

- Reder, Melvin W. 1982. Chicago Economics: Permanence and Change. *Journal of Economic Literature* 20: 1–38.
- Shiller, Robert J. 1993. *Market Volatility*. Cambridge, MA: MIT Press.
- Simon, Herbert A. 1959. Theories of Decision Making in Economics and Behavioral Science. *American Economic Review* 49: 252–283.
- Simon, Herbert A. 1978. Rationality as a Process and as a Product of Thought. *American Economic Review* 70: 1–16.
- Simon, Herbert A. 1987. Behavioral Economics. In *The New Palgrave: A Dictionary of Economics*, eds. John Eatwell, Murray Millgate, and Peter Newman, 221–225. London: Macmillan.
- Smith, Vernon L. 2003. Constructivist and Ecological Rationality in Economics. *American Economic Review* 93: 465–508.
- Smith, Vernon L. 2005. Behavioral Economics Research and the Foundations of Economics. *Journal of Socio-Economics* 34: 135–150.
- Stiglitz, Joseph E. 1987. The Causes and Consequences of the Dependence of Quantity on Price. *Journal of Economic Literature* 25: 1–48.
- Thaler, Richard H. 1992. *The Winner's Curse: Paradoxes and Anomalies of Economic Life*. New York: Free Press.
- Todd, Peter M., and Gerd Gigerenzer. 2003. Bounding Rationality to the World. *Journal of Economic Psychology* 24: 143–165.
- Tomer, J. F. 1997. *The Human Firm: A Socio-Economic Analysis of Its Behavior and Potential in a New Economic Age*. London and New York: Routledge.
- Tversky, Amos, and Daniel Kahneman. 1981. The Framing of Decisions and the Psychology of Choice. *Science* 211: 453–458.
- Williamson, Oliver E. 1975. *Markets and Hierarchies: Analysis and Antitrust Implications*. New York: Free Press.

*Morris Altman*

## ECONOMICS, CLASSICAL

The term “classical economics” was coined by the German political philosopher and economist Karl Marx, who stated “that by classical Political Economy, I understand that economy which, since the time of W. Petty, has investigated the real relations in bourgeois society” (Marx 1954, p. 85n.). Classical economics included, for example, the physiocrats, the English economist David Ricardo, and partly the Scottish economist Adam Smith; it excluded such authors as Thomas Robert Malthus and Jean-Baptiste Say, whom Marx considered “vulgar economists” dealing with “appearances” only.

Generally, economists and scholars have not adopted Marx’s definition of classical economics. According to

other interpreters there was no deep cleavage between earlier and later economists. The continuity thesis was expressed most forcefully by Alfred Marshall around the turn of the eighteenth century and in contemporary times by John R. Hicks and Paul A. Samuelson. Marshall perceived the classical economists as essentially early and somewhat crude demand and supply theorists, with the demand side in its infancy. The received Marshallian interpretation was challenged by Piero Sraffa, first in his introduction to volume I of his edition of Ricardo’s works and correspondence (1951), and secondly in his *Production of Commodities by Means of Commodities: Prelude to a Critique of Economic Theory* (1960), in which he reformulated the classical approach to the theory of value and distribution and showed that its analytical structure is fundamentally different from later marginalist (or neo-classical) analysis.

## METHOD, SCOPE, AND CONTENT

The classical economists were concerned with the laws governing the emerging capitalist economy, characterized by the stratification of society into three classes of workers, landowners, and the rising capitalists; wage labor as the dominant form of the appropriation of other people’s capacity to work; an increasingly sophisticated division of labor within and between firms; the coordination of economic activity via a system of interdependent markets in which transactions are mediated through money; and significant technical, organizational, and institutional change. In short, they were concerned with the production, distribution, and use of wealth of an economic system that was incessantly in motion. How should one analyze such a system? The ingenious device of the classical authors for seeing through the complexities of the modern economy consisted of distinguishing between the “actual” or “market” values of the relevant variables—the distributive rates and prices—and their “normal” or “natural” values. The former were taken to reflect all kinds of influences, many of an accidental or temporary nature, about which no general propositions were possible, whereas the latter were seen to express the persistent, nonaccidental, and nontemporary factors governing the economy, which could be systematically studied.

The method of analysis the classical economists adopted is known as the method of long-period positions of the economy. Any such position is one toward which the system is taken to gravitate as the result of the self-seeking actions of agents, thereby putting into sharp relief the fundamental forces at work. In conditions of free competition, that is, the absence of significant barriers to entry or exit from all markets, the resulting long-period position is characterized by a uniform rate of profits (subject, perhaps, to persistent inter-industry differentials reflecting different levels of risk) and uniform rates of

remuneration for each particular kind of primary input. Competitive conditions were taken to engender cost-minimizing behavior of profit-seeking producers.

The determination of the general rate of profits, the rents of land, and the corresponding system of relative prices constitute the analytical core of classical political economy. It was meant to lay the foundation of all other economic analysis, including the investigation of capital accumulation and technical progress; of development and growth; of social transformation and structural change; and of taxation and public debt. The pivotal role of the theory of value and distribution can be inferred from the fact that the latter is typically developed right at the beginning of major classical works.

### VALUE AND DISTRIBUTION

The classical concept of production starts from the following interrelated premises. First, human beings cannot create matter, they can only decompose or recombine and move it. Production involves productive consumption, and the real cost of a commodity consists in the commodities necessarily destroyed in the course of its production. This concept of physical real cost, according to Sraffa, differs markedly from later marginalist concepts, with their emphasis on “psychic cost.” Second, production consists essentially of a circular flow: Commodities are produced by means of commodities. This idea was advocated by William Petty and Richard Cantillon and was most effectively expressed in François Quesnay’s *Tableau économique* (Aspromourgos, 1996). It is in stark contrast with the “Austrian” view of production as a one-way avenue leading from the services of original factors of production to consumption goods. Third, all property incomes—profits and rents—are explained in terms of the social surplus; that is, those quantities of the different commodities that are left over after the necessary means of production used up and the means of subsistence in the support of workers have been deducted from the gross outputs produced during a year. In this conceptualization, the necessary real wages of labor are considered no less indispensable as inputs and thus “agents of production” (James Mill 1826, p. 165) than raw materials, tools, or machines. Fourth, profits, rents, and relative prices are explained essentially in terms of magnitudes that can, in principle, be observed, measured, or calculated. The objectivist orientation of classical economics has received its perhaps strongest articulation in a famous proclamation by William Petty, who, in his *Political Arithmetick*, published in 1690, stressed that he was to express himself exclusively “in Terms of Number, Weight, or Measure” (Petty 1986, p. 244).

The classical economists proceeded essentially in two steps. In a first step they isolated the main factors that

were seen to determine income distribution and the prices supporting that distribution in specified conditions; that is, in a given place and time. The theory of value and distribution was designed to identify in abstracto the dominant factors at work and to analyze their interaction. In a second step, the classical authors turned to an investigation of the causes that, over time, systematically affected the factors at work from within the economic system. This was the realm of the classical analysis of capital accumulation, technical change, economic growth, and socioeconomic development.

The rate of profits is the ratio of two bundles of heterogeneous commodities, the social surplus (exclusive of rent), and the social capital. In order to be able to compare these bundles, a theory of value was needed. With a circular flow the values of commodities can only be determined by means of simultaneous equations, a tool not available to the classical economists. They therefore approached the problem of value and distribution in a roundabout way, typically by first identifying an “ultimate measure of value” by means of which heterogeneous commodities were meant to be rendered commensurable. Several authors, including Smith, Ricardo, and Marx, had reached the conclusion that labor was the sought standard and thus arrived at some version of the labor theory of value. This was understandable in view of the unresolved tension between concepts and tools. However, it is far from clear how these labor values could be ascertained in a circular framework except by solving a system of simultaneous equations. In fact, with the benefit of hindsight, contemporary economists know that the labor theory of value landed the classical approach in an impasse and was one of the reasons for its premature abandonment and the rise to dominance of marginalist theory.

Yet, as Sraffa (1960, p. 6) showed, the classical economists were correct in assuming that a coherent determination of the general rate of profits and prices was possible in terms of the two sets of data on which they based their theory of value:

- (1) the system of production in use, described in terms of the methods of production and productive consumption actually employed; and
- (2) the real wage rate (or, alternatively, the share of wages).

This can be shown as follows: Let  $T_i$ ,  $M_i$  and  $F_i$  designate the inputs of three commodities—tools ( $t$ ), raw materials ( $m$ ), and the food of workers ( $f$ )—employed as means of production and means of subsistence in industry  $i$  ( $i = t, m, f$ ), and  $T$ ,  $M$  and  $F$  the total outputs in the three industries. Denoting the value of one unit of commodity  $i$  by  $p_i$  ( $i = t, m, f$ ), one has the following system of price equations:

$$(T_t p_t + M_t p_m + F_t p_f)(1 + r) = T p_t$$

$$(T_m p_t + M_m p_m + F_m p_f)(1 + r) = M p_m$$

$$(T_f p_t + M_f p_m + F_f p_f)(1 + r) = F p_f$$

Flukes apart, these equations are independent of one another. Fixing a standard of value, for example,  $p_f = 1$ , provides a fourth equation and no additional unknown, so that the system of equations can be solved for the dependent variables: the general rate of profits and prices. The distribution of the surplus must be determined at the same time and in the same way as are the prices of commodities.

### CAPITAL ACCUMULATION AND ECONOMIC DEVELOPMENT

With the rate of profits determined on the basis of data (1) and (2), the classical authors turned to the problem of the accumulation of capital and thus of the growth of the system. They typically assumed that the process of economic expansion was not constrained by an insufficient supply of labor, because the workforce needed was seen to be created endogenously, either via some population mechanism, as in the case of Malthus, or via the labor-displacing effects of machinery, as in the case of Marx's "industrial reserve army of the unemployed" (Marx 1977, p. 600). Ricardo discussed both mechanisms and also analyzed the case in which capital accumulates and the population grows, but there is no technical progress. Due to diminishing returns in agriculture, a rise in differential rents paid on intramarginal lands will, for a given real wage rate, entail a falling rate of profit. (The theory of intensive diminishing returns was later taken up by the marginalist economists who thought that the underlying principle could be generalized from agriculture to all industries and to all factors of production [labor, land, and capital] alike and a theory be elaborated in terms of a single principle only: that of relative scarcity.)

The classical authors also discussed different forms of technical progress. In Adam Smith capital accumulation increases the extent of the market and thus allows for an ever deeper division of labor. This increases labor productivity due to gains of specialization and induced inventions of machinery and thus engenders growing levels of income per capita. Smith's endogenous growth mechanism is a virtuous circle. Other classical authors were somewhat less optimistic. Ricardo, in the chapter on machinery in the *Principles* (1821) contemplated the case of a kind of mechanization that is gross output reducing: While labor productivity rises, total employment and the output-capital ratio (or maximum rate of profits) fall. This case reappears in Marx's discussion of the rising organic composition of capital and, given the share of wages, falling tendency of profitability. In 1967 Richard

Goodwin formalized some of the classical ideas on accumulation and distribution in terms of an adaptation of the predator-prey model developed in the theory of animal populations.

### TRADE AND MONEY

The classical economists advocated trade liberalization. According to Smith the specialization pattern of an economy would follow its absolute cost advantages. Via an opening of domestic and foreign markets trade would allow a deeper division of labor and thus enhance productivity growth. Ricardo showed, contrary to Smith, that what really mattered were comparative advantages and not absolute ones. Assume that one of two economies is able to produce all commodities at lower unit costs. Only this economy would export and the other one import. This would, however, engender a specie-flow mechanism with prices in the former economy rising and in the latter one falling. Ricardo's theory of money, a version of the quantity theory, was an integral part of his trade theory. Sooner or later some prices in the latter economy would have fallen below the levels in the first one and thereby reverse the competitive situation. This would relate precisely to those commodities in the production of which the second economy has a comparative advantage.

Since the publication of Sraffa's *Production of Commodities by Means of Commodities* there has been a revival of the classical approach. For a summary account of what has been achieved, see, for example, the work of Heinz D. Kurz and Neri Salvadori.

**SEE ALSO** *Capitalism; Capitalism, Managerial; Chicago School; Competition; Competition, Marxist; Economics, Institutional; Economics, Islamic; Economics, Keynesian; Economics, Neoclassical; Economics, Neo-Ricardian; Economics, New Classical; Economics, New Keynesian; Economics, Post Keynesian; Institutionalism; Libertarianism; Marginalism; Market Economy; Marx, Karl; Mill, John Stuart; Ricardo, David; Smith, Adam; Stockholm School*

### BIBLIOGRAPHY

- Aspromourgos, Tony. 1996. *On the Origins of Classical Economics: Distribution and Value from William Petty to Adam Smith*. London and New York: Routledge.
- Garegnani, P. 1987. Surplus Approach to Value and Distribution. In *The New Palgrave: A Dictionary of Economics*. Vol. 4, eds. John Eatwell, Murray Milgate, and Peter Newman, 560–574. London: Macmillan.
- Goodwin, Richard. 1967. A Growth Cycle. In *Socialism, Capitalism and Economic Growth*, ed. C. Feinstein. Cambridge: U.K.: Cambridge University Press.
- Kurz, Heinz D. 2004. The Surplus Interpretation of the Classical Economists. In *A Companion to the History of*

- Economic Thought*, eds. W. J. Samuels, J. E. Biddle, and J. B. Davis, 167–183.
- Kurz, Heinz D., and Neri Salvadori. 1995. *Theory of Production: A Long-Period Analysis*. Cambridge, U.K.: Cambridge University Press.
- Kurz, Heinz D., and Neri Salvadori. 1998a. *Understanding “Classical” Economics: Studies in Long-Period Theory*. London: Routledge.
- Kurz, Heinz D., and Neri Salvadori, eds. 1998b. *The Elgar Companion to Classical Economics*. 2 vols. Cheltenham, U.K., and Northampton, MA: Edward Elgar.
- Marx, Karl. 1854. *Theories of Surplus Value*. Moscow: Progress Publishers.
- Marx, Karl. 1977. *Capital*. Vol. 3. Moscow: Progress Publishers.
- Mill, James. 1826. *Elements of Political Economy*. 2nd ed. London: Harry G. Bohn.
- Petty, William. 1986. *The Economic Writings of Sir William Petty*. 2 vols. Ed. C. H. Hull. Reprint, New York: Kelley.
- Quesnay, François. 1972. *Quesnay’s Tableau Economique*. Eds. M. Kuczynski and R. L. Meek. London: Macmillan. (Orig. pub. 1759).
- Ricardo, David. 1951–1973. *The Works and Correspondence of David Ricardo*. 11 vols. Ed. Piero Sraffa with the collaboration of M. H. Dobb. Cambridge, U.K.: Cambridge University Press.
- Smith, Adam. 1976. *An Inquiry into the Nature and Causes of the Wealth of Nations*. Oxford: Oxford University Press. (Orig. pub. 1776).
- Sraffa, Pierro. 1960. *Production of Commodities by Means of Commodities: Prelude to a Critique of Economic Theory*. Cambridge, U.K.: Cambridge University Press.

Heinz D. Kurz

## ECONOMICS, DEVELOPMENT

SEE *Development Economics*.

## ECONOMICS, EVOLUTIONARY

SEE *Schumpeter, Joseph Alois*.

## ECONOMICS, EXPERIMENTAL

For generations economics was a nonlaboratory science. Economists could construct theories and analyze naturally occurring data, but the luxuries of control and replication were elusive. The discipline of experimental economics has challenged and changed this perception. Experimental

economics provides for a variety of modes of scientific inquiry through the creation of small-scale but real laboratory economic systems. Most experimental economics research has dealt with microeconomic problems, but there is a growing body of work with a more macroeconomic flavor.

Experimental economics got its start in the 1950s and was fully credentialed when Vernon L. Smith was awarded half of the 2002 Nobel Prize in Economic Science. In the Nobel citation Smith is recognized as the father of experimental economics, in the sense that he “made the most important early contributions, but he also remains a key figure in the field to date.” However, as with any scientific advance, there are other pioneering streams that feed into the final river. One universally recognized starting point for experimental economics was the effort by Harvard economist Edward H. Chamberlin (1866–1967) to demonstrate to his students the poor predictive theory of perfectly competitive market models. Chamberlin assigned each student a hypothetical “cost” or “value” and encouraged them to make profitable trades through a random meeting process. Chamberlin’s major insight was to argue that if the hypothetical costs and values were valid representations, then supply and demand curves could be computed for the minieconomy. Chamberlin’s result was that the markets failed to converge to the perfectly competitive predictions.

A few years later Smith, a young Harvard Ph.D. then on the faculty at Purdue, decided to try an exercise similar to Chamberlin’s, but with some critical changes. First, Smith conducted the markets with an institution, the double oral auction, which is an analog of the trading process on the New York Stock Exchange. The double auction has information and price progression features different from the Chamberlin exercise. Second, the markets were repeated. Third (and somewhat later), the individual costs and values were made salient by making real payments to the market participants. Under these conditions the markets converged robustly to the competitive outcomes. The *Journal of Political Economy* published Smith’s results in 1962, and experimental economics as it is most widely known today was born. Smith published his major methodology treatise on experimental economics in 1982. As delineated by Smith, the elements of an induced economic environment (essentially the conditions of supply and demand) and of a carefully defined economic institution are the core of any economics experiment. This holds true even when the institutions look less like regular markets and more like voting rules or bargaining processes (Fiorina and Plott 1978). Paired with this, the 1982 article also discussed experimental design conditions sufficient to produce a valid, controlled economics experiment.