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INTRODUCTION AND SUMMARY OF PRINCIPAL FINDINGS

THE TERM STRUCTURE of interest rates, i.e., the relationship between yields or internal rates of return and maturities of default-free securities, has been analyzed by what can be regarded as three independent theories. One that has had widespread appeal for theoretical economists has been called the expectations theory. According to this theory, long-term rates are an average of expected short-term rates; the holder of a long-term security will earn, on average, just as much as the holder of a series of short-term securities over any specified time interval. To illustrate: if one bought a one-year security today and another when the first matures, the expected return would be equal to the return that would have been obtained if a two-year security had been bought initially.

Another widely accepted theory, not necessarily inconsistent with the expectations hypothesis, is liquidity preference. This theory of the term structure of interest rates, which often is treated as a modification of the expectations hypothesis, rests on the postulates that (1) the risks associated with holding long maturities are greater than those of holding short maturities, (2) the community prefers to avoid risk, and (3) there are positive costs to society of obtaining the services of speculators. It implies that the expected yield to be derived from holding a two-year security is greater than that of holding a one-year security, or series of one-year securities, for identical periods of time. The greater risks associated with long-term securities imply that, on average, they yield more. This view, which has been associated with the name of Keynes, may be found in Hicks where it is linked with the expectations theory. Hicks treats the term structure of interest rates as being jointly determined by liquidity preference and expectations. Meiselman, in his

recent investigation, rejected the liquidity preference element of the Hicksian theory.

The third theory is based on the premise that the market for default-free securities is largely "segmented," i.e., that there is little or no switching among securities with different maturities by the large institutional buyers that dominate this market. To put the same point in somewhat different language, the cross elasticity of demand is low, possibly zero; securities of different maturities are poor substitutes for one another; what happens in the bill market has little or no relationship to what happens in the long-term bond market. This suggests that variations in inventories or stocks of securities by term to maturity produce variations in relative yields. Yields of short- and long-term securities need bear no necessary relationship to one another; yields of short maturities can either be greater or less than the yields of long maturities depending upon the inventories of each that are outstanding.

The first chapter of this study deals with the evidence relevant for examining the validity of these three hypotheses. The evidence bearing on the first two is quantitatively greater and can be interpreted more unambiguously than that for the market segmentation hypothesis. This chapter begins by explaining what the expectations hypothesis is. This is followed by an evaluation of the evidence developed by other investigators for and against this theory. Then the evidence produced as part of this investigation is presented. Finally, all of this data is evaluated insofar as it bears on all three theories.

In the second chapter market institutions are considered. An attempt is made to rationalize the existence of liquidity preference by examining the evidence on the costs of speculative services, assuming that the market prefers on balance to avoid risk.

The third chapter is a description of the behavior of interest rates for default-free securities over the cycle, particularly for the period since the end of World War II when data have been relatively plentiful. The business cycle is the unit for organizing, whenever possible, the data on yield variance, average yields, timing of peaks and troughs, and yield differentials as they are related to term to maturity.

The Hicksian theory of the term structure of interest rates is applied to the cyclical behavior of the term structure of rates in the fourth chapter. The first part represents a working out of the implications of the Hicksian theory. The latter part is expository; it illustrates the implications of the Hicksian theory for the term structure of interest rates at business peaks and troughs.

The principal finding of this investigation is that a combination of two hypotheses—liquidity preference and expectations—must be employed to interpret the term structure of interest rates. Taken by itself, the expectations hypothesis implies that forward rates are the spot rates expected by the market. Yet available evidence indicates that forward rates are high estimates of future spot rates. Hence it is difficult to interpret forward rates as expected rates. Similarly, liquidity preference alone implies that short rates ought always to be below long rates; this implication is contradicted by short rates above long rates, i.e., by the so-called “humped” yield curve. By interpreting forward rates as the sum of expected rates plus liquidity premiums, that is, by using both hypotheses, the rates expected by the market can be detected. Moreover, this more complex hypothesis explains both the bias in the estimates of a pure expectations hypothesis and short rates that are higher than long rates.

Correlations between forward and spot rates suggest that the market does have some power to foresee, up to a year in the future, spot rates from a month to a year to maturity. This same conclusion is reached if forward rates, adjusted for liquidity premiums, are used to predict subsequently observed spot rates, and if the mean square error is computed. Using either criterion, expectations seems to predict better than an inertia model.

The behavior of interest rates in the United States over the last century indicates that, relative to long-term rates, short-term rates are typically high about cyclical peaks and low at troughs; that is, they rise relatively during expansions and fall during contractions. Hence, the common belief that the shorter the term to maturity, the greater the cyclical variability in yields is, in general, correct.

Data reflecting the prices of government securities during the last forty years, and high-grade corporate securities during roughly the

same period, show that short maturities typically yield less than long maturities. On the average, yield curves have been positively sloped. Nevertheless, yield curves with negative slopes were not uncommon during the period from 1900 to 1930.

These observations of the cyclical behavior of the term structure of rates can be rationalized, assuming the market has some modest ability to predict the course of short-term rates over the cycle. High short-term relative to long-term rates—a characteristic of cyclical peaks—indicates that the market regards current short-term rates as abnormally high, and expects them to be lower in the future. Humped or declining yield curves imply that the market expects short-term rates to fall sharply. Low short-term relative to long-term rates—a characteristic of cyclical troughs—indicates that the market regards current short-term rates as abnormally low and expects them to be higher in the future. For at least the latest nine cycles, or since 1921, short-term rates for governments have been, on average over the full cycle, lower than long-term rates; this is a manifestation of the less than perfect substitutability of long- for short-term securities in the market. It can be explained by liquidity preference and the costs of providing the speculative services required to “convert” longs into shorts.