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Chapter Title: A Market Rating for Corporate Bonds

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A MARKET RATING FOR CORPORATE BONDS

LIKE the investment agencies and the compilers of the legal lists, the securities markets are engaged in the process of rating corporate bond investments. During most of the period covered by our records corporate bonds enjoyed an active market, so that it was possible to obtain tolerably reliable market prices and yields, and to infer from them the way in which the market rated the bonds. The particular rating used for the purpose is a "yield spread" or "risk premium," defined as the difference between the promised yield of a given issue and the promised yield of outstanding issues of the highest grade that had the same term to maturity.

Following the outline of preceding chapters, we shall first describe the nature of the measure used, indicate how similar ratings have been employed by official regulatory bodies in determining the eligibility and amortizable properties of corporate bonds for investment institutions, and review some of the weaknesses of the yield spread as well as of alternative market ratings. The next section presents statistics on the volume and characteristics of issues in different market-rating classes, and traces changes in their distributions over significant periods. It includes, among other things, an investigation of whether the market, like the rating agencies, was able to predict the deterioration in investment quality that occurred in the 1920's. The chapter closes with a section on the default and yield experience on corporate bonds.

SUMMARY OF FINDINGS

Market ratings of the type analyzed in this chapter have been applied in the insurance and savings bank fields to determine the amortizable and eligibility properties of corporate bond investments. The market rating recommends itself because it is easily computed and has comprehensive coverage; its computation requires only a knowledge of the promised yield of the issue and an appropriate schedule of basic yields on high-grade investments against which the promised yield may be compared. Requisite data for the computation of the market rating were available for 80 to 95 percent of the par-amount total of all straight bond issues

outstanding during the period 1900–1944. (The total includes bonds in default, which were deliberately not rated.) Issues rated by the market thus compare fairly closely with the 92 to 99 percent of aggregate outstandings rated by the investment agencies in the period from January 1, 1920 to 1944. On the average over the period studied, about half of the total volume of all rated outstandings had a market rating of under 1 percent; that group will usually be referred to hereafter as "high grade."

Unfortunately, the practical disadvantages of the market rating are fully as important as the advantages, and have recently led to its abandonment by the life insurance commissioners. Yield spreads are at best very rough measures of the intrinsic quality of bond issues, since they are influenced by differences in marketability, taxability, convertibility, call prices, etc. It is quite difficult to correct for such differences and no adjustment has been attempted in this report.

A second undesirable feature of the market rating is its instability. The volatility of the rating is particularly troublesome in practical applications since it precludes establishing a single objective yield standard that will separate high-grade from low-grade investments in all years. For example, a market rating of under 1 percent included 60 percent of the par-amount total of rated outstandings in 1928, but only 25 percent in the depressed thirties. This suggests the possible use of some variant of the yield spread as a market rating, a matter requiring more attention than can be given it in the present work. One of the important consequences of the instability of the market rating (considered as an absolute yield differential) was that the rating improved on bonds offered in the late twenties while the intrinsic quality of the offerings declined. Here the market contrasted unfavorably with the investment agencies, which assigned low ratings to an increasing proportion of bonds offered in the late twenties. Over the short periods spanned by most business cycles, however, there was less systematic upgrading and downgrading by the market than by the investment agencies or by a strictly enforced legal list such as Maine's. Although the market rating was unduly influenced by the speculative excesses of the late twenties (and by the depression psychology of the thirties), it was usually more stable over business cycles than most other quality measures examined in this report.

A third disadvantage of the market rating is that it is inappli-

cable to a substantial number of the smaller nonmarketable issues, the very ones for which a quality test is most needed. In practice, regulatory bodies must either infer the yield spreads for nonmarketable issues from the yields of "comparable" marketable issues—obviously a difficult process—or fall back upon some other method of rating. Although coverage in terms of the par amounts outstanding was good (market quotations being obtainable for 80 to 95 percent of the total in the different years), the number of issues not rated was considerable: market quotations were usually unavailable for about half of the issues outstanding. Moreover, there was a progressive downward drift in coverage after 1936 owing to the growth of nonmarketable private placements. This development became even more pronounced after 1944 (the last year covered by our records) and was an important factor leading to the abandonment of the yield test by the life insurance commissioners in 1953.

Despite its disadvantages, the market rating is not without merit as a quality measure for those issues for which it can be computed, and it was possible to compute it for about 85 percent of the par-amount total of outstandings in the years before the agency ratings and legal lists became available. In later years most of the issues rated high grade by the market were similarly rated by the investment agencies and the compilers of the legal lists, and most of the high grades under the different rating systems had similar characteristics with respect to size of obligor and issue, marketability, lien position, etc. Like the other ratings, market ratings assigned at offering and on quadrennial observation dates proved to be good indicators of subsequent default experience. In general, the lower the quality of an issue as rated prospectively by the market, the greater was the risk of default observed in retrospect. Moreover, the realized yields on defaulted issues calculated from offering to default were usually higher for issues rated by the market as high grade at offering than for those rated as low grade, and the loss rates on the high grades were considerably lower.

The general pattern of the relationships among market ratings and the various measures of subsequent investor experience thus resembles roughly what was observed in the preceding chapters on the legal lists and composite agency ratings. By the nature of the measure used, there is a direct relationship between weighted average promised yields on rated outstandings and their market ratings—the yield spreads assigned by the market. Realized yields

show a similar pattern, being higher the larger the yield spread (i.e., better, the poorer the quality). In short, on the average investors obtained lower returns on high-grade issues than on low grades, whether the measure of quality was the yield spread assigned by the market, legal status, or the ratings assigned by the agencies.

Because of the positive correlation between market ratings on the one hand and promised and realized yields on the other, no significant relationship is observed between the market ratings at offering and the life-span loss rates (differences between yields promised at offering and yields realized from offering to extinguishment). For large issues, where the data are most complete, capital gains were quite general but were virtually independent of the market rating. The market rating is sometimes conceived of as a pure risk premium or forecast of the loss rate. Under that interpretation, averages of risk premiums and loss rates should be equal for securities accurately priced in the market. But average risk premiums were actually higher than average loss rates, a fact which implies that the market either undervalued issues at offering, or exacted a premium for risk bearing. In addition, the independence of the average market ratings and loss rates implies that the undervaluation was greatest at the poor end of the quality scale. To put the matter differently, corporate bond investors, on the average and over long periods, obtained higher returns than those promised on the very best securities outstanding in the market, and the excess return was usually higher for the poorer quality ratings.

Various explanations for this phenomenon may be offered; the one favored here is based on the observation that institutional investors frequently shy away from riskier bonds, irrespective of the yield offered. For many years the corporate bond market has been dominated by large institutional investors. Even though many of the investment intermediaries are of sufficient size to balance default losses on low-grade issues against capital gains on others, under existing rules and procedures they may be temporarily embarrassed by the heavy default incidence on such issues, even if no loss ultimately occurs. To protect themselves against heavy defaults, institutional investors, managers of personal trust accounts, etc., generally purchase only high-grade issues. Other noninstitutional investors, who purchase at higher yields, are thus able to exact a premium for risk bearing on the low grades,

over and above the pure premium needed to offset the losses that might result from the high incidence of default.

NATURE, USES, AND LIMITATIONS
### OF MARKET RATINGS

Whenever possible in this investigation, market ratings were as-signed to offerings of all straight corporate issues included in the large and small issues samples, and, for both samples, to all out-standing issues that were in good standing both at the beginning and end of selected chronological periods. Since the market rating is defined as the difference between the promised yield of an issue and the promised yield of outstanding issues of highest grade with the same term to maturity, two elements are needed to de-termine a market rating: (1) adequate price data for the calcula-tion of the promised yield of the issue, and (2) an appropriate schedule or curve showing the relationship between the promised yields and maturities of high-grade issues. Prices needed to cal-culate the yields could be obtained for virtually all large issues and for a substantial number of the small issues (see below), so that the par-amount coverage of the data with respect to market rating is quite good. The basic yield-maturity schedules were con-structed annually from first quarter price data; for each high-grade issue, the average of monthly high and low sale prices was used if available; otherwise the average of high bid and low asking prices was used. Annual yield-maturity schedules for high-grade corporate bonds and a detailed description of the method of construction are given in David Durand's *Basic Yields of Cor-porate Bonds, 1900–1942*.[1] The promised yields of the quadrennial outstandings were constructed on the basis of price data exactly comparable to those used for the yield-maturity schedules; prom-ised yields at offering were usually based on offering prices (cf. Chapter 1).

To determine the market rating of a given issue, we simply read off the basic yield corresponding to the maturity of the issue from the yield-maturity schedule for the appropriate year, and subtracted the basic yield from the promised yield of the issue. Chart 15 illustrates the procedure for three issues outstanding at the beginning of 1940, one selling to yield 2.0 percent and matur-ing in seven years, a second yielding 2.8 percent and maturing in

[1] National Bureau of Economic Research (Financial Research Program), Technical Paper 3, June 1942.

cen years, and a third yielding 3.2 percent and maturing in thirty years. The market rating assigned the ten-year maturity, for example, was 0.8 percent, the difference between the promised yield of 2.8 percent and the basic yield on high grades in 1940 of 2.0 percent. Since the promised and realized yields for the chronological periods of this investigation are all based on first quarter price

CHART 15—Basic Yield-to-Maturity Curve for Corporate Bonds, First Quarter 1940, and Illustration of Market Rating
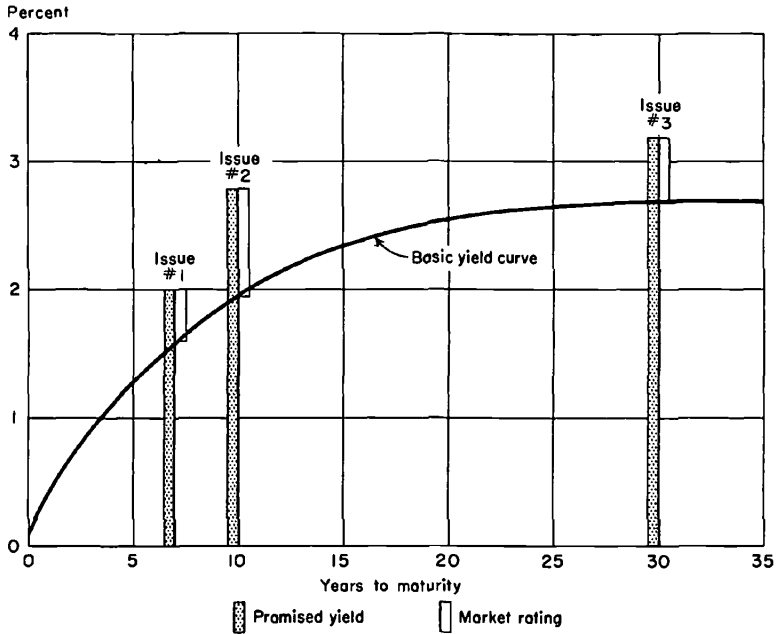
Basic yield curve from "Basic Yields of Corporate Bonds, 1900-1942," by David Durand (National Bureau of Economic Research, Financial Research Program, Technical Paper 3, June 1942).

data, the timing of the basic yield schedules is strictly appropriate for them (i.e. first quarter price data were used in assigning market ratings at the beginning of 1900, 1904, etc.).

In assigning the market ratings at offering, the annual basic yield schedule for the first quarter of the year of offering was used, except for offerings with terms to maturity of five years or less and offerings in years in which sharp changes in interest rates oc-

curred (1917, 1919–21, 1928, 1931–35 and 1938). In such cases, monthly basic yield values were obtained by interpolation.[2]

Official Uses of Yield Spreads
as Market Ratings

Perhaps the most important official use of a market rating analogous to the type employed in this report was by the National Association of Insurance Commissioners (N.A.I.C.) in determining the amortizable properties of investments of insurance companies. Although the so-called "yield test" has been abandoned, the procedures recommended by the Committee on Valuation of Securities of the N.A.I.C. for annual statements dated December 31, 1951 illustrate the type of use once made of the market rating in the insurance field.[3]

As has been indicated in Chapter 3, a corporate bond was ruled to be fully amortizable for insurance companies (i.e. it could be carried at amortized book value and the full promised yield could be carried into the income account) if the issue was rated in the first four grades by at least two of the rating agencies, or if, failing the rating test, it met a yield test based on a market rating. In the words of the commissioners: ". . . Bonds not in default as to principal or interest, which are certified by the insurer submitting the statement to be amply secured, shall be so deemed and shall be amortizable provided they are not income or perpetual bonds and provided . . . [they are] corporate bonds on which the yields to maturities based on December 31, 1949 and on December 31, 1950 Association Values do not, in the first case, exceed 1.70% and in the second case 1.50% plus the yield for comparable maturities of fully taxable unrestricted U.S. Government Treasury obligations at the respective dates. Bonds which were not outstanding on December 31, 1949, shall be deemed amply secured and amor-

[2] The interpolating series for 1900–1937, inclusive, were taken from Frederick R. Macaulay's *Some Theoretical Problems Suggested by the Movements of Interest Rates, Bond Yields and Stock Prices in the United States since 1856* (National Bureau of Economic Research, 1938), Table 10. Commercial paper rates in New York City were used as interpolators for maturities of under five years, and yields of American railroad bonds adjusted for economic drift for the longer-term issues. For later years, Macaulay's commercial paper series (as extended by the National Bureau of Economic Research) and the Standard and Poor's Corporation index of yields of high-grade corporate and municipal bonds were used as interpolating series.

[3] *The Principles of Valuation of the Committee on Valuation of Securities* (National Association of Insurance Commissioners, 1951).

tizable if the yield to maturity based on December 31, 1950 Association Values does not exceed 1.50% plus the yield for comparable maturities of fully taxable unrestricted U.S. Government Treasury obligations."[4] The yields to maturity based on the "Association Values" referred to are synonymous with the promised yields of this report.

One of the principal problems that arose in applying the yield test was the need for frequent revision. For example, when the test was first applied by the N.A.I.C. in 1942 many rail issues were selling at extremely low prices (high yields), so that the yield test for year-end reports was fixed by adding 3.90 percent to the Treasury yield on comparable maturities. As the market for corporates improved, the yield spread was gradually narrowed to 2.90 percent in 1944, 2.10 percent in 1945, 1.80 percent in 1946, 1.70 percent in 1949, and finally 1.50 percent in 1950–52. Because of the essentially arbitrary nature of the yield test, the need for frequent revision, the difficulties involved in applying the test to nonmarketable issues, and the possibility that the yield of an issue may reflect factors other than its quality, the yield test was abandoned in 1953 and replaced by various asset and earnings tests similar to those used in compiling the legal lists.[5] At the present time, to be fully amortizable an issue must meet an agency rating test or satisfy one of several alternative groups of financial ratio tests specified by the life insurance commissioners.

The market rating has also been applied officially in Massachusetts by the Savings Bank Investment Fund, a mutual fund established for savings banks in 1945. The enabling act for that organization provides that its funds may be invested in mortgages on real estate, public funds authorized for savings bank investment, and in corporate bonds and notes, provided they are not in default at the time of purchase and are quoted on recognized securities exchanges. The act provides further that "the Corporation shall not purchase bonds having a yield greater than two and one-half per cent in excess of the return on fully taxable United States Government securities of approximately similar maturity if such purchase at the time thereof would cause more than 10 percent of the Corporation's assets to be invested in such bonds."[6]

[4] *Ibid.*, pp. 7 ff.

[5] *Final Report to Insurance Companies, Societies and Associations* (National Association of Insurance Commissioners, 1953), pp. vi–xi.

[6] Massachusetts Acts of 1945, c. 283, § 12.

The yield tests used by the N.A.I.C. and the Massachusetts Savings Bank Investment Fund are conceptually equivalent to the market ratings of this study except that the official tests are based on the yields of fully taxable Treasury bonds, whereas ours refer to high-grade corporates. At present, Treasury yields have a definite advantage over corporate yields since Treasury bonds are more actively traded and are free from the risk of default. In the past, however, Treasury bonds were frequently outstanding in small amounts and had a very thin market and scattered maturities. In addition, the taxation of United States Government bonds under the federal income tax was different for different issues. It was, therefore, not possible to determine suitable yield curves for Treasury bonds for the full period covered by this investigation, and the curves for high-grade corporates were used instead.

Other Types of Market Rating

The use of the yield spread as an approximate measure of the market's rating of the quality of bond issues is suggested by the classical theory of investment values (cf. Chapter 2), according to which, other things being equal, the promised yield is comprised of two elements: (1) the basic yield on "riskless" investments having the same term to maturity, and (2) a pure risk premium assigned by the market to cover the risk of default loss. Other types of market ratings are easily formulated, and while it will not be possible to investigate most of them here, a brief indication of their principal properties may provide possible leads for future investigators. The alternative types of market rating include the market price of the issue, its promised yield, the current yield, a ranking of promised yield (or yield spread), and a ratio of the promised yield (or, possibly, the yield spread) to the basic rate. Also of possible interest is some system of quartile, decile, or percentile ranking based on one or another of the different types of market rating.

Market prices were used at one time in New York state to determine whether or not corporate bonds were amortizable for life insurance companies, but prices are conceptually the least satisfactory of the suggested market ratings.[7] The principal diffi-

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[7] In 1938 the New York authorities were concerned about the low prices of many rail bonds deemed amortizable under the agency rating test (the only test applied at that time). Issues were therefore held to be fully amortizable for year-end balance sheet purposes only if they sold at prices of

culty with the market price is that it reflects the coupon rate of the issue as well as the basic yield to maturity and the market's appraisal of risk. Consider, for example, two issues, Series A and Series B, both equally secured under a blanket mortgage, both maturing in ten years, and both identical in all other respects except that Series A bears a coupon rate of 4 percent and Series B a rate of 5 percent. If Series A and B are selling to yield, say, 4 percent, Series A will sell at par while Series B, because of its higher coupon rate, will sell at 108.

The promised yield is superior to the price as a market rating in that the yield automatically adjusts for differences in coupon rates. Thus Series A and Series B in the above illustration would sell at yields determined by the market's appraisal of risk and the general level of interest rates, and since these factors are the same for the two issues, they would both sell on approximately the same yield basis. On the other hand, the promised yield reflects the underlying structure of interest rates (the basic yield-maturity schedule), and thus is governed by the maturity of the issue as well as by its quality. The basic yield-maturity schedule is, of course, not stable over time but fluctuates with market conditions. It follows that promised yields can only be interpreted as a ranking of the market's appraisals of the quality of different issues if all of them are outstanding at approximately the same point in time and if all of them have approximately the same maturities. Since the promised yield is a function of the term to maturity, and since the function (i.e., the basic yield structure) shifts over time, promised yields are inappropriate for comparing market appraisals of issues with different maturities and for intertemporal comparisons.

The current yield, or ratio of the coupon rate to the market price, is mathematically equivalent to the promised yield of a perpetual bond. It is thus subject to all of the weaknesses of the promised yield as a market rating and has the added disadvantage of disregarding the maturity date specified in the bond contract. We shall, however, use the current yield later in the chapter when assigning market ratings to issues five years and one year before default. The use of the current yield at such times is suggested by the fact that the maturity date of an issue becomes indefinite as it

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50 or above (later raised to 55 and finally to 60 in 1941). In 1942 the price formula was replaced by the yield test referred to above (cf. footnote 4 and related text).

approaches default. For issues near default, the promised yield to maturity, the yield spread, or any other rating based on them is unrealistic, since all of these measures are constructed on the assumption that the issues will be paid in full at maturity. Maturity dates are usually disregarded in the treatment of bond issues in corporate reorganizations. In the absence of reliable information about the ultimate repayment date, the current yield provides about as good an indication as can be obtained of the market's appraisal of the prospects for treatment of the default.

Quartile, decile, or percentile rankings of promised yields or yield spreads might be constructed for purposes of drawing up lists of eligible or amortizable securities that would include a fixed proportion of the issues outstanding in the market (cf. Chapter 6, where we have used essentially this technique in drawing up so-called "equivalent" lists of securities). Under such a rating system, for example, issues in the top decile grade (the best 10 percent of the issues) might be assigned the rating I, issues in the next decile grade, the rating II, and so on. The difficulty is that the intrinsic quality of the majority of the outstanding issues may drift off as in the twenties, or the market's appraisal of the risk of the aggregate may shift as in the thirties (cf. Table 7 for changes in yield spreads over time). Since quartile or percentile rankings are independent of such changes they do not reflect variations in the general attitude of the market toward risk.[8]

Ratios of promised yields (or yield spreads) to the basic rates on high-grade issues deserve more attention than they can be given in this report. According to the classical theory of investment values, the simple yield spread, or algebraic difference between the promised yield and basic rate, would provide the best measure of the risk premium for issues properly priced in the market, since the yield is conceived of as the algebraic sum of the pure rate of interest and the risk premium. It is a matter of record, however, that yield spreads frequently narrow when basic rates fall, and widen when basic rates rise (cf. Table 8), perhaps because of the efforts of investors to compensate for changes in basic

[8] The percentiles rather than the percentile rankings reflect changes in the market's attitudes toward risk. For example, Chart 17 shows that the 33⅓ percentile stood at 0.8 percent in 1920, dropped to about 0.5 percent as the market became more optimistic in 1928, rose to about 1.2 percent when it became pessimistic in 1932, and dropped below 0.5 percent in 1944. The same point is illustrated in Table 53, which presents the variable percentages of total outstandings falling within market-rating classes.

rates. To the extent that yield spreads fluctuate systematically with the level of interest rates, a ratio of the promised yield or yield spread to the basic rate might serve as a better measure than the yield spread alone of the market's appraisal of the risk of future default; but such ratios have the disadvantages that their significance for short-term issues would be doubtful (particularly when basic yields on short terms are very low), and that they would not be directly comparable with the loss rates.

The yield spreads chosen for special investigation in this report are easily computed; moreover, they have been used by state regulatory bodies for the control of institutional investors, have been discussed extensively in the theoretical literature, and are directly comparable with the loss rates. (Certain other advantages of the yield differentials are discussed below in the section on market ratings and business cycles.) We have seen, however, that they serve at best as very rough indicators of the market's appraisals of risk.[9] It is hoped that future investigators will examine the relative merits of the other types of market rating systems as indicators of default risk and default loss.

VOLUME AND CHARACTERISTICS OF ISSUES CLASSIFIED BY MARKET RATING

As with agency ratings and legal lists, those who attempt to use market ratings as a guide in security selection are concerned with the volume of securities meeting a specific standard or test, the stability of that volume over time, and the principal characteristics of the included issues. Such matters are treated next. Comparisons of the default and yield experience of issues in different market rating classifications then follow.

Outstandings

Data on the number and par amount of outstanding issues in selected market-rating classifications are displayed in Charts 16

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[9] The market ratings used here are based solely on market prices or yields, and are thus influenced by many factors other than market appraisals of default risk, e.g. the size of the obligor and of the issue, the length of time the issue has been outstanding, special tax provisions, call, conversion, and warrant features, etc. The yield spread is subject to the further objection that the basic rates are those of high-grade corporate bonds, which are not entirely free of default risk. An additional objection already noted is that the promised yield (and yield spread) is meaningless for bonds approaching default. Adjustments could presumably be made for several of the disturbing elements affecting prices and yields, but have not been attempted in this report.

CHART 16—Number of Issues Outstanding Distributed by Market Rating, 1900-1944
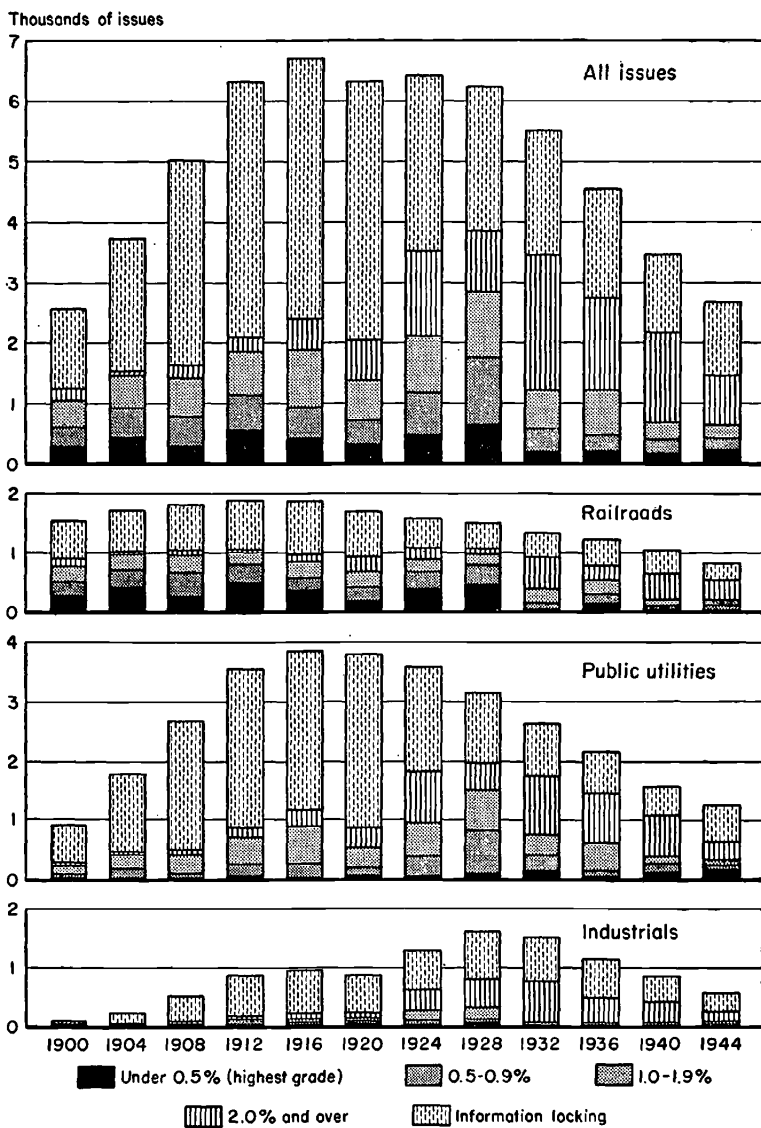
Thousands of issues

All issues

Railroads

Public utilities

Industrials

1900 1904 1908 1912 1916 1920 1924 1928 1932 1936 1940 1944

■ Under 0.5% (highest grade)   0.5-0.9%   1.0-1.9%

‖‖‖‖ 2.0% and over   Information lacking

Universe estimates for straight bonds, January figures, from "Statistical Measures," Table 13.

CHART 17—Par Amount of Outstandings Distributed by Market Rating, 1900-1944
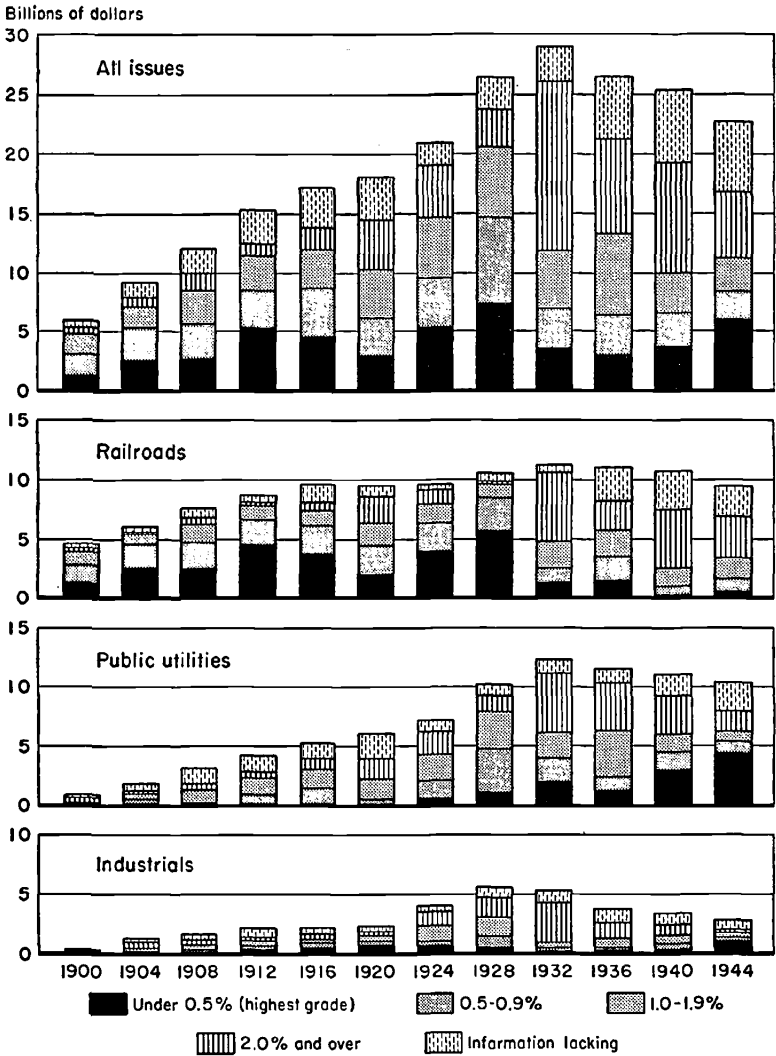
Billions of dollars

Universe estimates for straight bonds, January figures, from "Statistical Measures," Table 13.

and 17, and the percentage distributions of the par-amount totals are given in Table 53. These materials, like our other data covering the detailed characteristics of corporate bonds, are universe estimates for all straight bonds outstanding. The estimates were obtained by combining the data for the large and small issues samples, after adjustment of the latter for sample size.

A glance at the table and charts reveals several interesting features of the market rating. For one thing, the rating could be computed for a substantially larger proportion of the par-amount total of outstandings (a high of 90 percent at the beginning of 1924 and a low of 74 percent at the beginning of 1944) than for the total number of issues (under 63 percent in 1932 and slightly over 32 percent in 1908); likewise, for a much larger proportion of large issues than of small issues. The table shows that defaulted issues were responsible for a substantial part of the issues not rated in the later years, especially in 1936–44. Exclusive of the defaulted issues, adequate price data were lacking on an average over the period 1900–1936 for only 4 percent by volume of the large issues, but for 33 percent of the small issues. The proportions fell rather steadily from 1908 through 1936, especially for the small issues, but rose from 3.6 percent in 1936 to 11.1 percent in 1944 for large issues and from 13.5 percent to 34.8 percent for small issues. From the point of view of the regulatory authorities, this implies that a yield test would be inapplicable to a substantial number of issues (particularly those of small size), so that it must be supplemented in some fashion, such as by the assignment of conventional market values based on the yields of similar issues. The yield test is more easily applied to large issues than to small, yet it is precisely for the small issues that a yield test is most needed because of the absence of such information as agency ratings, earnings coverage, etc. In addition, yield tests have become increasingly difficult to apply in recent years because of the declining importance of the secondary bond market with the growth of private placements. Private placements occurred infrequently during the period covered by our records, but the effects of this type of offering can be detected in the aforementioned gradual rise of the proportion of issues with inadequate price information from 1936 to 1944. Comparable figures for later years are not available, but prices needed to compute the market rating at the present time (1956) would probably be unobtainable for over half

the par-amount total of outstanding issues and for a considerably larger proportion of the total number of issues.

Another interesting feature of the data on market ratings is the pronounced shifts that have occurred in the proportion of outstandings rated high grade by the market. (In the remainder of this section percentages will be based on all issues rated or in default, i.e. all issues other than those classified as information lacking.) For example, the proportion that had market ratings of under 1 percent averaged over 60 percent through 1916, dropped to slightly under 40 percent during the money market panic of 1920, rose again to 60 percent in the late twenties, fell to 25 percent in the depressed thirties, and stood at 42 percent in 1944.

On the average a market rating standard arbitrarily set to select as high grade all issues with yield differentials under 1.0 percent would include approximately half of the par-amount total of rated outstandings, but the proportion has fluctuated widely around this level. Two types of movements are clearly discernible in the proportions: short-run fluctuations associated primarily with changes in basic yields on high-grade bonds, and secular drifts reflecting the market's changing attitude towards risk. Over the four-year intervals of Table 53, the proportions of outstandings rated high grade by the market were closely related (inversely) to the level of basic yields, a point mentioned in Chapters 1 and 2, and earlier in this chapter in the discussion of possible defects of the yield spread as a measure of intrinsic quality. Thus, over the eleven four-year periods within 1900–1944, the proportion of total rated outstandings of the combined industries that had a market rating under 1 percent moved oppositely to the basic yields for thirty-year maturities nine times (cf. Table 8), and moved in the same direction only twice: 1900–1903, a period for which market behavior was classified earlier as doubtful (cf. page 134); and in 1932–35, when basic rates on high grades were depressed by the easy money policy of the federal government. The counts were approximately the same for each industry and size group except industrials, where the proportion rated high grade moved inversely to basic yields six times and directly five times. The short-run sensitivity of absolute yield differentials to basic rates suggests that some other concept of market rating, such as a ratio of promised yield to basic rate, might prove a more stable measure under certain conditions. In the final analysis, however, the usefulness of a rating depends largely upon the de-

TABLE 53—Percentage Distributions of Outstandings among High and Low Market Ratings, Quadrennially 1900–1944

BEGINNING OF YEAR	*Under 1 Percent* (*High grade*)	*1 Percent and over* (*Low grade*)	NO RATING	
			In Default	*Information Lacking*
All Issues				
1900	52.6%	36.2%	0.4%	10.8%
1904	56.8	27.5	0.3	15.4
1908	44.1	35.1	0.4	20.4
1912	55.5	26.3	1.7	16.5
1916	50.7	29.6	6.1	13.6
1920	34.0	46.4	5.2	14.4
1924	45.6	44.7	2.3	7.4
1928	55.5	34.3	2.8	7.4
1932	23.9	66.0	4.0	6.1
1936	23.8	56.3	14.9	5.0
1940	25.5	50.5	15.3	8.7
1944	36.7	37.1	13.0	13.2
Railroads				
1900	61.3	31.5	0.4	6.8
1904	74.6	17.3	0.1	8.0
1908	63.2	27.0	0.4	9.4
1912	76.3	16.2	0.8	6.7
1916	64.1	20.6	7.9	7.4
1920	46.4	43.1	4.0	6.5
1924	65.8	29.0	2.1	3.1
1928	79.4	13.4	3.2	4.0
1932	21.8	71.7	2.2	4.3
1936	31.1	42.9	21.6	4.4
1940	9.0	60.6	27.9	2.5
1944	16.9	55.8	26.0	1.3
Public Utilities				
1900	26.5	50.2	0.0	23.3
1904	32.7	32.9	0.1	34.3
1908	9.7	48.4	0.7	41.2
1912	23.9	44.7	2.7	28.7
1916	28.3	47.2	4.4	20.1
1920	9.4	56.7	8.4	25.5
1924	28.8	56.9	3.0	11.3
1928	47.0	43.3	2.8	6.9
1932	32.1	58.1	3.5	6.3
1936	20.4	69.5	6.1	4.0
1940	41.0	42.4	5.8	10.8
1944	51.8	24.5	3.5	20.2

Based on Tables 13 and 14 of *Statistical Measures:* par-amount data for all large (straight) corporate issues, and for 10 percent of small issues adjusted

TABLE 53
(concluded)

BEGINNING OF YEAR	Under 1 Percent (High grade)	1 Percent and over (Low grade)	NO RATING	
			In Default	Information Lacking
Industrials				
1900	3.2%	62.3%	1.3%	33.2%
1904	7.6	68.9	1.5	22.0
1908	23.1	46.7	0.2	30.0
1912	33.3	30.7	3.5	32.5
1916	45.7	27.3	2.7	24.3
1920	46.2	33.3	1.8	18.7
1924	27.1	60.5	1.6	10.8
1928	25.8	57.5	2.0	14.7
1932	9.5	71.7	9.2	9.6
1936	12.9	55.2	21.9	10.0
1940	27.4	45.0	6.4	21.2
1944	47.5	21.1	4.8	26.6
Large Issues				
1900	60.5	36.5	0.2	2.8
1904	64.6	30.1	0.2	5.1
1908	51.9	39.6	0.4	8.1
1912	66.1	28.0	1.2	4.7
1916	61.8	27.6	6.5	4.1
1920	40.0	51.6	4.2	4.2
1924	52.0	44.5	2.0	1.5
1928	61.9	32.3	2.5	3.3
1932	27.2	66.9	2.9	3.0
1936	26.0	56.5	13.9	3.6
1940	27.1	49.9	15.5	7.5
1944	39.0	37.2	12.7	11.1
Small Issues				
1900	37.8	35.5	0.7	26.0
1904	39.2	21.5	0.5	38.8
1908	25.0	24.2	0.6	50.2
1912	28.9	21.9	3.1	46.1
1916	20.3	35.1	5.2	39.4
1920	15.3	30.3	8.4	46.0
1924	24.2	45.4	3.4	27.0
1928	29.8	42.1	3.7	24.4
1932	7.1	61.2	9.8	21.9
1936	10.6	55.2	20.7	13.5
1940	11.3	56.1	14.3	18.3
1944	12.2	36.5	16.5	34.8

quadrennially to universe totals. The percents in default are from Tables
A-17 and A-18 of *Volume of Financing*.

fault and yield experience of issues classified under it—matters to be examined later in the chapter. Moreover, we shall find that the absolute yield differentials were more stable over business cycles than most other quality ratings examined in this report, despite their sensitivity to basic yields.

Secular drifts in the relative volume of high-grade outstandings were caused in part by changes in the attitude of the market toward issues of different industry groups. For example, the apparent downgrading of all issues in the thirties, when basic yields on high-grade bonds were very low, was caused mainly by the market's adverse reaction to the depression experience of the rails. But similar, although less pronounced, changes may be traced in each of the other major industry groups in that period, suggesting a general shift in the market's attitude toward the risks inherent in corporate bonds. As earlier chapters have indicated, a general downgrading in the thirties can also be detected in the agency ratings and legal lists. A comparative analysis of the stability of the various systems of ratings over this and other periods will be presented in Chapter 6.

The market—along with the agencies and the legal lists—rather consistently favored the rails until the Great Depression, judging by the proportion of issues with market ratings of under 1 percent. Rails had the highest proportion in eight of the twelve quadrennial years covered by our records and the second highest in two other years. In fact, the proportion of rail outstandings having market ratings of under 1 percent did not drop below that of both utilities and industrials until 1940. Curiously enough, in view of their depression experience, the rails were highly regarded by the market as late as 1936 (for rails, 33 percent of the total volume of issues on which information was available had a market rating of less than 1 percent at that time, as compared with 21 percent of the utilities, and 14 percent of industrials). On the average the market rated utility and industrial issues almost equally. In 1944, 65 percent of both rated utilities and industrials fell in the under 1 percent class, as compared with 17 percent of the rails. This contrasts sharply with the market's ordering of the quality of the issues in 1900, when the rails were far ahead of the utilities and the utilities far ahead of the industrials.

A final point to be noted from Table 53 is that the proportion of the aggregate volume of large issues with market ratings of under 1 percent was consistently above the corresponding pro-

portion of small issues. Moreover, the gap between the propor-
tions, although volatile, gradually widened. (In 1900 the propor-
tions were 62 percent for the large rated issues and 51 percent for
the small; in 1928 the corresponding proportions were 64 percent
and 39 percent; in 1944 they were 44 percent and 19 percent.) In
part, the differentials between large and small issues probably
reflect the broader market enjoyed by the large issues and the
premium paid for "marketability", or ease of liquidation; but the
widening of the gap can hardly be explained on the basis of
marketability alone. A similar widening was found in the propor-
tion of issues rated high and low grade by the agencies (cf. Table
27 and the related text discussion), suggesting that the market,
like the agencies, may have placed increasing reliance on the sta-
bility and financial strength of large business corporations in the
later period. (See, however, Chapter 8, where it is shown that the
size of the issue and of the issuing corporation are not so closely
correlated as might be expected on purely a priori grounds.)

Offerings

Percentage distributions by market rating of the par-amount
totals of straight bonds offered during the various quadrennial
periods are presented in Table 54. As was to be expected, these
materials are roughly similar to the related data on outstandings.
An interesting difference is that through 1928–31 the proportions
of quadrennial offerings of rated issues with market ratings of
under 1 percent (obtained by eliminating offerings for which in-
formation on market rating was lacking) were consistently below
those of outstandings in the same rating class at the beginning of
the corresponding periods. The same was usually the case within
major industry groups: through 1931 the proportion of total of-
ferings having a yield spread of under 1 percent was below the
corresponding proportion for outstandings in eighteen of the
twenty-four comparisons possible from the data in the tables, a
statistically significant result.

So far as we have been able to determine, the explanation is
that the market was usually willing to pay a premium for sea-
soned issues, so that they sold at a relative advantage as compared
with new bond offerings. Through 1931, new-money offerings ex-
ceeded repayments,[10] and the new issues were generally floated
at yields above those of old issues. The situation was reversed,

[10] See *Volume of Financing,* Chapter 3 and Table A-12.

however, after 1931. From 1932 on, repayments usually exceeded new-money offerings, and total outstandings declined. Moreover, outstanding issues were called and refunded in large volume at the low rates of interest of the thirties. Since only the best of the

TABLE 54—Percentage Distributions of Offerings among High and Low Market Ratings at Offering, Four-year Periods 1900–1943

PERIOD OF OFFERING	Under 1 Percent (High grade)	1 Percent and over (Low grade)	Information Lacking	Under 1 Percent (High grade)	1 Percent and over (Low grade)	Information Lacking
	All Issues			*Railroads*		
1900–1903	29.0%	38.3%	32.7%	53.8%	25.9%	20.3%
1904–1907	29.3	40.6	30.1	52.5	31.3	16.2
1908–1911	33.3	44.3	22.4	60.2	28.5	11.3
1912–1915	34.9	45.4	19.7	61.1	28.7	10.2
1916–1919	19.8	65.6	14.6	39.6	49.5	10.9
1920–1923	15.3	78.4	6.3	25.6	66.0	8.4
1924–1927	41.7	55.2	3.1	67.0	31.2	1.8
1928–1931	54.9	41.7	3.4	81.1	17.7	1.2
1932–1935	45.1	42.4	12.5	38.4	45.5	16.1
1936–1939	65.7	32.1	2.2	43.8	52.7	3.5
1940–1943	70.2	26.9	2.9	26.7	64.1	9.2
	Public Utilities			*Industrials*		
1900–1903	9.8	49.7	40.5	1.2	50.1	48.7
1904–1907	8.4	46.6	45.0	1.0	56.8	42.2
1908–1911	11.7	57.6	30.7	7.6	58.3	34.1
1912–1915	13.5	60.4	26.1	15.3	54.9	29.8
1916–1919	11.8	74.2	14.0	7.6	71.6	20.8
1920–1923	18.4	75.1	6.5	7.2	· 87.7	5.1
1924–1927	45.9	51.5	2.6	21.2	74.3	4.5
1928–1931	57.4	40.8	1.8	27.5	63.8	8.7
1932–1935	57.1	33.9	9.0	23.2	58.8	18.0
1936–1939	78.3	21.1	0.6	53.8	41.8	4.4
1940–1943	82.1	17.0	0.9	67.6	28.5	3.9

Based on Table 70 of *Statistical Measures:* par-amount data for all large (straight) corporate issues, and for 10 percent of small issues adjusted annually to universe totals.

outstanding issues sold in the open market in that period sufficiently close to their call prices to make refunding attractive to the issuing corporations, the new refunding issues could usually be floated at yields under the averages prevailing on outstandings. It follows that from 1932 through 1943 the proportions of total

offerings rated top grade by the market were consistently above the corresponding proportions for total outstandings. Funded debt has expanded rapidly since 1944, and most of the older issues have recovered from their depression lows. Although comprehensive data for the recent period are not available, examination of a number of offerings indicates that the relationship between the yields of new and old issues has reverted to the pre-depression pattern. The implication is that short-run trading profits may frequently be obtained by those who purchase new issues at offering and hold them until they have seasoned on the market.

Table 54 reveals that the market ranked the quality of the offerings of the major industry groups in roughly the same order as outstandings. Through 1931 the top position was assigned to the rails, and second place to the utilities. The single exception was the period 1912–15, when for industrials the proportion of the volume of rated offerings with market ratings under 1 percent slightly exceeded that for utilities. After 1936 the market assigned the top position to new offerings of utility bonds and the bottom position to rails. The agencies also assigned low ratings to rail offerings after 1936 (cf. pages 154 f.).

Drifts in market attitudes towards risk that were detected in outstandings may be traced in the data for new offerings. Judging by the percentages of the par-amount totals of offerings with market ratings under 1 percent, the market appears to have been fairly conservative until 1924 and less conservative thereafter. As was mentioned, the principal difference observed in the data on offerings and outstandings is that a large proportion of the volume of new issues coming onto the market in the thirties was rated high grade, whereas older issues were downgraded.

The tendency of the market to rate bonds up in the late twenties is particularly interesting in view of our earlier findings that the intrinsic quality of the offerings, as measured by agency ratings and subsequent default experience, actually deteriorated over that period (Chapters 2 and 3). To bring this point into sharper focus, detailed annual data for the 1920's on the percentages of offerings rated high grade by the market and the agencies have been brought together in Table 55. Annual data on offerings are erratic and the percentages behave accordingly; but if minor variations are ignored, the table shows quite clearly that the proportion of the aggregate volume of bond offerings rated by the market as high grade rose for issues of the combined industries

and for each of the major industry components. In contrast, the proportions rated high grade by the agencies showed little trend up to 1928 and then declined (Chapter 3). It would appear from this evidence that the market, unlike the rating agencies, was overly optimistic during the late twenties and was unaware of the gradual deterioration in the intrinsic quality of new bond offerings.

TABLE 55—Proportions of Offerings Adjudged High Grade: Market and Agency Ratings Compared, 1920–29

YEAR OF OFFERING	*Under 1 Percent*	*Grades I–IV*	*Under 1 Percent*	*Grades I–IV*
	All Issues		*Railroads*	
1920	1.7%	87.6%	6.5%	87.0%
1921	2.5	84.7	6.1	99.8
1922	35.0	75.3	46.1	91.1
1923	19.6	81.7	60.2	91.8
1924	39.0	83.9	79.4	97.9
1925	29.0	83.3	51.9	79.7
1926	40.0	81.8	67.8	82.0
1927	55.0	82.3	66.5	83.9
1928	49.7	73.0	76.7	76.7
1929	55.8	73.8	78.6	92.8
	Public Utilities		*Industrials*	
1920	0.4	70.8	0.8	99.0
1921	0.0	80.4	2.0	77.5
1922	38.6	67.2	25.5	75.6
1923	22.9	78.7	0.0	82.3
1924	23.3	81.2	18.4	72.2
1925	38.0	89.2	3.1	76.1
1926	44.6	85.7	26.0	76.3
1927	65.2	81.3	31.7	83.3
1928	51.0	70.7	28.7	74.9
1929	60.6	70.3	33.7	67.9

Based on Tables 52 and 70 of *Statistical Measures*, for offerings rated by the market or the agencies, respectively: par-amount data for all large (straight) corporate issues, and for 10 percent of small issues adjusted annually to universe totals.

Characteristics of Issues in
Different Rating Classes

The market for corporate obligations is essentially amorphous, consisting as it does of a complex system of trading relationships among myriads of investors and traders who set the prices of cor-

porate bonds. Because of the complexity of the market, it is impossible to determine by direct observation the processes and standards employed in rating corporate bonds. As in the case of agency ratings, these must be determined inferentially from an examination of the characteristics of issues rated high grade or low grade by the market.

Table 56 presents for this purpose distributions of straight bond outstandings with market ratings of under 1 percent, and those with ratings of 1 percent and over, by selected characteristics. As might be expected, the variables emphasized by the market in its rating system are quite similar to the ones stressed by the investment agencies and the compilers of the legal lists. For example, in each of the years for which breakdowns are presented, substantially larger proportions of issues with market ratings under 1 percent than of issues with market ratings of 1 percent and over were legal for savings bank investment in Massachusetts and were rated in the first four grades by the agencies. Moreover, the market—like the legal lists and the agencies—typically assigned top positions to the large, well secured, actively traded issues.

One of the interesting points brought out by the table is that a yield test set to include issues with market ratings of less than 1 percent was more selective than an investment rating test including issues in the first four grades, and that both were less selective than the Massachusetts legal list. The agencies' top four grades included practically 100 percent of the par-amount total of issues with market ratings of under 1 percent, plus from 47 to 81 percent of issues with market ratings of 1 percent and over. On the other hand, the Massachusetts legal list included only 29 to 56 percent of the volume of issues with market ratings under 1 percent plus a small proportion of issues rated low grade by the market (a maximum of 20 percent in 1936, and a minimum of 3 percent in 1928).

The proportion of the total volume of high grades that consisted of large issues ($5 million and over) gradually rose during the period studied, as did the proportion of large issues in total outstandings; but the gap between the proportions gradually narrowed. Similar trends are observable in the data for issues of obligors with assets of $200 million and over, although there was a drop in the proportion of large corporations among high grades between 1920 and 1928 and again between 1936 and 1944. The

TABLE 56—Proportions of Outstandings Characterized by Large Obligor, Exchange Listing, Long Term, etc for Issues with High and Low Market Ratings, 1900–1944

BEGINNING OF YEAR	Agency Rating I-IV	Legal in Massachusetts	Assets of $200 Million and over	Amount Outstanding $5 Million and over	Listed on New York Stock Exchange	Maturity over 30 Years	Senior Liens[a]	Debentures[b]
1900								
All issues			29.1%	63.5%	60.4%	58.7%	73.3%	3.5%
Market rating								
Under 1 percent			41.3	74.3	71.3	59.4	79.2	3.1
1 percent and over			19.2	62.6	61.0	64.4	66.6	1.2
1920								
All issues	79.5%	20.7%	45.5	73.7	56.5	33.0	75.1	9.3
Market rating								
Under 1 percent	99.2	43.7	67.5	87.7	76.6	49.9	81.6	6.8
1 percent and over	80.9	10.6	43.7	81.6	61.2	31.3	72.5	11.4
1928								
All issues	85.4	18.0	47.0	78.0	57.0	24.1	67.1	14.7
Market rating								
Under 1 percent	99.0	28.9	63.7	87.9	73.0	31.8	70.4	10.6
1 percent and over	73.0	3.1	26.9	72.2	42.0	17.2	62.8	21.0

TABLE 56 (concluded)

BEGINNING OF YEAR	Agency Rating I-IV	Legal in Massachusetts	Assets of $200 Million and over	Amount Outstanding $5 Million and over	Listed on New York Stock Exchange	Maturity over 30 Years	Senior Liens[a]	Debentures[b]
1936								
All issues	62.0%	25.9%	51.4%	84.0%	59.8%	21.5%	69.0%	16.3%
Market rating								
Under 1 percent	100.0	55.9	65.8	92.7	76.3	27.4	81.2	5.9
1 percent and over	63.0	20.3	47.3	84.1	54.5	26.3	63.8	21.8
1944								
All issues	60.0	25.7	58.9	90.0	65.7	15.1	67.0	20.6
Market rating								
Under 1 percent	99.7	51.5	60.3	96.5	75.5	7.1	68.4	25.3
1 percent and over	47.4	15.6	62.6	89.5	73.6	30.3	62.2	18.1

Based on Tables 2, 5, 7, 11, 23, 26, 28, 32, 34, 38, and 40 of *Statistical Measures*, and special supplementary tabulations: par-amount data for all large (straight) corporate issues, and for 10 percent of small issues adjusted to universe totals.

[a] A "senior lien" is an issue secured by mortgage, collateral, or leasehold, provided the lien is not entirely junior to that of other issues.
[b] A debenture is an issue not secured by lien.

first change occurred in both issues rated high grade and low grade and despite a rise in the proportion of total outstandings accounted for by the large obligors. The declines for rated issues in this period were caused primarily by the large volume of public utility bonds offered in the twenties by corporations with assets of under $200 million. These declines were, however, more than offset by a rise in the volume of unrated outstandings of larger corporations, so that the proportion of total outstandings (rated and unrated) accounted for by issues of obligors with assets of $200 million and over rose. Between 1936 and 1944, large obligors increased in importance in total outstandings and in issues rated low grade by the market, but declined in importance among high grades. Issues of many large railroads were rated down by the market in the thirties, while many high-grade public utility bonds of large corporations moved out of the rated class as they were refunded into private placements.

The data clearly indicate that the market has favored issues listed on the New York Stock Exchange, and the underlying industry breakdowns (cf. *Statistical Measures,* Table 12) show that the rating differentials were greatest in the utility and industrial fields. These were precisely the groups for which the Stock Exchange listing requirements were most restrictive as to quality. In 1944, for example, the same proportion of low-grade rail bonds (by volume) was listed on the New York Stock Exchange as of high grades (94 percent). In the same year, however, 66 percent of the total for high-grade utilities had Exchange listings but only 31 percent of the low grades. The corresponding figures for industrials are 91 percent and 70 percent.

Because of the poor experience record of many long-term rail issues during the Great Depression, the average term to maturity of outstanding issues has shortened materially in recent years,[11] and the yields have reflected the preference for the shorter maturities. (Note the relatively small proportion of high grades and the large proportion of low grades that had maturities of over thirty years in 1944.) In most of the earlier years, there was a slight market preference for the longer maturities, particularly for the long-term rail and utility issues.

The market has also exhibited a preference for senior issues as against debentures and junior mortgage liens. The market preference for senior liens was not so pronounced as that of the legal

[11] Cf. *Volume of Financing,* Chapter 2.

lists, however, although more pronounced than that of the agencies (cf. Tables 29 and 41). In the industrial field the market, like the agencies, began by about 1928 to develop a preference for the unsecured issues (debentures), a preference that became quite pronounced by 1944.

Stability of the Volume of Securities in Different Rating Classes

The feasibility of a yield test as a means of defining a list of eligible or amortizable securities depends largely upon the stability of the volume meeting the test. Pronounced fluctuations in the volume of securities meeting a given test imply either that the test must be revised frequently (with the time-consuming negotiations that usually precede such changes) or that a large volume of securities will continually move on and off the eligible list. In this section the stability of the volume of securities meeting various market-rating tests will be investigated in two ways: first, by examining the distributions in different market-rating classifications at offering, cross-classified by quality at extinguishment, and secondly, by an appraisal of similar distributions of outstandings based on market ratings at the beginning and end of quadrennial periods.

Table 57 presents the distributions of the par amounts of offerings by several quality measures at extinguishment. Since only 16 percent by volume of all straight issues extinguished between 1900 and 1944 was paid in full at maturity[12] and since yield to maturity is practically meaningless when an issue is approaching extinguishment by any other method, promised yields to maturity calculated near the extinguishment date do not provide reliable estimates of the market's appraisals of risk. Market ratings at extinguishment were therefore not used in this investigation (except in Table 59 where for obvious reasons no other system of ratings could be employed). To obtain rough approximations of the quality of bond issues at extinguishment for Table 57, we fell back upon the two rating systems examined earlier; that is, the composite agency ratings and legal status at extinguishment.

The table shows that the market's appraisal of the quality of an issue at offering is a fairly good indicator of its probable quality at extinguishment. The proportion of the par-amount total of

[12] For distributions of par amounts extinguished, by method of extinguishment, see *Volume of Financing*, Chapter 3 and Table A-11.

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TABLE 57—Offerings 1900–1943 in Given Market Rating Classes at Offering, Distributed by Agency Rating and Legal Status at Extinguishment

STATUS AT EXTINGUISHMENT	MARKET RATING AT OFFERING					MARKET RATING AT OFFERING				
	Under ½ Percent	½–1 Percent	1–2 Percent	2 Percent and over	Information Lacking	Under ½ Percent	½–1 Percent	1–2 Percent	2 Percent and over	Information Lacking
	All Issues					*Railroads*				
Agency Rating										
I–IV	80.3%	73.1%	59.7%	35.8%	32.6%	60.3%	53.2%	47.2%	11.9%	27.3%
V–IX	13.8	21.5	31.5	49.3	27.0	36.2	41.6	41.9	77.8	31.1
Not rated	5.9	5.4	8.8	14.9	40.4	3.5	5.2	10.9	10.3	41.6
Legal in										
1 state only	16.0	10.9	6.6	4.1	3.7	15.0	12.4	13.3	17.6	4.6
2 states	16.0	10.5	4.7	0.3	1.5	16.1	15.5	9.9	0.2	4.5
3 states	28.8	13.5	2.7	0.2	1.9	21.2	14.2	4.5	0.2	5.5
Not legal	39.2	65.1	86.0	95.4	92.9	47.7	57.9	72.3	82.0	85.4
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
PAR AMOUNT (IN BILLIONS)	$13.3	$17.1	$22.8	$10.8	$7.5	$4.7	$5.3	$5.0	$1.8	$1.8

TABLE 57
(concluded)

STATUS AT EXTINGUISHMENT	MARKET RATING AT OFFERING					MARKET RATING AT OFFERING				
	Public Utilities					*Industrials*				
	Under ½ Percent	½–1 Percent	1–2 Percent	2 Percent and over	Information Lacking	Under ½ Percent	½–1 Percent	1–2 Percent	2 Percent and over	Information Lacking
Agency Rating										
I–IV	94.2%	82.4%	61.1%	41.5%	36.1%	78.1%	81.1%	66.2%	40.0%	32.1%
V–IX	1.8	13.4	31.0	49.1	28.6	0.5	10.0	25.1	38.5	21.9
Not rated	4.0	4.2	7.9	9.4	35.3	21.4	8.9	8.7	21.5	46.0
Legal in										
1 state only	15.7	13.0	7.5	2.9	5.8	20.7	3.2	0.6	0.0	0.3
2 states	17.2	11.6	5.2	0.7	1.0	10.0	0.0	0.4	0.0	0.0
3 states	40.3	18.5	3.7	0.5	1.3	0.0	0.0	0.0	0.0	0.0
Not legal	26.8	56.9	83.6	95.9	91.9	69.3	96.8	99.0	100.0	99.7
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
PAR AMOUNT (IN BILLIONS)	$7.0	$8.4	$10.6	$4.2	$3.2	$1.6	$3.4	$7.2	$4.8	$2.5

Based on Tables 73 and 76 of *Statistical Measures:* par-amount data for all large (straight) corporate issues, and for 10 percent of small issues adjusted annually to universe totals. Agency rating and legal status at extinguishment refer to the status of an issue within one year before date of final extinguishment, or at the beginning of 1944 if still outstanding at that time.

offerings rated I–IV at extinguishment moves inversely, and quite systematically, with the size of the yield spread at offering—moves directly, that is, with the market's original estimate of quality. The same is true within each of the major industry groups, with the single exception of industrials with market ratings of under ½ percent, where, because of the sizable volume not rated by the agencies at extinguishment, the proportion rated I–IV was slightly under that of offerings with market ratings of ½ to 1 percent. For other industrial issues, and for the rails and utilities of all groups, the volume not rated by the agencies at extinguishment was fairly small, and the proportion rated grade V or lower at extinguishment was systematically larger the lower the quality as judged by the market at offering. The percentages of offerings not legal in any of the three states at extinguishment (Maine, Massachusetts, and New York), and their complements (the percentages legal in one or more of those states), also moved in agreement with the market's judgment at offering. The same is true throughout the table for issues legal in only one state, in two of the states, and in all three states at extinguishment, except for two groups: rails with market ratings of 1 percent and over at offering and legal in one state at extinguishment; and industrials with market ratings of 1 to 2 percent and legal in two states at extinguishment. The various proportions of issues legal and not legal at extinguishment and of issues in the different agency-rating groups are, of course, not all independent of one another. They may, however, be separated into several independent groups, and it can then be shown by correlation methods that the rankings are statistically significant.[13] We conclude that the quality of an issue at offering as determined by the market rating provides a fairly reliable forecast of its quality at extinguishment.

Table 57 indicates clearly that for top-grade issues the market was a less reliable indicator of the agency rating at extinguishment for rails than for industrials or utilities. For example, of the respective volumes of issues rated at extinguishment, 94 percent of the utilities and 78 percent of the industrial offerings with market ratings under ½ percent were rated I–IV by the agencies at

[13] For example, the proportions of offerings in the different market rating classes that were rated I–IV at extinguishment are independent for the major industry groups. The probability of obtaining the degree of correspondence of ranks observed in the table, or better, by chance (the concordance coefficient w) is 0.017; cf. M. G. Kendall and B. Babington Smith, "The Problem of m Rankings," *Annals of Mathematical Statistics*, Vol. X, pp. 275-87.

extinguishment, while only 60 percent of the rails were so rated. (Contrariwise, the market was a better predictor of agency rating for low-grade rails than for low-grade utilities and industrials.) The market was also less successful in predicting legal status at extinguishment for rails than for utilities. Reliable comparisons cannot be made for industrial issues since so few were eligible for savings bank investment during the period studied.

Table 58, containing percentage distributions of par-amount totals of issues rated high grade and low grade by the market at the beginning of quadrennial periods, each cross-classified by market rating at the end of the corresponding periods, throws additional light on the stability of the volume of securities in the different market-rating classifications. As in other tables of this type (cf. Tables 31 and 45), issues extinguished during a given period were excluded in order to eliminate the sporadic effects of redemptions and other retirements, thus making it possible to obtain ratings for most of the included issues at the end as well as at the beginning of the periods.

The table shows that for issues initially rated high grade by the market there was unusually heavy downgrading during the periods 1916–19, 1928–31, 1932–35, and 1936–39. One-third or more of the par-amount total of issues with market ratings of under 1 percent at the beginning of those periods had dropped below grade by the end of the period. Conversely, exceptionally heavy upgrading occurred during the periods 1900–1903, 1908–11, 1920–23, and 1924–27.

Since on the average a market rating of under 1 percent included about half of the total volume of all rated outstandings, a rough measure of the extent of upgrading and downgrading within a period can be obtained from Table 58 by subtracting the percentage of issues downgraded from the percentage upgraded and dividing by two. In 1924, for example, the par-amount total of rated outstandings was distributed almost evenly on either side of the 1 percent mark (see Table 53), so that one-half the difference between the proportion of low grades rated up during 1924–27 (38.4 percent) and the proportion of high grades rated down (4.7 percent), gives an estimate of 16.9 percent for the net upgrading of outstandings that were rated at the beginning and end of the period. On other quadrennial dates, the division of the total between high and low grades was more unequal, 1932 and 1936 being the extreme examples. By taking account of such variations

TABLE 58—Outstandings with High and Low Market Ratings at Beginning of Four-year Periods, Distributed by Market Rating at End; 1900–1943

	MARKET RATING AT BEGINNING OF PERIOD					
	UNDER 1 PERCENT			1 PERCENT AND OVER		
	MARKET RATING AT END			MARKET RATING AT END		
PERIOD	Under 1 Percent	1 Percent and over	Information Lacking	Under 1 Percent	1 Percent and over	Information Lacking
	All Issues					
1900–1903	93.9%	3.3%	2.8%	52.0%	46.7%	1.3%
1904–1907	81.6	15.6	2.8	18.9	75.0	6.1
1908–1911	97.7	1.7	0.6	42.7	50.4	6.9
1912–1915	82.4	14.4	3.2	12.3	68.8	18.9
1916–1919	63.5	33.8	2.7	6.3	79.0	14.7
1920–1923	93.9	6.0	0.1	36.8	58.6	4.6
1924–1927	92.4	4.7	2.9	38.4	52.1	9.5
1928–1931	42.0	55.3	2.7	2.5	84.7	12.8
1932–1935	54.8	43.2	2.0	8.8	69.7	21.5
1936–1939	38.9	57.1	4.0	0.6	86.5	12.9
1940–1943	95.9	2.8	1.3	8.5	88.3	3.2
	Railroads					
1900–1903	94.3	3.2	2.5	59.6	40.4	0.0
1904–1907	87.3	10.5	2.2	8.7	84.9	6.4
1908–1911	97.6	1.7	0.7	50.1	44.8	5.1
1912–1915	80.8	16.0	3.2	1.0	61.8	37.2
1916–1919	68.2	30.1	1.7	2.2	91.3	6.5
1920–1923	97.3	2.7	0.0	41.3	54.4	4.3
1924–1927	94.8	1.7	3.5	63.6	27.1	9.3
1928–1931	29.5	68.4	2.1	0.0	80.4	19.6
1932–1935	77.0	21.9	1.1	17.2	51.4	31.4
1936–1939	21.9	73.2	4.9	0.1	83.9	16.0
1940–1943	93.7	4.3	2.0	10.0	88.9	1.1

—that is, by weighting the percentages in Table 58 by the relevant figures in the first two columns of Table 53—reliable indexes for net upgrading of rated outstandings can be obtained. Such indexes show heavy net downgrading in 1928–31, sizable net downgrading in 1916–19 and 1936–39, and sizable net upgrading in 1900–1903, 1908–11, 1920–23, and 1924–27.

Changes in the quartiles of yield spreads (market ratings) in Table 8 may be interpreted similarly, although they cover all rated outstandings, whereas Table 58 includes fixed samples of issues rated at the beginning and end of the indicated periods,

TABLE 58
(concluded)

	MARKET RATING AT BEGINNING OF PERIOD					
	UNDER 1 PERCENT			1 PERCENT AND OVER		
	MARKET RATING AT END			MARKET RATING AT END		
PERIOD	Under 1 Percent	1 Percent and over	Information Lacking	Under 1 Percent	1 Percent and over	Information Lacking
	Public Utilities					
1900–1903	91.2%	4.4%	4.4%	36.1%	58.3%	5.6%
1904–1907	41.7	51.0	7.3	5.9	81.4	12.7
1908–1911	96.3	3.7	0.0	36.8	59.2	4.0
1912–1915	81.7	13.0	5.3	15.1	75.0	9.9
1916–1919	20.2	71.6	8.2	3.2	72.3	24.5
1920–1923	81.8	18.2	0.0	34.9	60.3	4.8
1924–1927	88.4	10.9	0.7	30.3	59.6	10.1
1928–1931	62.4	34.0	3.6	4.1	86.0	9.9
1932–1935	39.5	57.8	2.7	0.9	91.6	7.5
1936–1939	78.1	20.5	1.4	1.2	89.1	9.7
1940–1943	96.7	2.2	1.1	6.2	87.5	6.3
	Industrials					
1900–1903	48.5	0.0	51.5	37.8	62.2	0.0
1904–1907	87.3	12.7	0.0	44.0	56.0	0.0
1908–1911	100.0	0.0	0.0	37.8	44.8	17.4
1912–1915	97.7	2.3	0.0	28.7	65.3	6.0
1916–1919	94.9	3.8	1.3	31.9	64.5	3.6
1920–1923	84.6	14.8	0.6	20.9	73.2	5.9
1924–1927	84.5	12.2	3.3	11.6	79.9	8.5
1928–1931	60.2	36.5	3.3	1.6	85.1	13.3
1932–1935	32.7	64.1	3.2	2.7	71.6	25.7
1936–1939	24.6	67.2	8.2	0.0	84.4	15.6
1940–1943	94.2	4.2	1.6	3.9	87.4	8.7

From special tabulations of the National Bureau of Economic Research: par-amount data for all large (straight) corporate issues, and for 10 percent of small issues adjusted quadrennially to universe totals, with issues extinguished during each period excluded.

i.e. rated outstandings exclusive of offerings of new issues and extinguishments of old. In general the results correspond closely, in the sense that net upgrading of the fixed samples occurred when the yield spreads narrowed, and net downgrading when the yield spreads widened. The only exception is 1932–35, when the index constructed from Table 58 shows slight net downgrading, while yield spreads for total rated outstandings narrowed considerably. That was one of the two discrepancies noted in the discussion of

Table 53. In 1932–35 the yield spreads for total rated outstandings were reduced by a large volume of high-grade public utility offerings and by the default of many low-grade issues, which thereupon moved out of the class of rated outstandings.

As measured by the index of net upgrading the rails and utilities behaved similarly over the various four-year periods, and they dominated the totals for all issues. Generally speaking, the industrials behaved atypically. Through 1924–27 they were rated up consistently by the market, and then, after a period of heavy defaults in the mid-twenties, were consistently rated down.[14]

Within the major industry groups generally, the proportion of outstandings of high grades rated down by the market (i.e. gross downgrading) usually moved in sympathy with the default record of the industry, although it sometimes led and sometimes lagged behind actual defaults. Rails were rated down in large volume by the market during the period 1916–19, after particularly heavy defaults in 1913–16. Downgrading was unusually heavy in the utility group in 1916–19, and also in the industrial group in 1920–23, the downgrading corresponding to exceptionally heavy defaults on utilities in 1918–20 and on industrials in 1924. Moreover, the general downgrading of corporate issues in all groups in the thirties reflects the widespread defaults of that period. A similar sensitivity of composite agency ratings to impending defaults was noted in Chapter 3 (see the section on stability of ratings).

Some evidence as to the relative stability of the different quality measures is gained by comparing the percentages of outstandings with market ratings under 1 percent at the beginning of the periods that were still rated under 1 percent at the end with comparable figures based on issues rated i–iv by the agencies (Table 31). For all issues combined, the proportion remaining high grade throughout a period, when measured by market ratings, was almost always below the corresponding proportion as measured by agency ratings, and well below it in 1916–19 and 1928–39, indicating that the market was less stable than the agency ratings (or more sensitive to changing conditions, depending upon one's point of view).[15] The period 1920–23 was exceptional in that the proportion of the

14 For annal data on the volume of corporate bond defaults, see *Volume of Financing*, Chapter 5 and Table A-17.

15 It is perhaps unnecessary to note that the term "stability" is used here in a formal statistical sense; and it is not our intention to imply that a stable measure is necessarily more desirable, in and of itself, than a less stable (or more sensitive) measure. From the standpoint of administration, a stable meas-

amount outstanding with market ratings under 1 percent at the beginning of the period that was still so rated at the end of the period was slightly above the proportion for the agency ratings (94 percent versus 93 percent). The explanation is that the bond market was disorganized in 1920, so that only one-third of the aggregate volume of outstandings had a market rating of under 1 percent. The market had largely recovered by 1924 and most of the initial group of top-grade issues still had market ratings of under 1 percent. In addition, because of the broad market recovery 37 percent of the amount of outstandings that the market rated low in 1920 (yield spread, 1 percent or over) was rated high grade in 1924, as compared with only 32 percent rated up by the agencies. In several other periods as well, the low-grade sector of the market, as defined by the market rating, was less stable than the sector defined by the composite agency rating, suggesting that there was usually more upgrading and downgrading by the market. A similar conclusion may be drawn from a comparison of Table 45 for the legal lists with Table 58 for the market ratings. While less stable than a list selected by means of agency ratings, the legal lists appear usually to have been more stable than a list selected on the basis of the market rating. It should be noted, however, that the proportions shown in the various tables, although suggestive, are not strictly comparable since they are based on different amounts of outstanding issues. Further analysis, by means of equally inclusive lists of securities selected under the different rating systems, is reserved for the next chapter.
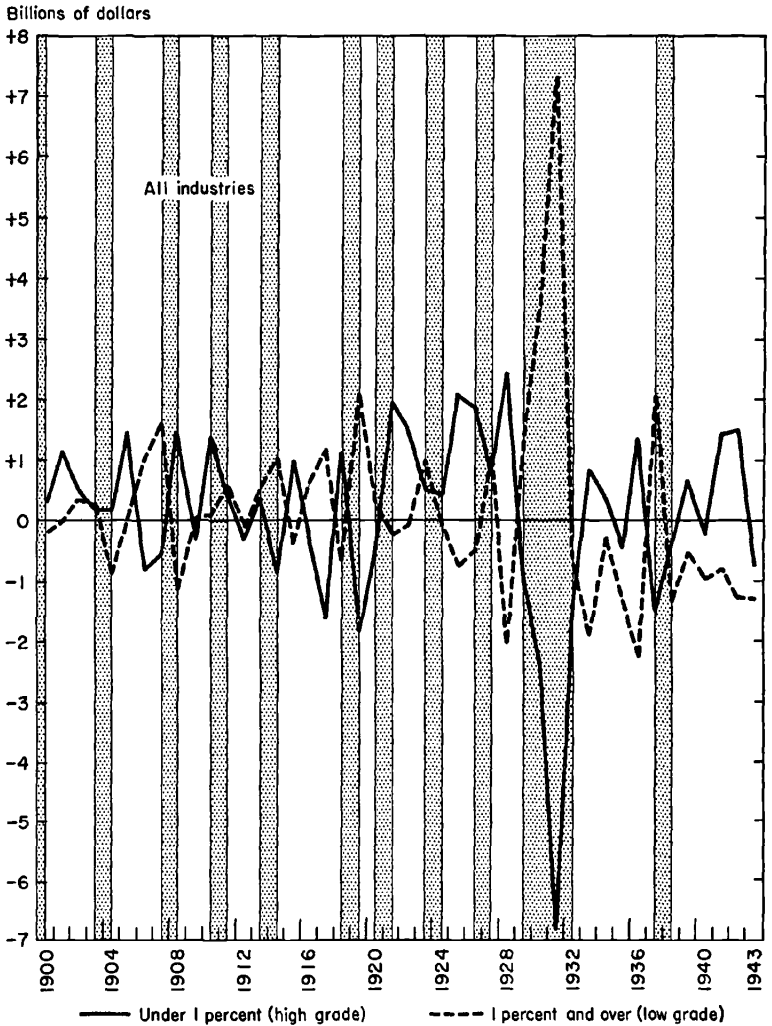
Market Ratings and Business Cycles

To investigate the short-run ups and downs in the volume of bonds rated high grade (market rating under 1 percent) and low grade (market rating 1 percent and over), annual series for outstandings were constructed along the lines described in the chapters on agency ratings and legal lists.[16] The annual net changes

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ure is, of course, more desirable since its use avoids the necessity for purchase and sale as securities meet or fail to meet a given quality test. Similarly, a stable measure is desirable if it fits a given investment situation for a longer period of time than a less stable measure. But a stable measure is undesirable, if it fails to reflect fundamental changes in investment worth. The evidence of the next chapter permits us to conclude that the advantage lies with the agency ratings from the standpoint of administrative ease; but the agency ratings were less sensitive to short-run default risks than the market ratings.

[16] Interpolating series based on special tabulations of data in the Annual

CHART 18—Net Changes in Outstandings with High and Low Market Ratings, 1900-1943

Billions of dollars

All industries

——— Under I percent (high grade)   — — — I percent and over (low grade)

Universe estimates for straight bonds, yearly totals in par amount, from "Statistical Measures," Table 12.

Shaded areas, representing contractions in general business activity, and white areas, representing expansions, are from Arthur F. Burns and Wesley C. Mitchell's "Measuring Business Cycles" (National Bureau of Economic Research, 1946), p. 78.

CHART 18, concluded

Billions of dollars   Billions of dollars

—————— Under 1 percent (high grade)   - - - - - 1 percent and over (low grade)
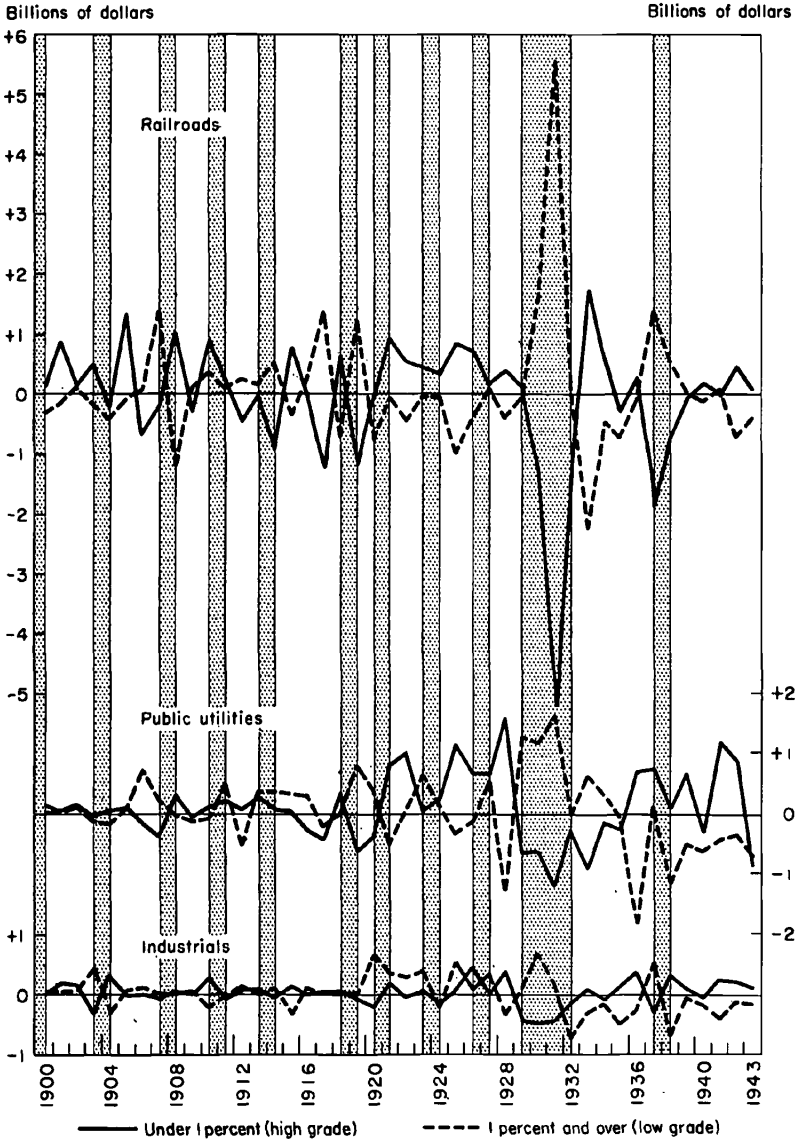
in outstandings are plotted in Chart 18 against the business cycle as defined by the National Bureau of Economic Research. The chart shows a pronounced inverse relationship between the high and low grades as rated by the market, but little correspondence between the timing of either series and business activity. In the preceding chapters also, no consistent correspondence in timing was found between business cycles and the net change series for issues on the New York and Massachusetts legal lists. Maine legals and the top agency rating grades, on the other hand, responded directly and systematically to the general business cycle (cf. Charts 8 and 13).

Since the principal characteristics of high-grade issues, whether designated by the agencies, the legal lists, or the market, have been found to be roughly similar, the divergent behavior of the series with respect to the business cycle calls for further study. For this purpose, special annual series on offerings, extinguishments, net upgrading, etc. were derived, comparable to those presented in earlier chapters.[17]

Conformity indexes for the various derived series are given in Table 59. Comparison with the corresponding indexes in Tables 32 and 46 reveals that all five of the high-grade offerings series—those covering market ratings under 1 percent, agency ratings I–IV, and Maine, Massachusetts, and New York legals—reflect the negative conformity of total bond offerings. Similarly, the various final extinguishment series for high grades reflect the low positive conformity of total final extinguishments.[18] While the conformity indexes for high-grade final extinguishments as defined by the market rating differ widely among industry groups, and with the

Record of the original Corporate Bond Project were used for issues in good standing. Although outstanding issues in default are included in our other series, they were disregarded when constructing the series for market ratings, since promised yields to maturity have no meaning for bonds in default. For the derived series, see *Statistical Measures,* Table 12.

[17] The original records of the Corporate Bond Project provide data on the market rating at offering but not at extinguishment. The latter series were estimated on the basis of market ratings on the last date that an issue appeared in the Annual or Periodic Records. Issues in default at extinguishment were treated as not rated from date of default to extinguishment. Because of possible errors in timing of the market rating at extinguishment and the difficulty of interpreting the rating at that time, the extinguishment series are more than usually liable to error.

[18] Conformity indexes for total offerings of straight corporate bonds, as given in *Volume of Financing,* Table 4, are +20, −80, −68; for total final extinguishments they are +40, +20, and +5.

TABLE 59—Conformity Indexes for Bonds with High and Low Market Ratings: Offerings, Extinguishments, Net Changes, and Net Upgrading, 1900–1938

	UNDER 1 PERCENT			1 PERCENT AND OVER		
	Expan-sion	Contrac-tion	Full Cycle	Expan-sion	Contrac-tion	Full Cycle
Net Changes						
All industries	−40	+40	+5	+20	+20	+16
Railroads	0	+40	+47	+20	0	−5
Public utilities	0	−20	−26	−20	+20	+16
Industrials	−20	0	−5	+20	0	+16
Offerings						
All industries	−20	−80	−79	+40	−20	−26
Railroads	−40	−60	−58	−40	−20	−47
Public utilities	−20	0	−26	+20	−20	−37
Industrials	−20	−60	−58	0	0	+5
Final Extinguishments						
All industries	+80	+60	+58	−10	−20	−47
Railroads	+60	+40	+37	−10	0	−16
Public utilities	+50	0	+5	−30	−60	−58
Industrials	+60	+30	+37	+20	−10	0

	NET UPGRADING, VARIANT I			NET UPGRADING, VARIANT II		
	Expan-sion	Contrac-tion	Full Cycle	Expan-sion	Contrac-tion	Full Cycle
All industries	0	+40	+16	−20	−20	−5
Railroads	+40	+40	+58	−20	0	+16
Public utilities	−20	0	−16	+20	−40	−16
Industrials	0	0	+5	−20	−20	−16

Based on annual par-amount data for straight corporate bonds from Tables 12 and 70 of *Statistical Measures*, and special supplementary tabulations for final extinguishment data. All series cover ten cycles. These indexes do not take account of possible leads or lags at reference-cycle turning points.

indexes based on the other systems of rating, not too much importance should be attached to the discrepancies, since the extinguishment series for the market rating are susceptible to sizable errors (cf. footnote 17).

The two variants of net upgrading (Chart 19) agree less well with one another than the corresponding pairs of variants based on agency ratings (Chart 9); yet their directions of change from one year to the next are usually the same. It will be recalled from

CHART 19—Net Upgrading of Outstanding Issues by the Securities Market, 1900-1943
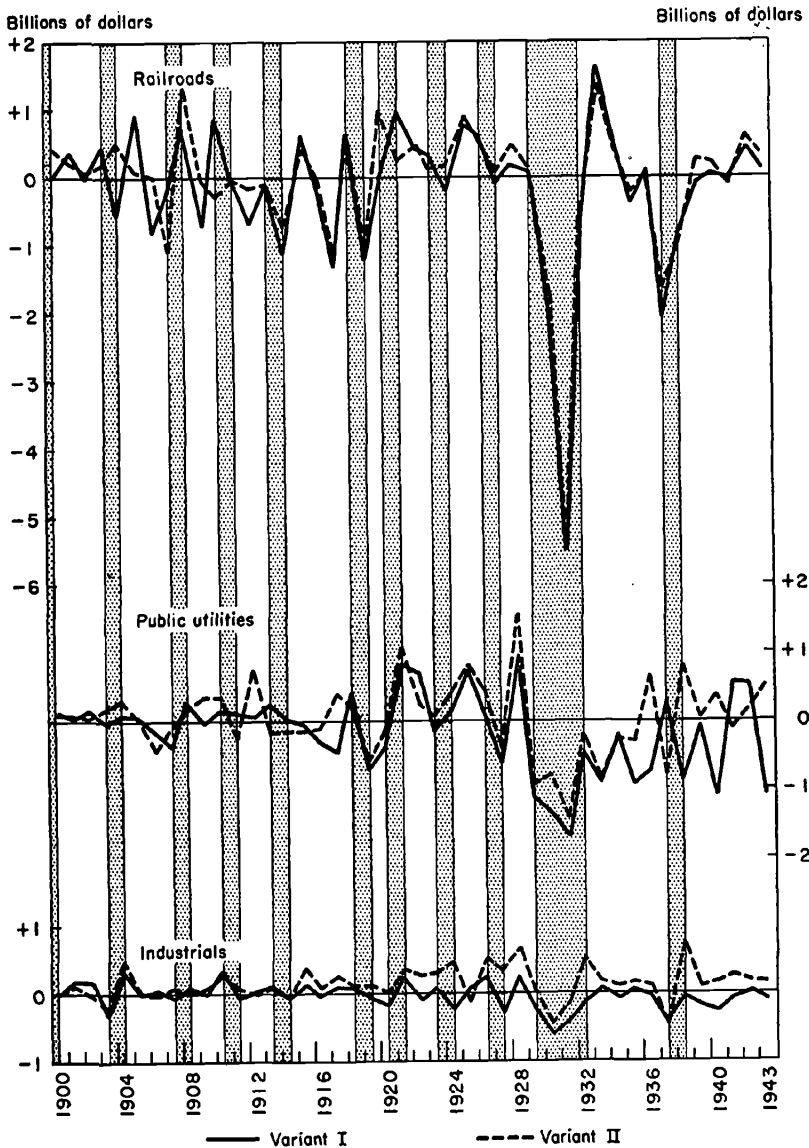
Billions of dollars

Variant I   Variant II
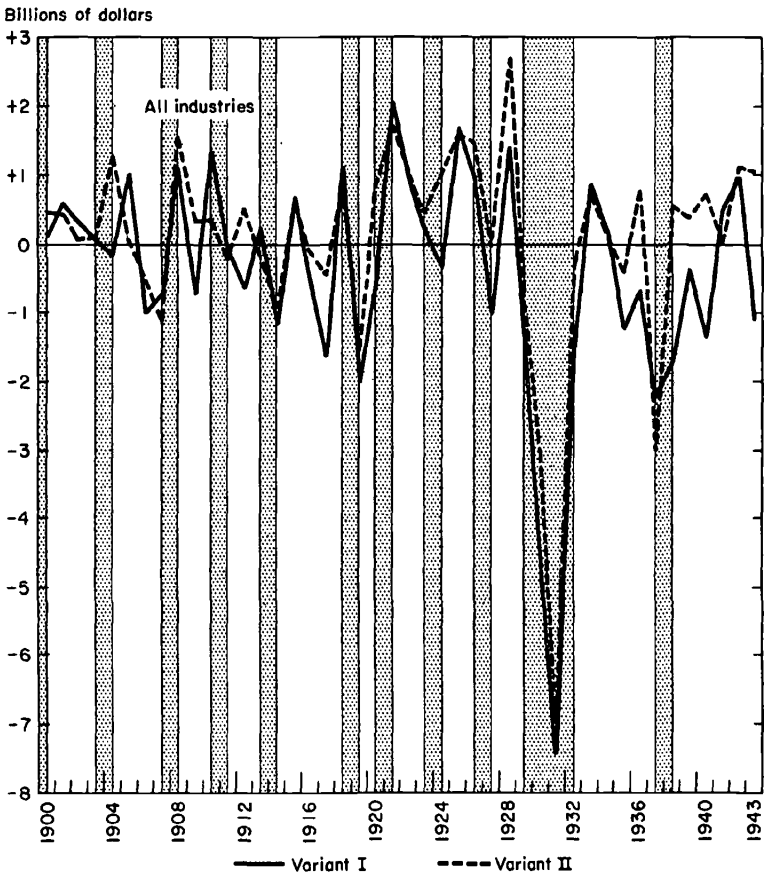
Universe estimates for straight bonds from "Statistical Measures," Tables 12 and 70, and from special supplementary tabulations.

Net upgrading is that part of the annual net change in the par-amount total of bond outstandings rated high (yield spread, under 1 percent) or low (yield spread, 1 percent and over) that is attributable to revisions of market ratings of outstanding issues. Positive values indicate an excess of upward over downward revisions; negative values, an excess of downward over upward revisions. Variant I was computed from changes in high grades and Variant II from changes in low grades. If yield information were available throughout the lives of all issues, including partial extinguishments, the two series would be identical.

Shaded areas, representing contractions in general business activity, and white areas, representing expansions, are from Arthur F. Burns and Wesley C. Mitchell's "Measuring Business Cycles" (National Bureau of Economic Research, 1946), p. 78.

CHART 19, concluded

Billions of dollars

Billions of dollars

Railroads

Public utilities

Industrials

——— Variant I   ----- Variant II

preceding chapters that Variant I measures the net change in the amount of high-grade outstandings after removal of the effects of new offerings and final extinguishments, and that Variant II measures the corresponding net change for low grades, taken with sign reversed. Except for the effects of partial extinguishments (for which ratings are not available), the two variants would be identical if all issues were rated throughout their lives; but by the same token, the absence of ratings (in this case of market quotations needed to compute the ratings) may be a source of serious error. For example, when quotations are available at the beginning of a year but not at the end, an issue is considered as downgraded under Variant I or upgraded under Variant II, depending upon whether it was high grade or low grade at the beginning of the year in question. Since issues were deliberately not rated during the period in which they were in default, it was necessary to remove such issues from Variant II in the year of default to prevent spurious upgrading; but other adjustments could not be effected. A glance at the chart will show that in many years Variant II was above Variant I, but the relationship was not so consistent as for agency ratings. Part of the explanation is the absence of information on partial extinguishments, which reduces Variant I and increases Variant II (cf. page 169). Also, the absence of information at the end of certain years, caused by heavy calls in the periods from which the quotations were taken (i.e. the first quarter of the following year) had the same effect, since the incidence of call is higher for high grades than low grades. Apart from these systematic differences, Variant I is believed to be more erratic than Variant II because of the gradual disappearance of high-grade issues into the vaults and strongboxes of permanent investors. As the market becomes thinner, and quotations are given less regularly, Variant I may show sporadic downgrading in some years and upgrading in others.

In any event, it is evident from the conformity indexes and the charts that the net upgrading series are dominated by the net changes in total outstandings, which provides confidence in the general results since the net changes are believed to be relatively free of error. More important for present purposes, the net upgrading series, like the net changes, show little conformity to business cycles. In this respect, the market ratings behaved like the New York and Massachusetts legal lists, which were also not closely geared to the business cycle. They are thus in sharp con-

trast with the agency ratings, which were highly sensitive to the ups and downs of the cycle.[19]

Additional evidence to the same effect may be obtained from Chart 19 by counting the number of times that the two variants for net upgrading moved upward and downward over successive phases of the business cycle. The chart indicates that Variant I rose in five business expansions and declined in the other five and that it rose in three business contractions and declined in the other seven. Similarly, Variant II rose in four business expansions and declined in six; and rose in six business contractions and declined in four. The general pattern throughout the full period studied was therefore one of negligible conformity to business cycles, although there is some evidence that the conformity may have improved in later years.[20]

The absence of clear-cut conformity of net upgrading by the market appears surprising, since it might be assumed a priori that the market rating, considered as a risk premium, would narrow when business is buoyant and widen when business is depressed. A possible explanation may be the pull on the yield spreads of the basic yields on high-grade bonds in certain periods. As we have seen, the proportion of outstanding issues rated high grade under the market rating was inversely related to the basic yields on high-grade bonds. This results from the fact that the yield spreads themselves were directly related to the basic yields. Comparison of the yields on high- and low-grade bond issues suggests further that the yield spreads usually lagged behind the basic yields (that is, yields of low-grade issues usually turned

[19] The conformity indexes of Table 59 were constucted on the assumption that the timing of the series was roughly coincident with that of the general business cycle. Detailed analysis of the annual data reveals little in the way of a systematic pattern of timing, either of this or of any other type. For example, it is difficult to decide whether the typical expansion period for high-grade bond offerings runs from reference peak to trough (stages v–ix) or from peak to mid-expansion (stages v–iii), and whether the typical expansion period for high-grade final extinguishments runs from trough to peak (stages i–v) or from trough to mid-expansion (stages i–iii). The typical expansion period for total offerings is from stages v to iii and for total extinguishments from stages i to iii (*Volume of Financing*, p. 69 n). Computed on these bases, the conformity indexes for high-grade offerings, all industries, are −60, −60, −68, and for high-grade final extinguishments, +100, +40, +68, negligible improvements in both cases. The net upgrading series show no evidence of systematic timing.

[20] For example, in the three cycles covered by the Maine legal list, the conformity of net upgrading by the market (Variants I and II) on a vii to iii basis was +100, +100, +100. Maine legals conformed similarly.

downward after yields on high grades had begun to fall; and conversely). Since the basic yields on high grades frequently rose during the early stages of most business expansions (particularly during the early part of the period studied), the tendency for the yield spreads to widen as basic yields rose may have neutralized the opposite tendency for the yield spreads (considered as risk premiums) to narrow as business improved. Conversely, since basic yields usually moved downward during the early stages of most business contractions, the tendency for yield spreads to narrow at that time may have offset the opposite tendency for risk premiums to widen as business deteriorated. But whatever the explanation, it is clear that the pull of the various factors operating on the yield spreads was sufficiently strong during the full period investigated to neutralize the effects of the business cycle. It follows that a list constructed on the basis of the market rating was less sensitive to the ups and downs of business activity than a list constructed on the basis of agency ratings. On the other hand, as has been noted earlier, the market was more sensitive to the optimistic fervor of the late 1920's than the investment agencies; and the market was extremely depressed by the sharp recession of the early thirties. Whether the same responses would be observed in market appraisals of quality measured in some other way (e.g. by means of ratios rather than simple yield differentials) remains an open question.

Investor Experience and Market Ratings

In preceding chapters it has been suggested that the principal aim of the compilers of the legal lists and the investment agencies is to distribute bond issues among classes in order of the relative risk of default and the magnitude of possible default loss. The difference between two given issues, one rated Aaa (and eligible for savings bank investment) and the other rated Caa (and ineligible for such investment), is simply that the risk of default of the former is judged to be less than that of the latter. It is not the intent of the agencies and compilers of the legal lists to suggest that the issues judged higher in quality are in any sense better "buys" than the lower grades. That would depend upon the particular circumstances in each case—the market price of the issue, trends in capital values, the stage of the business cycle, the requirements of the investor, the size of his portfolio, etc.

Loosely speaking, the market, too, is engaged in the process of

ranking issues in order of their relative risk of default. Other things being equal, the greater the prospective risk of default (or more precisely, the greater the discounted value of the expected default loss), the greater will be the risk premium in promised yield, i.e. the greater the yield spread or market rating. Unlike the investment agencies and the legal lists, the market is therefore not concerned solely with the ranking of issues according to default risk, but with the adequacy of the risk premium as well. According to Marshall's theory of investment values, a properly priced security (one selling at its long-run equilibrium price) would sell to yield the basic return on riskless investments having the same term to maturity, plus a risk premium just adequate, when combined with a large number of other securities, to offset the expected loss. In our terminology, if market appraisals were correct in that sense, the average realized yield on a group of issues held over a given period would equal the basic rate on high-grade issues maturing at the end of the period, and the average market rating would equal the average loss rate, or percentage of book value required to be set aside annually out of income to offset the capital loss.

Modern theories of investment values go somewhat beyond Marshall's statement by suggesting that the market exacts a complex premium for risk depending upon various parameters of the distribution of prospective yields, such as the mean or expected value of the distribution, the variance, the skewness, etc.[21] Reduced to their essentials, such theories imply that the promised yield contains three major components: (1) the basic yield on riskless investments, (2) a premium to cover the "expected" default loss, and (3) a premium for "risk bearing" or degree of clustering of the distribution of prospective yields about the expected value. Whether such theories are applicable to corporate bonds at the present time may be questioned, since they appear to be based on the assumption that the market is comprised largely of small investors, an assumption inappropriate for corporate bonds, which have been held principally by large investment institutions, at least since the 1920's. Nevertheless, institutional investors, like individuals, are embarrassed by the mere act of default (even

[21] See, for example, A. C. Pigou, *The Economics of Welfare* (London, 1920), Appendix I (particularly pp. 97 ff.); F. Lavington, *The English Capital Market* (London, 1921), Chapter IV; H. Makower and J. Marschak, "Assets, Prices and Monetary Theory," *Economica*, New Series, Vol. V, No. 19 (1938), pp. 271-74; J. R. Hicks, Value and Capital (Oxford, 1939), pp. 142 f.

though they may technically be able to withstand it), since under present legal arrangements they must either liquidate their holdings at that time or write them down to the market price (absorb a capital loss) irrespective of prospects as to the ultimate outcome of the investment. Given two securities with equal expected rates of return, most institutional investors prefer the one with the lower default risk, and exact a premium for risk bearing on the other (or refuse to purchase it at any yield), much as is implied by modern versions of classical investment theory. Present institutional arrangements therefore suggest the possibility that the returns actually realized on groups of investments may rise with (be an increasing function of) the size of the yield spread; that is, may vary inversely with quality as judged by the market. It is with the purpose of testing such notions that we turn to an examination of default risks and default losses on corporate bonds in different market-rating classifications, and to a comparison of the over-all rates of return obtained on the different groups of investments.

Default Rates

The default record of corporate bonds in selected market-rating classifications is presented in Tables 60–62, the first table containing percentages of the par amounts of offerings that subsequently went into default, and the latter two, proportions of the volume of outstanding issues at the beginning of quadrennial and longer periods that went into default before the end of the periods. Table 61 on quadrennial outstandings includes pooled sample data adjusted to represent all straight corporate bond outstandings; the other two tables present only the unadjusted data for issues in the large and small issues experience samples.

Like the investment agencies and the legal lists, the market has exhibited a remarkable ability to rank issues in order of the risk of future default. This is particularly true of the short chronological periods but remains true of the life-span periods from offering to extinguishment. As was pointed out in Chapter 2, default rates for bond offerings, calculated on the basis of the proportion of offerings that later defaulted, are influenced by the period of offering and of extinguishment, and by many other factors independent of the intrinsic quality of an issue at offering. Despite these disturbances, Table 60 reveals that the percentage of the par amount of the large issues that subsequently went into default

TABLE 60—Proportions of Offerings 1900–1943 in Given Market Rating Classes at Offering That Went into Default before 1944

	All Rating Classes	MARKET RATING			
		Under ½ Percent	*½–1 Percent*	*1–2 Percent*	*2 Percent and over*
Default Rates					
Large issues, all industries	17.3%	10.5%	13.9%	20.7%	32.4%
Railroads	28.1	22.8	28.2	29.3	54.3
Public utilities	10.6	1.1	6.2	18.8	24.3
Street railways	64.3	38.7	75.0	70.1	40.2
All others	6.3	0.8	2.9	11.4	20.7
Industrials	14.8	3.0	4.1	15.9	31.7
Small issues, all industries	24.9	13.1	10.6	27.8	28.2
Railroads	20.6	16.1	6.6	31.7	20.0
Public utilities	20.9	1.9	13.4	26.6	16.7
Street railways	67.1	0.0[a]	52.2	77.1	72.2
All others	13.2	2.4	0.0	16.5	14.1
Industrials	33.7		0.0[a]	27.6	39.5
Par Amount of Offerings, Defaults and Nondefaults (*millions*)					
Large issues, all industries	$52,438.4	$12,172.3	$16,817.3	$18,312.0	$5,136.8
Railroads	16,979.4	5,144.4	6,150.5	4,905.6	778.9
Public utilities	22,897.2	5,769.3	7,552.3	7,686.6	1,889.0
Street railways	1,694.0	38.1	348.0	961.4	346.5
All others	21,203.2	5,731.2	7,204.3	6,725.2	1,542.5
Industrials	12,561.8	1,258.6	3,114.5	5,719.8	2,468.9
Small issues, all industries	932.1	70.2	106.1	446.3	309.5
Railroads	180.6	55.1	39.2	73.3	13.0
Public utilities	459.1	15.1	64.6	237.5	141.9
Street railways	65.4	2.7	16.6	39.9	6.2
All others	393.7	12.4	48.0	197.6	135.7
Industrials	292.4	0.0	2.3	135.5	154.6

Based on Tables 191 and 192 of *Statistical Measures,* and special supplementary tabulations, covering regular offerings in the offerings experience sample.

[a] Based on less than five offerings.

varied consistently and inversely with the market's estimate of the quality of the offerings. The record of small issues is not so impressive in this respect as that of large issues. Yet for each of the eight industry-size groups presented in the table, it is clear that the default rates for offerings rated high by the market were rather consistently below the corresponding rates for offerings rated low. In particular, the default rates for top grade issues, those with market ratings of under ½ percent, were uniformly below the default rates of issues with market ratings of 1 to 2 percent or 2 percent and over.

Within the industry-size groups, the only notable evidence of market inaccuracy in ranking is for the very low-grade issues (market ratings of 2 percent and over). The table indicates that the market was least successful in forecasting the default experience of the large street railways and small railroads. Reference back to Table 33 shows that the investment agencies also underrated the low-grade street railways but ranked the rails correctly.

Although the general ordering of the market's appraisals of default risk at offering appears to have been reasonably good within industry groups, between industries the market committed essentially the same errors as the agencies and compilers of the legal lists. Like the other rating systems the market overrated the rails and street railways at offering, and underrated other utilities and industrials.

The market's short-run appraisals of default risk, based on ratings assigned to outstanding issues at the beginning of the quadrennial periods, were also quite accurate (Table 61). For all except three of the sixty-six comparisons that can be made from the data in the table, the default rate was more favorable for issues with market ratings under 1 percent than for issues rated as of lower quality, and the exceptions are really borderline cases. In the period 1904–07 the only default suffered by the small issues was an extension at maturity of a single high-grade issue guaranteed by a large street railway system. (The extension was treated as a default in our records, since the issue sold below par on the date of extension.) Although information is scanty, it seems likely that the system could have refunded the small issue in a more orthodox fashion, since no other issue of the system was in default at the time. In the period 1908–11 no small issue went into default, and in the period 1924–27 a single large issue was responsible for the 8.3 percent default rate on high-grade industrials. That issue,

TABLE 61—Quadrennial Default Rates for Outstandings with High and Low Market Ratings at Beginning of Periods, 1900–1943

PERIOD	All Issues			Large Issues			Small Issues		
	Under 1 Percent	1 Percent and over	Information Lacking	Under 1 Percent	1 Percent and over	Information Lacking	Under 1 Percent	1 Percent and over	Information Lacking
1900–1903	0.0%	2.2%	6.2%	0.0%	2.9%	31.9%	0.0%	1.0%	0.9%
1904–1907	0.0	8.6	2.3	0.0	11.3	7.2	0.2	0.0	0.7
1908–1911	0.2	1.7	18.1	0.2	2.1	27.1	0.0	0.0	14.3
1912–1915	3.5	19.6	15.2	2.9	22.0	32.1	7.1	11.9	10.6
1916–1919	1.8	11.1	12.0	1.3	9.8	22.3	5.7	14.0	8.6
1920–1923	0.0	3.9	11.7	0.0	3.6	18.9	0.0	5.2	9.5
1924–1927	1.0	6.4	13.5	1.1	6.9	32.9	0.0	4.8	9.4
1928–1931	0.0	8.9	8.9	0.0	6.7	7.4	0.0	15.8	9.7
1932–1935	0.0	22.1	39.2	0.0	21.4	41.7	0.0	25.6	37.2
1936–1939	0.8	10.3	20.1	0.9	11.2	21.6	0.0	4.8	17.5
1940–1943	0.0	3.8	9.4	0.0	3.3	3.2	0.0	7.5	32.3

PERIOD	Railroads			Public Utilities			Industrials		
	Under 1 Percent	1 Percent and over	Information Lacking	Under 1 Percent	1 Percent and over	Information Lacking	Under 1 Percent	1 Percent and over	Information Lacking
1900–1903	0.0	2.3	3.9	0.0	0.8	8.2	0.0	4.9	9.2
1904–1907	0.0	1.9	3.2	0.3	2.8	2.5	0.0	21.0	0.0
1908–1911	0.2	2.4	18.1	0.0	1.1	17.3	0.0	0.8	20.1
1912–1915	4.2	36.7	25.4	1.5	10.9	4.7	0.0	8.1	24.5
1916–1919	0.4	7.3	23.8	8.8	16.2	7.0	0.0	2.7	5.5
1920–1923	0.0	3.2	11.5	0.0	4.4	13.3	0.0	5.0	6.2
1924–1927	0.0	9.5	11.4	0.0	4.6	10.5	0.0	5.9	20.3
1928–1931	0.1	12.7	2.8	0.0	6.8	7.1	8.3	10.1	13.8
1932–1935	0.0	27.5	36.8	0.0	15.3	33.0	0.0	23.4	51.3
1936–1939	1.5	21.7	36.6	0.0	4.5	11.8	0.0	6.4	8.1
1940–1943	0.0	3.3	33.7	0.0	5.0	4.3	0.0	2.1	8.8

Based on Tables 164, 165, 174, and 175 of *Statistical Measures*: par-amount data for all large (straight) corporate issues in good standing at beginning of periods, and for 10 percent of small issues adjusted quadrennially to universe totals.

a joint obligation of the Reading Company and the Philadelphia and Reading Coal and Iron Company, was exchanged for new securities in a segregation of railroad and coal properties following an antitrust suit. Since the successor securities sold below par at date of exchange, the situation was treated as a default, although the annual loss rate on the successors, calculated from offering to five years after the exchange, was negative, indicating that their prices subsequently recovered. It should also be noted that among the high grades generally the quadrennial default rates reveal little bias in favor of any particular size or industrial group. It would seem from this evidence that the market ultimately corrected for its underestimation at offering of the risks of default on rail bonds. On the other hand, the market frequently erred as between industries, since in most periods the industry having the highest default rate for the high grades also had the highest default rate for the low grades. Although there is little evidence of systematic favoritism over the short periods, the market frequently had more difficulty in ranking issues between industries than within industries.

We have seen that the investment agencies, like the market, made excellent short-run forecasts of default incidence. From materials so far presented, a list comprised of issues meeting a yield test of 1 percent over the basic rate appears generally to have been of higher quality, from the standpoint of default risk, than one including issues in the first four agency rating grades. Thus, in the forty-eight possible comparisons of the data in Tables 61 and 35, the default rate of issues with market ratings under 1 percent was below the corresponding rate for issues in the first four rating grades in forty-one cases, was above in only four cases, and the two were tied in three cases. On the other hand, the volume of the issues in the under 1 percent class was usually less than that of issues rated I–IV (and in the 1 percent and over class exceeded the V–IX's), so that default rates on the low grades under the market-rating test were also usually below those on issues rated V–IX by the agencies. It is therefore not possible to decide on the basis of such information which of the two quality measures was the more sensitive to the risk of default. In the next chapter an attempt will be made to determine whether the agencies or the market was more discriminating as to short-run default risk by comparing equally inclusive lists of securities.

The default rates for longer chronological periods, reduced to a

quadrennial basis, are presented in Table 62.[22] Here, as in other tables of this type, the ratings were assigned to outstanding issues at the beginning of the indicated periods, on the basis of the ratings then prevailing. Like those for the four-year periods, they reveal the skill of the market in differentiating default incidence

TABLE 62—Long-period Default Rates Adjusted to a Quadrennial Basis for Outstandings with High and Low Market Ratings at Beginning of Periods, 1900–1939

PERIOD	*All Large Issues*	*Railroads*	*Public Utilities*	*Industrials*
	Market Rating of under 1 Percent			
1900–1907	0.0%	0.0%	0.0%	0.0%
1900–1919	1.3	1.2	2.5	0.0
1908–1915	2.2	2.5	0.0	0.0
1920–1927	0.9	0.0	0.0	5.3
1920–1931	0.0	0.0	0.0	0.0
1920–1939	1.9	2.4	0.0	0.0
1924–1939	1.7	2.4	0.4	0.0
1928–1939	4.7	8.0	0.2	0.2
1932–1939	0.4	1.1	0.0	0.0
	Market Rating of 1 Percent and over			
1900–1907	0.6	0.9	0.0	0.0
1900–1919	2.6	2.6	3.7	0.0
1908–1915	6.7	9.3	3.7	6.6
1920–1927	3.5	5.4	0.6	4.7
1920–1931	2.7	4.2	0.8	1.5
1920–1939	7.3	9.9	4.5	3.5
1924–1939	7.7	15.6	4.0	2.9
1928–1939	9.4	20.6	5.8	8.0
1932–1939	13.5	20.5	6.0	10.2

From special tabulations of the National Bureau of Economic Research: par-amount data for large issues in the periodic experience sample. Default rates are reduced to a quadrennial basis; e.g., one-half the default rate for 1920–27 was entered for that period.

prospectively within industries. (The record is marred only by the default rate for high-grade industrials, 1920–27, which resulted from the antitrust case mentioned previously; if it had not been for that one issue, the default rate would have been zero for the

[22] Adjustment of the long-period default rates to a quadrennial basis was effected by dividing by one-quarter of the number of years in the period. The adjustment in effect assumes that, other things being equal, the volume of defaults during a given period is proportional to the duration of exposure to default risk.

period.) In two important respects, however, the default rates for the longer periods differ markedly from those of the four-year periods. First, the early market preference for rail bonds, which existed through the early thirties, is revealed by the higher default rates on the top-grade issues in that group during the Great Depression than for the other major industries. Secondly, the default rates on large high grades over the longer periods are rather systematically above the corresponding averages of the four-year rates spanning identical periods. The two types of rates (that is, the long-period rate and the average of the four-year rates for the same periods) are not strictly comparable, since issues offered after the beginning of any long period, or maturing within that period, are excluded from the long-period calculations but may be included in one or more of the four-year periods.[23] Nevertheless, they suggest that the accuracy of the market's forecasts worsened as the period of forecast lengthened, a suggestion that is confirmed by the default rates of Table 60 covering the entire life span from offering to extinguishment.

We conclude that the market ratings, like the legal lists and the ratings assigned by the agencies, were good short-run indicators of the probable incidence of default, but that they deteriorated for longer periods. Like the other rating systems also, the market assigned higher ratings to the rails at offering and at the beginning of several of the longer chronological periods than were warranted by their subsequent default experience; but this bias may have disappeared in time, since it is less evident in the data for the four-year periods.

Default Losses

Statistics pertaining to default losses on corporate bonds in selected market-rating classifications are presented in Tables 63 and 64. Like the corresponding figures based on agency ratings and legal status (cf. Tables 37, 38, 49, and 50), the data are unweighted price and yield averages, and cover only defaulted issues.

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[23] A further difficulty arises from the procedure followed in selecting the samples. The large-issue default rates of Table 61 include all rated issues outstanding at the beginning of the respective four-year periods, provided only that they met the size test for inclusion in the large issues sample; those of Table 62 include only such of those issues as were in the periodic experience sample. The latter excludes issues maturing within the respective periods. It follows that the long-period rates are biased downward as compared with the averages of the four-year rates by the elimination of defaults at maturity.

TABLE 63—Market Prices at Default, Discounted Values of Receipts after Default, and Realized Yields after Default for Bonds Classified by Current Yield Five Years and One Year before Default, 1900–1943

CURRENT YIELD	BY CURRENT YIELD FIVE YEARS BEFORE DEFAULT					BY CURRENT YIELD ONE YEAR BEFORE DEFAULT				
	Number of Issues Used for Prices and Receipts	Average Price at Default	RECEIPTS DISCOUNTED AT		Realized Yield, Default to Extinguishment	Number of Issues Used for Prices and Receipts	Average Price at Default	RECEIPTS DISCOUNTED AT		Realized Yield, Default to Extinguishment
			3 Percent	6 Percent				3 Percent	6 Percent	
				Large Issues						
Under 5%	113	48	67	54	13.3%	33	70	91	77	14.7%
5–5.5	56	45	76	62	18.1	43	69	78	67	7.7
5.5–6	46	43	67	56	20.0	27	64	79	68	13.9
6–7	79	33	61	52	26.2	71	56	74	61	9.9
7–8	42	35	55	47	32.5	72	45	60	51	10.5
8–10	30	43	61	53	24.0	84	41	66	56	22.1
10 and over	34	37	57	50	26.1	223	25	50	42	28.1
Information lacking	181	46	61	52	17.3	28	53	72	61	30.2
				Small Issues						
Under 5%	6	67	89	75	10.8	5	56	65	58	2.5
5–5.5	7	65	92	75	7.6	7	79	102	85	8.3
5.5–6	10	43	68	58	14.7	5	70	92	75	7.3
6–7	26	36	63	54	36.4	12	60	76	66	19.5
7–8	10	25	53	48	44.1	12	44	53	45	11.0
8–10	7	45	52	49	11.4	20	34	58	50	27.7
10 and over	9	41	68	62	50.1	57	25	52	45	38.7
Information lacking	62	37	58	50	23.9	19	47	76	66	22.7

From Tables 222 and 224 of *Statistical Measures*, covering issues in the default experience sample. Receipts include liquidating values of securities still outstanding on January 1, 1944 at prices prevailing in the first quarter of that year. Prices, discounted values, and yields are unweighted averages.

Because of the difficulty of interpreting promised yields to maturity for issues approaching default, Table 63 was constructed on the basis of current yields five years and one year before default (cf. pages 287 f.). Although the use of the current yield as a market rating is open to the objection that no allowance is made for changes in basic interest rates, an examination of the data indicates that it is not without value as a predictor of capital losses and payouts on defaulted bonds. Generally speaking, the lower the current yield five years and one year before default, the higher was the market price at default and the smaller the capital loss (the difference between par and market values). Generally speaking also, the value of future receipts discounted at 3 percent and at 6 percent improved rather regularly with the market's appraisal of quality prior to default. (Note, however, issues with current yields of 8 percent and over.) On the other hand, the average realized yields on defaulted issues calculated from default to extinguishment were higher for low grades than for high grades, providing additional evidence that the market generally undervalued low-grade issues at date of default. Comparison of the price and yield averages for the large defaulted issues rated five years and one year before default indicates that the market's forecasts were less accurate the farther in advance the prediction was made. The market's forecasts appear, also, to have been more erratic in this respect than those made by the investment agencies (cf. Table 37).

Additional evidence on the long-range forecasting ability of the market is available in the average realized yields and loss rates on defaulted issues calculated for the periods from offering to default and to extinguishment (Table 64). The market ratings of this table are yield differentials assigned at offering. For both large and small defaulted issues, the average realized yields from offering to default were generally lower for bonds whose yield spreads at offering were wide. As was true of the agencies, the principal reason for this phenomenon was the remarkable success of the market in predicting default risk over short periods, with the result that high grades were outstanding, on the average, over much longer intervals before default than low grades.[24] Since wider yield spreads reflect higher promised yields, the loss rates from offer-

[24] For the market rating grades shown in Table 64, the respective average numbers of years that issues were outstanding before default were, for large issues, 19, 17, 12, and 8; and, for small issues, 25, 27, 12, and 7.

TABLE 64—Yields and Loss Rates up to Default and over Life Span of Issues Defaulting 1900–1943 Classified by Market Rating at Offering

MARKET RATING	Number of Issues	Promised Yield at Offering	FIRST OFFERING TO DEFAULT		FIRST OFFERING TO EXTINGUISHMENT	
			Realized Yield	Loss Rate	Realized Yield	Loss Rate
Large Issues						
All large issues	549	6.4%	−3.4%	9.8%	2.3%	4.1%
Market rating						
Under ½%	47	4.1	−0.7	4.8	2.3	1.8
½–1	100	4.6	−2.6	7.2	1.6	3.0
1–2	254	5.5	−4.9	10.4	1.7	3.8
2 and over	148	9.7	−2.5	12.2	3.7	6.0
Small Issues						
All small issues	119	7.8	−4.0	11.8	2.4	5.4
Market rating						
Under ½%	2	4.1	3.1	1.0	3.6	0.5
½–1	5	4.2	3.7	0.5	3.8	0.4
1–2	57	5.6	−3.3	8.9	1.5	4.1
2 and over	55	10.5	−5.7	16.2	3.2	7.3

From Table 221 of *Statistical Measures*, covering issues in the default experience sample. Yields and loss rates are unweighted averages. For issues still outstanding on January 1, 1944 liquidation is assumed at prices prevailing in the first quarter of that year.

ing to default were also worse for the lower-grade issues. The principal exception to this pattern is the average realized yield on large defaulted issues with market ratings of 2 percent and over, which was above that of issues with market ratings of 1 to 2 percent. A similar situation was noted for the large defaulted issues that were assigned low grades by the agencies at offering (cf. Table 38). In both cases, the explanation is largely the undervaluation of contract modifications or issues offered in exchange for defaulted issues during the corporate reorganizations of the thirties. Even though these issues (or rather, such of them as are included in Table 64) later went into default, the initial market prices were so low that extremely attractive returns were obtained from offering to default. These returns were sufficient to offset in part the negative returns obtained on some of the low-quality offerings of other periods.

The loss rates on defaulted bonds held from offering to ex-

tinguishment, like the rates from offering to default, were systematically higher the lower the quality as judged by the market. On the other hand, the realized yields from offering to extinguishment exhibit no systematic relationship to the market ratings at offering (as was true of agency ratings). It would seem, therefore, that for defaulted issues the risk premiums in the yields promised at offering were roughly sufficient to equalize the returns actually obtained on the investments in the different quality classes. It remains to examine what the relationship is between yields to extinguishment and market ratings when nondefaulted bonds are added to those that went into default.

Average Life-span Yields and Loss Rates
(nondefaulted and defaulted issues combined)

Life-span yields and loss rates on nondefaulted issues in selected market-rating grades are presented in Table 65, and comparable data on all issues, in Table 66. The data are weighted averages from the offerings experience sample, and cover total offerings, regular offerings, and regular offerings since 1920.

It will be observed from Table 65 that the promised yields rose as the market rating worsened (as would be expected, since the yield spread is a positive component of the promised yield). On nondefaulted bonds realized yields equal promised yields for issues extinguished by payment in full at maturity, exceed promised yields for other types of extinguishments, and fall short of them only for issues still outstanding and selling below book value on the terminal date of the study (January 1, 1944). Since the latter were unimportant, the realized yields on nondefaults rose as quality declined. The most significant point is that the realized yields rose more rapidly than promised yields, so that capital gains on nondefaults rose as the yield spreads widened.

The yields and loss rates of Table 66, where defaulted and nondefaulted issues are combined, may be interpreted as weighted averages of the respective averages for defaulted and nondefaulted issues. More specifically, the yield in any given cell of the table is equivalent to the product of the default rate for that cell (from Table 60) and the corresponding yield average for defaulted issues (from Table 64) plus the product of the complement of that default rate and the yield average for nondefaulted issues (from Table 65).[25]

[25] Not quite, since the yields on defaulted issues from Table 64 are unweighted averages, and cover only first offerings. Discrepancies introduced by interpreting them as weighted yields for total defaults are, however, minor.

TABLE 65—Life-span Yields and Loss Rates for Nondefaulted Bonds Classified by Market Rating at Offering: Regular versus Total Offerings 1900–1943

	All Rating Classes	MARKET RATING			
		Under ½ Percent	*½–1 Percent*	*1–2 Percent*	*2 Percent and over*
Promised Yield					
Total Offerings					
Large issues	5.3%	3.7%	4.5%	5.4%	10.0%
Small issues	6.4	3.9	4.6	5.7	8.4
Regular Offerings					
Large issues	4.8	3.7	4.4	5.4	7.1
Small issues	5.7	3.9	4.6	5.7	6.8
Regular Offerings since 1920					
Large issues	4.8	3.7	4.5	5.5	7.3
Small issues	6.1	4.3	4.9	5.9	6.9
Realized Yield					
Total Offerings					
Large issues	6.1	4.2	5.2	6.5	11.4
Small issues	7.6	4.0	4.8	6.3	10.9
Regular Offerings					
Large issues	5.6	4.2	5.2	6.5	8.4
Small issues	6.7	4.0	4.8	6.3	8.7
Regular Offerings since 1920					
Large issues	5.8	4.3	5.5	6.8	9.1
Small issues	7.5	4.9	5.3	6.7	9.4
Loss Rate					
Total Offerings					
Large issues	−0.8	−0.5	−0.7	−1.1	−1.4
Small issues	−1.2	−0.1	−0.2	−0.6	−2.5
Regular Offerings					
Large issues	−0.8	−0.5	−0.8	−1.1	−1.3
Small issues	−1.0	−0.1	−0.2	−0.6	−1.9
Regular Offerings since 1920					
Large issues	−1.0	−0.6	−1.0	−1.3	−1.8
Small issues	−1.4	−0.6	−0.4	−0.8	−2.5

From special tabulations of the National Bureau of Economic Research, covering issues in the offerings experience sample. Yields and loss rates are weighted averages with par amounts of included offerings as weights. For issues still outstanding on January 1, 1944 liquidation is assumed at prices prevailing in the first quarter of that year.

Table 66 shows that the realized yields on nondefaults rose sufficiently rapidly as yield spreads widened to more than offset the drag of the lower yields on the defaulted issues. The progression is quite regular, the only exception occurring in regular offerings of small issues since 1920. Although the ½ to 1 percent class included no defaulted issues, the following class included forty-two, which was sufficient to counteract the higher yield obtained on the nondefaulted issues. Otherwise, the weighted average realized yields were consistently higher the poorer the market-rating grade, indicating that the market usually undervalued the lower-grade issues at offering. A similar conclusion was reached in chapters 3 and 4 on the basis of legal status and the ratings assigned by the agencies at offering.

It is worth noting that purchasers of the large issues "beat the average" for all large issues if they concentrated on offerings in the 1 percent and over class, while purchasers of small issues beat the corresponding average for all small issues only if they concentrated on offerings in the 2 percent and over class. Although realized yields on all small issues averaged above those on all large issues, the relationship is reversed within market-rating classes. The explanation appears to be that the market rated down a larger proportion of small issues at offering than of large issues, in effect pushing the higher-yielding low grades into the next poorer market-rating class.

The most striking feature of Table 66 is that negative loss rates (capital gains) occurred regularly on total offerings of large issues in all the different market-rating classes, and that the size of the capital gain was virtually independent of the rating assigned at offering. The same was true of the large regular offerings, except those with market ratings of 2 percent and over, where capital losses occurred. The virtual independence of the market rating and the loss rate runs counter to the classical theory of investment values. According to that theory, the market rating is a forecast of the loss rate (cf. page 323), and the two should average out at about the same level for securities properly priced in the market. Market forecasts of the loss rates appear to have been somewhat more reliable for small issues than for large, but for small regular offerings since 1920 the average loss rate was negative for half the total volume (issues with market ratings of under 1 percent). Moreover, throughout the table the average loss rates were consistently below the mid-points of the corresponding market-rating

TABLE 66—Life-span Yields and Loss Rates for Bonds Classified by Market Rating at Offering: Regular versus Total Offerings 1900–1943

	All Rating Classes	MARKET RATING			
		Under ½ Percent	*½–1 Percent*	*1–2 Percent*	*2 Percent and over*
		Promised Yield			
Total Offerings					
Large issues	5.3%	3.8%	4.5%	5.4%	9.3%
Small issues	6.3	3.9	4.6	5.7	8.1
Regular Offerings					
Large issues	4.9	3.8	4.5	5.4	7.1
Small issues	5.8	3.9	4.6	5.7	6.9
Regular Offerings since 1920					
Large issues	4.9	3.8	4.5	5.5	7.5
Small issues	6.3	4.4	4.9	6.0	7.0
		Realized Yield			
Total Offerings					
Large issues	5.4	3.9	4.7	5.5	9.5
Small issues	6.1	3.9	4.6	5.1	8.3
Regular Offerings					
Large issues	5.0	3.9	4.7	5.5	6.8
Small issues	5.3	3.9	4.6	5.1	6.2
Regular Offerings since 1920					
Large issues	5.2	4.0	5.0	5.8	7.1
Small issues	5.6	4.7	5.3	5.1	6.2
		Loss Rate			
Total Offerings					
Large issues	−0.1	−0.1	−0.2	−0.1	−0.2
Small issues	0.2	0.0	0.0	0.6	−0.2
Regular Offerings					
Large issues	−0.1	−0.1	−0.2	−0.1	0.3
Small issues	0.5	0.0	0.0	0.6	0.7
Regular Offerings since 1920					
Large issues	−0.3	−0.2	−0.5	−0.3	0.4
Small issues	0.7	−0.3	−0.4	0.9	0.8

Based on Tables 190 and 191 of *Statistical Measures*, covering issues in the offerings experience sample. Yields and loss rates are weighted averages with par amounts of included offerings as weights. For issues still outstanding on January 1, 1944 liquidation is assumed at prices prevailing in the first quarter of that year.

classes. It thus appears that on the average risk premiums were larger than needed at offering, and that the excess was greater at the poorer end of the quality scale.

One more point should be noted before leaving Table 66. A close correlation is to be observed between the yields promised at offering and the life-span yields realized on issues classified by market rating at offering. This means that, on the average, for issues so classified the promised yield could have been used to predict the realized yield over the full period studied. On the other hand, the absence of a close relationship between the two yields for issues offered and extinguished in different minor periods (and for offerings of different minor industry groups; cf. Chapter 2) serves as a warning that the promised yield was a reliable indicator of the realized yield only in a broad average sense, and for issues classified by market rating at offering. Moreover, the close relationship between the promised and realized yields for issues classified by market rating at offering does not mean that the market was able to distinguish accurately between the prospective rates of return on issues of different grades. Quite the contrary is true. For if the risk premium as measured by market rating had been accurately determined at offering, the loss rates would have been roughly equivalent to the risk premiums; the realized yields would have been independent of the market ratings; and the promised yields would have been related to the realized yields only through the effect of the basic yields on each (and the two would have been independent of one another when classified by market rating, except for the possible influence of the level of basic yields on yield spreads at offering). The promised yields at offering proved to be good indicators of the life-span realized yields largely because the market failed to predict the returns actually obtained on issues in different quality classes, overvaluing high grades and undervaluing low grades.

Average Yields and Loss Rates
over Chronological Periods

In most important respects, the experience record of issues held over assumed chronological periods of investment (Table 67) confirms that of issues purchased at offering and held to extinguishment. As would be expected, the weighted average promised yields to maturity rise consistently throughout the table with the size of the yield spread at the beginning of the periods. For the

longer chronological periods the realized yields also rise fairly regularly for successively poorer market-rating grades, the exceptions being 1920–39, 1928–39, and 1932–39. In two of those periods the realized yields of issues with market ratings under ½ percent averaged only slightly higher than yields of issues in the ½ to 1 percent class, and in the third period the yields were slightly higher in the 1 to 2 percent class than in the 2 percent and over class. Because of the greater influence of market prices on the yields realized over quadrennial periods, these yields behaved more erratically than the yields for the longer periods. Yet the quadrennial yields, too, increase for successively poorer market-rating grades when averaged over the eleven four-year periods. (The averages of the quadrennial realized yields for the four market-rating classes given in the table, reading from left to right, are 3.7 percent, 4.0 percent, 4.6 percent, and 6.7 percent). Marked departures from the typical pattern occurred only in periods of market deterioration (see Chapter 2). Such were the periods 1912–15, 1928–31, and 1936–39 (cf. Table 8); in each, the high grades fared better than the low grades. Except for minor irregularities in 1916–19 and in 1940–43, the other returns were in inverse order of quality; that is, the realized yields were higher the larger the yield spread assigned by the market at the beginning of the respective periods.

The fluctuations of the quadrennial realized yields indicate that the superiority of high-grade issues stems partly from the fact that their prices and yields are more stable. Thus, reading from left to right in the table for the four market-rating classes, the average deviations of the quadrennial realized yields about the grand means calculated over the eleven periods are 2.3 percent, 2.6 percent, 3.1 percent, and 5.2 percent. Clearly, short-run trading losses (and profits) were larger on the low grades than on the high grades. On the average, however, higher returns were obtained on the low-grade investments.

Essentially the same point is brought out by the loss rates of Table 67. It will be recalled that the loss rate is zero only for an issue selling at its amortized book value at the end of an investment period, where the book value is based on the price ruling at the beginning of the period. Usually, the absolute values of the loss rates were larger for the low-grade issues, indicating that the high grades had the most stable market values. To put the matter differently, the average deviations of the quadrennial loss rates

TABLE 67—Yields and Loss Rates over Four-year and Longer
Periods of Investment on Bonds with High and Low
Market Ratings at Beginning of Periods, 1900–1943

PERIOD	*All Large Issues*	MARKET RATING			
		Under ½ Percent	*½–1 Percent*	*1–2 Percent*	*2 Percent and over*
Promised Yield					
1900–1903	4.2%	3.5%	4.0%	4.6%	5.9%
1904–1907	4.6	3.9	4.4	5.0	7.0
1908–1911	5.1	4.1	4.6	5.4	7.5
1912–1915	4.7	4.1	4.6	5.3	6.8
1916–1919	5.0	4.3	4.8	5.5	7.5
1920–1923	6.9	5.3	5.9	6.6	9.1
1924–1927	6.0	4.9	5.4	6.1	8.2
1928–1931	5.0	4.3	4.7	5.4	6.9
1932–1935	8.9	5.0	5.4	6.0	12.2
1936–1939	4.9	3.1	3.8	4.4	6.6
1940–1943	5.6	2.8	3.2	3.9	8.3
1900–1907	4.2	3.5	4.0	4.6	5.9
1900–1919	4.2	3.5	4.0	4.6	5.8
1908–1915	5.1	4.1	4.6	5.4	7.5
1920–1927	6.7	5.3	5.9	6.5	8.6
1920–1931	6.6	5.2	5.8	6.5	8.6
1920–1939	6.5	5.2	5.8	6.5	8.6
1924–1939	5.8	4.9	5.3	6.1	7.8
1928–1939	4.9	4.3	4.7	5.4	6.7
1932–1939	8.2	5.0	5.4	6.0	11.1
Realized Yield					
1900–1903	4.1	2.3	3.8	5.0	7.4
1904–1907	3.7	2.6	3.1	4.3	7.9
1908–1911	6.5	4.3	5.4	7.5	11.2
1912–1915	2.7	3.1	3.0	2.1	0.9
1916–1919	0.2	0.2	0.1	0.1	1.3
1920–1923	8.8	6.8	8.0	8.8	10.9
1924–1927	8.5	7.1	7.6	8.8	11.3
1928–1931	−0.9	−0.1	0.2	−1.5	−5.4
1932–1935	11.7	9.0	9.3	10.1	13.7
1936–1939	1.3	2.3	0.6	1.4	1.2
1940–1943	7.8	2.8	2.5	4.3	13.3
1900–1907	3.6	2.3	3.4	4.2	5.9
1900–1919	3.3	2.5	3.1	3.9	4.7
1908–1915	4.8	3.6	4.4	5.6	6.8
1920–1927	8.7	6.9	7.8	8.5	11.1
1920–1931	6.1	5.5	5.5	6.3	6.9
1920–1939	5.9	5.4	5.3	6.2	6.9
1924–1939	5.1	4.5	4.9	5.5	6.1
1928–1939	3.1	2.8	3.1	3.6	3.4
1932–1939	7.3	6.5	6.3	6.6	8.1

TABLE 67
(concluded)

PERIOD	All Large Issues	MARKET RATING			
		Under ½ Percent	½–1 Percent	1–2 Percent	2 Percent and over
		Loss Rate			
1900–1903	0.1%	1.2%	0.2%	−0.4%	−1.5%
1904–1907	0.9	1.3	1.3	0.7	−0.9
1908–1911	−1.4	−0.2	−0.8	−2.1	−3.7
1912–1915	2.0	1.0	1.6	3.2	5.9
1916–1919	4.8	4.1	4.7	5.4	6.2
1920–1923	−1.9	−1.5	−2.1	−2.2	−1.8
1924–1927	−2.5	−2.2	−2.2	−2.7	−3.1
1928–1931	5.9	4.4	4.5	6.9	12.3
1932–1935	−2.8	−4.0	−3.9	−4.1	−1.5
1936–1939	3.6	0.8	3.2	3.0	5.4
1940–1943	−2.2	0.0	0.7	−0.4	−5.0
1900–1907	0.6	1.2	0.6	0.4	0.0
1900–1919	0.9	1.0	0.9	0.7	1.1
1908–1915	0.3	0.5	0.2	−0.2	0.7
1920–1927	−2.0	−1.6	−1.9	−2.0	−2.5
1920–1931	0.5	−0.3	0.3	0.2	1.7
1920–1939	0.6	−0.2	0.5	0.3	1.7
1924–1939	0.7	0.4	0.4	0.6	1.7
1928–1939	1.8	1.5	1.6	1.8	3.3
1932–1939	0.9	−1.5	−0.9	−0.6	3.0

From Table 173 of *Statistical Measures*, covering large issues in the periodic experience sample. Yields and loss rates are weighted averages with par amounts of outstandings at the beginning of the relevant period as weights.

(computed about zero) for the eleven periods are 1.9 percent, 2.3 percent, 2.8 percent, and 4.3 percent, respectively, for the four market-rating classes of the table. The implication is that a short-run trading position in corporate bonds is more precarious, the lower the quality of the holding, but, since the average yields realized are usually higher for the poorer issues, the odds are biased, so to speak, in favor of the more speculative positions. This, of course, is simply another way of saying that the promised yields of the low-grade issues contain a premium for risk bearing over and above the normal risk premium; and that the premium for risk bearing may reflect in part the price instability of the low-grade issues.