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poses, shows that this series is rather highly correlated with the net change in outstandings. During the period studied, about five-eighths of the year-to-year variation in the net change in outstandings can be imputed to changes in new-money offerings and only about three-eighths to repayments. To put it differently, new-money offerings moved in the same direction as the net change in 33 of the 43 years for which our data can register the movements. It follows that a series on new-money offerings, such as that currently prepared by the *Commercial and Financial Chronicle,* may be of use as a rough indicator of the direction of change in outstandings until more precise statistics become available.

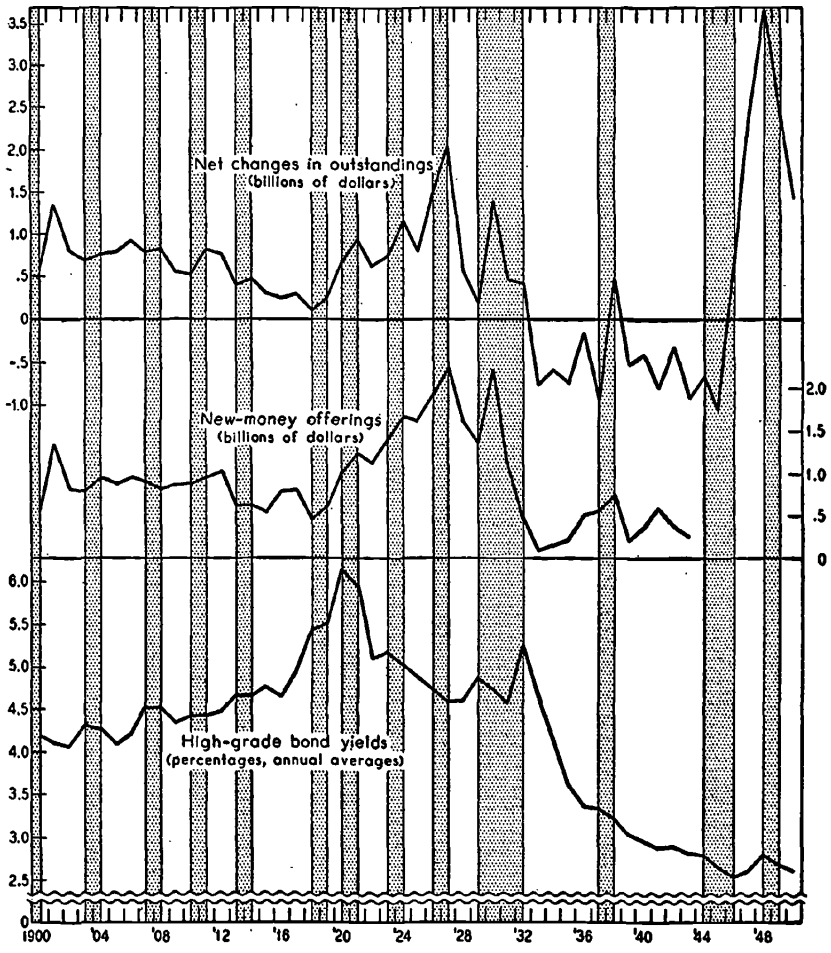
INTEREST RATES AND BOND FINANCING

The interrelated statistics developed in this study should prove useful in the analysis of the relationships between interest rates and bond financing. A preliminary examination of these matters, which is all that can be undertaken here, will suffice to show that the relationships are complicated, and to indicate some promising leads for further investigation.

Some of the basic data are presented in Chart 5, where high-grade bond yields are compared with the net changes in outstandings and with the closely related series on gross new-money offerings. In interpretation of this chart it is desirable to distinguish the long-run drifts in the series from the shorter ups and downs. At this point we shall concern ourselves mainly with the former; in the next section we take a look at the short-run movements.

To the extent that bond yields (the cost of long-term money) are effective regulators of the demand for bond financing, the higher the yield, the lower will be the net change in outstandings; and conversely, the lower the yield, the higher will be the net change in outstandings. The chart shows that between 1900 and 1920 the trend in bond yields was upward while that of both new-money offerings and the net changes in outstandings was on the whole downward. During 1920-32 bond yields moved sharply downward and then leveled off (rising sharply in 1931-32), while new-money offerings and net changes in outstandings first rose rapidly and then fell. From 1932 to 1945 bond yields declined

CHART 5 — Corporate Bonds: Net Changes in Outstandings, New-Money Offerings, and Yields, 1900-1950



Figures are for all industries combined (see Table 2, Appendix). The series of net changes in outstandings and for new-money offerings include straight bonds only, par amount. Yield series is a weighted average of Standard and Poor's Corporation high-grade railroad, public utility, and industrial bond yields, with National Bureau estimates of outstandings as weights.

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

almost continuously, while new-money offerings and net changes rose during 1933-38 and then declined irregularly. After World War II, yields moved moderately upward through 1948 and downward through 1950, while over the same years the net changes rose and fell enormously.

Although some of these movements suggest that interest rates operated to restrict the demand for long-term money, it is also true that corporations borrowed most in the twenties when interest rates were above average levels, and less in earlier and later periods when interest rates were lower. For the period 1900-1950 as a whole, it is evident that the relation between interest rates and bond financing was affected significantly by other strategic forces influencing the demand for long-term money. For example, in the period 1900-1920 stock prices were generally higher than they had been at most times in the late nineteenth century, so that the situation was conducive to stock rather than bond financing. Again, during World War I the bond market was controlled and this reinforced the effect of the rise in interest rates during the war. When control was lifted, bond yields rose rapidly, yet the decline in stock financing after 1919 induced a substantial advance in bond financing. During the twenties the upward trend in business activity, no doubt reinforced by the decline in bond yields, stimulated bond financing until 1927; but in 1927-29, while business activity continued upward, bond financing fell off abruptly as interest rates stiffened and stock financing boomed. In the depressed thirties, despite the low level of interest rates and of stock financing, bond financing was at an extremely low ebb. Finally, in the postwar years the upward trend of business activity, a corporate tax structure favoring bonds rather than stocks, and a relatively unfavorable market for new stock financing all contributed to the boom in bond financing.

A full-dress analysis of all factors affecting bond financing would carry us well beyond the scope of this paper. For the present we conclude simply that the observed long-run movements in bond yields were not in themselves sufficient to explain satisfactorily the observed movements in bond financing. This, of course, does not mean that bond yields play no role in determining the demand for

long-term money, nor does it establish that associated changes in money rates in other markets, or credit conditions in general, may not have far-reaching effects. Moreover, even if bond financing should, upon detailed investigation, prove to have been relatively insensitive to the rather moderate changes in bond yields that have occurred in the past, the possibility that large and rapid movements might have more pronounced effects should not be overlooked.

Data to be presented in the volume on which this paper is based indicate that a secular decline in interest rates may, in the long run, have a pronounced effect on bond financing. As interest rates decline, bonds rising above call price are successively refunded into lower yielding obligations. It follows that a secular decline in interest rates, such as occurred in the thirties, will ultimately lower the interest burden on debtor corporations, thus tending to increase profit margins and to encourage general corporate expansion. However, the process of refunding an appreciable portion of outstanding debt is a time-consuming one. We find, for example, that the impact of the downward revision of interest rates in the thirties was not fully felt until the postwar period of credit inflation.

Another implication of a secular decline in interest rates is that the associated reduction in debt burden may occur most promptly and be greatest for firms having the most favorable earnings records and prospects. In the late thirties, for instance, firms in the industrial and utility groups reduced their interest costs considerably while the railroads, partly because of their low credit standing and partly because many of their bonds were noncallable, effected only a slight reduction.

Finally, the results of a secular decline in interest rates must also be judged from the point of view of the investor. The downward adjustment of interest rates in the thirties and early forties reduced the burden of corporate funded debt, as measured by the ratio between interest actually paid and outstandings, from 4.6 percent in 1932 to 3.7 percent in 1943. This decline of nearly 20 percent in interest costs, while desirable from the point of view of the debtor corporation, represented an equal decline in the income received by corporate bond investors.

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