Chapter III. The Statistical Analysis of Output

The statistical analysis of the historical record of the output of the U.S. economy and of the major output-determining factors proceeded in five stages:

(1) Assembling of historical data on an annual basis for output and each of the related variables needed for the equation developed in chapter II.

(2) Transforming of the basic variables, where necessary, into the form required in order to fit the equation to the data.

(3) Fitting the equation to the data, using the classic least-squares regression procedure, making modifications of the equation as tests with the data progressed, and obtaining a final fit by successive approximations.

(4) Interpreting the function obtained in economic terms to test its reasonableness in light of economic analysis and other previous related studies.

(5) Computing the potential output of the economy for 1909–60, using the derived production function.

The variables and their measurement

As indicated previously, output of the economy is a result of a wide variety of forces. The growth in the economy's potential output is therefore similarly effected by a range of factors far too large to be incorporated directly in the computations at this time. Fortunately, it is possible to measure output for the economy as a whole, and the two major productive factors, labor and capital. As will be seen later, these dominate the rate of growth and cyclical fluctuations to such an extent that the variables that are not measured directly can be represented indirectly by a proxy or stand-in. In the historical analysis covering the years 1909–58, the influences on our potential economic growth were subjected to statistical analysis making use of the following measurements of output and inputs.

(1) *Output*.—The measure of output is the GNP deflated (adjusted for changes in prices) to prices prevailing for each of the component goods and services in the year 1954. This series is constructed by the National Income Division, Office of Business Economics, Department of Commerce, and published regularly on an annual and quarterly basis in the "Survey of Current Business" (29).

GNP measures the market value of the output of goods and services produced by the Nation's economy before deduction of depreciation charges and other allowances for business and institutional consumption of durable capital goods. The series in real terms, which was utilized in this study, reprices this output in terms of prices