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Alain Herscovici. The Historicity of Economic Sciences: The Main Epistemological Ruptures. 2023. hal-04189632v1

HAL Id: hal-04189632

<https://hal.science/hal-04189632v1>

Preprint submitted on 28 Aug 2023 (v1), last revised 3 Apr 2024 (v2)

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The Historicity of Economic Sciences: The Main Epistemological Ruptures

Alain Herscovici

Abstract: The object of this work is threefold: it consists (a) in explaining and justifying, based on Foucault's concept of episteme, the epistemological foundations from which Classical Economics, Keynesian Economics and Neoclassical Economics were built; (b) in studying the nature of the epistemological ruptures that allow differentiating these schools; and (c) in defining the degree of incommensurability of these different paradigms.

In the first part, I will define the main epistemological tools that allow studying the birth and evolution of science. In the second part, I will study the nature of the epistemological ruptures that characterize these evolutions and these different schools.

Keywords: Historicity – Epistemological Ruptures – History of Economic Thought – Episteme.

La représentation subjective du monde social comme légitime fait partie de la vérité complète de ce monde

((The subjective representation of the social world as legitimate is part of the complete truth of this world)

(Bourdieu, *Questions de Sociologie*)

Introduction

1) Any scientific research program has implicit or explicit epistemological foundations. Denying this implies falling into the naive positivism refuted today by modern epistemology, from Popper to Lakatos and Kuhn.

The object of this paper is threefold: (a) it consists in making explicit, on the basis of the concept of episteme, as defined by Foucault, the epistemological foundations on which Classical Economics, Keynesian economics and Neoclassical Economics were built; (b) on the basis of this definition, it is necessary to study the nature of the epistemological ruptures that allow these schools to be differentiated; and (c) to show to what extent it is possible or not to speak of the incommensurability of these different paradigms.

2) There are two theses concerning science and its evolution: the first one starts from the principle that the evolution of science is the product of an autonomous and sovereign logic: thus, scientific production is characterized by its cumulative character, and it is possible to affirm that there is a progress of science.

This conception is adopted, implicitly or explicitly, by Neoclassical Economics: in such perspective, since its birth, economic science has developed from this linear logic, the Neoclassical Scientific Research Program (SRP) representing the most pertinent form. From this conception, Neoclassical Economics, or the so-called 'mainstream', has always tried to incorporate the other currents and the other schools into its theoretical framework.

The second thesis, which I will describe as historicist, refutes this conception: science can only be studied on the basis of the criteria in force during the period in which it was conceived. The evolution of science does not follow a linear trajectory, but it is characterized by *discontinuities and ruptures*.

3) In this paper, I will use the concept of episteme, a concept elaborated by Foucault in two books: 'Words and Things' and 'The Archaeology of Knowledge'. From such a perspective, (a) it is necessary to analyze the nature of the epistemological ruptures that run through these long-term evolutions; (b) on the other hand, this approach allows refuting the epistemological strategies of integration developed by neoclassical economists. Concerning Ricardian and Keynesian economics, I will show how, and why, this integration can only be carried out on

the basis of *an epistemological emptying*, denying the specificities of the schools being integrated. Contrary to Foucault, based on the concept of episteme, I will include in my analysis the neoclassical school.

4) In the first part, I will define the main epistemological tools that allow us to study the birth and evolutions of science, from the different epistemological approaches. In the second part, I will highlight the hypotheses from which Classical Economics, Neoclassical Economics and Keynesian Economics were built, and I will study the nature of the epistemological ruptures that characterize these evolutions.

I) The Episteme concept in Foucault's conception

1) Study object and subject

1.1 The epistemological position

The oppositions between the idealist and the materialist position are directly related to the opposition between universalism and historicism, between determinism and methodological indeterminism; this debate refers directly to the nature of scientific laws, and to the definition of subject and object.

Seventeenth-century methodological determinism is found, in its most elaborate form, in the works of Kant, Leibniz and Descartes. What is the nature of 'reality,' how is it possible, in the case of science, to define the nature of the object of study and its relations with the subject who implements this study?

Kant's Philosophy is characterized by the hypothesis according to which the world exists outside of us: reality exists as a 'real' and immutable fact (Fournier and Rigal 2007, p.3), science is able to objectively analyze this reality, and to reveal its mechanisms; the ultimate aim of science is to discover the 'truth.' The epistemological project of this deterministic view is to produce *universal knowledge* (Ong-Van-Cung 2018, pp. 7 and 11), that is, knowledge that is totally independent of different historical contingencies. Leibniz thus elaborates the *mathesis universalis*, which makes it possible to conceive as a '(...) formal science of order and measure (...) (Idem, p. 9).

This objective and positivist conception of science presupposes the neutrality of the subject. If, on the one hand, the object of science is to discover natural and universal laws, the subject must be 'neutral'. The Cartesian cogito states that '*I think, therefore I am*'; it is necessarily true, every time *I* utter this statement or conceive it (Descartes [1647]). *I* is a transcendental subject insofar as it is 'neutral,' devoid of any historical dimension; *I* is a universal subject.

Finally, this type of deterministic approach presupposes that the systems are (a) stable systems, in the sense of being able to predict their trajectories (Vercelli 1991); (b) universal, by nature and (c) that the laws of nature are analyzed from a mathematical determinism (Dahan, 1992).

1.2 *Object and subject of science*

1.2.1 Hayek (1952) states in several works that aggregate analytical categories are not facts, but intellectual constructions: the object cannot be studied independently from the subject's 'Habitus'. Aggregate mechanisms do not constitute objective facts and cannot constitute the object of study of economics. Thus, Hayek rejects this approach to choose as the concrete object of study the objective facts that, according to him, are limited to the individual behaviors of economic agents.

Popper comes to a similar conclusion: he states that, according to historicist theses, '([...] most objects [...] are theoretical constructions.' ([1976] 1988, p. 170), and deduces that such analysis confuses '[...] theoretical models and concrete things.' (Idem.).

1.2.2 An epistemological rupture appears from the moment that certain philosophers refute this conception of reality, that is, of the world. Regarding Feuerbach's conception, Marx and Engels ([1845] 1976, p. 24) state that this author '[...] does not see that the sensible world around him is not a given object determined for all eternity and always the same [...], but it is a historical product [...]'. Heidegger also claims this historicity of the world: 'Reality can only be discovered from the foundation of an already revealed world' (Heidegger, [1927] 1985, p. 247).

These approaches make it possible to refute the hypothesis of an immutable and ahistorical reality, of an external reality that can be known objectively, regardless of the sensitive world proper to the subject who carries out the observation.

The observation thus carried out is implemented from a particular language, from a particular *point de vue* (Bourdieu, 1984, p. 16); it is not possible to dissociate observation and reality. Sensible objects are not dissociated from the objects of thought (Marx, Engels, 1845, 1976 p. 1), which implies that reality cannot be conceived independently from these sensible objects. This suggests redefining the goal to be achieved by science, as well as the very concept of progress in science.

The subject is a historical subject: he is not transcendent, but, on the contrary, *he speaks from a certain place*, a place determined from its historical, sociological, and temporal dimension. As far as Economics is concerned, it is not possible to elaborate a system on the basis of the hypothesis of a substantive rationality exercised by a generic and abstract man, the *homo economicus*, or to attribute to human beings a natural propensity to exchange (Smith [1776] 1980). The same kind of remarks can be made about the concept of labor used

by classical economists: Marx's critique is based on the fact that economics does not deal with labor '*en général*', but with the specific form taken by labor in the capitalist mode of production (Marx [1859] 1972,, p. 169): the abstract labor.

On the other hand, the 'world' is not an object that has its own characteristics, but a pure mental and intellectual construction mediated from concepts, from a certain language (Sobel, 2017, p. 7). The 'I think, therefore I am' has to be replaced by 'I speak, therefore I am'; the subject is intrinsically historical, and uses the mediation of language in his perception of the world.

1.3 *Some examples in Economic Science*

The epistemological rupture that prevails in Economic Sciences is defined in terms of these two antagonistic conceptions: Kant's conception and Heidegger's conception, with regard to the nature of reality. The Neoclassical analysis is directly linked to this first conception; I will illustrate this from the capital controversy and the implicit assumptions that underpin the entire theoretical framework of the theory of rational expectations.

1.3.1 *The Cambridge Controversy*

In the famous capital controversy between the two Cambridge, the neoclassical position asserts that it is possible to conceive and measure a certain amount of heterogeneous capital independently from the value of distributive variables and that, consequently, the aggregate capital is represented by physical quantities. This hypothesis allows formulating the following conclusions: (a) the 'value' of an aggregate amount of heterogeneous capital is constant, that is, it does not vary over time; (b) capital is a component that can be found in any type of society, and at any time (Piketty 2013), capital is universal; and (c) finally, the distribution of income, that is, the relative share of wages and profits in the national product, is determined from the quantities of factors of production and their scarcity. This implies the universalization of social and economic mechanisms inherent to a historically determined system, the capitalist system.

In this regard, it is possible to speak of '*capital-centrism*': all societies and all economic structures are analyzed using the same conceptual tools. On the other hand, the capitalist system represents the most elaborate form of society, a form towards which any type of society will 'naturally' arrive.

1.3.2 *The Rational Expectations Theory*

The implicit hypotheses from which the Theory of Rational Expectations (TRE) was elaborated (Lucas 1975; Sargent and Wallace 1975), is the pure product linked to the exacerbation of this approach: all agents elaborate their expectations integrating the available information into the relevant theoretical model, that is, into the neoclassical

General Equilibrium (GE) model. From an epistemological point of view, it is difficult, if not impossible, to sustain such a hypothesis:

(i) This implies that the only theoretical model that allows an observation of reality to be carried out is the neoclassical one. From an epistemological point of view, it is possible to state that the TRE uses the hypotheses of Descartes, Leibniz and Kant, hypotheses linked to Classical Mechanics: the subject is transcendent, the definition of the object is objectively carried out and the ultimate objective of science is to reveal the intrinsic truth embedded in reality.

(ii) This thesis is hardly sustainable: as shown by several economists (Keynes [1936] 2009, Arrow 1974, Grossman and Stiglitz 1976), the concrete reality of the market, that is, the simultaneous existence of a demand and a supply, in given point in time, implies in the heterogeneity of expectations. Such heterogeneity can only be explained from the moment that expectations are elaborated based on different theoretical models. On the other hand, rational expectations elaborated on the basis of the Keynesian model will produce Keynesian results (Neary and Stiglitz 1983), and not neoclassical ones.

(iii) Finally, the sociology of knowledge allows understanding why the Neoclassical School, founded on subjective hypotheses, like any other school, is able to appear as objective. The orthodox school (the mainstream) that dominates the social field, in this case the academic field, manages to '(...) impose its subjective representation (...) as an objective representation' (Bourdieu 1984,p.93); the different heterodoxies, due to the fact that they are dominated, cannot acquire the legitimacy that would look as objective in the eyes of actors operating in the field.

More generally, Neoclassical Economics, based on a tradition inherited from the Physiocrats, conceives economic mechanisms as natural and ahistorical: (a) natural mechanisms because they do not depend on the will of individuals (Tsoulfidis 2017, p. 4) (b) ahistorical mechanisms due to the fact that they do not include institutional changes in market analyses (Idem, p. 17).

1.3.3 *Classical and Keynesian Economics*

On the contrary, institutional elements are present in Classical and Keynesian Economics:

- As stated by Ricardo ([1821] 2001), the wages that correspond to the reproduction of the labor force are determined as a function of social and historical variables that vary depending on the periods studied. On the other hand, in the Sraffaian scheme, distributive variables are determined exogenously: these wage-setting mechanisms can be assimilated to institutional mechanisms (Boyer 1987; Hodgson 1988).

-In Marx's economics, the very concepts of capital and commodity, and the system of property rights that characterize them, are 'institutional' mechanisms that are directly related to a historically determined system, the capitalist system (Herscovici 2019).

- In Keynesian economics, the concept of convention plays an important role in determining economic dynamics; it serves as a basis for agents to elaborate their expectations, to strengthen the state of confidence of entrepreneurs and thus to contain the destabilizing effects produced by uncertainty (General Theory, GT, [1936], 2009, p. 124 and 126).

It is interesting to note in this regard that, in several economics articles, economists invoke 'empirical evidence' to validate their analyses. Even if the formula may seem elegant, within the scope of a historicist perspective linked to the dissociation between the subject and the object, this formula is nothing more than an *epistemological incongruity: the concrete level* (Marx [1859] 1972, pp. 165 and 166) *represents the more complex analytical level. It has to be conceived as the result of scientific knowledge, and not as its starting point: it is necessary* '(...) to rise from the abstract towards the concrete (...)' (Idem, p. 165). Empiricism is the opposite of evidence.

2) Episteme: a definition

2.1 *Episteme and Historicity*

We cannot ignore the parallel between Foucault's and Kuhn's approaches ([1962]1991): within each episteme, there is a certain consensus regarding the problems to be considered and the methods used to 'solve' these problems. This corresponds to solving problems using tools provided by normal science. Beyond the oppositions that manifest themselves within the field of scientific production, there is a tacit agreement on certain 'rules of the game.' In Lakatos' terminology, it is possible to state that the controversies are related to the auxiliary hypotheses, but they do not represent a threat in relation to the hard core, which allows avoiding the *modus tollens*.

The periodization proposed by Foucault distinguishes three different epistemes (Foucault 1966):

i) The *preclassic episteme* (until the end of the sixteenth century) presents the following characteristics: the world is characterized by signs deposited by God: the interpretation of these signs is carried out from the principle of similarity. The analogy is widely used (Foucault 1966, pp. 36 and 47), as highlighted by the category of the microcosm (Idem, p. 46); the observations carried out at the micro level will be extended to the macroscopic level (and vice versa), on the basis of equivalences, analogies and similarities: analogies that allow comparing the functioning of the human body and the astrological mechanisms, for example.

ii) The *classical episteme* (seventeenth and eighteenth centuries) [1] intends to reveal the Order of the world (ibid., 1966, pp. 73, 86) based on the interpretation of signs: these signs are deciphered, organized and classified based on scientific knowledge. They can only be revealed and acquire a precise and univocal meaning from their representation carried out from a *mathesis* and/or a *taxonomy* (Idem, p. 88). The order of the world is represented from the Cartesian interpretation. With regard to Economics, Quesnay's general framework is representative of this type of *démarche*. The object of knowledge is the order that prevails in Nature, and the scientific representations constructed to explain nature use a logical time, which is by nature reversible (Israël 1992; Herscovici 2019).

To this episteme corresponds a *deterministic* conception of science, represented by Classical Mechanics; Descartes, Laplace and Leibniz are part of this global logic. Scientific laws are of the same nature as natural laws and, consequently, they are *universal*. This episteme represents the first step towards the emancipation and autonomy of the scientific field: the internal logic substitutes progressively and partially the religious power. The natural order will be analyzed from the stable equilibria that science allows discovering.

Voltaire, one of the most brilliant author of the Enlightenment, ironically highlights the limits of these two epistemes, the preclassical and the classical ones: regarding the first one, Zadig makes the following statement: 'Nothing more successful (...) than a philosopher who reads in this great book that God has placed before our eyes: the truths he discovers belong to him: he nourishes and uplifts his soul (...)' (Voltaire 1747). With regard to the classical episteme, when Candide asks Pangloss if, after all the misfortunes he has suffered, he always believes that everything is better in the best of all worlds, the latter responds as follows: '(...) I am a philosopher; it is not right to deny, Leibniz cannot be wrong, and the pre-established harmony being the most beautiful thing in the world (...)' (Voltaire 1759).

iii) According to Foucault, historicity appears in the episteme linked to *modernity*, from the end of the eighteenth century onwards. The object of study is Man, the human being defined in his finiteness and in his productive activities. In Classical Economics, this is reflected in the primacy of production over circulation (Foucault 1966, p. 271); production is conceived as the human activity that allows scarcity to be temporarily removed.

Human activities occupy a central role in economics; they make it possible to dominate Nature and thus compensate for the limitations Nature imposes on humanity. The production relations are no longer conceived as the use of the wealth provided by Nature but, on the contrary, by the control that Man exercises over Nature, and by the social relations that allow the implementation of these production activities (Ricardo, Marx).

Contrary to what the Physiocrats claimed, Nature no longer lavishes its riches; on the contrary, as emphasized in Ricardo's theory of differential income, it is 'greedy.' Scarcity

appears, and the function of labor is to reduce this scarcity: labor becomes a central element in economic analysis.

The (relative) emancipation of Economics as a science appears in the classical episteme and is developed in the episteme linked to modernity. In the classical episteme, the divine Order is substituted by the order of nature; in modernity, this natural order is replaced by the appearance of Man and his productive activities (Foucault 1966, p. 16). *Modernity is characterized by the existence of a 'purely' economic order.*

This economic order is characterized by *the active role of Man, as an economic subject by definition*: his action determines this order. On the contrary, pre-classical and classical epistememes were linked to a holistic conception of society and human activities (Dumont, 1985), because the individual has no active role in determining this order, because the individual is a 'passive' subject. In Classical Economics, this action is manifested mainly through the mediation of labor and institutions; in Neoclassical Economics, by the subjective and exogenous preferences of economic agents, in the absence of institutions.

Foucault emphasizes *a Fundamental Historicity*: the different types of scientific discourses are possible, legible and legitimate, depending on the episteme within which they were produced (Foucault, 1969, Deleuze, 1986, p. 56). This Fundamental Historicity corresponds to an absolute relativism: the coherence of any discourse, notably the scientific discourse on economics, can only be judged on the basis of the criteria specific to a given episteme.

In the same way that, in the classical episteme, knowledge is embodied in nature and is universal, in modernity, time is the manifestation of human scarcity and finitude. In Ricardo's and Marx's work, time is present: labor time determines the value of commodities, the rotations of capital determine the rate of profit.

2.2 *The nature of the ruptures*

Within the same paradigm or episteme, it is possible to have oppositions (the points of heresy mentioned by Balibar (2020)). However, none of these oppositions questions the foundations of the paradigm or episteme. These are *incremental ruptures*, in the sense that they act on the surface and do not threaten the perenity of the paradigm. *Fundamental ruptures*, on the other hand, translate into a change of paradigm or episteme [2]. *Can the main controversies present today in economic theory be interpreted as opposition between different epistememes, or as simple oppositions within the same episteme?*

The commensurability of paradigms implies the existence of scientific progress, and the cumulative character of the production of science; incommensurability limits the possible comparison between the different schools within the same episteme, and it is incompatible with the thesis of long-term scientific progress: *commensurability is a short-term intra-paradigmatic mechanism*, incommensurability a long-term inter-paradigmatic mechanism.

Obviously, the neoclassical integration attempts were implemented on the basis of commensurability of the different paradigms and/or epistemes.

2.3 *Episteme and economics*

Classical Economics was born with the Physiocratic school; it continued with Adam Smith, and became autonomous with Ricardo and Marx; Sraffa and the Neo-Ricardian school recovered and rehabilitated the classical school, and developed a radical critique of the neoclassical construction in regard to its micro and macroeconomic foundations.

This relative autonomization corresponds to the definition of its own criteria linked to the field of economics, the definition of the object of study, and the (relative) distancing from political and religious powers. An economic order gradually and partially replaces the divine and natural orders.

Nevertheless, unlike other sciences, economics is characterized by the coexistence of several paradigms or epistemes: Foucault states that ‘In a given culture and at a given moment, there can only be one episteme, which defines the conditions of possibility of any knowledge.’ (1966, p. 17). This epistemological heterogeneity of Economic Science can be explained by the following elements:

- i) *The different schools of thought considered drawing on elements belonging to different epistemes*: the classical school is assimilated, according to Foucault, to modernity. Nevertheless, it also has characteristics that are typical of the classical era: implicit references to a natural order, a transcendent and ahistorical subject, which prefigures the *homo economicus*. The same observations can be made about Neoclassical Economics
- ii) The Marxian, Neo-Ricardian and Post-Keynesian schools are different: (a) The critique of Political Economy elaborated by Marx is based on a historicization of the analytical categories (Herscovici, 2002); (b) Starting from the elements present in the works of Smith, Ricardo and Marx, the neo-Ricardian school highlights the logical inconsistencies of the neoclassical construction (Kanal, 2015) and affirms the intrinsic historicity of economic mechanisms (Herscovici, 2019); (c) Finally, Keynesian theory emphasizes the use of irreversible time (Davidson, 1996) and, consequently, historical time.

II) Classical Economics, Neoclassical Economics and Post-Keynesian Economics: heresies or bifurcations?

1) *The production/realization dichotomy: Classical Economics*

1.1 Despite the ambiguities present in Smith's work (Herscovici, 2020 (b)), based on the paradox of the water and the diamond, this author refutes utility as the source of value, in

the name of objective utility: water and diamonds have an intrinsic utility, the same for all individuals. In the same way, Marx and Ricardo dismiss the role of use value in the formation of prices and in the modalities of value determination. Marx recognizes that use value is 'natural': utility is determined '[...] by the bodily properties of commodities [...]' ([1867] 1976, Book I, p. 44) and '[...] does not express a social relation of production' (1859, p.8), which may seem paradoxical coming from Marx (Herscovici, 1994, Orléan, 2011).

Within such a perspective, use value constitutes only a necessary condition for the realization of exchange value. Use value exists as an objective fact (Kanal, 2015, p. 8); in this sense, it is intrinsically different from the utility value theory used by Neoclassical Economics.

1.2 Classical Economics attaches little importance to supply and demand: excess of demand or supply determines only the temporary deviation between the market price and the natural price (or price of production).

As the situation becomes competitive, the deviations between market prices and natural prices will systematically disappear: if, for example, the market price is higher than the natural price, one of the components of natural prices will be remunerated at a rate higher than its natural rate. There will be a transfer of capital, or labor, towards this sector, (Smith [1776] 1980, p. 165), until these rates equalize with the value that corresponds to the natural rates.

Ricardo ([1821] 2001, p. 79) adopts the same position: referring directly to chapter VII of the *Wealth of Nations*, he qualifies the deviations between market prices and natural prices as temporary and accidental (Idem). In this respect, Marx states that, due to a double determination, the play of demand and supply does not explain prices: 'If the market price is determined by supply and demand, supply and demand are determined by the market price [...]' ([1876] 1976, Book III, p. 205).

The natural price, defined in the sphere of production, constitutes the regulating element. Market prices fluctuate from the value of these natural prices: 'The natural price is therefore, so to speak, the central price, towards which the prices of all goods continually tend' (Smith, [1776] 1980, p. 163). Consequently, the object of the labor theory of value is to make explicit the ways in which this natural price, or price of production, is determined.

The primacy of the sphere of production is interpreted as the primacy of the 'real' sphere in relation to the sphere of circulation. However, the primacy of the sphere of production can also mean the neutrality of money and finance, that is, ultimately, the fact of adopting Say's law. If this hypothesis was adopted by Smith and Ricardo, it was refuted by Marx and, obviously, by post-Keynesian authors; these, on the contrary, speak of a monetary economy of production, which is characterized by the existence of strong uncertainty, and by the non-neutrality of money and finance.

This primacy of production is interpreted differently by Neoclassical Economics: on the one hand, based on the theory of subjective value, along the lines of the works linked to Physiocracy (Foucault, 1966, Herscovici, 2020 (b)), it focuses its study on the sphere of circulation (and not production), i.e. on the supply and demand game. On the other hand, the neutrality of money corresponds to the primacy of the real sector. Finally, saving is interpreted as a real mechanism (the intertemporal choice of consumption), which implies the neutrality of money and finance (Herscovici, 2020 (a)); this conception is based on Smith's thesis regarding the role played by 'parsimony'.

This incommensurability of the paradigms proper to these two scientific research programs (SRP) comes from their adopting different theories of value: 'The labor and utility theories of value seek to explain the prices of goods in terms of what takes place respectively in the sphere of production and in the market.' (Lucarelli, Lunghini, 2012, p. 7). These theories of value constitute the irrefutable premises that characterize any SRP, i.e. '[...] an accepted 'basic value' judgment' of the scientific elite' (Lakatos, 1970, p. 110). The choice of a particular theory of value represents what Wittgenstein (1912, apud. Lucarelli and Lunghini, op. cit) qualifies as '[...] all the primitive propositions that are assumed as true without proof by the various sciences.'

Despite this incommensurability of paradigms, neoclassical authors, from Marshall to Friedman, Blaug and Mankiw, have always tried to integrate these schools into the neoclassical framework. This strategy, in the epistemological sense of the word, starts from the principle according to which the neoclassical paradigm represents the most complete form that results from these long-term evolutions. I will show later that the same strategy was adopted by neoclassical authors to integrate Keynes' General Theory model.-

2) The Definition of the Object of Study

2.1 *Scarcity*

2.1.1 The Ricardian theory of value excludes from its field of investigation goods that are not reproducible from an industrial process, and whose value is only determined by their intrinsic scarcity:

'Some goods have their value determined only by their scarcity. No labor can increase the quantity of such goods (...). Their value is totally independent of the amount of labour originally required to produce them, and fluctuates with changing wealth and preferences of those who wish to own them.' (Ricardo [1821] 2001, pp. 43 and 44).

Thus, the Ricardian theory of value excludes from its field of investigation the goods whose value can only be explained from the subjective theory of value: Ricardo cites the example of statues, paintings, rare books and wines of specific quality, and observes that the value of

these goods fluctuates with the modification of tastes and preferences (Idem). As these preferences change over time, the value of those goods changes accordingly.

For Neoclassical Economics, on the contrary, scarcity defines such object: Robbins (1945, p. 83) defines the object of Economic Science as the efficient allocation of scarce resources which have alternative uses: 'Economics is the science which studies human behavior as a relationship between ends and scarce means which have alternative uses.' This object is constituted by scarce means that must be rationally allocated, that is, from the maximization of some objective functions.

2.1.2 I will focus my analysis on the nature of the scarcity invoked here: for Neoclassical Economics, this scarcity is natural, that is, devoid of any historical component. In the construction of aggregate production functions of the Cobb-Douglas type, the scarcity of factors of production is evaluated based on the ratios between the quantity of capital and the quantity of labor; this evaluation in terms of quantity is the most obvious expression of the universalization of the analysis and its pseudo-objectivity.

The law of diminishing marginal productivity is stated from the relative quantities of the factors of production; when one factor is abundant, in relation to the other factor, its marginal productivity is diminishing. Solow's (1956) growth model and the steady state trend depends on the law of diminishing marginal productivity of capital (Harris, 1978).

In Ricardo's differential rent analysis, on the contrary, the scarcity of the best quality land causes the relative share of land rent in output to rise and the relative share of profit to fall. The cause of this mechanism lies in the 'Development of society and wealth' (Ricardo [1821] 2001, p. 97), a development that is directly translated into an increase in the demand for wheat. As Sraffa (1925, p. 301) wrote: 'The characterization of the Ricardian theory, acknowledged by us as fundamental, i.e. assigns an economic cause rather than a physical cause to the diminishing productivity [...]'. Ricardo's analysis incorporates this historical dimension: scarcity is by nature social and historical, whereas it is conceived as a natural fact in the neoclassical analysis.

The two antagonistic conceptions are matched by equally antagonistic theories of distribution: in the Ricardian analysis, the divergence of interests between landowners and workers on the one hand, and capitalists on the other, is fully explicit. In the neoclassical aggregate model, distribution is explained on the basis of the Walrasian concept of *service producteur*, or the contribution of factors of production to output (Clark, 1891): these analyses emphasize convergence of interest and deny, by definition, any distributive conflict.

Ricardo introduces a definitive rupture with Physiocracy and utilitarianism: in his analysis, contrary to Physiocracy, nature ceases to be the source of wealth and becomes 'avaricious'

(Foucault, 1966, p. 268). On the other hand, this analysis is centered on production and no longer on the satisfaction of human needs.

While Ricardo justifies the tendency for the rate of profit to fall based on an extensive margin (Kanal, 2015) (which comes from incorporating land of inferior quality into the productive structure), Marshall, in order to justify the law of diminishing marginal productivity, considers only intensive margin (which comes from applying an increasing amount of labor to land of the same quality). In order to maintain the equivalence between value and price (Herscovici, 2019), Marshall has to ignore Ricardo's fundamental hypothesis: the heterogeneity of land and, by extension, of capital. According to Schumpeter, Marshall '(...) does not generalize Ricardo's scheme but instead destroys it' (Schumpeter, 1954, p. 739).

2.1.3 All the economic theories considered here recognize that profit is explained by the scarcity of capital; Smith states that an increase in productive capital implies an increase in the demand for labor, an increase in wages, and consequently a decrease in profits ([1776] 1980, Book I, p. 215). In Ricardo's differential rent theory, an increase in the demand for wheat translates into an increase in the value of wheat, an increase in the relative share of wages and rent in the product, and consequently a decrease in the relative share of profit, from the scarcity of the best quality land. Marx considers that technical progress causes the organic composition of capital to increase more than the rate of surplus value.

Similarly, in *The General Theory* ([1936] 2009), Keynes links a high rate of profit to the scarcity of capital:

- (a) He shows why, in both the short and the long run, the marginal efficiency of capital decreases when investment increases (Idem, pp. 115 and 116).
- (b) With the paradox of abundance, he highlights the fact that the richer the collectivity, the smaller the multiplier (Ibid., p. 103).
- (c) Finally, he states that the abundance of capital means that '[...] there is no new investment apparently capable of [...] yielding in the course of its life more than its replacement cost.' (Ibid., p. 248).

All these schools, for different reasons, associate profit with the scarcity of capital. Nevertheless, the nature of scarcity is radically different, which goes back to the famous Cambridge controversy. In Ricardian, Marxian and Keynesian matrices, scarcity is, by nature, social and historical. In his differential rent theory, Ricardo demonstrates that the value of a quantity of wheat obtained from heterogeneous capital changes over time (Scheffold, 2017, Herscovici, 2019). Finally, the neo-Ricardian school shows that the value of a quantity of heterogeneous capital changes when distributional variables change (Scheffold, 2017).

In these different approaches, with regard to a quantity of heterogeneous capitals, there is no equivalence between physical quantities and economic values (Herscovici, 2019). From this characteristic, the analysis acquires an intrinsically historical dimension: scarcity, necessarily measured in economic value, and not in quantity, is determined by social and historical conditions: the level of development for Ricardo, the distributive variables, with regard to the neo-Ricardian school, the state of long-term expectations for Keynes.

The response provided by neoclassical economists to this criticism was more than partial and incomplete: starting from the construction of a pseudo production function (Samuelson, 1962), Neoclassical Economics continues to evaluate an aggregate quantity of capital in physical units. This quantity is totally devoid of any historical dimension. It is thus possible to assimilate any tool necessary for material production to a capital; this makes it possible to universalize the analytical categories and to consider that scarcity, i.e. the object of the analysis, is an intrinsic characteristic of the goods exchanged.

The incommensurability of paradigms is explained by the incorporation or refutation of the historicity thus defined; and this historicity, or its absence, necessarily translates into different conceptions regarding the nature of capital (Schefold, 2017, p. 16). Finally, each of these conceptions leads to the formulation of different theories of income distribution and economic growth.

2.2 The concept of order

2.2.1 As seen above, Foucault distinguishes three epistemes, each one characterized by an order: the divine order, the natural order and the economic order. With regard to the first two orders, man, as an individual being, assumes no role: the order exists regardless of the individual, and he cannot modify it. These orders transcend individual wills: for example, with regard to the classical order, ‘The term ‘natural’ signifies the fact that economic phenomena have their own internal dynamics, just like natural phenomena, and operate, as Francois Quesnay observed, in a way that is ‘independent of men's will.’ (Tsoulfidis, 2017, p.104).

In the order linked to modernity, and more specifically to Economics, man, as an active subject, is being introduced into the center of analysis (a) in his productive activities, in his capacities to control nature, in Classical Economics; (b) as a fundamental unit, from the individualism proper to marginalist theory and the subjective theory of utility value.

This change of perspective corresponds to the shift from holistic to individualistic societies. Such a change only became possible when economics became autonomous as a discipline and, at least partially, detached itself from religion and politics.

There is a tradition in economics that, from Quesnay to Mandeville, Smith, Pareto and Hayek, denies the central role of the individual and the exercise of a substantive rationality:

Mandeville's Fable of the Bees (. [1732] 1988), Adam Smith's parable of the baker, or Hayek's spontaneous order of the market, highlight the existence of an order that surpasses individual rationalities and that manages to make individual wills and social welfare compatible: the myth of the 'Invisible Hand'. This transformation makes it possible to both morally justify hedonism and individual interest, i.e., self-love. (Dumont, 1985, p. 102).

Nonetheless, this order is incompatible with the exercise of substantive rationality in the way it was conceived by Neoclassical Economics. Neoclassical Economics, in its micro and macroeconomic foundations, rests on the figure of a *homo economicus*: he maximizes his utility from a substantive rationality. At the macroeconomic level, the first welfare theorem shows that, in a state of pure and perfect competition, the General Equilibrium necessarily corresponds to a Pareto optimum.

In addition to the criticisms that can be leveled at this optimum (Sen, 1982), the following contradiction arises: on the one hand, rational calculation is the result '(...) of a rigorous assessment of prospective costs and benefits (...)' (Hirschman, 1986, p.8): the rational individual is able to assess, *ex-ante*, all the effects linked to his choice. Specifically, this individual can only assess individual costs: he does not know the social cost or benefit. Consequently, their rationality is intrinsically limited. Public economics, starting with the pioneering works of Pigou, Musgrave and Samuelson, studies this type of situation.

Thus, although rationality is bounded, the neoclassical conception of saving, for example, presupposes substantive rationality: (a) as a function of preference for the present, the rational individual compares utility levels at different time horizons, based on the update made to the interest rate base; (b) in growth models, saving is an intertemporal consumption choice.

Keynes's refutation of neoclassical theory in the General Theory is built mainly on the refutation of this conception of the interest rate (GT, chapters XII, XIII and XIV): investment cannot depend on prior saving because the income from which the saving comes does not exist in the period in which the investment is being made (Chick, 1991).

The other schools of thought do not make use of substantive rationality:

- In Classical Economics, the pursuit of individual interest is not linked to the exercise of substantive rationality: for example, the natural rate of profit, which constitutes one of the components of the natural price, is defined by the '[...] profit which [the capitalist] may reasonably expect to obtain from the sale of his produce.' (Smith [[1776] 1980, vol. I, p. 160). Here, profit is not the product of the maximization of an objective function, but simply corresponds to a 'satisfactory' level. In Marx, within the same sector, there can be differentiation of individual profit rates (Herscovici, 2002).

- In Keynesian Economics, due to the strong uncertainty that characterizes the economic universe, and the refutation of the ergodic hypothesis (Davidson, 1996), it is not possible to match the marginal cost of capital with its marginal productivity; consequently, it is not maximization. As Keynes states, entrepreneurs' expectations will fail (GT).
- For entirely different reasons, Hayek refutes the concrete possibility of maximizing individual objective functions (1958).

The generic concept of the invisible hand is explained by the presence of externalities, which are beyond the reach of *homo economicus*. What is the nature of these externalities, and what is the nature of the coordination implemented by the market?

i) For the schools linked to 'liberal' thinking, market produces positive externalities that make it possible to reconcile individual interests and collective welfare: with regard to the invisible hand, these positive externalities are manifested by the fact that private interests implement social welfare; for Hayek, '[...] prices act to coordinate the separate action of different people in the same way as subjective values help the individual to coordinate part of his plant.' in such a way that an efficient allocation of resources is achieved (Hayek, 1945, p. 526). In Neoclassical Economics, pure and perfect competition allows, for a given initial distribution of income, reaching a social optimum.

ii) The various heterodoxies highlight the paradoxes and contradictions present in the 'liberal' argument:

- Concerning the tendency for the rate of profit to fall, Marx states that the necessary depreciation of a part of the capital stock to momentarily maintain the rate of profit translates into a struggle between the different individual capitalists ([1876] 1976, Book III, p. 269): the invisible hand has failed, and the regulation operated by the market game implies a partial destruction of a part of the capital stock (Idem).

- In Keynes' General Theory, the equilibrium represented by the point of Effective Demand is an equilibrium without full employment, which constitutes a contradiction in terms employed by Neoclassical Economics. On the other hand, Harrod's model perfectly illustrates the coordination failures inherent to the market (Herscovici, 2006).

- The analyses of Grossman and Stiglitz (1980), based on the refutation of the homogeneity postulate and the existence of information asymmetries, highlight the paradox of the efficient markets hypothesis: the stability of the competitive equilibrium is explained by the positive externalities produced by informed agents in favor of uninformed agents. Nevertheless, the existence of the speculative cycle shows that (a) the equilibrium is by nature unstable and (b) that the externalities produced explain the fact that the gain of informed agents is realized to the detriment of uninformed agents, which does not allow the conditions of Paretian optimality to be verified (Herscovici, 2019).

3) *The construction and deconstruction of economic facts*

3.1 Economic Science provides a perfect illustration of Foucault's and Kuhn's ([1962]1991) theses: facts are, by nature, historically constructed. What is considered as a relevant fact within a given paradigm may be totally ignored in another:

- Neoclassical Economics rules out, at least in the long run, the existence of coordination failures. In the Walrasian general equilibrium model, prices adjust instantaneously to the equilibrium position. On the other hand, these are 'false' trades, as trades do not take place while the price is different from the equilibrium price.

- Similarly, Rational Expectations Theory rules out the problem of coordination failures: by hypothesis, there is continuous market clearing (Greenwald and Stiglitz, 1987). Any deviation from equilibrium is interpreted as the absence of rationality on the part of the agents who draw up their expectations.

- Finally, the analysis of speculative bubbles, in terms of rational expectations (e.g. Fama, 1998), proceeds from the same *démarche*, stemming from the hypothesis of the neutrality of finance. Since, by hypothesis, there are no information asymmetries, the price system provides the same information, in the same periods, to all agents participating in exchanges: instability will be explained from the random walk, the price system being fully informative.

The facts constructed by other economists are totally different: Keynes ([1936] 2009), with respect to the parable of the beauty contest, clearly shows (a) that there are asymmetries of information between different agents; (b) that agents elaborate different expectations; and (c) that the gains of speculators are explained by the asymmetries existing between them and the 'general public'.

From a similar perspective, it is possible to construct models of financial cycle in which (a) equilibrium is intrinsically unstable; (b) the pricing system does not provide the same information at the same time to all agents; and (c) certain informationally privileged agents realize gains at the expense of most of the majority of agents intervening in these speculative markets (Herscovici, 2019).

3.2 Classical Economics develops tools to analyze the concrete modalities of competition (Kanal, 2015, Tsoulfidis, 2017, p. 108); it is a 'realistic' approach, in the sense that it is not normative. This dynamics is explained by the fact that this economy is an economy of disequilibrium, in which equilibrium is (eventually) realized *ex-post*: this notional equilibrium is the result of the agents' reaction to an initial disequilibrium (Duménil, Lévy, 1987).

Deviations between market prices (the prices really observed) and the equilibrium position represented by natural prices (or production prices) are explained by the initial inequality between demand and supply. Intersectoral transfers of capital, and eventually of labor (i.e. the reaction of agents), should progressively reduce these deviations. The natural price (or production price) represents, in fact, the ‘abstract’ price that corresponds to the reproduction of the system (Kanalau, 2015, p. 24/25).

To a certain extent, we can make the same observations with regard to Keynesian Economics: it is an economy of disequilibrium. Relaxing the assumption of constant long-term expectations allows us to provide an endogenous explanation of the cycles (Herscovici, 2019), and to build dynamic models in which the movement is explained by the reaction of agents to an initial disequilibrium (Setterfield, 1999).

Marshall's interpretation of market prices and natural prices radically modifies the content attributed by classical economists to this concept: for the latter, the market price is the product of an initial disequilibrium between demand and supply (Kanalau, 2017, p. 8). The eventual convergence towards natural prices is the result of the agents' reaction: (a) the eventual ‘long-run’ equilibrium is not realized *ex-ante*, but *ex-post*; (b) adjustments are made gradually and not instantaneously. On the contrary, Marshall assimilates the market price with the short-run equilibrium price: ‘The market price of everything, i.e. its price for short periods, is determined mainly by the relations in which the demand for it stands to the available stocks of it [...].’ (Marshall, 1920, p.333).

3.3 In contrast to the Classical Economics ‘realistic’ approach, Neoclassical Economics is essentially normative: it analyzes economic reality on the basis of the deviations it presents from a state of pure and perfect competition. It is not in a position to spell out the actual modalities of competition, its dynamics, or the modalities by which, from an initial disequilibrium, the system returns to this equilibrium. While Classical and Keynesian analyses allow for the analysis of competitive dynamics, the neoclassical construction assumes that competition has already taken place and that equilibrium has already been reached.

The Walrasian general equilibrium is an equilibrium realized *ex-ante*, centralized by the auction mechanism, and ‘fictitious’: it is determined before the agents act – it is centralized by the fact that the Walrasian auctioneer centralizes the responses provided by the different components of demand – it is fictitious by the fact that exchanges are not realized as long as prices do not allow matching supply and demand. In this respect, it is interesting to note that the neoclassical methodology has been the target of several criticisms, both from Classical Economics (notably the neo-Ricardian school) and Austrian economists (Hayek, 1950).

Similarly, Keynesian macroeconomic equilibrium is not systematically associated with the equalization of demand and supply: within the framework of path-dependence mechanisms, it is the result of the reaction of agents to an initial disequilibrium, in the form of a change in long-term expectations, depending on their degree of realization (Setterfield, 1999). Finally, Stiglitz (2003) demonstrates that in the presence of information asymmetries, markets are rationed.

In the light of these methodological observations, it is possible to conclude that all attempts to integrate Classical and Keynesian analyses into the neoclassical framework fail. In order to implement this integration, it is necessary to empty some or all of the components of its hard core. This allows conceiving Classical Economics and Keynesian Economics as different stages of the same evolution. This integration can only be achieved by violating the hard core of the Research Program to be integrated, i.e. by emptying it of its epistemology: it is an '(...) epistemological break portraying itself as one of continuity' (Kanal, 2015, p. 4).

The interpretation of Keynes made by neoclassical authors (Friedman and/or Mankiw, for example) limits Keynes' analysis to the short term, and does not work with uncertainty, nor with the path dependence that, in my view, characterizes Keynesian analysis. I will cite just two examples:

- i) The demand functions for money elaborated by Friedman (1974), for example, consider that the demand for money depends, in the framework of a negative correlation, on the interest rate. This is contrary to what Keynes states in chapter XIII of the *General Theory*: money fulfilling the function of store of value, its demand depends on the Preference for Liquidity, and not on the interest rate; on the contrary, the interest rate depends on the demand for money, via the Preference for Liquidity (Herscovici, 2020 (a)).
- ii) Menu cost analyses (Mankiw, 1985) study only the response of the different components of supply to an exogenous demand shock: what is left of a Keynesianism that ignores, by hypothesis, the modalities of demand formation?

Final Remarks

The evolution of SRPs, or paradigms, should be studied from the following perspective: in the short term, according to Lakatos' concepts (1970, 1978), compatibilities can only be identified within the same SRP: the different models developed modify the auxiliary hypotheses, but share the same hard core. The long term, on the other hand, is characterized by the modification of the hard core, which corresponds to a fundamental rupture. The epistemological study cannot be limited to the changes that occur within the same SRP, but must study the '(...) underlying world-view which generated them.' (Dow 1985, p.2), that is,

the changes that relate to the hard core. Limiting the analysis to a single SRP does not allow us to exercise the *reflexivity* necessary to the evolution of any science (Boyer, 2021).

The incompatibilities between the orthodoxies and the heterodoxies can be defined in the following manner: 'A particular contrast is drawn by the critical realists between an open-system ontology, which requires some kind of open-system methodology, and the closed-system ontology identified as implicit in orthodox methodology' (Dow, 1985, p.2), that is, *by the way in which historicity is incorporated, or refuted, in each of these theoretical matrices studied* [3].

Foucault's and Kuhn's epistemology allows us to draw the following conclusions: the neoclassical paradigms, on the one hand, and the Classical and Keynesian paradigms, on the other hand, are incommensurable, in the sense that they are built from totally different elements, from different hard cores. Consequently, outside a given paradigm, or episteme, it is not possible to speak of progress in science; *in the long run, the evolution of Economic Science is characterized by fundamental ruptures, and not by a linear progression.*

Finally, from this perspective, the potential convergences between Keynesian, neo-Ricardian and Institutional SRPs appear to be a promising field of investigation (Herscovici, 2019).

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Endnotes

[1]: It must be made clear that, according to Foucault, Classical Economics is not the product of the Classical Episteme, but of the episteme that corresponds to Modernity.

[2]: These fundamental ruptures correspond to the concept of bifurcation, as defined by Balibar (2020, p. 141).

[3]:For example, in the neo-Ricardian resolution, the closure of the system is determined by a historical element, i.e. the value of the distributive variables; in this sense, it is possible to speak of an open system. In the Equilibrium model, this closure is based on a purely mathematical solution; it is a closed system

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