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These findings contribute something to our understanding of the influence of the long-term rate of interest on the net flow of funds to industry through the bond market, and suggest some of the difficulties with monetary theories that posit a uniform and simple causal relationship between bond yields and bond financing. The relationship so far as it is observable in our data appears neither very simple nor very stable. Further evidence to this effect will be developed in the next section.

#### CYCLICAL FLUCTUATIONS IN CORPORATE BOND FINANCING

The series on corporate bond outstandings, although influenced by the business cycle, is dominated by trend movements. The business cycle affects more strongly the net change in outstandings and the related series on offerings and extinguishments.

Total offerings of corporate bonds and each of the two component series — bonds offered to refund other bonds, and bonds offered to raise new money — exhibit negative conformity to the business cycle. This means that as the pace of general business activity quickens, the volume of bonds offered in the market typically falls; contrariwise, as the pace of general business activity slackens, the volume of bonds offered typically rises. The same behavior characterizes the gross cash proceeds obtained by corporations from sale of bonds. On the other hand, total bond extinguishments, bond repayments (total extinguishments less refundings), and gross cash payments by corporations at extinguishment all show the reverse pattern of behavior. Typically they are positively conforming series, rising during business expansions and falling during business contractions.

The cyclical behavior of the net change in outstandings (which, as we have seen, may be interpreted either as the difference between total offerings and extinguishments or as the difference between new-money offerings and repayments) is governed by the behavior of its components. During business cycle expansions, offerings usually fall while extinguishments rise, so that the net changes in outstandings fall. Conversely, during business cycle contractions, offerings rise while extinguishments fall, so that the net changes in outstandings rise. The average cyclical pattern of the net change in

outstandings is exhibited in Chart 6.<sup>9</sup> Roughly the same pattern characterizes the net cash flow to the corporate sector of the economy from sale of corporate bonds. Thus, both net cash receipts and net par amount of bond financing are inverted with respect to the pace of general business activity.

These findings throw new light upon the familiar theory that "credit," in a generic sense, plays a dominant role in the business cycle. Clearly a distinction needs to be drawn between the various types of credit. Many types of financing — for example short-term and stock financing — appear to behave in the way theory would indicate; but bond financing runs a contrary course to other types and thus acts, so to speak, as a stabilizing force.

Some idea of the stabilizing role of the bond market during business cycles may be gained by comparing turning points in the bond and stock series with turning points in general business cycles. If we take a stand at the point in the general business cycle at which stock offerings turn upward, the financial process typically appears to unfold as follows. Soon after the upturn in stock offerings and while general business activity is still falling, the net changes in bond outstandings turn downward. The immediate cause is a rise in extinguishments, possibly induced by the repayment of some funded debt from the proceeds of stock offerings. Since certain corporations are still financing their capital programs via the bond market at this time, bond offerings continue to rise through early business expansion. As stock prices become increasingly attractive, corporations turn from bond to stock financing; bond offerings turn downward; and the net changes in bond outstandings continue to fall. These movements persist until a late stage in business expansion, when stock offerings and stock prices fall. In the next stage, proceeds from the stock market are no longer obtainable for the retirement of bonds; bond extinguishments turn downward; and the net volume of bond financing begins to rise. Bond offerings

<sup>9</sup> For a description of the derivation of such patterns, see Arthur F. Burns and Wesley C. Mitchell, *Measuring Business Cycles* (National Bureau of Economic Research, 1946). Essentially the method consists in removing the seasonal from the series, calculating the relative standing of the series at nine stages within each business cycle, and striking an average of the relative standings at each stage over all cycles covered by the series.

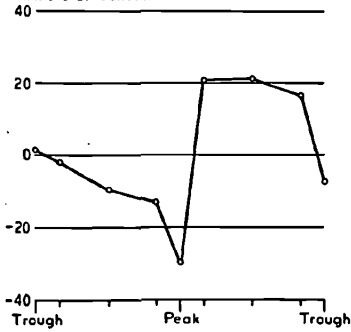
continue to fall, however, since the bond market moves sympathetically with the stock market at this point. Soon after the business peak, the bond market stabilizes, and bond offerings turn upward, thus reinforcing the rise of the net changes in outstandings. These movements continue until late in business contraction, when the stock market recovers. The entire process is then re-enacted during the next business cycle.

It will be observed from the preceding discussion that the stock market complements the bond market over business cycles. In our opinion, the strategic variable governing the relative volume of financing in these two markets is either the ratio of stock to bond prices or the level of stock prices alone. A comparison of the relevant lines on Chart 6 will show these relationships: When the ratio of stock to bond prices moves upward from one cycle stage to the next, the ratio of bond financing to stock offerings usually moves downward. And conversely, when the ratio of stock to bond prices moves downward, the ratio of bond financing to stock offerings moves upward. This finding, which is amply borne out by the evidence, may be explained on the basis of the differential costs of financing in the two markets. The significant point is that bond prices alone (or bond yields alone) appear to play a relatively minor role in this story. Indeed, during the cycle, corporations frequently borrow more heavily when bond yields are high than when bond yields are low. As the chart shows, bond prices and the net changes in outstandings move in the same direction during parts of the cycle, and in the opposite direction during others. Detailed study of monthly data reveals that the timing relationships can be viewed in either of two ways: (1) The net changes consistently lead the corresponding turns in bond prices by fairly long intervals; or (2) the net changes lag behind the opposite turns in bond prices, also by fairly long intervals. These complex timing relationships cannot be adequately explained, we believe, by any simple theory of the response of bond financing to bond yields, or without reference to the dominating influence of the stock market. In our view it is necessary to substitute a theory of differential money costs for a bond yield theory in order to account for the cyclical behavior of the bond market.

# CHART 6—Average Cyclical Patterns for Bonds and Stocks during Cycles in General Business Activity

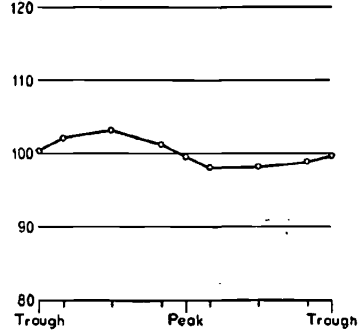
**Net Changes in Bond Outstandings, 1908-38**

Deviations from cycle averages (millions of dollars)



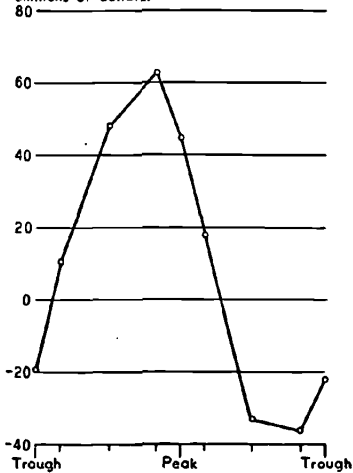
**Bond Prices, 1900-1933\*\***

Percent of cycle averages



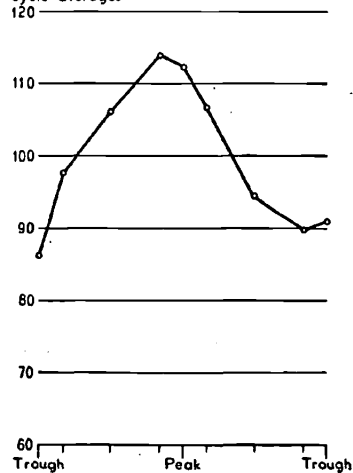
**Stock Offerings, 1908-38**

Deviations from cycle averages (millions of dollars)



**Stock Prices, 1900-1938**

Percent of cycle averages



\*For bond prices, the last two points in the pattern cover 1900-1927 adjusted to the level of the preceding point.

Index of common stock prices from Alfred Cowles 3rd and Associates, *Common-Stock Indexes* (Bloomington, Indiana, 1939); bond prices from inverted index of yields of high-grade corporate and municipal bonds, Standard and Poor's Corporation; stock offerings (including those for refunding purposes) United States, Canadian, and foreign from *Journal of Commerce*; net changes in bond outstandings from monthly data to be presented in the book on which this paper is based.

Much empirical research remains to be done before we can obtain a well-rounded picture of the behavior of money and credit during business cycles.<sup>10</sup> What, for example, happens to bank credit and short-term interest rates in each cycle stage, and what is the relationship of these factors to funded debt and equity funds? How are these various credit series influenced by the changing cash requirements of business corporations over the cycle? One may conjecture that as business expands, cash is absorbed increasingly into inventories and trade credit; that corporations replenish their depleted cash accounts through the banking system and the stock market; and that surplus funds obtained from these sources are used to retire funded debt. During business contractions, on the other hand, the stock market ceases to be an attractive source of funds; banks allow marginal loans to run off; and the gap is partially filled through the liquidation of inventories and trade credit and the flotation of bonds.

The foregoing analysis describes the typical behavior of bond financing during the cycles of the period 1900-1938. An important exception, however, occurred after the stock market collapse of 1929. At first the net volume of bond financing increased in the usual way, but in late 1931 the bond market broke badly as the result of a tightening of the money markets and a general deterioration of credit. The bond market therefore could not perform its typical contracyclic function at the business trough of 1932. During the next cycle, 1932-38, and on through the wartime cycle, 1938-46, bond financing again followed its typical pattern, moving downward during business expansions and upward during business contractions. During the following transitional cycle, 1946-49, however, the series again behaved atypically. Indeed, in that cycle the net volume of bond financing reached an all-time high in 1948 at the crest of the business expansion. The postwar experience raises important questions as to the applicability of the earlier relation-

<sup>10</sup> A contribution in this direction has recently been made by Ilse Mintz in *Deterioration in the Quality of Foreign Bonds Issued in the United States, 1920-1930* (National Bureau of Economic Research, 1951). Mrs. Mintz observed a complementary relation between flotations of foreign bonds and of domestic stocks in the cycles of the twenties.

ships to the economy of the future. Rising commodity prices and taxes, and the relatively low level of stock prices, we have seen, have all encouraged bond and discouraged stock financing since the war. Similar changes have affected the relationship between stock and bond financing in the past and may well affect it in the future.

#### AGGREGATE DEFAULT AND SETTLEMENT EXPERIENCE ON CORPORATE BOND INVESTMENTS

A corporate bond default is defined as the failure to pay principal or interest promptly when due. Comprehensive data on corporate bond defaults in major industry and size groups will be presented in the volume on which this paper is based. The series are of the interrelated "stock-flow" type used generally throughout the investigation. They provide annual estimates of the volume of bonds outstanding in default, of new defaults, of default settlements (bonds previously in default that were restored to good standing, extinguished through reorganization, etc.), and of the net change in outstanding defaults (new defaults less default settlements). Ancillary estimates are also provided for special categories of new defaults and settlements. More detailed breakdowns by minor industry groups and other classifications will be presented in a later monograph. Chart 7 gives the picture for all industries combined, and the discussion will bring in some of the differences between major industry groups.

Between 1900 and the onset of the Great Depression the aggregate volume of corporate bonds outstanding in default was quite small, both in absolute and in relative terms. During this period the average par amount of bonds outstanding in default was only \$0.4 billion or 2.7 percent of total outstandings. With the financial difficulties of the early thirties, outstanding defaults climbed rapidly to a peak level in 1936 of about \$4 billion or 15 percent of outstandings. Although there was a mild improvement in 1936-37, the situation again deteriorated and the amount outstanding in default in 1940 was about as large as in 1936. After that, default settlements generally exceeded new defaults, so that the volume of outstanding defaults declined.