

CHAPTER 3

DATA SOURCES

The empirical analysis in this paper uses both quarterly and annual data. The quarterly data span the 1953:2 to 1985:3 period. The annual data extend from 1872 to 1984. A detailed discussion of each variable used is contained in Appendix C. The following is a brief discussion of the data.

When calculating consumption growth, the National Income and Product Accounts (NIPA) quarterly consumption data are used. These data incorporate the 1985 revision in the National Accounts. The consumption data are in 1982 dollars and are seasonally adjusted¹ by the Department of Commerce.

There are numerous problems associated with the NIPA consumption data. Some of the components of consumption are omitted in the data collection. Another possible problem is the method of seasonal adjustment that the Bureau uses. The Census Method II X-11 deseasonalizes by applying a series of centered moving averages to the data. Unfortunately, important variation in the series may be smoothed away. The method may also over-correct for seasonality. The data

¹ When calculating the four quarter consumption growth, the not seasonally adjusted consumption data are used. The X-11 seasonal adjustment program that the Department of Commerce applies a number of centered moving averages to the data to extract the seasonal factors. These factors are allowed to vary through time. Hence, the annual rate of change in the seasonally adjusted data will not match the annual rate of change in the not seasonally adjusted data.

considered a proxy for true consumption. It is difficult to evaluate the quality of the proxy.

The NIPA divide the consumption data into three categories: durables, non-durables and services. The empirical work in the next sections uses the combined measure of non-durables and services. All variables are transformed into *per capita* terms with the Department of Commerce's population estimate.

The consumption data represent average consumption over the quarter.² If consumption decisions were made once a quarter and on the first day of the quarter, then it would be appropriate to use the interest rate for the first day of the quarter. Since the consumption data represent average consumption over the quarter, it seems more appropriate to use average interest rates in the analysis.³ In fact, the optimal averaging of the interest rate would exactly replicate the averaging of the consumption data. Since it is extremely difficult disentangle the consumption averaging process, simple averages have been imposed on the interest rate data. To test the sensitivity of the empirical work to the use of the average interest rate data, most of the results are replicated using spot interest rate data for the last day of the first month of the quarter.⁴

The bill and bond data are obtained from the Selected Interest Rates and

² Most of the Personal Consumption Expenditures on Non-Durables are sampled monthly from the Retail Trade Survey. Approximately 35% of the Personal Consumption Expenditures on Services are sampled annually and trended, 5–10% of the Services are sampled quarterly and 55–60% of the data is sampled monthly. The quarterly consumption numbers are a sum of the monthly data. The measure is best thought of as average consumption over the quarter.

³ The averaging problem has been considered by Christiano (1984), Breeden, Gibbons and Litzenberger (1985), Grossman, Melino and Shiller (1985), Hall (1985) and Litzenberger and Ronn (1986).

⁴ Data for the second week of the second month of the quarter would be a better mid-point but, unfortunately, these data were not available.

Bond Prices table of the *Federal Reserve Bulletin*. The data used are the yields on three month, six month and nine month Treasury bills and yields on one year Treasury bonds. The monthly data published by the Federal Reserve represent the average of daily closing bid yields of at least five dealers. All bills are quoted on a bank discount basis. The yields have been adjusted from bank discount to true yield throughout the analysis. The quarterly yield data are the arithmetic average of the monthly data. The spot interest rate data are an updated version of the data used by Fama (1984a,b).

The annual data originate from a number of sources. The early consumption data were collected by Kuznets (1961). As with the quarterly data, the annual consumption variable is the sum of non-durables and services. The data span from 1871 to 1929 and are in 1929 dollars. The Department of Commerce's consumption estimates are used from 1929 to 1984. The data are spliced at the common year, 1929, and are converted into *per capita* measures by dividing by the Department of Commerce's population estimate.

The yield data are mainly from Homer (1963), Macaulay (1938) and the Federal Reserve. A short-term interest rate is constructed by splicing yields on New York City 30 to 60 day Commercial Paper (1900–1919) with yields on 90 day Treasury bills (1920–1984). A longer term interest rate is constructed with a one year corporate bond yield found in the *Historical Statistics of the United States* (1900–1970) and some unpublished data from Scudder, Stevens and Clark (1971–1984). Since the risk of the long term instrument is greater than the short term instrument, a one year Treasury bond yield series is also used from 1953–1984.