

**FOUNDATIONAL PROBLEMS OF POLITICAL ECONOMY
PART TWO: ECONOMIC LAWS
AND THE DYNAMICS OF THE ECONOMIC SYSTEM**



By Dr. Nicolas Laos¹

Causes and Consequences in Political Economy

In the philosophy of science, by the term ‘law’, we mean a proposition that establishes a relation between variables, variables being concepts that can take different values. The concept of a ‘natural law’ has been central to our understanding of the natural sciences. The history of modern political economy can be traced back to physiocracy, which was the first methodical attempt to explain economic behavior in similar ways to natural (that is, inanimate) behavior. Physiocracy was particularly dominated by François Quesnay (1694–1774) and Anne-Robert-Jacques Turgot (1727–81). According to the physiocrats, there was a ‘natural order’ that allowed human beings to live together. Within the framework of the physiocrats’ political economy, the human being is merged with the natural world, so that it reduces to merely a particular consequence of the operation of natural laws. Paul Samuelson and William D. Nordhaus write about physiocracy:

A remarkable depiction of the economy as a circular flow, still used in today’s texts . . . was made by Quesnay, Louis XIV’s court physician. He

¹ Dr. Nicolas Laos (born in Athens, Greece, in 1974) is a philosopher and noopolitics consultant, and his formal education includes social sciences and mathematics. His publications include the books *The Metaphysics of World Order* (2015) and *Methexiology: Philosophical Theology and Theological Philosophy for the Deification of Humanity* (2016), both published by Pickwick - Wipf and Stock Publishers. He is the Founder and President of the think-tank and private intelligence company F.S.C. Ltd, and he has extensive consulting experience internationally.

Email: nicolaslaos@nicolaslaos.com and nlaosoffice@gmail.com

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stressed that the different elements of the economy are as integrally tied together as are the blood vessels of the body.²

The founder of the so-called classical economics is Adam Smith (1723–90). The thought of the physiocrats and other 18th century economists as well as the mentality of industrialism converge in the publication by Adam Smith of *The Wealth of Nations* in 1776, which “marks the birthdate of modern economics”³. In this book, Adam Smith, analyzed the price system, the distribution of income and various theories of wages, and he performed an empirical study of inflation. However, his most important contribution to economic analysis is his attempt to place the economic rationale of the physiocrats within a scientifically rigorous analytical setting by arguing that the market mechanism is a self-regulating ‘natural’ order and that the price system organizes the behavior of people in an automatic fashion.

In the half century after *The Wealth of Nations* appeared, the law of diminishing returns was formulated by Thomas Malthus (1766–1834) and David Ricardo (1722–1823). Campbell McConnell has explained the law of diminishing returns as follows:

Imagine an economy whose property resources (land and real capital) are absolutely fixed. In particular, visualize a primitive, underdeveloped economy whose stock of capital goods is negligible and whose supply of arable land is fixed. Assume, too, that technology . . . is fixed; this means that the *quality* of capital and labor are both given. Assuming its population is growing, the simple agrarian society is concerned primarily with adding labor to a fixed amount of land and a few rudimentary farm tools to produce the food and fiber needed by its population . . . The law of diminishing returns indicates that *as successive equal increments of one resource (labor, in this case) are added to a fixed resource (land and property), beyond some point the resulting increases in total output will diminish in size.*⁴

Furthermore, Samuelson and Nordhaus have made the following comment about the law of diminishing returns:

ironically, just as the Industrial Revolution in the West was offsetting the dire workings of that dismal law, the Reverend T.R. Malthus . . . enunciated the *iron law of wages*, holding that population growth will inevitably drive workers’ wages down to subsistence level.⁵

For Ricardo (from whose thinking neoclassical and, in general, modern economics are derived), given that the total social product is limited by diminishing returns, “what was gained by one social class had to be taken away from another one”⁶. In the 19th century, the reactions of both capitalists and socialists to Ricardo’s thought was positive, for different reasons though:

² P.A. Samuelson and W.D. Nordhaus, *Economics*, 14th edition, New York: McGraw-Hill, 1992, p. 376.

³ Ibid, p. 376.

⁴ C.R. McConnell, *Economics*, 5th edition, New York: McGraw-Hill, 1972, p. 345–346.

⁵ Samuelson and Nordhaus *Economics*, p. 377.

⁶ Ibid, p. 377.

No wonder the capitalists like Ricardo. They could find quotations in his work to prove that trade unions and reforms can do little for the masses. No wonder the socialists liked Ricardo. They found in him a proof that capitalism would have to be destroyed if workers were to win their rightful share of national output.⁷

Following the intellectual legacy of Ricardo, in the 1870s, W. Stanley Jevons (1835–82) in England, Carl Menger (1840–1921) in Austria, and Léon Walras (1834–1910) in Switzerland, working independently from each other, founded modern ('neoclassical') economics "by devising an analysis that could synthesize both demand elements and cost elements"⁸. Moreover, Walras devised a method of analyzing the economy as a whole. In particular, Walras started from the following definitions: (i) A market for a particular commodity is in equilibrium if, at the current price of the commodity, the quantity of the commodity demanded by potential buyers equals the quantity supplied by potential sellers. (ii) An economy is in general equilibrium if the markets for all goods and services are simultaneously in equilibrium. (iii) Excess demand refers to a situation in which a market is not in equilibrium at a specific price because the quantity of the commodity demanded by potential buyers exceeds the quantity supplied by potential sellers at that specific price. Then he formulated the following law, known as Walras's law: the existence of excess supply in one market must be matched by excess demand in another market, and, thus, finally, it balances out.

The physiocrats, the classical economists, and the neoclassical economists follow a positivist epistemology, which has been summarized by J.E. Cairnes as follows:

Political Economy is a science in the same sense in which Astronomy, Dynamics, Chemistry, Physiology are sciences. Its subject-matter is different; it deals with the phenomena of wealth, while they deal with the phenomena of the physical universe; but its methods, its aims, the character of its conclusions, are the same as theirs. What Astronomy does for the phenomena of the heavenly bodies; what Dynamics does for the phenomena of motion; what Chemistry does for the phenomena of chemical combination; what Physiology does for the phenomena of the functions of organic life, that Political Economy does for the phenomena of wealth: it expounds the laws according to which these phenomena co-exist with or succeed each other; that is to say, it expounds the laws of the phenomena of wealth.⁹

In general, modern economics¹⁰ is dominated by the argument that there are economic laws and that the primary aim of economics is the discovery of those laws. Thus, in the light of the arguments that I put forward in Part One, the dominant theories of modern economics are fixated in a flawed perception of philosophical

⁷ Ibid, p. 377.

⁸ Ibid, p. 378.

⁹ J.E. Cairnes, *The Character and Logical Method of Political Economy*, London: Macmillan, 1888, p. 35.

¹⁰ See: Harold Kincaid, *Philosophical Foundations of the Social Sciences: Analyzing Controversies in Social Research*, Cambridge: Cambridge University Press, 1996; Alexander Rosenberg, *Microeconomic Laws: A Philosophical Analysis*, Pittsburgh: University of Pittsburgh Press, 1976.

realism and Newtonian mechanics. Alexander Woodcock and Monte Davis have pointed out that, even in the context of natural sciences, “Newton’s triumph was not an explanation of anything”, and that “it is possible to see the shapes of processes within the traditional framework, but only for a certain class of processes—those involving continuous change”¹¹. “Many processes”, Woodcock and Davis continue, “yield graphs with ostensibly ill-behaved curves . . . The planets travel in stately Newtonian paths, but meanwhile winds wrap themselves into hurricanes, chickens alternate with eggs, and we change our minds”¹². Thus, Woodcock and Davis observe that “the twentieth century has taught us that the universe is a queerer place than we imagined, perhaps (in J.B.S. Haldane’s words) queerer than we *can* imagine”¹³, and that “much of reality is not so obliging”¹⁴.

The method of sustainable creativity, which I delineated in Part One, implies that there is a dynamic continuity between the structure of consciousness and the structure of the world, a dynamic continuity that allows the conscious mind to reconstruct and utilize economic reality. Furthermore, according to the principle of sustainable creativity, on which these essays are founded, the scientific world-conception is not a ‘world’ more than it is a ‘conception’.

Science is an expression of the creativity of the human mind, in the sense that it intends to create theories that help one approach reality (both the reality of consciousness and the reality of the world). During the process of scientific creation, the conscious mind passes through three stages¹⁵: (i) the first stage consists in an intuitive, general comprehension of its object; (ii) the second stage consists in an analytical discernment of the constituent elements of the given object in order to be systematically investigated; (iii) the third stage consists in a synthetic reassemblage of the previous elements, so that the conscious mind can achieve the final interpretation of its scientific subject-matter as a whole.

In the light of the dialectic of sustainable creativity, which I defined in Part One, it follows that analysis and synthesis constitute an important dual tool by means of which the conscious mind of the economist reconstructs and utilizes economic reality. From this perspective, economic reality is not merely an object whose partial expressions are statically conceived by economists; instead, economic reality is a goal toward which the economist’s conscious mind is dynamically oriented, and, in general, economists seek to eliminate the distance that separates economic reality from the economist’s conscious mind. Hence, the completion of the previous scientific process signals the transformation of the original scientific subject-matter into a mental construction, and, at a next stage, the previous scientific process leads to the objectivation of the theory that originates from the given scientific process.

At this point, we must explain the difference between social science and natural science. As Michael Nicholson has pointed out, “at the most general level a social science is the study of human beings in a social context”¹⁶, and “international relations is just one of those contexts and we would expect the same problems and

¹¹ Alexander Woodcock and Monte Davis, *Catastrophe Theory*, London: Penguin Books, 1991, p. 10, 14

¹² *Ibid*, p. 14.

¹³ *Ibid*, p. 11.

¹⁴ *Ibid*, p. 14.

¹⁵ For an extensive analysis of these issues, see: Martin Curd and J.A. Cover, *Philosophy of Science: The Central Issues*, New York: W.W. Norton & Co., 1998.

¹⁶ Michael Nicholson, *Causes and Consequences in International Relations: A Conceptual Study*, London: Pinter, 1996, p. 54.

probabilities to be involved in it as with any other social science”¹⁷. Therefore, according to Nicholson, “the central question is, to what extent can these phenomena be described by the same sort of procedures as natural phenomena, such as planets or genes, and are the differences, which clearly exist, of such a nature as to preclude their analysis by the same sorts of methods?”¹⁸.

To answer the aforementioned question, we must explain the difference between the evolution of the physical world and history. The evolution of the physical world has undergone and continues undergoing several crises. Prigogine and Stengers have emphasized the dynamic character of the world of nature: “Our universe has a pluralistic, complex character. Structures may disappear, but also they may appear. Some processes are, as far as we know, well described by deterministic equations, but other involve probabilistic processes”¹⁹. However, none of the crises of the physical world can be considered as an object of history or of social-scientific research unless it has affected a human society. In order for an event to be considered as ‘historical’, it must involve humanity, because history is an exclusively human creation and an exclusive characteristic of human life. From the perspective of the dialectic of sustainable creativity, history expresses humanity’s potential, and, therefore, it can be identified with the evolution of the human being.

From the previous viewpoint, there is a fundamental asymmetry between physical (or astronomical) time and historical time, and, therefore, there is a fundamental asymmetry between natural science and social science. Whereas physical time is, more or less, uniform, historical time is subject to structural changes. Moreover, physical time obeys its own entropy, which means that it flows in a precise and unalterable (irreversible) direction toward a precise but unknown aim²⁰. On the other hand, historical time is not characterized by any entropy, because it is a free outcome of the action of human consciousness, and, therefore, it is subject only to the laws imposed upon it by the intentionality of human consciousness through the ages. Hence, the process of history functions according to the dialectic of sustainable creativity. In other words, historical becoming combines alternatively causality and freedom, progression and regression, recurrence and uniqueness.

Because we can find causality and recurrence in history, many social scientists (especially those who follow the positivist-empiricist tradition) are led to “the notion that we can identify certain sorts of situations as the ‘same’, or at least ‘the same’ in some crucial and relevant aspects”²¹, and, therefore, they argue that “generalization is possible” and “we can move on to formulating deductive theories of social behavior in the standard scientific way and devise a social science of behavior in this mode”²². On the other hand, because we can find freedom and uniqueness in history, modern idealists, such as Peter Winch²³, and post-modernists, such as Michel Foucault²⁴,

¹⁷ Ibid, p. 54.

¹⁸ Ibid, p. 54.

¹⁹ Ilya Prigogine and Isabelle Stengers, *Order out of Chaos: Man’s New Dialogue with Nature*, New York: Bentam, 1984, p. 9.

²⁰ Ibid.

²¹ Nicholson, *Causes and Consequences in International Relations*, p. 62.

²² Ibid, p. 66.

²³ According to Winch, “social relations fall into the same logical category as do relations between ideas”, and, therefore, “social relations must be an equally unsuitable subject for generalizations and theories of scientific sort to be formulated about them” (Peter Winch, *The Idea of a Social Science and Its Relation to Philosophy*, London: Routledge, 1990).

Jacques Derrida²⁵ and Richard Rorty²⁶, “are averse to causal analyses of the sort practised in behavioral political science”²⁷ and argue that “there are no social events but multiplicities of events—perhaps as many as there are people who have experience of the event either directly, as observers or by report”²⁸. All the previous views are partial approaches to reality, and, therefore, they give only a fragmented knowledge of reality. For, according to the dialectic of sustainable creativity, history is characterized by a dynamic, dialectical relation between causality and freedom, progression and regression, recurrence and uniqueness. Therefore, neither positivism-empiricism nor idealism-postmodernism can stand as a general epistemological theory. Positivism-empiricism is philosophically justified due to the existence of causality and recurrence in history, but it cannot account for freedom and uniqueness in history. Idealists and postmodernists, on the other hand, are right to emphasize freedom and uniqueness in history, but they treat history as if it were the outcome of arbitrary idealistic action, and, thus, they fail to recognize the principle of sustainable creativity, which I explained in Part One.

As a conclusion, since history is created by the intentionality of consciousness, according to humanity’s sustainable creativity, the most adequate way of studying history consists in the study of the intentionality, and, especially, of the underlying ethos and education, of the actors’ conscious minds.

Communication Among Conscious Beings and the Dynamics of the Economic System

As I have argued in Part One, the conscious mind is not merely a framework within which the accumulation of experiences takes place, but it is an alive and structured presence that has all the characteristics of a being, namely: substance, structure, temporal and spatial activity, and it is continuously restructured, determining the laws of its activity, of its intentionality and of its integration into the world. Thus, consciousness is the fullest expression of the reality of the human being.

²⁴ Foucault argues that the development of scholarly disciplines is determined by power relations and is not a neutral result of scholarly inquiry. As a result, Foucault does not ask for a correspondence theory of truth, but he construes truth as a tool for resisting power (Michel Foucault, “Nietzsche, Genealogy, History”, in P. Rabinow (ed.), *The Foucault Reader*, Harmondsworth, Peregrine Books, 1986, p. 76–100).

²⁵ Derrida expresses his anti-foundationalist epistemology through deconstructions involving a reading of a text where the author fails to produce the conclusions he intends (Jacques Derrida, *Of Grammatology*, trans. and ed. G. Spivak, Baltimore, MD: Johns Hopkins University Press, 1976). Thus, Derrida “refuses to see the knower as a given and instead as merely one more construction of language and culture”, so that “the knower is always caught up in a language and mode of thinking which, far from interpreting a world, instead constructs it” (Steve Smith, “Positivism and Beyond”, in S. Smith, K. Booth and M. Zalewski (eds), *International Theory: Positivism and Beyond*, Cambridge: Cambridge University Press, 1996, p. 30).

²⁶ The task undertaken by Rorty consists in the deconstruction of analytical philosophy, and, thus, he proposes that philosophers give up on the idea that our knowledge ‘mirrors’ nature and instead adopt a pragmatic theory of truth which is compatible with his self-description as a “postmodern bourgeois liberal” (Rorty, *Objectivity, Relativism and Truth*, Vol. I, p. 197–202).

²⁷ Nicholson, *Causes and Consequences in International Relations*, p. 112.

²⁸ *Ibid*, p. 112.

Consciousness is both the ontological synopsis of the human being and the means by which the human being confirms its autonomy and its quest for other beings.

Conscious beings come into contact with each other in the contexts of their conscious minds. These contacts take place in accordance with the intentionality of consciousness and, especially, in accordance with the principle of sustainable creativity. The means by which conscious minds communicate with each other are called symbols. A symbol is a form that objectivates conscious beings' attempts to participate in each other's mental reality. Furthermore, symbols are forms that express commonly accepted intentions and actions and can be organized in sets that are called codes²⁹. When conscious minds act and behave according to common codes, a society of conscious minds is an inter-subjective and conscious continuum.

As a code becomes more complete and more complex, it may increase the efficiency and the accuracy of the communication among conscious minds, but, on the other hand, it may make the communication among conscious minds more difficult. The elements of a code with which conscious minds communicate with each other are signs. Each and every sign receives a meaning that is related to its acceptance by each and every consciousness and to its participation in the overall code. Every code and every sign have a dynamic structure that makes it possible for them to be functionally adapted to various requirements. The functional success of every system of communication depends on the extent to which and the manner in which it can comply with a generalized correspondence between the signifier and the signified³⁰.

²⁹ The choice of a code depends on the following factors: (i) the convenience of codeword transmission (e.g. it is technically easier to use a binary code), (ii) the convenience of perception (e.g. machine codes are more convenient for processor operation), (iii) providing for maximum channel capacity (by the term communication channel, I mean a device with one input and one output), (iv) providing for noise-stability, and (v) providing for definite properties of an algorithm for encoding (e.g. encoding simplicity, unique decipherability, etc.).

³⁰ According to Ferdinand de Saussure, language is made up of signs and every sign has two sides: (i) the signifier, i.e. the 'shape' of a word, its phonic component (the sequence of letters or phonemes, e.g. H-O-R-S-E), and (ii) the signified, the ideational component, the concept or object that appears in our minds when we hear or read the signifier. See: Hadumod Bussmann, *Routledge Dictionary of Language and Linguistics*, London: Routledge, 1996. However, the mathematician and philosopher René Thom, in his "Topologie et linguistique", argues that, if we restrict ourselves to a Saussurean view on language, then only one aspect of the sign seems amendable to objective description, namely, the physical one, the signifier, whereas the signified is accessible only through introspection, and, thus, it escapes all third person determination. In Thom's view, this situation is paradoxical insofar as our folk understanding of language and the function that language serves call for a robust link between the signified (our meaning intentions, as Husserl would have put it) and the signifier. Hence, Thom's analysis is focused on the encoding of pre-linguistic representations in language. This problem has two aspects: (i) representations, or the signifiers, are endowed with a structure that precedes their linguistic articulation; (ii) if such representations are to be expressed faithfully, then language must dispose of semantic forms by means of which it can express these structures. In the context of Thom's analysis, the Saussurean transformation from an amorphous signified to a formed signifier, which remains opaque within the framework of Saussure's theory, can be readdressed as follows: we can consider the level of the signified as a structured domain, a morphology of meaning, and, therefore, consider the signified-signifier relation as a mapping of this morphology onto the morphology of language. See: René Thom, *Mathematical Models of Morphogenesis*, trans. W.M. Brookes and D. Rand, Chichester: Ellis Horwood Ltd, 1983, ch. 11.

At this point, we must clarify the difference between the terms ‘meaning’ and ‘significance’. In addition to having a ‘meaning’, i.e. a denotation, or conceptual definition, every sign also has a ‘significance’, i.e. a mode of referring us to a being (or a collection of beings) that is denoted by the given sign, transcends the given sign and constitutes the correct interpretation of the given sign. The distinction between ‘meaning’ and ‘significance’ is originally due to the mathematician and philosopher Gottlob Frege, who suggested that, in addition to having a denotation, names and descriptions also express a ‘sense’, which is the way by which one conceives the denotation of the term. Frege’s views about the distinction between ‘meaning’ and ‘significance’ were adopted by Wilhelm Dilthey, who applied them in the “mental” sciences, and by Ernst Troeltsch, who applied them in the social sciences. Moreover, Jaspers developed the distinction between ‘explanation’ and ‘understanding’ on the basis of the distinction between ‘meaning’ and ‘significance’.

In its attempt to assign meanings and significances to things, consciousness has the continuous tendency to move toward two directions: an extrinsic one and an intrinsic one. When consciousness follows an intrinsic direction, the purposes of its action are to gain access to its own self in order to structure and experience it in a more complete manner as well as to be sheltered in its own inner world and to strengthen its ontological status by itself. In this way, a being becomes ‘deeper’ and, by refusing to widen itself, avoids the danger of wasting its potential. However, this entrenchment in the inner ego cannot secure the integration of a being, because every being is characterized not only by its autonomy but also by its participation in other beings. If consciousness persists in intensifying its inner ego, then the inner ego inhibits the manifestation of the social ego, and, in this case, the social ego is unable to strengthen the conscious person through a dialectical relationship with other conscious persons.

In its attempt to endow things with meanings and significances, the ego needs assistance from and cooperation with other egos. The existence of symbols and signs corresponds to the need of the ego to be complemented by other egos. Symbols and signs specify the relations among conscious beings that partake of common aesthetic experiences or exchange information with each other. Thus, consciousness is faced two risks: the risk of over-information, which is associated with extremely high information entropy³¹, and the risk of under-information, which is associated with

³¹ In general, according to the *Oxford Dictionary of Science* (2005), ‘entropy’ is “a measure of the unavailability of a system’s energy to do work; also a measure of disorder; the higher the entropy the greater the disorder”. In information theory, the concept of ‘entropy’ was originally devised by Claude Shannon in 1948 to study the amount of information in a transmitted message: in this case, ‘entropy’ is the average amount of data deficit (‘Shannon’s uncertainty’) that the informee (i.e. the person/the machine for whom/which a message is intended) has before the inspection of the output of the informer (i.e. the producer of the given message). In fact, in his famous article “A Mathematical Theory of Communication” (*Bell System Technical Journal*, Vol. 27, 1948, p. 379–423, 623–656), Shannon laid down the basic elements of communication: an information source that produces a message; a transmitter that operates on the message to create a signal which can be sent through a channel; a channel, which is the medium over which the signal, carrying the information that composes the message, is sent; a receiver, which transforms the signal back into the message intended for delivery; and a destination, which can be a person or a machine for whom or which the message is intended. Following Shannon, W. Weaver, in his article “The Mathematics of Communication” (*Scientific American*, Vol. 181, 1949, p. 11–15), presented a tripartite analysis of information in terms of: (1) technical problems concerning the quantification of information and dealt by Shannon’s theory, (2) semantic problems relating to meaning and truth, and (3) what he called “influential” problems concerning the impact

extremely low information entropy. Over-information intensifies the social ego and, by increasing information entropy, leads to a disorientated being. Under-information intensifies the inner ego and leads to an ego-centric being. The risks of over-information and under-information can be avoided by following the four-fold dialectic of sustainable creativity, which I defined in Part One.

The economic system is a particular case of the general phenomenon of the communication among conscious beings. If we leave the realm of unconscious interdependence—which, in fact, is the realm of classical and neoclassical microeconomics—and attempt to deal with problems of deliberate cooperation, we need a new way of theorizing about economic organizations based on sustainable creativity. In the following sections, I shall study the states to which an economic organization is attracted, namely: (i) stable equilibrium, (ii) instability, and (iii) the point of sustainable creativity.

Stable equilibrium: If we follow the terminology used by Chester Barnard³², then an economic organization is a “system of consciously coordinated activities or forces of two or more persons”. The following conditions are necessary for organization to emerge: (i) persons must be willing to contribute actively to the (cooperative) system; (ii) they must share a common goal; (iii) deliberate communication must be possible and present. The first two conditions must be met if the pattern is to be considered consciously cooperative, and the third condition must be met if conscious coordination and, hence, organization is to emerge. Herbert Simon³³ has argued that the cooperative pattern emerges when the participants prefer the same set of consequences. If anticipations concerning one another’s behavior are correct, then all will act (cooperate) to secure these consequences. Nevertheless, in the absence of deliberate communication, the pattern tends to be highly unstable. Thus, conscious coordination is the device or process whereby each participant is informed as to the strategies selected by the others. The process of communication within the formal system of an organization is specialized in fairly stable centers of communication that make up the executive body of the given organization. However, the executive is not a mere center of communication, but it also yields authority over the members of the organization, i.e. the executive function implies the issuing of coordinating and authoritative communications to those who contribute activities to the organization.

The formal system of an organization aims mainly at carrying out established, repetitive, day-to-day activities as efficiently as possible, and, therefore, it must function according to well-defined hierarchical structures and strictly applied rules and procedures. An efficient formal system in an organization is necessarily based on the non-ephemeral character of at least part of the interactions that are included in the organization, and, thus, it is meant to resist change and sustain the *status quo* to secure efficiency. Hence, the formal system of any successful organization is orderly and stable³⁴. The formal system of an organization is pulled toward stable equilibrium

and effectiveness of information on human behavior. For more details, see: Luciano Floridi, “Information”, in L. Floridi (ed.), *The Blackwell Guide to the Philosophy of Computing and Information*, Oxford: Blackwell, 2003, p. 40–61, and the references therein.

³² Chester Barnard, *The Functions of the Executive*, Cambridge, MA: Harvard University Press, 1938.

³³ H.A. Simon, *Administrative Behavior*, New York: Macmillan, 1947.

³⁴ The concepts of stability and instability are studied in the theory of dynamical systems. A dynamical system is a mathematical formalization for any fixed rule that describes the time dependence of a point’s position in a geometric space. A motion or its orbit is said to be

by the forces of integration, maintenance controls and the need to adapt to the environment³⁵.

The informal system of an organization refers to a culture primarily satisfying the human desire for security, certainty and conformity (it is not only this, however, as I shall show later). In case the above-mentioned pull of the formal system of an organization toward stable equilibrium is reinforced by the informal system, then the given organization as a whole will be attracted to stability. Negative feedback³⁶ drives both formal and informal systems; in this case, 'negative feedback' refers to the law of diminishing marginal utility³⁷ or to the law of diminishing returns.

As a conclusion, in the absence of strong destabilizing conscious and/or unconscious causes, organizations seem to be attracted to a stable bureaucratic state in which they carry on doing the same thing: this is the point emphasized by classical and neoclassical microeconomics³⁸.

Instability: Whereas all organizations are pulled to stability, they are simultaneously pulled to instability by powerful forces of division and decentralization³⁹. If the formal systems of an organization move too far in the direction of division and decentralization, then they become fragmented and unstable⁴⁰. Moreover, even if the formal systems of an organization do not move so far in this direction, the informal systems of an organization are pulled toward instability by even more powerful forces. It should be mentioned that informal systems are a device not only for security and conformity but also for satisfying human desires for innovation, individuality (experience of existential 'otherness') and isolation from the environment. If informal systems are dominated by behavior patterns that refer to innovation, individuality and isolation from the environment, then they pull the entire organization to fragmentation and instability. Thus, in organizational terms, the attractor to instability

'stable' if the effect of small disturbances on the motion or its orbit is small. A motion or its orbit is said to be 'unstable' if the effect of small disturbances on the motion or its orbit is significant. A motion or its orbit is said to be 'asymptotically stable' if the effect of small disturbances on the motion or its orbit tends to disappear. For a mathematically rigorous study of these concepts, see: Nicolas Laos, *Topics in Mathematical Analysis and Differential Geometry*, London: World Scientific Publishing Co., 1998.

³⁵ See: P.R. Lawrence and J.W. Lorsch, *Organization and Environment*, Cambridge, MA: Harvard University Press, 1967.

³⁶ By the term 'feedback', we mean a situation when output from an event in the past will influence an occurrence or occurrences of the same event in the present or future.

³⁷ According to the law of diminishing marginal utility, "as the amount of a good consumed increases, the marginal utility of that good tends to diminish". See: Samuelson and Nordhaus, *Economics*, p. 84.

³⁸ For more details, see: Danny Miller, *The Icarus Paradox: How Excellent Organizations Can Bring About Their Own Downfall*, New York: Harper Business, 1990; R.T. Pascale, *Managing at the Edge: How Successful Companies Use Conflict to Stay Ahead*, London: Viking Press, 1990; Samuelson and Nordhaus, *Economics*.

³⁹ See: Lawrence and Lorsch, *Organization and Environment*.

⁴⁰ See: Miller, *The Icarus Paradox*.

means that positive feedback⁴¹ behavior, such as political interaction and organizational defense mechanisms, cause disorder in the system⁴².

The point of sustainable creativity: The alternative to either stability or instability lies in the border between them, namely, at a point of sustainable creativity, where both negative and positive feedback, both stability and instability, operate simultaneously to cause the emergence of changing patterns of behavior. In organizational terms, at a point of sustainable creativity, the formal systems operate in a stable way to secure efficient operations on a daily basis whereas the informal system operates in a destabilizing manner to cause change. For an organization to be changeable and, hence, innovative, its informal system (namely, the shifting network of social and other informal contacts between people within an organization and across its borders) must operate according to the dialectic of sustainable creativity⁴³.

An informal network operates according to the dialectic of sustainable creativity when opposing ways of behaving are simultaneously present. For instance, there is ‘instability’ when an organization experiences the clash of countercultures, the tensions of political activity, or when some managers operate in the formal organization using capital-budgeting techniques to keep the organization stable while, at the same time, others operate in the informal system to get around those budgetary controls, etc.⁴⁴ If an organization is attracted only to the state of behavior that we call stability, then it will stop being creative; in fact, Cornelius Castoriadis has argued that:

if the system were actually able to change individuals into things moved only by economic ‘forces’, it would collapse not in the long run, but immediately. The struggle of people against reification is, just as much as the tendency toward reification, the condition for the functioning of capitalism. A factory in which the workers were really and totally mere cogs in the machine, blindly executing the orders of management, would come to a stop in a quarter of an hour.⁴⁵

If an organization is attracted only to the state of behavior that we call instability, then it will be dissolved. An organization can remain simultaneously orderly and changeable if and only if the disorderly dynamics of conflict and dialogue (which are the foundations of changeability and, hence, of innovation) produce a sustainable new synthesis (conscious communication), i.e. if and only if it operates according to the dialectic of sustainable creativity.

⁴¹ A system is said to exhibit ‘positive feedback’, in response to perturbation, if it acts to increase the magnitude of the perturbation. In social-economic systems, positive feedback effects may also be referred to as ‘virtuous’ or ‘vicious’ cycles.

⁴² See: Chris Argyris, *Overcoming Organizational Defenses: Facilitating Organizational Learning*, Boston: Allen & Bacon, Prentice-Hall, 1990.

⁴³ See: R.D. Stacey, *Strategic Management and Organizational Dynamics*, London: Pitman, 1993.

⁴⁴ See: Ikujiro Nonaka, “Creating Organizational Order Out of Chaos: Self-renewal in Japanese Firms”, *California Management Review*, Vol. 30, 1988, p. 57–73; M.M. Waldrop, *Complexity: The Emerging Science at the Edge of Order and Chaos*, London: Viking, 1992.

⁴⁵ Cornelius Castoriadis, *The Imaginary Institution of Society*, London: Polity Press, 1987 (originally published in 1975 by Éditions du Seuil), p. 16.

When one studies patterns of consumer behavior⁴⁶, ‘negative feedback’ is analogous to diminishing marginal utility; ‘positive feedback’ to increasing marginal utility. The Hollywood, the mass media and the advertising industry tend to make consumers behave under conditions of increasing marginal utility. Thus, demand can get out of control, since it is deliberately and continuously stimulated by the cultural context. We gain added insight into the significance of positive feedback for the explanation of patterns of consumer behavior by analyzing specific aspects of the so-called super-industrial economy⁴⁷. First of all, in the super-industrial era, the production and control of what D. Bell calls “codified knowledge” (namely, systematic, coordinated information) is the main strategic resource on which the economy depends. Those who are concerned with the creation and distribution of “codified knowledge” (namely, scientists, managers/economists and skilled professionals of all kinds) increasingly become the leading social groups, often replacing the entrepreneurs of the old system⁴⁸. Hence, in the super-industrial economy, the consumers who spend on education and professional-training programs in order to acquire more knowledge and more professional skills operate under the conditions of increasing marginal utility. In fact, in the super-industrial era, the need for life-long, continuous education/training shows the significance of positive-feedback analysis for the explanation of consumer behavior.

Furthermore, the significance of positive-feedback analysis for the explanation of consumer behavior is increased by the fact that the products of the so-called ‘new economy’, such as operational systems for PCs, mobile-phone sets, music CDs, iPods, etc., as well as many products of the so-called ‘old economy’, such as cars, are characterized by a high level of inherent obsolescence (namely, these products become obsolete very quickly), and those who buy them are continuously pushed to buy new/updated products.

In classical and neoclassical partial-equilibrium analysis⁴⁹, the idea of a single equilibrium is encouraged by the law of diminishing returns. This one-sided single-equilibrium explanation of the law is wrong, especially in the context of the ‘new economy’ industries. Computers, software, optical fibers and telecommunications equipment, medical electronics and pharmaceuticals are all subject to increasing returns. This is because, from the outset, they necessitate enormous outlays on Research and Development, designing and redesigning, developing a prototype and setting up tools and automated plants for manufacture. But, once the products start rolling off the production line, the cost of producing additional units of output drops very sharply in relation to the initial investment⁵⁰ (e.g. software—once written, tested,

⁴⁶ See: Brian Mullen and Craig Johnson, *The Psychology of Consumer Behavior*, New Jersey: Lawrence Erlbaum, 1990.

⁴⁷ See: Daniel Bell, *The Coming of Post-Industrial Society*, New York: Basic Books, 1973; Alvin Toffler, *The Third Wave*, London: Pan, 1981; Alain Touraine, *The Post-Industrial Society*, London: Wilwood, 1974; Raymond Williams, *Towards 2000*, Harmondsworth: Penguin, 1985.

⁴⁸ See: J.K. Galbraith, *American Capitalism*, Boston: Houghton Mifflin, 1952.

⁴⁹ ‘Partial-equilibrium analysis’ means “analysis concentrating on the effect of changes in an individual market, holding other things equal, (e.g. disregarding changes in income)”, whereas ‘general-equilibrium analysis’ refers to “an equilibrium state for the economy as a whole in which the markets for all goods and services are simultaneously in equilibrium”; see: Samuelson and Nordhaus, *Economics*, p. 737, 743.

⁵⁰ See: Georges Anderla, Anthony Dunning and Simon Forge, *Chaotics*, Twickenham: Adamantine Press, 1997.

debugged and enhanced—is very cheap to duplicate, and it can become a massive source of continuous ever-increasing returns, until the producers bring out a better version).

The many input and output markets are connected in an interdependent system that can be conceived in terms of a Boolean network⁵¹. A Boolean network consists of a number of elements, or cells. Each cell is connected to others and sends outputs to all or some of those others. What state each cell is in at any moment—namely, what it is outputting at any moment—depends on the inputs it is receiving and the rules it follows to respond to those inputs. Thus, the state of an individual cell changes from moment to moment according to the energy or information it receives and the rules it follows for converting inputs into output.

Suppose that each cell in the network is randomly connected to others and randomly assigned a different decision-making rule. Moreover, suppose that we assign randomly different initial conditions. When every cell is connected to every other, then the whole system is attracted to instability: it behaves randomly, and any time change in the initial pattern from which the system is started will lead to completely different subsequent patterns over time. However, when each cell is connected to only two others and random decision rules are assigned to all the cells, the whole system is attracted to stability: random local rules of behavior can cause the emergence of order at a global level, and whether there is order or not depends on the degree of connectedness between cells of the network. Furthermore, it should be mentioned that, just before such systems go completely random, i.e. at a point of sustainable creativity, they behave in a different manner: coherent structures that grow, split apart, and recombine in different patterns⁵² due to the dialectic of sustainable creativity.

⁵¹ See: S.A. Kauffman, “Antichaos and Adaptation”, *Scientific American*, August 1991, p. 78–84; S.A. Kauffman, *Origins of Order: Self-organization and Selection in Evolution*, Oxford: Oxford University Press, 1993.

⁵² For a mathematically rigorous study of these patterns, see: Stephen Wolfram, “Computer Software in Science and Mathematics”, *Scientific American*, September 1986, p. 188–203.