STATISTICAL MEASURES OF CORPORATE BOND FINANCING SINCE 1900

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NATIONAL BUREAU OF ECONOMIC RESEARCH
FINANCIAL RESEARCH PROGRAM

Studies in Corporate Bond Financing

1. The Volume of Corporate Bond Financing since 1900
2. Corporate Bond Quality and Investor Experience
3. Statistical Measures of Corporate Bond Financing since 1900

STATISTICAL MEASURES
OF CORPORATE BOND FINANCING
SINCE 1900

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PREFACE

THIS is the last of a series of three reports prepared by the National Bureau's corporate bond research project:

The Volume of Corporate Bond Financing since 1900
(published 1953)
Corporate Bond Quality and Investor Experience
(published 1958)
Statistical Measures of Corporate Bond Financing since 1900

The third report contains basic statistics on which the analyses of the second report are founded, supplementary tables on topics not covered in that report, and a description of estimating procedures and notes on coverage and suggested uses.

As were the other two reports of the series, the present report is based largely on extensive materials compiled by the Corporate Bond Project, a Work Projects Administration project, sponsored by the Federal Deposit Insurance Corporation and directed by the National Bureau of Economic Research with the active cooperation of several public agencies and private investment services. The data sheets and tabulating card records of the Corporate Bond Project originally covered the period from January 1900 to January 1939, and were subsequently edited by the National Bureau and extended to January 1944.

The present project, which was initiated by the National Bureau in mid-1946, has a twofold purpose: first, to provide basic statistical series on corporate bond financing in a form that we hope will prove useful to investors, to government agencies, and to students generally; and second, to analyze and interpret the behavior of these series for what light they may throw on the workings of the economy. The first report presents and analyzes the broad aggregates, and the second report deals with detailed breakdowns covering the characteristics and investment behavior of the securities included in the aggregates.

The original records were compiled under the supervision of the National Bureau's Committee on the Corporate Bond Project, which was composed of the following members: Winfield W. Riefler, chairman, William J. Carson, vice chairman, Raymond W. Goldsmith, William R. Leonard, Harold V. Roelse, Raymond J. Saulnier, Woodlief Thomas, Donald S. Thompson, Donald B. Woodward, and Ralph A. Young. Technical consultants to the committee included Henry Bodwell, Leslie L. Drew, Erling C. Olsen, and E. L. Vogelius. The project was staffed by the following members, whose services were contributed by the various cooperating agencies: Melvin W. Brethouwer, administrative director, Harold G. Fraine, technical director, Lewis N. Dembitz, Frederick C. Dirks, David Durand, Rose Director Friedman, William Hayes, W. Braddock Hickman, George P. Hitchings, Harold P. Pfleeger, S. Grant Saunders, and Elizabeth T. Simpson.

The first volume of the series and the basic tabulations were completed with the aid of grants from the following sources: the Life Insurance Association of America; the American Life Convention; the Association of Reserve City Bankers; J. Reed Morss, President, Boston Five Cents Savings Bank; the Savings Banks Trust Company of New York; the Trust Investment Study Committee of the New York State Bankers Association; and with general funds of the National Bureau of Economic Research. The International Business Machines Corporation originally placed at our disposal its elaborate machine installation at the Watson Scientific Computing Laboratory, Columbia University, and later provided and maintained a complete tabulating unit at our Hillside offices. The New York State Banking Department, the American Bankers Association, and the Life Insurance Investment Research Committee also cooperated generously in the work of the project.

The preparation of the second and third volumes of the series was supported by grants from the Merrill Foundation for Advancement of Financial Knowledge.

I have benefited greatly, particularly during the planning stages of the work, from the expert advice of the National Bureau's Technical Committee on Corporate Bond Research. Those who served on the committee as members and alternates are: Winfield W. Riefler, chairman, Arthur F. Burns, Irvin Bussing, William J. Carson, A. J. Casazza, Eleanor Bagley Daniel, J. R. Dunkerley, William E. Dunkman, Harold G. Fraine, Gabriel S. Hauge, Frederick W. McComas, Jr., Fergus J. McDiarmid, Adrian M. Massie, J. Reed Morss, John J. Moynahan, Roger F. Murray, James J. O'Leary, Raymond J. Saulnier, A. Edward Scherr, Jr., Elizabeth T. Simpson, Bascom H. Torrance, Donald B. Woodward, and James W. Wooster, Jr.

It is a pleasure, once again, to acknowledge the assistance of all those who have participated in this undertaking. A preliminary draft of this report was reviewed by the directors' reading committee of the National Bureau of Economic Research and by other friends and associates who have had a long-standing interest in the work. In this connection I am indebted to Melvin G. de Chazeau, Lewis N. Dembitz, Harold G. Fraine, Raymond W. Goldsmith, Murray Shields, Boris Shishkin, and Donald B. Woodward.

I am also indebted to those of the National Bureau staff who participated in one way or another in the preparation of the report. The text and the format of the tables were edited by Mary Phelps and were greatly improved by her helpful suggestions. My deepest debt is to Elizabeth T. Simpson, who assisted in all phases of the investigation, including the supervision of table preparation and checking of the tables here presented. Many able workers had a hand in the computation and processing of the data, among whom Georgette M. Welscher deserves special mention. The I.B.M. tabulations and computations were supervised at different stages by Mario P. Bosso, Charles F. Earley, and Martha S. Jones.

W. Braddock Hickman

January 24, 1959

⤙ INTRODUCTION ⤚

THE findings of the National Bureau studies in corporate bond financing are presented in a series of three reports. The first of the series, *The Volume of Corporate Bond Financing since 1900*, was published in 1953. It presents and analyzes broad aggregate statistics relating to new corporate bond offerings, extinguishments, and outstandings; and to new defaults, default settlements, and outstandings in default. The second report, which appeared in 1958, is entitled *Corporate Bond Quality and Investor Experience*. It is essentially an analytical study of the detailed characteristics of bond offerings, outstandings, and defaults, and of the experience record of offerings and outstandings in different quality classes over various assumed investment periods. The report in hand, which is the third and concluding volume of the series, contains basic statistics on which the analysis of the second report is founded, supplementary tables on topics not presented in the other reports, and brief descriptive notes on coverage and suggested uses.[1]

In locating tabular materials of special interest, it is suggested that the reader refer first to the table of contents of this volume, which includes detailed references, under topical headings, to related materials in each of the three reports of the series. To present maximum information without duplication, the tables contained herein are supplementary rather than comprehensive. For example, extensive tables relating to the broad aggregates of corporate bond offerings, outstandings, and related matters are presented in the first volume and are not repeated here. Similarly, certain data reflecting the experience on defaulted issues classified by legal status for savings bank investment, which are presented in full detail in the second report of the series, are omitted here. The present statistical compilation is therefore not a data book containing all tabulations in the other studies, but, rather, it contains new or more detailed data supplemented by a listing of materials presented in earlier reports. The table of contents will, it is hoped, serve as a guide to the tabular materials of the entire series.

The general structure of the tables presented in the three volumes was determined largely by three considerations: (1) the reliability of the data, (2) the interests of potential users of the materials, and (3) the amount of space available. In other words, the objective was to include meaningful breakdowns, and to exclude tabulations where the data were thin or were believed to be liable to appreciable sampling error. Since the basic records were on I.B.M. punched cards, a larger number of breakdowns and cross-classifications were possible than could be included in a single volume. Some interesting breakdowns have been excluded, but they may be obtained for appropriate uses from the punched cards, which are on file at the National Bureau of Economic Research.

Throughout the studies in corporate bond financing, the usual terminological problems were encountered in attempting to classify mass statistical data in reasonably meaningful ways. All special terms used in describing and classifying the bond data throughout the series of studies are brought together in a glossary at the end of this report. Readers troubled by terminological problems may refer to it for brief definitions, and to the indexes of the first and second reports for more detailed explanations and derivations. Accepted usage in the United States capital markets has been followed as closely as possible, but a few solecisms have undoubtedly crept in, and will perhaps be forgiven in an investigation of this extent.

There is, however, one fundamental definitional matter that must be faced up to at the start, namely, the particular type of corporate bond to which our statistics relate. Roughly expressed, corporate bonds are of four basic types: straight bonds, equipment obligations (usually in serial form), other serial bonds, and income bonds (see Chapter 1 of *Volume of Financing* for detailed descriptions of the different types). Aggregate statistics for each basic type are given in *Volume*

[1] For brevity, the three reports of the series will be referred to hereafter as *Volume of Financing*, *Corporate Bond Quality*, and *Statistical Measures*.

of Financing, but the second and third reports, which contain all of the detailed information on bond characteristics and experience, relate only to so-called straight corporate bonds.

A straight bond, in our usage, is a fixed-income, single-maturity obligation (and no such bond was excluded, save the few equipment trust obligations that were not in serial form). Straight bonds are by far the most important type employed by U.S. business corporations, comprising 76 percent of the 28,005 corporate issues of all types outstanding during the period studied (January 1, 1900 to January 1, 1944) and 86 percent of the $89.9 billion par amount of all corporate bond offerings. Throughout these reports, coverage is further restricted to so-called "domestic corporate bonds," that is, obligations of U.S. business enterprises in the railroad, public utility, and industrial fields held by the United States domestic investing public.

A fundamental sampling problem arose in selecting a group of straight corporate bonds for detailed study of characteristics and experience, since it was clearly impossible within the financial limits imposed upon the project to analyze in detail each of the 21,189 straight issues outstanding during the period covered by the investigation. Much of the broad aggregate data developed and presented in *Volume of Financing* covers the number and par amount of all domestic corporate bonds offered, outstanding, and extinguished in the period January 1, 1900 to January 1, 1944. These data were compiled from a card catalog covering all issues mentioned in the investment manuals (for sources of data and derivations of basic estimates, consult *Volume of Financing*, Appendix B); in the aggregate, therefore, they represent universe totals. The detailed breakdowns presented in the other reports (and to some extent, in the first report as well) are based on sample data adjusted upward annually within major industry group (rails, utilities, and industrials) to sum to the universe totals developed in the first report. The sample used for detailed study is comprised of all large issues (those whose offerings summed to $5 million or more during their life spans) and a 10 percent sample of the smaller issues (those whose offerings summed to less than $5 million). The small-issues sample is a controlled sample, selected by drawing every tenth card from a card catalog covering all small issues, after arraying the cards by year of maturity within year of first offering (year the issue first appeared). The characteristics of the issues thus selected were then recorded in detail: at offering date (first and all succeeding offerings); at extinguishment date; at default date, if the issue defaulted; and at selected chronological dates over the life span of each issue studied (quadrennially, for all issues in the sample, and annually, for a large sample of actively traded issues for which reliable market quotations could be obtained). Similarly, in so far as the data would permit, various measures of investment experience were computed for each issue in the sample over selected natural and chronological periods.

The tables of the present volume are arranged under six major headings:

I. Characteristics of Outstanding Issues
II. Characteristics of Offerings and Extinguishments
III. Characteristics of Defaulted Issues
IV. Measures of Experience over Chronological Periods
V. Measures of Experience from Offering to Extinguishment
VI. Measures of Experience on Defaulted Issues

As will be explained in greater detail in the notes preceding the tables of the first two sections, estimates for total outstandings, offerings, and extinguishments were obtained by applying annual raising factors to the small issues within industry group so that they summed to the corresponding universe estimates for all small issues, and then combining with the data for the large issues. Since the large issues are so important in the par-amount totals for all straight issues, global estimates of par amounts obtained in this way are believed to be reasonably accurate. (For example, the par amount of offerings of large straight corporate bond issues, for which the data are complete, comprises 79 percent of the par-amount total of all straight bond offerings in the period January 1, 1900–January 1, 1944.) On the other hand, because of the very large volume of small issues (74 percent of the total number of all offerings represented issues whose offerings summed to less than $5 million), we cannot be nearly as confident of the breakdowns by number as of those representing par amounts.

An attempt has been made to meet this difficulty in several ways, but primarily by presenting less detail for number than for par amount. For example, most cross-classifications of bond characteristics, such as agency rating by legal status, are presented only for par amounts. In addition, since professional investors are interested primarily in the large issues, for which the data are most complete, detailed estimates for large issues are usually presented separately in the tables of the first two sections, additional to the estimates for all issues (large and small combined). Separate estimates for the small issues may, of course, be obtained by subtraction, but the reader is forewarned that such data are presumed to be less accurate (in the sense that they may contain a larger percentage error) than the figures for the totals or for the large issues. The estimates are particularly liable to error when they relate to number rather than par amount.

There is another source of error in our data, similar to errors of nonresponse in sample surveys. Such errors may be present whenever information on one or more of the distributing variables could not be determined from the basic source materials. Errors of this type presumably do not occur in the tabulations of agency ratings and legal status, since most issues during the period studied were deliberately considered by the rating agencies and the banking authorities, and were either rated or not rated; hence the columns for issues with "no rating" or "not legal." In the case of the market rating and most of the other variables, the requisite information could not always be found in the source materials. Such observations were therefore tabulated under separate column headings labeled "information lacking." When the amount in the information-lacking column of any table is large relative to the total for which information is available, the classified data may be liable to substantial bias or error.

A further difficulty arises when dealing with the small issues in the tables on characteristics of defaulted issues (Section III) and the bond experience tables (Sections IV-VI), owing partly to the inherent thinness of some of the data in these sections, and partly to the lack of information on cash receipts needed to compute some of the experience measures. Generally speaking, less information was available for small issues than for large. The possible bias resulting from this fact is discussed in Chapter 1 of *Corporate Bond Quality*, and more briefly in the notes preceding the tables contained in this volume. Because of possible bias in the selection, the data on default characteristics and on bond experience are presented separately for large issues and for the small-issues sample, but no attempt has been made to combine the two groups into universe estimates for all issues, large and small. Tables showing universe distributions of the number and par amounts of issues falling in the major categories and periods over which the bond experience statistics are distributed are presented at appropriate places, and may be used to obtain rough estimates of aggregate experience, when the small issues are combined with the large. Such data, in conjunction with statistics presented on the number of issues in the various sample cells, should provide the reader with tolerably reliable guides as to whether or not the combination of issues in the two size groups will provide reasonably good universe estimates.

Specific comments on the construction, use, and adjustment of the data in the tables here presented are contained in the notes preceding each main section into which the book is divided.

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