

CHAPTER 5

AUSTRIAN ECONOMICS AS AN EVOLUTIONARY SCIENCE

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ABSTRACT

The author presents a comparative study of the three evolutionary economic schools, namely the Austrians, neo-Schumpeterians, and institutionalists. The comparison is based on an analysis of nine basic features of the evolutionary process and evolutionary approach, including a dynamical view of economic phenomena (seen from a historical perspective), a focus on far-from-equilibrium analysis, a proper and realistic perception of time, and a population perspective (to what extent emergent properties are results of interaction among economic agents). The relevant features of the evolutionary process are the heterogeneity and behavior of economic agents, the search for novelty based on a concept of economic agents' hereditary information, a selection process (based on the concept of rivalry), spontaneity of development, and the presence of decision-making procedures (how economic agents make decisions, and to what extent their subjective values play a role). The goal of the comparative analysis is to estimate the level of "evolutionary content" of the three schools. My subjective evaluation suggests that only the Austrian school can be called entirely evolutionary. Slightly less evolutionary are the neo-Schumpeterians, and the least evolutionary are the institutionalists.

Keywords: Evolutionary economics; spontaneous order; Austrian School of Economics; neo-Schumpeterian economics; institutionalism

JEL classification: B15; B25; B41; D50; E14

The evolutionary approach to economic analysis is not a new one, but its significance and popularity substantially increased in recent decades. Besides proposing a new approach to economic analysis, evolutionary economics stipulates a new, humbler attitude of economists to controlling and predicting the course of the economic process. Friedrich A. Hayek (1960) wrote in *The Constitution of Liberty* (p. 4):

I want to make it quite clear here that the economist cannot claim special knowledge which qualifies him to co-ordinate the efforts of all the other specialists. What he may claim is that his professional occupation with the prevailing conflicts of aims has made him more aware than others of the fact that no human mind can comprehend all the knowledge which guides the actions of society and of the consequent need for an impersonal mechanism, not dependent on individual human judgments, which will co-ordinate the individual efforts.

Historical evidence, starting at least from the French Revolution (1789–1799), through the Bolshevik Revolution of 1917, to Pol Pot, and Khmer Rouge rule of Cambodia (1975–1979), clearly indicates the negative results of all attempts to design social order and to achieve predetermined social aims. Naturally, the social engineers devising all these attempts aim at improving human conditions and are full of goodwill. Facing all of civilization's problems and keeping in mind all the social experiences of the last two to three centuries, we see how little we know about social and economic reality. The words of Hayek (1988, p. 76) seem to convey that essential truth: "The curious task of economics is to demonstrate to men how little they really know about what they imagine they can design."

An orthodox economist, especially a neoclassical one, intends to discover laws of economic life and, using these laws, tries to manipulate human actions to achieve predetermined goals. Evolutionary researchers see themselves in the opposite role. In their opinion, it is more important to learn human motivations, human decision-making processes, and mechanisms governing the economic process to better understand economic agents' behavior (Hayek, 1988, p. 98; Mises, 1966, p. 878).

We can identify the three main modern evolutionary economic schools, namely the Austrians, neo-Schumpeterians, and institutionalists (see Fig. 1). The main aim of this article is to give evidence that only the Austrians fulfill the criteria to be called a truly evolutionary school. The arrows in Fig. 1 indicate the main influences of different authors and researchers. Contemporary evolutionary economics has its roots in biology (Charles Darwin, A. R. Wallace, and Jean-Baptiste Lamarck) as well as in the classical school of Adam Smith, David Hume, and Adam Ferguson. I stress the influences of the social sciences on the emergence of the Darwin/Wallace theory of biological evolution (these influences are indicated by the arrows from the great Scots [Smith, Hume, and Ferguson] and Thomas Malthus, Charles Babbage, and William Jones). The expression "evolutionary economics" is used in many, in some cases very different, approaches to economic analysis. In the most general understanding, it is used to emphasize the role of changes in economic processes, which indicates its opposition to economic analysis focused on static and equilibrium properties. In a narrow sense, it relates to economic analysis based on analogies and metaphors borrowed from the Darwin/

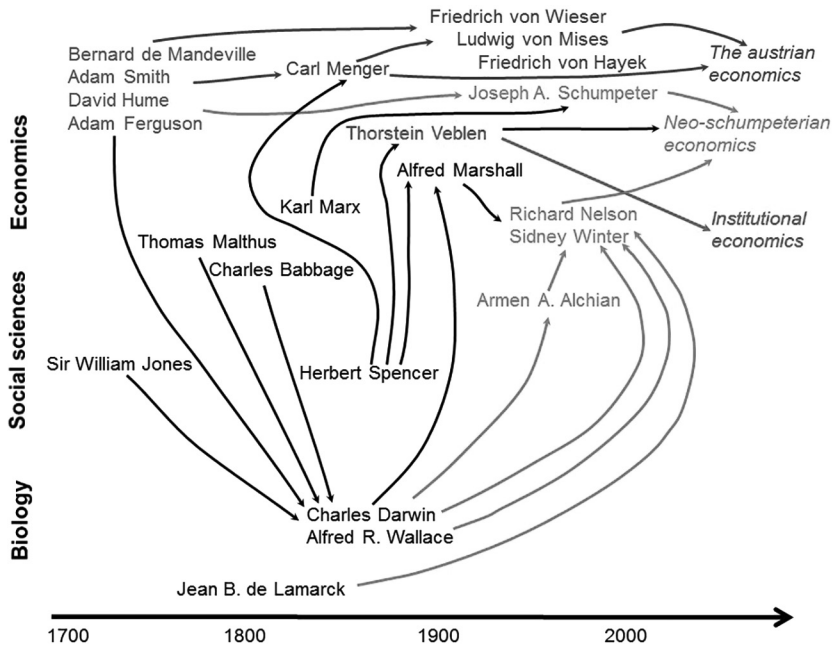


Fig. 1. Evolutionary Economics and Mutual Influences of Economics, Social Sciences, and Biology.

Wallace and Lamarck theories. As I said above, the label has frequently been used in recent decades by a few distinguished economic schools:

- Economists calling themselves neo-Schumpeterians. The school originated with Joseph Alois Schumpeter's work. By the term "evolutionary," they indicate the importance of long-term economic development, innovation, and the role of the entrepreneur. According to this school, the evolutionary process is a dynamical, historical one with macroeconomic characteristics resulting from microeconomic activity. A fundamental feature of the evolutionary economic process is the heterogeneity of behaviors. Selection and search for innovation are two primary mechanisms of development.
- Institutional theory, initiated by the work of Thorstein Veblen (which Veblen sometimes called post-Darwinian). Followers of Veblen and John Commons use the terms "evolutionary" and "institutional" interchangeably.
- The Austrian school. The work of the founders of this school, especially Carl Menger's theory of the formation of money and other social institutions, is truly evolutionary. Friedrich Hayek frequently used the adjective to describe his approach (particularly his approach to spontaneous order). Other Austrian economists (e.g., Friedrich von Wieser and Ludwig von Mises) have directly referred to the concept of evolution.

- Many mathematical approaches used to describe economic phenomena, including chaos theory, computer simulations based on selection and replicator dynamics, genetic algorithms and genetic programming, and game theory.

Reviewing the literature, I frequently get the impression that the term “evolutionary economics” is used by many authors to describe essentially different approaches to the study of economic phenomena, with little correspondence to essential properties of evolutionary processes. Many authors use this term without explaining its meaning, assuming it is not necessary because everybody understands the term. This practice is not peculiar to economics but seems to be present even in biology. Jacques Monod, a well-known biologist of the twentieth century, said: “Another curious aspect of the theory of evolution is that everybody thinks that he understands it!” (quoted in Dawkins, 1976, p. 19).

A very general definition of what constitutes modern evolutionary economics can be found in the 2008 *New Palgrave Dictionary of Economics* (vol. II, pp. 67–68):

Evolutionary economics focuses on the processes that transform the economy from within... These processes emerge from the activities of agents with bounded rationality who learn from their own experience and that of others and who are capable of innovating.... The question in evolutionary economics is therefore not how, under varying conditions, economic resources are optimally allocated in equilibrium.... The questions are instead why and how knowledge, preferences, technology, and institutions change in the historical process, and what impact these changes have on the state of the economy at any point in time. (Witt, 2008)

That definition seems too general, allowing some approaches (mainly those focused chiefly on dynamical properties of the economy) to be unjustifiably called evolutionary. Some essential features of the evolutionary process are missing. Therefore, I would like to make the definition more operational. Hopefully, it will allow us to evaluate to what extent each approach to economic analysis is indeed evolutionary.

The first important feature of the evolutionary approach in economics is *the dynamical view* of economic phenomena, seen from a historical perspective. The dynamical view is closely related to the second feature, namely to focus on *far-from-equilibrium analysis*. The dynamical perspective and far-from-equilibrium analysis ought to be coupled with a proper and realistic perception of *time*. The other feature that seems crucial for a school to be called evolutionary is a *population perspective* (to what extent emergent properties are results of interactions among economic agents). The population perspective is connected with the *heterogeneity of economic agents and their behavior*, the *search for novelty based on agents’ hereditary information*, and a *selection process* that leads to a diversified set of products. Last, but not least, is the extent to which considerations are based on the concept of *spontaneity of development*. Evolutionary economic models incorporate *decision-making procedures* (i.e., how economic agents make decisions, and the importance of agents’ subjective values). These decision-making procedures are closely related to the problem of price setting (e.g., to what extent diversity of prices results from the abovementioned evolutionary factors).

Naturally, all the features are equally important, but it is worth commenting on spontaneity of development. In a most general understanding, spontaneity of

development relates to the emergence of some properties, phenomena, and order due to interactions of economic agents, not the actions of any central institutions or groups of people. This idea has a long history, which can be called the Mandeville–Hume–Galiani–Smith–Ferguson–Menger–Leoni–Polanyi–Hayek tradition. The tradition starts with Bernard Mandeville’s *Private Vices and Public Benefits*, followed by Ferdinando Galiani’s idea of the supreme hand (*Della moneta*, 1751) and Smith’s invisible hand. Hume describes the idea well: “The rules of morality ... are not conclusions of our reason.” Ferguson writes: “Nations stumble upon establishments, which are indeed the result of human action, but not the execution of any human design.”

Two lesser-known scientists involved in the research on spontaneous order were Bruno Leoni and Michael Polanyi. Leoni (1961), contemplating the limitations of the planned social order, indicated that central decision-making bodies did not have the necessary knowledge to manage social systems. As a lawyer, he focused his attention on the formation of legal norms. He discussed law as an example of central control of an institution whose complexity goes beyond humans’ cognitive ability. He pointed out that rather than constructing the law, it should be discovered within a polycentric system.

Polanyi (1948, 1951, 1958, 1966) developed the idea of self-organizing structures. He made a distinction between corporate order and dynamic order. The corporate order is exogenous, which means relations among its elements are determined by external factors. In endogenous dynamic orders, the behavior of a given element depends on the behavior of other elements. Consequently, the regularity of a given order is the result of a process in which the elements of the system mutually adapt their behavior. Such an order is deprived of an overriding authority imposing its decisions on the system.¹

Ulrich Witt (1994, p. 179) is entirely right in his opinion that

spontaneous order in the interactions of the members of society is something to which everyone contributes, from which everyone benefits, which everyone normally takes for granted, but which individuals rarely understand.

I have made a purely subjective evaluation of evolutionary features present in the three outlined schools. I have evaluated each of the nine discussed features using a scale from zero (no presence) to five (full presence). The maximal possible evaluation is thus 45 points. The overall evaluations are presented in Table 1. The sums of collected points are in parentheses beside the names of the schools (the first column). The most advanced school is the Austrians (43 points), with the neo-Schumpeterians collecting slightly fewer points (38). The institutionalists received around half of the maximum, namely 25 points.

NEO-SCHUMPETERIANS

Joseph A. Schumpeter (1883–1950) was one of the first economists (besides Carl Menger) who formulated and presented relatively mature propositions of principles and goals of economic analysis in the evolutionary spirit. He did it in his *Theory of Economic Development* in 1912 and in later publications

Table 1. Overall Evaluation of the Three Evolutionary Schools in Economics (Each Feature Worth 0 to 5).

	Dynamical Vision	Far-from- Equilibrium Analysis	Perception of Time	Population Perspective	Diversity	Search for Novelties Hereditary Information	Selection Process	Spontaneity of Development	Decision Making Procedures
Austrian School (43)	4	5	5	5	5	4	5	5	5
Neo- Schumpeterians (38)	5	4	4	5	4	5	5	2	4
Institutionalists (25)	4	3	2	3	4	3	3	1	2

(e.g., Schumpeter, 1928, 1935, 1939, 1942, 1947). Conventional marginalist theory, dominating at the beginning of the twentieth century, searched for the causes of development in factors exogenous to the economic process. One of the founders of that marginalist school, J. B. Clark (*The Distribution of Wealth*, 1894), treated population growth, changes in consumers' attitudes, and changes in production methods (emerging out of current, normal economic activity) as such exogenous factors. This view was challenged by Schumpeter, who correctly pointed out that the causes ought to be sought in the economic process itself. In his opinion, capitalism never can be in an equilibrium state and never can be treated as stationary. The essential element of Schumpeter's theory is the concept of recurring structural changes, what he called gales of creative destruction, followed by waves of expansion and rapid growth: "Evolution is lopsided, discontinuous, disharmonious by nature ... evolution is a disturbance of existing structures and more like a series of explosions than a gentle, though incessant, transformation" (Schumpeter, 1939, vol. 1, p. 102). Persons responsible for those gales of creative destructions are pioneering entrepreneurs introducing radical innovations. Entrepreneurs search for new products and combinations of factors (innovations, in Schumpeter's understanding) to gain higher profit. Entrepreneurs' profit flows from what Schumpeter called temporary monopoly position. Profit emerges during economic growth – in other words, in a dynamic economy. In Schumpeter's opinion, profit is not always the primary motivation for entrepreneurs. Frequently, such motivation comes from entrepreneurs' drive for artistic creation, as an outlet for their temperament, or from a wish to show what is possible by acting in novel ways.

Schumpeter was so convinced of the evolutionary character of the capitalistic economy that in 1942 he wrote:

The essential point to grasp is that in dealing with capitalism we are dealing with an evolutionary process. It may seem strange that anyone can fail to see so obvious a fact which moreover was long ago emphasized by Karl Marx. (p. 82)

Nevertheless, Schumpeter's understanding of the word "evolutionary" is slightly different from that of Darwin or Lamarck. Economic development, like all evolutionary processes, is a historical one in which future development is determined by past changes as well as by current changes:

Every concrete process of development finally rests upon preceding development. ... Every process of development creates the prerequisites for the following. Thereby the form of the latter is altered, and things will turn out differently from what they would have been if every concrete phase of development had been compelled first to create its own conditions. (Schumpeter, 1934, p. 64)

Innovations in the economic process, like mutations in biological evolution, are an essential element of development. In 1939, he wrote that economic evolution is equivalent to "changes in the economic process brought about by innovation, together with all their effects, and the responses to them by economic system" (Schumpeter, 1939, vol. 1, p. 86). In Schumpeter's (1942) opinion, those changes

illustrate the same process of industrial mutation – if I may use that biological term – that incessantly revolutionizes the economic structure from *within*, incessantly destroying the old one, creating a new one. This process of Creative Destruction is the essential fact about capitalism. (p. 84)²

The notion that economic changes come “from within,” not exogenously to the economic process, seems to be one of the most important contributions of Schumpeter’s theory. This notion shaped the future development of the evolutionary approach to economic analysis. Schumpeter’s vision leads to a diminished role for analysis of the economic process in a state of equilibrium and instead treats analysis of states far from equilibrium and of transitions as much more important. Schumpeter’s approach to economic analysis stresses qualitative changes as much more critical than quantitative ones, although it is tough to encompass them in mathematical models or any other formal approach. Qualitative differences and generation of economic diversity are central from a long-term perspective on economic change. Therefore, for Schumpeter ([1912] 1934), the most interesting kind of change is one

which so displaces its equilibrium point that the new one cannot be reached from the old one by infinitesimal steps. Add successively as many mail coaches as you please, you will never get a railway thereby. (p. 64)

Schumpeter pointed out an essential feature of the capitalistic economy, a feature common to all evolutionary processes: progress strongly depends on diversity, which is the primary source of innovation and can be called an evolutionary engine. Diversity leads systems to diminish in current performance. Therefore, from a short-term perspective, it is disadvantageous. But it is beneficial from a long-term perspective. As Schumpeter wrote (1942, p. 83):

A system ... that at every point in time fully utilizes its possibilities to its best advantage may yet in the long run be inferior to a system that does so at no given point in time, because the latter’s failure to do so may be a condition for a level or speed of long-run performance.

Schumpeter is considered one of the founders of the evolutionary approach to economic analysis, and his works have been read in such a way in recent decades. Nevertheless, and paradoxically, Schumpeter, commenting on the possibility of using biological analogies to analyze economic phenomena, wrote that “no appeal to biology would be of the slightest use” (Schumpeter, 1954, p. 789).

One feature of capitalist systems is their relatively high product diversity. Chamberlain ([1933] 1962; see also Robinson, 1933) proposed a model of monopolistic competition. Although Chamberlain’s model was rooted in the neoclassical paradigm, it included an evolutionary element, namely it focused on the importance of product diversity. Despite its dynamical features, Chamberlain’s model is not based on evolutionary foundations. Armen A. Alchian, almost two decades later, was the first to formulate such a model. Alchian searched for a way to replace the neoclassical maximization principle with the biological concept of natural selection. The possibility of using natural selection to describe firms’ behavior was discussed by Alchian in 1950 and by Penrose two years later (Alchian, 1950; Penrose, 1952). As Alchian argued, competition is not described by the motive of profit maximization but by “adaptive, imitative, and trial-and-error behaviour in search for profit,” and therefore “those who realize *positive profit* are the survivors; those who suffer losses disappear.” Alchian’s vision is concordant with the Darwinian proposition (Alchian, 1950, pp. 211–13). His work was the first significant step toward building mathematical models of economic development based on evolutionary metaphors. In one place, he stated that “the

economic counterparts of genetic heredity, mutations, and natural selection are imitation, innovation, and positive profits” (Alchian, 1950, p. 220).

The proposition of Alchian and Penrose was developed, and rooted in the evolutionary paradigm, by Richard Nelson and Sidney Winter in their numerous articles and books (e.g., Nelson, 1968; Nelson & Winter, 1973, 1977, 1980, 1982; Winter 1964, 1971). Nelson and Winter’s primary interest was competing firms searching for innovation. During its development, each firm bases its behavior in its distinct environment on “routines,” where a routine is “a pattern of behavior that is followed repeatedly, but is subject to change if conditions change” (Winter, 1964, p. 264). Routines encompass

technical routines for producing things ... procedures of hiring and firing, ordering new inventory, stepping up production of items in high demand, policies regarding investment, research and development, advertising, business strategies about product diversification and overseas investment. (Nelson & Winter, 1982, p. 14)

Searching for innovations and ways of proceeding with research is, to some extent, also governed by routines. In fact, “routines govern choices as well as describe methods, and reflect the facts of management practice and organizational sociology as well as those of technology” (Winter, 1964). Each firm searches for new routines and a new combination of routines to improve its status compared to its competitors. In contrast to the neoclassical approach, firms in Nelson and Winter’s model do not optimize their behavior.

Nelson and Winter’s work was continued and extended by numerous researchers working to apply the Darwinian notions of selection and mutation to economic processes (Dosi, 1983; Freeman, 1990; Haag, Weidlich, & Mensch, 1987; Kleinknecht, 1987; Silverberg, 1987; Verspagen, 1993) or searching for evolutionary mechanisms acting at the industry and firm levels. Researchers also sought to understand the influence of technological and organizational innovations on aggregate characteristics of economic activity; the behavior of industries and firms under the pressure of technological and price competition; and the diversity of economic agents, routines, and institutions (Gowdy, 1985; Iwai, 1984a, 1984b; Kwasnicki, 1994/1996; Kwasnicka & Kwasnicki, 1992).

To make the above outline more adequate, it is necessary to mention some other streams of modern economic analysis related in some sense to the evolutionary paradigm, namely the behaviorists (among them Herbert Simon, Richard M. Cyert, and James G. March) and managerialists (e.g., W. J. Baumol and Oliver E. Williamson). Nicholas Kaldor’s research showed that a market is never balanced in Walras’s sense (e.g., his *Economics without Equilibrium* [1985]). Businesspeople know and take into account this qualitative fact in their activity, introducing innovations and fulfilling orders. Despite theoretical postulates, in practice we do not observe any tendency to price uniformity (movement toward the equilibrium price) – quite the contrary. Through introducing innovations, and in responding to ongoing changes in the market, economic agents contribute to the emergence of a high diversity of prices. Industrial development is a historical process in which cumulative causation plays a significant role.

In the theory of the firm by Coase (1937), Penrose (1959), Cyert and March (1963), and Simon (1955, 1988), the basic notion is that firms’ knowledge is far

from complete and everlasting. Firms cannot be called *maximizers*. They aim to satisfy some general behavioral criteria, and therefore it is better to call them *satisficers* (as Herbert Simon proposed). Humans are not fully rational; reality is too complicated to take into account all the influences, constraints, and prerequisites that make optimization possible. Human action and firms' behavior are governed by rules worked out during lengthy processes of human development and firm growth. Therefore, Herbert Simon worked out the concept of *bounded rationality*. A similar opinion was expressed by Cyert and March (1963), who also argued that firms might not have clear and precise criteria to act appropriately. In most cases, those criteria exist in verbal form only, not as any set of well-defined equations.

INSTITUTIONALISTS

Thorstein Veblen (1857–1929) was an economist at the end of the nineteenth century who also declared the necessity of an evolutionary approach to economic analysis. In his famous article of 1898, he asked the titular question, “Why is economics not an evolutionary science?” It is a vital and fundamental question, but he did not give a full answer. Like Alfred Marshall (1925), Veblen did not propose a cohesive research program based on the evolutionary paradigm. In the Veblenian tradition, the adjective “evolutionary” was used in the next decades by institutionalists to describe a particular kind of development based on the selection principle, but without the detailed precision of evolutionary biologists after Darwin. Veblen, like Marshall, saw in biology a source of fertile metaphors for better understanding economic and social processes, especially those of technological change in a capitalist economy. His position differs from Marshall's in paying more attention to dynamics and less to static analysis and analysis of economic equilibrium (the neoclassical concepts of equilibrium and static analysis were borrowed from physics, especially from classical mechanics). Veblen said, “The question is not how things stabilize themselves in a ‘static state’, but how they endlessly grow and change” (Veblen, 1934, p. 8). What he considered important was to better understand economic development and technological change. He wrote in 1898,

An evolutionary economics must be a theory of a process of cultural growth as determined by the economic interest, a theory of a cumulative sequence of economic institutions stated in terms of the process itself. (Veblen, 1919, p. 77)

Veblen studied deeply biology, psychology, philosophy, and the social sciences. In many articles, he demonstrated his knowledge of Darwinism, Mendelian genetics, and Hugo de Vries's theory of mutation. Using his biological knowledge and the philosophical ideas of Charles Sanders Peirce and William James, Veblen attempted to build an evolutionary theory of socioeconomic development. He assumed customs of thought-dominate human behavior. Veblen tried to find causes of the origin and development of those customs. Under the influence of the theory of instincts presented by Spencer in *Principles of Psychology* (1855) and the ideas of McDougall presented in *Introduction to Social Psychology* (1908), Veblen postulated that the roots of these customs lie in human instincts. The emergence of mental customs results from people's evolutionary adaptation

to the continuously changing environment in which they live. Cultural changes, everyday experiences, and technological changes shape these mental customs. Still, Veblen's approach neglected to explain how these mental customs become the hereditary element of human nature. From his notion of instinct, he was only a step away from working out his concept of an institution. In the opinion of Veblen (1919, p. 241),

Institutions are an outgrowth of habit. The growth of culture is a cumulative sequence of habituation, and the ways and means of it are the habitual response of human nature to exigencies that vary incontinently, cumulatively, but with something of a consistent sequence in the cumulative variations that so go forward.

Veblen saw analogies between institutions and genes. He interpreted socioeconomic development with the concepts of Darwinian selection (Veblen, 1899, p. 188)

Thorstein Veblen did not go further than a verbal description of socioeconomic development. There are a few reasons for the limited further development of biological economics in the first decades of the twentieth century. Biological evolution was still a young science, still defining itself. Although Darwin's ideas influenced the work of social researchers significantly, all those influences were visible at the level of concepts, not at the level of formal, methodologically consistent, and valid models of socioeconomic phenomena. The research was focused on classification problems and qualitative description. One of the favored themes of that period was competition as the basic force controlling economic processes. The competition was treated as a force analogous to Newtonian gravitation, allowing the economy to reach equilibrium, not as a selective force in the Darwinian sense. All these economic considerations missed almost wholly the problems of technological change. Diversity of products and processes, a diversity observed in everyday economic life, is caused by technological change. Up to the 1950s, all considerations of the economic process from the evolutionary perspective were confined to verbal description.

Veblen's work was continued by the next generations of institutionalists, among them those associated with new institutional economics (e.g., Williamson, 1975) and those broadly associated with the viewpoints of Ronald Coase, Douglass North, Mancur Olson, and Richard Posner. A revival of the "old institutionalists" in the style of Thorstein Veblen, Wesley Mitchell, John Commons, and Clarence Ayres came at the end of the 1970s and beginning of the 1980s (e.g., John Kenneth Galbraith; Marc Tool, 1979).

The great work of putting institutionalism back into the context of evolutionary economics was done by Geoffrey Hodgson (1993; Hodgson, Warren, Samules, & Tool, 1994, 1995, 1998).

THE AUSTRIANS

At the end of the nineteenth century, some economists declared unequivocally and explicitly the need for an evolutionary approach to economic analysis. Paradoxically, they did so during the same period when Stanley Jevons and Leon Walras founded neoclassical economics, the basic principles of which were rooted in the mechanistic paradigm.³ Carl Menger (1840–1921) was one of a few evolutionary economists

of this period. Similarly to what the great Scots had done a hundred years earlier, he used such phenomena as language, customs, morality, and common law as examples to show that regularities in the development of human societies are the outcome of individual decisions and actions of all members of society. Menger ([1871] 2004) understood money as a pragmatic, “organic” social institution, similar to language or common law. In his understanding, “organic” means being the spontaneous product of human activity, not the result of any rational project or design. We find Menger’s (2004) suggestion of an evolutionary process leading to the emergence of money in his *Principles of Economics* of 1871:

The origin of money ... is entirely natural.... Money is not an invention of the state. It is not the product of legislative act. Even the sanction of political authority is not necessary for its existence. Certain commodities came to be money quite naturally, as the result of economic relationships that were independent of the power of the state. (pp. 261–62)

Money is the unintended outcome of individual cooperation and personal choices (Menger, 1950, p. 260).

In 1883, he published *Investigations into the Method of the Social Sciences with Special Reference to Economics* (*Untersuchungen über die Methode der Socialwissenschaften und der politischen Oekonomie insbesondere*). He suggested that goods selected to be money were those “the most easily transported, the most durable, the most easily divisible” ([1883] 1985, p. 154). Money originates as the result of selection. Because it is selection at the level of customs, agreements, and conventions, it can be debated to what extent it is natural selection. It is interesting that Menger ([1883] 1985) uses the term “genetically” in his considerations, arguing that each economic theory

has primarily the task of teaching us to understand the concrete phenomena of the real world as exemplifications of a certain regularity in the succession of phenomena, i.e., genetically.... This genetic element is inseparable from the idea of theoretical science. (p. 94)

In Menger’s understanding, genetic means causal. As Menger ([1883] 1985, p. 130) observes, spontaneous development is present in the evolution of a broad spectrum of human institutions:

Natural organisms almost without exception exhibit, when closely observed, a really admirable functionality of all parts with respect to the whole, a functionality which is not, however, the result of human calculation, but of a natural process.... But with closer consideration they still do not prove to be the result of an intention aimed at this purpose, i.e., the result of an agreement of members of society or of positive legislation. They, too, present themselves to us rather as “natural” products (in a certain sense), as unintended results of historical development.

Friedrich von Wieser (1851–1926) followed Menger’s idea of individualistic and spontaneous emergence of social institutions. However, Wieser pointed out that old institutions act as a restraint and that people make decisions in an institutional context. As Wieser (1927) wrote,

Indeed, the mass never acts with a clear consciousness of aim. It is not teleological. Rather it follows the path of success opened by the leaders without measuring its operation.... Men always act with diverse emotions.... The much-quoted phrase ‘the good is the enemy of the better’ holds especially for social institutions and their historical power. The individual is helpless against the historical force of old institutions. He must take them as he finds them. (pp. 165–66)

Wieser proposed a genuinely evolutionary concept of competition as a rivalrous process, contrasting it with a static perception of competition (Wieser, 1927, pp. 210–211). In his understanding, competition

is a condition in which a number of persons in rivalry with one another pursue identical aims of supply and demand. By deflection of its meaning, the term may also be made to stand for this rivalry in trade itself. (Wieser, 1927, p. 174)

Rivalrous competition is fundamental to a proper understanding of the market economy.

In *Social Economics* as well as in his previous work *Natural Value*, Wieser discussed the relationship between natural value and the objective theory of value. For him, natural value “arises from the social relation between amount of goods and utility” (Wieser [1889] 1893, p. 60). Natural value

is one element in the formation of exchange value. It does not, however, enter simply and thoroughly into exchange value. On the one side, it is disturbed by human imperfection, by error, fraud, force, chance; and on the other, by the present order of society, by the existence of private property, and by the differences between rich and poor. (pp. 61–62)

In his last work, *The Law of Power* (1926), Wieser combined economic analysis and sociology in his interpretation of the role of institutions. It seems that at least partly he put aside his liberal ideas and stood much closer to Schumpeter’s ideas than to Menger’s. He develops his original concept of the institution, in which power and social stratification play a leading role in the formation and evolution of institutions.

Ludwig von Mises in *Human Action* commented under the heading “Current Misinterpretations of Modern Natural Science, Especially of Darwinism” (Mises [1949] 1966, p. 174) that “the notion of the struggle for existence as Darwin borrowed it from Malthus and applied it in his theory, is to be understood in a metaphorical sense” (p. 176). In the vein of Carl Menger, Mises ([1949] 1966) wrote that

the evolution of reason, language, and cooperation is the outcome of the same process; they were inseparably and necessarily linked together. But this process took place in individuals. It consisted in changes in the behavior of individuals. There is no other substance in which it occurred than the individuals. (p. 43)

Mises paid special attention to the emergence of cooperation and the division of labor (Mises [1949] 1966, p. 145).

Frequently in *Human Action* Mises pointed out that human institutions are products of evolutionary mechanisms:

“Conscious and purposeful cooperation is the outcome of a long evolutionary process” (p. 194).

The market economy is a man-made mode of acting under the division of labor.... The market economy is the product of a long evolutionary process. It is the outcome of man’s endeavors to adjust his action in the best possible way to the given conditions of his environment that he cannot alter. It is the strategy, as it were, by the application of which man has triumphantly progressed from savagery to civilization. (p. 265)

“Property rights as they are circumscribed by laws and protected by courts and the police, are the outgrowth of an age-long evolution” (p. 654).

Mises referred to evolution, spontaneous order, and Darwinism in *Theory and History* (1957). In his opinion, “the keystone of Western civilization is the sphere of spontaneous action it secures to the individual” (Mises [1957] 1985, p. 374). Mises saw evolution in the broader context of biological and cultural development. He wrote that “the evolution of society and that of civilization were not two distinct processes but one and the same process” (Mises [1957] 1985, p. 252).

However, Mises ([1957] 1985) saw essential differences between biological and social evolution:

The biological evolution that resulted in the emergence of the structure–function systems of plant and animal bodies was a purely physiological process in which no trace of a conscious activity on the part of the cells can be discovered. On the other hand, human society is an intellectual and spiritual phenomenon. In cooperating with their fellows, individuals do not divest themselves of their individuality... Men have ideas and seek chosen ends, while the cells and organs of the body lack such autonomy. (p. 253)

Friedrich A. Hayek (1899–1992) was one of the followers of Menger’s and Wieser’s ideas. Hayek frequently used the expression “evolutionary approach,” especially concerning “the evolution of systems of rules of conduct.”⁴ He wrote: “The evolutionary selection of different rules of individual conduct operates through the viability of the order it will produce,” and the

transmission of rules of conduct takes place from individual to individual, the natural selection of rules will operate on the basis of greater or lesser efficiency of resulting order of the group. (Hayek, 1967, pp. 67–68)

We find direct references to evolutionary biology in his essay on Bernard Mandeville (Hayek, 1978, p. 265). He similarly incorporates evolutionary concepts in his analysis of socioeconomic process in his three-volume work *Law, Legislation and Liberty* (Hayek, 1982, vol. 1, pp. 9, 23–24, 152–53, vol. 3, pp. 154–59, 199–202). However, the fullest expression of his evolutionary view is seen in his latest works – for example, *The Fatal Conceit* (1988, pp. 8–9, 11–28, 147). Hayek postulated the existence of a second basic mechanism of social evolution, which is complementary to selection, namely a mechanism for generating new solutions. Institutions and practices that had “been adopted for other reasons, or even purely accidentally, were preserved because they enable the group in which they had arisen to prevail over others” (Hayek, 1982, vol. 1. p. 9).

In 1952, Hayek published the not-so-well-known book *The Sensory Order*, which he thought to be of considerable importance. He seems to have been right, because the ideas presented in that book shaped all of his economic ideas, among them ideas related to the evolutionary approach to economic analysis. Steven Horwitz (2000) is entirely right in seeing that work as a way (to borrow from his title) “from the sensory order to the liberal order.” Horwitz (2000) writes at the end of his paper that

Hayek’s thought will have come to fruition when the social sciences abandon rationalist and constructivist explanations of social phenomena in favor of ones that recognize the roles of tacit and contextual knowledge, institutional evolution, and spontaneous order. Such an approach would dramatically improve our understanding and appreciation of the liberal order, and must begin with a better understanding of the human mind. Hayek’s *The Sensory Order* provides just such a beginning.⁵

FINAL REMARKS

Modern evolutionary economics can be characterized as an approach focused on analyzing economic development from short- and long-term perspectives, on searching for causes and mechanisms of industries' emergence and persistence, on researching the motivations of economic agents, and on understanding their actions.

This short review of evolutionary approaches taken by three schools, namely the Austrians, neo-Schumpeterians, and institutionalists, suggests that from the methodological point of view the Austrian school is the most advanced school. Less methodologically advanced, although much more prolific (e.g., regarding the number of publications), is the neo-Schumpeterian school. The institutionalists' methodology of economic analysis seems rather feeble.

All three schools focus their analysis on dynamics of economic phenomena and keep in mind that far-from-equilibrium analysis is much more important than static, equilibrium analysis. The Austrians and neo-Schumpeterians are more consistent and rigorous in that matter than the institutionalists. All three schools treat with almost equal importance some other features of evolutionary approach mentioned at the beginning of the paper, namely the population perspective, diversity of economic agents and their behavior, search for innovation, hereditary information of economic agents, and selection process. However, the Austrian school seems to be much more advanced in the realistic perception of time and treating spontaneity of development as a prerequisite for the proper understanding of the economic process. Institutionalists, and to some extent neo-Schumpeterians, still treat elements of central planning, government intervention, and constructivism as essential for economic development.

Despite the solid methodological foundations for evolutionary analysis provided by Menger, Wieser, Hayek, and Mises, the general perception is that the achievements of the Austrian economists are smaller than those of the neo-Schumpeterians and institutionalists. What are the reasons for that? I do not know, but it seems that it ought to be treated as a challenge for the next generation of Austrian economists.

Evolutionary economics is far from having reached a mature formulation. However, given the development of evolutionary economics in recent decades, we may conclude that the description of the economic process and behavior of economic agents at the micro level provided by researchers working within the evolutionary paradigm is far more complete and closer to reality than the description provided by orthodox economists.

Further development of evolutionary economics requires efficient and very specific tools of informal and formal analysis. As Kenneth Boulding (1991) writes:

One of the great opportunities ... for the next few decades is the development of a mathematics which is suitable to social systems, which the sort of 18th-century mathematics which we mostly use is not. The world is topological rather than numerical. We need non-Cartesian algebra as we need non-Euclidean geometry, where minus minus is not always plus, and where the bottom line is often an illusion. So there is a great deal to be done. Let's get after it!

The simulation approach, mostly used in nonlinear, evolutionary models in economic analysis, seems to be very useful but does not completely fulfill the requirements to be considered the right and entirely appropriate tool of formal analysis.

One of the important criteria used by researchers to apply one or another approach is the potential for further development. It seems the neoclassical paradigm has approached the limits of its development, but the evolutionary paradigm, although it is as old as the neoclassical one and has been developing much slower in the last 150 years, still has ample possibilities for further development.

NOTES

1. For discussion of the relationship between Polanyi's and Hayek's ideas on spontaneous order, see, for example, Bladel (2005), Jacobs (1997, 1999), and Leszek (2014).

2. A few decades earlier, Schumpeter ([1912] 1934) expressed it as follows: "By 'development' ... we shall understand only changes in economic life as are not forced upon it from without but arise by its own initiative, from within" (p. 63). And:

Development in our sense is a distinct phenomenon, entirely foreign to what may be observed in the circular flow or in the tendency toward equilibrium. It is spontaneous and discontinuous change in the channels of flow, disturbance of equilibrium, which forever alters and displaces the equilibrium state previously existing. (p. 64)

3. Stanley Jevons, 1871, *The Theory of Political Economy*; Leon Walras, 1874, *Éléments d'économie politique pure*.

4. Hayek (1960, pp. 57–61); see also a number of essays written in 1960 – for example, Hayek (1967, pp. 31–34, 66–81, 103–4, 111, 119).

5. Discussing evolutionary ideas of the Austrian school, I started from Carl Menger and continued to his followers: Wieser, Hayek, and Mises. I have not mentioned other famous Austrian economists, such as Eugen von Böhm-Bawerk, Ludwig Lachmann, Murray Rothbard, or Israel Kirzner. Not all members of the Austrian school have referred directly to the evolutionary approach or evolutionary metaphors. In their research, these other economists were focused on different aspects of economic analysis, although we can identify some specific elements of the evolutionary approach. This situation is not peculiar to the Austrians but can be identified within the other discussed evolutionary schools, the institutionalists, and neo-Schumpeterians.

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