

History, crucial choices and equilibrium

Rogério P. Andrade

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Abstract

This paper discusses alternative conceptions of time and scrutinises the ideas of crucial choice, determinism and equilibrium. The relevant notion is that of historical time, where time is seen as irreversible, flowing from the irrevocable past to an unknown future, like an arrow. This notion is consistent with the concept of fundamental uncertainty and is at odds with deterministic explanations of reality. The economy is an open, evolving process in which free will, Shacklean genuine choices, Schumpeterian innovative behaviours, and unpredictable, unintended consequences of human actions have an important role to play. Human imagination and crucial decisions preclude the full operation of rigid laws of necessity. In the light of these ideas, the paper also approaches a few suggestions of reconceptualisations of the notion of equilibrium, whose purpose is to render the concept more palatable.

Key words: Historical time; Crucial choices; Shackle; Determinism; Equilibrium.

Resumo

O texto discute concepções alternativas de tempo e as idéias de escolha crucial, determinismo e equilíbrio. Enfatiza a importância da idéia de tempo histórico, em que o tempo é visto como irreversível, fluindo de um passado irrevogável em direção a um futuro desconhecido, como uma seta. Tal noção é compatível com o conceito de incerteza fundamental e não se adapta bem a visões deterministas do mundo. A economia é um processo em aberto, evolutivo, em que o livre arbítrio, escolhas genuínas shackleanas, comportamentos inovadores schumpeterianos e consequências não-intencionais das ações humanas têm um papel importante a desempenhar. À luz das ideias apresentadas, o texto avalia algumas propostas de reformulação da noção de equilíbrio que procuram tornar este conceito mais palatável.

JEL Code: A10, B41, B50.

Introduction

The attempts to advance arguments which take into account how the passage of time affects the performance of the economy, through the formation of expectations and their fulfilment or disappointment, and through the link between actions and their consequences, is one of the most complex in economic analysis, but, at the same time, one of the most fascinating.

(1) This paper is a modified version of Andrade (1998, chapter II).

(2) Institute of Economics, University of Campinas (Unicamp), Brazil.

The “problem of time” is at the core of a discussion of uncertainty; it is partly because of the passage of time that uncertainty arises. However, time in economics is often the forgotten or hidden dimension, for it is usually treated in such a way which violates its real nature. It is a fact of human affairs in general, and economic conduct in particular, that the passage of time pervades circumstances affecting agents’ actions. This is an essential aspect of existence, for human beings do not exist outside time: history exists, and does not repeat itself.

Time is a dimension of change. Change can be perceived only as time passes, through our understanding that reality has been altered.

The meaning of temporal flows is different from that of space. Although one can speak of the three dimensions of space, time has only one dimension. An event occurs at a unique (moment or period of) time. Time, unlike space, has an irreversible direction, from the past to the future. Thus, the notion of an absolute now, of simultaneity, is at odds with time as change.

The irreversibility of time is evident in the growth of a tree or of a human being, the breaking of a glass or the undertaking of an investment decision. They cannot happen in reverse. Time-travel can be a stimulating exercise of imagination for physicists (or science fiction writers), but has no meaning at all for the analyst of socio-economic phenomena. To speak of timeless events is like to conceive of an empty space without matter; that is, these are nonsensical ideas.

1 Notions of Time

In economics, familiar taxonomies for analysing time make use of a two-way classification consisting of mechanical (or logical) and historical time.

In the mechanical approach, time is seen “to move forward to envisage outcomes and events that can occur only in the future, but then time moves backward again when that future is collapsed completely into the present by intertemporal reduction devices” (Vickers, 1981, p. 545). Future values of variables are assumed to be random variables accountable by probability distributions. The consequence is that there is no genuine (Shacklean) “unknowledge” of the future, no “fundamental uncertainty” (Dequech, 2000). Uncertainty is reduced to probabilistic risk by a discounting procedure and transformed into a form of knowledge. The future then will never bring novelty and surprise, for some sort of knowledge has been posited from the very beginning.

Mechanical time has the same nature as space – one can move from place to place like locomotion in space (from the left to the right and then back to the left;

backwards and forwards and then back to the original position). Time is reversible. There are no “qualitative permanent changes” (Carvalho, 1983-84, p. 266). Mechanical time is time without direction. This is the notion of time usually associated with neoclassical economics.

Historical time is a sequential continuum without end. Actions taken yesterday cannot be reversed in order to solve problems today. Changes occur in time, not in space. “Parameters” change (Carvalho, 1983-84, p. 266). While mechanical time is truly “atemporal”, historical time has a direction: it runs from the irrevocable past towards the unknown future.³ It is in the present that everything actually happens. As Shackle asserts, the time at which action is taking place is the “all-embracing present”, that is, “the time *in* which the individual feels, thinks, decides and acts. ... *Present* thoughts and acts, so far as our consciousness can tell us, are all that *is*. To be is to be in the present” (Shackle, 1965, p. 189).⁴

This is the actual setting where people take decisions. One cannot decide to go tomorrow to the Royal Festival Hall and enjoy Claudio Abbado conducting the Berlin Philharmonic in a Beethoven programme which was performed yesterday. Unfortunately, for not having gone yesterday one has definitely lost it. This is the unavoidable consequence of that particular action and one cannot reverse it. As Bausor states, “Every distinct instant combines an idiosyncratic past with a singular future embracing its own special planning horizon. Thus each moment lies uniquely embedded within history; the situation currently inherited can never be repeated” (Bausor, 1982-83, p. 164-165).

One can only fill the information gap of the things that have not happened through *imagination* about what one expects will happen in numerous future circumstances. Although in many situations we may say what we believe will happen in the near future, or sometimes even in a more distant future, the future exists only in our imagination. What people do in their moments of decision is influenced by their “*imaginative perception of the possibilities inherent in it* [historic time]” (Vickers, 1981, p. 546).

There are slightly different conceptions about the most suitable taxonomy of time, for different authors and purposes. For instance, Shackle (1954, 1958) starts from claiming that the essential distinction is between “dynamic time” (“the locus of actual

(3) As Joan Robinson was fond of saying, “today is an ever-moving break between the irrevocable past and the unknown future” (Robinson, 1977, p. 8). See also Robinson (1980, p. 86).

(4) “[T]he nature of the ‘present’, the essence of the moment-in-being, is an impregnable self-contained isolation” (Shackle, 1958, p. 16).

experiences”) and “imaginary time”, the latter comprising “expectational time” (“images associated with future moments”) and “memory time” (“thoughts about events or situations associated with past moments”) (Shackle, 1954, p. 4).

Later, Shackle (1965) suggests another classification with four categories: “mechanical time” (which he associates with Kalecki, Samuelson, Hicks, Austrian capital theory), “timeless models” (general equilibrium models), “evolutionary time” (Marshall) and “expectational” time. This latter notion of time deems uncertainty as a central concept: “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” (Shackle, 1965, p. 187). He also refers to it as the “time of uncertainty”.⁵

On the other hand, Possas (1987) advocates that there are three distinct dimensions of economic time, namely, chronological, historical and theoretical. The “chronological” notion of economic time is related to the passage of time in terms of the Gregorian calendar (one week, one month, one year etc.). The “historical” dimension relates to the historical “compatibility” of economic events and theorising. In this, there are two levels in which the realm of the “historical” overlaps with the province of the “economic”. The first, more general connection, refers to the idea that the characteristics of a given mode of production necessarily determine economic relations and the basic theoretical categories; the stage of the historical process circumscribes the acts of theorising and the scope of economic theory. The second, more concrete connection, relates to the inevitable changes which take place in economic relations in the same historical stage without eliminating the basic traits of a given mode of production. This imposes on theorising the necessity of incorporating new elements. Finally, the “theoretical” dimension is related to the influence of the passage of time upon agents’ decisions. The latter is the sphere of expectations under conditions of uncertainty.

Despite those apparently conflicting suggestions, the unifying perception is that real economic time is different from the idea of mechanical time employed by the classical (Newtonian) approach in physics, which was without qualification transported to the language of economics. Time as actually experienced by agents is historical and irreversible, while in classical science (and neoclassical economics) time is mechanical and reversible. Whether we consider Shackle’s “expectational time” or Possas’s “theoretical time” the idea is the same. In a “historical-time model”, the essential traits are: unknowability of the future, causation operating in a forward-looking manner, and non-repeatability of events (Bausor, 1984, p. 362). Therefore, a more suitable approach

(5) For a discussion of Shackle’s approach, see Carvalho (1983-84).

needs to treat time in terms of a unidirectional flux. The idea of an “arrow of time” is the appropriate image or metaphor.⁶

As Paul Davidson unwaveringly has been pointing out for a long time, economic processes happen in time (see, for instance, Davidson, 1982, 1994). The production of goods requires a lapse of time; decisions to demand both capital and consumption goods involve consideration of the irreversible passage of time. Uncertainty surrounds production and investment decisions. Firms enter into contractual commitments and use resources to produce goods, and their receipts will be determined in the market at a future date at an unknown price. Doubts as to the future results surround investment decisions. Liquidity preference is directly affected by both expectations as to what will happen in the future and the degree of confidence in those expectations. The effects of current economic actions will become clear only after some time.

Agents make decisions taking into account the fact that they do not know the whole set of pertinent information or possible future states of affairs which will enter into operation after they decide which course of action to follow. The identification of regularities may provide some form of knowledge; however, as the future is unknown, observations of past situations do not always afford reliable information concerning possible future states. Predictions based on past experience are of limited scope. Decisions are taken under a “veil of ignorance” of varied degrees of uncertainty. The more remote the future, the thicker this veil of ignorance, and the more fragile the grounds for expectations formation.

If it is true that memories of past experiences enter into the mental fabric of agents deciding at any moment, it is also true that expectations and imagination are important elements determining the infinitely extensible plurality of (even antagonistic) possibilities. In a situation of uncertainty as to the future, the existence of rival expectational pictures is inevitable: “Actuality is unique, expectation is multiple and uncertain” (Shackle, 1959, p. 17). Expectations are the set of beliefs or opinions which agents form as to the possible imagined future states of the world. Their formation is influenced both by agents’ unique experiences and by their participating in a myriad of social interactions. Expectations are formed in the mind of individuals, but are influenced by their living in a world of interdependent actions.⁷

(6) See Prigogine and Stengers (1984) and Coveney and Highfield (1990). To play on words, neoclassical general equilibrium theory is the “Arrow without Time”. Here, time is not an arrow, but a boomerang.

(7) For discussions of theoretical approaches which recognise the intersubjective nature of economic reality, see the various contributions in Fullbrook (2002).

The time horizon for investment decisions in fixed capital is by and large longer than for most of other economic decisions. This means that in general the degree of uncertainty surrounding investment decisions might be different from the uncertainty surrounding, say, consumption behaviour or price formation. Also, firms investing in the same market may perceive differently their future prospects: some might be successful innovators, others more “uncertainty-averse”, others better equipped to start new undertakings (for instance, the leader in that market). In the case of investment in fixed capital the situation can be aggravated by the fact that entrepreneurs face higher degrees of illiquidity commitments, which renders the time horizon “rigid” (that is, it takes some time before one is able to dispose of a capital good).

In sum, time is an important element surrounding economic decisions. It is through the passage of time that change and surprise surface, that knowledge might turn out to be fallible and contingent, that our knowledge becomes “unknowledge” (*à la* Shackle).

2 Determinism and Genuine Choice

Determinism is the view according to which the state of the world at any moment determines a unique future. Every event that actually happens has to happen according to the iron laws of nature, to causal necessity. Nothing can be other than it is. Everything, including human action, really happens with absolute inevitability, with no room for alternatives. All our mental states and actions are no more than effects of other equally necessitated events.

Determinism is at odds with deliberation (or genuine choice). If “hard” determinism is true, then no one can ever rationally deliberate about any sort of action. Deliberation has meaning only if genuine alternatives are available for people willing to act, if they could have acted otherwise. Determinism requires that only one course of action is genuinely open to a person; deliberation would then be “non-rational”.

In the economic domain, a form of determinism is the idea that human action is not an important factor in the creation or transformation of economic reality. History is determined irrespective of the exercise of human choice; economic processes continue to develop regardless of whether agents decide to act on them. Structures have their own existence autonomously, without the interference of intentional actions. The idea of free will, that a person is able to choose and act according to the dictates of his/her own will, is at odds with the deterministic faith.

The conventional view in economics is deterministic in the sense that it does not allow an important role for genuine choice. Decisions are pre-reconciled and the results of these decisions will always lead to a pre-determinedly known end-state, that of equilibrium. Its deterministic character is evident for it is a scheme of things where necessary patterns obtain; nothing could be different.

These schemes preclude the creative nature of decision and the injection of something essentially new into the texture of affairs. Creativity and novelty in decision-making, on one hand, and determinism and underlying ideas such as perfect foresight and certainty of knowledge, on the other, are antipodes.

Shackle's vision captures remarkably well the issues at stake in the present discussion. For Shackle, the new is the "unforeknowable" (Shackle, 1976, p. 33). The unforeknowable is what emerges in the form of change and "essential novelty".⁸ History is a generative, creative process influenced by the transformative power of "originative, non-empty choices". Pure ("hard") determinism cannot be reconciled with a view grounded on "crucial decisions":

Conventional economics is not about choice, but about acting according to necessity. Economic man obeys the *dictates* of reason, follows the *logic of choice*. To call his conduct choice is surely a misuse of words, when we suppose that to him the ends amongst which he can select, and the criteria of selection, are given, and the means to each end are known. The theory which describes conduct under these assumptions is a theory of structure, not creation of history. Choice in such a theory is empty, and conventional economics should abandon the word. Is the only alternative to a theory of necessary action a theory of non-rational, of arbitrary action? The escape we have suggested consists not in abandonment of rationality, not in abandonment of the adoption of the means which will lead to the selected end, but in abandonment of the postulate that the available ends are given. The escape from necessity, we suppose, lies in the *creation of ends*, and this is possible because ends, so long as they remain available and liable to rejection or adoption, must inevitably be experienced by imagination or anticipation and not by external occurrence. Choice, inescapably, is choice amongst thoughts, and thoughts, we suppose, are not *given* (Shackle, 1961, p. 272-273).

The orthodox view has, in my opinion, overlooked and ignored the difficulty of giving a meaning to the summation or integration of subjective experience over time. The very word "uncertainty" suggests an objectively existing future which it would be to our advantage to know exactly, comprehensively, and for certain. Uncertainty thus comes to be looked on as an inadequacy of our own powers, or a disadvantage of our situation, which are in principle to some degree remediable. I am suggesting instead the future is created afresh from moment to moment by the individual imagination. What we speak of as "uncertainty" is the essential freedom of this imagination, bounded by the consciousness of

(8) "[D]eterminism assumes a single initial act of creation while free will supposes continuing creation" (Shackle, 1954, p. 7). See also Shackle (1958, p. 26).

law in nature but not paralysed and killed by a knowledge of something objective. If we believe in a fully determined universe, a universe engaged in working out a destiny irrevocably fixed in the beginning, then the individual imagination is merely a link in the mechanism. But if we believe in a nondeterministic universe where creation of something essentially new can happen from moment to moment, then the individual imagination seems to be the locus, so far as human beings are concerned, of this continual projection of essential novelty into the world process (Shackle, 1954, p. 12-13).

Actual, genuine human decisions are not taken in conditions of perfect foresight or complete knowledge. A “non-empty decision” changes the context in which a decision is part of, for “a decision is in some strict and full sense a beginning, something constrained indeed but not determined” (Shackle, 1959, p. 22). Crucial choices generate the new and give meaning to the very idea of “history”, for history is an *ex post* understanding of what was not given or known *ex ante*.

Conventional approaches in economics attempt to cope with the idea of time by idealising a situation where important aspects are ruled out. The “taming of time” is present in many analytical procedures devised with the aid of what Lawson (1997, p. 108) calls “fictitious idealisations”. As Shackle puts it:

The pure static system is one where either there are no changes, or where all changes take place instantaneously, so that all *connected* changes take place simultaneously. ... The stationary state is a mere concession to intellectual weakness. ... The stationary state is at best as artificial as the static system, since while the latter abolishes expectation altogether, the former constrains it to such beliefs about the future as can be entertained without giving rise to change. The static system is clear-cut and goes the whole way to exclude time, the stationary state pretends to admit it (Shackle, 1959, p. 24).

In sum, an account of time and decision-making processes on the above terms, to which the flow of (historical, irreversible) time implies unpredictable results and truly affects the very moment of decisions, is not consistent with any notion of determinism or necessity at all.

3 Varieties of Equilibrium

The analysis of historical time, determinism and genuine choice is not complete without a discussion of an important notion widely employed in economic analysis, namely, that of equilibrium. This concept is used to investigate interactions and co-ordination of activities in a decentralised economy. However, the idea of equilibrium “is inextricably tied up with the treatment of time” (Dow, 1996, p. 112). Some refer to “the thorny problem of marrying the concepts of time and equilibrium” (Boehm, 1986, p. 21).

Equilibrium is one of the central organising categories of conventional economic theory. It is seen as a state of affairs in which there is no inherent tendency to change, a

situation in which the forces that determine the behaviour of some variables are in balance. It is a position of rest or an end state.

In particular, an economic system is understood to be in equilibrium when it reaches a state in which for every good demand and supply are equal. Prices in this system are then equilibrium prices. If an equilibrium position is stable, then forces will be set in motion in order to restore the equilibrium position. The economic system is self-correcting.

There are many facets of the notion of equilibrium and the following accounts may help to clarify some broader elements. They are the conventional mainstream view of general equilibrium and the “gravitacionist” view. They are chosen because equilibrium has an important role to play in the corpus of the theory.

Hahn describes the Arrow-Debreu equilibrium – “a special ideal type of the notion” (Hahn, 1974, p. 69) – in the following manner:

Goods are distinguished one from the other by their physical property, by their location in space and time and by the state of the world. A price is defined for each good. There are two kinds of agents – households and firms. Given any non-negative price vector each household chooses an action which defines a point in the space of all goods. It has the property that there is no other action available to the household under its budget constraint which it prefers. Again, given any non-negative price vector, firms choose an action represented by a point in the space of all goods such that there is no other action which is both technologically feasible and more profitable. An equilibrium is then a triple; a non-negative price vector, a vector of demand and a vector of supply, such that (a) the demand vector is the vector sum of household action at these prices, (b) the supply vector is the vector sum of firms’ actions at these prices, and (c) for no good does demand exceed supply (Hahn, 1974, p. 47).

For Hahn, equilibrium might also be specified as “a state of affairs where (a) all actions are decided upon at only one instant of time and (b) actions always contain contingent elements” (Hahn, 1974, p. 52). This notion should mirror “the sequential character of actual economies” (p. 53), a claim which shows the purpose of employing some notion of time (and some degree of realism) in the analysis.

In addition, Hahn also suggests a slightly different definition than the usual one: “an economy is in equilibrium when it generates messages which do not cause agents to change the theories which they hold or the policies which they pursue” (Hahn, 1974, p. 59). The agent’s theory at time t is a process in three stages. First, an agent separates the messages received in two categories: *exogenous* messages – “those which the agent considers independent of his own actions” – and *endogenous* messages – “messages by the agent to himself”. Second, for any sequence of exogenous messages from date t

agents assign a probability distribution of the outcome of any contemplated sequence of actions from t ahead. Third, agents assign at t a probability to receiving any exogenous message at any date in the future conditional on the messages received since the date t and that future. An agent thus has a “theory” if a Bayesian calculation is made concerning the operation of the economy. It is a condition of equilibrium that there is no learning, that is, an agent’s theory is independent of the date t . If agents are capable of translating the collection of messages they receive into actions, then we have a “policy”. Actions are undertaken conditional on the theories (Hahn, 1974, p. 54-56).

The notion of equilibrium can also be expressed in a different manner. According to Millgate (1987), equilibrium is

that outcome which any given economic process might be said to be ‘tending towards’, ... the idea that competitive processes tend to produce determinate outcomes. It is in this last guise that the concept seems first to have been applied in economic theory. Equilibrium is, as Adam Smith might have put it (though he did not use the term), the centre of gravitation of the economic system – it is that configuration of values towards which all economic magnitudes are continually tending to conform (Milgate, 1987, p. 105).

In this “gravitationist” view, an important concept is “normal values”, a “permanent state of things” (in the words of Ricardo). Deviations from them in the form of market values are regarded as accidental and temporary, that is, frictions which in the long run will by necessity be eliminated. There is a centre of gravitation around which market values fluctuate in the short run and toward which they tend in the long run (e.g., to a uniform rate of profit). Equilibrium as a long-period position implies that the relevant adjustment processes have reached an end. Expectations concerning the relevant variables are not disappointed (in fact, according to this approach, expectations and their frustration are not of primary importance for the analysis). Equilibrium, in this account, is a notional concept, not an actual one. More precisely, the focus is on the process of gravitation, rather than on the state of rest (cf. Dow, 1996, p. 129).

Thus, from the above accounts, whenever one is talking about equilibrium one is implying one or some of the following aspects:

- 1) a balance of forces whose outcome is rest,
- 2) no endogenous tendency to change,
- 3) simultaneity of decisions,
- 4) no demand-supply excess (market clearing),
- 5) no changes in agents’ theories and policies in response to signals from the economy,

6) a centre of gravitation toward which variables systematically tend.

The following can be derived from the above. One may refer to equilibrium when there is also:

- 7) satisfaction of expectations,
- 8) co-ordination success of agents' plans,
- 9) a stationary state,
- 10) a steady path of change.

Truly, what unifies both the general equilibrium analysis and the gravitationist (neo-Ricardian) account is the underlying belief that deterministic forces govern the behaviour, the path and the development of the economic system; these inescapable forces engender results known in advance.

However, this view and the concept of uncertainty required by the notions of historical time and crucial choice are not easily reconcilable. In view of these, the following questions will be addressed next: what is the relevance and adequacy of the notion of equilibrium as a central organising idea for economic analysis? Should equilibrium be seen either as a theory of wider applicability or as an auxiliary method of analysis for quite restrictive purposes? Should it be reconceptualised – some notion of equilibrium, not in its “general” guise, is retained – with the consequence that it becomes strongly circumscribed as a method of investigation?

4 Critiques

There are different alternative conceptions of equilibrium within economic paradigms.⁹ Different views of time lead to different interpretation of, and analytical status for, equilibrium. Analysis employing historical time cannot make the same use of the concept as analysis based on mechanical time.

If time is historical, the specification of equilibrium on the above terms becomes quite problematic. As Joan Robinson asserts, “As soon as the uncertainty of the expectations that guide economic behaviour is admitted, equilibrium drops out of the argument and history takes its place” (Robinson, 1974, p. 126). The difficulties are of the following types:

(9) See Dow (1996, chapter 6), for a more detailed treatment of this.

- 1) to reconcile the notion of equilibrium with that of uncertainty: the deterministic belief that the future results of individuals' current actions are known in advance for certain with the belief that we do not know what the future will bring;
- 2) to reconcile the view that the system is systematically forced to a state of rest with a dynamic account in which change, learning and evolution are important for the analysis;
- 3) to reconcile the type of idealisation implied in the idea of equilibrium with correspondence with reality.

As to the first point, it has been said above that the idea of equilibrium implies a form of determinism. If the system is in (or forcefully tends to) equilibrium, then other alternative results are discarded *a priori*. We know in advance, before consequences take place, that everything will achieve, necessarily, a state of equilibrium. Nothing could be otherwise. There is no escape from that. Agents' decisions are only (logical) links in this unavoidable process of adjustment. There is no real, genuine choice, for decisions have no power to change creatively the trajectory of the system towards an uncertain or unpredictable, perhaps more profitable, path. Creativity, when it exists, is something which belongs to the very logic of the necessitated scheme of things.

However, a real concern with future time needs to account for the uncertainty of the states to come. An important feature of agents' knowledge in historical time is that it is fallible, contingent and limited. The path of an open system evolving in time, subject as it is to change, cannot be predicted, but at best imagined. That is, historical time and determinacy cannot be easily reconcilable. This critique can be made for both accounts of equilibrium.

As to the other two aspects, I will concentrate my objections on the general equilibrium view, for it is the most problematic concept. General equilibrium theory requires perfect foresight and complete knowledge: agents know everything which is necessary to be known, including the possible consequences of their actions, a belief in conflict with the view of fundamental uncertainty.

The specification of a self-reproducing system based on general equilibrium analysis is built on a system of simultaneous equations, which does not need to define any date nor its solution involves history. A distinct composition of output would imply a distinct set of equations. The available stock of inputs at any time is arbitrary and is not influenced by the technology and output composition available yesterday for the production of an ongoing output. The consideration of the effects of unforeseen changes alters completely the situation initially devised for a self-reproducing system, and, as a

consequence, nothing based on the original set of equations can be said until we devise afresh a new system accounting for disequilibria (cf. Robinson, 1974, p. 127-128).

Equilibrium and Reality

A major problematic aspect of equilibrium theorising is the lack of correspondence between the theory and the actual operation of the economic system. General equilibrium analysis does not provide satisfactory account of the relevant economic issues of the world in which economic agents (and human beings in general) actually live.¹⁰ In other words, it has limited explanatory and predictive power. If one is concerned with prioritising the understanding of real-world phenomena, equilibrium analysis is of no practical relevance, despite the claims as to its analytical rigour.

Important features of capitalistic productive processes are not approached: what happens to the system when it is out of equilibrium; what are the effects of disappointment of expectations; what sort of impacts the activities of speculation might cause; what is the role of financial variables; what is the role of active price-quantity interventions by firms; adjustment mechanisms leading to convergence to equilibrium are complicated by the many types of barriers to entry; what happens if there is no complete mobility of both capital and labour to assure such adjustments etc.¹¹

The analysis refers to the end equilibrium result based on the allocative functions of markets. However, as Kaldor points out, it cannot say anything at all about the “creative functions” of markets (Kaldor, 1972, p. 181). Endogenous and cumulative changes engender departures from previous states or trends. Underlying mechanisms which lead to change might be more pervasive than conditions facilitating equilibrium. In the equilibrium framework, as markets are continually in (or tending towards) equilibrium, change is due to exogenous factors or perfectly foreseen.¹² But dynamic

(10) This kind of preoccupation – that is, realism – led J. Robinson to state that “[i]t is not legitimate to introduce an event into a system of simultaneous equations” (Robinson, 1974, p. 130). Equilibrium analysis “applies rather to a once-over meeting of independent peasants at a rural market or to the prisoner-of-war camp where parcels were occasionally received from the Red Cross” (Robinson, 1977, p. 6). See also Chick (1996; 1998) and Lawson (2005) for cases endorsing the importance of realism in the analysis.

(11) Even Hahn, a “friend” of the theory, admits its insufficiencies. In particular, he agrees that in an Arrow-Debreu model money has no role, that “it cannot take account of certain forms of uncertainty and certain forms of market expectations”, that it abstracts the oligopolistic features of a capitalist economy and that it rules out both informational asymmetry among agents and the possibility of coalition formation (Hahn, 1981, p. 78-79). In other words, that it cannot take account of crucial aspects of economic reality.

(12) “[I]f only general equilibrium positions are studied, then the only source for involuntary change is change in exogenous variables” (Dow, 1996, p. 119). See also Loasby (1991, chapter 3) and Chick and Caserta (1997).

processes do not systematically produce equilibrium states, but to a large extent unpredictable evolution of structures and patterns of behaviour.

Equilibrium analysis assumes co-ordination success of the agents' actions, for they know everything relevant that is happening. It has no space for a view of knowledge in which its uncertain nature is stressed. The simultaneous interaction of buyers and sellers depend critically upon *knowledge* of equilibrium prices; this knowledge is supposed to guarantee the coordination of agents' decisions. Thus, "[t]hat time stops for the auctioneer is no accident" (Bausor, 1982-83, p. 166).

Equilibrium analysis depicts a sequence of harmoniously co-ordinated states. One of the prerequisites of the simplification (distortion?) of reality in such models is the assumption of *omniscience* on the part of all individuals taking part in the economic process. But the world is characterised by agents possessing uncertain, limited knowledge, as emphasised by Keynes (1937), as well as other "philosopher-economists" such as, for instance, Hayek (see Hayek, 1945, p. 530).¹³

Therefore, the concept of general equilibrium has no relevant meaning disconnected of the precise specifications of the initial conditions for any model. At its best, this notion should be considered merely as the *solution concept* relevant only to a particular model, applicable to a limited number of cases (Milgate, 1987, p. 112). If specification of the domains of applicability is required, then a) a state of equilibrium as an empirical observation (or tendency) is but a particular (highly transient) aspect of a more complex, evolving reality, and b) equilibrium theories are of reduced scope.

The notion of equilibrium originated from a misleading mechanical analogy with movements in space, which cannot be applied to movements in time. Its unqualified application to the study of aspects of the social and economic system is also problematic. One important difference with the natural sciences is that, unlike human beings, atoms and molecules do not express purposeful, creative behaviour or free will. An important class of human decisions is by nature "non-empty", experimental, innovative; they have an important role to play in the process of creation and transformation of reality.

(13) Hayek is asking for realism when he contends that "the situation which [equilibrium analysis] describes has [no] direct relevance to the solution of practical problems; ... it does not deal with the social process at all" (Hayek, 1945, p. 530). It is worth noting in passing that Hayek's reluctance in embracing the concept of equilibrium grew over time (mainly after his famous 1937 paper). A general equilibrium framework cannot be reconciled with Hayek's views, for an analysis which emphasises agents' "irremediable ignorance" (and processes) is not compatible with the idea that they fully know everything which is relevant to be known in order to move the system to a predetermined end state. For a discussion of Hayek's views of the notion of equilibrium (and the alternative concept of order), see Fleetwood (1995), in particular chapters 5 and 10. See also Lawson (2005, p. 438-442).

If, even in the natural sciences, conceptions such as equilibrium are being re-examined due to recent developments (see, e.g., the “science of complexity” of Prigogine and Stengers, 1984, and Prigogine and Nicolis, 1989; see also Coveney and Highfield, 1995), it is bizarre, to say the least, that in economics the concept has, at least in its conventional form, such an enduring life. In part, this is truly a case of inertia. Or, perhaps, to put it in a more modern parlance, as theorising itself can also be seen as a path-dependent process in which current (theoretical, empirical) research is at every moment crucially dependent on past performance, practices, conventions etc., one has here another interesting instance where one could state that the phenomenon in question (the use of equilibrium frameworks) is one of path dependence locked-in on the initial condition. Understandably, lock-in effects make it costly to change to other trajectories.

5 Reconceptualisations

At this point, the question one could raise is: should one recognise that the notion of equilibrium has an important role to play in economic analysis and, therefore, strive for some form of reconceptualisation *on conventional terms* or should one simply abandon it? My answer is that we should abandon it. However, a reconceptualisation of equilibrium is possible on alternative terms. As Hahn says, “we must consider new equilibrium notions” (Hahn, 1981, p. 85). This position has some ingenious solutions for the dilemma.

Bausor (1982-83, 1984) develops a “historical-time model” and proposes to conceive equilibrium as a dynamic persistence of habits and conventions (Bausor, 1982-83, p. 173). In this model, equilibrium entails “historical permanence” in the form of satisfaction of expectations. It is sheer accident, not necessity. A state of equilibrium obtains when there is intertemporal coherence among agents’ plans, in the sense of similarity of previous expected and actual states.

In this account, disruptions are not violent; they are neither new relevant information nor generation of new insights from old information (Bausor, 1982-83, p. 176). Equilibrium is the “intertemporal continuity of *ex post* phenomena. ... [I]t suggests no correspondence between *ex ante* intentions and *ex post* actualization. Only certain knowledge prevents repeated disappointment” (Bausor, 1982-83, p. 174). This intertemporal consistency is not the same as instantaneous co-ordination; there is no reconciliation of *ex ante* decisions. It is, in sum, a very special, rare situation:

General historical equilibrium exists, therefore, in the sense that there are special functions and special states of the system for which perceptions, expectations, strategies, and outcomes are all intertemporally equilibrated. It does not mean that an equilibrium state

exists. ... Nor does its logical existence entail the very different assertion that an economy ever actually achieves equilibrium (Bausor, 1982-83, p. 177).

Chick and Caserta (1997), by their turn, propose to specify a different, “pragmatic”, notion of equilibrium, christened “provisional equilibrium” (PE), as opposed to “final equilibrium” (FE). The first category of equilibrium is present, for instance, in the theories of Marshall and Keynes, as well as in Post Keynesian growth theory. The second characterises Walrasian and neo-Ricardian theories; respectively, the general equilibrium and the gravitationist views discussed above. The authors also call attention to the suggestive distinction between “equilibrium theories” – “theories whose only purpose is to identify and characterise an equilibrium” – and “theories with equilibrium” – “theories which have an equilibrium result” (Chick and Caserta, 1997, p. 226).

PE is compatible with change; FE does not account for it. FE is the type of equilibrium “after which the economy may replicate its activities, but there are no further changes. It is a class of teleological positions, toward which the economy is either portrayed as ‘tending’, or for the discovery of which it is waiting, while all activity is suspended” (Chick and Caserta, 1997, p. 224). Change is either exogenous (comparative statics) or fully known and expected, where novelty is absent and change is part of equilibrium itself (comparative dynamics).

PE operates for “a particular, limited theoretical purpose” (p. 224). It is a useful device for analysing “situations which may eventually be transformed, [by] the very decisions which bring about a provisional equilibrium, into something else, with a new provisional equilibrium. In other words, the shock may be endogenous. ... [P]rovisional equilibrium is consistent with innovation, learning and evolution” (Chick and Caserta, 1997, p. 225). This view does not see change and evolution as the outcome of exogenous occurrence. Instead, “change might develop from within as a result of the passage of time or of a process of learning, or as a result of the resolution of a previously contained conflict” (Chick and Caserta, 1997, p. 233).

So far, so good. But it is clear from the above that both alternative accounts agree that the notion of equilibrium they have in mind is neither of the same type as the Walrasian general equilibrium theory nor the “gravitationist” view.¹⁴ These accounts are interesting attempts to provide a more acceptable status to the notion of equilibrium, but they reach a meaningful conclusion: equilibrium is only achieved by chance, not as

(14) For other suggestions concerning reconceptualisation on alternative terms, see also Hicks (1979) and Chick (1998). For illuminating interpretations of Keynes’s (peculiar) idea of equilibrium, see, for instance, Kregel (1976) and Chick (1996; 1998).

necessity, an outcome among an endless set of likelihoods with a very low degree of real possibility. It is a “temporary resting place”, where temporary seems to be more important than resting. A more sensible thought is that situations of equilibrium are less probable, for frequent changes, a much more pervasive feature of reality, disrupt any possibility of enduring states of equilibrium.

For the concept to have any meaningful applicability, one needs to restrict severely its scope. If this is not done, then the risk of lack of realism is great. It is not useful for the more common situations we observe in a capitalist economy, for the latter is, in Schumpeter’s words, “a method of economic change” which, because of “creative destruction”, is far from being stationary in any meaningful economic sense (Schumpeter, 1943, p. 82-83).

As Fleetwood (1995, p. 137) remarks, some believe that the abandonment of the notion of general equilibrium would necessarily lead to “analytical anarchy”. But why this should be the case? No cases are put forward to validate this statement. Rather, this is a normative stance which imposes on the analyst that she or he *ought* to use the notion of equilibrium for the proposed analysis. As Keynes states in a different context, the onus of the proof rests with the believer, not with the sceptical, for “it is for those who make a highly special assumption to justify it, rather than for one who dispenses with it, to prove a general negative” (Keynes, 1937, p. 109).

Bausor’s “equilibrium in a historical model” and Chick-Caserta’s “provisional equilibrium” attempt to make a compromise, so to speak, but, ultimately, ascribe to equilibrium analysis a quite reduced domain of applicability. Equilibrium states are not the typical traits of the fleeting reality evolving in time people live in. Open systems are characterised by “a state of change” (or provisional absence of change) rather than by such things as equilibrium as the normal state of affairs. Thus, a change of focus is needed: in analytical terms, change should not be subordinate to equilibrium, but the opposite. In a process in historical time in which change and novelty often emerges, one might be faced with situations where a “temporary resting place” manifests itself in the form of an “equilibrium”. But nothing in the system guarantees its persistence or unavoidability.

The economic system is partly governed by entrepreneurial decisions seeking in the course of time the most profitable opportunities. Such actions lead to constant upsets of equilibrium. Imagination, experimentation and creativity often take place, engendering novelty and changing prospects (induced by active competitive rivalries), favouring those who have successfully embarked in the activity of innovation (*à la* Schumpeter), rightly used differential information, or still are far more fortunate in their uncertain

undertakings. As Dow properly puts it, “equilibrium rules out the exploitation of new opportunities, and thus creativity; ... the moving force behind competition” (Dow, 1996, p. 115).

If analysis of dynamic non-equilibrium processes are important, the operation of the “historical model” itself, should one make either a concession or instead discard something for its narrow applicability? If the aim is to account for the process of economic change, then the concept of general equilibrium is of little value. Insistence with this method does violence with the nature of real processes underlying the operation of economic systems. And it is not on flimsy foundations that one should focus the attention in order to provide suitable explanations of economic phenomena. Thus, rather than being an indispensable tool for economic analysis, general equilibrium theory may instead be an (Bachelardian) “*obstacle épistémologique*”; as such, the analyst might well dispense with it. Paraphrasing J. Robinson (1980, p. 94), the search for equilibrium is like looking in a dark room for a black cat that probably is not there. I dare to say that in the real world this probability approaches unity.

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