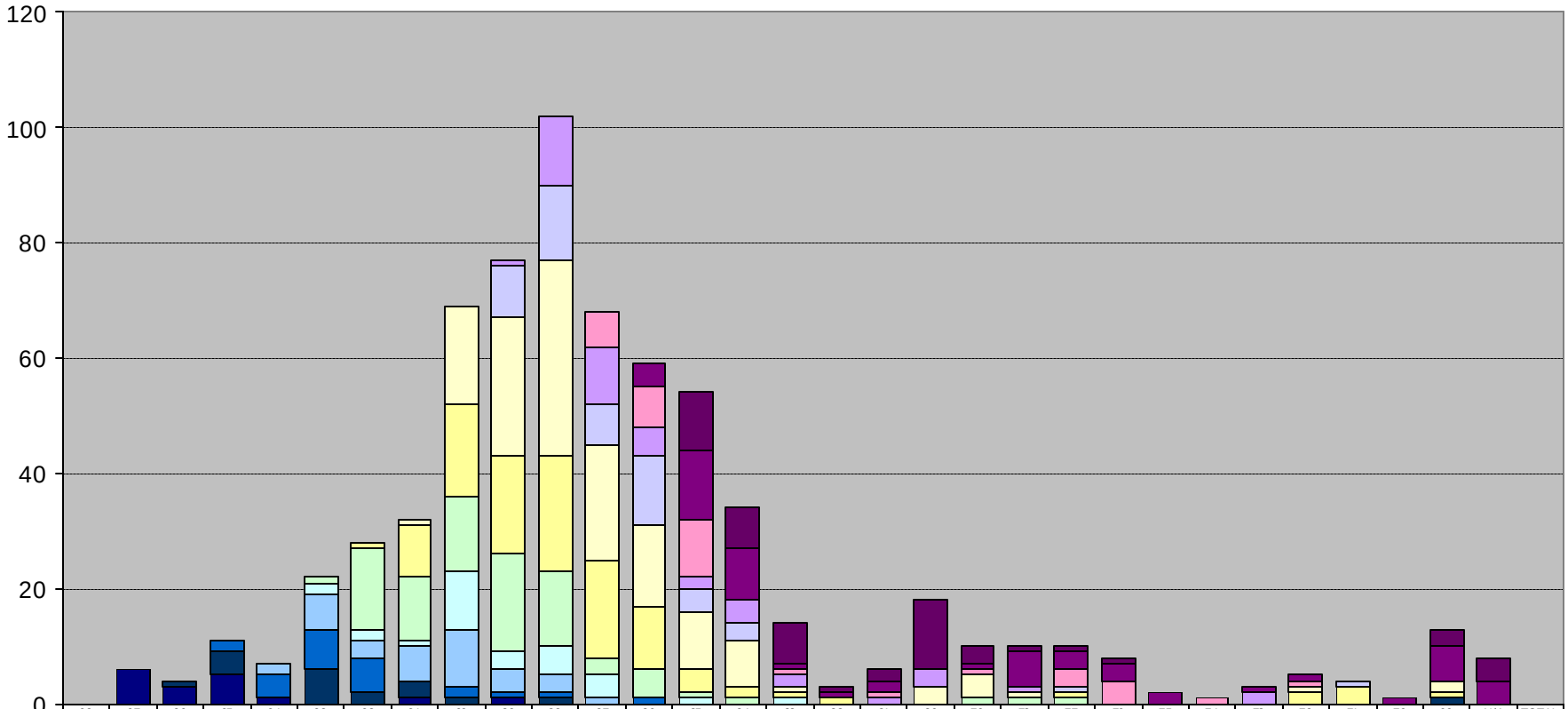


	0.3	1.0	2.0	3.0	4.0	4.5	5.0	6.5	7.5	8.5	9.5	10.5	11.5	12.5	13.0	14.5	15.5	16.5	17.5		19.0
B.I.G.	0.07%	1.34%	2.57%	2.40%		0.94%			0.69%				1.53%				0		1.22%		0
Overall	0.02%	0.22%	0.37%	0.37%		0.36%			0.23%				0.15%				0		0.12%		0
I.G.	0.01%	0.05%	0.16%	0.18%		0.13%			0.07%				0.00%				0		0.05%		0

Years Since Funding

Cross Tabulation:
Funding Year
By Experience Year

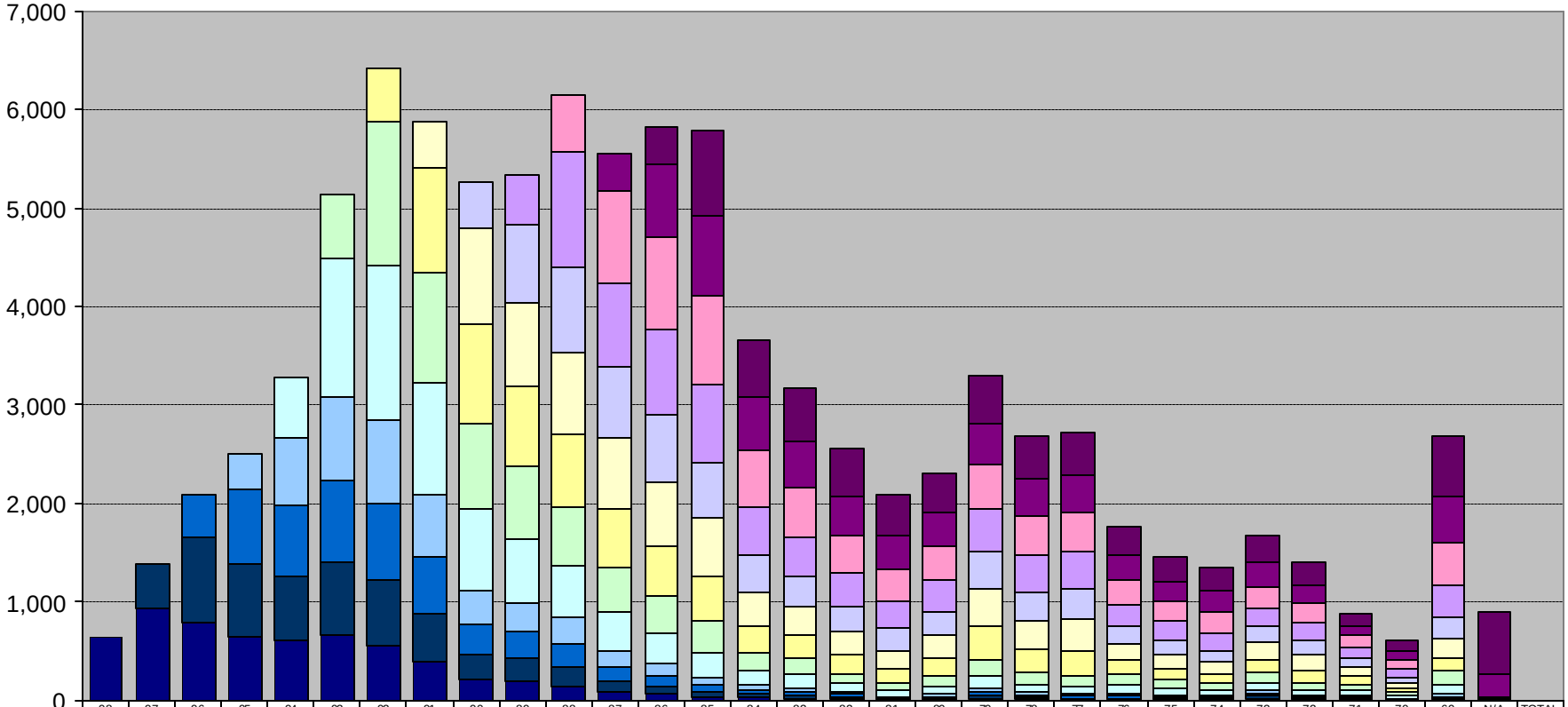
of CREs
By Funding Year & Experience Year



	98	97	96	95	94	93	92	91	90	89	88	87	86	85	84	83	82	81	80	79	78	77	76	75	74	73	72	71	70	69	N/A	TOTAL
86	-	-	-	-	-	-	-	-	-	-	-	-	-	10	7	7	1	2	12	3	1	1	1	-	-	-	-	-	-	3	4	52
87	-	-	-	-	-	-	-	-	-	-	-	-	4	12	9	1	1	2	-	1	6	3	3	2	-	1	1	-	1	6	4	57
88	-	-	-	-	-	-	-	-	-	-	-	6	7	10	-	1	-	1	-	1	-	3	4	-	1	-	1	-	-	-	-	35
89	-	-	-	-	-	-	-	-	-	1	12	10	5	2	4	2	-	1	3	-	1	-	-	-	-	2	-	-	-	-	-	43
90	-	-	-	-	-	-	-	-	-	9	13	7	12	4	3	-	-	-	-	-	-	1	-	-	-	-	-	1	-	-	-	50
91	-	-	-	-	-	-	-	1	17	24	34	20	14	10	8	1	-	-	3	4	1	-	-	-	-	-	1	-	-	2	-	140
92	-	-	-	-	-	-	1	9	16	17	20	17	11	4	2	1	1	-	-	-	-	1	-	-	-	-	2	3	-	1	-	106
93	-	-	-	-	-	1	14	11	13	17	13	3	5	1	1	-	-	-	-	1	1	1	-	-	-	-	-	-	-	-	-	82
94	-	-	-	-	-	2	2	1	10	3	5	4	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	29
95	-	-	-	-	2	6	3	6	10	4	3	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	35
96	-	-	-	2	4	7	6	-	2	1	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24
97	-	-	1	4	-	6	2	3	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	19
98	-	6	3	5	1	-	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	17
Total	-	6	4	11	7	22	28	32	69	77	102	68	59	54	34	14	3	6	18	10	10	10	8	2	1	3	5	4	1	13	8	689

Funding Year

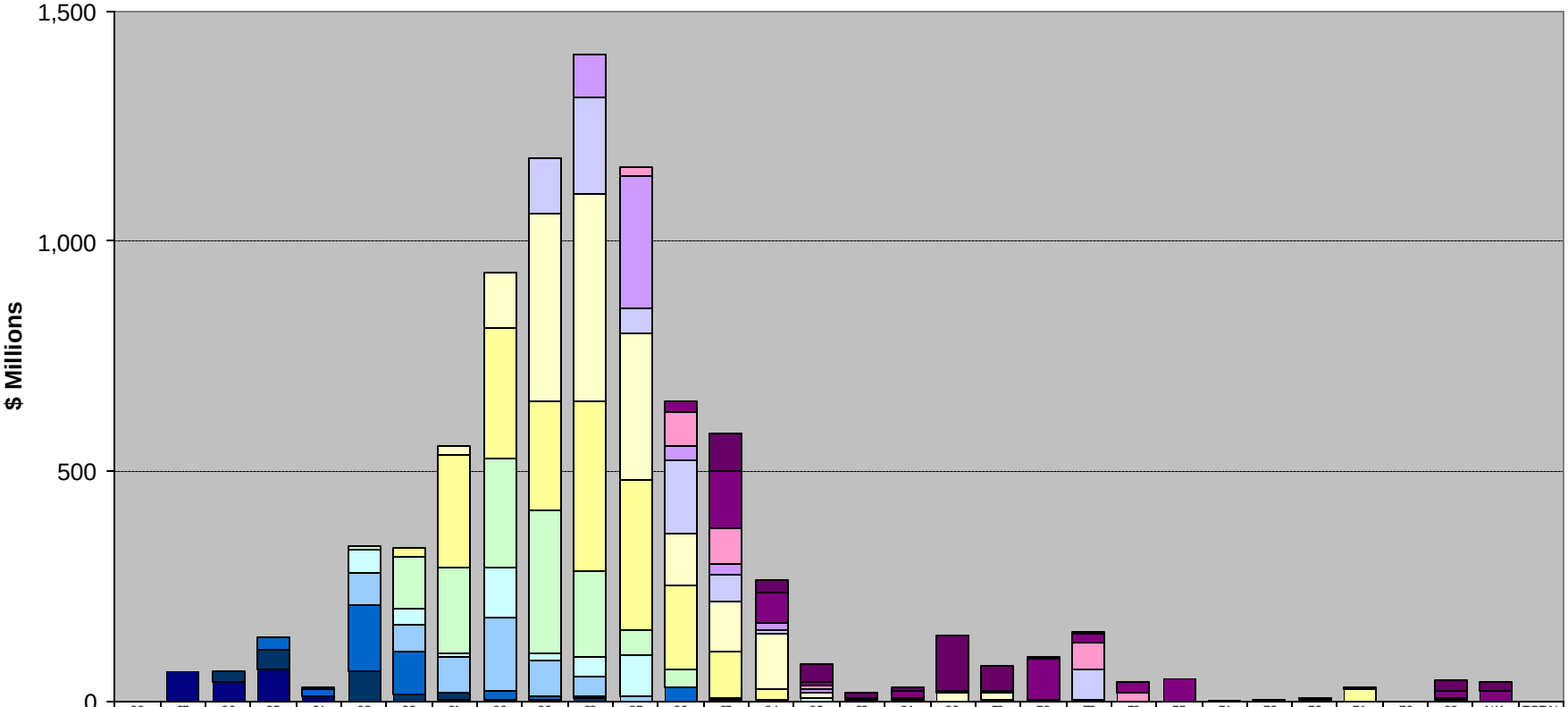
Exposure in
By Funding Year & Experience Year



	98	97	96	95	94	93	92	91	90	89	88	87	86	85	84	83	82	81	80	79	78	77	76	75	74	73	72	71	70	69	N/A	TOTAL
86	-	-	-	-	-	-	-	-	-	-	-	-	369	858	571	542	478	409	394	476	436	421	307	247	249	281	233	128	101	610	634	7,740
87	-	-	-	-	-	-	-	-	-	-	-	390	750	813	542	470	406	347	337	427	381	376	251	202	217	246	190	98	93	476	230	7,239
88	-	-	-	-	-	-	-	-	-	-	575	927	939	908	573	491	382	318	349	449	392	399	241	202	214	222	186	116	96	432	12	8,419
89	-	-	-	-	-	-	-	-	-	500	1,164	853	858	792	501	414	331	280	324	435	377	378	215	192	182	185	181	114	91	334	4	8,700
90	-	-	-	-	-	-	-	-	481	803	864	718	689	557	376	303	256	231	242	378	295	321	182	152	111	158	155	98	55	213	-	7,631
91	-	-	-	-	-	-	-	474	965	850	841	730	645	583	343	281	237	183	219	368	280	311	170	136	112	172	156	89	47	187	-	8,373
92	-	-	-	-	-	-	532	1,052	1,010	798	735	588	517	461	270	235	187	138	197	342	242	254	136	114	105	141	123	82	44	137	3	8,439
93	-	-	-	-	-	648	1,459	1,120	867	743	605	456	366	324	181	173	106	77	102	170	120	110	111	87	69	99	74	64	38	138	10	8,310
94	-	-	-	-	605	1,416	1,577	1,139	836	656	520	400	307	258	146	133	79	63	78	122	79	75	88	65	53	71	59	46	25	99	8	8,996
95	-	-	-	371	686	843	837	643	335	294	263	161	131	74	42	39	28	16	21	42	29	28	29	19	15	33	17	24	7	24	1	5,048
96	-	-	439	752	727	820	780	578	308	269	236	147	113	67	42	35	27	13	19	36	24	24	22	16	13	30	16	17	6	21	1	5,589
97	-	456	853	731	651	741	666	486	255	228	193	110	78	49	39	29	21	7	13	27	19	13	14	13	11	25	11	8	4	14	-	5,759
98	645	936	797	653	604	668	560	386	214	196	149	77	61	35	33	24	16	4	8	22	12	6	11	10	10	20	6	6	4	6	-	6,173
Total	645	1,392	2,088	2,506	3,273	5,134	6,410	5,877	5,270	5,335	6,142	5,556	5,820	5,777	3,655	3,167	2,552	2,083	2,301	3,291	2,683	2,713	1,774	1,452	1,358	1,679	1,404	887	609	2,688	900	96,413

Funding Year

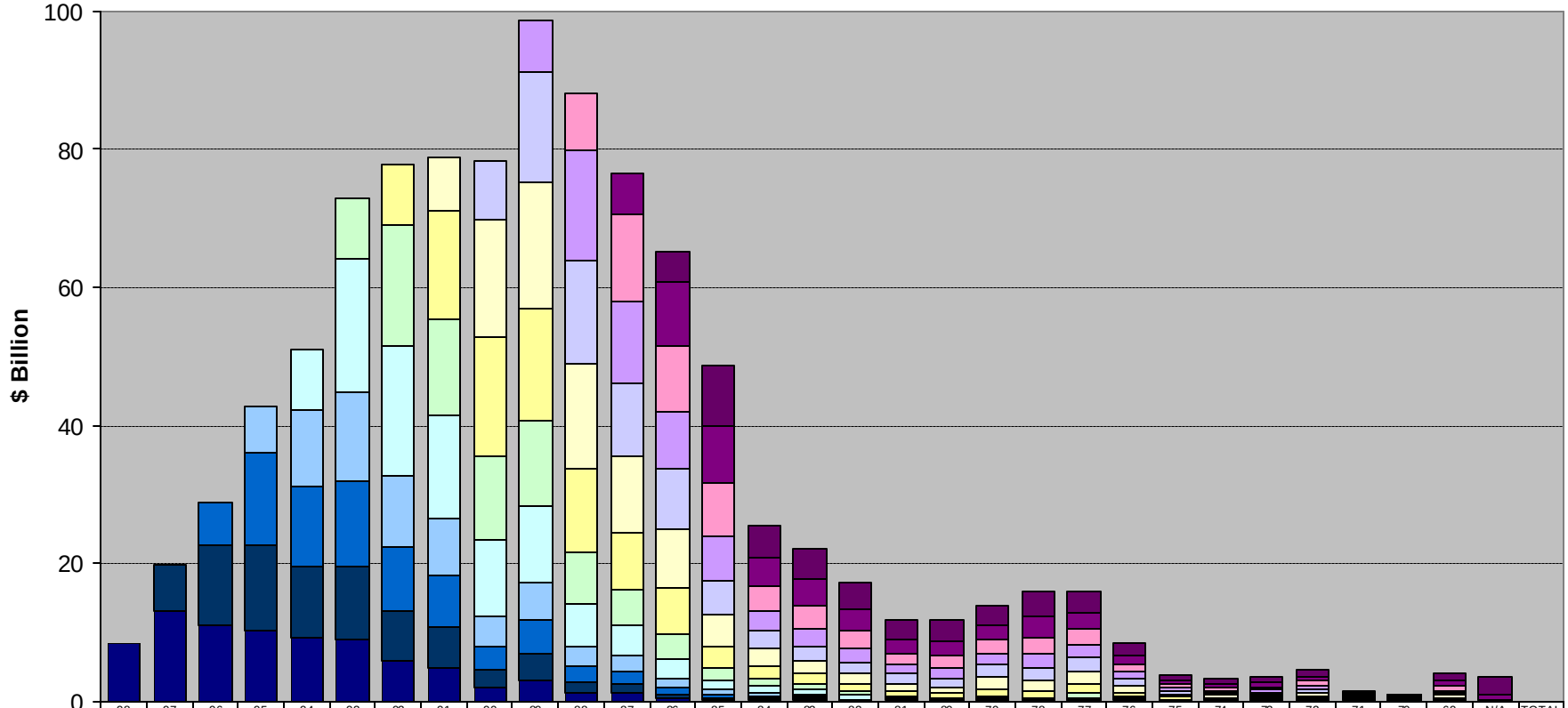
Exposure in $ Associated with CREs
By Funding Year & Experience Year



	98	97	96	95	94	93	92	91	90	89	88	87	86	85	84	83	82	81	80	79	78	77	76	75	74	73	72	71	70	69	N/A	TOTAL
86	-	-	-	-	-	-	-	-	-	-	-	-	-	81.520	26.100	39.526	11.640	6.945	117.07	52.459	2.080	1.336	2.000	-	-	-	-	-	-	25.259	18.395	384.33
87	-	-	-	-	-	-	-	-	-	-	-	-	25.604	125.97	66.402	6.956	2.525	15.000	-	2.606	90.341	23.387	20.173	51.174	-	1.734	0.881	-	0.267	12.892	23.360	469.27
88	-	-	-	-	-	-	-	-	-	-	-	20.461	72.768	74.935	-	10.000	-	3.623	-	2.278	-	56.142	19.903	-	2.580	-	0.522	-	-	-	-	263.21
89	-	-	-	-	-	-	-	-	-	3.000	94.836	286.02	28.900	23.254	16.450	8.666	-	3.631	7.599	-	2.453	-	-	-	-	0.700	-	-	-	-	-	475.50
90	-	-	-	-	-	-	-	-	-	119.87	209.69	57.000	160.65	61.900	6.760	-	-	-	-	-	-	64.991	-	-	-	-	-	3.016	-	-	-	683.88
91	-	-	-	-	-	-	-	22.000	119.02	406.19	447.65	318.13	111.10	105.61	122.65	8.173	-	-	16.290	16.560	0.289	-	-	-	-	-	1.788	-	-	4.673	-	1,700.1
92	-	-	-	-	-	-	20.000	241.91	284.63	238.53	372.10	324.27	182.80	104.02	23.000	2.944	3.000	-	-	-	-	2.937	-	-	-	-	3.164	26.972	-	1.496	-	1,831.8
93	-	-	-	-	-	5.000	112.02	187.35	234.82	310.04	185.43	56.500	39.507	0.600	1.750	-	-	-	-	0.517	0.240	0.750	-	-	-	-	-	-	-	-	-	1,134.5
94	-	-	-	-	-	53.900	36.082	7.334	109.78	17.492	43.831	88.201	-	4.279	-	5.388	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	366.29
95	-	-	-	-	5.000	69.671	59.903	76.550	161.55	77.435	41.712	10.227	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	502.05
96	-	-	-	30.000	15.072	141.48	90.421	-	15.640	8.077	3.657	-	30.282	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	334.63
97	-	-	23.000	41.500	-	65.500	15.771	15.877	4.623	-	6.154	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.167	-	174.59
98	-	65.574	40.178	67.857	10.000	-	-	4.200	-	1.000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	188.80
Total	-	65.574	63.178	139.35	30.072	335.56	334.20	555.22	930.08	1,181.6	1,405.0	1,160.8	651.62	582.09	263.12	81.653	17.165	29.199	140.96	74.420	95.403	149.54	42.076	51.174	2.580	2.434	6.355	29.988	0.267	46.487	41.755	8,509.1

Funding Year

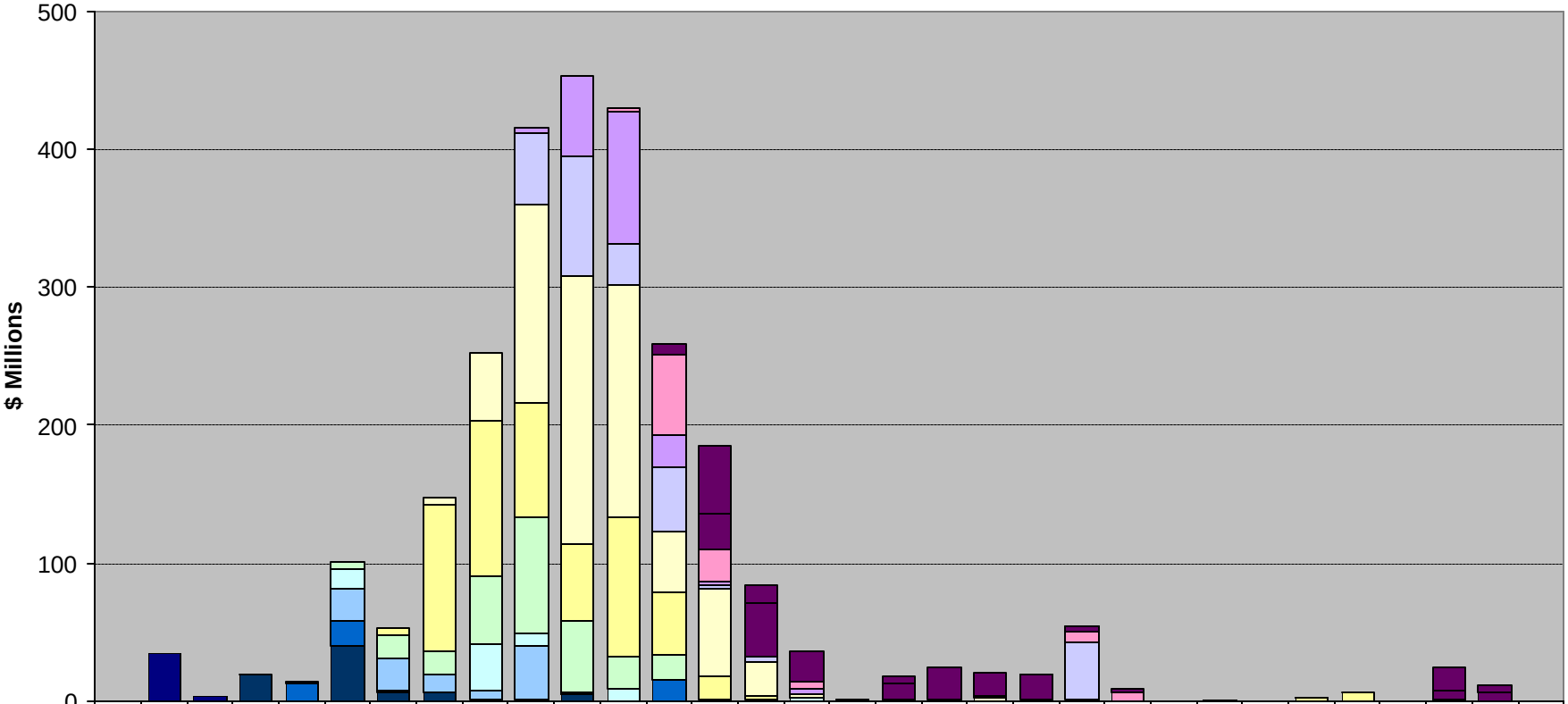
Exposure in $
By Funding Year & Experience Year



	98	97	96	95	94	93	92	91	90	89	88	87	86	85	84	83	82	81	80	79	78	77	76	75	74	73	72	71	70	69	N/A	TOTAL
86	-	-	-	-	-	-	-	-	-	-	-	-	4.465	8.686	4.743	4.289	3.763	2.888	2.917	2.787	3.682	3.054	1.857	0.843	0.649	0.761	0.834	0.301	0.135	1.153	2.559	50.366
87	-	-	-	-	-	-	-	-	-	-	-	5.979	9.111	8.444	4.118	3.805	3.116	2.193	2.233	2.297	3.099	2.513	1.373	0.587	0.497	0.570	0.712	0.247	0.111	0.846	0.819	52.668
88	-	-	-	-	-	-	-	-	-	-	8.389	12.694	9.482	7.719	3.524	3.463	2.558	1.608	1.812	1.958	2.459	2.168	1.058	0.441	0.400	0.457	0.597	0.202	0.086	0.595	0.010	61.679
89	-	-	-	-	-	-	-	-	-	7.398	15.990	11.718	8.312	6.241	2.958	2.654	2.080	1.191	1.484	1.648	1.998	1.801	0.920	0.387	0.367	0.375	0.517	0.168	0.070	0.380	0.004	68.661
90	-	-	-	-	-	-	-	-	8.367	16.049	14.893	10.727	8.731	5.123	2.580	2.071	1.622	1.399	1.173	1.794	1.788	2.131	1.086	0.504	0.372	0.317	0.599	0.204	0.164	0.337	0.000	82.028
91	-	-	-	-	-	-	-	7.538	17.072	18.149	15.008	10.926	8.643	4.522	2.582	1.787	1.405	1.166	0.898	1.590	1.582	1.912	0.948	0.456	0.325	0.288	0.565	0.172	0.156	0.314	0.000	98.004
92	-	-	-	-	-	-	8.753	15.754	17.235	16.259	12.273	8.354	6.626	3.179	1.795	1.354	1.048	0.660	0.637	1.060	1.034	1.210	0.635	0.263	0.244	0.203	0.298	0.129	0.132	0.226	0.001	99.362
93	-	-	-	-	-	8.771	17.402	14.095	12.246	12.559	7.501	5.138	3.656	1.710	1.032	0.898	0.679	0.356	0.238	0.373	0.221	0.571	0.288	0.140	0.151	0.148	0.127	0.053	0.030	0.142	0.078	88.605
94	-	-	-	-	8.563	19.397	18.858	14.730	10.956	10.828	5.986	4.352	2.869	1.396	0.920	0.782	0.538	0.365	0.179	0.242	0.120	0.457	0.243	0.113	0.130	0.115	0.110	0.032	0.018	0.123	0.078	102.499
95	-	-	-	6.648	11.233	12.949	10.313	8.426	4.279	5.649	2.963	2.235	1.246	0.589	0.411	0.291	0.102	0.045	0.052	0.099	0.032	0.064	0.069	0.034	0.013	0.071	0.040	0.010	0.046	0.018	0.001	67.929
96	-	-	6.009	13.341	11.645	12.290	9.202	7.313	3.484	4.777	2.246	1.805	0.960	0.449	0.302	0.248	0.078	0.035	0.044	0.055	0.022	0.046	0.036	0.027	0.010	0.065	0.037	0.007	0.041	0.017	0.001	74.591
97	-	6.560	11.692	12.346	10.343	10.555	7.349	5.990	2.627	3.831	1.622	1.434	0.597	0.337	0.272	0.235	0.071	0.019	0.024	0.021	0.014	0.023	0.013	0.021	0.008	0.043	0.030	0.003	0.037	0.009	0.000	76.124
98	8.315	13.213	10.991	10.260	9.094	8.975	5.764	4.851	1.943	3.065	1.225	1.154	0.437	0.259	0.256	0.198	0.064	0.008	0.007	0.011	0.007	0.007	0.009	0.011	0.006	0.018	0.025	0.002	0.033	0.003	0.000	80.212
Total	8.315	19.773	28.691	42.595	50.879	72.936	77.641	78.696	78.209	98.562	88.097	76.517	65.136	48.653	25.492	22.074	17.125	11.932	11.698	13.934	16.058	15.957	8.535	3.828	3.171	3.431	4.493	1.529	1.058	4.162	3.552	1,002.7

Funding Year

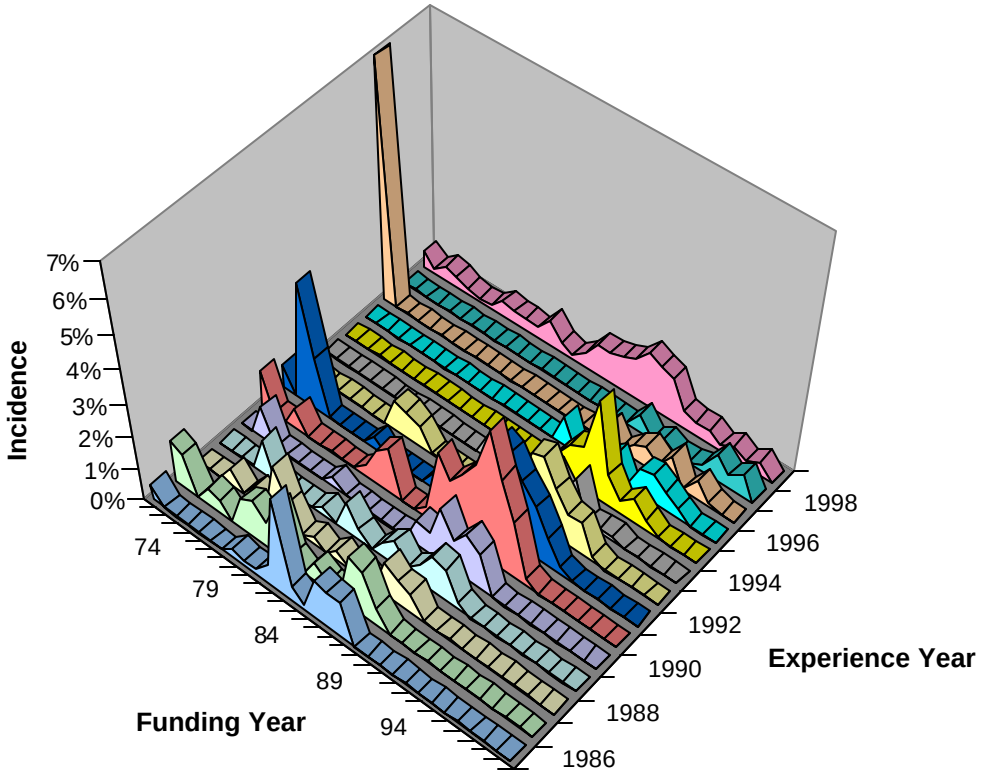
Economic Loss of CREs
By Funding Year & Experience Year



	98	97	96	95	94	93	92	91	90	89	88	87	86	85	84	83	82	81	80	79	78	77	76	75	74	73	72	71	70	69	N/A	TOTAL
86	-	-	-	-	-	-	-	-	-	-	-	-	-	49.475	13.538	22.127	0.886	4.884	23.507	17.113	0.581	0.437	(0.251)	-	-	-	-	-	-	17.259	5.127	154.68
87	-	-	-	-	-	-	-	-	-	-	-	-	6.956	24.721	38.339	(0.030)	0.073	11.046	-	0.656	18.516	4.019	2.069	(4.568)	-	(0.005)	0.027	-	0.057	6.121	5.910	113.90
88	-	-	-	-	-	-	-	-	-	-	-	2.500	59.360	23.990	-	4.912	-	0.827	-	0.076	-	6.840	6.298	-	0.155	-	0.170	-	-	-	-	105.12
89	-	-	-	-	-	-	-	-	-	3.000	58.770	95.238	22.834	2.648	(1.155)	4.134	-	0.422	0.503	-	(0.086)	-	-	-	-	0.022	-	-	-	-	-	186.32
90	-	-	-	-	-	-	-	-	-	52.811	86.090	29.746	46.559	2.938	4.565	-	-	-	-	-	-	42.446	-	-	-	-	-	0.160	-	-	-	265.31
91	-	-	-	-	-	-	-	4.868	48.420	143.49	194.65	168.23	44.810	63.196	24.556	1.978	-	-	(2.249)	2.398	0.289	-	-	-	-	-	0.205	-	-	0.172	-	695.02
92	-	-	-	-	-	-	5.354	106.28	113.63	82.136	56.370	100.85	44.404	16.368	2.649	0.087	0.285	-	-	-	-	0.286	-	-	-	-	1.934	6.022	-	0.159	-	536.82
93	-	-	-	-	-	5.000	16.662	16.684	48.435	84.418	50.624	24.391	19.067	(0.081)	0.433	-	-	-	-	0.095	0.041	(0.034)	-	-	-	-	-	-	-	-	-	265.73
94	-	-	-	-	-	13.918	-	-	33.796	9.469	1.780	8.167	-	1.017	-	2.143	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	70.289
95	-	-	-	-	1.045	24.081	22.488	13.523	7.184	39.270	(0.744)	(0.299)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	106.54
96	-	-	-	0.714	12.807	17.603	1.375	-	0.269	0.330	0.196	-	14.426	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	47.719
97	-	-	(0.629)	18.536	-	39.870	6.405	5.391	(0.189)	-	4.626	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.705	-	74.715
98	-	34.790	3.200	(1.148)	(0.093)	-	-	0.041	-	0.019	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	36.809
Total	-	34.790	2.571	18.102	13.759	100.47	52.284	146.79	251.54	414.95	452.36	428.82	258.41	184.27	82.925	35.351	1.244	17.179	21.761	20.338	19.341	53.994	8.116	(4.568)	0.155	0.017	2.336	6.182	0.057	24.416	11.037	2,659.0

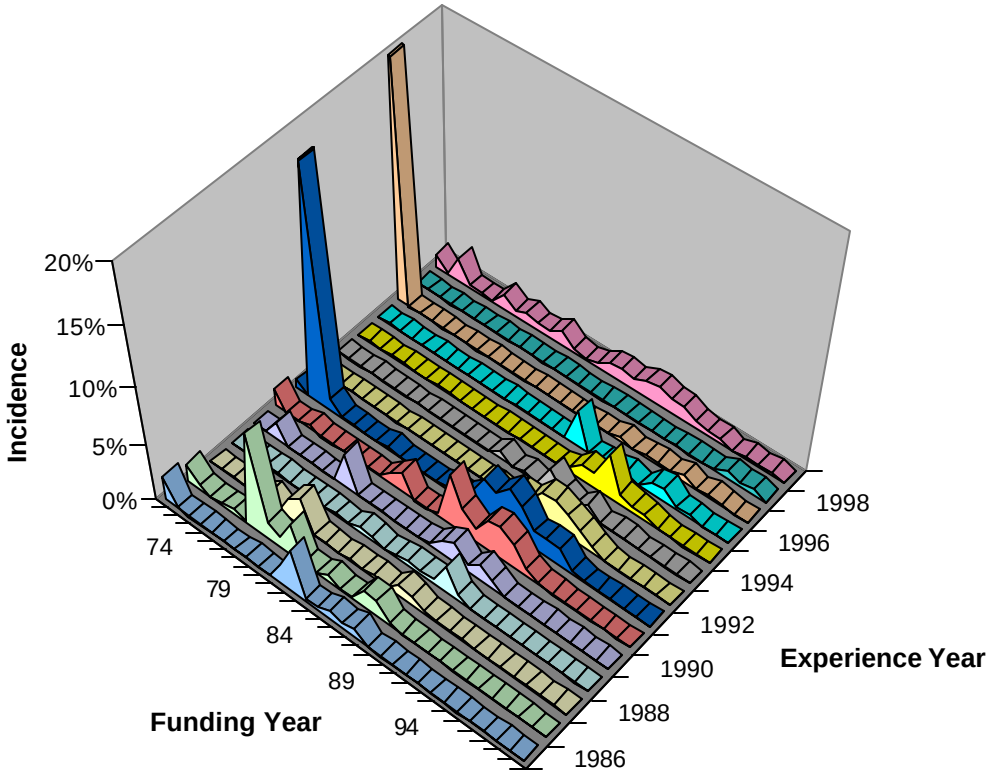
Funding Year

Incidence Rate by
By Funding Year & Experience Year



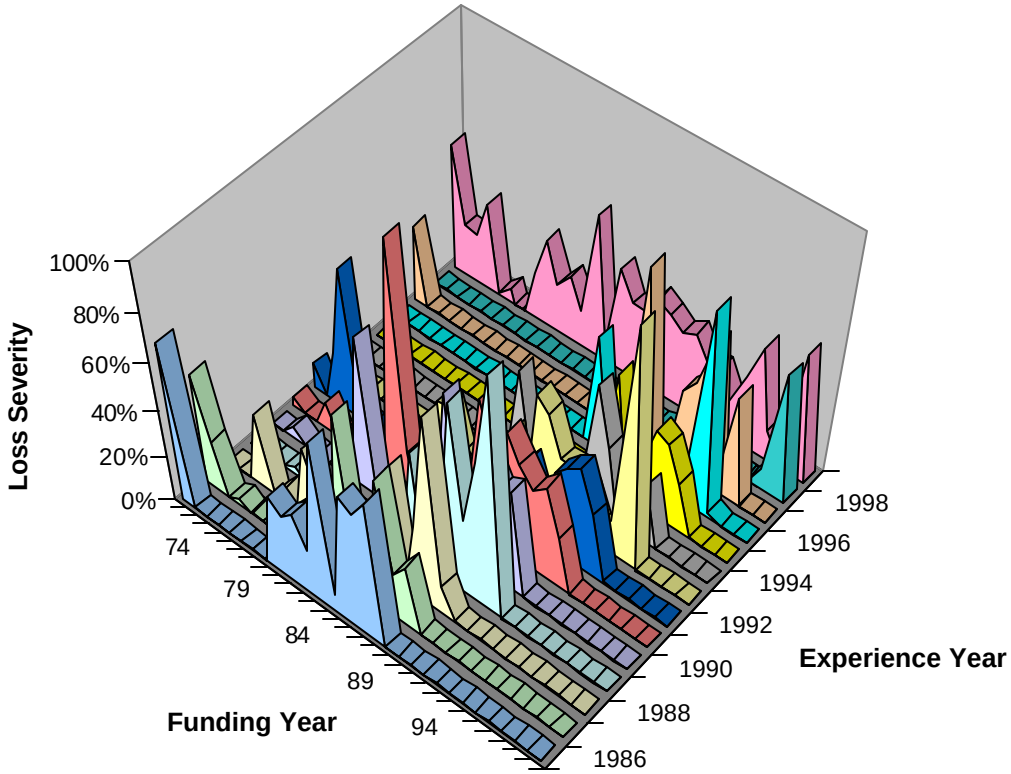
		70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98
1986	0.49%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.33%	0.24%	0.23%	0.63%	3.05%	0.49%	0.21%	1.29%	1.23%	1.17%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1987	1.26%	1.08%	0.00%	0.53%	0.41%	0.00%	0.99%	1.20%	0.80%	1.57%	0.23%	0.00%	0.58%	0.25%	0.21%	1.66%	1.48%	0.53%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1988	0.00%	0.00%	0.00%	0.54%	0.00%	0.47%	0.00%	1.66%	0.75%	0.00%	0.22%	0.00%	0.31%	0.00%	0.20%	0.00%	1.10%	0.75%	0.65%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1989	0.00%	0.00%	0.00%	0.00%	1.08%	0.00%	0.00%	0.00%	0.00%	0.27%	0.00%	0.93%	0.36%	0.00%	0.48%	0.80%	0.25%	0.58%	1.17%	1.03%	0.20%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1990	0.00%	0.00%	1.03%	0.00%	0.00%	0.00%	0.00%	0.00%	0.31%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.80%	0.72%	1.74%	0.97%	1.50%	1.12%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1991	1.07%	0.00%	0.00%	0.64%	0.00%	0.00%	0.00%	0.00%	0.00%	0.36%	1.09%	1.37%	0.00%	0.00%	0.36%	2.34%	1.72%	2.17%	2.74%	4.05%	2.83%	1.76%	0.21%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1992	0.73%	0.00%	3.68%	1.63%	0.00%	0.00%	0.00%	0.00%	0.39%	0.00%	0.00%	0.00%	0.00%	0.53%	0.43%	0.74%	0.87%	2.13%	2.89%	2.72%	2.13%	1.58%	0.86%	0.19%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1993	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.91%	0.84%	0.59%	0.00%	0.00%	0.00%	0.00%	0.55%	0.31%	1.37%	0.66%	2.15%	2.29%	1.50%	0.98%	0.96%	0.15%	0.00%	0.00%	0.00%	0.00%	0.00%
1994	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.75%	0.00%	0.39%	0.00%	1.00%	0.96%	0.46%	1.20%	0.09%	0.13%	0.14%	0.00%	0.00%	0.00%	0.00%	0.00%
1995	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.62%	1.14%	1.36%	2.99%	0.93%	0.36%	0.71%	0.29%	0.00%	0.00%	0.00%	0.00%
1996	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.89%	0.00%	0.42%	0.37%	0.65%	0.00%	0.77%	0.85%	0.55%	0.27%	0.00%	0.00%	0.00%
1997	7.41%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.52%	0.00%	0.39%	0.62%	0.30%	0.81%	0.00%	0.55%	0.12%	0.00%	0.00%

Incidence Rate by $
By Funding Year & Experience Year



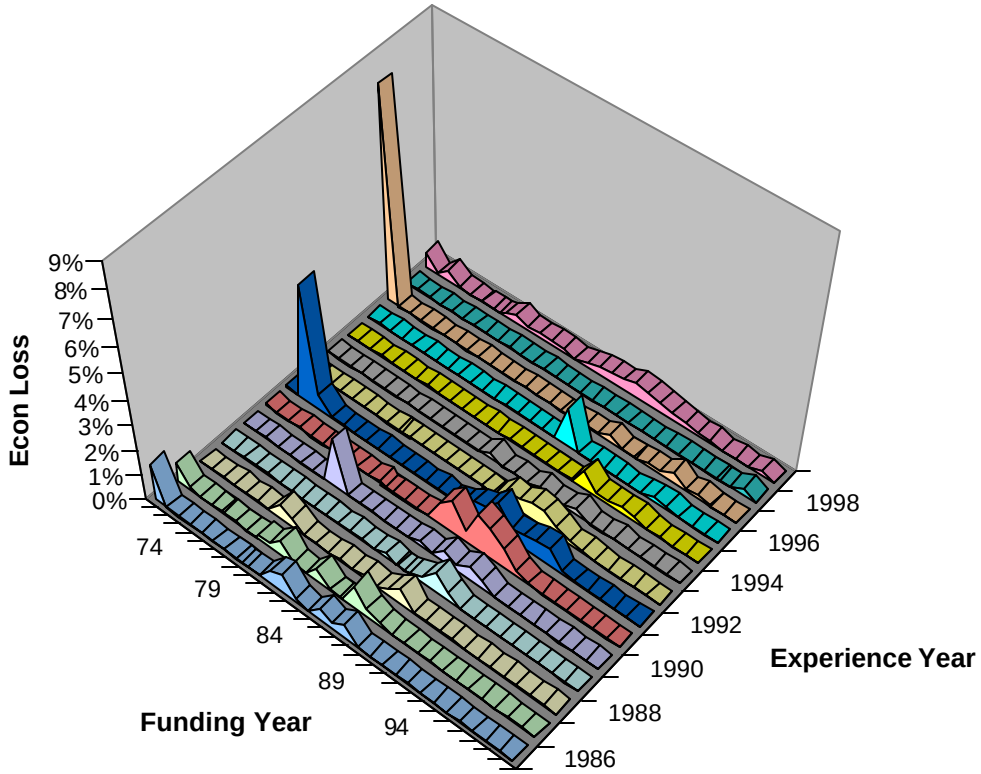
		70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98
1986	2.19%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.11%	0.04%	0.06%	1.88%	4.01%	0.24%	0.31%	0.92%	0.55%	0.94%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1987	1.52%	0.24%	0.00%	0.12%	0.30%	0.00%	8.72%	1.47%	0.93%	2.92%	0.11%	0.00%	0.68%	0.08%	0.18%	1.61%	1.49%	0.28%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1988	0.00%	0.00%	0.00%	0.09%	0.00%	0.65%	0.00%	1.88%	2.59%	0.00%	0.12%	0.00%	0.23%	0.00%	0.29%	0.00%	0.97%	0.77%	0.16%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1989	0.00%	0.00%	0.00%	0.00%	0.19%	0.00%	0.00%	0.00%	0.00%	0.12%	0.00%	0.51%	0.30%	0.00%	0.33%	0.56%	0.37%	0.35%	2.44%	0.59%	0.04%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1990	0.00%	0.00%	1.48%	0.00%	0.00%	0.00%	0.00%	0.00%	3.05%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.26%	1.21%	1.84%	0.53%	1.41%	0.75%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1991	1.49%	0.00%	0.00%	0.32%	0.00%	0.00%	0.00%	0.00%	0.00%	0.02%	1.04%	1.81%	0.00%	0.00%	0.46%	4.75%	2.34%	1.29%	2.91%	2.98%	2.24%	0.70%	0.29%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1992	0.66%	0.00%	20.87%	1.06%	0.00%	0.00%	0.00%	0.00%	0.24%	0.00%	0.00%	0.00%	0.00%	0.29%	0.22%	1.28%	3.27%	2.76%	3.88%	3.03%	1.47%	1.65%	1.54%	0.23%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1993	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.13%	0.11%	0.14%	0.00%	0.00%	0.00%	0.00%	0.17%	0.04%	1.08%	1.10%	2.47%	2.47%	1.92%	1.33%	0.64%	0.06%	0.00%	0.00%	0.00%	0.00%	0.00%
1994	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.69%	0.00%	0.31%	0.00%	2.03%	0.73%	0.16%	1.00%	0.05%	0.19%	0.28%	0.00%	0.00%	0.00%	0.00%	0.00%
1995	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.46%	1.41%	1.37%	3.78%	0.91%	0.58%	0.54%	0.04%	0.00%	0.00%	0.00%	0.00%
1996	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.16%	0.00%	0.16%	0.17%	0.45%	0.00%	0.98%	1.15%	0.13%	0.22%	0.00%	0.00%	0.00%
1997	24.75%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.38%	0.00%	0.18%	0.27%	0.21%	0.62%	0.00%	0.34%	0.20%	0.00%	0.00%

Loss Severity
By Funding Year & Experience Year



		70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98
1986	68%	0%	0%	0%	0%	0%	0%	-13%	33%	28%	33%	20%	70%	8%	56%	52%	61%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
1987	47%	21%	0%	3%	0%	0%	-9%	10%	17%	20%	25%	0%	74%	3%	0%	58%	20%	27%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
1988	0%	0%	0%	33%	0%	6%	0%	32%	12%	0%	3%	0%	23%	0%	49%	0%	32%	82%	12%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
1989	0%	0%	0%	0%	3%	0%	0%	0%	0%	-4%	0%	7%	12%	0%	48%	-7%	11%	79%	33%	62%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%
1990	0%	0%	5%	0%	0%	0%	0%	0%	65%	0%	0%	0%	0%	0%	0%	68%	5%	29%	52%	41%	44%	0%	0%	0%	0%	0%	0%	0%	0%	0%
1991	4%	0%	0%	11%	0%	0%	0%	0%	0%	100%	14%	-14%	0%	0%	24%	20%	60%	40%	53%	43%	35%	41%	22%	0%	0%	0%	0%	0%	0%	0%
1992	11%	0%	22%	61%	0%	0%	0%	0%	10%	0%	0%	0%	0%	10%	3%	12%	16%	24%	31%	15%	34%	40%	44%	27%	0%	0%	0%	0%	0%	0%
1993	0%	0%	0%	0%	0%	0%	0%	0%	-5%	17%	18%	0%	0%	0%	0%	25%	-14%	48%	43%	27%	27%	21%	9%	15%	100%	0%	0%	0%	0%	0%
1994	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	40%	0%	24%	0%	9%	4%	54%	31%	0%	0%	26%	0%	0%	0%	0%	0%
1995	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-3%	-2%	51%	4%	18%	38%	35%	21%	0%	0%	0%	0%
1996	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	48%	0%	5%	4%	2%	0%	2%	12%	85%	2%	0%	0%	0%
1997	33%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	75%	0%	-4%	34%	41%	61%	0%	45%	-3%	0%	0%

Economic Loss as % of Exposure
By Funding Year & Experience Year



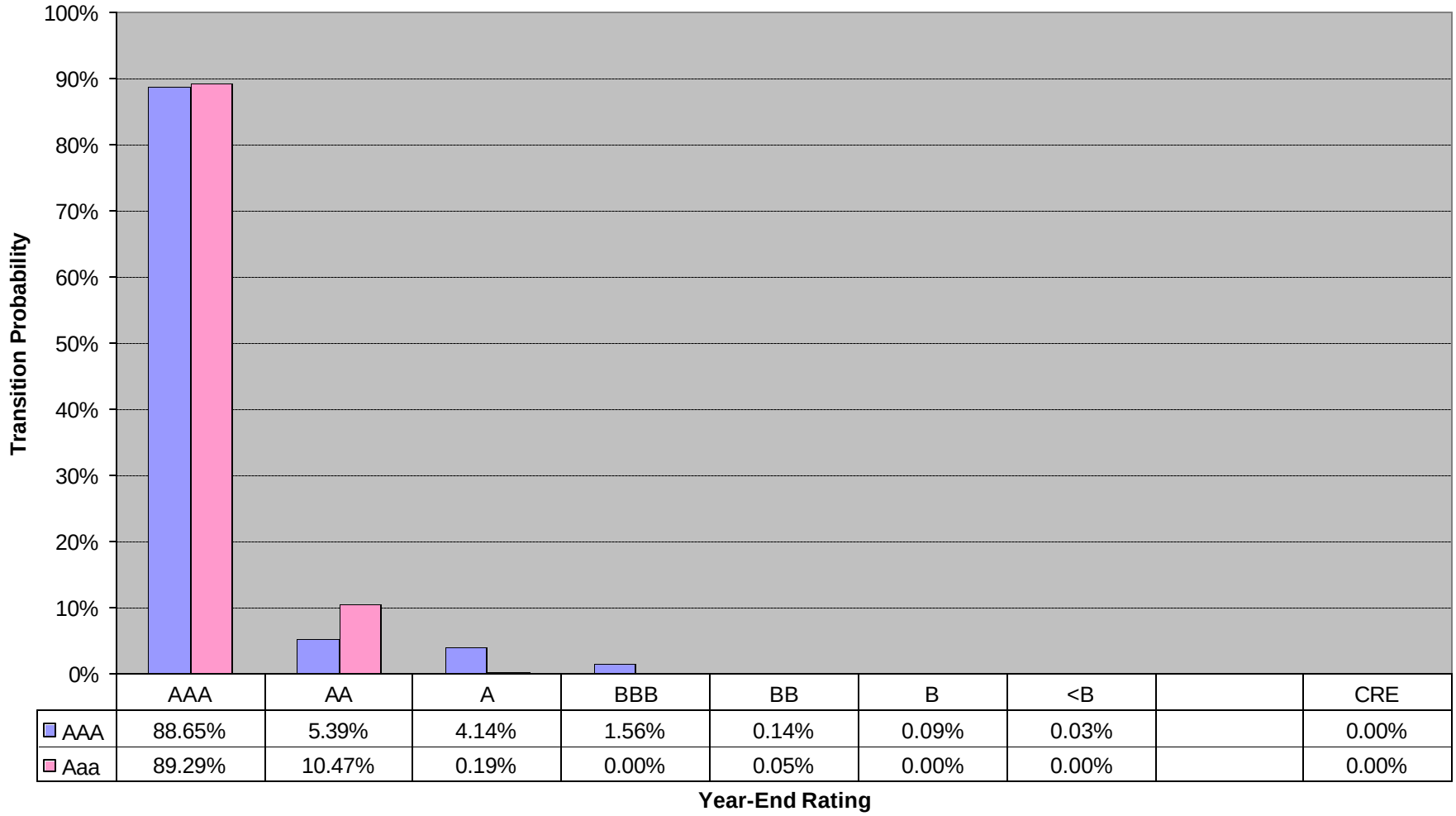
		70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98
1986	1.50%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	-0.01%	0.01%	0.02%	0.61%	0.81%	0.17%	0.02%	0.52%	0.29%	0.57%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1987	0.72%	0.05%	0.00%	0.00%	0.00%	0.00%	-0.78%	0.15%	0.16%	0.60%	0.03%	0.00%	0.50%	0.00%	0.00%	0.93%	0.29%	0.08%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1988	0.00%	0.00%	0.00%	0.03%	0.00%	0.04%	0.00%	0.60%	0.32%	0.00%	0.00%	0.00%	0.05%	0.00%	0.14%	0.00%	0.31%	0.63%	0.02%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1989	0.00%	0.00%	0.00%	0.00%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.03%	0.04%	0.00%	0.16%	-0.04%	0.04%	0.27%	0.81%	0.37%	0.04%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1990	0.00%	0.00%	0.08%	0.00%	0.00%	0.00%	0.00%	0.00%	1.99%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.18%	0.06%	0.53%	0.28%	0.58%	0.33%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1991	0.05%	0.00%	0.00%	0.04%	0.00%	0.00%	0.00%	0.00%	0.00%	0.02%	0.15%	-0.25%	0.00%	0.00%	0.11%	0.95%	1.40%	0.52%	1.54%	1.30%	0.79%	0.28%	0.06%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1992	0.07%	0.00%	4.66%	0.65%	0.00%	0.00%	0.00%	0.00%	0.02%	0.00%	0.00%	0.00%	0.00%	0.03%	0.01%	0.15%	0.51%	0.67%	1.21%	0.46%	0.51%	0.66%	0.67%	0.06%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1993	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	-0.01%	0.02%	0.03%	0.00%	0.00%	0.00%	0.00%	0.04%	0.00%	0.52%	0.47%	0.67%	0.67%	0.40%	0.12%	0.10%	0.06%	0.00%	0.00%	0.00%	0.00%	0.00%
1994	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.27%	0.00%	0.07%	0.00%	0.19%	0.03%	0.09%	0.31%	0.00%	0.00%	0.07%	0.00%	0.00%	0.00%	0.00%	0.00%
1995	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	-0.01%	-0.03%	0.70%	0.17%	0.16%	0.22%	0.19%	0.01%	0.00%	0.00%	0.00%	0.00%
1996	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.50%	0.00%	0.01%	0.01%	0.01%	0.00%	0.01%	0.14%	0.11%	0.01%	0.00%	0.00%	0.00%
1997	8.05%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.29%	0.00%	-0.01%	0.09%	0.09%	0.38%	0.00%	0.15%	-0.01%	0.00%	0.00%

Rating-Transition Probabilities

One-Year Rating-Transition Probabilities
Comparing Private Placements (SOA) to Public Corporate Bonds (Moody's)

Migration from Internal Rating of	Compared to Moody's Transition from	Likelihood to Upgrade	Likelihood to Downgrade (Excluding CREs)
AAA	**Aaa**	Not applicable	More multiple downgrades
AA	**Aa**	Similar	Similar
A	**A**	Similar	Similar
BBB	**Baa**	Similar	Similar
BB	**Ba**	Similar except greater to BBB	Similar except smaller to B
B	**B**	Similar except greater to BBB	Similar
<B	**<B**	Similar except greater to B	Not applicable
Overall	**Overall**	Similar for Investment Grade	Similar for Investment Grade but more dispersed for AAA
		Greater for Below Investment Grade	Slightly smaller overall for Below Investment Grade

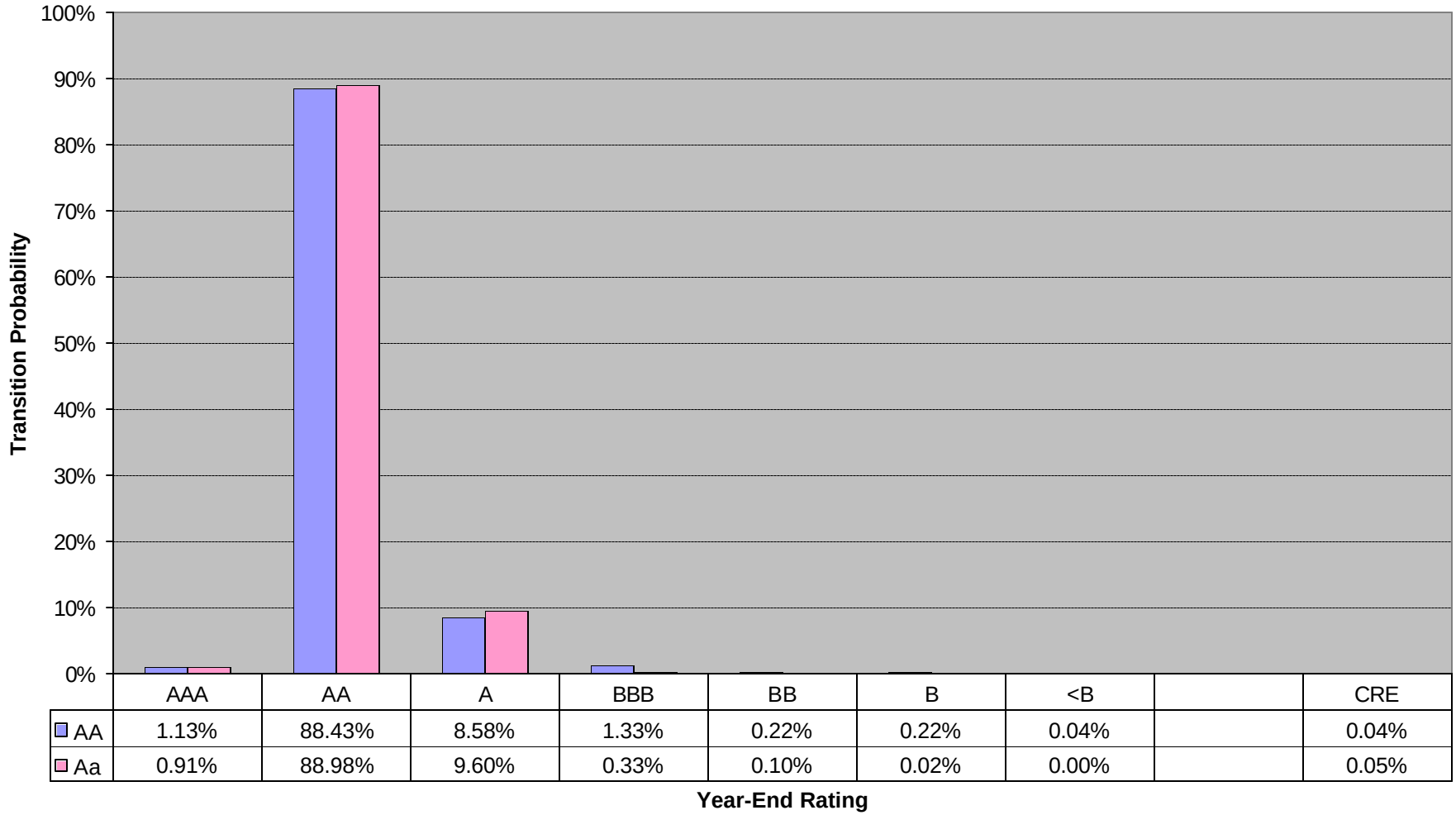
One-Year Migration in Rating - SOA Study versus Moody's (Adjusted for 'Not Rated')
From AAA (SOA) or Aaa (Moody's) at the Beginning of the Year
More Likely to Multiple-Downgrade to A & BBB at Expense of Single Downgrade to AA



	AAA	AA	A	BBB	BB	B	<B		CRE
AAA	88.65%	5.39%	4.14%	1.56%	0.14%	0.09%	0.03%		0.00%
Aaa	89.29%	10.47%	0.19%	0.00%	0.05%	0.00%	0.00%		0.00%

Year-End Rating

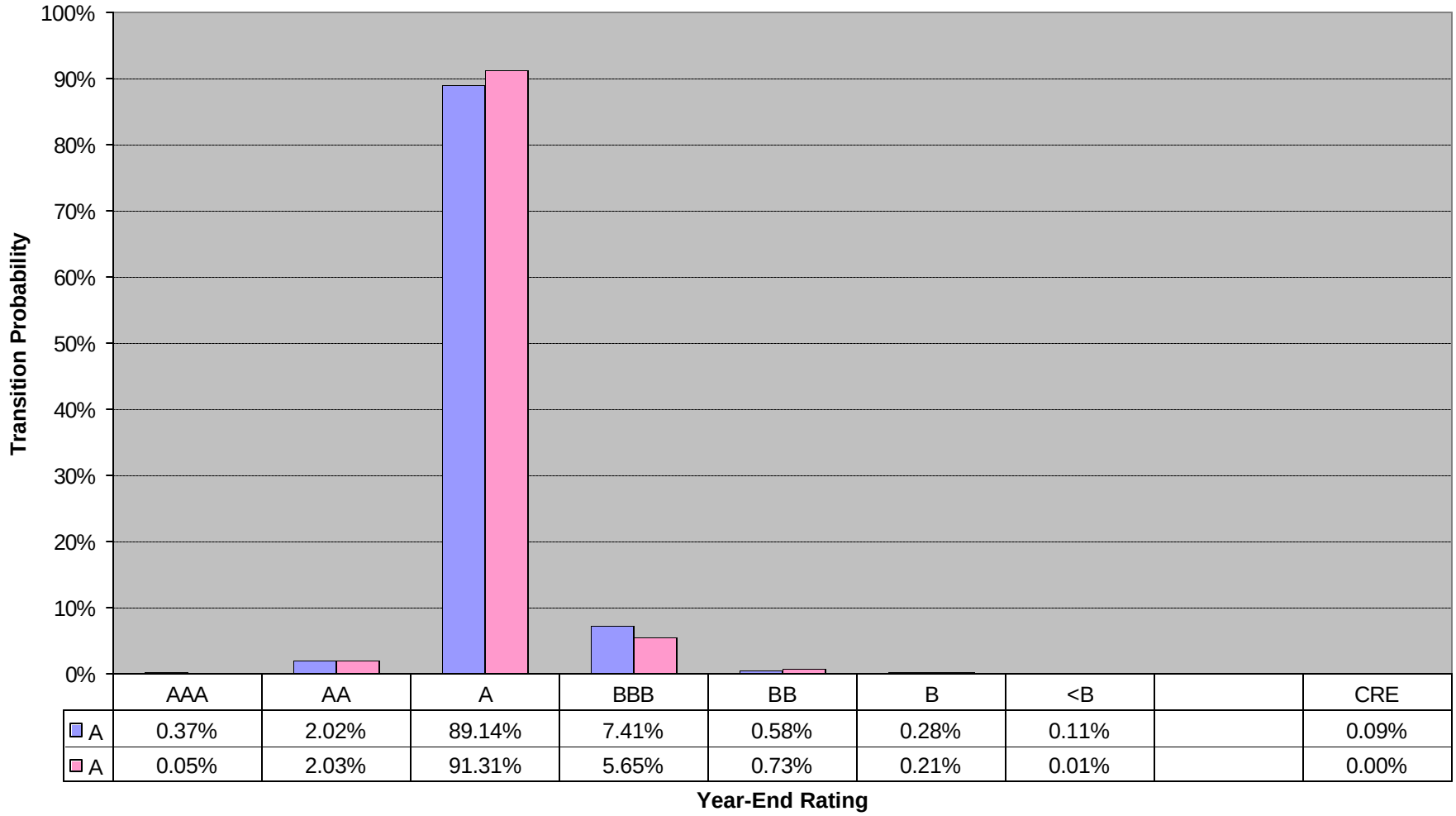
One-Year Migration in Rating - SOA Study versus Moody's (Adjusted for 'Not Rated')
From AA (SOA) or Aa (Moody's) at the Beginning of the Year
Similar between Public (Moody's) & Private (SOA)



	AAA	AA	A	BBB	BB	B	<B		CRE
AA	1.13%	88.43%	8.58%	1.33%	0.22%	0.22%	0.04%		0.04%
Aa	0.91%	88.98%	9.60%	0.33%	0.10%	0.02%	0.00%		0.05%

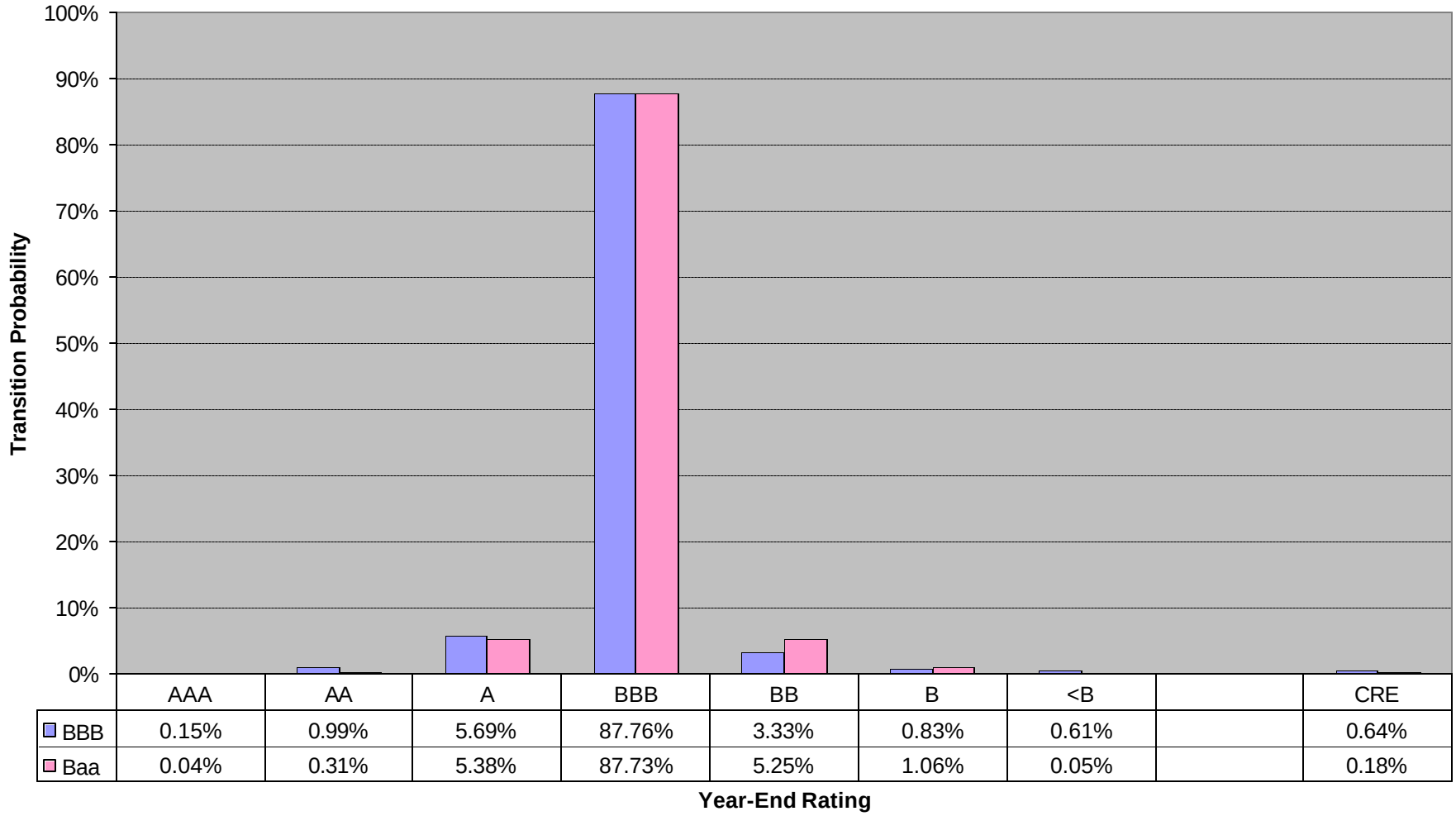
Year-End Rating

One-Year Migration in Rating - SOA Study versus Moody's (Adjusted for 'Not Rated')
From A at the Beginning of the Year
Similar between Public (Moody's) & Private (SOA)



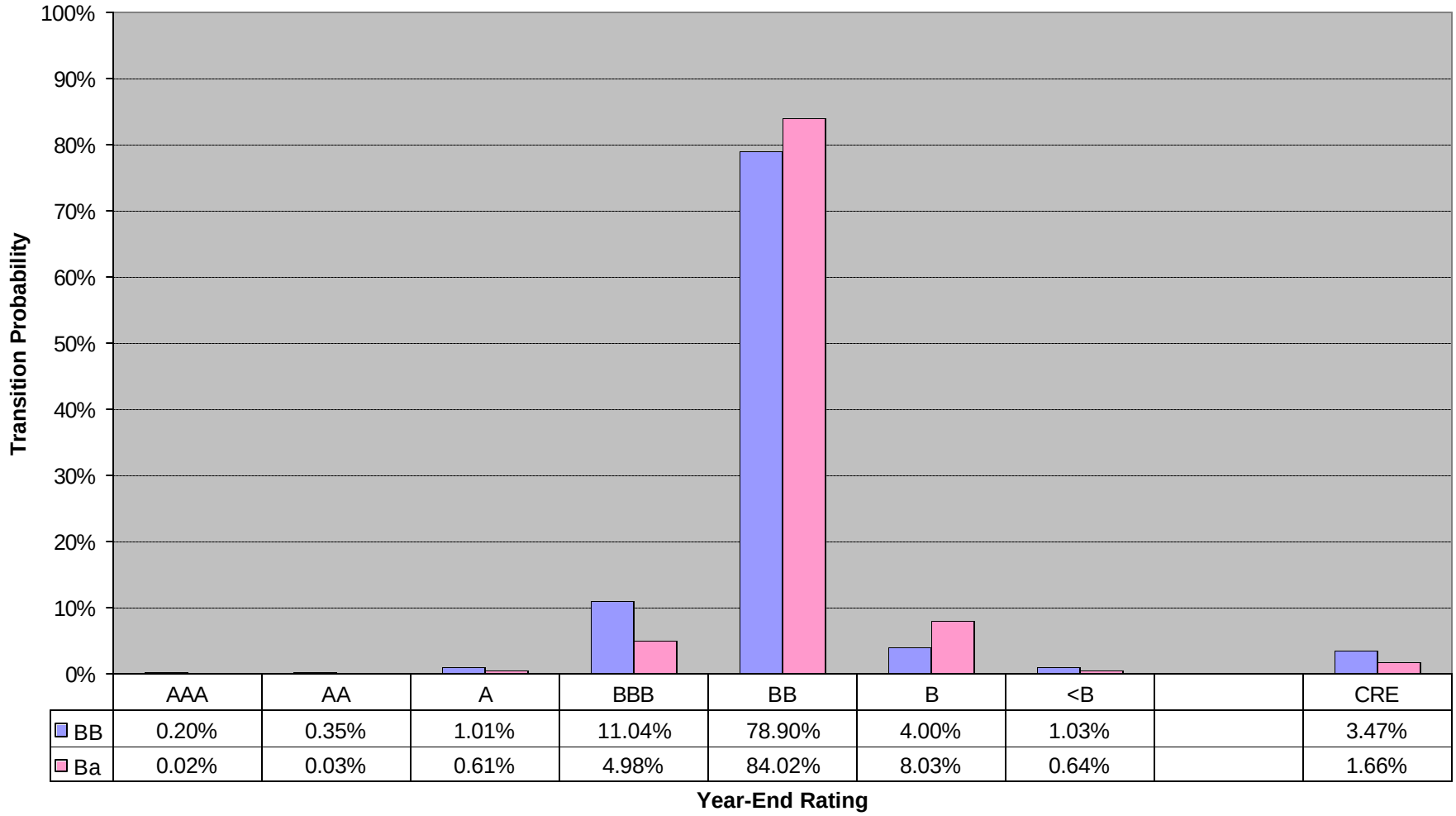
	AAA	AA	A	BBB	BB	B	<B		CRE
A	0.37%	2.02%	89.14%	7.41%	0.58%	0.28%	0.11%		0.09%
A	0.05%	2.03%	91.31%	5.65%	0.73%	0.21%	0.01%		0.00%

One-Year Migration in Rating - SOA Study versus Moody's (Adjusted for 'Not Rated')
From BBB (SOA) or Baa (Moody's) at the Beginning of the Year
Similar between Public (Moody's) & Private (SOA)



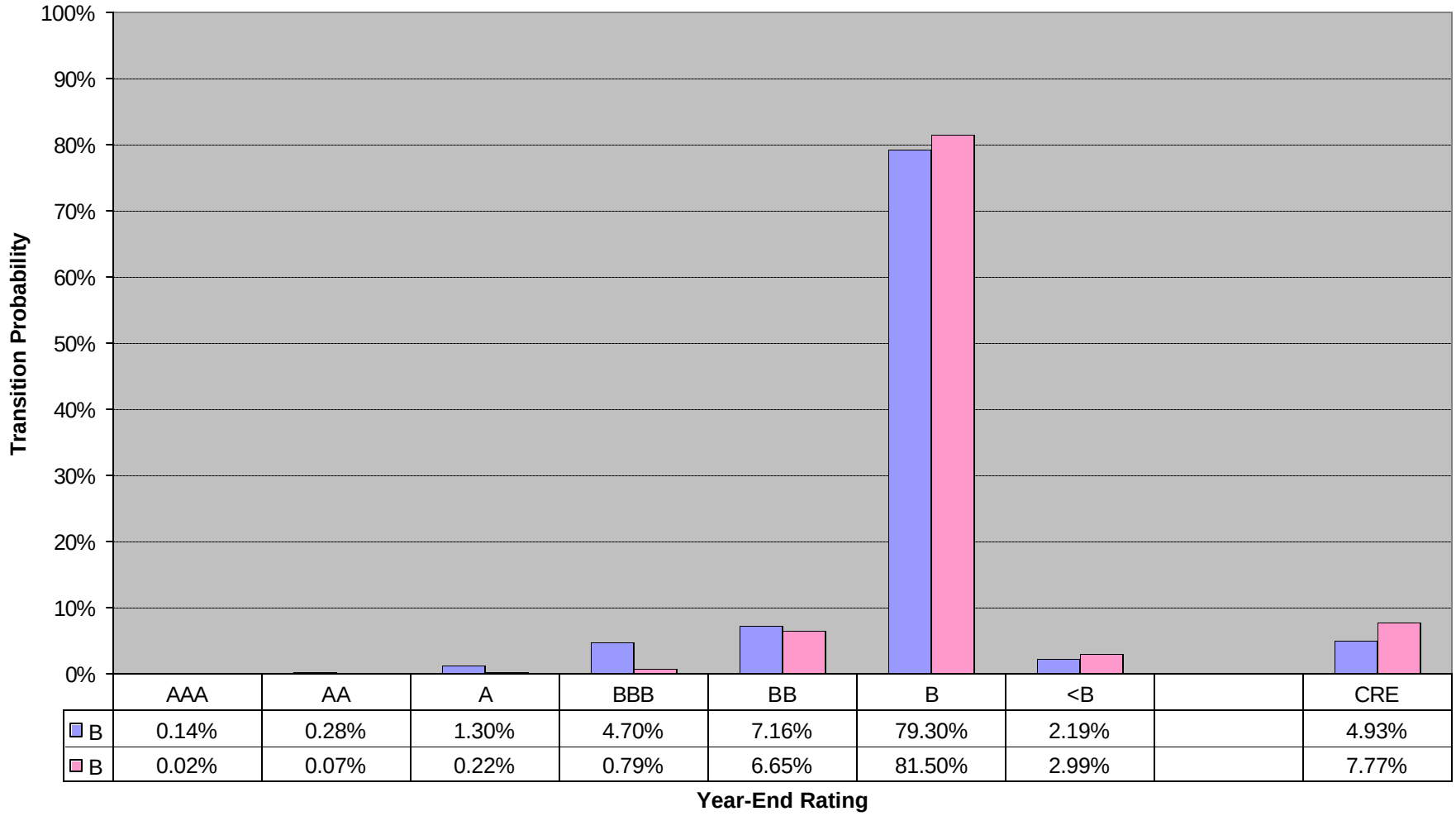
	AAA	AA	A	BBB	BB	B	<B		CRE
BBB	0.15%	0.99%	5.69%	87.76%	3.33%	0.83%	0.61%		0.64%
Baa	0.04%	0.31%	5.38%	87.73%	5.25%	1.06%	0.05%		0.18%

One-Year Migration in Rating - SOA Study versus Moody's (Adjusted for 'Not Rated')
From BB (SOA) or Ba (Moody's) at the Beginning of the Year
More Likely to Upgrade (to BBB) but Less Likely to Downgrade (to B)



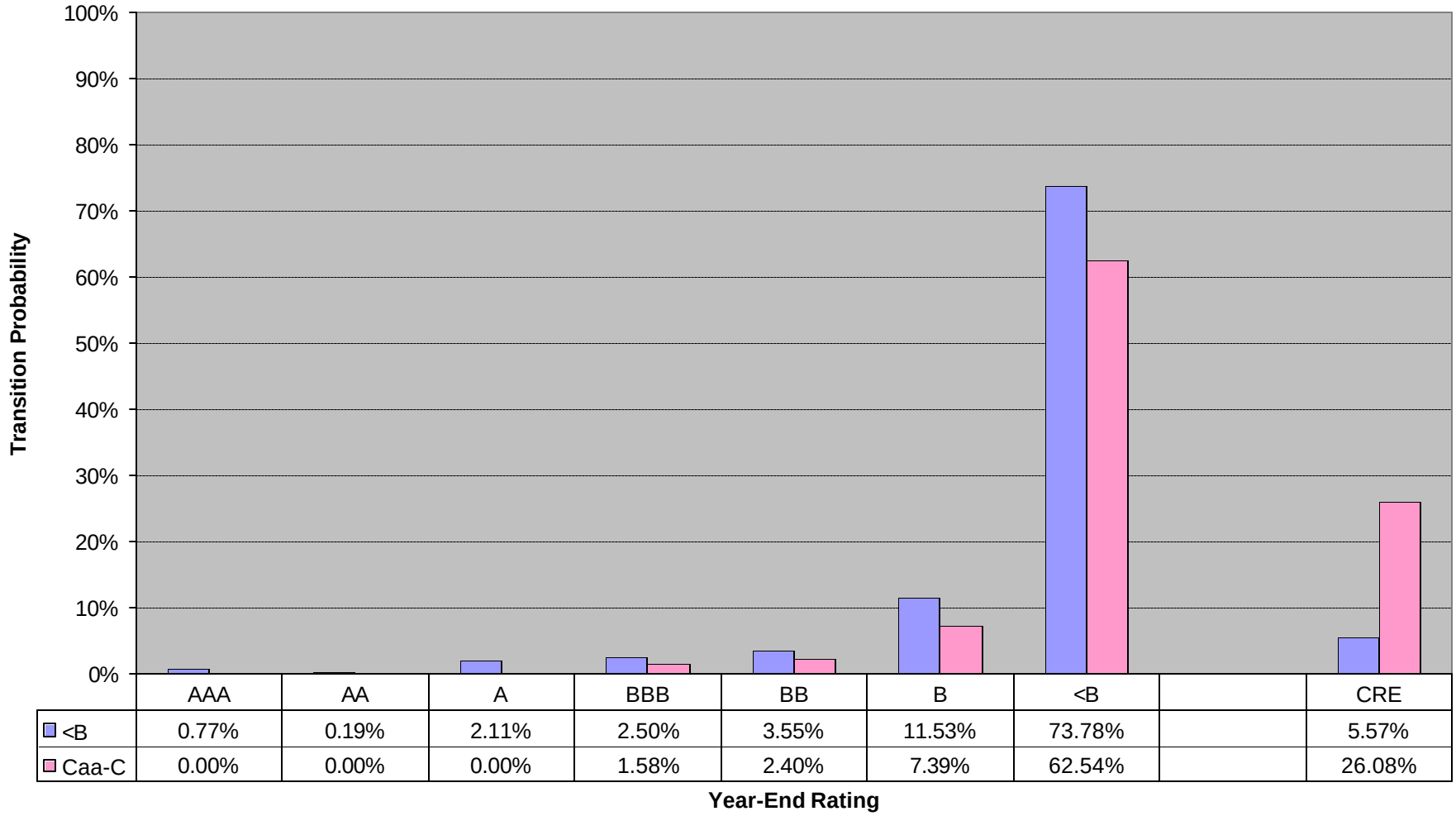
	AAA	AA	A	BBB	BB	B	<B		CRE
BB	0.20%	0.35%	1.01%	11.04%	78.90%	4.00%	1.03%		3.47%
Ba	0.02%	0.03%	0.61%	4.98%	84.02%	8.03%	0.64%		1.66%

One-Year Migration in Rating - SOA Study versus Moody's (Adjusted for 'Not Rated')
From B at the Beginning of the Year
More Likely to Upgrade (Two Levels to BBB)



	AAA	AA	A	BBB	BB	B	<B		CRE
B	0.14%	0.28%	1.30%	4.70%	7.16%	79.30%	2.19%		4.93%
B	0.02%	0.07%	0.22%	0.79%	6.65%	81.50%	2.99%		7.77%

One-Year Migration in Rating - SOA Study versus Moody's (Adjusted for 'Not Rated')
From <B (SOA) or Caa-C (Moody's) at the Beginning of the Year
More Likely to Upgrade (to B) and Less Likely to 'Downgrade' to CRE

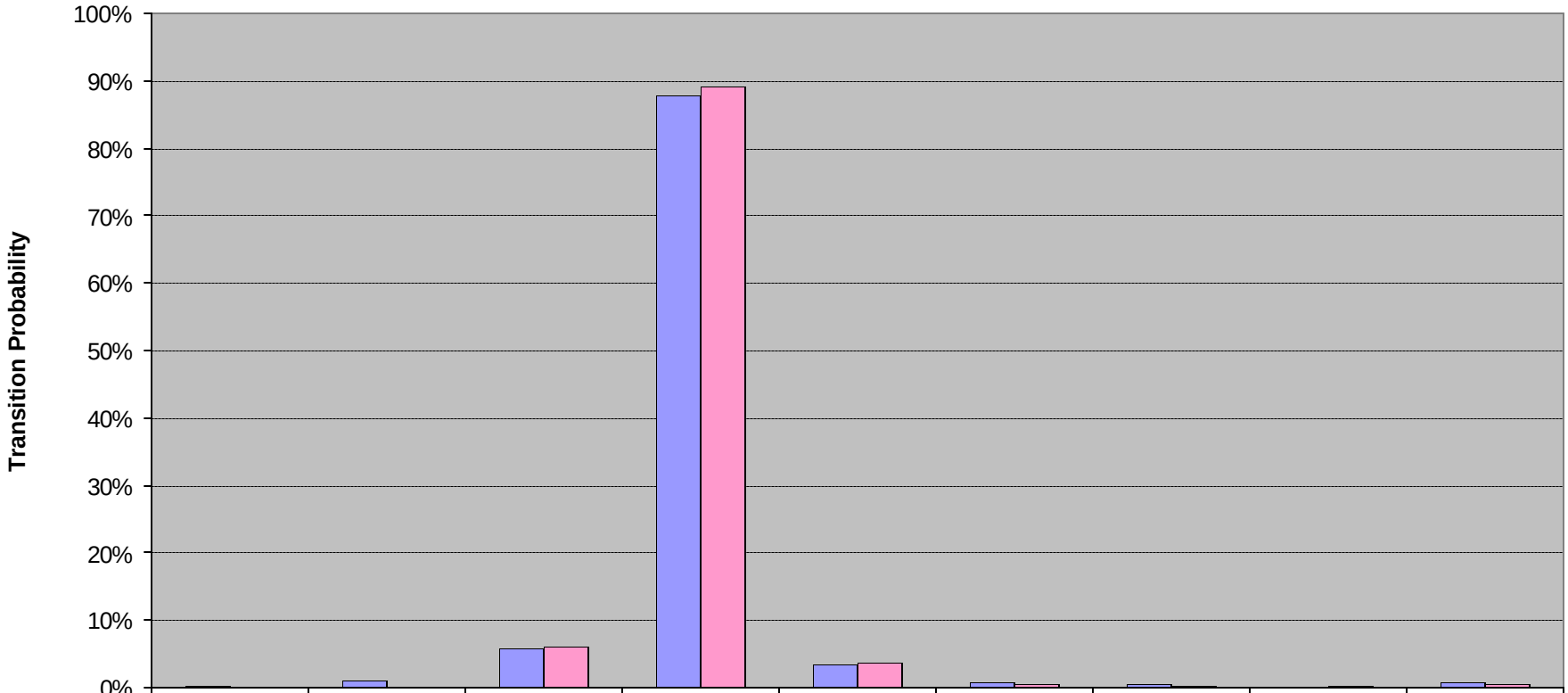


	AAA	AA	A	BBB	BB	B	<B		CRE
<B	0.77%	0.19%	2.11%	2.50%	3.55%	11.53%	73.78%		5.57%
Caa-C	0.00%	0.00%	0.00%	1.58%	2.40%	7.39%	62.54%		26.08%

One-Year Rating-Transition Probabilities
Comparing Patterns between Internal Ratings and NAIC Ratings

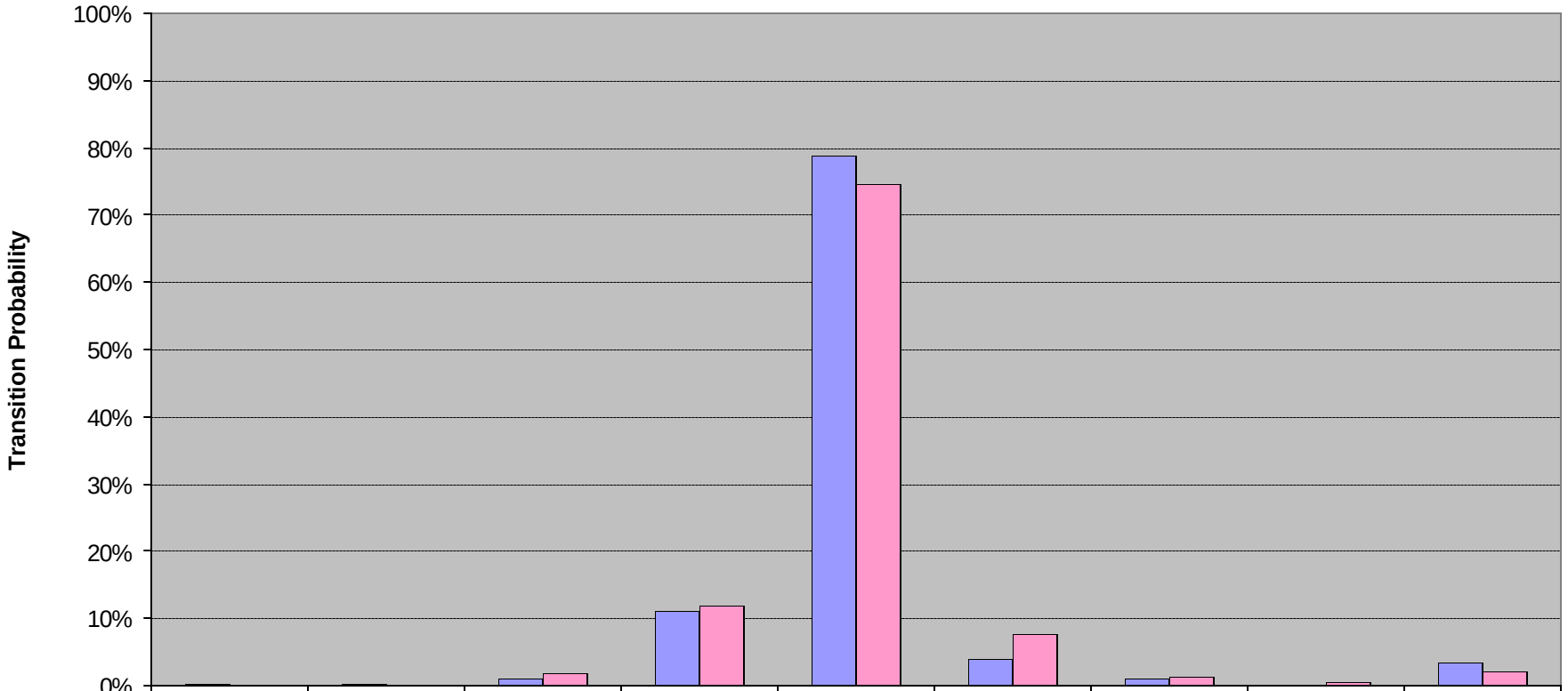
Migration from Internal Rating of	Compared to Migration from	Likelihood to Upgrade	Likelihood to Downgrade (Excluding CREs)
AAA-A	**NAIC 1**	No one-to-one correspondence for direct comparison	
BBB	**NAIC 2**	Similar	Similar
BB	**NAIC 3**	Similar	Similar except smaller to B (NAIC 4)
B	**NAIC 4**	Similar	Similar except smaller to <B (NAIC 5)
<B	**NAIC 5**	Similar on the whole	Not applicable
	NAIC 6	No exact analog for comparison	
Overall	**Overall**	Similar	Smaller for Below Investment Grade

One-Year Migration in Rating - Internal Rating versus NAIC (NR-Adjusted)
From BBB or NAIC 2 at the Beginning of the Year
Similar between Internal & NAIC Ratings



	AAA	AA	A NAIC 1	BBB NAIC 2	BB NAIC 3	B NAIC 4	<B NAIC 5	NAIC 6	CRE
BBB	0.15%	0.99%	5.69%	87.76%	3.33%	0.83%	0.61%		0.64%
NAIC 2			5.97%	89.14%	3.61%	0.38%	0.22%	0.30%	0.37%

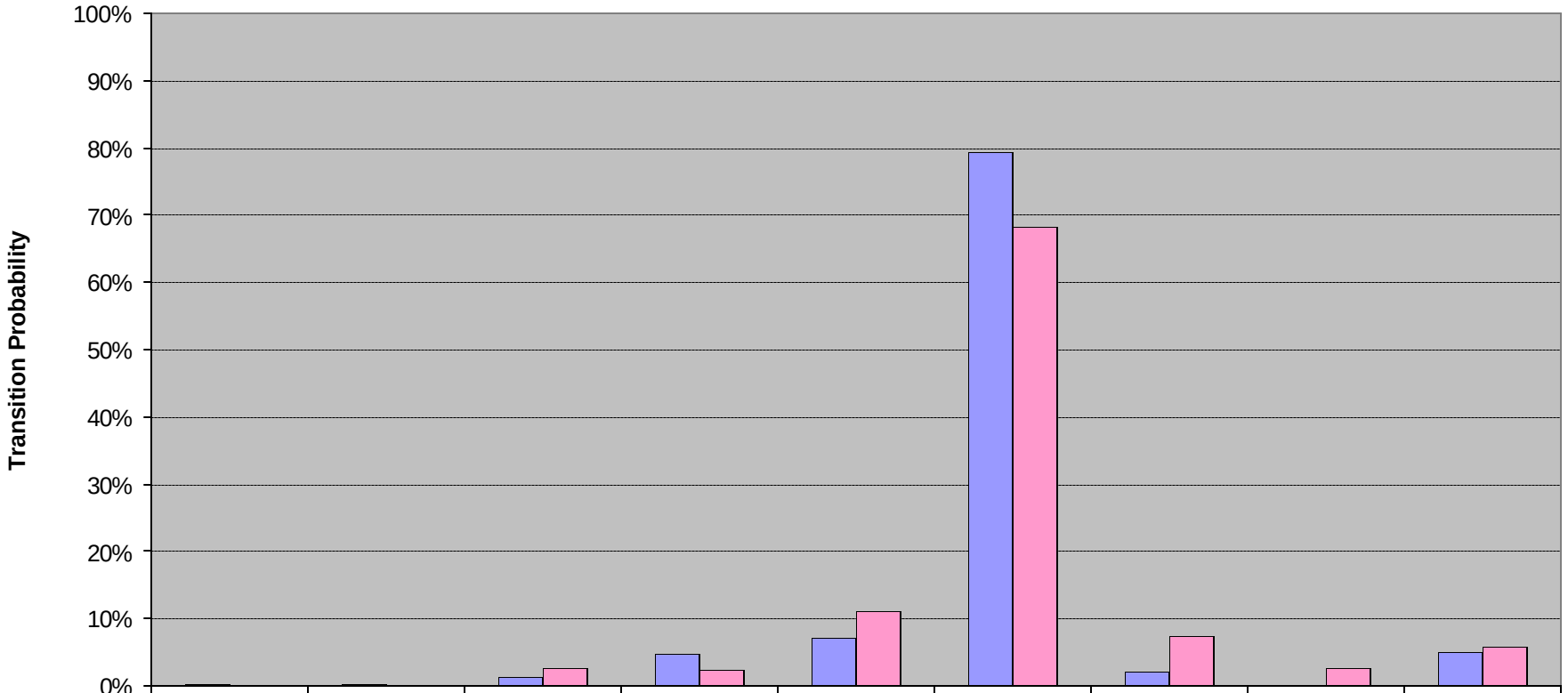
One-Year Migration in Rating - Internal Rating versus NAIC (NR-Adjusted)
From BB or NAIC 3 at the Beginning of the Year
Less Likely for BB to Downgrade to B Than for NAIC 3 to Downgrade to NAIC 4



	AAA	AA	A NAIC 1	BBB NAIC 2	BB NAIC 3	B NAIC 4	<B NAIC 5	NAIC 6	CRE
BB	0.20%	0.35%	1.01%	11.04%	78.90%	4.00%	1.03%		3.47%
NAIC 3			1.69%	11.96%	74.56%	7.71%	1.34%	0.55%	2.18%

Year-End Rating

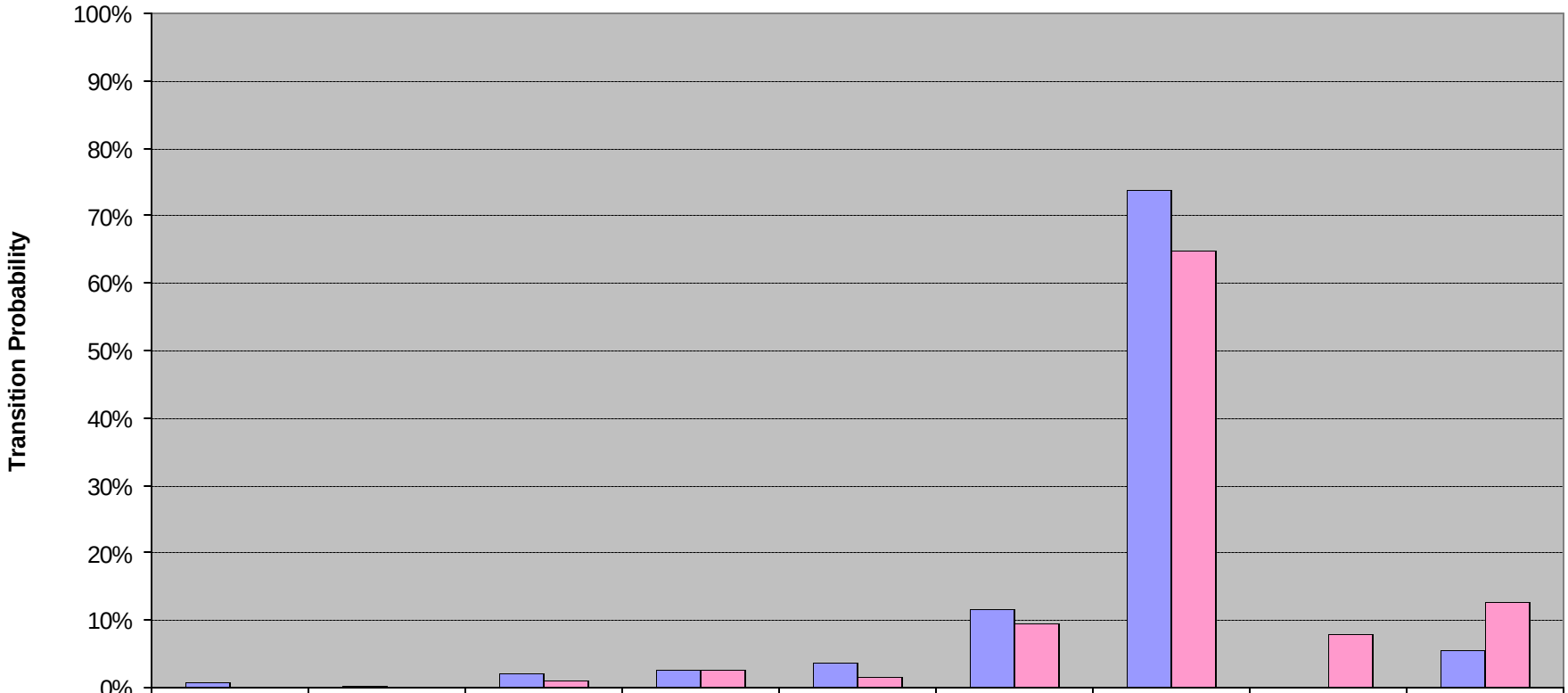
One-Year Migration in Rating - Internal Rating versus NAIC (NR-Adjusted)
From B or NAIC 4 at the Beginning of the Year
Less Likely to Uprade to BB but Also Less Likely to Downgrade to <B



	AAA	AA	A NAIC 1	BBB NAIC 2	BB NAIC 3	B NAIC 4	<B NAIC 5	NAIC 6	CRE
B	0.14%	0.28%	1.30%	4.70%	7.16%	79.30%	2.19%		4.93%
NAIC 4			2.52%	2.33%	11.13%	68.18%	7.37%	2.71%	5.76%

Year-End Rating

One-Year Migration in Rating - Internal Rating versus NAIC (NR-Adjusted)
From <B or NAIC 5 at the Beginning of the Year
Less Likely 'Downgrade' to CRE



	AAA	AA	A	BBB	BB	B	<B		
			NAIC 1	NAIC 2	NAIC 3	NAIC 4	NAIC 5	NAIC 6	CRE
<B	0.77%	0.19%	2.11%	2.50%	3.55%	11.53%	73.78%		5.57%
NAIC 5			1.02%	2.61%	1.60%	9.43%	64.89%	7.83%	12.62%

Year-End Rating

APPENDIX V

Committee Members

Society of Actuaries

Private Placement Experience Committee:

Nicholas Bauer, FSA, Chair
Eckler Partners

Mark S. Carey, Vice-Chair *
Federal Reserve Board

Giacomo Arianna *
TIAA-CREF

Mark Poeppelman *
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TIAA/CREF

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New York Life

Kin On Tam, FSA
Metropolitan Life

Peter D. Tilley, FSA
Great-West Life & Annuity

Robert A. Ward, FSA
ING Variable Annuities

John A. Luff, FSA
SoA Experience Studies Actuary

* non-members representing the investment community

Committee Support:

William McDonald
MIB

Nancy Morse
MIB

Korrel Crawford
SoA Staff