

NOT FOR PUBLICATION

PROBLEMS OF BANK SUPERVISION WITH RESPECT TO
BANK INVESTMENTS IN CORPORATE BONDS

By

Donald S. Thompson, Chief
Division of Research and Statistics
Federal Deposit Insurance Corporation

Delivered Before the Advisory Conference on Research in Finance
of the National Bureau of Economic Research and the
Association of Reserve City Bankers

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Appraisal of quality of bonds. The Federal bank supervisory authorities are committed to the policy of appraising bonds held by banks on the basis of quality. In practice this means that corporate bonds are appraised primarily on the basis of ratings prepared by private agencies which also engage in the business of selling advice on security investments. The assumption underlying this practice is that these ratings give a reasonable approximation of the risk of loss through default. One of the purposes of the Corporate Bond Study^{1/} was to assemble data by which this assumption could be tested.

The Corporate Bond Study undertook to collect and organize data in a form which would facilitate an analysis of the forces

^{1/} A WPA project, sponsored by the Federal Deposit Insurance Corporation with the cooperation of the Office of the Comptroller of the Currency, the Board of Governors of the Federal Reserve System, the Securities and Exchange Commission, the Division of Statistical Standards of the United States Bureau of the Budget, the Federal Reserve Bank of New York, four private rating services and several research and educational institutions, and directed by the National Bureau of Economic Research.

underlying developments of the past 38 years. It has become a commonplace that history does not repeat itself precisely, but we believe that many of the forces which have operated in the past will continue to influence events in the future. We shall attempt to identify these forces, and, insofar as possible, evaluate in quantitative terms those which are subject to statistical measurement. Insofar as we achieve this purpose, it will be possible to appraise more accurately the forces at work in the new perspectives of today and tomorrow.

The study secured information regarding the issue and extinguishment of about 4,500 domestic corporate bonds outstanding on January 1, 1900 or issued during the period from 1900 to 1938. The data were secured from investment manuals and similar financial publications. The bonds include all issues with fixed coupons and of single maturity of \$5 million or more, and nearly 10 percent of such issues of less than \$5 million listed in the manuals. Insofar as price data were obtainable, the expected yield to maturity on each offering, the actual realized yield from offering to extinguishment, and the differential between expected and realized yields for each of the offerings were computed. The data were then placed on punch cards together with distinguishing characteristics of which the more significant for our purposes are: (1) dates of offering and extinguishment; (2) manner of extinguishment; (3) size of offering; (4) size of issue; (5) size of obligor; (6) seniority of issue; (7) sinking fund provisions; (8) times interest earned; (9) offering price; (10) call price; (11) composite of agency rat-

ings ; (12) legal listing; (13) market rating; and (14) industry.

These data permit measuring the results achieved by investors investing at the time of issue. Banks, however, invest also, or perhaps I might say chiefly, in bonds after they have been outstanding for some time. Data have also been secured for these same bonds showing ratings, prices and yields annually and for selected periods of time so as to permit the measurement of investment performance of issues of different characteristics purchased at different times and under different market conditions. What was the relative performance of issues of different quality purchased during periods of high money rates and extinguished during periods of low money rates? and vice versa? What was the relative investment performance of securities purchased during periods of economic depression but extinguished during periods of prosperity? and vice versa? Answers to these questions are essential to an appraisal of the investment process.

At the time the study was undertaken it was hoped that considerable data relating to small issues would be assembled, but great difficulties were encountered in securing reliable data on the sample of small issues. To what extent we shall be able to analyze small issues we will not know until the data have been tested. I am afraid, however, that we shall not be able to do as much with small issues as we had hoped. Fortunately, the small issues do not bulk very large in the aggregate, and our examiners, trained as they are to appraise loans, can for the most part cope with the problem of appraising small local security issues. However, lack of

knowledge concerning the behavior of these small issues constitutes an important gap in our knowledge.

An illustration of the nature of the data available from the study is given in Chart A which covers only domestic corporate issues of \$5,000,000 and over which were extinguished by December 31, 1938. The chart shows average expected yields and average realized yields of such bonds grouped according to rating at time of offering. The figures are shown in Table I. The rating used is a composite of the ratings of four private rating services. Where only one service rated the issue that rating was used. Where two or more services rated the issue the median of the ratings was selected as a composite. While this procedure is not identical with that now used by the bank supervisory agencies in classifying rated securities, it yields classifications sufficiently comparable in most cases to afford a basis for evaluating that procedure. Bonds which were not rated at the time of issue are not included in the chart even though they may have been rated on some date subsequent thereto. Data relate only to bond issues of \$5 million or more each, representing approximately 2,400 offerings with a total par value of \$18.5 billion. The data are for offerings. A single offering of a \$50,000,000 issue is counted the same as each of five offerings of a \$5,000,000 issue. It was necessary to deal with offerings rather than with bond issues as such because the yields on separate offerings of the same issue differed with differences in offering price.

N o t f o r p u b l i c a t i o n

Table I

COMPARISON OF EXPECTED AND REALIZED YIELDS BY RATINGS

Domestic Corporate Bond Issues of \$5,000,000 or More Extinguished by December 31, 1938

Composite rating at offering	Number of offerings	Par amount offered (000 omitted)	Average expected yield	Average realized yield	Average differential yield
<u>Total</u>	<u>3,652</u>	<u>\$26,244,540</u>	<u>5.77%</u>	<u>5.33%</u>	<u>-0.44%</u>
- 1	154	2,436,760	5.26	5.83	+0.58
- 2	389	4,486,340	5.54	5.95	+0.41
- 3	674	4,859,650	5.76	6.11	+0.35
4	732	4,121,380	6.15	5.96	-0.18
5	326	1,978,840	6.83	4.50	-2.33
6 and lower	96	562,800	10.42	2.56	-7.87
Information lacking or not rated	1,281	7,798,770	5.08	4.74	-0.34

+ Realized yields exceed expected yields.

- Expected yields exceed realized yields

Source: Preliminary tabulation of data assembled by the Corporate Bond Study. The issues included in this table, i.e., those extinguished by December 31, 1938 on which price data were available, were separated from a population which includes corporate bonds issued in amounts of \$5,000,000 or more either outstanding on January 1, 1900 or issued from January 1, 1900 to December 31, 1938. Included are 269 offerings with a par amount of \$1,887,710,000 on which there was a net loss from offering to extinguishment. Issues in default but not extinguished by December 31, 1938 (by exchange, extension, or other compromise) are not included.

As anticipated, the chart shows that the lower the quality of issue the higher were the expected yields. Expected yields ranged from an average of $5\frac{1}{4}$ percent for the highest rated issues to an average for the sixth grade and lower of nearly $10\frac{1}{2}$ percent, or approximately double that of the highest grade. In this connection the term "expected yield" is probably a misnomer; what is really meant is indicated yield. I doubt that the investors expected to average $10\frac{1}{2}$ percent on their investment in low grade issues. As a matter of fact, most of the offerings rated sixth grade and lower at time of issue appear to have been extensions or compromises of other issues. Under the procedure followed in the study, the extension or compromise would be considered an extinguishment of the original obligation and an offering of another issue.^{1/} The chart indicates that, for the period covered, the realized yield on those large issues rated sixth grade or lower at the time of issue was only one-fourth of the expected yield and was less than one-half of the average realized yields for any of the first four grades. Starting with an average realized yield of about 5.8 percent for the first grade, realized yields averaged higher as the quality of issue diminished until an average yield of 6.1 percent is shown for the third grade. The change for the three grades is too small to be

^{1/} Analysis of the record of defaults is permitted by the data but is not attempted in this illustrative analysis.

considered significant in this analysis. Realized yields averaged lower in the fourth grade but still averaged as high as the second grade and above that of the first grade. Below the fourth grade realized yields declined sharply.

Realized yields averaged higher than expected yields in each of the first three grades (see Chart B) probably because of the fact that many of the issues were called at a premium before maturity, either because the corporation wished to refinance with a stock issue or sell bonds at a lower rate of interest. The former practice was prevalent in the 20's, and the latter in the 30's. The fact that realized yields in these computations are higher than expected yields does not indicate that the investors made a profit. Since bonds are callable at the option of the issuing corporation, they, presumably, will never be called except when it is to the advantage of the corporation to do so, which, in practice, means the investor will have difficulty in finding another issue of equal quality without accepting a lower yield. In interpreting the data the difference in concept between investment in a particular issue terminable at a given point of time and investment as a continuing operation must be kept in mind.

Realized yields approximated expected yields, on the average, in the fourth grade and were substantially below expected yields in the lower grades. The differences are shown graphically in Chart B. The data are presented in Table I.

Not only did the yields on bonds of the sixth grade and lower average well below those of better grades but the odds against securing a satisfactory yield in any of the issues were very much against the investor. Chart C shows that in 41 out of every 100 offerings rated sixth grade and lower at time of offering the investor received back less in interest and principal than he paid for the bond. And that refers only to bonds in which an actual loss was shown after final settlement. A large number of other offerings went into default but were still in litigation (not extinguished) at the end of 1938. The latter are not included in Chart C and Table II. None of the offerings rated in the first grade at time of offering showed a loss. Of those in the second grade two percent showed losses; in the third grade, three percent of the offerings showed losses. In the fourth grade eight percent of the offerings, representing 14 percent of the par value of the offerings of that grade, showed losses. In the fifth grade and in lower grades the proportions of offerings showing losses were much higher, as indicated by the chart. The figures are presented in Table II.

An analysis of defaults as such is, of course, contemplated and the study has assembled a great deal of data regarding bonds which have gone into default.

A warning about the data presented here. Any conclusions drawn from the data presented in this paper would rest upon the assumption that changes in interest rates and in economic and financial conditions cancelled out and had a net effect of zero on the data. These assumptions have not been tested. As indicated earlier

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Table II

PROPORTION OF OFFERINGS SHOWING LOSS BY RATINGS

Domestic Corporate Bond Issues of \$5,000,000 or More
Extinguished by December 31, 1938

<u>Composite rating at offering</u>	<u>Percent showing loss</u>	
	<u>Number of offerings</u>	<u>Par amount</u>
1	0	0
2	2	2
3	3	4
4	8	14
5	22	25
6 and lower	41	20

the data must be analyzed for selected time periods and with allowance for changing conditions.

The generally high level of expected yields shown in Chart A reflects the preponderance of issues extinguished before the close of 1938 originally offered when rates of interest were high. The substantial differences between expected and realized yields in the lower grades may reflect the influence of heavy losses incurred in the period 1931 to 1934, a period fatal perhaps to low grade issues but in which high grades could survive.

The yields shown in the table and charts are averages of yields by offerings. As a consequence, an issue of \$50,000,000 with a single offering is counted once, whereas an issue of \$5,000,000 with five separate offerings of \$1,000,000 each is counted five times. The assumption underlying the averages presented in this paper is that the individual items are distributed according to the laws of chance. Are they so distributed? The data of the Corporate Bond Study have been so compiled as to permit not only the study of this question but also the measuring of the influence of a number of other complicating factors, some of which I have already mentioned.

To repeat, the data presented in this paper are preliminary and illustrative not definitive. They deal only with one selected group of issues and one particular type of phenomenon.

In the analysis of rating behavior, we are interested not only in average performance but also in the chances of realizing the average performance. What are the chances of suffering loss on

investments in the various grades? The data have been compiled with a view to answering this question.

The bank supervisory authorities are also interested in rating changes. Ever since the adoption of the uniform agreement in 1938, the Federal Deposit Insurance Corporation has maintained currently a record of changes in ratings with a view to analyzing their significance and their influence upon investment markets, bank investment, and the condition of banks. The Corporate Bond Study has assembled data of rating changes for the period prior to 1938 for which ratings are available with a similar view in mind.

Analysis of value of bonds. What is a reasonable valuation policy with respect to bank investments? The answer to that question depends in part upon one's point of view regarding the role of bank investment in securities and in part upon one's assumptions regarding the nature of markets and the behavior of bonds. Evaluation of points of view regarding the role of bank investment in securities requires historical analysis of the growth of bank investments, the reasons therefor, and a review of that growth in terms of monetary and banking theory, in terms of principles of bank supervision, and in terms of theory of corporate and governmental financing. If bonds are looked upon as a temporary investment to be bought and sold frequently the policy of valuation could conceivably be different from that employed if bonds are looked upon as a relatively permanent investment. This important subject, however, lies outside the scope of this paper.

Given a point of view from which to start, the data of the Corporate Bond Study should permit a testing of assumptions regarding bond performance and of valuation procedure calculated to yield results most nearly in conformity with the point of view adopted.

The present system of "convention values" employed by the Federal bank supervisory agencies represents a compromise. Acquisition cost is used for securities of investment grade. An average of market prices is generally used for substandard bonds not in default and market prices are used for defaulted bonds and for stocks. In the case of substandard bonds not in default, only one-half of the depreciation from book values is deducted in determining the net sound capital of the bank.

Because the present system of valuing securities in bank examinations is a compromise the principles upon which it was established and the manner in which it works are not well understood and the system gives rise to controversy. The present system attempts to arrive at a valuation which will approximate what the banks will get at maturity or extinguishment.

The use of acquisition value on securities classified by examiners as eligible for bank investment assumes that there is little doubt of the fulfillment of the terms of contract stated in the bond. The use in connection with substandard securities of market prices either as of a specific date or averaged over a period of time represents an attempt to measure the added risk involved and assumes that market discrimination is an adequate basis for measuring that risk. One of the things we hope to do with the material

obtained from the Corporate Bond Study is to test the validity of that assumption and to determine in what manner the assumption should be modified. We propose to study the performance of bonds classified according to the extent to which they have been favored or discriminated against by investors.

One of the end products of our investigations, if successful, would be the development of a set of principles governing the accumulation of reserves against losses in bond portfolios. How much reserves should be accumulated? When may such reserves be considered to be deficient? excessive? Is it proper to use valuation procedures and requirements for accumulation of reserves as devices for discouraging "undesirable" investment practices? At present, principles governing supervisory policy with respect to the accumulation of reserves in the bond portfolio are vague to say the least. Any principles developed could apply properly only to large institutions or large aggregates of holdings. A general rule cannot be expected to work satisfactorily for each issue or for each case involving only a few issues.

One proposal that has been made governing accumulation of reserves is as follows: (1) require placing in reserve all yield in excess of the riskless rate for comparable maturity or in excess of some other rate representing a reasonable minimum risk; (2) charge any losses on the bond portfolio against this reserve; (3) so long as the reserve is below the amount which should be accumulated against the bond account require accumulation in accordance with

(1) above; (4) require no further additions to reserves when the accumulated reserve is equal to or more than the amount which should be accumulated against a given bond account.

Such a formula presumably would permit management to benefit from wise selection of securities inasmuch as a favorable experience would result in accumulation of excess valuation reserves and would permit a management to cover all income thereafter into its undivided profits account. A management with below average experience, on the other hand, would be required to continue to accumulate reserves in accordance with the formula given above. This formula would provide only for protection against "normal" or average risk. It would not protect against the hazard of concentrated loss in an individual issue, or against economic catastrophe. For protection against such risks reliance would have to be placed, as in the past, on the capital account. The materials from the Corporate Bond Study should permit the testing of such a proposal as well as others.

There are a number of other possible bases of valuation, among which may be listed the following:

- (a) Current market price;
- (b) Some average or representative market price;
- (c) Acquisition cost less amortization of principal or discount --- with adjustment for estimated loss;
- (d) Par or face --- with adjustment for estimated loss;
- (e) And, of course, some combination of the above.

Analysis of prices. An understanding of market price behavior is essential for the appraisal of the results of research directed along the narrower lines of bank supervisory interest. Study of the many ramifications of price phenomena, however, is beyond the capacity of the Corporation's existing staff burdened as it is with other problems. Some of the lines of investigation among others which we would like to see pursued more intensively than has hitherto been possible are:

- (1) The extent to which price stability is related to quality of bond;
- (2) The influence of the following factors upon prices:
 - (a) Interest rates;
 - (b) Market bias with respect to:
 - (i) Industry,
 - (ii) Maturity,
 - (iii) Size of concern or issue;
- (3) The consistency of behavior of prices at various price ranges. For example, what are the patterns of price behavior of two bonds of the same indicated quality, same maturity, same expected yield to maturity, one of which is priced at 80 and the other at 50?

It was with these broader questions in mind that Mr. Crowley in his letter of May 28, 1938, addressed to Dr. Willits, formally inviting the National Bureau of Economic Research to assume the direction of the Corporate Bond Study, said:

"The subjects have such broad implications and the investigations could develop material of such importance to the study of our economic system that it would seem to be entirely proper for the National Bureau, particularly through its Financial Research Project, to assume direction of such a project."

. . . .

"The WPA phase of the investigation should put the material in convenient shape for analysis. It would then be the responsibility of the National Bureau to subsidize or finance scholars in the numerous analyses which could be made from the material. The Corporation would naturally be interested in such studies and would cooperate in their completion in every way possible. We believe, however, that the interests of general economic thought would be better served by having the National Bureau assume primary responsibility."

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CHART A

EXPECTED AND REALIZED YIELDS BY RATINGS Domestic Corporate Bond Issues of \$5,000,000 or More Extinguished by December 31, 1938

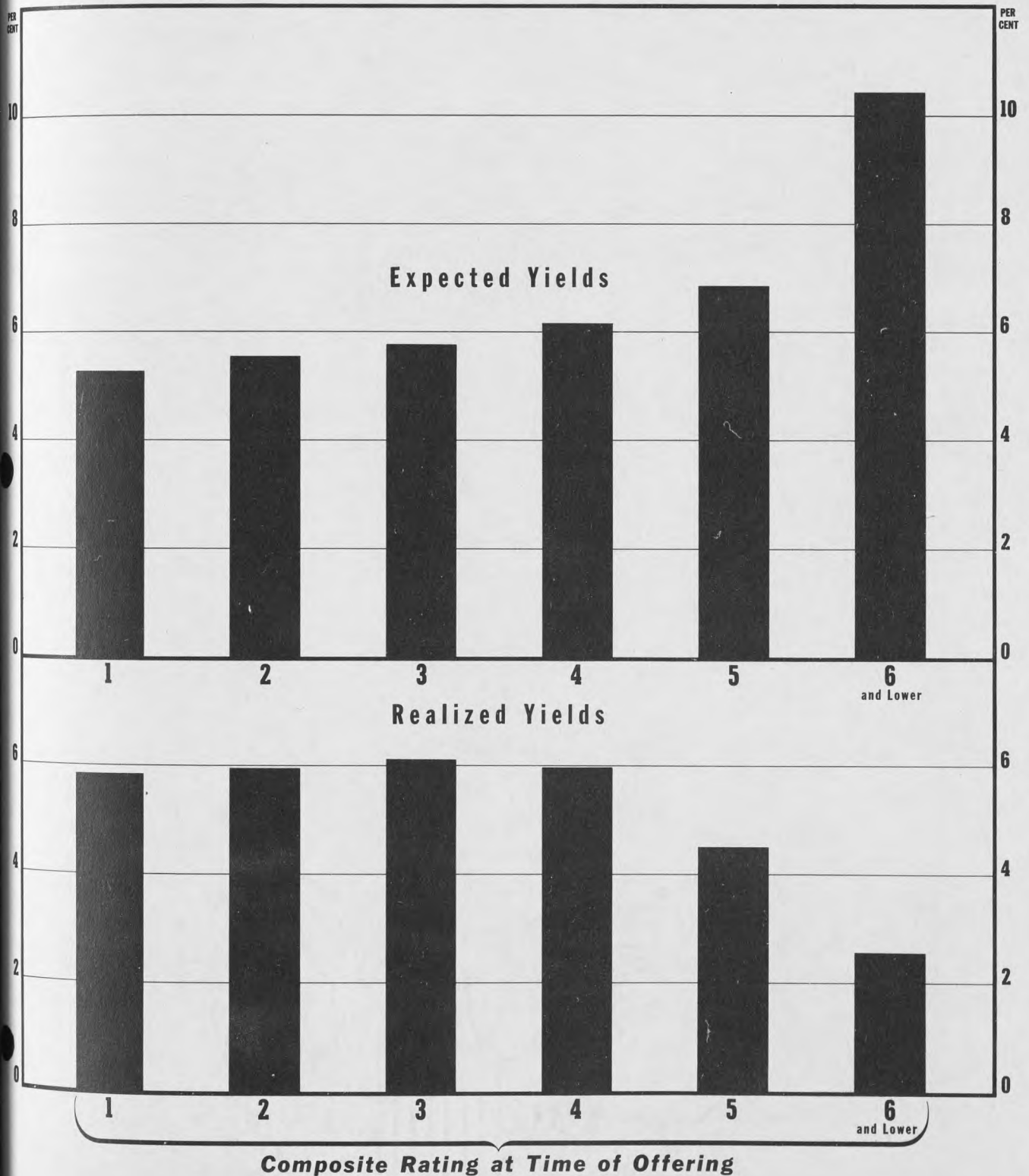


CHART B

DIFFERENTIAL BETWEEN EXPECTED AND REALIZED YIELDS BY RATINGS Domestic Corporate Bond Issues of \$5,000,000 or More Extinguished by December 31, 1938

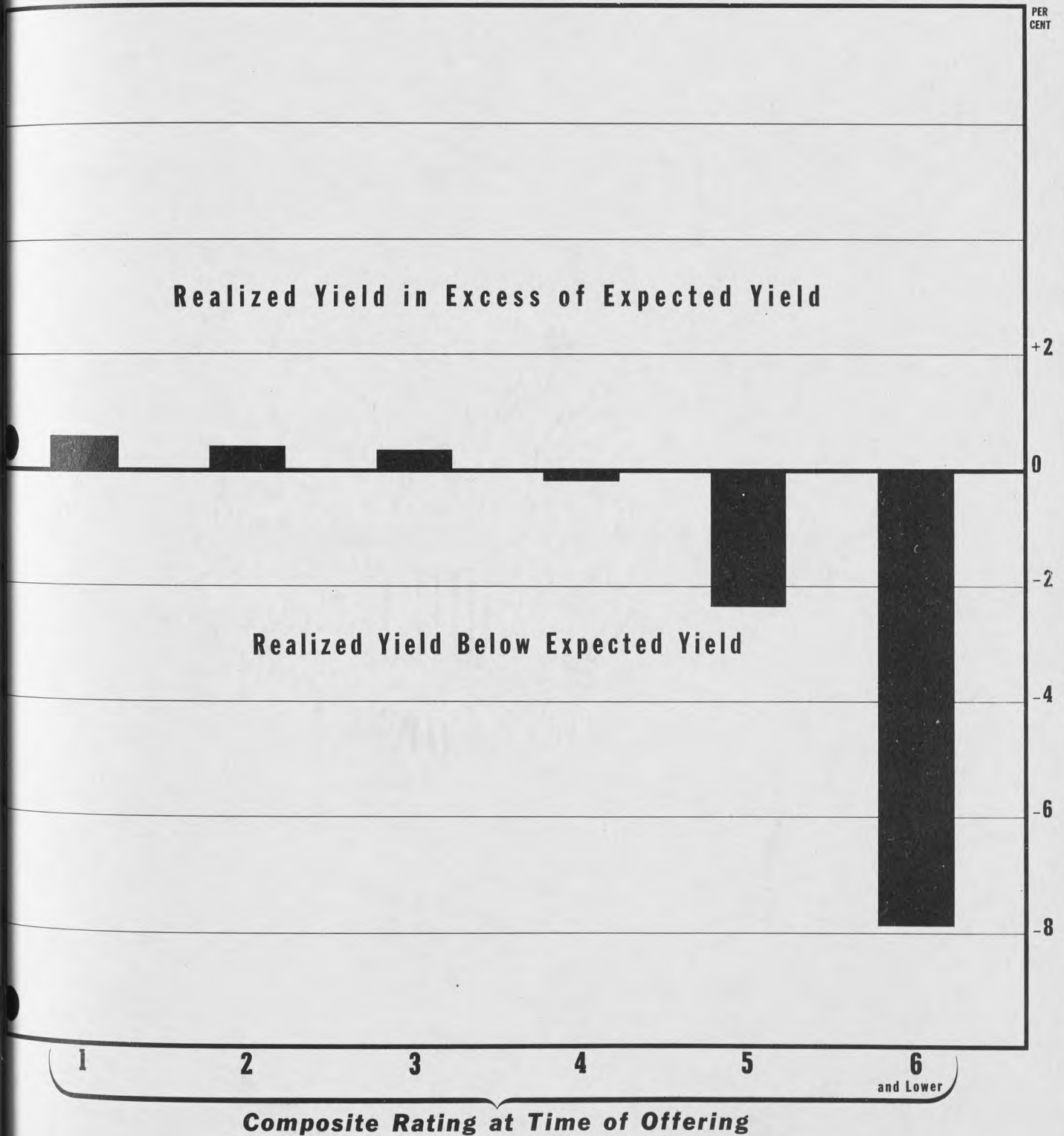


CHART C

PROPORTION OF BONDS SHOWING LOSSES BY RATINGS Domestic Corporate Bond Issues of \$5,000,000 or More Extinguished by December 31, 1938

