GNP, only the value added in each establishment or firm is counted, costs of purchased materials being deducted, so that total output is as free as possible of double counting. The total of the incomes paid to productive factors will equal total output for the economy as a whole but will fall short for the individual productive unit by the value of purchased materials and components.

A second distinction exists between the flows per unit of time—year, month, etc.—of inputs and outputs, on the one hand, and stocks of goods or productive resources on the other. Generally, inputs and outputs are time flows, such as hours of labor or of machine time on the input side of the productive process, and tons of steel per year or months of rent of dwellings on the output side. Stocks are sources of flows of productive services—capital and labor—and are results of past output flows, being the sums (integrals) of those parts of past output flows which were not used up, consumed, in the time period in which they were produced.

The production function relates the flow of outputs per unit of time to the various flows of inputs per unit of time in such fashion that if the coefficients of the function are known, and the volumes of the various inputs are known, the resulting volume of output can be predicted from the function.

The third important distinction is between production under stationary or static and under dynamic conditions. A static situation may be thought of as one in which productive capacity is unchanging and technical knowledge always remains the same. Under these conditions, met with occasionally in an individual unit, but rarely, if ever, in an entire economy, the volume of production can vary only between zero and the fixed capacity volume, and the constant knowledge of technical possibilities readily yield the best combination of productive resources to yield any required output volume between these limits.

In a dynamic situation, capacity can be expanded to meet demands as they push beyond present capabilities, present inputs may increase either current output, as in the static case or future outputs, and technical knowledge can change, making possible combinations of productive services or types of outputs not previously feasible. In a dynamic world, current output possibilities and the spectrum of input combinations reflect the cumulative effects of an endless stream of past decisions allocating resources between consumption and investment, and between investment in tangible productive resources and in intangibles such as education, research, health, institutional arrangements (protection of competition, economic and political rights at law, etc.) and promotion of moral standards.

To bring out the implications of these distinctions for the later analysis, let us assume a productive unit with a fixed stock of plant and equipment, operating in competitive markets for both inputs and outputs, and during a time period in which technical knowledge is unchanged. At low rates of production, output will tend to rise faster than inputs, productivity will rise as volume rises and the firm will experience increasing returns. At higher operating ranges, output and inputs will rise together, the rise in productivity will slow down and finally halt so that constant returns appear. If very high rates of production are attempted, productivity may fall and decreasing returns set in as inputs rise faster than output.