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Volume Title: Trends and Cycles in Corporate Bond Financing

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Volume Publisher: UMI

Volume ISBN: 0-87014-352-2

Volume URL: <http://www.nber.org/books/hick52-1>

Publication Date: 1952

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Chapter URL: <http://www.nber.org/chapters/c3110>

Chapter pages in book: (p. 2 - 13)

estate groups, by government, and by eleemosynary and other non-profit-seeking organizations. Bonds held by government and by the issuing corporation are excluded also, as are domestic bonds payable in a foreign currency.

A corporate bond is a long-term, negotiable debt instrument running between the issuing corporation and the bondholder. The most popular type is a "straight" bond, which has a fixed coupon rate and single maturity date; such issues account for 90 to 95 percent of the total par amount for all types. Bond issues may also mature serially (serial bonds); interest payments may vary in some predetermined way with earnings (income bonds); or the issues may be offered explicitly for the purchase of such equipment as the rolling stock of railroads, street railways, etc. (equipment obligations); but these minor types of issues account in the aggregate for only 5 to 10 percent of the principal amount of bonded debt outstanding.

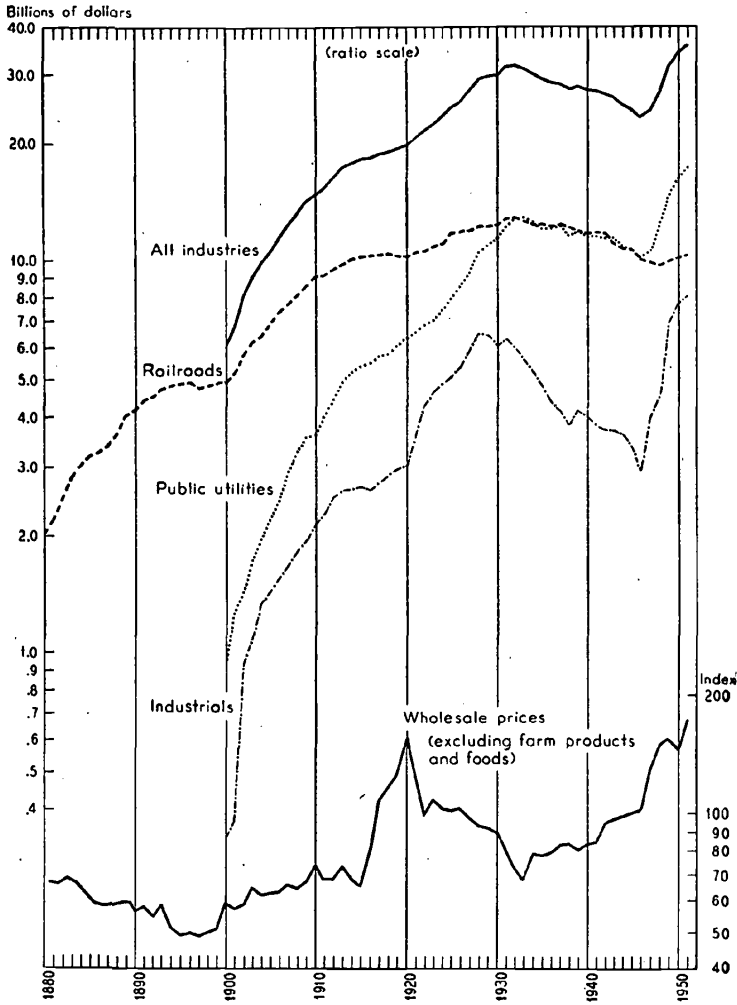
#### TRENDS IN CORPORATE BOND OUTSTANDINGS

Our special compilations of data on outstandings cover the period January 1900 – January 1944, and reasonably reliable extrapolations can be made backward to 1880 and forward to the beginning of 1951.<sup>2</sup> By piecing together these data, we find (Chart 1) that outstandings traced out a very simple trend over this seventy-year period. Since rail debt, which is the only part that can be shown before 1900, was such a large proportion of the total in the early years, we infer that the funded debt of all industries moved upward continuously from 1880 to 1895 with the rail debt, and, after a possible dip in the following year, again moved upward to 1900. The chart then shows a continuous increase from \$6 billion to a peak of \$32 billion at the beginning of 1932. Outstandings then turned downward, and except for a brief reversal in 1938 continued their fall to a trough of \$24 billion at the close of World War II. After that they shot upward, reaching an all-time high of about \$36 billion at the beginning of 1951.

Over the period 1900-1944, for which our data are complete,

<sup>2</sup> Except as otherwise noted, data on outstandings refer to the situation at the beginning of the year.

CHART 1 — Corporate Bond Outstandings by Major Industry Group, and Index of Wholesale Prices, 1880-1951



On the vertical scale, equal distances represent equal ratios of change.

Outstandings are January figures, par amount, and include issues of all types (see Table 1, Appendix). The price index, 1913-51, covers wholesale prices of commodities other than farm products and foods (Bureau of Labor Statistics, January prices, 1926 = 100). For earlier years, this index was estimated from movements in the BLS "all commodities" index.

the curve of total outstandings, and of each of the major industry components, described somewhat less than one full swing upward and downward, following patterns of long-term growth roughly similar to those observed in many other economic time series. An initial period of rapid growth was followed successively in each case by gradually retarded growth up to a peak and by mild contraction.

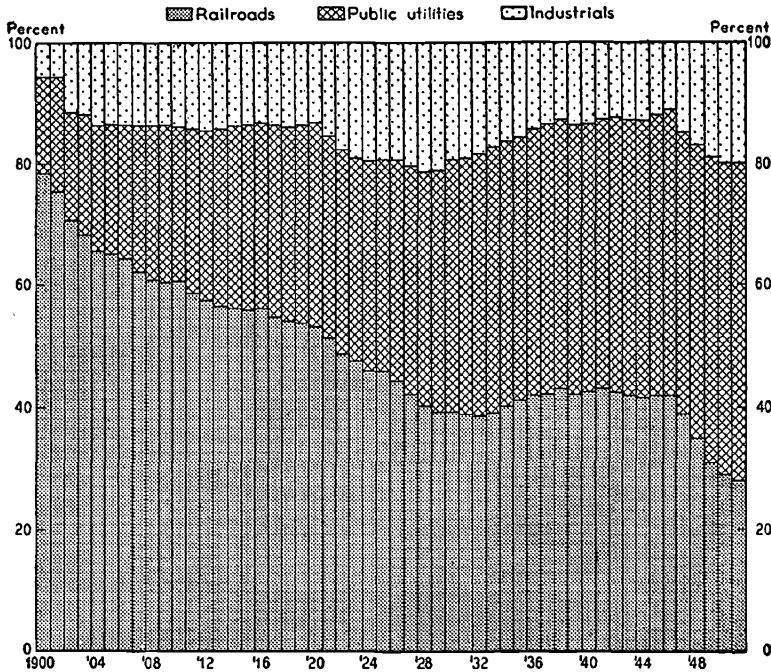
Over shorter periods within the years 1900-1944, bond outstandings behaved somewhat less regularly than this summary statement would indicate. But such movements against the trend as were observed were not sufficiently pronounced to disturb the underlying pattern. It is suggestive that the high growth rates that followed World War II were similar to those observed around the turn of the century. Moreover, these rates already show some signs of tapering off; but this does not necessarily mean, of course, that the past pattern of growth and retardation will be repeated.

Although no systematic attempt was made during the investigation to trace the effects of the many factors governing the broad movements in corporate bond outstandings, it is tempting to speculate about them in this summary statement. Among the factors that have clearly played an important role are: general economic and technological developments in industry; the increasing size of business concerns; fluctuations in the price level; corporate liquidity, earnings, and taxes; and the condition of the capital markets. It may be of interest to comment on each of these at least generally.

### *Industrial Development*

General industrial developments have had a pronounced effect on the capital requirements of business and hence on the volume and composition of outstanding obligations. Generally speaking, industries with relatively heavy fixed-capital requirements (those having high ratios of plant and equipment accounts to total assets) have been the most dependent on long-term financing. For example, during the present century the railroads have had ratios of fixed assets to total assets ranging closely around 90 percent, and ratios of book value of stocks and bonds to total assets ranging closely

CHART 2—Percentage Share of Major Industry Groups in Corporate Bond Outstandings, 1900-1951



Outstandings include straight issues only, January figures, par amount; from special tabulations to be presented in the book on which this paper is based.

around 70 percent.<sup>3</sup> Comparable ratios for the electric light and power industry are respectively 80 percent and 80 percent; for large manufacturing corporations, 60 percent and 60 percent; and for large trade, 45 percent and 55 percent.<sup>4</sup> Again speaking generally, industries with relatively heavy fixed-capital requirements have been the largest issuers of corporate bonds. Thus, until very

<sup>3</sup> As used here, "book value" includes the par value of bonds and of stocks having par value, and the stated value of no-par stocks. Proprietary reserves and surplus accounts are excluded.

<sup>4</sup> Data for railroads are from *Statistics of Railways*; for the private electric light and power industry from *U.S. Census of Electrical Industries*; for manufacturing and trade from sample data covering 84 large manufacturing corporations and 27 large trade corporations, collected by the National Bureau of Economic Research.

recently the ratio of the long-term debt of the railroads to their total assets has ranged narrowly around 40 percent. Approximately the same figure applies to the electric utilities, but the ratio stands at only about 10 percent for large manufacturing corporations and at about 2 percent for large trade.

It is clear, then, that those developments that have encouraged the expansion of industries with heavy fixed-capital requirements have also encouraged corporate bond financing. The railroads expanded rapidly between 1880 and 1900, and their funded debt expanded apace; at the beginning of the century, as Chart 2 shows, rail bonds accounted for nearly 80 percent of the total of all straight corporate bonds outstanding. By then the railroads were largely "in being," so that rail debt subsequently grew much less rapidly than that of the other industry groups, and now (in 1951) it accounts for only about one-quarter of total outstandings.

At the beginning of the century, public utilities (mostly street railways at that time) accounted for 16 percent of outstanding bonds, industrials making up but 5 percent. Like the rails, the public utilities are heavy users of fixed capital. Along with rapid technological developments in the electric light and power industry, and the expansion of street railway and telephone and telegraph systems, went an increasing use of the corporate bond as a device for capital financing. These developments were so rapid that public utility outstandings expanded over tenfold between 1900 and 1932, while for rails the increase was only twofold. And though public utility debt contracted slightly more rapidly than rail debt from then until the close of World War II, the postwar expansion was much greater. From 16 percent of total outstandings at the beginning of the century, the share of public utility bonds in corporate bonded debt has increased to more than 50 percent, the remainder being almost equally divided between rails and industrials.

### *Growth in Corporate Size*

The influence of growth in the size of corporations on outstandings is somewhat more difficult to trace statistically, principally because comprehensive data on size of firms and their indebtedness are not available for most of the period studied. Sample data for large and

small manufacturing concerns, however, collected by the National Bureau, suggest the effect of increasing size. During 1926-35 the large concerns (those with total assets exceeding \$10 million) had a ratio of aggregate funded debt to aggregate total assets of about 10 percent, while for the small concerns (with assets of less than \$250,000) the ratio was about 5 percent, so that an increase in average size seems to encourage the wider use of bond financing. Doubtless this is due in good part to the fact that large corporations generally have relatively heavier fixed-capital requirements than small concerns, and freer access to the organized securities markets.

Besides exerting a stimulating effect on outstandings, the growth in the size of corporations issuing bonds has brought about a rise in the average size of issue (Chart 3). Between 1900 and 1944 the average size of straight issues for the combined industries increased from \$2.3 million to \$8.5 million. Rail issues increased at an almost uniform rate over this period from an average size of \$3.0 million at the beginning to \$11.7 million at the end. The average utility issue ranged narrowly between \$1.0 million and \$1.5 million during the first two decades of the century but increased rapidly thereafter until it stood at \$8.1 million by 1944. Industrial issues had a somewhat more checkered history, with no systematic tendency for their size to increase until about 1940.

So far as we can determine, the principal factor underlying the rise in average size of issue was not simply a rise in the size of the productive unit per se but an increase in average size of enterprise through corporate consolidation. The effects of consolidation are most easily traced in the railroad field, where the funded debt of the merged roads was systematically refunded into large "blanket mortgage" issues, and in the public utility field in cases where large issues of holding companies replaced small issues of operating companies. The average size of industrial issues rose abruptly between 1900 and 1904 because of the formation of the giant trusts, many of which were financed largely by bond issues. When the trusts were dissolved, on the other hand, the large issues were exchanged for stocks and bonds of the operating companies, with the result that the average size of industrial issues shrank by 50 percent between 1904 and 1912.

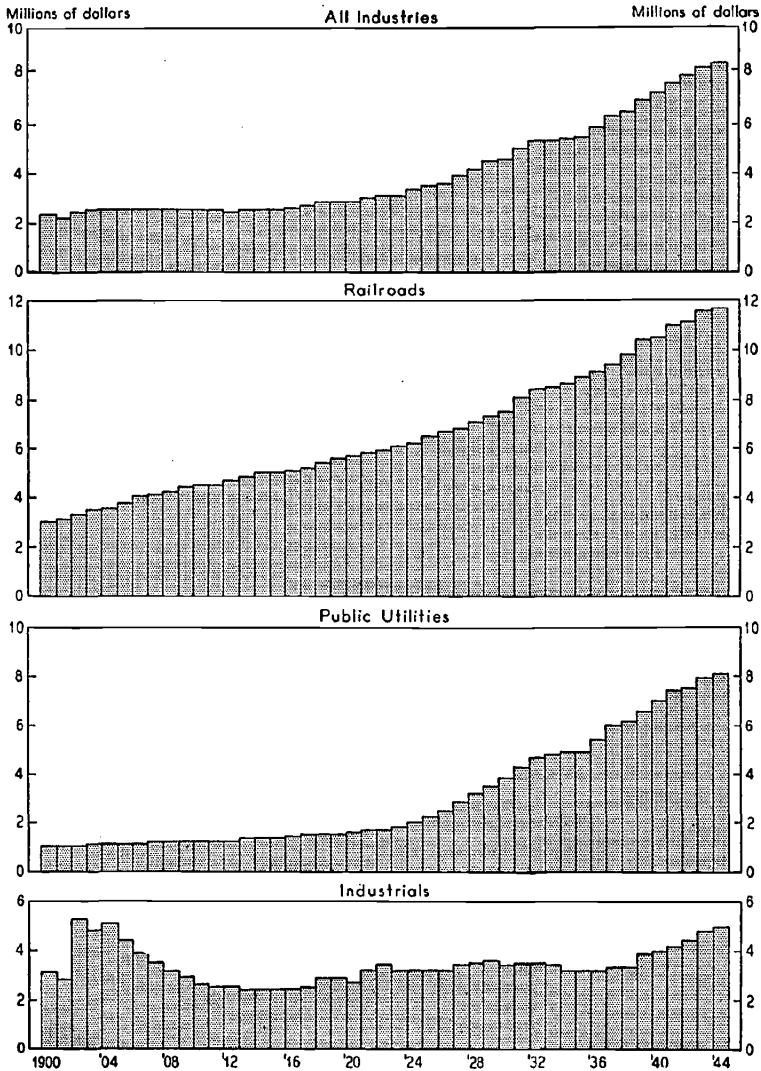
### *Price Level Changes*

In addition to their many other effects, prices have two direct effects on bond financing. Generally speaking, the higher the price level at the time of financing, the greater will be the volume of financing required by a given firm. Second, the higher the level of current prices, the lower the burden of past financing. No systematic attempt was made to eliminate these price influences from the series utilized in our investigation; certain technical problems, such as the selection of the correct price index and the complexity of an appropriate weighting system, make this unfeasible. However, an examination of the index of wholesale prices as given in Chart 1 shows that unadjusted dollar figures may be grossly misleading. For example, the dollar volume of corporate funded debt increased threefold between 1900 and 1920, but debt in real terms was about the same at the end of the period as it had been at the beginning. There were, of course, important changes within the period: debt in terms both of current and of constant dollars more than doubled by 1914; by 1920, though the current figures showed a further increase, debt in constant dollars had fallen back to its 1900 level. From 1920 until 1932 debt in current dollars increased by only 60 percent, but the increase in terms of constant dollars was much greater—250 percent—because of declines in the price level at the beginning and end of the period. Because of the rise in the price level after 1932, the contraction in constant dollar debt through the end of World War II was even sharper than in the current dollar figures. It is particularly suggestive that, notwithstanding the abrupt run-up in the dollar volume of outstandings after World War II, the deflated total in 1951 was about equal to that for such years as 1946, 1923, and 1910, and was less than half of the deflated dollar volume at the peak year, 1932.

### *Corporate Liquidity, Earnings, and Taxes Capital Market Conditions*

Along with other factors corporate earnings, corporate cash balances, tax considerations, and the condition of the equity market have had an important influence on corporate bond outstandings.

CHART 3 — Average Size of Corporate Bond Issues  
 Outstanding, by Major Industry Group, 1900-1944



Data are January figures, par amount, and include straight issues only; from special tabulations to be presented in the book on which this paper is based.

Throughout most of the period of secular expansion 1900-1932, cash balances appear to have been drained off by expanding inventories and trade credit, so that corporations necessarily resorted to the banking system for short-term funds and to the stock and bond markets for fixed-capital requirements. During the thirties the situation was reversed. In the industrial field, and to some extent among utilities as well, inventories and trade credit contracted, while capital programs were deferred; thus cash balances partly were used to repay debt obligations, and outstandings of all maturities declined.<sup>5</sup> At the same time, corporations hampered by comparatively heavy fixed charges and low cash throw-off from operations, for example many railroads and street railways, were unable to meet payments on their outstanding bonds. Many of these obligations were later settled by part payment in stock or by write-downs, which furthered the decline in bond outstandings.

Throughout World War II the net cash receipts of railroads expanded markedly, and again many railroads were able to retire debt. In other fields, expanding cash requirements induced by the war effort were met partly out of swollen cash balances inherited from the thirties, and partly through federal advances and prepayments to war contractors, deferral of tax liabilities, and increased retained earnings. When the enormous capital expansion programs got under way at the close of the war, the wartime sources proved inadequate, and corporations turned again to the capital markets. Small and medium-sized corporations had recourse to the banking system; large corporations financed themselves principally by direct placements of bond issues with financial intermediaries, thus causing bond outstandings to rise abruptly. The rise in corporate tax rates and the deductibility of interest charges in arriving at taxable income, the growing institutionalization of savings, the upward surge of commodity prices, and the relatively low level of stock prices as compared with bonds, all served to encourage bond and discourage stock financing during the postwar period.

<sup>5</sup> For a discussion of the banking side of this story, see Neil H. Jacoby and Raymond J. Saulnier, *Business Finance and Banking* (National Bureau of Economic Research, Financial Research Program, 1947) pp. 10-13.

THE POSITION OF CORPORATE FUNDED DEBT RELATIVE TO TOTAL DEBT: ELEMENTS OF STABILITY AND ELEMENTS OF CHANGE

Two things stand out clearly when one examines the position of corporate bonds relative to other types of debt (Chart 4). The first is the stability in the composition of private debt; the second is the enormous rise in the ratio of public to private debt.

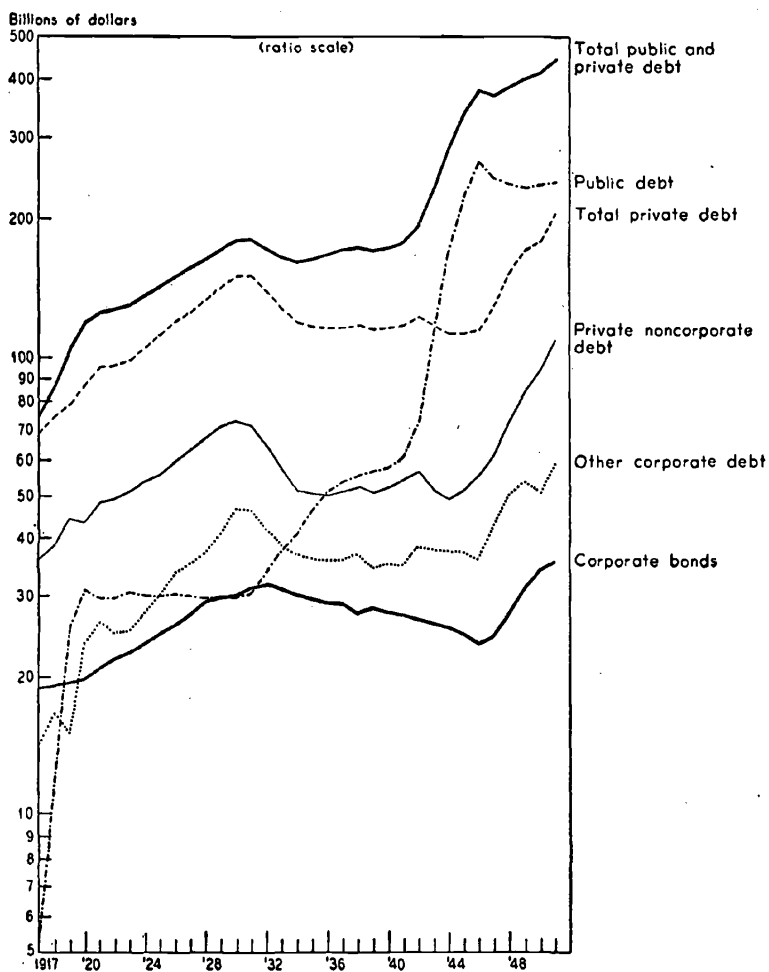
These observations are based on a comparison of our data with net debt estimates of the Department of Commerce. On the chart, total corporate debt is broken down into bonds and "other corporate debt," the latter covering short-term debt and such unfunded long-term items as direct mortgage loans, receivers' certificates, term loans, and other long-term notes to banks.<sup>6</sup> As the chart indicates, bonds and other corporate debt have moved similarly since 1917, the latter being slightly more volatile principally because of variations in short-term debt. With minor exceptions, the funded debt of railroad, public utility, and industrial corporations has usually accounted for about two-thirds of corporate long-term debt (not shown separately on the chart), and the latter has constituted a similar proportion of total corporate debt.

Rough stability is also exhibited in the relationship between corporate and private noncorporate debt. (In the private noncorporate category are included the debt of unincorporated business units, real estate mortgage debt of individuals, and consumer debt.) Before 1931 these two components of private debt were approximately equal, but from then until the close of World War II noncorporate debt was lower. In the postwar period this relationship was reversed, mainly because of the sharp rise in residential mortgages. Between the beginning of 1946 and the beginning of 1951, private noncorporate debt increased by 98 percent, corporate short-term debt by 73 percent, total corporate debt by 59 percent, and corporate bonds by only 52 percent.

In contrast with the relative stability of the various components

<sup>6</sup>The Department of Commerce estimates include, and our bond estimates exclude, the debt of financial and real estate corporations. Hence the difference — other corporate debt — covers, besides the items listed, an undetermined amount of bonds of the financial and real estate groups.

CHART 4—Total Debt of the American Economy,  
and Its Major Components, 1917-51



On the vertical scale, equal distances represent equal ratios of change.

All series other than corporate bonds are U. S. Department of Commerce estimates of net public and private debt after adjustment to exclude corporate reserves for taxes, dividends, etc. (*Survey of Current Business*, September 1945, p. 12, October 1950, pp. 9-15, and September 1951, pp. 20-24).

Corporate bonds are par amount of outstandings, January figures, including issues of all types (see Table 1, Appendix).

For note on "other corporate debt" see text footnote 6.

of private debt in most years, a marked shrinkage of private as against public debt characterizes the period covered by Chart 4. In 1917, corporate debt accounted for about 44 percent of total debt (public and private), and private noncorporate debt for about 48 percent, so that the private components together accounted for about 92 percent, and public debt for only 8 percent. Thereafter, except for a minor reversal in the twenties, the share of the public sector in total debt moved gradually upward until it stood at 34 percent just before World War II. In the years of heavy war financing by the federal government the share of the public sector increased much further, reaching its high point, 70 percent of total debt, at the close of the war. Since then a pronounced expansion in the dollar volume of private debt and a moderate contraction in public debt have lowered the share of public debt to 54 percent of the total (at the beginning of 1951).

The position of corporate bonds has also changed drastically. We estimate that they accounted for about 25 percent of total debt in the years immediately preceding World War I and for only 6 percent at the close of World War II. Since then, their share, like the shares of the other components of private debt, has expanded slightly. At the beginning of 1951 they accounted for about 8 percent of total debt.

#### RELATIONS BETWEEN BOND OFFERINGS AND EXTINGUISHMENTS

The volume of funded debt outstanding at any moment measures on the one hand the total indebtedness of business corporations arising from their past offerings of corporate bonds (less repayments), and on the other hand the volume of past savings held in this form by the investing public. To interpret the behavior of these "stock" figures, we must study the "flows" by which they are generated.

For this purpose the net and gross flows into and out of the "stock" of bond outstandings have been measured at various levels. Our basic gross estimates are monthly and annual series of total offerings (including bonds offered both for new-money purposes and for refunding old bonds), and of total extinguishments (including both bonds actually extinguished in an economic sense