

On the concept of time in Shacklean and Sraffian economics

Shackle has consistently criticized economists for not presenting the assumptions underlying the concept of "time" which they are using. "Time" is a concept that is usually neglected even in methodological discussions. Neoclassical economics, particularly, has treated this problem in a rather light way, approaching time as just another "space dimension."¹

The importance of an unambiguous statement on the concept of time cannot be exaggerated. Until one deals explicitly with the concept of time one cannot analyze the concept of changes in the economic system.

Time is defined by what is possible for agents to do while it is passing away. Thus, it has to do with the perspective of the researcher, his starting points, and the preselection of processes considered as the most essential for the understanding of economic activity. The idea of an economic "process" itself is at stake. False ideas related to processes will inevitably entail pseudo-concepts of time and vice versa. Any theoretical proposition that involves processes of any nature has to allow "time" in some sense to flow. The concept of time employed depends in a crucial way on the idea of change. If nothing changed, time would not exist.² The reverse is also true: for things which do not change there is no time.³

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¹Shackle (1968), p. 19, (1976), chap. 27. See also J. Robinson (1978), p. 12.

²"There could be no Time if nothing changed" is "a proposition hard to deny" (Georgescu-Roegen, 1971, p. 131).

³God, for instance, cannot get "older." His traditional representation as an old man

Although space allows for "change" (that is, locomotion), it differs from history (that is, changes in time) for the latter is not reversible. There are no ultimate "givens" in history. States engender states in the sense that the "parameters" of a certain situation change to transform themselves into new "parameters."⁴ This means that history is not a collection of states associated with given parameters among which one can travel at will. To give birth to a new "state" it is necessary to destroy the old one and this means that it is impossible "to go back" to the original situation.

This conceptualization requires rejection of the mechanistic view of time, where time is conceived as being "absolute," something that flows independently of what is happening (and even of whether something is happening or not).⁵ In this mechanistic approach the only form of motion that is defined is locomotion, that is, something that does not cause qualitative permanent changes.⁶ In other words, one can go somewhere, know it, map it, and "come back" in time (as well as in space). If on the other hand time is irreversible, this "mapping" of the future is impossible and uncertainty emerges with full force.

Georgescu-Roegen conceives of two ways of defining time: as historical, irreversible, [quality-changing] "Time" or as mechanistic, locomotion-like "time."⁷ It is Time with a capital T that is important in economic phenomena and a fundamental concept to the study of monetary economies.

Production takes Time: In monetary economies productive activity is always oriented toward a future market⁸ undertaken by entrepreneurs with the objective of earning profits (and not necessarily to the "satisfaction" of consumers). The existence of money and liquidity in such systems makes it possible to "move" purchasing power through

certainly tries to grasp the wisdom associated with age but it is an obvious contradiction of the idea of eternity.

⁴Strictly speaking, in this situation they are no longer parameters.

⁵See Einstein and Infeld (1966), 177-192. Or, as it is put by Nordman: "In a word, if I dare use this image, time in classical science was similar to a stream carrying phenomena as well as ships but it does not flow less or differently when there are no ships" (1921, p. 16).

⁶"Mechanics only knows locomotion, and locomotion is both reversible and quality-less" (Georgescu-Roegen, 1971, p. 1).

⁷Georgescu-Roegen, 1971, pp. 134-140. Processes that are Timeless but not time-less are what P. Davidson (1982-83) calls ergodic processes: it is possible to allow for the flow of "time" in them but not of "Time"!

⁸Even production to order faces some degree of uncertainty. In times of crisis, for instance, contracts are broken.

time (Davidson, 1972, pp. 64-65). In monetary economies the connection between time, uncertainty, and money plays a fundamental part in the determination of the laws of historical motion.

Neoclassical views of time, on the other hand, clearly fall into the category of mechanistic time. If the Post Keynesian approach is to become a viable alternative to neoclassical economics, it must explicitly develop the importance of Time (as opposed to time) to economic processes. There are two significant currents of Post Keynesian thought that attempt to deal with the Time concept; one strand is strongly influenced by Shackle, the other by Sraffa. The limitations of neoclassical thought are seen differently by these branches and hence two alternative approaches have been constructed. In this paper we intend to discuss each of these in terms of the concept of time that is, implicitly or explicitly, employed. We will show that both of these branches of Post Keynesian thought, while providing significant insights, still have important limitations as historical approaches.

Shacklean theory

Classification of time

Shackle's lifelong concern with decision-making processes under non-probabilistic uncertainty led him to become one of the first interpreters of Keynes to stress that the "new economics" consisted mainly of the full acknowledgement of the fundamental ignorance that surrounds economic decisions which focus on future consequences.

To define the subject of economics as the study of decision making implies taking into account the modes through which agents construct hypothetical outcomes to choose among them. Shackle desired to show the conditions under which these decisions are not "empty," i.e., what makes a decision "creative." This required resolving the question of the Time concept at the outset of his analysis which relates *present* decisions and *future* outcomes. To develop his approach, Shackle created a four-way classification of Time (Shackle, 1968).

1. // Firstly, we have *mechanical* time: this is the time of the external observer, who knows everything, the future as well as in the past. With this concept all moments become "co-valid" (1968, p. 3), in the sense that past, present, and future are just moments of a known sequence. Motion is conceived as the mechanistic interaction between force and acceleration, as in classical mechanics. Examples of this kind of approach are the models of business cycles of Kalecki, Samuelson, and

Hicks (Shackle, 1968, p. 223).

// Secondly, there is the *evolutionary* time, whose paternity Shackle attributes to Marshall. This rather complex concept refers to "a segment of real history" (1968, p. 188). In this case, the outside observer is no longer omniscient. Historical approaches require this concept of Time.

✓ Thirdly, we have *timeless* models, in which time does not flow in any significant sense. The best examples of this approach are General Equilibrium models, which assume prereconciliation of plans via instantaneous processes of information generation and diffusion.

11// The fourth concept is *expectational* time. This concept occupied most of Shackle's attention: it is a concept relevant to the agent, the decision-maker at the moment of decision (Shackle, 1969, Part 1). Decision-making processes are, by definition, future-oriented. The agent "knows" that the past is immutable and the future is to be created, as a result of the choices done *in the present*. "Expectational time is an aspect of a decision-maker's effort to choose a course of action in face of uncertainty about the outcome which would flow from this course or that" (1968, p. 67).

Expectational time, however, is not a reality, but a mental construct, a mode of organization of information about the past and an elaboration of hypotheses about the future. In this construct, from the point of view of the decision-maker, there is only the "solitary moment," the present during which the construction of hypotheses is done and actions are chosen. It is an existential experience where imagination performs the main role, creating alternative "scenarios" as Ariel created visions to the shipwrecked in Prospero's island. Seen as an existential experience, expectational time is in fact atemporal because it is always present: it does not flow. It allows for uncertainty in decision making, and for the possibility of sudden changes in the "state of expectations," but it does not allow for processes. If one is concerned with History, however, one has to go beyond expectational time and combine it with evolutionary time.

Expectational versus evolutionary time

Shackle realized the risks in using only expectational time. While Shackle correctly indicates that mechanical time (as well as timeless approaches) fails to consider phenomena resulting from decision making under uncertainty, he nevertheless does not always succeed in making it clear that the analysis of crises, liquidity preference, and unemployment cannot solely rely on the concept of expectation time.

These phenomena must be studied in evolutionary time. In particu-

lar, the role of money and finance in capitalist economies can be grasped only in terms of expectational time combined with evolutionary time. Alone, the expectational time approach can suggest *how* money can alleviate an individual's fears in his moment of decision; it cannot, however, by itself explain where money came from or even, really, *what* is money. The expectational time approach cannot explain why money alleviates fears nor can it deal with the consequences of money to the economic process as a whole. What is lost by focusing only on expectational time is the concepts both of process and of interactions.

These latter concepts, on the other hand, are at the core of *evolutionary time*.⁷ As Shackle indicates, the idea of *mechanism* is fundamental to a theory of evolution (1968, p. 188). Despite the common semantic root, however, a *mechanism* is not a *mechanistic* device whose motion would take place in mechanical time. Living bodies are mechanisms because they involve interactions between organs that limit the extent to which changes are possible. As biology illustrates (Foa, 1982), we can conceive of process that takes place in historical time, in which many individual parts are involved in a global fabric. The existence of limits does not preclude changes, not even radical changes. Evolutionary time in economics would find an analogue of living bodies in social bodies (Foa, 1982; Georgescu-Roegen, 1971, p. 11).

The Shacklean expectational time approach must face a difficult problem: the concept of mechanism, fundamental to the idea of evolution and evolutionary time, necessarily reduces the solitariness of individuals. There is a conflict between the order of the mechanism and the imagination of the solitary person which must be resolved.

Orderliness versus imagination

Shackle's main subject is the mediation exerted by active consciousness as a non-neutral connection between external stimuli and behavioral responses. His central proposition is: the future must be created by human action; the future is not (completely) determined by the past; the future exists only as a "plan" in the present; therefore, the freedom to "create" the future is the freedom to "imagine" it. Shackle's apparatus is mainly oriented to the study of important decisions (Kahn, 1972, p. 81n.), "crucial experiments" as Shackle would call them (cf. Davidson, 1982-83). In these decisions, the role of free imagination is more important than it is in routine matters. Yet, this distinction is often blurred by the general concept of decision as a choice among imagined outcomes.

As a theory of free imagination Shackle's approach is radically

individualistic and subjectivistic. Those characteristics he shares with the "Austrian" School (see Dolan, 1976). The modern Austrian school denies any possibility of objective determinism in economic processes. Its starting point is a radical form of subjectivism. Since individuals are continuously gaining new knowledge their behavior is likely to be nonrepetitive and, therefore, unpredictable (Dolan, 1976, pp. 30, 40, 42). Austrians strongly emphasize uncertainty (and welcome Shackle's works for his views about it); they take the "freedom" of the agent to its ultimate consequences. The individual mind is the ultimate source of all action and this makes the future completely unpredictable.

It is remarkable therefore that, as critical of neoclassical equilibrium concepts as they are, Austrian economists cannot free themselves of the necessity of using the equilibrium apparatus. Lachman, for instance, despite his radical denial of the possibility or the usefulness of any notion of general equilibrium, when faced with the natural implication of his analysis, namely, the impossibility of "order" in economic life, can offer as the only alternative the idea of equilibrium of the individual (Dolan, 1976, p. 131). If there is no order beyond the individual, decision is empty and powerless. The future then cannot be "created" except as a result of accidental interactions of otherwise unrelated individuals. Shackle's approach to some extent shares this limitation of the Austrian approach; it overemphasizes the freedom of the agent and underestimates the influence of conditions other than his own imagination. In this context, orderliness becomes an external necessity or constraint, something that cannot be explained *within* Shackle's theory.

Shackle does recognize that order is necessary to guarantee that a decision is not powerless (as it would be were the world entirely unpredictable). "Orderliness" means regularity, but regularity while dealing with more than one agent in an interdependent economic system. It is necessary, therefore, to go beyond expectational time and the unending moment of decision if order is to be assessed in the actual historical, evolutionary development of the economy. Moreover, order must be real (not imaginary), if we wish to avoid the concept of "accidental coincidence."⁹

Orderliness is a theoretical puzzle for any individualistic

expectational approach. Shacklean economics will be increasingly encumbered if it does not break out of its individualistic expectational time premises. While emphasizing the creative individual's freedom to create the future, Shackle does recognize constraints on individuals' actions. These are vaguely identified as "natural laws," human nature, and institutions (Shackle, 1969, p. 12).

Acknowledging the existence and importance of institutions, however, creates new problems for the Shacklean approach. Institutions transcend individuals. They enforce constraints on actions and events because they orient, constrain, and direct the behavior of individuals. Yet, institutions are a datum to each individual: they cannot originate from his solitary deliberations.

Institutions are at the same time the offspring and the guarantee of order. Their existence implies the presence of a social fabric, a mechanism in which individuals perform their functions. The existence of institutions therefore conflicts with the identification of the individual as the ultimate explanation of all phenomena, as an "uncaused cause" (Shackle, 1982-83, p. 180).

Institutional questions tend to be obscured by the Shacklean approach, losing place to a growing emphasis on the process of imagination. This creates a tension in his works between his adherence to the Keynes and Myrdal approaches and his Austrian roots. Keynes, despite his use of the concept of uncertainty, clearly believed that behavioral uniformities existed.¹⁰ Policy making would be a useless activity if these uniformities did not exist and could not be played upon. Keynes was of course very conscious that at times certain policies can obtain unexpected results; nevertheless it is undeniable that he supposed that wise policies would achieve good results. Shackle praises Myrdal for the distinction he created between *ex ante* and *ex post* variables. Time is explicitly introduced in this fashion (Shackle, 1973, p. 40). For Myrdal, however, this is part of the Wicksellian theory of cumulative process and monetary equilibrium. Consistent patterns of behavior are an integral part of this latter theory.¹¹

¹⁰As to Keynes in the *General Theory*, Shackle says that it is possible to find two different propositions: the first, present in Books 3 and 4, would *totally* deny connections between periods; the second, in chapter 22, implicitly supposes these connections (Shackle, 1976, p. 447).

¹¹An essential element in the Wicksell/Myrdal cumulative process is the supposition that certain behaviors must follow certain stimuli: "In the theory (of cumulative processes) is implied not only certain causal relations between them but also a *given order of sequence in their movements*" (emphasis in the original) (Myrdal, 1939, p. 27).

⁹How could a great number of individuals imagine the same rules? It should be remembered that the whole group of questions studied as "macroeconomic theory" is intractable from the standpoint of the individual. Besides, the individual himself is posed, in this way, in an "empty" space, in social, political, or, broadly, institutional terms.

Shackle's concentration on the theory of imagination, loosely connected with a theory of action, however, has led him to gradually downplay these concerns for the evidence of uniformities. Even similarities among individuals necessary for the existence of regularity and order become only *ad hoc* assumptions. Shackle's economics, with its attempt to clearly expose the fallacy of the neoclassical mechanical time concept, correctly emphasizes expectational time. Unfortunately evolutionary time (and its associated institutional developments), which must interact with expectational time for a more complete description of the real world, has not been sufficiently emphasized.

It is necessary to consider "social" aspects that act as constraints on decision-actions.¹² Decision choice analysis requires some information about how the system operates to restrict agents' expectations and feasible acts. Thus we must augment a theory of imagination with a theory of action and interaction. One can then investigate the "coherence" of social interaction in real History (e.g., the analysis of financial instability by Minsky and the role of money by Davidson).¹³

A summing up of Shacklean economics

Shackle is interested primarily in the process of creation, of imagining the future and taking decisions. The importance of constraints is clearly underestimated and usually reduced to perception of "natural laws" (Shackle, 1969, p. 12). "Social laws" are not dealt with although they represent a constraint involving the *interaction* of decision-makers, thereby reducing the "solitariness" of the decision process.

It is difficult to reconcile the complete freedom of the individual with the existence of orderliness. In the absence of constraining social laws, there are no connections between successive economic periods and the carrying over of debt contracts and personal real property. These can be discussed only within a theory of social actions and relations in a historical (or institutional) frame.

Finally, an important part of the history of the system, its production and reproduction, depends on the concept of orderliness. The impor-

tance of production and reproduction is absent in the works of Shackle. On the other hand, it is at the very core of Sraffa's 1960 work, *Production of Commodities by Means of Commodities* (1975).

Sraffian theory

Centers of gravity

The *Production of Commodities* is the result of Sraffa's lifelong concern with the theory of value. It is the culmination of a long struggle to escape the conventional theory of value as well as the problems connected with the Ricardian-Marxian alternative, either in terms of an invariant measure of value or in terms of the "transformation problem."¹⁴

Sraffa's book deals with the determination of production prices: prices that allow a uniform rate of profit to exist (Roncaglia, 1978, p. xvii). These are equilibrium prices: if the rate of profit is the same everywhere, then capitalists have no reason to alter their activities.

Sraffa is concerned with the *logical* requirements for the determinations of production prices. He does not commit himself with any description of actual processes that would lead to equilibrium. Sraffa's analysis resembles those obtained in timeless models of general equilibrium. The method to obtain equilibrium prices is, in fact, the same, although the parameters are different.¹⁴ Prices and the rate of profit (given wages) have to be defined simultaneously.

If prices of production are those prices that allow for a uniform rate of profit, they cannot be determined before that rate itself is determined. The profit rate, on the other hand, is a relationship between the "value" of the capital advanced and the "value" of the surplus generated in that economy. It cannot be known before the prices of production are determined.

In Sraffian economics, a time-dimension concept is introduced, not by Sraffa but by some of his followers.¹⁵ The central question is, How

¹²Vickers (1978), despite his adherence to the Shacklean approach, gives more importance to the influence of objective factors and the environment, through his concept of "inheritance" (p. 20).

¹³Although they share the same concept of uncertainty, different assumptions about time lead Shackle and Davidson to stress the liquidity properties of money in very diverse ways. While Shackle focuses on only the individual necessity of "safeness" to answer the question "Why money?" Davidson refers to the Keynes's argument about money's elasticities of production and substitution that are closely related to the forms of social organization of capitalist economies.

¹⁴"... Sraffa's system is beyond doubt competitive and general equilibrium in nature" (Kregel, 1971, p. 39).

¹⁵It should be noted that the notion of dated labor does not really involve Time. Dated labor is only an alternative way of measuring the use of inputs to the production of each commodity (Sraffa, 1975, chap. 6). The means of production are continuously decomposed into their constituent labor and earlier means of production components up to a point in the "past" where there exists only labor and raw materials or objects in their natural states.

should production prices be interpreted? What is the relationship that price of production maintain to actual (or market) prices?

For some Sraffians, production prices are long-run equilibrium prices. For Garegnani [(1979) and Harcourt (1977)] production prices are a center of gravity around which the market prices fluctuate.¹⁶ This gravitational conceptualization clearly involves the idea of a process and of a time span necessary for the production prices to emerge and assert themselves.

The process by which production prices emerge is a process similar to that imagined by the classical economists. Given technology implies that a given set of production prices would be sufficiently stable (in the long run) to permit them to serve as "lighthouses" to which the market prices would converge. Naturally, in order to be able to perform this role (and implicit in the idea of a gravitation center) it is necessary that these prices gradually become visible as "the solution" toward which the system converges (as a position consciously sought for or, more probably, as an "imposition" of the system operation).

The determinants of the equilibrium solution must be invariant to the equilibrating process. In Sraffian economics these determinants are (given) technical coefficients of production and (given) distribution of income. This means that the technical conditions of production are invariant to changes in the composition of output. At the same time, distribution of income must be invariant to changes in market prices. If fluctuations of market prices affect the general rate of profits no stable position could ever be determined.¹⁷

¹⁶This decomposition process constitutes only an analogy with the actual "history" of each product. It does not refer to the historical record, only to the "past" that can be identified in an input/output table.

¹⁷The various labor quantities are not defined as the quantities actually expended in the historical past but as the quantities which would have been expended had technical conditions of production always been just as they are in the 'current' period. The 'resolution' into a backward time series of labor expenditures is thus purely conceptual" (Steedman, 1977, p. 70n). (See also Harcourt, 1974, pp. 185-186. Kregel, 1971, seems to take the opposite view—pp. 29-31.)

¹⁶For Marxians, production prices are a "potential state" which exists side by side with actual prices but is never attained because the gravitational process itself (if it could be defined) could contradict and jeopardize the determination of an equilibrium position itself.

¹⁷In a very general manner, this refers to the relationship between market prices and natural (or production) prices. C. Benetti, for instance, notes that "there is a contradiction between the idea that the deviations of market prices in relation to na-

"Reaching" equilibrium

There are two possible ways to "reach" the gravity center:

- (1) being "there" from the outset¹⁸; and
- (2) "groping" toward the position by adjustments in the structure of supply given the composition of demand.

The first possibility would mean that production prices are not only "long-run" prices but also "short-run" prices. None of the Sraffian economists, however, suggests that short-run prices are necessarily costs of production prices or that the rate of profit is uniform at each moment of time.

The "groping" approach implies a theory of investment. Capital flows from sectors with rate of profit smaller than the average to those sectors with rate of profit greater than the average. Agents, therefore, assume that *actual*, observed differences in rate of profits are due to a given structure of demand, and the latter is expected to remain the same whatever acts are decided (and performed) by firms. Expectations are entirely determined by current demand conditions no matter how wrong the early decisions have showed themselves to be. There is not any kind of "imagination," only a reflection of present conditions, that is, the current rates of profit.

A necessary feature of this process is the reversibility of action without losses. To keep the gravity center stable over time requires that agents can make mistakes, perceive them, and correct them without any destabilizing effects on the composition and level of demand and on income distribution.

In sum, in order to conceive of prices of production as a long-run gravity center we have to accept that the technique adopted and the income distribution profile and composition of demand are invariant to investment, realization, and price movements. Unexpected changes and uncertainty cannot be introduced in this scheme.

Short run versus long run

The Sraffian system displays a long-run equilibrium position when all mistakes have been corrected and all capitalists find the best employment of resources that allows them to earn the uniform rate of profit.

him this is a "contradiction interne" in the classical theory (see Maurisson et al., 1976, Introduction). Spaventa (1977, chap. 4) shows that the equilibrium solution in this system and with constant returns is invariant to the composition of output if transactions are always realized at equilibrium prices.

that in fact this is the only possibility!

Competition ensures that this result will obtain no matter what agents think or decide. A theory of production prices as a gravity center demonstrates that the indeterminacy associated with individual choices is just a temporary (and inoffensive) phenomenon.

The subjectivistic element contained, for instance, in Keynes's theory of investment is criticized by Garegnani. Keynes's weakness, in Garegnani's view (1979, p. 160; Garegnani et al, 1979, p. 182/3), is the importance given to the subjectivity of decision making. Garegnani believes that subjectivism in Keynes allows neoclassical economists to recover their dominance because it restricts Keynesian analysis to the short run, where it is impossible to achieve determinate results. The long run is therefore open to the introduction of neoclassical hypotheses. Garegnani considers the short run as a "minor" concern, because it lacks "determinateness": in the short run we can achieve only accidental positions, unexplainable by any "general" principle. Only in the long run can we obtain "determinate" results.

It should be noted that the "determinateness" of the long run in Sraffian economics is assured *by construction*. The long run is defined as the period in which the ultimate determinants predominate over supposedly *accidental* short-run circumstances.

Is it necessary to suppose the existence of a long-run position that is *independent* of short-run results and behaviors? After all, with investment decisions, inevitable "errors" are committed; are these errors neutral in relation to the given long-run position? If they are not neutral, the commitment of resources to a certain use would impose a whole new configuration of income distribution, capital, and technology on the system and create the necessity of looking for another set of "long-run" prices. The dilemma is, therefore, that a gravitation theory is meaningless in the short run but that, in order to be significant to the long run, it demands that the gravity center remain fixed over time no matter what actions are taken by the agents.¹⁹

In the "center of gravity" approach to Sraffian economics there is an overemphasis on "determinateness" in a world lacking this quality in expectational and evolutionary time. As far as investment "decisions" are involved it is difficult to see how to eliminate subjectivity without getting rid of the very problem to be resolved.²⁰ The supposition of a

¹⁹Besides, *ça va sans dire*, it is necessary to suppose that the actions will converge to equilibrium.

²⁰That this is a result of methodological assumptions is perceptively but subtly noted by Harcourt: "The latter group, especially Garegnani, worry about concentration

determinate "subjectivity-free" long-run position is an answer that eliminates the question itself in the sense that it allows one to comfortably suppose that all steps are convergent as a function of time. It transforms that "long-run" position in a *deus ex machina* whose kingdom will be attained someday.

The notion of processes and of time in Sraffian economics is not an alternative to neoclassical economics in the sense that it cannot transcend the treatment of time we find in the traditional theory. The *method* is essentially the same in both schools: the search for gravity centers.²¹ These Sraffian gravity centers are determined by the profile of income distribution and the given techniques. In neoclassical economics, the equilibrium centers of gravity are determined by utility functions, resources, and technical conditions of production. There is no theoretical time "duration" associated to these ultimate parameters in the sense that no change in them is explainable by either Sraffian or neoclassical schools. All that is possible to do is to determine what is the equilibrium position associated to each combination of them. There is no "traverse" but only comparisons between equilibrium positions. All "moments" (that is, all configurations of income distribution and technical coefficients) are co-valid. This means that time is reversible. Therefore, the theory of prices of production as gravity centers admits only mechanical time or no time at all.

Conclusion

Both Shackle and Sraffa are critics of conventional neoclassical economics, but their views are radically different. Shackle stresses individual behavior and the role of expectations in situations of fundamental uncertainty, in a theory of individual creative decision; Sraffa has as his main concern the conditions of reproduction of the system in a timeless world of parameter stability.

on the short-run because it gives over much emphasis to the importance of expectations so that definite results might not be possible (*this, of course, might be a strength*) . . ." (Harcourt, 1982, p. 14, my emphasis).

²¹"In Garegnani's view, a belief in long-period gravitation towards natural prices has been shared by all economists up until Hicks' *Value and Capital*. . . . Furthermore, it is *not* this methodological procedure which is at fault but rather, its use in conjunction with the concepts of supply and demand . . ." (Harcourt, 1977, p. 357, Harcourt's emphases). Harcourt quotes Garegnani as saying that "it is therefore apparent that this difficulty . . . (concerns) the theory, i.e., the way in which the centers of gravitation of the system are determined, and not the static method of analysis based on such 'centers' . . ." (p. 358).

The comparison between them, nevertheless, is important, if for no other reason than that what is being proposed as the "Post Keynesian" alternative to mainstream economics is, to some extent, based on the "visions" of these authors (Davidson, 1982, ch. 1). The Shacklean system and the Sraffian system are in their current states of development limited in their approach to the "real world"; neither deals extensively with the problem of historical, evolutionary time. In Shackle, time is the eternal present of the individual existential experience. From the point of view of the individual, moreover, all history is accidental. In Sraffian theory, on the other hand, there is no place given to historical time.

Nevertheless, both these brands of Post Keynesian thought point out important aspects to be considered in the formulation of a theoretical alternative to conventional economics. The stress on the uncertainty and fragility of the bases on which agents take decisions, characteristic of Shackle's approach, opens the way to the consideration of this decision-making theory for a broader theory of investment, money, and finance. Sraffian analysis, for its part, stresses fundamentally the necessity of taking into consideration the broader systemic framework, to approach (and solve) problems; a framework that is meaningless if we stick solely to the individual's point of view. Each approach, taken by itself, is incomplete; a viable alternative theory must approach interactions in historical time. A timeless or mechanical time approach can never suffice.²²

Expectations and uncertainty are not only clouds hiding the sun. Agents do take decisions based in uninformed expectations. They know that their expectations are based on "flimsy" foundations. Their behavior can be "kaleidic." Decisions, once transformed into actions, however, are not necessarily easily reversed (certainly not instantaneously); they change the "face" of the world, and the value (or even the set) of determinants to be considered.

A theory of history is a theory of action *and* social interactions. This means that collective creations, habits, and customs or, more generally,

²²The necessity of consideration of historical time is clear, for instance, in Minsky's theory of financial instability and the "incoherence" of capitalist economies. To define incoherence we need to be able to recognize the interdependence of agents, the unfolding of decisions, the verification of results, the influence on the reshaping of expectations, the settlement of debts, etc. (Minsky, 1980). On the other hand, historical time means taking in consideration that agents decide under uncertainty and that, as they know it, they try to insure themselves against unpredictable failures. As Kregel (in Maurisson et al., 1976) points out, this kind of problem "cannot be easily integrated . . . in the Sraffa system" (p. 158). For a contrary position, see Roncaglia (1978, chap. 2).

institutions have to be brought into light not only as "givens" but, to a great extent, as historical results as well. These institutions limit the individual's visions of things to come.

The problem of analyzing time is in fact the problem of adopting a philosophy of history. The idea of change (implicit in the concept of creative choice) must be combined with the notion of orderliness. Order requires a certain degree of permanence of features, of repetitiveness. This is obtained, on one side, through the creation of institutional constraints to what is permitted for agents to do. On the other side, the whole cultural ideological determination of modes of behavior considered as socially acceptable is a constraint. The very definition of goals and means to attain them that agents are socially permitted to adopt are culturally determined. It is essential to consider the limits to action imposed by the *social structure*; the set of social roles and institutions that frames that individual behavior.

This concern with history is not new. Both Marx and Schumpeter had history in the forefront of their economic theory. Change, not rest, is the characteristic "state" of capitalism.²³ The birth and evolution of structures themselves is a subject to Marx. History, in this sense, was also a concern to Keynes and it is an important part of his heritage left to Post Keynesian economists.²⁴

All these approaches are certainly different in many respects. Some of them seem more appropriate to particular subjects. All of them have in common, however, in contrast to conventional economics, the assumption that substantive change and structural continuity (but not fixity!) are complementary rather than contradictory requirements of a method suitable to investigate economic reality.

²³"The essential point to grasp is that in dealing with capitalism we are dealing with an evolutionary process. It may seem strange that anyone can fail to see so obvious a fact which more over was long ago emphasized by Karl Marx" (Schumpeter, 1976, p. 82. In the same work see chapter 3).

²⁴E.g., "Money can only be studied in an historical and institutional context" (Davidson, 1982, p. 241, with emphasis in the original).

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