

STATIC MODEL OF PRODUCTION AND THE EVOLUTION OF ECONOMICS

The purpose of studying economics is not to acquire a set of ready-made answers to economic questions, but to learn how to avoid being deceived by economists.

Joan Robinsonⁱ

Economics is a science of thinking in terms of models, which are relevant to the contemporary world. ... Good economists are scarce because the gift for using “vigilant observation” to choose good models, although it does not require a highly specialized intellectual technique, appears to be a very rare one

J. M. Keynesⁱⁱ

Economics is the social science concerned with the production, distribution and consumption of wealth. The word economics is derived from the ancient Greek word ‘Oikonomia’. This roughly translates to household management. The ancient Greeks used oikonomia to refer to the organizing of activities in a household and to larger political units as well, such as city-states. Oikonomia, as used in ancient times, can be thought of as an early image of the idea of productionⁱⁱⁱ. In one way or another societies have always produced, traded, consumed and distributed products and services. Economics and human activity are intimately related. The major divisions of economics are ‘Microeconomics’ and ‘Macroeconomics’.

Microeconomics deals with the behavior of individual consumers, companies, traders and farmers. Microeconomics considers individuals both as suppliers of labor and capital and as the ultimate consumers of the final products, and it analyses firms as suppliers of labor and capital. Microeconomics seeks to analyze the market or type of mechanism that establishes relative prices among goods and services and allocates society’s resources among their many alternatives.

Macroeconomics deals with the study of an entire economy in terms of the total amount of goods and services produced, total income earned, the level of employment of productive resources and the general behavior of process. Macroeconomics is about aggregates, for instance the level of income in an economy, the volume of total employment, and the flow of investment.

In practice, macroeconomics deals with three interdependent main topics: unemployment, inflation, and growth. Government expenditure on employment would add to deficit, and from this could come the specter of future tax increase. Low interest rates, even if not especially effective against continuing unemployment, are adverse to renter income. They also lower the price that banks charge for their salable product, namely the money lend^{iv}.

If policy makers are to steer an economy toward lower unemployment, then macroeconomics theory must provide the beacon that lights that way. Recessions and inflation are severe economic maladies whose fundamental cause is undesirable gyration of total spending (aggregate demand). Although not entirely eradicable recessions and inflation can and should be ameliorated by enlightened administration of medicines the government know how to dispense - control of aggregate demand through monetary policy (the money supply and interest rates) and fiscal policy (taxes and government spending). But the demand management cannot fight both problems at one. Faster growth of demand is good for employment, but bad for inflation. Slower growth of demand has the opposite effects^v. The instruments of government economic intervention include: budget deficits, direct and indirect taxation, interest rates, the exchange rate, development expenditures of government-owned corporations, and regulation of economic activity^{vi}.

Through the ages various theories regarding the wealth of nations were advanced. An early set of the idea concerning the theory of wealth has come to be called Mercantilism. Popular in the 17th and 18th centuries, it did not rest on an elaborated theory; rather, it was the set of actions and ideas practiced by politicians, statesmen, and merchants. In essence, Mercantilism was based on the approach that the best policy for a nation was the same as that for an individual merchant; the wealthier nation would be the one that is the 'better' trader; the one that sells more than it buys; the one that exports more than it imports. Unemployment was not seen as a problem since the availability of labor would drive down wages.

Reacting to Mercantilism were a group of 18th century thinkers in France known as the Physiocrats who felt that wealth lay not in industry or commerce but in the land itself. All wealth, it was believed, ultimately derived from the land according to a natural law that is both basic and benevolent. For Physiocrats those who worked the land were the only true producers of wealth. The only surpluses, the only wealth, came from agricultural activities. By definition, the activities of non-agricultural workers, while necessary, were not productive. The physiocrats were the inventors of the term 'laissez faire'; they believed it would be better to leave the economy to the natural order of things, that is, 'laissez faire'.

Adam Smith (1723-90), the founder of new economics, went to France and studied Physiocracy. He was impressed with the concept of laissez faire and advanced the argument that market forces should be allowed to operate without government intervention. Smith's epic treatise, "The Wealth Of Nations", focuses on production resulting from labor and resources. Wealth was measured as total production in relation to the size of the population, or income per capita. The key to wealth, he maintained, lay in an increase in production.

It is customary to associate the beginning of modern economics with the publication of Adam Smith's "The Wealth of Nations" (1776), its distinguishing characteristics is its limited use of the method of simplification and abstraction^{vii}. Adam Smith's ideas continue to this day and are consciously or unconsciously sprinkled throughout lectures on economics virtually everywhere. Building on laissez faire and self interest, Adam Smith felt that the greatest good for the greatest number would arise from allowing individuals to operate from their self-interest and this could be achieved by allowing markets everywhere to operate openly and freely.

Distribution of a nation's wealth was determined by the theory of the day. According to the Mercantilists, traders would receive the greatest returns; for the Physiocrats, agriculture and resources would generate the greatest returns. Economics holds that returns flow to the productive factors: "land, labor and capital". This division is fairly arbitrary and there is often an overlap between them. However, the classification of productive resources into land, labor and capital, has had a profound impact on the process of development of economics as a discipline.

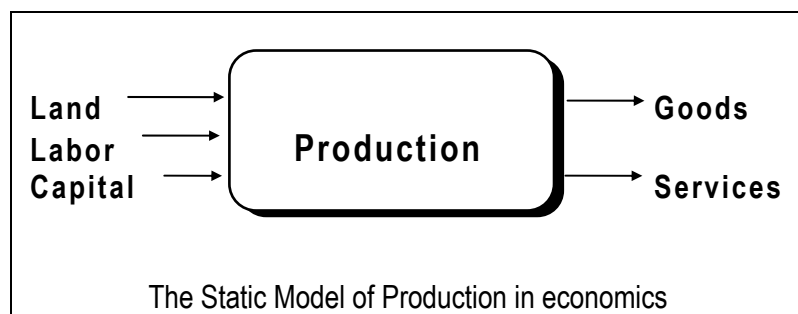
Land: Everything useful in its natural state as a production input, including agricultural land, building sites, forests, mineral deposits etc. Land in its broadest sense includes virtually all non-human natural resources: agricultural land and building land, mines and quarries, rivers, oceans, and the atmosphere - and everything in them. Part of land thus consists of a supply of 'environmental free goods' - air and sea water, for example.

Labor: Everyone who works for a business. All kinds of human occupation and effort are included here, both physical work and skilled mental effort.

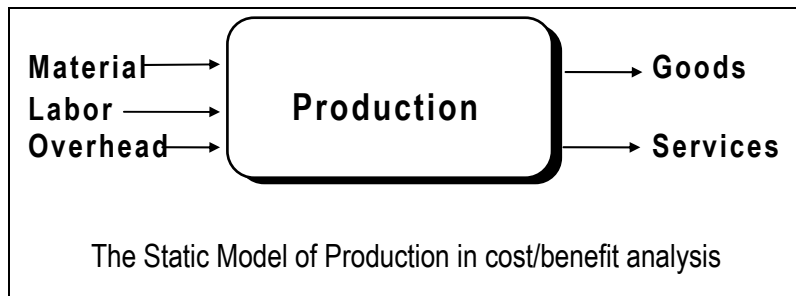
Capital: Capital is a word with many meanings in economics, but it may be defined as the stock of assets accumulated by society which facilitate the economic process. Plant and machinery are the most obvious kind of capital, but roads, schools, and hospitals also represent capital and make an important indirect contribution to the production of goods and services.

Adam Smith was preoccupied mainly with the political issues of wealth distribution among the main social classes of his time: **workers, capitalists, and landlords**^{viii}. Although Adam Smith was a pioneer because of his detailed study of the division of labor in the process of production in a pin making shop, his Wealth of Nations pays practically no attention to machines, factories, or industrial production^{ix}. In addition, the analysis of the factors of production into land, labor and capital was first formulated by Jean Baptist Say (1767-1832), a French economist^x. **Two hundred years later, economics text books still limit production resources to the same factors of production, which are based on the eighteenth century social class concepts.**

Economists refer to the production outputs as **products** or **commodities**. Products or commodities are classified as **goods**, which are tangible, and **services**, which are intangible. **Production** is the process of transforming factors of production (inputs) into products (outputs).



The above classification for products and resources constitutes a tacit model of production, called the **Static** or formal model of production^{xi}. The Static model has been used - as the main model - in all the major economic schools, varying from Classical, Marxian to Neoclassical.



In addition to macroeconomics, a version of the Static model has also been used as the main model in accounting and financial analysis of projects. Accounting systems cover the financial status of firms in terms of the assets and obligations (liabilities) recorded in

the balance sheet, the cost accounted for over the reporting period, and the corresponding income shown in the net income statement. Costs include the cost of acquired **materials** and supplies, cost of **labor**, and **overhead** which covers the depreciation of the used capital. These three main sources of costs correspond to the three factors of production in the Static model. In this structure, the outputs are also labeled as **goods** and **services**. Revenue is due to sold outputs (goods and services multiplied by prices). Gross profit is the difference between revenues and costs. The remaining financial analysis methods such as cash flow, net-present-value ratio, internal rate of return, and break-even point are based on the above basic classifications and definitions for accounting. This formation has also been presented here.

Obviously there exist many commonalities between the variables in the both versions of the Static model. Land is the source of material, and overhead covers the cost of using capital (machinery, equipment and facilities). However the economic studies, as well as accounting practices, have rarely studied the structure of the common model being used by both disciplines.

Ammers^{xii} argue that to the mercantilists' emphasis on trade and to the physiocrats' emphasis on agriculture, the classical economists added industry, which they felt was equally productive. Though the classical economists were among the first to analyze the economy as a whole (macroeconomics) and the laws they believed to be operative in it, their analysis was essentially static. They took into account neither the increasingly inequitable distribution of wealth and not the realities of technological change. Nor did they understand the role of demand in a free enterprise system, any more than they understood the roles played by money and interest. Long after most of their specific theories had been rejected, their abstract deductive approach, their assumption of pure competition, their belief in *laissez faire*, and their faith that economic forces tend toward an equilibrium all reappeared in the 'neoclassic' theories of Alfred Marshal and others.

Although the classification of the factors of production has been used for about two centuries, but it has rarely been treated as a model and the purpose of the model has not been well articulated. Without considering its domain, the Static model has generally, and of course tacitly, been applied as the most basic economic model. Naturally, there should be concern about the interpretation of so many of those analyses.

Some versions of the Static model have been amended to include entrepreneurship as a factor of production. An entrepreneur is a person who takes risks by investing in an innovative project with a view to making a profit. An entrepreneur is some one who endows resources with new wealth-producing capacity^{xiii}. But entrepreneur is not totally separate from labor, and the definition of entrepreneurship as an independent factor of production, however, is not sufficiently studied or widely supported at this time.

It may be tempting for an individual to think of money as an economic resource, but in economic studies, money has usually been defined as any generally accepted medium of exchange. Money acts as a medium of exchange, as a store of value and as a unit of account, but not as an economic resource or a factor of production^{xiv}.

The Static model is also consistent with an imaginary state of 'equilibrium', a concept lifted from physics. Equilibrium is a static state in which the opposing forces exactly balance one another. Employing such a model was more than an attempt to formalize the 'ceteris paribus' technique, one of the most valuable aids in reasoning. It was the creation of a closed system of independent parts, all conceived as fitting together in a linear, even a mechanical way. Necessary assumptions of this model were that everyone had perfect knowledge, that all expectations were identical, and that all resources were already allocated to their most valued use. It implied that economies are, or ought to be, continuous, orderly and stable. This process fundamentally misrepresented the character of economy as a complex system^{xv}. Transition, not equilibrium, has become the standard operating condition. Flexibility is the way to adapt, and to survive and prosper in an epoch of transition^{xvi}.

The recognition of the role of economic gain in the achievement of technical advance can be traced back at least to the father of modern philosophy, Rene Descart. Adam Smith indicated how, as a by-product, the division of labor would yield improvements in methods of production. However, he failed to develop a theory of technical advance as a deliberate economic process^{xvii}.

Lack of attention to the role of knowledge/information is a, *even the*, notable shortcoming of the Static model, as in this model, no place has been foreseen for knowledge and information as a resource. Due to lack of considering knowledge as a variable, it is hardly possible to study innovation and technology in the context of the Static model, although their roles in economic development may seem so obvious.

The place of technology in economic analysis is, and always has been, fundamentally ambiguous. The study of the short-term equilibrium, which today remains the most elaborate set of theories, thus assumes that the technological level remains constant. The same hypothesis is widely held by Keynesians. The Ricardian and even the Marxist dynamics generally run along these lines^{xviii}. Economists have long treated technological phenomena as events transpiring inside a black box. The economics profession has adhered rather strictly to a self-imposed ordinance not to inquire seriously into what transpires inside the box^{xix}.

Freeman (1994)^{xx} suggests that when it came to formal neoclassical mathematical models of growth the black box took the form of a 'residual factor' (sometimes called the Third Factor) in an aggregate production function. This residual comprised all those awkward hard-to-measure elements other than labor and capital, such as technical and institutional change. From Solow's original study^{xxi} onwards, most of these formal models showed that the 'residual' apparently accounted for a larger part of the growth than the simple accumulation of capital and growth of labor force (sometimes as much as 90 per cent of the total).

Mokyr (1990) provides another interesting outlook to the role of technology in economics. He argues that economists typically approach the explanation of technological change by considering

the relationship between demand and supply variables, research and development, and productivity growth. In so doing, they implicitly treat technology as an input - albeit one with peculiar features - that is produced and sold in the market for research and development. Such a market analysis may or may not be a useful description of the post-1945 period. It is clear that, however, that for an explanation of the diffusion of wind power in medieval Europe, the adoption of iron casting in China during the Han dynasty, or the adoption of intensive husbandry in seventeenth-century Britain, such a framework is wholly inappropriate. Technological change throughout most of history can hardly be regarded as the consequence of an orderly process of research and development. It possessed few elements of planning and precise cost-benefit calculation^{xxii}.

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