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# Equilibrium Visions

Mario J Rizzo



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E K O N O M I E

## EQUILIBRIUM VISIONS

M.J. RIZZO\*

IN MOST VARIANTS of modern-day neoclassical economics an equilibrium is simply the solution of a particular model. It embraces no claim of market clearing, or, more generally, of co-ordination of plans. Thus rationing and unemployment can be perfectly compatible with equilibrium if appropriate costs are built into the model. Furthermore, it is now possible to derive traditional Keynesian results with no compromise of micro-economic or choice-theoretic foundations as in the "New Keynesian Macro-economics."<sup>1</sup> Hence the economy is always in an optimizing equilibrium defined in terms of the data of the particular model applied. In the "genetic-causal" tradition, on the other hand, the economy is described as passing through disequilibrium positions to, or simply toward, an equilibrium of market clearing or of system-wide plan co-ordination.<sup>2</sup> This is not a mere terminological dispute or a conflict of modelling styles. It goes to the very heart of our conception of the market. Is the market a *process* of movement through real time or is it a complex *state* of affairs that is, at some deep level, completely unchanging? To the extent that there is some motion in an equilibrium model, it is either perfectly predictable or it results from exogenous shocks. In a disequilibrium model, motion can emanate from forces within the system, such as the correction of errors or the seizing of arbitrage opportunities.

The question addressed by this article is embedded within the genetic-causal tradition: What is the role of the equilibrium construct in understanding economic change? The question can be restated somewhat paradoxically as: How can we understand movement by positing the absence of movement?

One of the principal stands of thought within the genetic-causal tradition is that of the Austrian school. Accordingly, we will survey, contrast and evaluate the views of Mises, Hayek, and Lachmann on the uses of equilibrium theory in a system of economic processes. The importance of this task goes beyond understanding the Austrian school. The ideas we will discuss apply to many other traditions of economic thought, including evolutionary economics, institutionalism, post-Keynesianism, and Schumpeterianism, to mention only some.

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\*Professor of Economics, New York University.

While we will discuss the views of three economists, there are really only two fundamental perspectives. The first, expounded by Mises, is that of equilibrium as a technique of analysis. Here no claim is made that actual market processes move in the direction of an equilibrium (although this is often implicit in many parts of Mises's work not under consideration at this time). The second perspective, argued by Hayek and by Lachmann, is that market processes move at least sometimes in the direction specified by the equilibrium construct. Hayek and Lachmann disagree over the extent to which differences in expectations are reduced by market processes. Thus they disagree about the extent to which an equilibrium of beliefs is *attainable*. The *attainability* of an equilibrium is closely connected with its usefulness as a mental construct.

### 1. EQUILIBRIUM AS AN ANALYTICAL TOOL

To understand the analytical part of Mises's view of equilibrium it is important to see the concept as one of many "imaginary constructions" used by economists (1966:236).<sup>3)</sup> The social sciences must make use of imaginary and artificially isolated systems partly because of the difficulties inherent in social experiments. "Inconceivable" or "unrealizable" constructions can shed light on complex phenomena because of their ability to trace the effects of a single factor in a system undergoing many changes (247).

In the realm of equilibrium theorizing, this form of explanation is accomplished by eliminating from the system all changes except the single postulated one. By abstracting from change altogether, it is possible to understand the effects of a disturbing change. Machlup illustrated this analytical use of the equilibrium construct by a simple four-step scheme (1967: 47):

- Step 1. *Initial Position*: "equilibrium,"  
i.e., "Everything could go on as it is."
- Step 2. *Disequilibrating Change*: "new datum,"  
i.e., "Something happens."
- Step 3. *Adjusting Changes*: "reactions,"  
i.e., "Things must adjust themselves."
- Step 4. *Final Position*: "new equilibrium,"  
i.e., "The situation calls for no further adjustments."

The first step requires the complete elimination of change in order to ensure that in the second step, only one disturbing change has been introduced. If the initial position were not an equilibrium, it would be impossi-

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ble to isolate a single cause at this stage. This is analogous to the introduction of a single change in a laboratory setting. Step Three catalogues the effects of the particular change. The fourth step requires that the series of adjusting changes culminate in an equilibrium in order to ensure that all of the adjustments have been noted. If we stopped our analysis short of an equilibrium position, there would be further adjustments that we would have overlooked.

Such a procedure is simply a mental experiment designed "to introduce an isolated factor provoking change and ultimately to analyze its effects" (Mises, 1966:284). The analysis presupposes nothing about actual process beginning from an equilibrium position and ending in an equilibrium. In fact, according to Mises, both are unlikely events. Nevertheless, the analytical use of the equilibrium construct enables us to isolate the particular effect(s) of a particular cause even amid the complexities of the world. Furthermore, without this isolation technique it would be impossible to ascertain the individual effects of a multiplicity of causes operating simultaneously. For this reason Mises argued that it is "absurd" to think that the more realistic an equilibrium construct is, the more powerful it is in explaining the world (*ibid*). With respect to the presence or absence of change, just the opposite is true.

Let us consider the precise kind of explanation to which an analytical use of the equilibrium construct gives rise. Consider for a moment the ends toward which individual action and individual planning tend. All action aims at the elimination of the desire which brought it into existence. Thus action tends toward inaction or toward a state-of-rest equilibrium. Intertemporal planning aims at the establishment of a moving equilibrium, that is, the evenly rotating economy (ERE). In the ERE all actions are repeated in an endless round. Under unchanging conditions the individual aims to correct his errors until he attains a plan — a series of coherent intended actions — that is optimal with respect to these conditions. The ERE is for planning what satiation-of-desire is for action. Each is a state of affairs in which the reason for the relevant motion (i.e., changes in plans or action) is eliminated. For these equilibria to be brought about, action and planning must each be successful in attaining its goals under the stipulated conditions. Empirically, of course, there is no guarantee of this result. Analytically, however, it is certain that success at the relevant level is the individual's goal. An action comes into being for the sake of satisfying a particular desire, not for its frustration. Similarly, changes in plans come into being for the sake of correcting errors, not for making an additional error. This is an explanation in terms of Aristotelian "final causation"

(Taylor, 1955:50-4), that is, in terms of the purposes and intentions of the individual agents.

From an empirical perspective, this is a weak form of causal explanation. We have no assurance that an actual process of adjustment will end in an equilibrium. We do know, however, that if the process ends at all it will be in an equilibrium. This is what Hahn calls the "weak causal claim" (1984:47). A stronger form of empirical explanation, on the other hand, would involve specifying the actual end of a process rather than its hypothetical (and perhaps contrary-to-fact) end.

## 2. EQUILIBRIUM AS A BRIDGE TO CAUSAL ANALYSIS

Hayek addressed himself to the following question: Is there a connection between the analytical use of the equilibrium construct and the understanding of real economic processes? He gave an affirmative answer based on the somewhat fuzzy idea of equilibrium as a bridge from static to causal analysis. To the extent that this idea is correct, Hayek would have successfully reconciled the analytical aspect of Mises's approach to equilibrium theory to the requirements of explaining actual economic processes. Unfortunately, the idea is not entirely correct and the reconciliation is at best only partially successful. In order to see this we must begin at the beginning and retrace the steps of Hayek's analysis.

Let us begin by distinguishing between a logical analysis of the equilibrium relations among the plans of different members of society, and a causal analysis of a process of plan revision (Hayek, 1941:18).<sup>4)</sup> The former consists of a description of a system in which the plans of all individuals are consistent with their own preferences, the objective physical data, and the plans of all other relevant individuals. This is a general intertemporal equilibrium which may be stationary, or nonstationary so long as only predictable changes in the plans of others are admitted. Genetic-causal analysis, on the other hand, does not emphasize the mutual interdependence of plans, but the ways in which plans change before they become compatible. Since plans change over a period of time Hayek believed that the analysis stresses "an unilateral dependence of the succeeding event on the preceding one". The preceding event is an error, that is, a failure to achieve the mutual compatibility of plans. The succeeding event is an attempt to correct the error so that in the subsequent periods the individual will be able to implement his plans. But, contrary to Hayek, this is not a relationship of successive dependence. The preceding event provides *the occasion* for plan revision but it is current ideas about the future that gener-



ate or cause the particular plan revisions ultimately undertaken. A causal analysis consists of ideas about the future moulding the dynamics of the present.

When presented in this way, the connection between the analysis of compatible plans and the analysis of what will happen when plans are not compatible is far from obvious. This is as it should be, because the bridge between these forms of analysis does not travel a direct route. To see this, we must distinguish among three paths of inquiry: (1) the elucidation of "the factors which will compel entrepreneurs to change their plans" when they are in a disequilibrium setting; (2) the understanding of "the way in which plans will have to be changed" if equilibrium is to be restored; and (3) the prediction of "what will happen if entrepreneurs attempt to carry out" incompatible plans. These are quite separate issues among which Hayek failed carefully to distinguish. This failure has been the source of analytical confusion.

Let us first consider a static case in which there is only a single deviation from full intertemporal equilibrium. Under these circumstances Hayek claimed that "the statement of the condition under which individual plans will be compatible is therefore implicitly a statement of what *will* happen if they are not compatible" (*ibid.* Emphasis added). Suppose, in a given market, the prevailing price is such that there is excess supply of the commodity. Then simple examination of a supply-and-demand diagram will show three things. First, the higher-than-equilibrium price is such that the intentions of sellers are incompatible with the intentions of buyers. In other words, both sides of the market are bound to be frustrated in the implementation of their plans. This is the factor which will normally compel entrepreneurs to change their plans.

Second, the intersection of the two curves shows that if equilibrium is to be restored then suppliers must lower their selling-prices and demanders must revise upward the quantity they intend to consume. And, finally third, this adjustment *will* occur because suppliers and demanders are, under the postulated circumstances, highly likely to learn the correct things. Each party will gain if his behaviour outside of equilibrium is revised in such a way as to conform to equilibrium behaviour.

Let us now consider a case in which there are numerous deviations from intertemporal equilibrium. Here the analysis "is no longer so simple" (*ibid.*, n.1). It is still true that the equilibrium construct will, by contrast, elucidate those factors that will "compel" agents to change their plans. It is also true that knowledge of the equilibrium relations will tell us the way in which plans will have to be modified *in order for* equilibrium to be re-

stored. Nevertheless, it is no longer true that by reference to the equilibrium position we shall be able to predict what agents will do — how they will revise their plans in the next period. The reasons for this are fairly straight-forward. Agents do not attempt directly to attain a full intertemporal equilibrium. They simply attempt to make profits by exploiting disequilibrium arbitrage opportunities. This in no way ensures a movement toward a full intertemporal equilibrium. Even if agents on a particular market know what changes are required for equilibrium to be attained *on that market*, it is likely to be an equilibrium *relative to the existing disequilibria on other markets*. The decentralization of knowledge means that entrepreneurs will be better at discovering profit opportunities within their own markets than at knowing what adjustments will be made, by other entrepreneurs, on other markets. This is not to say that they will know nothing of these other adjustments but that what they will find out may well contain many errors.<sup>5)</sup>

Examination of the above two cases leads us to a rough generalization that Hayek endorses. The closer a system is to full intertemporal equilibrium the more likely it is that perturbations from that equilibrium will result in movements restoring it (1976:125). The informational demands of the case of numerous deviations from equilibrium are quite severe and are far less likely to be met than the demands of the case of a single deviation.

### 3. CAN EQUILIBRIUM BE OBSERVED?

The conclusion at which we have thus far arrived is purely formal. *If* the system is close<sup>6)</sup> to equilibrium in the first place, *then* the analytical use of the equilibrium construct will be useful in explaining real economic processes. It will point in the direction of change. If, on the other hand, we do not know how close we are to full intertemporal equilibrium or if we are far away, we cannot argue that equilibrium provides a bridge from static to causal analysis. The equilibrium relations implicit in the original economic data will not provide a picture of where actual processes are moving. Hayek's own conclusion, however, was not simply formal. He believed that *observation* shows that the world approximates a full intertemporal equilibrium. From this it follows that there is a bridge from the analytical use of the equilibrium construct to causal explanation. It is this observation and this putative bridge that justify our use of the notion of equilibrium. Let us now examine the critical observation-argument in detail.

The economist, according to Hayek, begins with two observations: (1) the generally close correspondence of the subjective data of many

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individuals to the objective data, and (2) the approximate equality of prices and costs.<sup>77</sup> The plainest example of the correspondence of subjective to objective data is the mutual compatibility of plans. Buyers and sellers will have compatible plans only when their expectations (the subjective data) of the actual behaviour of the other party (the objective data) prove correct (1978:184). With regard to the second observation, that is, the approximate equality of prices and costs, Hayek presumably means the equality of prices and average costs of the best technology in the industry. If indeed this were to be observed, we could infer not only the efficient dissemination of technological knowledge but possibly other kinds of relevant knowledge as well (1978:185).

We must now address the central question: Is it possible to observe such an equilibrium? We can easily dismiss the possibility of observing either the *ex ante* compatibility of plans or the *ex ante* dissemination of knowledge. *Ex ante* compatible plans are those which are so adjusted to each other that they can all be carried out at the appropriate future dates. *Ex ante* dissemination of knowledge means that plans for future production will incorporate the best available technology. In each case the equilibrium pertains to a relationship among many minds at the planning stage, not at the stage of observable action.

The cases of *ex post* equilibria are more complicated. When we see buyers purchasing six apples at \$0.25 each and suppliers selling six apples at \$0.25, we see a clearing market. But markets can clear even if there is disappointment of plans. The buyers may have originally intended to purchase ten apples at \$0.15 each, and suppliers may have planned to sell twelve at \$0.35. If the participants learn the actual state of the market quickly enough, they will come to a mutually compatible set of actions even though their original plans have been disrupted. This, of course, is mutual compatibility of *immediate* plans or intentions. We observe only market-day compatibility.<sup>80</sup>

It is no easier to observe full *ex post* dissemination of (technological) knowledge. In the first place, to say that each firm is using the best technology does not imply that each is using the same technology. What is "best" depends on the particular circumstances in which the firm finds itself and the particular variant of the product it produces. Secondly, it is hard to distinguish between incomplete dissemination of previously-available knowledge and the exogenous shock of newly-available knowledge. Since adjustment is not instantaneous, what exactly must we look for?

It is hard to imagine that Hayek has ever seen prices that were close to the average costs of the best technology. His "observation" is more likely an

inference from his belief that it is difficult to make a pure economic profit. But this latter belief is consistent with incomplete dissemination of knowledge and a low level of entrepreneurial alertness to profit opportunities.

We cannot directly observe these equilibria. We are, however, willing to accept the existence of rational decisionmaking and of planning. From this we can conclude that there must be a reasonable amount of order and predictability in society. If people's plans were always frustrated and if circumstances changed in a completely unpredictable way, there would be no point to planning, or more generally, to rational decisionmaking. A "reasonable" amount of social order, however, need not be an equilibrium in any of the specific senses we have discussed. Our observation is not precise enough to lend support to the claim that *these* equilibria are simply facts in need of an explanation.<sup>9)</sup>

#### 4. THE ABANDONMENT OF HAYEKIAN EQUILIBRIUM?

Lachmann was clearly a Hayekian. He implicitly accepted the latter's double criterion for the successful analytical use of the equilibrium construct — that it must provide a bridge from static equilibrium to causal explanation and that, in order to do so, the economist must confine himself, when utilizing the construct, to a system close to full intertemporal equilibrium. Unlike Hayek, however, Lachmann rejected the idea that the world was near such an equilibrium. Given this rejection, he could not justify use of the intertemporal equilibrium construct *on Hayekian grounds*. The key to Lachmann's rejection of this close-to-equilibrium hypothesis lies in his prior rejection of the assumption of static conditions, an assumption that pervades much of Hayek's analysis. Hayek is a process economist only in a limited sense, that is, to the extent that he is concerned with the issue of how unchanging data are disseminated throughout a system (Rizzo 1990:25). Because Lachmann took time and change very seriously, he had to scrutinize this basic empirical assumption. Hayek's "dynamic" equilibrium of plans incorporated only a static notion of time. Lachmann on the other hand, was concerned with a dynamic conception of time as involving endogenously-generated changes in "data."<sup>10)</sup> It is this concern that led him ultimately to question general intertemporal equilibrium.

Hayek attempted to dynamize the concept of equilibrium by extending it to include plans. Since a plan is an integrated sequence of intended actions through time, the compatibility of plans encompasses the compatibility of actions through time. In this sense, Hayek believed he was integrating equilibrium and time.<sup>11)</sup> Such a dynamic equilibrium can only be a

full intertemporal equilibrium. It is homogeneous, one set of plans, and it is a retrospective equilibrium. It does not expect people to change their plans on the other hand. These weak plans of behavior are described as not in equilibrium or sellers' equilibrium. That one is not in equilibrium. Because people can revise their plans. This will be a problem. Thus, that includes

Divergence of "technical" equilibrium from the supply and demand equilibrium. The purchase and sale of congruent purchases and sales of housing and other goods. The

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full intertemporal equilibrium if the expectations of all interacting parties are homogeneous or consistent. Without consistent expectations at least one set of actors will ultimately experience disappointment and thus, in retrospect, would be in disequilibrium. Suppose, for example, sellers possess an existing stock of weapons that they plan to sell soon because they expect peace in a year and hence a fall in the price of weapons. On the other hand, let us imagine that there are buyers who plan to purchase these weapons because they expect war and hence a rise in prices. The plans of both parties *are* mutually compatible, but the situation cannot be described as a full intertemporal equilibrium.<sup>12)</sup> This is because the actors are not in individual equilibrium. After the year elapses, either the buyers or sellers will experience disappointment. The passage of time will reveal that one side of the market based its decisions on mistaken expectations. Because plans are interrelated, those who are disappointed will doubtless revise their as yet unimplemented plans for further purchases or sales. This will result in lack of co-ordination in other parts of the economic system. Thus the absence of individual equilibrium will have repercussions that include the breakdown of the *ex ante* mutual compatibility of plans.

Divergent expectations generate disequilibrium not only in the above "technical" sense but also in a more dramatic intermarket sense. Consider the suppliers of housing materials who expect consumers to increase their purchases of houses in the next six months. If these expectations are not congruent with those of consumers who expect, perhaps, to make large purchases of other consumer durables instead, there will be losses in the housing-supplies industry. These losses will arise from a lack of convergence of expectations and thus from disequilibrium between the two markets. There will be too many housing supplies for too few houses.<sup>13)</sup>

The divergence of expectations, which Lachmann believed was an ineradicable feature of the real world (1978:3), is firmly based on the subjectivism of interpreting or projecting the future on this basis of current facts. The elimination of divergence is not only "unrealistic" but also "humanly impossible" (1978:5). In the absence of a determinate future and of the One True Method of predicting it, different individuals will clearly have different expectations. Thus, "we should abandon all concern with a 'dynamic equilibrium' in the sense of a state of affairs in which all expectations are consistent" (*ibid.*).

## 5. A SECOND LOOK

The foregoing seems to imply abandonment of the construct of general intertemporal equilibrium. The significance of this, were it to take place on a

large enough scale, goes beyond a change of techniques in formal economic theory. It extends to the economists' vision of the systematic nature of market processes and the degree of plan compatibility attainable. An uncompromising interpretation of Lachmann would lead to a deeply pessimistic view of the direction of market processes and of the prospects for the co-ordination of plans. We can, however, find an alternative interpretation in Lachmann's earlier ideas. In 1971 he made the following statement: "(T)o deny the significance of general equilibrium is not to deny the existence of equilibrium forces. It is merely to demand that we must not lose sight of the forces of disequilibrium and make a comprehensive assessment of all the forces operating in the light of our general knowledge about the formation and dissemination of human knowledge" (1977:189-90).

The key to this alternative argument is to emphasize his rejection of the *state* of general intertemporal equilibrium, rather than of the construct altogether. If we "abandon all concern with a 'dynamic equilibrium' in the sense of a state of affairs" (1978:5), how can we accept the idea of equilibrating forces? Hayek had argued that closeness-to-equilibrium is a requirement for the assurance of equilibrating movements and since Lachmann seemed to accept this idea, it is hard to see how he could claim both that general equilibrium is a fantasy and that there exist significant equilibrating forces. It is therefore important at this stage to clarify what the Hayekian argument implies and what it does not. Closeness-to-equilibrium is required to ensure that *every* force or movement is in the direction of equilibrium. It is not necessary to ensure that *some* (or even most) forces are in this direction. Hayek's argument rests on the ease with which correct knowledge can be acquired in different cases. It is only in the special circumstance of nearness-to-equilibrium that agents will always, or almost always, acquire correct information and make correct predictions about the future. It is unnecessary for a satisfactory theory "to show that *every* stage of the market process 'points' in the direction of equilibrium" (emphasis added). Although "a process may have a direction at each point of time it may change directions over time. The direction the process follows need not be the same throughout" (Lachmann, 1976:130).

If there are both equilibrating and disequilibrating forces, how can the construct of general intertemporal equilibrium be useful? The answer is there is nothing that requires a useful equilibrium idea to function as a center of gravitation in respect to *each and every* movement in disequilibrium. It is sufficient that there be movements in a equilibrating direction often enough to make the toil and trouble of equilibrium construction



worthwhile. Obviously this is a matter of scientific judgment, rather than of scientific precision.

#### 6. FORECASTING AMID INDETERMINACY

Lachmann strenuously argued that individual decisionmaking is not a determinate function of external facts, that is, the objective physical data and the plans of other relevant individuals (1971:36; 1986:112-16). It is rather a spontaneous and creative act, one which could be characterized as originative. But how far did he go in insisting on indeterminacy? His arguments often contained a good deal of ambiguity. Nevertheless, he clearly rejected the idea of determinacy in the sense of a one-to-one function. The same external circumstances (including the expectations and plans of other people) do not always give rise to the same interpretations and decisions. Different individuals, faced with the same external circumstances, will make different decisions. And sometimes these decisions will vary widely.

This produces a possible problem. To the extent that agents' forecasts vary, expectations will not converge and general intertemporal equilibrium will not be attained. But, under these circumstances, it also seems unclear that expectations will change in the correct direction, so that even movements *toward* equilibrium might be problematic. Therefore, Lachmann's insistence on the indeterminacy of decisionmaking appears to be at war with his admission that there can be systematic equilibrating forces.<sup>14</sup> This is a problem, however, only to the extent that expectations continually vary widely. There is no doubt that some parts of Lachmann's work give the reader the impression that variation can be boundless. Yet his explicit statements are to the contrary. "Human action is not determinate, but neither is it arbitrary," and "human action is free within an area bounded by constraints" (1971: 37). Unfortunately, aside from resource constraints and the need to pursue consistent plans, not much is said directly about such bounds.

Individuals are not completely different and so, while expectations diverge, they do not normally diverge by amounts so large as to render the probability of equilibrating forces nil. The suppliers of housing materials are not so different from the purchasers of homes that the former can know nothing of the plans of the latter. We inhabit an inter-subjective "life-world" (Schutz and Luckmann, 1973). Lachmann's emphasis on the importance of institutions is an implicit recognition of this fact (1971:49-141). In addition, changes in expectations are not always widespread or

drastic. After all, "(t)he daily flow of the news will affect (only) some of the divergent expectations" (1978:4). Not everyone changes his mind with each change in the data. Thus, the divergence of expectations is limited in two general ways: (1) by the bounds generated at the individual level, such as resource constraints and the constraints imposed by the agent's previous decisions; and (2) by the common stock of knowledge, opinions and methods of interpretation and inference shared by members of a society. So while expectations diverge, they do not do so in a boundless or uncontrollable way. Lachmann can rightly be criticized for not emphasizing these limits. Nevertheless, a fair reading of his work does reveal a deep concern with social institutions, the non-arbitrary and bounded nature of decisionmaking, and a comprehensive assessment of both equilibrating and non-equilibrating forces. All of this contains the elements of a reconstructed genetic-causal approach to equilibrium theorizing.

## 7. CONCLUSIONS

In this brief survey of some Austrian views on equilibrium and equilibrating adjustments, we have witnessed the gradual attempt, to apply, at increasingly lower levels of abstraction, the concept of equilibrium to actual processes. Mises sometimes treated the equilibrium construct as an analytical tool for understanding what individuals are attempting to achieve in their action and planning. Hayek wanted to build a bridge from static equilibrium to the causal analysis of processes through time. He believed that the analytical construct of general intertemporal equilibrium could, under the assumption that the system is near equilibrium, tell us in what direction adjustments are headed. When we are farther from equilibrium the analysis "is no longer so simple." Lachmann agreed with Hayek that the empirical relevance of an equilibrium construct justifies its analytical role. Lachmann thought that Hayek had down-played the disequilibrating forces, preferring to view them simply as exogenous shocks, instead of as endogenous developments. Lachmann was interested in a comprehensive assessment of both equilibrating and disequilibrating forces. He tended to emphasize the latter sometimes at the expense of the former. There is no doubt, however, that he saw the task of genetic-causal economics to be an empirically or historically orientated analysis of economic process, with different equilibrating strengths, across many markets over various periods of time. This is an important and exciting research agenda, one which should not be lost among the many theoretical speculations which Lachmann's work may inspire.

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# FOOTNOTES

1. For an interesting summary of this school of thought see Phelps (1990: 52-65).
2. The genetic-causal tradition is explored in Cowan and Rizzo (1990).
3. All references to Mises's writings are to Mises (1966) unless otherwise indicated.
4. All references to Hayek's works are to Hayek (1941) unless otherwise indicated.
5. Stock prices may provide information to those outside of the industry.
6. By "close" to equilibrium we mean there are only a few prices that deviate from general intertemporal equilibrium.
7. There are many references throughout Hayek's works to these observations. See Hayek 1941:18, 27, n. 2, 1948b:95-96, and 1948a:51.
8. It is not easy empirically to distinguish planned from unplanned price changes, and planned from unplanned inventory adjustments.
9. This is Hayek's view (1948a:51).
10. A discussion of the dynamic conception of time is contained in O'Driscoll and Rizzo (1985:79-88).
11. For a criticism of this idea, see O'Driscoll and Rizzo (1985:79-88).
12. For a discussion of Hayek's conception of full intertemporal equilibrium, see Rizzo (1990:16-18).
13. The market for housing supplies will clear, however. See Lachmann (1986:142-43) for his favourable view of Marshallian partial equilibrium.
14. This is obviously not a problem if equilibrating forces are conceived as arising randomly rather than systematically.

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