

An increase in the domestic output of a country will result in an increase in its demand for imports. If this calculation is put on a percentage basis, the result is an estimate of the income elasticity of demand; that is, the percentage increase in the demand for imports when income rises 1 percent. Most empirical evidence indicates that the income elasticity for all primary products for Western Europe and the United States is somewhere around unity; that is, an increase of 1 percent in income stimulates a 1-percent increase in imports. There is, of course, a different income elasticity for each product and over time elasticity changes. For foods and stable primary products it is probably lowest. For petroleum, on the other hand, it may be quite high. For example, per capita petroleum consumption increased 6 times for the United States and 13 times for Western Europe between 1927-29 and 1955-57.

2. Technological and industrial change

Technological change probably has a net detrimental effect upon the market for primary commodities. The record of the last few decades indicates that some less developed countries have been damaged by changes in technology. In general, the effect has been to economize on the use of raw materials so that at present a smaller input of raw materials is required to produce a given value of output compared with two decades ago.

More complicated and highly fabricated products are introduced as incomes rise and these new products contain a relatively smaller value of raw materials. The weight of metals in an automobile does not increase in the same proportion as its value, since more gadgets and refinements are being added. The attainment of higher degrees of precision in machinery and equipment makes them cost more but does not necessarily add to the value of the raw materials used. In addition, there have been a number of technological changes which have tended to economize raw materials. Electroplating of tin requires less raw material input per unit output. The lead content of the storage battery has been steadily declining. Greater precision permits less scrap wastage. Most of these changes have not been spectacular, but along with the higher degree of fabrication of products, have resulted in substantial economies in raw material inputs.

One of the most spectacular kinds of changes affecting raw material requirements has been the development of synthetic materials. Synthetic textile fabrics—rayon, nylon, orlon—along with shifting consumption patterns, have made deep inroads into cotton and wool trade. Between 1927-29 and 1955-57 the per capita consumption of textile fibers in the United States declined by one-fourth and in Western Europe by almost one-fifth. Wool, cotton, and jute have been particularly hard hit. Petrochemicals and plastics have begun to have an impact on raw material markets. Synthetic rubber has prevented any increase in per capita consumption of natural rubber in the last three decades.

In addition, technology has permitted the substitution of one primary commodity for another so that the fortunes of individual less developed countries are affected differentially as substitution takes place. Substitution takes place in response to changes in relative prices, as well as to changes in technology which make substitution