

This PDF is a selection from an out-of-print volume from the National Bureau of Economic Research

Volume Title: Monetary Trends in the United States and United Kingdom: Their Relation to Income, Prices, and Interest Rates, 1867-197

Volume Author/Editor: Milton Friedman and Anna J. Schwartz

Volume Publisher: University of Chicago Press

Volume ISBN: 0-226-26409-2

Volume URL: <http://www.nber.org/books/frie82-2>

Publication Date: 1982

Chapter Title: The Basic Data

Chapter Author: Milton Friedman, Anna J. Schwartz

Chapter URL: <http://www.nber.org/chapters/c11404>

Chapter pages in book: (p. 98 - 137)

Our basic data are annual time series for (a) money, (b) income in current and constant prices, (c) prices, (d) short- and long-term interest rates, and (e) population. The United States money series before 1947 are our own estimates; the remaining time series are the work of other investigators, though we have occasionally revised their estimates for years for which they appeared defective. And, of course, we have supplemented the basic series with other data in analyzing particular problems. The basic series as well as a series for high-powered money are given in the appendix to this chapter (sec. 4.4), which also gives detailed references to sources. This chapter describes the series in general terms.

Since this book is about trends in money, the availability of the money series determined our starting point—1867 for the United States, 1871 for the United Kingdom. The United States income and implicit price series are available only since 1869; the time series for all the other basic data cover a longer period, so that in studying some relations not directly involving money we have been able to start earlier than 1867 for the United States and 1871 for the United Kingdom. We have taken 1975 as the terminal year for both countries.

Many historical time series decline in accuracy the further they extend into the past, but by no means all. When underlying statistics are adequate for early years, the margin of error of the final estimates may be no greater for those years than for later years. The difference in reliability between estimates for the nineteenth and twentieth centuries for a particular variable may well be less than between estimates for different variables—for example, estimates for interest rates and prices may well differ more in quality than the earlier and later segments of each series.

The rest of this chapter describes the salient features of each time series used, first for the United States, then for the United Kingdom, and finally for the United States and United Kingdom combined.

## 4.1 United States Data

### 4.1.1 Money

Our series is an annual average of the sum of currency and adjusted deposits, both demand and time, held by the public, excluding large negotiable certificates of deposit from 1961 on. Terms like “the stock of money” and “the quantity of money,” without additional modifiers, refer to this total. We have explained why we chose this definition in an earlier volume, which also explains in detail how the estimates were constructed.<sup>1</sup> The estimates are our own from 1867 through 1946 for deposits, 1942 for currency; Federal Reserve estimates are used thereafter. The annual estimates are averages of quarterly estimates before May 1907 and of monthly estimates thereafter, all seasonally adjusted. The basic quarterly estimates are single-day figures for the end-of-month; so are the basic monthly estimates through 1946; they are monthly averages of daily figures thereafter. All annual averages are centered on 30 June.

### 4.1.2 Income

Income, here and throughout this study unless otherwise specified, refers to annual estimates of net national product, variant III, component method, computed by Simon Kuznets, in current and 1929 prices, 1869–1947,<sup>2</sup> as revised by us for 1869–1909, 1917–19, and 1942–45. For 1948 and later years we used, for income in current prices, Department of Commerce net national product estimates multiplied by the ratio of the Kuznets estimates for 1947 to the Commerce estimates for that year, in order to adjust the Commerce series to the lower level of Kuznets’s net national product, current prices. For income in constant prices for 1948 and later years, we deflated the adjusted Commerce net national product estimates, 1948–75, by the Commerce price deflator implicit in net national product on a 1972 base, shifted to the base 1929, and then multiplied by the ratio of Kuznets’s implicit price deflator for 1947 to the Commerce deflator for that year to adjust to the level of the Kuznets series. We refer to net national product in current prices as nominal income; in 1929 prices, as real income or output.

In *A Monetary History*, we expressed agreement with Kuznets’s own reservations about the accuracy of his estimates for the initial decade he covered. Our doubts derived from the anomalous behavior of the nominal income estimates relative to the money stock estimates.<sup>3</sup> Since then,

1. M. Friedman and A. J. Schwartz, *Monetary Statistics of the United States*, chaps. 1 and 4.

2. From unpublished worksheets underlying his *Capital in the American Economy: Its Formation and Financing* (Princeton: Princeton University Press for NBER, 1961).

3. pp. 36–41.

Robert E. Gallman has produced revised estimates of some components of Kuznets's estimates of gross national product in current prices as a by-product of work undertaken principally to extend Kuznets's estimates backward to 1834–59.<sup>4</sup> Kuznets offers three statistical variants that differ in the size of the various flows to consumers. We adopted variant III, which ties in with Commerce commodity flow and service estimates in 1929. Gallman, however, worked only with variant I, which reflects the basic Kuznets estimates for 1869–1909.

One reason Kuznets was doubtful about the accuracy of the early estimates was that he feared that deficiencies of the 1869 Manufacturing Census made his 1869 GNP estimate too low and gave the rate of change of the series an upward bias. Gallman, however, concludes that the deficiencies of the ninth (1869) and tenth (1879) manufacturing censuses had insignificant effects on the aggregates. He made minor adjustments to the estimates of final flows of manufactured and unmanufactured commodities, which necessitated changes in estimates of services flowing to consumers (the estimates are based on benchmark ratios of consumer expenditures on services to consumer expenditures on commodities). He also revised Kuznets's estimates of manufactured producer durables and gross new construction. Gallman's gross new construction estimate differs markedly from Kuznets's figure in 1869 and less markedly in later benchmark years. He did not revise Kuznets's estimate of changes in claims against foreigners or changes in inventories, although he expressed the view that revision would be desirable. He did not comment on or revise Kuznets's estimate of capital consumption, since he confined his study to GNP.

Using Gallman's revised components and the Kuznets components Gallman left unrevised, we compiled revised net national product estimates, 1869–1909, in current and 1929 prices.<sup>5</sup> We have substituted these estimates for Kuznets's, though they are clearly interim revisions, subject to further improvement as the remaining unrevised components are reviewed by investigators.

For wartime periods, 1917–19 and 1942–45, we revised Kuznets's estimates because they are misleading for our purpose. He estimated the value of government services to consumers as equal to the amount of direct taxes paid, and he treated any excess of government spending over

4. Robert E. Gallman, "Gross National Product in the United States, 1834–1909," in *Output, Employment, and Productivity in the United States after 1800*, Studies in Income and Wealth, vol. 30 (Princeton: Princeton University Press for NBER, 1966), pp. 3–76. Gallman also presents estimates in 1860 prices.

5. We are grateful to Professor Gallman for making available to us his unpublished revised annual estimates, 1834–59 and 1869–1909. In addition to revised components in current prices, he also made available to us his estimates of flows of goods and services to consumers in 1929 prices. We deflated the remaining components in current prices, revised and unrevised, by the appropriate Kuznets implicit price deflators.

direct taxes plus government capital formation as measuring intermediate services already incorporated in the value of marketable output. However good or bad an approximation this may be in peacetime to the puzzling problem of how to classify government expenditures, it seems clearly inappropriate for wartime. Its effect is to omit wartime spending from the national income on the specious ground that the services rendered are included elsewhere. John W. Kendrick adjusted Kuznets's estimates from 1889 on by adding national security outlays to obtain what he calls the "national security version" of net national product.<sup>6</sup> We used Kendrick's "national security version" in current prices as an interpolator of Kuznets's estimates. Values of Kuznets's net national product, current prices, were interpolated along a logarithmic straight line connecting the estimates for 1916 and 1920 and also along a logarithmic straight line connecting the estimates for 1941 and 1946. To these trend values for 1917, 1918, and 1919 and for 1942, 1943, 1944, and 1945, we added the difference between the logarithms of actual values of Kendrick's national security version and the corresponding trend values for Kendrick's series. The antilogs are the revised estimates in current prices. For 1916–20 these estimates were deflated by Kuznets's implicit price deflator for wartime years to get estimates in 1929 prices. For 1943–46 we deflated the estimates by a revised version of Kuznets's implicit price deflator described below in the section 4.1.3, on prices.

#### 4.1.3 Prices

In order to have a consistent triplet of income in current prices, income in constant prices, and prices, we use the implicit price index obtained by dividing national product in current prices by national product in 1929 prices. These series are described in the preceding section.

The behavior of measured prices in the United States during World War II and also from 1971 to 1974 is distorted by the effects of price control, since price control meant that price increases took indirect and concealed forms not recorded in the indexes. The large rise in price indexes when price control was repealed in 1946 consisted largely of an unveiling of the earlier concealed increases. Hence the recorded price indexes understate the price rise during the war and overstate the price rise after the war. This defect is reflected in the national income estimates in an overestimate of the wartime rise in income in constant prices, and hence an underestimate of the wartime rise in the implicit price index. Similar defects are present in the recorded indexes for 1971 to 1974.

6. See his *Productivity Trends in the United States* (Princeton: Princeton University Press for NBER, 1961), 235 ff. His table A-1, col. 7, pp. 290–92, shows the national security version in 1929 dollars; we obtained figures in current dollars from Kendrick's unpublished worksheets.

To correct, at least to some extent, for this distortion, we made independent estimates of the implicit price index for the four years 1943 through 1946 and for the period from the third quarter of 1971 to the second quarter of 1974 by interpolating between prior and succeeding values primarily on the basis of movements in nominal income. We use these estimates throughout this book, though we fully recognize that they are at best a crude approximation.

We have used this procedure because other indirect techniques for correcting the distortion that we experimented with, particularly for the United States for World War II, proved notably unsuccessful.<sup>7</sup> Accordingly, we decided instead to interpolate price indexes for the period in question by using a related series and the method of interpolation developed in constructing our money series.<sup>8</sup> Nominal income is the obvious candidate for the related series, since changes in the logarithm of nominal income equal the change in the logarithm of prices plus the change in the logarithm of output, so there must be a close relation between movements in nominal income and in prices. This procedure has the defect that the measures of nominal income are also affected by price control. The concealment of transactions at above legal prices and the omission of black market transactions presumably produced underestimates of nominal income during the years of price control that varied in size from year to year. However, the error in nominal income is presumably smaller than in the reported price index. We describe separately the estimates for the wartime period and the postwar period.

### *World War II*

The procedure involves first interpolating both the logarithm of nominal income and the logarithm of the implicit price index along a straight line between their reported values for 1942 and 1947, then computing the deviation of the logarithm of nominal income from the interpolated values for 1943 through 1946, multiplying the deviations by factors designed to convert them to estimates of the deviation of the logarithm of the price index, adding the price deviations to the interpolated values for prices, and finally taking antilogs of the sum.

To estimate the conversion factors, we used the relation between such deviations from trend for 1914-42 and 1947-65, when price control was

7. One indirect technique that initially seemed promising was to use the average denomination of currency or the average denomination of checks as a proxy for the price level. However, exploration of this technique gave disappointing results. See John J. Klein, "German Money and Prices, 1932-44," in *Studies in the Quantity Theory of Money*, ed. M. Friedman (Chicago: University of Chicago Press, 1956), pp. 142-46; "Price-Level and Money-Denomination Movements," *Journal of Political Economy* 68 (August 1960): 369-78.

8. M. Friedman, *The Interpolation of Time Series by Related Series*, Technical Paper 16 (New York: NBER, 1962).

not in effect. For overlapping five-year intervals (to correspond to the five-year interval, 1942-47), 1914-19, 1915-20, 1916-21, through 1934-39; and 1947-52, 1948-53, through 1960-65, we computed the difference between the logarithms of implicit prices and the logarithm obtained by linear interpolation between the initial and terminal year of each five-year interval. We computed a similar set of logarithmic differences for nominal income.

We thus had pairs of deviations from trend values for implicit prices and nominal income for each of the four central years of each overlapping five-year interval. We then computed two sets of regressions of the deviations of prices on the deviations of nominal income, one for the prewar years and one for the postwar years. Each set consisted of separate regressions for the first, second, third, and fourth of the four central years, for the pooled first and fourth of the four central years (since each of the deviations was only one year distant from an actual value), and for the pooled second and third of the four central years (since each of those years was two years distant from an actual value). Table 4.1 records the slopes of the regressions and adjusted  $R^2$ .

There is a considerable difference between the pre- and postwar price regressions. The postwar correlations are lower because there is much

**Table 4.1** Statistics from Regressions of United States Prices (P) on Nominal Income (Y) Expressed as Deviations from Five-Year Trends, by Groups of Ordered Years within Trend Periods: World War I and Interwar, Post-World War II, and Full Period (Standard Errors in Parentheses)

Group Number	1914-39		1947-65		1914-65	
	Adjusted $R^2$	$b$	Adjusted $R^2$	$b$	Adjusted $R^2$	$b$
1	.66	.4473 (.071)	.37	.2697 (.092)	.65	.4342 (.054)
2	.72	.4131 (.008)	.38	.2715 (.090)	.71	.4095 (.044)
3	.75	.3992 (.010)	.29	.2507 (.100)	.74	.3980 (.040)
4	.68	.4203 (.007)	-.02	.0820 (.092)	.67	.4133 (.050)
<i>Pooled Groups</i>						
1, 4	.68	.4325 (.006)	.27	.2147 (.065)	.66	.4240 (.036)
2, 3	.74	.4062 (.010)	.37	.2630 (.064)	.73	.4037 (.030)
1, 2, 3, 4	.72	.4150 (.028)	.34	.2432 (.045)	.71	.4105 (.022)

less variability. As a result, the two regression coefficients of price on nominal income and nominal income on price differ much more for the postwar period than for the prewar period. A scatter diagram of the price deviations on the nominal income deviations for the two middle years of the overlapping five year intervals shows that the postwar points are concentrated around the origin and are not out of line with the points for the earlier period (see chart 4.1). Because the postwar points are limited in variability, they give little information on the slope. If the prewar and postwar periods are pooled, the slopes are not much changed from the prewar figures (table 4.1). Moreover, the deviations for 1943–46 that are to be interpolated are all outside the range of the post-1947 observations.

We therefore concluded that the slopes for the prewar period are more relevant to the years to be interpolated than the slopes for the postwar period, and that pooling the data for both periods would not change the estimates much but would make them less reliable. As anticipated, the slopes for groups 1 and 4 do not differ significantly, and neither do the slopes for groups 2 and 3, whereas the slope for the pooled group 1 and 4 is on the borderline of differing significantly from the slope for the pooled group 2 and 3. Accordingly, we used the pooled slopes for these two groups from the period 1914–39 as our conversion factors. Table 4.2 shows the final estimates and how they were computed and compares them with the reported price figures. The adjustment clearly makes an appreciable difference.

Because of our reservations about the adjusted price series as well as the different economic circumstances during World Wars I and II, we frequently present separate results excluding the wartime and immediately postwar years.

#### *United States 1971–74*

One further episode of price control in the United States occurred during the nine quarters from 1971:3 through 1973:3. To correct for the resulting understatement of price movements, we initially corrected the quarterly Commerce net national product implicit deflator on a 1972 base that is the counterpart of the annual series underlying our post-1947 data. We started with 1971:2, the quarter before price controls were introduced, and ended with 1974:3, to allow for the unwinding of the effects of controls. Since 1974:1, 1974:2, and 1974:3 were also affected by the OPEC price rise, we decided provisionally to eliminate that influence on the price level so that only price decontrol effects would be present. On the assumption that the OPEC price hike was equivalent to a 1.5 percent decrease in real GNP—this being the amount of the extra cost of imported oil—and that the effect was produced evenly during the first three quarters of 1974, we adjusted the reported price indexes for 1974:1 by

dividing by 1.005, for 1974:2 by dividing by 1.010, and for 1974:3 by dividing by 1.015.

We then applied our usual method of interpolation, first obtaining the deviations of the logs of reported nominal net national product from the straight-line values interpolated between the 1971:2 and 1974:3 logs of nominal net national product, and multiplying the deviations by .41, the conversion factor shown in table 4.2, column 4, for central years. We then added the deviations so adjusted to the straight-line trend values interpolated between the 1971:2 log of the price index and the 1974:3 adjusted log. After obtaining the antilogs, we multiplied the result for 1974:1 by 1.005, for 1974:2, by 1.010, and for 1974:3, by 1.015, to restore the effect of the OPEC price rise. To obtain quarterly corrected real income estimates, we subtracted the logs of the corrected price indexes from the logs of reported nominal net national product. Table 4.3 shows the reported and corrected price and real income figures.

We corrected our annual estimates of the price deflator and real income by multiplying the reported figures by the respective annual averages of the quarterly ratios of the corrected to the reported data. Table 4.4 shows the original and the corrected annual estimates.<sup>9</sup>

#### 4.1.4 Interest Rates

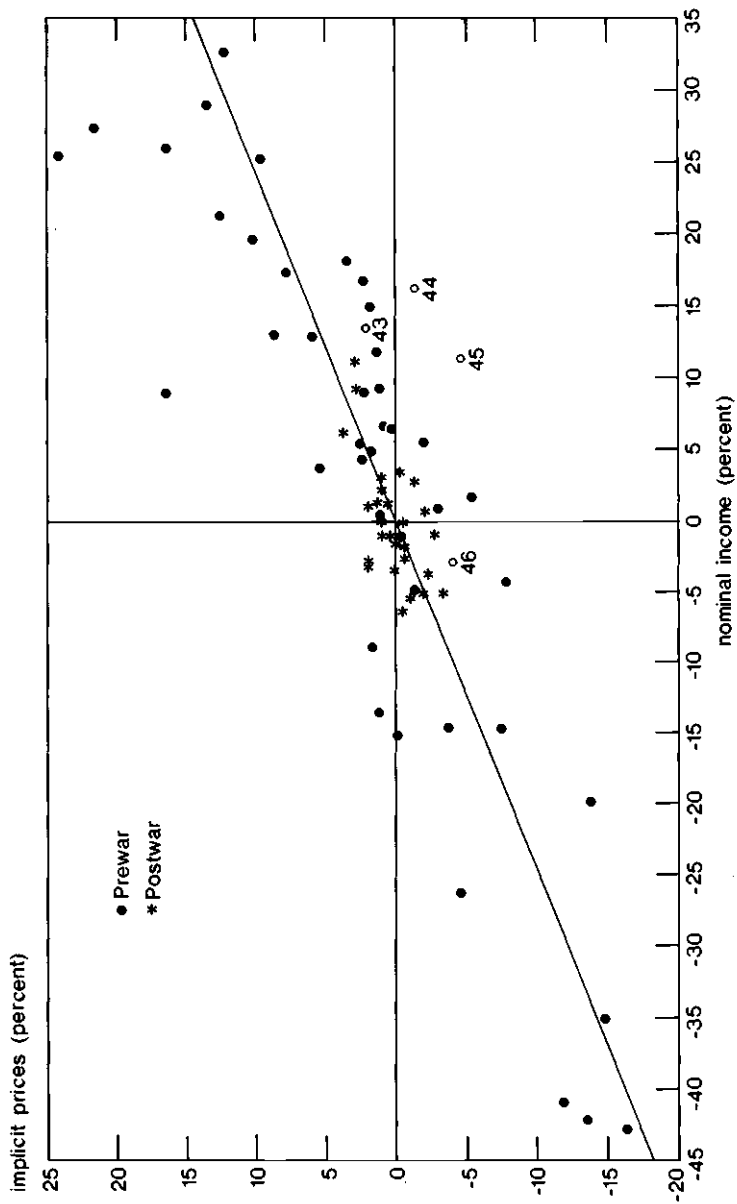
Our interest rate series include two short-term rates (the commercial paper rate and the call money rate) and two long-term yields on corporate bonds (the basic yield on high-grade corporate bonds and the yield on high-grade industrial bonds).

9. Different investigators of this episode of United States price controls disagree on its impact on the rate on inflation. Using different estimating techniques and different price indexes to evaluate the effects of controls, Barro, McGuire, and Feige and Pearce present findings that the inflation rate was no different than it would have been in the absence of controls; Darby and R. J. Gordon present contrary findings. See *The Economics of Price and Wage Controls*, Carnegie-Rochester Conference Series on Public Policy, vol. 2 (Amsterdam: North-Holland, 1976), for the papers by Darby, Feige and Pearce, and McGuire; also, R. J. Gordon, "Alternative Responses of Policy to External Supply Shocks," *Brookings Papers on Economic Activity* 6, no. 1 (1975): 183-204, and R. J. Barro, "Unanticipated Money, Output, and the Price Level in the United States," *Journal of Political Economy* 86 (August 1978): 549-80.

To test our corrections, we compared reported and corrected real income changes with reported employment changes, 1971-74. The correlations between quarter-to-quarter changes in payroll employment and in real NNP, as reported and as corrected by the ratio of our corrected to the original price index, are as follows for 1971:2 to 1974:3:

Reported NNP	.77
Corrected NNP	.81

The minor improvement in the correlation coefficient is weak evidence in favor of our correction.



**Chart 4.1**

Deviations from trend of overlapping five-year periods of United States implicit prices and nominal income: scatter diagram of deviations of two central years of each period before and after World War II.

Table 4.2 Estimated United States Price Index, 1943-46

Five-Year Interval	Logarithm of Nominal Income (1)	Straight-Line Trend Values, Col. 1 (2)	Col. 1 Minus Col. 2 (3)	Con- version Factor (4)	Col. 3 Times Col. 4 (5)	Logarithm of Implicit Prices (6)	Straight-Line Trend Values, Col. 6 (7)	Col. 7 Plus Col. 5 (8)	Estimated Price Index (Antilog Col. 8) (9)	Kuznets Reported Price Index (10)
1942	25.58546									98.7
1. 1943	25.78274	25.64659	.13615	.4325	.05888	-.01308	.05192	.11080	111.7	107.6
2. 1944	25.86789	25.70773	.16016	.4062	.06506		.11693	.18199	120.0	110.8
3. 1945	25.87662	25.76886	.10776	.4062	.04377		.18193	.22570	125.3	114.1
4. 1946	25.80163	25.82999	-.02836	.4325	-.01227		.24693	.23466	126.4	122.2
1947	25.89115					.31189				136.6

(Natural Logarithms)

**Table 4.3**      **Correction for United States Price Controls,  
Third Quarter, 1971, through Second Quarter, 1974**

Year and Quarter		NNP Deflator (1972 = 100)		Real Income (Billions of 1972 \$)	
		Reported	Corrected	Reported	Corrected
1971	1	94.3		994.9	
	2	95.6		1002.4	
	3	96.4	96.7	1009.1	1006.2
	4	97.2	97.9	1017.4	1010.8
1972	1	98.8	99.8	1037.7	1027.1
	2	99.4	101.3	1055.9	1036.1
	3	100.3	102.9	1073.2	1045.7
	4	101.4	104.8	1096.2	1060.1
1973	1	102.9	107.0	1120.9	1078.1
	2	104.7	108.3	1119.7	1082.8
	3	106.6	109.8	1124.4	1091.2
	4	109.1	111.6	1128.2	1102.5
1974	1	111.3	112.6	1114.9	1095.8
	2	114.2	114.1	1108.1	1098.6
	3	117.3		1099.3	
	4	120.8		1080.9	

**Table 4.4**      **United States Price and Real Income Annual Estimates: As  
Reported and Corrected for Price Controls, 1971-74**

Year	Implicit Price Deflator (1929 = 100)		Real Net National Product (Billions of 1929 \$)	
	Reported (1)	Corrected (2)	Reported (3)	Corrected (4)
1971	262.5	263.2	305.248	304.546
1972	273.7	279.8	323.440	316.389
1973	289.7	298.9	340.885	330.352
1974	318.4	321.7	332.751	330.621

Each short-term rate by itself presents problems. Commercial paper refers to promissory notes issued by firms and offered on the open market. It is similar to the bill of exchange in the United Kingdom as a form of short-term business debt. However, commercial paper has changed in composition since the nineteenth century. Formerly, it consisted of trade notes received by manufacturers, wholesalers, or jobbers in payment for shipments to other firms. Denominations were in odd amounts related to the value of particular shipments. Dealers who bought the notes in turn sold them to banks. In recent decades, commercial

paper has been issued in round denominations, unrelated to shipments of goods, usually by a finance company. As a result, the level of commercial paper rates before World War I is not continuous with the level since. The pre-World War I rates were raised by both high transactions costs and more than nominal default risk premiums. By contrast, neither affected the call money rate, our alternative short-term interest rate. Since World War I, both transactions costs and risk premiums have dwindled. In addition, the eligibility of commercial paper for rediscount at Federal Reserve banks under the Federal Reserve Act of 1913 presumably also lowered commercial paper rates relative to other short-term rates. The series we use is an annual average of monthly rates on sixty- to ninety-day commercial paper through 1923, thereafter four- to six-month commercial paper in New York City, based on weekly figures of dealers' offering rates until 1944 and on daily figures thereafter.

Our alternative short-term rate is for call loans at the New York Stock Exchange with securities as collateral. Call loans are made for an indefinite period but are subject to call on twenty-four hours' notice, the rate of interest varying from day to day. In the 1930s, placing call loans on account of "others" by the New York money market banks was prohibited, and the banks terminated the practice of borrowing at call to relend in the stock market because payment of interest on demand deposits was prohibited. These developments drastically changed the character of the call loan market. The call money rate, which used to be posted daily at the Stock Exchange Money Desk, has since been posted by the money market banks. It is the rate on stock exchange collateral for loans to brokers, who in turn lend to customers, usually at higher rates. Such loans are rarely called by the banks, though before the mid-1930s banks called loans to adjust reserve positions, and "others" called loans to obtain cash. The call money rate in recent decades has been relatively sticky, remaining unchanged in months when other short-term rates have fluctuated. Until 1923, the monthly averages underlying the annual averages were based on weekly renewal rates (rather than rates on new loans, which were discontinued in 1957); thereafter they depended on daily renewal rates.

The basic yield on high-grade corporate bonds to thirty years' maturity, one of our long-term interest rates series, was initially constructed as an annual series by David Durand for the period 1900-1947 and has been continued by other hands. It estimates the yield prevailing in the first quarter of each year on the highest grade corporate issues, classified by term to maturity. For each year, the yields to maturity of outstanding bonds—including practically every high-grade, seasoned, nonconvertible corporate bond not subject to special influences for which quotations were available during the period covered—were plotted by term to maturity on a scatter diagram. The basic yield curve for each year is a

free-hand curve so fitted that it passes below most of the yields on the chart except for a few isolated low ones. Basic yields for each maturity are read from the curve. In the absence of fifty- or sixty-year corporate bonds in recent years, the thirty-year term to maturity is the longest maturity for which reliable basic yield estimates are available as a continuous series. We extended the series into the nineteenth century by linking it with an annual average of monthly yields on American railroad bonds constructed by F. R. Macaulay for the period beginning 1857.<sup>10</sup> During those years of the nineteenth century, the railroad industry had a higher credit rating than any other industry. The Macaulay series is available before and after adjustment to eliminate economic drift arising from secular changes in the quality of bonds included. We used the series adjusted for economic drift and raised its level to that of the basic yield segment by adding the average difference between the basic yield and the railroad yield for the overlapping years 1900–1902. The Macaulay series is based on yields for thirteen bonds in 1857, rising to thirty-seven in 1900, all with maturities of ten years or more. Yields for individual bonds were based on arithmetic averages of monthly high and low sale prices; the series is a chain index number based on the individual bond yields.

The other alternative long-term series we use is the yield on high-grade industrial bonds. We included it to check whether the first-quarter or February date of the annual basic yield series introduced a significant error, since all other annual series are dated at midyear. For the period from 1900 on, we use Standard and Poor's yield on high-grade industrial bonds, which before 1929 was an arithmetic average of the yield to maturity of fifteen bonds, based on the mean of monthly high-low prices. Beginning 1929, the series is an average of the four or five weekly figures for the month, the number of bonds and the average maturity varying slightly because of changes in rating or approaching maturity. In recent years only seven bonds with an average term to maturity of twenty-six years have been included. For the years before 1900, we used the same series based on railroad bonds that we used to extend the basic yield series, once again linking the two segments by adding to the earlier series the average excess of the later for the overlapping years 1900–1902.

10. Table 6.17 below gives estimates of yields on thirty-year-term-to-maturity railroad bonds from 1873 to 1899 that we constructed from Macaulay's tables of individual railroad bond yields (see pp. 294–95 for details of the construction of the estimates). At the time we assembled our basic United States data set, we did not anticipate making such estimates. Accordingly, our basic yield series was extended for years before 1900 in the way described in the text. As might be expected, the movements of the two series are essentially identical, but the estimates in table 6.17 tend to be higher than those in table 4. A. 1 by an amount that tends to increase, the earlier the date to which the estimates relate. The largest difference is for 1875, for which the series in table 4.8 is 5.57, in table 6.17, 6.26. Fortunately, most of the differences are much smaller, so we have not regarded it as worth recomputing our results to use the more recent and, we believe, slightly preferable series for the early years.

### 4.1.5 Population

The population series is the total population residing in the United States except for 1917–19 and since 1940, when it also includes the Armed Forces overseas.

## 4.2 United Kingdom Data

### 4.2.1 Money

The United Kingdom money series is compiled from figures for gross deposits at London and country joint stock and private banks (later, London clearing banks and other domestic deposit banks and, since 1968, the National Giro) and at Scottish and Irish banks, less interbank and transit items, plus private deposits at the Bank of England and currency held by the public. We shifted gross deposits for 31 December to 30 June dates by a two-year moving average; the other components are 30 June estimates.

A published series of the United Kingdom money stock is available for 1880–1966.<sup>11</sup> The estimates we use revise the deposit component of this series for 1880–96 and the currency component for 1880–1910. In addition, we have extended the revised series back to 1871 on the basis of unpublished gross deposit estimates for 1870–80 in an unpublished paper.<sup>12</sup> For 1897–1966, we use Sheppard's underlying deposit components, and for 1911–60 we use his currency component. For 1967–68, Sheppard kindly furnished us with unpublished figures extending the money stock estimates in his book. We used them after substituting for those years and years back to 1960 revised official estimates of currency held by the public. The money estimates we use for 1969–75 were derived from Bank of England figures and linked to Sheppard's 1968 estimates.

We discuss the deposit estimates before 1891, the currency estimates before 1910, and the Bank of England figures for 1969–75 that we linked to Sheppard's 1968 estimate.

### *Deposits*

Before 1891, reports of condition are not available for all joint stock and private banks in operation in England and Wales. Sheppard's figures beginning in 1880 make an inadequate allowance for the incomplete coverage of his statistics. His series is the sum of data from the balance sheets of banks published in the banking supplements of the *Economist*. Since private banks did not publish their balance sheets for 1880–90,

11. David K. Sheppard, *The Growth and Role of U.K. Financial Institutions, 1880–1962* (London: Methuen, 1971).

12. Shizuya Nishimura, "The Growth of the Stock of Money in the U.K., 1870–1913," unpublished paper, Hosei University, Tokyo, 1973.

Sheppard multiplied total deposits at joint stock banks (the coverage of which was not 100 percent), by a splicing factor ( $= 1.135$ ) to obtain total deposits at all banks. The splicing factor was derived from the ratio of deposits at reporting joint stock and private banks in 1891, when the *Economist* first published private bank balance sheets, to reported joint stock deposits. Sheppard's deposit estimates for 1880–90 are clearly an underestimate, both because of undercoverage of joint stock banks and because he used too low a multiplier to adjust for private banks.

For 1870–80, Nishimura constructed a new deposit series from more comprehensive data in parliamentary sources, *Bankers Magazine*, and the *Banking Almanac*. He estimated separately deposits at London and country private banks by multiplying the number of offices of each class by the average deposits per branch of London and country joint stock banks, respectively. For joint stock banks, less estimation was required. All London-based joint stock banks reported a total of deposits plus acceptances. For eight of the nine London-based joint stock banks, data on acceptances were available; for the ninth, he obtained an estimate based on the ratio of acceptances to deposits plus acceptances in 1879–80. For country joint stock banks, he applied a multiplier representing the ratio of deposits and acceptances at all banks to reported deposits and acceptances and subtracted data on acceptances he obtained from the *Economist* banking supplements.

Sheppard regards Nishimura's procedure as questionable, since in his judgment many of the private bank offices were merely shops to settle debts between farmers, operated, for example, in pubs, and were not engaged in deposit business at the start of the period covered by Nishimura. He believes that only by 1891 were the private bank offices doing the same type of business as the head office.

To link the Nishimura gross deposit estimates to Sheppard's while taking account of the latter's criticisms of the estimates for 1870–80, we proceeded as follows. Assuming that Sheppard's series for 1891 eliminated underestimation of private bank deposits, we fitted a straight-line trend to the logarithms of the ratio of private to joint stock bank deposits for 1891–1914 and extrapolated the trend back to 1870. Similarly, using Nishimura's estimates, we fitted a straight-line trend to the logarithms of ratios of private to joint stock bank deposits for 1870–80 and obtained the deviation of each year's ratio from the corresponding trend value. For 1870–80, we added the deviation to the trend values obtained from the 1891–1914 regression and multiplied Nishimura's estimates of joint stock bank deposits for each year by the antilog. For 1881–90, we multiplied adjusted joint stock deposits (to be described below) by the antilog of the trend values obtained from the 1891–1914 regression. In this way we derived a new set of declining private bank deposits that keyed into Sheppard's figure in 1891.

In 1880, Nishimura's estimated joint stock bank deposits was 1.09 times Sheppard's estimate. We raised the level of Sheppard's estimate by this ratio in 1880 and by successively smaller ratios, declining arithmetically until 1896, when we set the ratio at 1.00. These are the adjusted joint stock bank deposits referred to in the preceding paragraph.

The sums of private and joint stock bank deposit estimates were shifted from year-end to midyear dates. The average of 31 December 1870 and 31 December 1871, dated 30 June 1871, is our initial estimate. We deducted an estimate of annual average interbank deposits obtained by multiplying our estimates of gross deposits for 1871-90 by the ratio of interbank to gross deposits in 1890-91. We then added an estimate of private deposits at the Bank of England obtained by allocating an aggregate of the deposits of private holders and branch offices of banks between private and other deposits in the same way that Sheppard had done for later years. The net result of these operations is total deposits adjusted for cash items.

### *Currency*

The currency series is a residual after subtracting currency held by banks from total currency outstanding. Total currency outstanding is a sum of coin and notes outstanding. Notes outstanding of the Bank of England, Scottish, Irish, and other banks are reported figures, in compliance with the requirements of the Banking Acts of 1833 and 1844-45. Coin outstanding, consisting mainly of gold, but including also lesser amounts of silver and negligible amounts of bronze coin, was estimated before 1914. The gold coin estimates depend crucially on the validity of selected benchmark estimates. Sheppard used such estimates from published sources and from private communications from the Mint. Some of the estimates he used impart erratic movements into the estimates of gold outstanding, 1883-1905.

To construct the gold coin series for the decade for which Nishimura provides deposit estimates, we use an 1868 benchmark figure attributable to Jevons.<sup>13</sup> The first benchmark date thereafter that we regard as usable is the figure for 1888 that Sheppard obtained privately from the Mint. Later benchmark estimates for 1892, 1895, 1899, 1903, and the final one in 1910 seem unexceptionable.

Sheppard interpolated yearly estimates between the benchmark figures by constructing a total net change series, summing the net gold coin issued by the Mint and net imports of gold coin, adding or subtracting the net change series from the benchmark figure, starting anew with each benchmark year. The initial benchmark plus yearly cumulated net change yielded an estimate higher than the next benchmark figure.

13. *Investigations in Currency and Finance*, p. 269.

Sheppard then reduced the interbenchmark estimates by the ratio of the terminal original benchmark figure to the cumulated net change benchmark estimate. Nishimura experimented with a linear regression of gold coin on silver coin, 1905–13, and estimated gold coin for 1895–1904 from the regression coefficients.

We use an alternative interpolator. We converted annual estimates, 1868–1910, of the world monetary gold stock in ounces into dollars, and subtracted estimates given in the same source of the United States gold stock in millions of dollars.<sup>14</sup> We interpolated the ratio of the United Kingdom benchmark figures converted to dollars to the gold stock outside the United States along a straight line between the benchmark ratios. We multiplied the interpolated ratios by the stock outside the United States and converted dollars to pounds sterling. The new gold estimates were added to the remaining components of currency outstanding.

Currency held by banks was estimated by Sheppard, 1880–1920, and is a reported series thereafter. Our estimates for 1871–79 were constructed on the assumption that the 1880–85 average ratio of coins and notes held by the banks to bankers' balances at the Bank of England, which was approximately equal to one, was the same in the preceding decade.<sup>15</sup>

#### *Bank of England Estimates, 1969–75*

From 1963 to September 1971, the Bank of England published estimates of a number of monetary aggregates, including  $M_2$ , which corresponds to the concept we use for 1968 and earlier dates. It then discontinued the  $M_2$  estimates but has continued to publish estimates of  $M_1$  and  $M_3$ . For 1969 and later years, we used a two-year moving average of the Bank of England 31 December  $M_3$  estimates, adjusted to the lower level of the  $M_2$  estimates, by multiplying the later estimates by the ratio of our 1968 estimate to the centered Bank of England  $M_3$  estimate for that year.

#### 4.2.2 Income

The United Kingdom income series in current prices, 1868–1949, is C. H. Feinstein's GNP at factor incomes minus capital consumption.<sup>16</sup> These estimates key precisely into the official estimates of net national product, 1950–75 (described as "national income" in the Blue Books) since they are constructed in the same way.

Feinstein does not provide a table in constant prices matching the factor incomes table in current prices. Instead, he gives estimates of GNP from the expenditure side in current prices and of GNP and NNP in

14. G. F. Warren and F. A. Pearson, *Prices* (New York: Wiley, 1933), pp. 85–86.

15. See M. D. Bordo, "The U.K. Money Supply 1870–1914," *Research in Economic History* 6 (1981): 107–25, who used this procedure.

16. C. H. Feinstein, *National Income, Expenditure, and Output of the United Kingdom, 1855–1965* (Cambridge: Cambridge University Press, 1972).

constant prices, for 1870–1913, at 1900 prices; for 1913–48, at 1938 prices, and 1948 and later years, at 1958 prices.<sup>17</sup> We first derived NNP in current prices by deducting current price capital consumption from the GNP series in current prices. We then divided current price NNP by constant price NNP, both expenditure-based, and shifted the price deflators implicit in the NNP estimates to the base 1929. Finally, we divided net national product in current prices from the income side by the 1929-based price deflator.

Since we had a current price series from the income side back to 1868 but no constant price series in Feinstein's work for 1868–69, we derived an implicit price deflator for those years to apply to the current price series. The deflator was derived as follows. As shown in the source notes to table 4.9, column 4, GNP, calculated from the expenditure side, is available for the two years in question in both current and 1900 prices. To get net national product estimates, we subtracted Feinstein's current price capital consumption from the GNP figures. An estimate of net total fixed capital formation in current and 1900 prices is also available in another source. We used the deflator implicit in net total fixed capital formation to deflate capital consumption in current prices. Capital consumption in 1900 prices was then subtracted from GNP in 1900 prices to get NNP in 1900 prices. The procedure thereafter is the same as described in the last two sentences of the preceding paragraph.

The Blue Books give constant net national product in 1970 prices for 1950–75. For these years also we shifted the implicit price deflator to a 1929 base and deflated nominal income by the 1929-based implicit price deflator.

#### 4.2.3 Prices

Price controls were in effect in the United Kingdom not only during World War II but also during World War I.<sup>18</sup> In World War I, controls were imposed mainly on food, 1917–18, and were rapidly dismantled in the following three years. The price rise 1914–16, before controls, was 25

17. For this reason, we initially adopted the expenditure-based series for our data set. Subsequent work with that series in constant prices, particularly in real per capita income form, convinced us that the series was defective. The pre-World War I trend was so much higher than the trend of post-World War I years that the gap was never closed in all the subsequent period. We therefore discarded the expenditure-based series and adopted the income-based current price series, deflating it by the price index implicit in the expenditure-based series. The trend problem that persuaded us that the expenditure-based real series is defective does not affect the income-based real series.

18. On World War I controls, see Sidney Pollard, *The Development of the British Economy, 1914–1950* (London: E. Arnold, 1962), pp. 48–53; A. C. Pigou, "Government Controls in War and Peace," *Economic Journal* 28 (December 1918): 363–73; R. H. Tawney, "The Abolition of Economic Controls, 1918–21," *Economic History Review* 13, nos. 1–2 (1943): 1–30.

percent; 1916–18, during controls, 45 percent. In addition, as chart 5.5, panel 3, for the United Kingdom demonstrates, the rate of change of money stock per unit of output and the rate of reported prices show nearly identical movements during World War I. Accordingly, we made no attempt to correct for possible understatement of true price behavior during 1917–18.

Price controls during World War II, though not comprehensive, were much more extensive than during World War I. They remained in effect for some items until 1953 or so, though most items were decontrolled in 1949–50.<sup>19</sup> We initially considered correcting the price deflator for the years 1940 through 1952 (a fourteen-year trend period from 1939 to 1953). However, a scatter diagram we prepared for the United Kingdom covering deviations from fourteen-year trends for nonoverlapping years, including 1940–52, comparable to chart 4.1 for the United States, showed that the observations after 1946 were closer to the main cluster of points for the full period than the observations for 1940–46, which were outliers. We therefore corrected the price index for price control only for the seven years 1940 through 1946 (an eight-year trend period from 1939 to 1947).

Table 4.5 presents statistics from regressions of United Kingdom prices on nominal income, both prices and income expressed as deviations from eight-year trends, and the deviations classified by their order within the eight-year trend periods. Separate regressions were calculated for pre-World War I, interwar, post-World War II ending 1971, and the combined periods. Chart 4.2 is a scatter diagram of overlapping observations. Table 4.6 gives the estimated United Kingdom price index, 1940–46, based on the full period conversion factors.<sup>20</sup>

19. J. C. R. Dow, *The Management of the British Economy, 1945–60* (Cambridge: University Press, 1964), pp. 162–77.

20. In our final revision and checking of this manuscript, we discovered that an error in a figure used in the calculations had affected slightly these results. The effect is too small to justify the expense of the extensive recomputations that would have been required to incorporate the necessary revision in all our later work. However, for those who may want to use these data for other purposes, we note here the revised estimates that would supersede those in table 4.6 and in table 4.9:

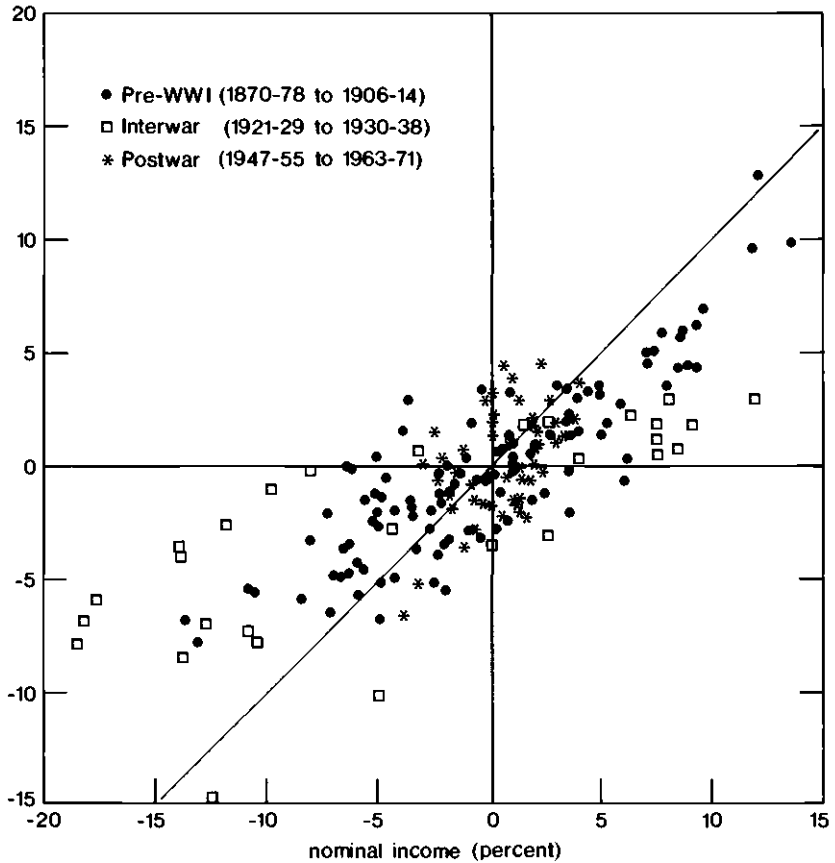
1940	114.7	1944	145.7
1941	127.4	1945	146.2
1942	134.8	1946	150.0
1943	142.0		

One further qualification to our estimates: We made the estimates in table 4.6 before we decided to correct also the figures from 1966 to 1974 for statutory price controls. Hence we use the original uncorrected figures in the regressions in table 4.5. The omission of these years, or the substitution of the corrected figures, would almost certainly have a negligible quantitative effect on the final estimates.

**Table 4.5** Statistics from Regressions of United Kingdom Prices ( $P$ ) on Nominal Income ( $Y$ ) Expressed as Deviations from Eight-Year Trends, by Groups of Ordered Years within Trend Periods: Pre-World War I, Interwar, Post-World War II, and Full Period (Standard Errors in Parentheses)

Pooled Groups	1870-1914		1921-38		1947-71		1870-1971	
	Adjusted $R^2$	$b$	Adjusted $R^2$	$b$	Adjusted $R^2$	$b$	Adjusted $R^2$	$b$
1, 7	.47	.4291 (.053)	.38	.4223 (.1188)	.43	.7887 (.1537)	.45	.4609 (.0454)
2, 6	.59	.5391 (.0523)	.32	.3386 (.1076)	.40	.7919 (.166)	.47	.4727 (.0440)
3, 4, 5	.74	.5863 (.0329)	.32	.2688 (.0703)	.27	.6728 (.1508)	.54	.4580 (.0303)
1-7	.66	.5508 (.0245)	.34	.3089 (.0507)	.36	.7409 (.0902)	.51	.4625 (.0215)

implicit prices (percent)

**Chart 4.2**

Deviations from trend of overlapping eight-year periods of United Kingdom implicit prices and nominal income: scatter diagram of deviations of three central years of the pre-World War I, interwar, and post-World War II periods.

The estimated index exceeded the reported index during the central years of price control by between 8 and 10 percent in the United States, by between 2 and 8 percent in the United Kingdom. One possible explanation is that the price controls were under less pressure in the United Kingdom than in the United States because the quantity of money rose decidedly less relative to output (see chart 5.6). A second is that controls were evaded less in the United Kingdom than in the United States. A third is that the United Kingdom nominal income estimates were biased by price control more than the United States estimates. We have not been able to assess the validity or relative importance of these

**Table 4.6** Reported United Kingdom Price Index, 1940–46, and Index Corrected for Effect of Price Control

Year	Price Index (1929 = 100)	
	Reported	Corrected
1939	99.9	—
1940	109.0	114.4
1941	118.4	125.8
1942	126.6	133.4
1943	131.4	140.5
1944	139.0	144.6
1945	143.3	145.7
1946	145.6	149.9
1947	158.5	—

possibilities, though the first must have played some role, and the second conforms to the casual impression of greater law obedience in Britain than in the United States.

As in the case of the United States, because of our reservations about the United Kingdom adjusted price series, we frequently present separate results excluding the wartime and immediately postwar years.

So-called voluntary price controls were imposed in Britain at various times from 1950 through mid-1966; statutory controls were imposed from July 1966 through February 1974.<sup>21</sup> We have not attempted a correction for the earlier period of voluntary controls, but we have done so for the later period of statutory controls.

Table 4.7 gives the results of our correction. Our procedure is similar to that used for the wartime period except that we did not use the same conversion factor. Instead, we used a conversion factor of .8342, calculated as the ratio of the change from 1965 to 1975 in the log of prices to the change over the same period in the log of nominal income. The corrected price series exhibits higher rates of annual price change than the reported series in the years from 1966 through 1970 and in 1973, and lower rates of change in other years. The corrected real income series rises throughout the period, failing to show the decline in 1975 of the reported series.<sup>22</sup>

21. See S. Brittan and P. Lilley, *The Delusion of Incomes Policy* (London: M. T. Smith, 1977), table 6, pp. 154–55, for a summary of United Kingdom incomes policies, 1948–76. See also *OECD Economic Surveys: United Kingdom* (November 1970), pp. 24–25; (March 1975), pp. 10–13; and F. T. Blackaby, “Incomes Policy,” in *British Economic Policy 1960–74* (Cambridge: Cambridge University Press for NIESR, 1978), pp. 399–401.

22. We have tested our correction by comparing the reported and corrected price series with earlier monetary aggregates and the reported and corrected real income series with contemporaneous movements in employment and industrial production. The evidence is

**Table 4.7**                      **Reported and Corrected United Kingdom Price and Real Income Series, 1965-75**

Year	Implicit Prices (1929 = 100)		Real Income (Millions of 1929 Pounds Sterling)	
	Reported	Corrected	Reported	Corrected
1965	315.9		9,113	
1966	328.3	330.5	9,255	9,195
1967	338.2	345.2	9,467	9,275
1968	350.0	364.7	9,772	9,377
1969	362.5	381.3	9,951	9,460
1970	391.0	412.2	10,128	9,607
1971	431.3	454.1	10,313	9,794
1972	475.1	498.1	10,460	9,976
1973	515.3	566.1	11,243	10,233
1974	595.6	635.2	11,169	10,470
1975	765.6		10,866	

#### 4.2.4 Interest Rates

For short-term United Kingdom interest rates, we use the open market rates on three-month bankers' bills. This series is continuous over two centuries. The level and fluctuations in the rate on bankers' bills during post-World War II years have been similar to those of the rate on three-month Treasury bills, while the call money rate has tended to be lower than both.

For long-term rates, we use the yield on the perpetual funded government debt known as consols.<sup>23</sup> This is also a continuous series over two centuries, but it is less representative of the long-term market since World War I than it was earlier. Until World War I, the United Kingdom national debt consisted largely of consols. Since then, the government has floated many issues with limited maturities. Consol yields tend to be at the lower end of the band of yields on long-term government issues. The yield series we use is an annual average based on the mean of opening and closing prices each day, excluding gross accrued interest, of 3 percent consols until 1888; 2.75 percent consols until July 1903; and thereafter 2.5 percent consols.

---

less clear-cut than that cited in footnote 9 above for the 1971-74 United States corrections, but seemed to us on the whole to support the corrected series as less inaccurate than the standard ones.

23. No comparable United States series exists, which explains why we use the United States corporate bond yield instead. Before 1917, many United States government securities bore the circulation privilege, which affected their yield; from 1917 to 1941, many United States government bonds were partially tax exempt; and, for some years, no long-term government bonds were outstanding.

#### 4.2.5 Population

The United Kingdom population figures are midyear estimates. Except for the years 1915–20 and 1940–50, the figures refer to the population at home, that is, actually in the country. The figures for 1915–20 and 1940–50 are for the total population including the armed forces serving overseas but excluding Commonwealth and foreign forces in the United Kingdom.

#### 4.2.6 Exclusion of Southern Ireland

The data for money, income, prices, and population in the appendix (sec. 4.4) show overlapping estimates for 1920, including and excluding Southern Ireland. (The Irish Free State was officially constituted a British dominion on 15 January 1922.) We used the percentage difference in 1920 to estimate figures excluding Southern Ireland in 1919 and including Southern Ireland in 1921. We were thus able to construct phase bases 1–15 including Southern Ireland, and from 14 to 37 excluding Southern Ireland. We adjusted the level of the bases 1–14 to the level of the later segment. We made no adjustments to the rates of change computed from triplets of the original phase bases. The triplet centered on 1919–20 (phase bases 13–15) includes Southern Ireland; the triplet centered on 1920–21 (phase bases 14–16) excludes Southern Ireland. Rates of change are not materially different for the two geographical entities, although the levels of the phase bases are affected by the exclusion of Southern Ireland.

### 4.3 Combined United States and United Kingdom Data

In some contexts, further discussed in the chapters that follow, we view the United States and the United Kingdom as a single economy. It is simple to add the populations. However, nominal magnitudes are expressed in United Kingdom pounds and United States dollars. One way we have combined the data is to convert United Kingdom nominal values (money stock, income in current prices) from pounds to dollars by multiplying by the annual exchange rate for pounds in dollars. The shortcomings of this procedure are discussed in chapter 6. National income in constant prices was converted to dollars by multiplying by the 1929 exchange rate. An implicit price deflator for the combined countries was derived by dividing the current price by the constant price income series. We did not combine the interest rate series for the two countries.

### 4.4 Appendix: Basic Annual Data

The appendix gives the annual data for the basic series discussed in this chapter and the source notes for each series (see table 4.8 for the United States data, table 4.9 for the United Kingdom data).

Table 4.8

Year	Interest Rates (Annual Percentage)									
	Short-Term					Long-Term				
	Money Stock (Billion \$) (1)	Nominal Income (Billion \$) (2)	Real Income (Billion 1929 \$) (3)	Implicit Price Deflator 1929 = 100 (4)	Population (Millions) (5)	Commercial Paper Rate (6)	Call Money Rate (7)	Yields on High-Grade Corporate Bonds (8)	Yields on High-Grade Industrial Bonds (9)	High-Powered Money (Billion \$) (10)
1867	1.28				37.376	7.33	6.22	6.44	7.90	0.820
1868	1.27				38.213	7.26	7.36	6.37	7.83	0.769
1869	1.28	7.242	9.959	72.7	39.051	9.66	10.45	6.64	8.10	0.760
1870	1.35	6.960	10.133	68.7	39.905	7.25	5.67	6.52	7.99	0.766
1871	1.50	6.946	9.956	69.8	40.938	6.98	5.40	6.46	7.92	0.778
1872	1.61	8.127	12.251	66.3	41.972	8.63	8.07	6.30	7.76	0.782
1873	1.62	8.074	12.319	65.5	43.006	10.31	14.41	6.33	7.79	0.789
1874	1.65	7.776	12.000	64.8	44.040	5.98	3.49	6.02	7.48	0.795
1875	1.72	7.665	12.104	63.3	45.073	5.44	3.13	5.57	7.04	0.773
1876	1.68	7.820	12.942	60.4	46.107	5.13	3.31	5.28	6.75	0.754
1877	1.65	8.062	13.859	58.2	47.141	5.18	3.81	5.29	6.76	0.758
1878	1.58	7.993	14.840	53.9	48.174	4.80	4.08	5.22	6.68	0.763
1879	1.66	8.509	16.367	52.0	49.208	5.06	5.60	4.88	6.34	0.801
1880	2.03	10.770	18.765	57.4	50.262	5.23	4.68	4.58	6.05	0.949
1881	2.44	10.762	19.130	56.3	51.542	5.20	5.88	4.26	5.72	1.077
1882	2.63	11.595	19.940	58.1	52.821	5.64	4.87	4.31	5.78	1.140
1883	2.80	11.228	19.578	57.4	54.100	5.62	3.68	4.33	5.80	1.186
1884	2.80	10.889	20.015	54.4	55.379	5.20	3.03	4.28	5.74	1.204
1885	2.87	10.127	19.954	50.8	56.658	4.06	1.54	4.08	5.54	1.233
1886	3.10	10.521	21.015	50.1	57.938	4.76	3.86	3.81	5.27	1.213

1887	3.31	10.887	21.530	50.6	59.217	5.75	5.23	3.87	5.34	1.271
1888	3.40	10.717	20.801	51.5	60.496	4.89	2.52	3.80	5.26	1.318
1889	3.60	11.093	21.422	51.8	61.775	4.86	4.32	3.66	5.12	1.342
1890	3.92	11.752	23.131	50.8	63.056	5.62	5.94	3.78	5.25	1.390
1891	4.08	12.112	24.074	50.3	64.361	5.39	3.47	3.95	5.41	1.461
1892	4.43	12.691	26.289	48.3	65.666	4.11	2.90	3.83	5.30	1.533
1893	4.26	12.497	25.266	49.5	66.970	6.79	4.57	3.93	5.40	1.561
1894	4.28	11.005	23.734	46.4	68.275	3.04	1.10	3.72	5.18	1.582
1895	4.43	12.089	26.470	45.7	69.580	3.67	1.85	3.59	5.05	1.499
1896	4.35	11.445	25.795	44.4	70.885	5.81	4.18	3.63	5.10	1.451
1897	4.64	12.613	28.277	44.6	72.189	3.50	1.80	3.44	4.90	1.554
1898	5.26	13.195	28.774	45.9	73.494	3.82	2.26	3.38	4.84	1.682
1899	6.09	15.136	32.114	47.1	74.799	4.15	4.95	3.24	4.71	1.812
1900	6.60	16.447	33.171	49.6	76.094	4.38	2.84	3.30	4.86	1.954
1901	7.48	18.254	37.030	49.3	77.584	4.28	4.20	3.25	4.78	2.096
1902	8.17	18.870	36.969	51.0	79.163	4.92	5.31	3.30	4.71	2.168
1903	8.68	19.910	38.628	51.5	80.632	5.47	3.71	3.45	4.88	2.278
1904	9.24	19.765	37.799	52.3	82.166	4.20	1.76	3.60	4.87	2.423
1905	10.24	21.794	40.809	53.4	83.822	4.40	3.97	3.50	4.53	2.489
1906	11.08	25.185	46.239	54.5	85.450	5.68	6.38	3.55	4.58	2.646
1907	11.60	26.479	46.628	56.8	87.008	6.34	6.57	3.80	4.98	2.833
1908	11.44	23.564	41.588	56.7	88.710	4.37	1.94	3.95	5.07	3.093
1909	12.68	27.780	47.294	58.7	90.490	3.98	2.70	3.77	4.76	3.122
1910	13.34	28.974	48.105	60.2	92.407	5.01	3.09	3.80	4.83	3.174
1911	14.12	29.233	48.939	59.7	93.863	4.03	2.67	3.90	4.78	3.276
1912	15.13	32.093	51.534	62.3	95.335	4.74	3.54	3.90	4.81	3.343
1913	15.73	33.758	53.942	62.6	97.225	5.58	3.18	4.00	4.99	3.417
1914	16.39	30.871	48.636	63.5	99.111	4.79	3.39	4.10	4.93	3.532
1915	17.59	32.847	50.121	65.5	100.546	3.45	1.94	4.15	4.97	3.669
1916	20.85	43.525	58.817	74.0	101.961	3.42	2.59	4.05	4.89	4.178

Table 4.8 (Continued)

Year	Interest Rates (Annual Percentage)										
	Money Stock (Billion \$) (1)	Nominal Income (Billion \$) (2)	Real Income (Billion 1929 \$) (3)	Implicit Price Deflator 1929 = 100 (4)	Population (Millions) (5)	Short-Term			Long-Term		
						Commercial Paper Rate (6)	Call Money Rate (7)	Yields on High-Grade Corporate Bonds (8)	Yields on High-Grade Industrial Bonds (9)	High-Powered Money (Billion \$) (10)	
1917	24.37	52.344	57.269	91.4	103.268	4.74	3.40	4.05	5.09	5.096	
1918	26.73	66.124	62.915	105.1	103.208	5.87	5.30	4.75	5.45	6.190	
1919	31.01	69.864	65.477	106.7	104.514	5.42	6.47	4.75	5.40	6.770	
1920	34.80	75.707	62.208	121.7	106.461	7.37	7.79	5.10	6.01	7.368	
1921	32.85	61.793	59.567	103.7	108.538	6.53	6.00	5.17	5.96	6.679	
1922	33.72	62.996	63.859	98.6	110.049	4.42	4.29	4.71	5.21	6.358	
1923	36.60	74.095	73.460	100.9	111.947	4.97	4.86	4.61	5.26	6.726	
1924	38.58	75.235	75.559	99.6	114.109	3.90	3.05	4.66	5.21	6.913	
1925	42.05	78.602	77.343	101.6	115.829	4.00	4.18	4.50	5.06	7.098	
1926	43.68	84.566	82.807	102.1	117.397	4.23	4.50	4.40	4.91	7.182	
1927	44.73	83.104	83.623	99.4	119.035	4.02	4.06	4.30	4.83	7.214	
1928	46.42	84.980	84.918	100.1	120.509	4.84	6.01	4.05	4.88	7.169	
1929	46.60	90.320	90.308	100.0	121.767	5.78	7.67	4.42	5.04	7.159	
1930	45.73	76.862	80.483	95.5	123.077	3.55	2.97	4.40	4.87	6.949	
1931	42.69	61.733	73.508	84.0	124.040	2.63	1.77	4.10	4.79	7.302	
1932	36.05	44.773	60.285	74.3	124.840	2.72	2.05	4.70	5.58	7.777	
1933	32.22	42.650	58.205	73.3	125.579	1.67	1.16	4.15	4.98	8.151	
1934	34.36	50.341	64.420	78.1	126.374	0.88	1.00	3.99	4.28	9.086	
1935	39.07	58.165	75.393	77.1	127.250	0.75	0.56	3.50	3.73	10.644	
1936	43.48	68.257	84.965	80.3	128.053	0.75	0.91	3.20	3.34	12.175	

1937	45.68	75.070	92.717	81.0	128.825	0.94	1.00	3.08	3.16	13.426
1938	45.51	68.793	85.391	80.6	129.825	0.86	1.00	3.00	2.82	14.537
1939	49.27	73.848	92.268	80.0	130.880	0.72	1.00	2.75	2.64	17.501
1940	55.20	81.843	101.176	80.9	132.122	0.81	1.00	2.70	2.57	21.358
1941	62.51	98.958	113.348	87.3	133.402	0.70	1.00	2.65	2.50	23.341
1942	71.16	129.275	130.978	98.7	134.860	0.69	1.00	2.65	2.54	25.427
1943	89.91	157.521	141.021	111.7	136.739	0.72	1.00	2.65	2.54	30.181
1944	106.82	171.503	142.919	120.0	138.397	0.75	1.00	2.60	2.58	35.788
1945	126.63	172.983	138.055	125.3	139.928	0.75	1.00	2.55	2.50	41.851
1946	138.73	160.465	126.950	126.4	141.389	0.81	1.16	2.43	2.44	44.241
1947	146.00	179.049	131.075	136.6	144.126	1.03	1.38	2.50	2.52	45.026
1948	148.11	198.360	136.236	145.6	146.631	1.44	1.55	2.80	2.70	46.166
1949	147.46	196.072	136.445	143.7	149.188	1.49	1.63	2.74	2.52	45.396
1950	150.81	217.891	148.731	146.5	151.684	1.45	1.63	2.58	2.48	43.642
1951	156.45	251.358	161.024	156.1	154.287	2.16	2.17	2.67	2.72	47.165
1952	164.92	263.775	166.946	158.0	156.954	2.33	2.48	3.00	2.87	49.485
1953	171.19	277.847	173.221	160.4	159.565	2.52	3.06	3.15	3.08	50.201
1954	177.16	276.755	170.206	162.6	162.391	1.58	3.05	3.00	2.74	49.380
1955	183.69	302.321	182.011	166.1	165.275	2.18	3.20	3.04	2.97	49.160
1956	186.87	317.153	185.687	170.8	168.221	3.31	4.09	3.09	3.34	49.720
1957	191.82	332.880	188.494	176.6	171.274	3.81	4.50	3.68	3.80	50.069
1958	201.12	336.242	187.845	179.0	174.141	2.46	3.72	3.61	3.65	49.859
1959	210.49	365.775	199.768	183.1	177.830	3.97	4.22	4.10	4.25	50.490
1960	212.56	380.651	204.212	186.4	180.671	3.85	4.99	4.55	4.26	50.000
1961	223.68	393.912	209.194	188.3	183.691	2.97	4.50	4.22	4.20	49.273
1962	236.67	426.376	221.840	192.2	186.538	3.26	4.50	4.42	4.18	50.920
1963	251.97	450.620	230.850	195.2	189.242	3.55	4.50	4.16	4.12	52.420
1964	267.82	482.756	243.202	198.5	191.889	3.97	4.50	4.33	4.26	55.173
1965	289.25	523.820	257.785	203.2	194.303	4.38	4.69	4.35	4.39	58.100
1966	311.89	574.186	273.552	209.9	196.560	5.55	5.78	4.75	5.09	61.530

**Table 4.8 (Continued)**

Year	Interest Rates (Annual Percentage)									
	Short-Term					Long-Term				
	Money Stock (Billion \$) (1)	Nominal Income (Billion \$) (2)	Real Income (Billion 1929 \$) (3)	Implicit Price Deflator 1929 = 100 (4)	Population (Millions) (5)	Commercial Paper Rate (6)	Call Money Rate (7)	Yields on High-Grade Corporate Bonds (8)	Yields on High-Grade Industrial Bonds (9)	High-Powered Money (Billion \$) (10)
1967	335.88	605.779	280.194	216.2	198.712	5.10	5.66	4.95	5.47	64.628
1968	366.02	660.090	292.334	225.8	200.706	5.90	6.33	5.93	6.12	69.362
1969	389.82	708.573	299.228	236.8	202.677	7.83	7.96	6.54	6.92	73.625
1970	405.96	740.587	296.591	249.7	204.878	7.71	7.95	7.60	7.76	77.530
1971	453.12	801.277	304.546	263.2	207.053	5.11	5.73	7.12	7.16	83.227
1972	500.94	885.254	316.389	279.8	208.846	4.69	5.16	7.01	7.09	89.052
1973	549.12	987.543	330.352	298.9	210.410	8.15	8.25	7.20	7.37	94.478
1974	595.35	1059.479	330.621	321.7	211.901	9.84	10.98	7.80	8.04	103.592
1975	640.96	1125.473	324.812	346.5	213.540	6.32	8.02	8.35	8.43	108.439

Source, by Column

Column 1, *United States Money Stock*

These are annual averages, centered on 30 June, of quarterly figures 1867-1907, end-of-month data, 1908-46, and monthly averages of daily figures thereafter. Sums of currency held by the public plus adjusted deposits at all commercial banks, less large negotiable CDs since 1961.

1867-1946:

M. Friedman and A. J. Schwartz, *Monetary Statistics of the United States*, pp. 61-65 and 9-37.

1947-58:

*Federal Reserve Bulletin*, December 1970, p. 898.

1959-75:

Banking Section of the Federal Reserve Board's Division of Research and Statistics, Statistical Release (22 February 1977).

*Column 2, United States Nominal Income*

1869–1909: Based on unpublished estimates provided by Robert E. Gallman, and worksheets underlying Simon Kuznets, *Capital in the American Economy: Its Formation and Financing*. See text.

1910–16,  
1920–41,  
1946–47: Worksheets underlying Kuznets, *Capital in the American Economy*.

1917–19,  
1942–45: Values of Kuznets's nominal income for each year were interpolated arithmetically along a straight line connecting the estimates for the terminal years; these trend values were multiplied by the ratios to corresponding trend values of Kendrick's national security version (J. W. Kendrick, *Productivity Trends in the United States*).

1948–75: Commerce NNP estimates, multiplied by the ratio of Kuznets's figure to Commerce NNP in 1947. Department of Commerce, *The National Income and Product Accounts of the United States 1929–1974*, pp. 23–24, and *Survey of Current Business*, July 1976, p. 27.

*Column 3, United States Real Income in 1929 Dollars*

1869–1909: Based on unpublished estimates provided by Robert E. Gallman, and worksheets underlying Kuznets, *Capital in the American Economy*. See text.

1910–16,  
1920–41,  
1947: Worksheets underlying Kuznets, *Capital in the American Economy*.

1917–19,  
1942–46: Column 2 divided by Kuznets's implicit price deflator including correction of price deflator, 1943–46, for effect of price controls. See text.  
1948–75: Column 2 divided by Commerce price deflator implicit in net national product, shifted to base 1929, as described in source notes for that series, and corrected for effect of price controls, 1971–74. See text.

*Column 4, United States Implicit Price Deflator (1929 = 100)*

1869–1947: Column 2 divided by column 3. For estimates, 1943–46, see text and tables 4.1 and 4.2.

1947-75: Price deflator implicit in Department of Commerce NNP was shifted from 1970 to 1929 base (by multiplying by 2.994) and then adjusted to level of Kuznets's 1947 figure by multiplying by 0.9143. See *The National Income and Product Accounts of the United States, 1929-1974*, pp. 276-77, and *Survey of Current Business*, July 1976, table 7.6, p. 60. For estimates, 1971-74, see text and tables 4.3 and 4.4.

#### Column 5, United States Population

These are midyear figures of the resident population except for 1917-19 and since 1940, when the armed forces overseas are also included.

1867-1900: United States Bureau of the Census, *Historical Statistics of the United States to 1957* (Washington, D.C.), p. 7.

1900-1939: *Population Estimates*, P-25, no. 521 (May 1974).

1940-75: *Economic Report of the President*, February 1975, p. 275; February 1977, p. 217.

#### Column 6, United States Short-Term Interest Rate: Prime Commercial Paper Rate

These are annual averages of monthly rates on sixty-to-ninety-day, through 1923, since four-to-six-month commercial paper in New York City, based on weekly figures of dealers' offering rates until 1944, thereafter, on daily figures.

1869-Jan. 1937: F. R. Macaulay, *The Movements of Interest Rates, Bond Yields and Stock Prices in the United States since 1856*, pp. A145-A161.

Feb. 1937-44: *Bank and Quotation Record of the Commercial and Financial Chronicle*, 1937-45.

1945-63: Board of Governors of the Federal Reserve System, *Supplement to Banking and Monetary Statistics*, sec. 12, Money Rates and Securities Markets (January 1966) p. 37.

1964-75: Council of Economic Advisers, *Economic Indicators*, December 1971, p. 33; June 1977, p. 30.

#### Column 7, United States Short-Term Interest Rate: Call Money Rate

These are annual averages of monthly rates, based on weekly renewal rates until 1923; thereafter, daily renewal rates.

1869-1937: Macaulay, *Movements of Interest Rates, Bond Yields and Stock Prices in the United States since 1856*, pp. A145-A161.

1938-41: Board of Governors of Federal Reserve System, *Banking and Monetary Statistics*, 1943, p. 451.

1942-63: Board of Governors of Federal Reserve System, *Supplement to Banking and Monetary Statistics*, sec. 12, Money Rates and Securities Markets, (January 1966), p. 37.

1964-75: Federal Reserve System, Statistical Release, G13.

*Column 8, United States Long-Term Interest Rate: Yields on High-Grade Corporate Bonds*

1869-99: Annual average of monthly yields on railroad bonds adjusted for economic drift, Macaulay, *Movements of Interest Rates, Bond Yields and Stock Prices in the United States since 1856*, pp. A145-A152, col. 5, plus 0.114 percentage points to raise averages to level of following segment.

1900-1975: Basic yield on corporate bonds to thirty-year maturity (first quarter or February data). United States Bureau of the Census, *Historical Statistics of the United States, Colonial Times to 1970, Bicentennial Edition, Part 2*, (Washington, D. C., 1975), series X-491; United States Bureau of the Census, *Statistical Abstract of the United States: 1976 (97)* (Washington, D. C., 1976), p. 495.

*Column 9, United States Long-Term Interest Rate: Yields on High-Grade Industrial Bonds*

1869-99: Same as column 8, except that 1.468 percentage points is added to raise averages to level of following segment.

1900-1975: An arithmetic mean of yield to maturity based on mean of monthly high-low prices before 1929, thereafter, an average of four or five weekly prices for the month. Standard and Poor, *Trade and Securities Statistics: Security Price Index Record, 1972 ed.*, p. 205; *Trade and Securities Statistics: Current Statistics*, January 1973, p. 36; *Security Price Index Record, 1974 ed.*, p. 221; *Trade and Securities Statistics: Current Statistics*, January 1976, pp. 41-42.

*Column 10, United States High-Powered Money*

These are annual averages, centered on 30 June, of quarterly figures, 1867-1907, and of monthly data thereafter. Sums of (a) currency held by the public; and (b) bank vault cash, 1867-October 1914, thereafter including also (c) member bank deposits and (d) nonmember clearing account at Federal Reserve Banks.

1867-1907 II: (a) and (b) M. Friedman and A. J. Schwartz, *Monetary Statistics of the United States*, pp. 344-50.

1907-42: (a) and (b) *ibid.*, pp. 8-34, 380-93; (c) *Annual Report, Federal Reserve Board, 1914-21; Banking and Monetary Statistics, 1914-1941*, pp. 378-94; *Federal Reserve Bulletin*, monthly issues; (d) *Annual Reports, Federal Reserve Board and Board of Governors of the Federal Reserve System, 1914-21, 1926-42*.

1943-75: (a) *Monetary Statistics*, pp. 34-52; Banking Section of the Federal Reserve Board's Division of Research and Statistics; (b) *A Monetary History*, pp. 741-44; Banking Section of the Federal Reserve Board's Division of Research and Statistics; (c) *Banking and Monetary Statistics, 1941-1970*, pp. 558-89; *Federal Reserve Bulletin*, monthly issues; (d) *Annual Report, Board of Governors of the Federal Reserve System, 1943, 1945-75*.

Table 4.9

Year	Interest Rates (Annual Percentage)										
	Money Stock (Million £) (1)	Nominal Income (Million £) (2)	Real Income (Million 1929 £) (3)	Implicit Price Deflator (1929 = 100) (4)	Population (Millions) (5)	Short-Term		Long-Term		Exchange Rate for £ in U.S. \$ (8)	High- Powered Money (Million £) (9)
						Rates on Three-Month Bills (6)	Yields on Consols (7)	Yields on Consols (7)	Yields on Consols (7)		
1868		805	1,346	59.8	30,690	2.46	3.20		6.8624		
1869		833	1,419	58.7	30,918	3.37	3.23		6.5045		
1870		899	1,597	56.3	31,257	3.28	3.24		5.6120		
1871	502	972	1,682	57.8	31,556	2.89	3.23		5.4858	159	
1872	551	1,037	1,689	61.4	31,874	4.08	3.24		5.5094	162	
1873	583	1,111	1,750	63.5	32,177	4.70	3.24		5.5203	163	
1874	605	1,084	1,763	61.5	32,501	3.56	3.24		5.4482	164	
1875	618	1,072	1,811	59.2	32,839	3.14	3.20		5.6169	170	
1876	619	1,056	1,827	57.8	33,200	2.26	3.16		5.4586	173	
1877	615	1,047	1,863	56.2	33,576	2.62	3.15		5.1059	172	
1878	591	1,015	1,839	55.2	33,932	3.59	3.15		4.9141	174	
1879	573	994	1,883	52.8	34,304	2.14	3.08		4.8556	179	
1880	581	1,037	1,885	55.0	34,623	2.53	3.05		4.8490	170	
1881	591	1,076	2,000	53.8	34,935	3.05	3.00		4.8460	167	
1882	605	1,116	2,044	54.6	35,206	3.55	2.99		4.8757	166	
1883	616	1,102	2,041	54.0	35,450	3.22	2.97		4.8543	164	
1884	629	1,073	2,044	52.5	35,724	2.57	2.97		4.8590	164	
1885	636	1,058	2,070	51.1	36,015	2.40	3.02		4.8597	166	
1886	634	1,082	2,151	50.3	36,313	2.33	2.98		4.8682	163	

Including Southern Ireland

1887	632	1,127	2,232	50.5	36,598	2.65	2.95	4,8617	162
1888	648	1,204	2,384	50.5	36,881	2.53	2.97	4,8826	163
1889	676	1,296	2,531	51.2	37,178	2.85	2.81	4,8812	169
1890	698	1,326	2,545	52.1	37,485	3.88	2.67	4,8703	173
1891	726	1,307	2,518	51.9	37,802	2.77	2.70	4,8677	182
1892	743	1,268	2,448	51.8	38,134	1.76	2.65	4,8777	184
1893	748	1,274	2,474	51.5	38,490	2.32	2.61	4,8704	187
1894	752	1,362	2,692	50.6	38,859	1.18	2.52	4,8819	192
1895	793	1,395	2,796	49.9	39,221	0.96	2.39	4,8944	198
1896	840	1,431	2,879	49.7	39,599	1.56	2.28	4,8774	211
1897	847	1,481	2,950	50.2	39,987	1.92	2.25	4,8673	203
1898	865	1,563	3,095	50.5	40,381	2.62	2.28	4,8536	202
1899	895	1,649	3,221	51.2	40,773	3.35	2.36	4,8715	205
1900	919	1,695	3,104	54.6	41,155	3.70	2.54	4,8717	209
1901	927	1,668	3,077	54.2	41,538	3.17	2.67	4,8786	210
1902	929	1,687	3,165	53.3	41,893	2.97	2.66	4,8764	212
1903	935	1,661	3,122	53.2	42,246	3.38	2.75	4,8682	213
1904	924	1,647	3,090	53.3	42,611	2.68	2.83	4,8717	211
1905	942	1,725	3,218	53.6	42,981	2.62	2.78	4,8663	216
1906	971	1,827	3,383	54.0	43,361	3.97	2.83	4,8573	218
1907	992	1,921	3,499	54.9	43,737	4.49	2.97	4,8667	223
1908	1,000	1,831	3,323	55.1	44,124	2.29	2.90	4,8684	223
1909	1,019	1,861	3,390	54.9	44,520	2.28	2.98	4,8760	226
1910	1,047	1,943	3,520	55.2	44,916	3.16	3.08	4,8676	226
1911	1,078	2,025	3,623	55.9	45,268	2.90	3.15	4,8660	226
1912	1,119	2,132	3,708	57.5	45,436	3.62	3.28	4,8701	233
1913	1,160	2,206	3,810	57.9	45,649	4.36	3.39	4,8689	244
1914	1,263	2,231	3,833	58.2	46,049	2.90	3.46	4,9296	327
1915	1,404	2,517	3,951	63.7	46,340	3.66	3.82	4,7570	367
1916	1,559	2,985	4,095	72.9	46,514	5.20	4.31	4,7660	437

Table 4.9 (Continued)

Year	Money Stock (Million £) (1)	Nominal Income (Million £) (2)	Real Income (Million 1929 £) (3)	Implicit Price Deflator (1929 = 100) (4)	Population (Millions) (5)	Interest Rates (Annual Percentage)			Exchange Rate for £ in U.S. \$ (8)	High-Powered Money (Million £) (9)
						Short-Term		Long-Term		
						Rates on Three-Month Bills (6)	Yields on Consols (7)			
1917	1,867	3,722	4,059	91.7	46.614	4.78	4.58	4.7644	513	
1918	2,223	4,506	4,172	108.0	46.575	3.56	4.40	4.7651	634	
1919	2,600	4,671	3,681	126.9	46.534	3.92	4.62	4.4258	732	
1920	2,886	5,223	3,389	154.1	46.821				728	
<i>Excluding Southern Ireland</i>										
1920	2,831	5,077	3,288	154.4	43.718	6.40	5.32	3.6643	711	
1921	2,768	4,249	3,099	137.1	44.072	5.16	5.21	3.8490	684	
1922	2,676	3,713	3,218	115.4	44.372	2.64	4.43	4.4292	638	
1923	2,561	3,542	3,342	106.0	44.596	2.72	4.31	4.5748	614	
1924	2,520	3,677	3,499	105.1	44.915	3.46	4.39	4.4171	610	
1925	2,500	3,959	3,742	105.8	45.059	4.14	4.43	4.8289	610	
1926	2,509	3,747	3,599	104.1	45.232	4.48	4.55	4.8582	597	
1927	2,546	3,983	3,928	101.4	45.389	4.26	4.56	4.8610	589	
1928	2,600	3,996	3,980	100.4	45.578	4.16	4.47	4.8662	584	
1929	2,616	4,127	4,127	100.0	45.672	5.26	4.60	4.8569	572	
1930	2,638	4,065	4,098	99.2	45.866	2.57	4.46	4.8621	566	
1931	2,606	3,658	3,810	96.0	46.074	3.61	4.53	4.5350	561	
1932	2,666	3,550	3,838	92.5	46.335	1.86	3.76	3.5061	569	
1933	2,804	3,650	4,007	91.1	46.520	0.69	3.38	4.2368	605	

1934	2,812	3,910	4,325	90.4	46,666	0.82	3.08	5.0393	612
1935	2,912	4,078	4,471	91.2	46,868	0.58	2.89	4.9018	624
1936	3,100	4,308	4,703	91.6	47,081	0.61	2.94	4.9709	663
1937	3,244	4,556	4,786	95.2	47,289	0.58	3.28	4.9440	715
1938	3,228	4,754	4,876	97.5	47,494	0.64	3.38	4.8894	731
1939	3,272	4,907	4,912	99.9	47,761	1.23	3.72	4.4354	758
1940	3,607	5,530	4,834	114.4	48,226	1.04	3.40	3.8300	855
1941	4,155	6,720	5,342	125.8	48,216	1.03	3.13	4.0318	970
1942	4,788	7,449	5,584	133.4	48,400	1.03	3.03	4.0350	1,157
1943	5,376	7,918	5,636	140.5	48,789	1.03	3.10	4.0350	1,362
1944	6,082	8,114	5,611	144.6	49,016	1.03	3.14	4.0350	1,571
1945	6,698	8,227	5,647	145.7	49,182	0.93	2.92	4.0302	1,761
1946	7,396	8,165	5,447	149.9	49,217	0.53	2.60	4.0328	1,878
1947	8,035	8,688	5,481	158.5	49,519	0.53	2.76	4.0286	1,982
1948	8,173	9,621	5,633	170.8	50,014	0.56	3.21	4.0313	1,873
1949	8,300	10,311	5,859	176.0	50,312	0.63	3.30	3.6872	1,897
1950	8,382	10,823	6,091	177.7	50,565	0.69	3.55	2.8007	1,904
1951	8,457	11,837	6,210	190.6	50,290	0.91	3.79	2.7996	1,962
1952	8,584	12,729	6,170	206.3	50,431	2.71	4.23	2.7926	2,028
1953	8,849	13,518	6,355	212.7	50,593	2.77	4.08	2.8127	2,130
1954	9,189	14,437	6,629	217.8	50,765	1.84	3.76	2.8087	2,239
1955	9,246	15,480	6,874	225.2	50,946	3.75	4.17	2.7913	2,354
1956	9,175	16,606	6,939	239.3	51,184	5.05	4.74	2.7957	2,464
1957	9,373	17,477	7,016	249.1	51,430	4.98	4.98	2.7932	2,557
1958	9,704	18,222	6,987	260.8	51,652	4.74	4.98	2.8098	2,633
1959	10,122	19,253	7,246	265.7	51,956	3.49	4.82	2.8088	2,717
1960	10,495	20,959	7,745	270.6	52,372	5.05	5.42	2.8076	2,843
1961	10,722	22,145	7,920	279.6	52,807	5.32	6.20	2.8022	2,962
1962	10,925	23,203	8,029	289.0	53,274	4.41	5.98	2.8078	2,986
1963	11,448	24,759	8,376	295.6	53,552	3.82	5.58	2.8000	3,060

Table 4.9 (Continued)

Year	Interest Rates (Annual Percentage)									
	Money Stock (Million £) (1)	Nominal Income (Million £) (2)	Real Income (Million 1929 £) (3)	Implicit Price Deflator (1929 = 100) (4)	Population (Millions) (5)	Short-Term		Long-Term Yields on Consols (7)	Exchange Rate for £ in U.S. \$ (8)	High- Powered Money (Million £) (9)
						Rates on				
						Three-Month Bills (6)				
1964	12,010	26,772	8,836	303.0	53,885	4.81	6.03	2.7921	3,232	
1965	12,702	28,787	9,113	315.9	54,218	6.29	6.42	2.7959	3,429	
1966	13,219	30,385	9,195	330.5	54,500	6.43	6.80	2.7930	3,623	
1967	13,796	32,017	9,275	345.2	54,800	6.08	6.69	2.7504	3,728	
1968	14,780	34,201	9,377	364.7	55,049	7.42	7.39	2.3935	3,936	
1969	15,538	36,073	9,460	381.3	55,263	8.48	8.88	2.3901	4,085	
1970	16,528	39,600	9,607	412.2	55,421	8.26	9.16	2.3959	4,245	
1971	18,405	44,479	9,794	454.1	55,610	6.41	9.05	2.4442	4,589	
1972	22,002	49,696	9,976	498.1	55,793	6.11	9.11	2.5008	4,951	
1973	27,841	57,933	10,233	566.1	55,933	10.43	10.85	2.4510	6,401	
1974	33,175	66,512	10,470	635.2	55,965	13.06	14.95	2.3403	7,213	
1975	36,480	83,188	10,866	765.6	55,943	10.62	14.66	2.2216	8,057	

Source, by Column

## Column 1, United Kingdom Money Stock

This series is the sum of gross deposits at London and country joint stock and private banks (later, London clearing banks and other domestic deposit banks and, since 1968, the National Giro) and at Scottish and Irish banks, less interbank and transit items, plus private deposits at the Bank of England and currency held by the public.

1871-80: See text. Based on Shizuya Nishimura, "The Growth of the Stock of Money in the U.K., 1870-1913."

- 1881-96: See text. Based on David K. Sheppard, *The Growth and Role of U. K. Financial Institutions, 1880-1962*, table (A)1.1, col. 4, pp. 116-17; table (A) 3.3, col. 3, pp. 182-83.
- 1897-1966: Based on Sheppard's deposit components and his currency components for 1911-60. Thereafter currency held by the public is from *Annual Abstract of Statistics*, 1976 (no. 113), table 415.
- 1967-68: Unpublished estimates of deposits provided by Sheppard combined with currency obtained from source listed above.
- 1969-75: Bank of England, *Statistical Release*, October 1976. Bank of England M3 estimates linked to Sheppard's 1968 estimates.

*Column 2, United Kingdom Nominal Income*

This series is an estimate of net national product from the income side.

- 1868-1949: C. H. Feinstein, *National Income, Expenditure and Output of the United Kingdom, 1855-1965*, table 1, col. 13.
- 1950-75: Central Statistical Office, *National Income and Expenditure, 1962-72; 1963-73; 1964-74; 1965-75* issues, table 1.1, national income plus or minus residual error (reference number 25 plus or minus reference number 21).

*Column 3, United Kingdom Real Income in 1929 Pounds Sterling*

- 1868-1975: Column 2 divided by column 4.

*Column 4, United Kingdom Implicit Price Deflator (1929 = 100)*

This series is the deflator implicit in net national product from the expenditure side obtained by dividing the series in current prices by the series in constant prices on various bases and then shifted to the 1929 base.

- 1868-69: The current price series is the one for 1870-1949, cited below. The constant price series was derived as follows: GNP, calculated from the expenditure side, is available for these years in both current and 1900 prices (Phyllis Deane, "New Estimates of Gross National Product for the United Kingdom, 1830-1914," pp. 104-7). To get net national product we subtracted an estimate of capital consumption from the GNP figures. The current price estimate is from Feinstein (table 1, col. 12). An estimate of net total fixed capital formation in current and 1900 prices is available (B. R. Mitchell and P. Deane, *Abstract of British Historical Statistics*, pp. 373-74). We used the deflator implicit in net total fixed capital formation to deflate capital consumption in current prices. Capital consumption in 1900 prices was then subtracted from GNP in 1900 prices to get NNP in 1900 prices.

1870-1939,  
1947-49:

The current price series is in Feinstein, *National Income*, table 2, column 10, minus table 1, column 12 (pp. T4-T9). The constant price series on various bases is in *ibid.*, table 5, column 15 (pp. T14-T16).

1940-46:  
1950-65,  
1975:

As above, and then adjusted for correction of reported implicit prices during period of price controls. See text and tables 4.5 and 4.6.

The current price series is from table 1.1 (reference number 25), the constant price series on a 1970 base, from table 2.1 (reference number 25), in Central Statistical Office, *National Income and Expenditure*, 1962-72; 1963-73; 1964-74; 1965-75 issues.

1966-74:

As above, and then adjusted for correction of reported implicit prices during period of price controls. See text and table 4.7.

#### *Column 5, United Kingdom Population*

1868-1951: Feinstein, *National Income*, table 55 (pp. T120-T121).

1952-74: C.S.O., *Annual Abstract of Statistics*, 1974, no. 111 and 1976, no. 113, table 6, p. 7.

1975: C.S.O., *Monthly Digest of Statistics*, May 1977, table 2.2., p. 14.

#### *Column 6, United Kingdom Short-Term Interest Rate: Rates for Three-Month Bankers' Bills*

1868-1938: These are annual averages of monthly figures. Mitchell and Deane, *Abstract of British Historical Statistics*, p. 460.

1939-75: C.S.O. *Annual Abstract of Statistics*, nos. 84, 88, 96, 102, 111, 113.

#### *Column 7, United Kingdom Long-Term Interest Rate: Annual Average Yield on Consols*

1868-1959: Sidney Homer, *A History of Interest Rates*, pp. 196-97, 409-410.

1960-73: C.S.O., *Annual Abstract of Statistics*, 1965, no. 102, table 351; 1974, no. 111, table 388.

1974-75: *Monthly Digest of Statistics* (May 1977) table 16.16, p. 147.

*Column 8, United Kingdom Exchange Rates on the United States Dollar*

These are annual averages of monthly data that are averages of daily rates, except for 1868-78, which are annual averages of quarterly data.

1868-78: \$4.8665 times premium or discount on gold bills, from L. E. Davis and J. R. T. Hughes, "A Dollar-Sterling Exchange, 1803-95," table A-2, column headed "Macaulay," and times United States gold premium, from W. C. Mitchell, *Gold, Prices, and Wages under the Greenbacks Standard*, p. 4.

1879-1912: A time series in NBER files, compiled from *The Economist*, except 1899-1908, for which data are given in National Monetary Commission, *Statistics for Great Britain, Germany, and France, 1867-1909*, pp. 70-74.

1913-41: *Banking and Monetary Statistics*, p. 681.

1942-60: *Supplement to Banking and Monetary Statistics*, section 15, p. 92.

1961-75: *Federal Reserve Bulletin*, p. A-75.

*Column 9, United Kingdom High-Powered Money*

Sums of currency outside banks, currency held by banks, bankers' deposits, special deposits, and private deposits at the Bank of England.

1871-1968: See sources listed for column 1.

1969-75: Bank of England *Quarterly Bulletin*, and Bank of England *Report and Accounts for the Year Ended 28 February, 1969-76*.