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## 2. Scope of the First Interest Rate Project

Our next step was to decide upon six specific studies in order to open up a number of different approaches to the problem of the determination of interest rates and to provide background for further work. In two of these we examine important but neglected sectors of the capital market: mortgages and direct placements. In two we study time series behavior: seasonal and cyclical movements. In two we study specific aspects of the linkage of markets: the term structure of rates and the new-outstanding yield spread on corporates. I will here outline briefly some of the reasons for choosing these areas of study; in the next section I will report on some of the findings in each area; and in the final section I will describe present plans for studies to be made in the next phase of the interest rate project.

One of the limitations of the simple interest rate model described above is its failure to recognize that there is no such thing as the interest rate. There is a whole host of interest rates, depending upon term to maturity, type of lender, risk of nonpayment, and many other features of the loan. Even when this is recognized, however, there is a tendency to think of interest rates chiefly in terms of the more widely quoted rates on outstanding public issues of corporate bonds, of United States government obligations, and of state and local issues. Mortgages and directly placed corporate debt are frequently overlooked in discussion of interest rates and their determination. One reason for this fact is that we know far too little about these markets, and another is that their quantitative importance is often inadequately recognized.

### *The Mortgage Market*

As Table 1 shows, mortgage debt in the United States amounted to \$252 billion at the end of 1962, compared with only \$100 billion

TABLE 1

*Long-Term Debt, Selected Items, 1948, 1962*

Type of Debt	Amount Outstanding		Increase in Amount	Per Cent Increase
	1948	1962		
	(billion dollars)			
State and local debt	24.8	84.5	59.7	241
Corporate bonds and notes	32.9	100.0	67.1	204
Mortgage debt (total)	56.2	251.6	195.4	348
1-4 family, nonfarm	[33.3]	[166.5]	133.2	400
Commercial and multifamily	[17.6]	[69.9]	52.3	299
Farm	[5.3]	[15.2]	9.9	187
Long-term federal and agency (net)	216.5	258.3	41.8	19

Source: Raymond W. Goldsmith and Robert E. Lipsey, *Studies in the National Balance Sheet of the United States*, Princeton University Press for National Bureau of Economic Research, 1963, Vol. I, and subsequent data compiled by Lipsey, using the same methods.

in total corporate long-term bonds and notes outstanding. Furthermore, mortgage debt had risen 348 per cent since 1948, compared with a rise of 204 per cent in corporate bonds. A more complete picture of data on changes in debt by various categories between 1954 and 1963 is shown in Chart 2.

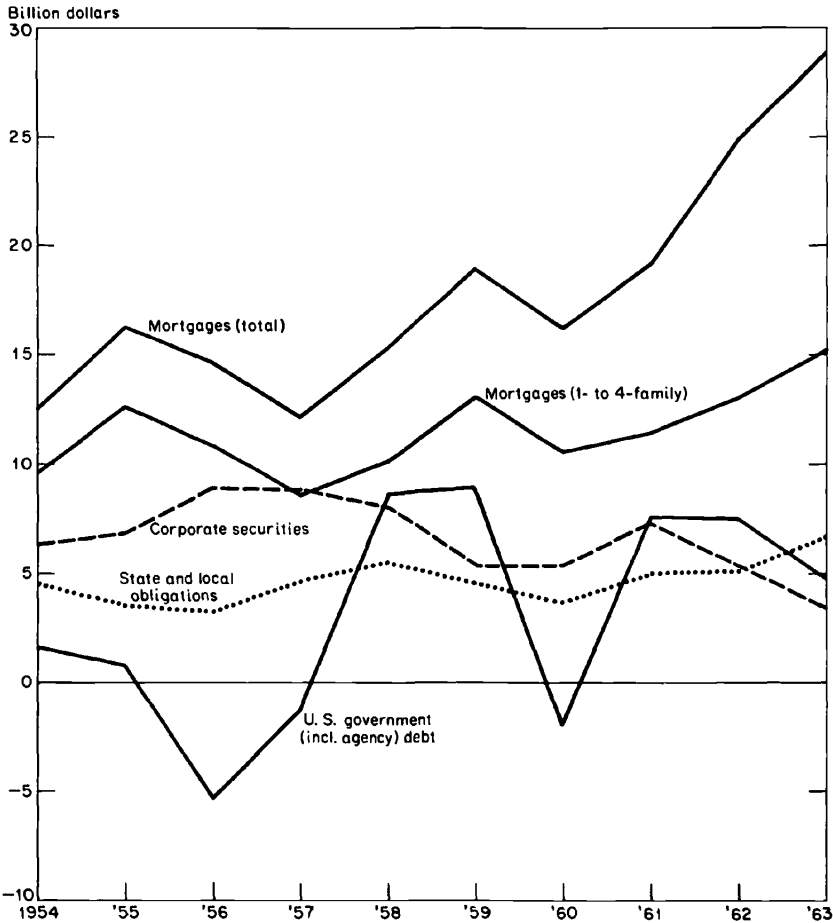
The mortgage market is of special interest for other reasons besides its size. This sector displays some of the clearest evidence of an influence of interest rates on economic activity. In this market direct controls have been repeatedly suggested and sometimes applied as an adjunct to monetary policy. Government activity here is substantial, including the programs of the Federal Housing Administration and Veterans Administration, as well as the activities of the Federal National Mortgage Association and other agencies. In this sector we can examine the effects of ceilings on contract interest rates, as in the case of FHA and VA programs.

With all its importance, we know disturbingly little about the mortgage market. Although a number of yield series have been published,

their coverage is limited and their reliability unknown. We need an independent study to check the reliability of existing series; we need series on new issues that give yields by commitment date rather than the date on which funds exchange hands (the lag ranges from one to eighteen months); we need monthly series on conventional mortgages as well as on FHA and VA mortgages; and we need series broken down by significant classifications in order that essentially

CHART 2

Annual Changes in Debt Outstanding, 1954-63



SOURCE: Federal Reserve Bulletins, Flow of Funds tables.

homogeneous mortgages may be used in any one series. We need to know more than we do about what the yield-determining variables are. Since such a study requires a prodigious amount of data gathering, a substantial portion of the resources of the initial project has been devoted to study of the mortgage market.

This study is being directed by Jack Guttentag, formerly of the Federal Reserve Bank of New York, now at the University of Pennsylvania. A major segment of the work, gathering data on residential mortgage yields, was under the direction of Morris Beck of Rutgers State University.

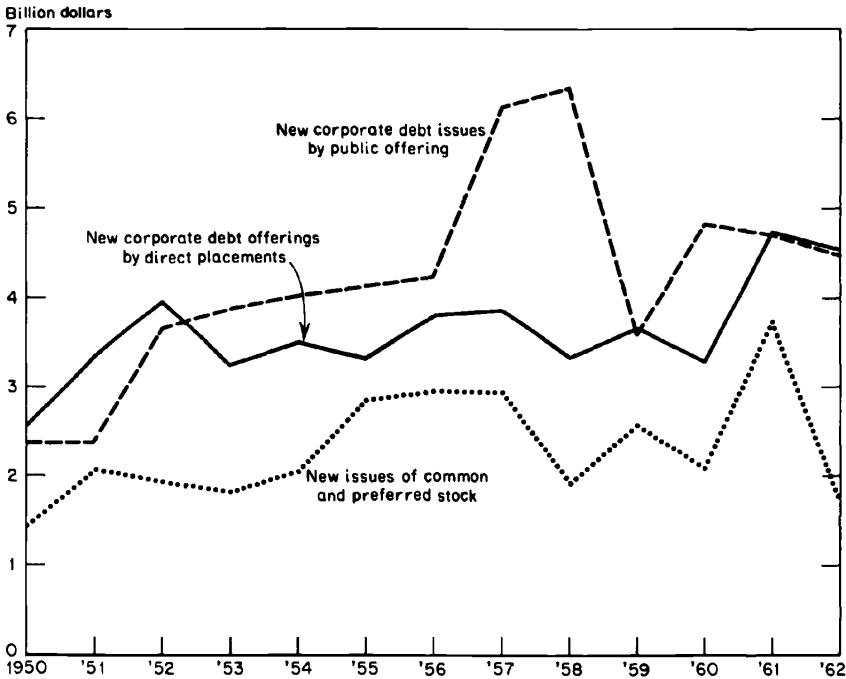
### *Direct Placements*

The second sector of the capital market that seemed to us especially in need of study is that in which corporate bonds are placed directly through negotiation between borrower and lender. As Chart 3 shows, this market is quantitatively extremely important. The volume of newly issued directly placed debt has averaged quite close to that of public offerings except in two or three years of the period shown. In every year of the fifties substantially larger amounts of new money were secured through this avenue than through all new equity issues including both common and preferred shares.

Yet even less is known about this market than is known about the mortgage market. A second major project, therefore, was an intensive study of direct placements. Its initial objective was to discover what are the most important yield-determining variables and to measure their importance as yield determinants.

This part of the study is obviously important in its own right as a contribution to the understanding of interest rate determination. But it is essential also as a basis for the preparation of time series of yields on direct placements. To be meaningful, each time series must pertain to homogeneous securities. But classification into homogeneous categories obviously requires the identification and quantification of yield-determining characteristics. Our second objective, therefore, was to employ the initial results in the preparation of a number of time series, one for each of various "quality" characteristics, just as Moody publishes series for Aaa, Aa, A, and other rating classes of publicly offered securities. The behavior of these series can then be studied in relation to that of yields on other financial assets.

## CHART 3

*New Long-Term Security Issues, 1950-62*

SOURCE: Securities and Exchange Commission, *Annual Reports*.

Our study of direct placements is being conducted by Avery B. Cohan, formerly active in government and business, and now professor of finance at the University of North Carolina.

*Seasonal Behavior*

Just as we decided upon two projects dealing with important but neglected sectors of the capital market, so we also decided to undertake studies of two aspects of the movement of yields over time. The first of these was the seasonal behavior of interest rates. Toward the end of the 1950's Frank E. Morris of the Investment Bankers Association and others were publishing evidence of a seasonal movement in certain interest rates. We decided to explore this behavior and its explanations for a number of reasons. In the first place, any cyclical

work by us or others should be based on correctly adjusted series if a true seasonal can be revealed. In the second place, a study of seasonal patterns should give significant clues regarding the factors determining levels of interest rates.

William H. Brown, Jr., of Swarthmore College is carrying on this study, with the assistance of Stanley Diller.<sup>1</sup>

### *Cyclical Behavior*

Cyclical movements of interest rates are so important, both because of their possible influence on other economic variables and as a source of clues toward understanding the determinants of interest rates, that the need for a study of this kind was clear. One indication of the importance of these movements is their amplitude. The average amplitude of cyclical movement (rise and fall) on three-month Treasury bills between October 1949 and February 1961 was 1.86 percentage points. The amplitude of yields on twenty-year Governments during the same period averaged about three-quarters of a percentage point, representing a price difference of about eleven points. The size of these yield changes may be better grasped if it is noted that the average peak yield on bills was 233 per cent of the average of yields at the preceding and following troughs; the corresponding figure for longs was 127 per cent.

The most important reasons for a cyclical study do not lie simply in the striking amplitude of cyclical movements in yields, but in the many ways by which cyclical analysis can cast light on the determinants of yields and on the interpretation of yield movements over periods of time longer or shorter than those associated with the business cycle.

This study is being conducted by Phillip Cagan of Brown University. Reuben A. Kessel of the University of Chicago has also examined certain aspects of the subject.

### *The Term Structure of Rates*

Our third pair of studies consists of two studies of the linkage of markets. The first of these, the term structure of interest rates, is funda-

<sup>1</sup> EDITOR'S NOTE: William Brown died on January 16, 1966.

mental to any analysis of interest rates. This is especially true because major contending theories about the term structure imply entirely different determinants of long-term rates. At one extreme, the unmodified expectations hypothesis implies that longs and shorts are perfect substitutes for one another, so that, with any given set of market expectations regarding future interest rates on shorts, no change in the mixture of short and long outstandings can influence the structure of rates. The opposite extreme suggests that longs and shorts are essentially different "goods," bought and sold by different buyers, with virtually no substitution among them. Hence, by this theory, the relative supplies of shorts and longs in the market will powerfully affect the term structure of rates. Thus any attempt to find the determinants of yields on bonds requires that we first cope with the problem of the determinants of the term structure.

The study of term structure is important not only because it is central to any interest theory but also in its own right both for government policy and for portfolio management. Its relevance for the latter is self-evident. Its relevance for policy is seen in relation to any program where debt management is proposed in order to influence the level of economic activity, or where monetary policy is conducted by trading in securities of different term. An important contemporary objective directly involving term structure is the government's desire for low long-term rates to encourage business at home together with high short-term rates in order to prevent the balance of payments consequences of short-term capital exports.

Reuben A. Kessel of the University of Chicago has carried out our major study of the term structure of interest rates. Jonathan Freudenthal and I, both of Swarthmore College, have conducted supplementary explorations.<sup>2</sup>

### *The Spread Between New and Seasoned Yields on Corporates*

The second study of linkage in markets is an examination of the yield differences between newly issued securities and seasoned issues of the same character. The size of this spread, as observed from published series such as those of Moody, give this question importance both for investment policy and because of the problem it presents regarding

<sup>2</sup> EDITOR'S NOTE: Jonathan Freudenthal died on March 16, 1966.



the efficiency of the capital market. If new and seasoned issues are essentially identical, it would seem that any difference between their yields implies imperfections in the capital market. Yet the published record seems to indicate that such spreads are often great. In June 1957, it equaled 90 basis points according to Moody data. In every month from April 1956 through December 1957, the investor could have obtained a higher yield on new Aa's than he could have received on seasoned A's, and his average gain by securing the higher grade bond would have been 33.5 basis points. Less dramatic but substantial new-outstanding yield spreads appear to have persisted most of the time through 1960. The purpose of this study was partly to find whether this yield spread is genuine, and partly to explain the determinants of any part that is found to be real.

The exploration of this question has been one of my responsibilities, but in connection with it Mark Frankena, student at Swarthmore College, has prepared a very useful study of the effect of coupon and call on corporate bond yields. Part of his work is summarized below.