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CHAPTER 5

Summary and Conclusions

THERE IS COMPELLING evidence of the presence of repetitive seasonal movements in both long- and short-term interest rates in the years between 1955 and 1960. Outside this period, both before and after, the evidence is less conclusive, and certainly the seasonal movements are smaller. Nevertheless, a seasonal pattern apparently existed in most of the rates studied over a period substantially longer than the brief period of peak seasonality. This result is largely predicated on the demonstrated similarities among the seasonal patterns of the several rates, as well as the relative uniformity of the pattern for a given rate over an extended period. The study's primary focus is on the quality of the evidence for these conclusions.

The seasonal factors for short-term rates are found typically to decline from a relative high in January through the spring months to a trough in June and then sharply increase to September, from which they rise gradually to a peak in December. This pattern is conspicuous in the late fifties but occurs with some variation throughout the postwar period. The amplitudes, however, vary considerably, rising gradually after the early fifties through 1957 or 1958 and falling off quite rapidly thereafter. By 1965 the seasonal movement had all but vanished, although recent evidence not considered in this study indicates some resurgence in the seasonal.

The seasonal pattern for yields on bankers' acceptance is, perhaps, the most stable of those examined, although its amplitude is somewhat less than that of Treasury bill rates. During part of the period of peak seasonality, the amplitudes, that is the variation from seasonal high to seasonal low, exceeded 20 per cent of the level of the series. These amplitudes dropped sharply after 1959. By 1963, the seasonal pattern for bankers' acceptances virtually disappeared. The seasonal pattern for Treasury bills appears to have continued through 1965, the end of the study period, although its amplitude then was barely 2 per cent of the level of the series. The seasonal movement in commercial paper rates is far less stable and its amplitude smaller than those of the other two series.

While this study did not specifically evaluate the relation between seasonal amplitude and term to maturity, there is an obvious decline in both seasonal amplitude and the period over which there is a measurable seasonal factor, as the maturity of Treasury securities increases. The patterns of the seasonal factors of long-term rates are less stable than those of the short-term rates (except commercial paper) and have a much smaller amplitude. In the early fifties the pattern typically starts with a January low that falls to a trough in March, then rises to a plateau extending from June to October, before declining to an intermediate position for the last two months. The patterns for all the private long-term bonds are alike with respect to their midyear highs and January lows, the characteristic distinguishing these patterns from those of the same securities in the later period, as well as from the patterns of the short-term rates. Starting in 1955 the seasonal patterns of private long-term bond rates change—the January factors from lows to highs and the June and July factors from highs to lows. The troughs remain in March and April and the peaks in September and October. As in the case of the short-term rates the amplitude is greatest in the late fifties and tapers off thereafter. By 1965, the amplitude is very low and in some cases nonexistent.

While this evidence strongly supports the view that seasonality exists in the interest rate series, questions relating to the methods, as well as the desirability of adjusting the data for seasonal variations remain. In addition to the sampling problem of drawing from a hypothetically stable population (a common problem of empirical

economics), the estimation of seasonal factors must cope with the effects of a shifting population. That is, the seasonal factors for a given month estimated for different years differ not merely because of random fluctuations but also because the true value, apart from randomness, may itself be varying. The difficulty in empirical seasonal analysis is to distinguish the random from the systematic variation of the seasonal factors. While it is possible to devise tests of the significance of differences in estimated factors for nonoverlapping periods, a continuous reading of their accuracy from year to year is elusive. Visual comparisons of the adjusted with the nonadjusted data (or, correspondingly, the seasonal factors with the ratios-to-moving average) may help to determine whether the estimated seasonal component captures the systematic seasonal movements of the raw data. Unfortunately, this method ties the conclusions to the particular analyst and invites differences in judgment. Because of the subjectivity of this element, the study merely suggests the periods within which the factors are deemed relatively accurate.

While the similarity in the patterns of all the long-term rates considered is strong evidence of a seasonal element in the rates, the patterns themselves may not be sufficiently stable to warrant an attempt to eliminate this element. The question whether a seasonal pattern exists is distinct from the question whether the seasonal movement is sufficiently stable to justify seasonally adjusting the data and risking the introduction rather than the elimination of variation. It is often maintained that a seasonal pattern in long-term rates would not persist because of the profits available to those who would arbitrage the seasonality away by buying securities in periods of seasonally high rates and selling them when the rates are seasonally low. This argument is true only to the extent the seasonal amplitude is sufficient to cover the costs of arbitrage, including the risk that on any given occasion the cyclical, trend, or random components may swamp the seasonal effect, and to the extent the seasonal movement is sufficiently stable to make the arbitrage more than a mere speculation. The greater the importance of these two effects—swamping by other components of variation and instability from year to year—the greater will be the seasonal amplitude that will survive arbitrage. Municipal bond yields, for example, a series with a large irregular

component and an unstable seasonal component, has a relatively high seasonal amplitude.

The cause of the variation in seasonal amplitudes, the salient characteristic of the seasonals observed in this study, is a complex issue. At the risk of oversimplification this study considered the problem in the light of the supply of and demand for money. On the assumption that the seasonal variation in the demand for money is relatively constant from year to year, the change from year to year in the seasonal patterns for short-term interest rates would depend on that of the seasonal patterns for the supply of money. In years when the seasonal factor for, say, January in money outstanding is high the corresponding seasonal factor for interest rates would be low; and when the former is low the latter would be high. The observed relationship between the changing seasonal factors of money supply and short period interest rates is, indeed, inverse. Hence the data are consistent with the hypothesis that the rise in the amplitude of the seasonal variations in interest rates during the 1950's and its virtual disappearance during the 1960's is attributable to changes (in the opposite direction) in the seasonal movements in money supply. This inverse relationship is more conspicuous when allowance is made for seasonal movements in the quantity of bills outstanding, a finding consistent with the hypothesis that the Treasury made some attempt to benefit from the seasonal variation in interest rates. Failure to take account of this effect, which involves a change in demand in the same direction as the change in supply, obscures the relation between money supply and interest rates. When this change in demand is statistically nullified the full effect of the change in supply is observable.