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AND GENERAL LIMITATIONS OF THE ESTIMATES

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PLAN OF THE STUDY, COVERAGE OF  
THE DATA, AND GENERAL LIMITATIONS  
OF THE ESTIMATES

SINCE this monograph embodies but a part of the investigation of domestic corporate bond financing planned by the National Bureau of Economic Research, it is appropriate at the outset to indicate the general nature of the undertaking and the place of the first report in the over-all plan. Secondly, in this opening chapter, attention is drawn to the coverage of the bond estimates, to the difference between bonded debt and other debt, and to various other terminological distinctions that will be made throughout the study. A third section considers the general limitations of our estimates. The chapter concludes with a brief plan of the book from Chapter 2 on.

NATURE OF THE NATIONAL BUREAU STUDIES IN  
CORPORATE BOND FINANCING

The report in hand—*The Volume of Corporate Bond Financing since 1900*—presents aggregate statistics relating to new offerings, extinguishments, and outstandings of corporate bonds; and to total new defaults, default settlements, and outstandings in default. In addition it presents estimates of money flows to and from the corporate sector of the economy arising from transactions in corporate funded debt.

The basic debt series are expressed in par amounts. The par amount of an issue, sometimes referred to as its nominal or principal amount, is the dollar amount that the obligor contracts to pay at maturity; and the aggregate par amount of all issues outstanding is a measure of the total volume of corporate indebtedness on bond account. Owing to the close relationship among the par, market, and book values of corporate bonds, the series on the aggregate par value of outstandings may be used also as rough estimates of total market and book values.<sup>1</sup>

<sup>1</sup> Except in periods of unusual market disturbance or of particularly heavy defaults, the prices of most issues are close to par. Par amounts of outstand-

The series on the aggregate par amounts of offerings and extinguishments measure, respectively, the total volume of new debt originating in the form of corporate bonds and the total volume of old debt retirements. Other series, adjusted to a cash basis, indicate the gross proceeds of corporations from sale of corporate bonds and their gross payments at extinguishment.

In the first report the approach is comprehensive and general, and the only breakdowns given are by broad industry and size groups. For these broad groups, however, the estimates are given for intervals as short as the data permit: monthly for the basic series on funded debt and interest payments, and annually for all other series. Such material is the logical forerunner of the rest, since the universe estimates developed here are needed for the adjustment and interpretation of certain sample data on which the later, more detailed analyses will be based.

Here, and throughout the investigation, we utilize what may be called an integrated stock-flow technique. An example is the set of interrelated series on offerings, extinguishments, and outstandings. New bond offerings may be considered the gross flow into the "stock" of corporate bond outstandings, and bond extinguishments the gross flow out of this stock. With a view of obtaining estimates of the stock of outstandings, offerings and extinguishments are defined consistently so that the difference between them over a given period is the net change in outstandings for that period. Since we have benchmark estimates of outstandings, these net changes may be used to obtain intermediate estimates of outstandings. Estimates of other investigators are available for offerings and for outstandings, but these are not easily reconciled owing to differences in coverage and definition.<sup>2</sup> This is the first

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ings may be multiplied by price averages, which will be presented in a subsequent report, to obtain closer approximations to aggregate market values.

Most corporate and individual investors carry bonds on their books at par plus or minus small adjustments for bond premiums or discounts. Bond investments are carried in this way on the books of life insurance companies—which currently hold the largest volume of corporate bonds—if they are in the "amortizable" category (that is, are high grade and not in default); otherwise book values are adjusted downward toward market values. Statistics relating to defaulted bonds are given in Chapter 5; estimates of the volume of amortizable bonds will be presented in a later report.

<sup>2</sup> Appendix C describes the available estimates and compares them with

time that mutually consistent estimates of debt and money flows have been given for the corporate bond market.

Among the materials reserved for examination in a later report are detailed cross-classifications of sample data pertaining to outstandings and offerings, and selected averages of market prices and yields. Attention will there be focused on the volume and characteristics of key groups of quality bond issues (issues on the "legal lists" and those judged as high-grade by the rating agencies and the market) to which the large and growing demand for low-risk outlets for funds has given great importance. Another task will be to develop and analyze significant measures of corporate bond experience, such as default rates, loss rates, and promised and realized yields. In this connection also attention will be directed to the behavior of selected portfolios of quality bonds, as well as to bonds offered during business expansions and contractions and to those held over long and short periods. Such materials should throw light not only on the behavior of the capital markets generally, but on important special areas of investment experience. Thus, the long-period data will be relevant for various classes of investors, such as the large life insurance companies, who typically purchase bonds at offering and hold to extinguishment, while the breakdowns for shorter periods will be pertinent for smaller investors, who frequently trade in and out of the market.

#### COVERAGE OF THE DATA

Throughout the project the statistics presented will relate to domestic corporate bonds, i.e. corporate funded debt, a subgroup of all corporate long-term debt and of the still broader group of corporate debt as a whole. According to recent estimates, on January 1, 1951 slightly over two-thirds of net corporate long-term debt (excluding mortgage loans) and approximately three-eighths of all corporate debt (short-term and long-term debt, including mortgage loans) were in the form of corporate bonds.<sup>3</sup>

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the series being presented here. Details about our benchmark estimates of outstandings are included in Appendix B.

<sup>3</sup> Current figures on debt in bond form are from Chapter 6 and figures on corporate debt from the Department of Commerce (see *Survey of Current Business*, September 1951, for recent estimates, and *Indebtedness in the United States, 1929-41*, Department of Commerce, Economic Series No. 21,

The principal types of corporate long-term debt instruments other than corporate bonds are mortgage loans, term loans, and other notes payable with maturities of over one year. Corporate short-term debt includes accounts payable and notes with maturities of one year or less.

The coverage of our estimates is determined by a particular interpretation of the category "domestic corporate bonds." To be included in this category an issue must be (1) in "bond" form, (2) an obligation of a "domestic corporation," and (3) held by the "domestic investing public."

### *Bonds, Bond Issues, and Bond Offerings*

Financial practice as to what does or does not constitute a bond issue is quite loose, and so it has been necessary to define rather closely the terms to be employed. In our usage, a distinction is made between a bond and a bond issue, and between a bond issue and a bond offering. A *bond* is defined as an individual piece of a bond issue—usually with par value of a thousand dollars—running between the corporation and the bondholder. A *bond issue* is the entire group of such pieces that have common characteristics and rights. A *bond offering* or *flotation* is any part of a bond issue sold by the issuing corporation at a particular time.<sup>4</sup>

The common characteristics and rights that distinguish one corporate bond issue from another are usually set forth in the trust indenture, an agreement running between the obligor and

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1942, for estimating procedures). We exclude from the Commerce figure for net corporate debt the component "other short-term debt" (federal income tax liability and miscellaneous liability and accrual accounts). Neither our current estimates nor those of the Department of Commerce are as reliable as we would wish, ours being obtained by extrapolation beyond our basic data, and the Department of Commerce estimates from corporate balance sheets submitted to the Bureau of Internal Revenue for tax purposes after adjustment for underreporting and consolidations. Some support for the reasonableness of both sets of estimates is lent by the stability of the annual percentages of funded debt to total corporate long-term debt. Over the period 1917-51 such percentages ranged between 59.0 percent and 67.3 percent.

<sup>4</sup> In the literature, and in statistical compilations relating to corporate bond financing, bond offerings in our sense are sometimes referred to as issues. We have thought it best to distinguish between the two, since bonds of a single issue are frequently offered at different times.

a corporate trustee. Under the indenture the trustee is empowered to act in behalf of all bondholders jointly as beneficiaries. A bond, as distinguished from other debt instruments, is usually thought of as a long-term obligation, and as having a definite maturity date and coupon rate.<sup>5</sup> Under the usual bond contract, the obligor promises to pay periodically to the bondholder over the life of the bond an annuity stipulated by the coupon rate, and a lump-sum payment (the "principal" or "par" amount) at maturity. The foregoing may be summarized by defining a corporate bond as a long-term debt instrument running between the obligor and the bondholder, secured under a trust indenture, and having a definite coupon rate, maturity date, and principal amount. Although not all bonds have all of these features, the definition is sufficiently precise to cover practically all cases. It specifically excludes the following types of obligations:

(1) Real estate mortgage loans to households and business units, as distinct from mortgage bonds. (A mortgage loan has no corporate trustee and is usually evidenced by a single debt instrument rather than by a multiplicity of them such as characterizes a corporate bond issue.)

(2) All obligations maturing in less than one year from the date the loan is made. (Excluded under this heading are short-term notes payable, demand obligations, and securities renewable from year to year.)

(3) Term loans and other long-term notes payable, except as there is provision for a definite coupon rate, trust indenture, and corporate trustee. (This excludes most long-term bank loans, since usually they are made without provision for a trustee; on the other hand, many issues privately placed with insurance companies carry such a provision and are therefore included.)

<sup>5</sup> A few issues were excluded from our estimates because the maturity date or coupon rate was indefinite (not clearly stated). We did not require that the maturity date be finite or that the coupon rate be fixed. Perpetual bonds are rarely used in American corporation finance, but the few issues that occur are included. Similarly, the coupon rate may be "fixed-constant," e.g., 4 percent per annum throughout the life of the bond; "fixed-variable," e.g., 3 percent for the first five years and 4 percent thereafter; "contingent," e.g., up to 4 percent if earned; or some mixture of these, e.g., 2 percent fixed plus 2 percent if earned. All such issues are included.

(4) Non-interest-bearing securities and those not bearing interest in cash.

(5) Receivers' certificates.

### *Domestic Corporate Obligors*

The term "corporate obligor" is used loosely in our investigation to refer to any business enterprise issuing bonds, whether such an enterprise is incorporated in the strict legal sense or not. To qualify as a "domestic" corporate obligor, a firm must have been chartered by one of the forty-eight states, by the United States, or by the territory of Alaska or Hawaii. The distinction between incorporated and unincorporated businesses is unimportant for our analyses because enterprises of sufficient size to issue bonds are generally incorporated.<sup>6</sup> Obligations of the federal government and its agencies, of the states and their civil divisions, and of eleemosynary and other nonprofit institutions are excluded as "nonbusiness."

Corporate obligors are divided on the basis of their principal activity into the following three major industry groups: railroads, public utilities, and industrials. Real estate and financial concerns are excluded. The "rail" group includes steam railroads and industries serving such railroads (switching and terminal companies, tunnel and bridge companies, freight forwarders, etc.). Utilities include electric and gas, telephone and telegraph, street railway, and water companies, and miscellaneous others. Industrials are largely manufacturing concerns, but include also the service, trade, construction, and extractive industries. The service group includes certain enterprises, such as garages, hotels, and theatres, that are occasionally classified by other investigators in the real estate group, but it excludes apartment houses and office buildings when the operation, management, or leasing of such properties is the principal business of the obligor. Among the financial groups excluded, the principal ones as measured by the volume of their bond financing are investment trusts, sales finance companies, and acceptance and factoring houses.<sup>7</sup>

<sup>6</sup> We estimate, on the basis of a sample study, that between 95 and 99 percent of all obligors whose securities are included in our estimates are corporations, the remainder being partnerships, Massachusetts trusts, limited liability associations, etc.

<sup>7</sup> Our classification system for industrials is identical with that of the

*Bonds Held by Domestic Investors*

The investigation is intended to cover only bonds held by the private, domestic investing public. Strictly interpreted, that criterion would exclude all bonds held by governmental divisions and agencies at the various levels, domestic obligations held abroad, and bonds held within systems of affiliated corporations. Actually, however, it has been possible to exclude only bonds held by the federal government and its agencies. A rough correction for the volume of bonds held abroad was made by excluding issues or parts of issues of domestic obligors payable in a foreign currency (in most cases, sterling). Two corporations were considered to be affiliated if one owned 50 percent or more of the voting shares of the other, or if one corporation operated the other under leasehold. In such cases, bonds of the subsidiary (or lessor) held by the parent corporation, or bonds of the parent (or lessee) held by the subsidiary, were excluded as not being outstanding in the hands of the investing public.

Like most other debt statistics, the series developed in the corporate bond studies exclude bonds authorized but unissued, bonds redeemed but held alive in the treasury (treasury bonds), and bonds pledged under other issues. Our estimates for the rail group, however, fall short of the gross estimates prepared by the Interstate Commerce Commission, which include bonds "nominally issued" (pledged bonds or bonds certified by the trustee but not sold) and "nominally outstanding" (treasury bonds) as well as those actually held by the investing public. On the other hand, our statistics exceed the ICC net estimates,

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Central Statistical Board as given in *Standard Industrial Classification* (Washington, 1939), principal divisions A-E, and H, exclusive of "government." From our groupings their entire financial division (section F) is excluded, except for lessors of real property in the extractive, railroad, and public utility groups (their industry codes 7131-7134) and holding companies (codes 6611, 6621, and 6631), all of which are classified by us under the principal activity of the lessee or operating company. We divide their section G (transportation, communication, and other public utilities) into rails and public utilities. The rail group is essentially the same as that covered by the twelve classifications of the Interstate Commerce Commission: steam railways, classes I-III; switching and terminal companies, classes I-III; and the nonoperating subsidiaries of each of the six operating groups.



which exclude all rail bonds held by railroads whether on investment account or not.<sup>8</sup>

*Types of Issues Included in the Category "Domestic Corporate Bonds" and the Dominant Position of Fixed-Income, Single-Maturity Bonds*

The primary sources for the period 1900-1943, inclusive, mention some 36,000 debt issues, approximately 8,000 of which do not meet the above-described criteria of a domestic corporate bond: that it be an obligation of a domestic corporation, in bond form, and held by the domestic investing public. The remaining 28,005 issues that meet the definition may be classified into four groups as follows: (1) straight issues, (2) equipment obligations, (3) serial issues, and (4) income issues.

*Straight issues* are defined as fixed-income, single-maturity obligations, exclusive of equipment obligations. A small number of issues whose interest was partly fixed and partly contingent on earnings have been included also (see footnote 5).

*Equipment obligations* include equipment trust certificates issued under the Philadelphia and New York plans, and equipment notes secured by conditional sales agreements.<sup>9</sup> Equipment obligations are secured in most cases by the rolling stock of steam railroads (that is, by cars and locomotives for use on such railroads, whether owned by a railroad or an enterprise in some other industry group); less often by the rolling stock of street and interurban railways; and in scattered cases by steamboats, barges, etc.<sup>10</sup> Although a few equipment obligations fall due in

<sup>8</sup> Details on coverage of the different estimates for rail bonds are given in Appendix C.

<sup>9</sup> Under the Philadelphia plan, title to property securing the obligation rests with a trustee who leases it to the user, the title passing to the latter when the loan is repaid. Under the New York plan the obligor takes title to the property and executes a chattel mortgage upon it as security for the loan. In the usage common in railroad equipment financing, a shadow of the title under a conditional sales agreement rests with the obligor, but full title does not pass unconditionally until interest and principal are paid. Arthur Stone Dewing, in *Financial Policy of Corporations* (New York, third revised edition, 1934, p. 89), estimated that 97 percent of all equipment obligations outstanding as of January 1, 1934 had been issued under the Philadelphia plan.

<sup>10</sup> Equipment obligations have not been used so extensively in airline

a single lump sum, most mature serially. Obligations in the nature of trade credit given to manufacturers of equipment are excluded as not in bond form.

*Serial issues* include all those maturing regularly over time (usually annually or semiannually), with the exception of equipment obligations.<sup>11</sup>

*Income issues* are those whose coupon rates are entirely contingent upon earnings, sales, etc.

The breakdown by type of issue of the 28,005 corporate bond issues outstanding during the period studied (January 1, 1900 to January 1, 1944) is as follows:

TYPE OF ISSUE	Number of issues studied	Par amount offered (billions of dollars) <sup>12</sup>
All issues	28,005	\$89.9
Straight issues	21,189	77.5
Equipment obligations	2,267	4.4
Serial issues	3,886	5.8
Income issues	663	2.2

It is evident that straight corporate issues were the dominant type during 1900-1943, both in the total number of issues studied and in their total par amount.

The corporate bond records on which our investigation is based were originally compiled to throw light on the investment behavior of corporate bonds of the traditional type—that is, straight bonds—and relatively little information was collected on the three minor types of issues. Nevertheless the primary sources contained sufficient information to permit us to construct basic debt series (annual estimates of the volume of offerings, extinguishments,

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financing as by other transportation industries, possibly because of the risk to the lender of personal or property liability under the Uniform Aeronautics Act. (See *Airline Finance*, Bankers Trust Company, the Mutual Life Insurance Company of New York, the Chase National Bank of the City of New York, the New York Trust Company, p. 12.) The heavy equipment expenditures by airlines since the close of the period under study have been financed largely by debentures and to a lesser extent by term loans. The few early airline debentures are included in our data.

<sup>11</sup> A group of bonds secured under a single blanket mortgage but distinguishable, say, as series A, B, and C bonds, possibly with different maturities, is treated here as three separate straight issues. Typically such issues do not mature regularly over time.

<sup>12</sup> Includes amounts outstanding January 1, 1900.

net changes, and outstandings) for each type of issue and for issues of all types combined (see Appendix Tables A-1 through A-5). By comparing outstandings of straight bonds with outstandings of all types of issues (the all industries sections of Tables A-1 and A-2),<sup>13</sup> we found that straight corporate issues were by far the most important type in every year from 1900 through 1944, although their share in the total declined from 95 percent in 1900 to 90 percent in 1944 (Table 1). Changes in outstandings of the three minor types of issues combined to effect the decline. The principal developments in the statistical history of the minor types of obligations will be noted at this point, so that the remainder of the discussion may be focused on the behavior of straight bonds.

TABLE 1—Percentage Distribution of the Par Amount of Corporate Bond Outstandings by Type of Issue, 1900-1944 by Decades

(DOLLAR FIGURES IN MILLIONS)

YEAR	Straight	Equip- ment	Serial	Income	TOTAL	
					Percent	Amount
1900	95.1%	0.3%	0.2%	4.4%	100.0%	\$ 6,244.2
1910	93.9	1.7	2.1	2.3	100.0	14,880.4
1920	91.6	1.9	4.0	2.5	100.0	19,743.3
1930	90.8	3.9	3.2	2.1	100.0	29,964.7
1940	92.0	2.0	2.4	3.6	100.0	27,567.3
1944	89.8	2.6	3.2	4.4	100.0	25,387.4

During the first two decades of the century, the growth of serial bonds was mainly responsible for the drift away from straight bonds. Serial bonds are primarily industrials, as Table A-4 indicates. Over 50 percent of the increase in industrial outstandings in the second decade was in the form of serial issues, and by 1920 such issues accounted for 20 percent of total industrial funded debt. In the total of all types of corporate bond outstandings, however, serials have never amounted to more than 4.5 percent (their proportion in 1921).

The unimportance of the serial form in corporate bond financ-

<sup>13</sup> Appendix tables are numbered with a preceding letter to show the appendix in which they appear. Tables designated only by numerals will be found in the text.

ing seems particularly striking when compared with the widespread use of regular repayment schedules in the consumer credit field and of the amortized loan in the real estate mortgage field. Until lately, the serial form in bond financing has been used most frequently when the credit rating of the obligor was low. This was the case with industrial obligors in the second decade of the century, when offerings of serial bonds were proportionately heaviest. As the standing of industrial bonds improved during the twenties, many industrial corporations shifted away from serial bonds to straight bonds, usually with provision for a sinking fund.<sup>14</sup> The shift may have been encouraged by a small cost advantage in certain years when short-term interest rates were above long-term; but the principal reason for it appears to have been the inflexibility of the serial maturity schedule as compared with the greater flexibility of sinking fund arrangements attaching to single-maturity bonds. In practice, failure to meet any serial maturity payment constitutes an act of default, but failure to make a sinking fund payment rarely draws action against the obligor by the corporate trustee.

Railroad equipment obligations, little used before 1900, underwent a spectacular growth between 1920 and 1927 (cf. Table A-3), in which period they accounted for 53 percent of the increase in railroad outstandings. The impetus toward their use was given by the Railroad Administrator, who took such securities in exchange for equipment purchased for the railroads during the period of federal operation and subsequently resold them to the public. By 1927 equipment obligations comprised 10 percent of railroad funded debt, but less than 5 percent of the total funded debt of all industries combined. New offerings of railroad equipment obligations have continued to come to the market quite frequently, but in small amounts. These issues usually mature serially over a relatively short span (in most cases less than fifteen years), and consequently the total amount outstanding at any time has been relatively small.

<sup>14</sup> In recent years the serial form has become more important (cf. footnote 1 of the Introduction). It is interesting to note that much insurance company and bank lending to business is now done on the basis of serial loans and that this is ordinarily for the highest-grade risks. See *Term Lending to Business*, by Neil H. Jacoby and Raymond J. Saulnier (National Bureau of Economic Research, Financial Research Program, 1942).

It is interesting to observe that the highest proportion of income bonds outstanding (4.4 percent of the total of all issues; cf. Tables A-5 and A-1) was reached twice, at the beginning and at the close of the period studied, both times after deep depressions. Income bonds—the alternative title “adjustment bonds” describes the origin of these securities—have rarely been offered for new money, but have usually appeared in the settlement of claims against failed corporations. The relatively large volume of income bonds outstanding in 1900 was a carry-over from the large railroad reorganizations that followed the panics of 1873, 1884, and 1893.<sup>15</sup>

The absolute volume of income bond outstandings increased gradually through the twenties (though not so much but that their relative importance declined). The upward movement accelerated in the late thirties and early forties because of the large number of corporate reorganizations following the defaults of the thirties. The expansion in the volume of income bonds outstanding between 1932 and 1944 was greatest for the utilities and industries; income bond outstandings of the railroads did not expand markedly then, because many of the railroad defaults of the thirties had not yet been settled.

#### LIMITATIONS OF THE ESTIMATES

Like much financial information, the corporate bond statistics developed in our investigation are approximations obtained from partial or incomplete data. Appendix B gives details of the sources and procedures used. The basic debt estimates on offerings, extinguishments, and outstandings for each of the four types of issues were obtained from a catalog of all corporate bond issues appearing in the primary manuals. Ancillary estimates on the characteristics and investment behavior of straight bonds were recorded for all large issues (issues whose offerings amounted to \$5 million or more) and for a 10 percent sample of small issues. Even for the basic debt estimates—where we attempted to obtain universe coverage—certain information was unavailable for some issues. The sample material presented the same problem, and the further one of making assumptions and adjustments to raise the

<sup>15</sup> Atchison, Topeka and Santa Fe Railway Company adjustment gold 4's of 1995, offered in 1895, and Wabash Railroad Company income debenture 6's of 1939, offered in 1889, are examples of such early issues.

figures to universe totals. The resulting inaccuracies should not, in view of the richness of the data at our disposal, be of great practical significance, provided the materials are used with discretion. Particular cautions to be observed in interpreting some of the fine breakdowns will be noted in Appendix B and occasionally in the text.

In general, three types of errors must be considered in working with the bond materials: possible errors of omission or commission by the compilers of primary source materials; errors in transcription of data from the source materials; and errors of estimation associated with the raising of sample data to universe totals.

The effects of errors of the first type are not easily evaluated, although certain indirect checks have been made by comparing our estimates with those of other investigators (see Appendix C). Our general impression is that except for a few small issues missing, whose public significance would be slight, the primary sources are complete. Moreover, the size distribution of the par amounts of offerings and of extinguishments is such that the possible omission of even a fairly large number of small issues would have little effect on the aggregate estimates. In 1944, for example, large issues represented only 20 percent of the total number of issues but accounted for 79 percent of the par amount of outstandings. Our basic estimates on rail and public utility outstandings compare quite closely with other published materials. Unfortunately, suitable materials are not available for checking industrial outstandings, and it may well be that these estimates are somewhat too low for the decade 1900-1909. But industrial bond financing was of little importance before World War I, so that even a substantial amount of underreporting of industrials in the early years would have little effect on the accuracy of the estimates for all industries combined.

The transcription of data from the primary sources was subject to rigid controls, and we believe errors in that process were kept to the irreducible minimum. All transcription sheets were completely checked against alternative sources, and a random sample of 10 percent was given an additional check. Finally, the various records relating to the volume of offerings, extinguishments, outstandings, and defaults, which were originally transcribed in-

dependently, were reconciled by the National Bureau on an issue-by-issue basis before estimates were constructed.

The size of inferential errors arising from the use of sample data depends upon a number of factors: the size and representativeness of the sample of issues selected for detailed study, the nature of the estimating procedures used in raising the sample figures to universe totals, the completeness of the information obtainable on particular bond characteristics, and so on. As has been mentioned, the only sampling done was from small straight issues. Here, a representative sample was selected by arraying the card catalog of all straight issues by year of first offering, further arraying each annual group by year of maturity, and then pulling every tenth card. While the sample was found to cover almost exactly 10 percent of the total volume of straight bonds offered and extinguished in each major industry group during the whole period studied, the annual totals were less exact. As a matter of general procedure, therefore, sample amounts were adjusted by year and by major industry group to raise them to the basic universe estimates. The proportion of the universe of straight bonds covered by the sum of all large issues (par amount \$5 million and over) plus the 10 percent sample of small issues ranges from 68 percent of the aggregate par amount of straight bonds outstanding in 1900 to 92 percent in 1944 (cf. Chapter 2). The relative error in the estimates should therefore be small, although the size of the absolute error may be appreciable for some of the early years when the small issues constituted a larger part of the total than at other times.<sup>10</sup>

In order to avoid reading more into the data than is warranted by the specific information actually obtained from the sources, we have followed the general rule of setting up a category for "information-lacking" entries in most tables. (See, for example,

<sup>10</sup> The situation is substantially altered when it is the number of straight issues outstanding, rather than their aggregate par amount, that is under observation. Tables A-7 and A-8 show that of the 2,566 issues outstanding on January 1, 1900 only 310 or 12.1 percent were large issues. Although large issues had increased in number to 969 by January 1, 1944, they were still a minority (36.2 per cent) of all issues outstanding. One implication of this finding is that estimates derived from the 10 percent sample of the number of issues offered, extinguished, or outstanding are liable to considerably greater error than the estimates based on par amounts. For this reason, among others, we present very few estimates in terms of number of issues.

Table A-19 on nature of default and settlement.) The principal departure from this rule in the investigation so far has been in the construction of monthly series on offerings and extinguishments. Information on the amount of offerings and extinguishments, and on the year or quarter in which these transactions occurred, could usually be obtained from the primary sources. The month was given less frequently, and in monthly series the undated amounts were therefore apportioned over the quarter or year. In consequence, the annual estimates are usually more reliable than the quarterly, and the quarterly than the monthly. The monthly estimates are more reliable for years after 1910 than for earlier ones.

#### ORGANIZATION OF THE TEXT

Three broad topics occupy the rest of the text. Chapters 2 through 4 deal with various series on the aggregate par amount of straight corporate bonds; Chapter 5 deals with the par amount of straight corporate bonds in default; and Chapter 6 examines the money flows arising from transactions in straight corporate bonds and issues of other types.

In Chapter 2 the annual series on offerings, extinguishments, and outstandings are analyzed by major industry and size groups, and in Chapter 3 the various types of transactions included in offerings and extinguishments are presented. Chapter 4, based largely on quarterly and monthly data, considers the movements of the debt series over business cycles: in particular, the timing of their turning points, and their cyclical behavior as compared with general business activity and with other capital market data.

Chapter 5 is similar to Chapters 2 and 3 except that it concentrates on defaulted bonds. Interrelated series on new defaults, default settlements, and outstandings in default are developed and are analyzed with particular attention to the default and settlement experience of bonds in major industry and size groups.

Chapter 6, on money flows, is divided into two sections, the first dealing with estimates of cash proceeds and payments arising from capital transactions in corporate bonds, and the second with cash interest payments.

All of the supporting tables are brought together in Appendix A. Appendix B discusses the sources of data and the estimating



procedures used in deriving the basic estimates on total offerings, extinguishments, and outstandings. In Appendix C the estimates are compared with those of other investigators.

Brief summaries introducing each chapter, it is hoped, will prove a helpful guide in first reading and a convenience in locating areas of special interest.