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ABSTRACT

Hayek's Four Tendencies Toward Equilibrium

In the first section of this essay we distinguish between analytical and empirical tendencies. This distinction is central to the subsequent analysis. In the second section we present a very brief overview of the four meanings that Hayek attaches to the general term "tendency toward equilibrium." Section Three digresses from our main task to provide the reader with a clear picture of the equilibrium toward which it is claimed we are tending. Section Four is the heart of the article. Here we explore in considerable detail the characteristic features of each of the tendencies. In Section Five we conclude that although we have found no critical flaws in the basic structure of his analysis, Hayek, nonetheless, has failed in his effort to provide us with a genuinely causal analysis of the process of equilibration.

It is my conviction that if we want to explain economic phenomena at all, we have no means available but to build on the foundations given by the tendency towards an equilibrium.

Friedrich A. Hayek [1967:34]

The idea of a tendency toward equilibrium occupies a critical position in the structure of modern economics. One group of economists, exemplified by Franklin Fisher [1984], believes that only the existence of a strong and rapid tendency justifies the dominant preoccupation with equilibrium states. In the absence of this tendency there is no assurance that equilibrium states reflect or are descriptive of the real world. The correspondence between subjective beliefs and objective facts, the fundamental requirement of equilibrium, is not something simply given to us. It can occur only if there are systematic forces driving the system toward such correspondence. As soon as a rapid tendency is demonstrated, however, economists of this "school" can presumably return to equilibrium analysis with a newly-found ease of conscience.

Another group of economists, sometimes referred to as embodying the "genetic-causal" approach [Fossati, 1965: 43-44], is exemplified by Friedrich Hayek. For these economists the central task is to explain how an equilibrium, or more exactly a near-equilibrium, could come about. The method used for this task is cause-and-effect analysis. The primary cause of action outside of equilibrium is a change in the individual's beliefs about what others will do or about the external world. The usual unintended effect of such changes, it is argued, is to move the entire system closer to the

equilibrium state implied by the initial technical data. But since equilibrium is never actually achieved, the primary occupation of economists must be to study causal processes. Disequilibrium analysis is not simply a prelude to or foundation for equilibrium analysis. It is the primary concern of economists. Nevertheless, the tendency toward equilibrium is the fundamental governing principle in the analyses employed by most economists using this approach.

Despite its obvious importance, there is a good deal of confusion underlying discussions of the tendency toward equilibrium. We believe that some of the confusion can be cleared away by a close study of Hayek's thoughts on this subject. While his ideas span a forty-year period and are understandably not consistent with each other in every respect, they do provide us with a profound and largely unified analysis. Many other economists have surpassed Hayek in technical and mathematical virtuosity, but few have matched him in exposing and elucidating the fundamental issues. In this article we shall probe deeply into Hayek's ideas. In part we shall cover what is explicit in his work, but, for some reason, not widely appreciated. And in part we shall extract, rationally reconstruct, and extend what is only implicit in his analysis. Therefore, while this is primarily an article on Hayekian economics, it is also, inevitably, an article in Hayekian economics¹.

In the first section of what follows we distinguish between analytical and empirical tendencies. This distinction is central to the subsequent analysis. In the second section we present a very brief overview of the four meanings that Hayek attaches to the general term "tendency toward equilibrium." Section Three digresses from our main task to provide the reader with a clear picture of the equilibrium toward which it is claimed we

are tending. Section Four is the heart of the article. Here we explore in considerable detail the characteristic features of each of the tendencies. In Section Five we conclude that although we have found no critical flaws in the basic structure of his analysis, Hayek, nonetheless, has failed in his effort to provide us with a genuinely causal analysis of the process of equilibration.

I. ANALYTICAL AND EMPIRICAL TENDENCIES

The tendencies we shall be discussing are those that inhere in market processes generated by disequilibria. Before we can understand the nature of the state toward which a tendency propels a system, we must understand the two senses in which the term "tendency" is used.

As long ago as 1831, Richard (Bishop) Whately [1855] saw the ambiguity in the way in which economists used, and still use, the word. There are two basic meanings. First, by "a tendency toward a certain result is sometimes meant 'the existence of a cause which, if operating unimpeded, would produce that result' " [Ibid: 164]. Second, "sometimes, again, a 'tendency toward a certain result' is understood to mean 'the existence of such a state of things that the result may be expected to take place' " [Ibid: 165]. The first is what we shall call the "analytical tendency;" the second the "empirical tendency."

An analytical tendency can exist independently of any actual outcome or set of outcomes.² Elaborating Whately's definition, J.S. Mill [1974: 161] defined an analytical tendency as "a power with a certain intensity in [a

certain] direction." When the specific outcome, toward which the tendency is directed, does not emerge, it is not because the tendency admits of exceptions. To a tendency law "there is no exception." The reason is that there is "some other force which impinges against the first force, and deflects it from its direction" [Ibid: 162]. Therefore, an analytical tendency is an individual power that drives the system, without exception, toward some result. This power or potential is fully actualized only in the absence of disturbing causes.

Sometimes there can be least two or more conflicting "tendencies." Usually, however, one is considered the tendency and the other the disturbance. But how should we distinguish between the two? Mill apparently believed it is simply a matter of the standpoint of the analyst. "[T]he force...being the less conspicuous of the two, is called the disturbing force" [Ibid.]. Unfortunately, this is too facile an answer. There are actually two reasons. The first is related to the way we can understand the full development of market processes. We shall concentrate on this later. The second depends on the economist's empirical estimate of which force is dominant. The dominant force is often given the appellation "tendency". The second reason is valid but it reduces the analytical tendency to a mere handmaiden of the empirical tendency. For this reason it is not useful to pursue this terminological practice here.

An empirical tendency is a generalization about what outcome is approximately produced in most actual situations. Mill stressed that in any real-world context, "effects are commonly determined by a concurrence of causes" [Ibid: 160]. Often "there are two laws [a 'tendency' and a 'disturbance']... bringing about a common effect by their conjunct operation"

[Ibid: 162]. If there is an empirical tendency toward that outcome specified in an analytical tendency, then the latter must be the dominant force. It must be more powerful than any disturbing force. Since an empirical tendency is an assertion about the actual world, it must involve a net weighing up of conflicting analytical forces.

II. HAYEK'S FOUR TENDENCIES: AN OVERVIEW

There are four senses in which Hayek uses the term "tendency toward equilibrium ": two of them are analytical, and two empirical. In this section we shall provide a brief thumbnail sketch of each of these, to be followed later with a more detailed analysis.

1. Analytical Tendencies

In each of the analytical cases the forces generated by a disequilibrium will, if unimpeded by forces outside of the model, definitely reduce an equilibrium. The differences between the two cases lie in both the type of equilibrium produced and the degree to which appropriate external (exogenous) conditions are needed for the result.

a. Strong Analytical Tendency

This tendency is "strong" because it impels the system toward a specific result quite independently of any cooperating external conditions. Nothing external to the model is required to attain the postulated

equilibrium. As we shall see, the strength of the tendency is, in part, made possible by the limited form of this equilibrium. Here the equilibrium is simply one of the mutual compatibility of plans. This is a state of affairs in which everyone can implement his plans as long as the external data does not change. Yet in such an equilibrium it is possible for there to be an incomplete dissemination of available knowledge which, if completely disseminated, would doubtless affect the nature and content of the individual plans. As such, this equilibrium is not Pareto-efficient in the strongest sense.

b. Weak Analytical Tendency

This tendency is "weak" because it requires the cooperation of external conditions. The system or the corresponding model does not have within its own confines all that is necessary to produce a new equilibrium. The agents are not bound to find out, in the process of adjusting, all they need to know for the attainment of equilibrium. The weak tendency appears in the context of a movement toward an equilibrium that is more complete than in the previous case. Here market forces will have completely disseminated all available knowledge and exhausted all profit (arbitrage) opportunities.

2. Empirical Tendencies

In each empirical tendency a claim is made about how the world looks. It is a claim about the "unity and coherence of the economic system" [Hayek, 1948b: 106]. Much of Hayek's normative economics rests on the existence of this kind of tendency.

a. Tendency toward Perfectly Competitive Equilibrium

This tendency asserts the existence of a state of near-equilibrium. This equilibrium embodies an approximation to most of the characteristics of the perfectly competitive model. The approximation is not, however, close enough to ignore the degree to which the real world falls short of the model. Hayek's primary emphasis lies in explaining how this situation comes about.

b. Tendency toward Maximum Coordination

Here the process of adjustment results in a much looser form of equilibrium. (In fact Hayek prefers not to call it an "equilibrium" [1978: 184].) This is characterized by a maximum compatibility of plans and dissemination of knowledge, subject to adaptation to constant changes in the system's external data. How close is this to full compatibility and full dissemination of knowledge? It need not be very close. It is simply the case that competitive market processes will bring us closer than by any other means.

III. WHAT IS EQUILIBRIUM?

The "plan" is the basic unit of analysis. A plan is a consistent and integrated set of intended actions through time. If an individual's actions can be interpreted as part of a single personal plan, these actions are in an ex ante equilibrium relationship to each other. [Hayek, 1948: 36] This ex

ante equilibrium is a state which follows simply from the assumption of rationality, subject, of course, to limitations of knowledge on the part of the individual. If during the implementation of the plan, nothing unexpected happens, then the individual's actions are in ex post equilibrium [Ibid: 37].

In society as a whole there is a similar division of equilibria into ex ante and ex post. One type of social equilibrium exists, in the ex ante sense, if the plans of the individuals are "mutually compatible" [Ibid: 40]. Mutual compatibility of plans means two things. First, each individual must base his intentions on a correct expectation of what others are intending to do. If the demanders of apples intend to buy 6 at \$0.25 each, the suppliers must intend to sell 6 at \$0.25 each. Second, each individual must base his intentions the same set of expected external events (that is, all relevant events other than the plans of other people). This requirement is for the homogeneity of expectations. It excludes the possibility of mutually consistent plans based on heterogeneous expectations. If, for example, buyers intend to purchase 10 umbrellas tomorrow because they think it will rain, and sellers intend to sell 10 umbrellas because they think it will be sunny, we do not have ex ante compatibility of plans in Hayek's sense. There is no single set of events that could occur that would enable everyone to implement his original plan successfully. There is ex post compatibility of plans if the common expectations upon which the plans were based turn out to have been correct. In such a world everyone will be able to implement his plan fully in accordance with his preferences, and no plans will be revised.³

The mutual compatibility of plans is not, in and of itself, an optimum position [Ibid: 53]. Individuals could be trading with each other in perfectly compatible fashion without being aware of superior knowledge,

existing somewhere in the system, that would affect either the terms or content of their trades. The existence of superior knowledge somewhere means that there is still incomplete coordination and hence less than full equilibrium. Suppose, for example, that apples are being produced at \$0.10 each in New York where there is superior technology, and at \$0.20 each in Washington state where the producers are unaware of that technology. This is consistent with the New York consumers planning to pay \$0.10, Washington consumers planning to pay \$0.20 (that is, with clearing markets in both locations), and yet with an unexploited profit opportunity. Technological knowledge can be discovered or purchased by Washington producers, initially earning them profits. Such dissemination of knowledge would increase the coordination and coherence of the economic system [Hayek, 1948b: 95-96, 106].⁴ Knowledge is completely disseminated ex ante if all of the relevant economic knowledge has been disseminated by the time people make their plans. Ex post dissemination prevails if no new discoveries are made between the making of plans and their implementation.

A full Hayekian equilibrium thus has three requirements: (1) equilibrium of the individual; (2) mutual compatibility of plans; and (3) complete dissemination of knowledge. These requirements imply the exhaustion of profit opportunities or the (full) coordination of the economic system. In what follows we shall be directly concerned with equilibria in only the social sense (that is, requirements (2) and (3)).

IV. FOUR TENDENCIES: A DEEPER VIEW

For Hayek the theory of economic processes and dynamic competition begins with the fact that most of the time something close to equilibrium characterizes the actual world in which we live [Hayek, 1948a: 51-52; 1941: 27, n.2]. The economist begins with two "observations": first, the correspondence of the subjective data of many individuals to the objective facts; and second, the approximate equality of prices and costs. The plainest manifestation of the first is the mutual compatibility of plans. Only when individuals hold correct expectations of what others will in fact do can their plans be compatible. The second observation is manifest in the rough equality of prices and the average costs of the best technology in the industry. From this we could infer the efficient dissemination of technological and possibly other kinds of knowledge as well.

1. Analytical Tendencies

To say there is an (analytical) tendency toward equilibrium is, in our interpretation of Hayek, equivalent to saying that market processes responding to changes in the data all have an inner impulse to produce an equilibrium. This inner impulse can be disturbed or deflected, of course, by external factors. But what exactly is an "inner impulse"? An inner impulse to equilibrium is a causal process with three characteristics: (1) It is initiated by something explicable within the system itself, that is, specifically, by disequilibrium profits; (2) It is completely equilibrating, or to be more exact, there is nothing internal to this process that is

disequilibrating ; and (3) The terminus of the undisturbed process is implicit in the initial data of the system.

a. Strong Analytical Tendency

Let us suppose that for some reason people have made plans which, unbeknownst to them, are mutually incompatible. In attempting to implement these plans they will find that they cannot. For any individual who finds himself in the situation, "it may be inevitable that in the course of his attempt he will find the facts are different than he expected" [Hayek, 1948a: 52, emphasis added]. Furthermore, "the relevant knowledge which he must possess that equilibrium may prevail is the knowledge which he is bound to acquire in view of the position in which he originally is, and the plans which he then makes" [Ibid: 53, emphasis added]. Two very different claims are being made here. First, people will find out that they were wrong about what others were planning to do and, possibly, about the external data as well. Second, under certain circumstances, people will acquire the correct knowledge they need for equilibrium to be brought about. The second kind of learning will take place because of the presence of negative feedback: Those who continue to make mistakes will suffer losses. However, "negative feedback... will produce an increased correspondence of expectations of the different persons so long as current prices provide some indications of what future prices will be, that is, so long as, in a constant framework of known facts, always only a few of them change..." [Hayek, 1976: 125, emphasis added].

Near-equilibrium thus seems to be a necessary condition for the spread of correct foresight about what others will do and for the homogenization of opinion about the external data. Hayek does not offer the additional

conditions that would provide a sufficient explanation of the learning that actually does take place. In fact, the above statement is close to a truism. Expectations will become homogeneous as long as "current prices provide" the same indications to everyone "of what future prices will be." Read more charitably, however, Hayek has in mind an incompletely worked-out model in which people are bound to learn the "right" things, that is, a model in which the causal process generated by disequilibrium is indeed sufficient to attain equilibrium.

An example of the strong analytical tendency can be found in Hayek's discussion [1967] of the depression phase of an artificially-induced credit expansion by the Central Bank. At first during the expansion, interest rates fall. This increases the value of goods farther from the consumption stage (capital goods) relative to the value of a goods closer to consumption (consumer goods). The value of a good that will bear its fruit in the farther future will be affected by a fall in the interest rate - the factor used to discount future product - to a greater extent than a good which is consumable now or in the nearer future. Accordingly, the profitability and output of capital goods industries will increase at the expense of consumer goods industries. Sooner or later, however, the Central Bank will slow its credit expansion and the interest rate will rise again and business loans fall. Capital goods industries will then be unable to attract all of the labor and raw materials necessary to complete their projects. This is because, with a higher interest rate, some spending has now shifted to consumer goods industries where factors of production can earn relatively more. Therefore production of capital goods can no longer be carried on profitability to the same extent as before. The shortage of factors at a critical stage in the

production process and the lower profitability of capital goods ensures that people are bound to learn that they must contract their activities. The corresponding surplus of factors that emerges in the consumer goods industries enhances the profitability of production there in a way that is also too obvious to miss. So market participants are portrayed as bound to learn what is necessary to restore equilibrium after the disequilibrating effects of an expansionary credit policy.

As we have seen, the strong analytical tendency exhibits an inexorable internal impulse to equilibrium if the system is undisturbed by outside forces. In this setting the picture of an equilibrium state toward which we are moving renders the learning process intelligible.⁵ What people are learning is what will produce an equilibrium. We can understand the kinds of learning that take place by reference to the equilibrium state of affairs they jointly produce. Of course, this is not a full causal analysis. Equilibrium per se says nothing about the motives people have for learning, or how and in what steps they acquire the requisite knowledge. Instead, the equilibrium concept in conjunction with a strong analytical tendency "provides the bridge from equilibrium analysis to the explanation in terms of causal sequences, since it is designed to elucidate the factors which will compel entrepreneurs to change their plans and to help us understand the way in which their plans will have to be changed" [Hayek, 1941: 23, emphasis added]. Thus, the assumption of a strong tendency toward equilibrium allows us to locate an implicit dynamic in every statement of equilibrium conditions. It is this, inter alia, that allows Hayek to take the results of equilibrium theory and use them for the analysis of change.⁶ A causal analysis, however, requires us to make explicit the dynamics of the strong tendency.

It is probably true that we can show people are bound to learn that which will produce an equilibrium only under highly restrictive conditions. If this is indeed the case, then the strong tendency is unacceptable as a general explanation of how a system actually attains an equilibrium or near-equilibrium. We could not object, as Hayek does, to simply assuming that all relevant knowledge is disseminated and all plans are mutually compatible, and then be justified in assuming that market participants have superhuman learning capacities. This is why Hayek establishes, as we saw earlier, the requirement that a system will exhibit a tendency toward equilibrium only if it is already near equilibrium. The plausibility of a learning process that is bound to discover the right things is greater, it seems to us, the nearer we are to equilibrium. Consequently, the adaptation of the strong tendency to the business-cycle context is particularly disturbing. It is hard to argue that business cycles, especially of the magnitude of the Great Depression, are Hayekian near-equilibrium phenomena. Therefore, the learning that occurs at a presumably far-from-equilibrium crisis point is more problematic than Hayek would have us believe. Decisions at that point might compound, rather than correct, previous mistakes.

The sufficiency of a learning process to generate the kind of knowledge needed to attain an equilibrium is troublesome in yet another way. If the factors sufficient to learn the truth are present at every stage of the process, why does learning take time? Why isn't everything that will be learned eventually, learned immediately [O'Driscoll and Rizzo, 1985: 52-59]? In the business-cycle case, the cycle would probably never get started in the first instance. People would know ex ante that the movement toward greater output of capital goods and then back again to less only produces a net loss

in wealth. Hence they would avoid the entire dreary affair [Lachmann, 1977: 79].⁷

b. Weak Analytical Tendency

In order to understand more fully the weak analytical tendency toward equilibrium, we must distinguish between two types of error in disequilibrium. The first is an error of overoptimism. In this case buyers and sellers "deliberately pass up desirable opportunities in the erroneous belief that still more attractive opportunities can be secured" [Kirzner, 1963: 114]. This kind of error results in the mutual incompatibility of plans. Some sellers, for example, will be frustrated in their attempts to sell at a given price simply because buyers wrongly think they can buy more cheaply elsewhere. In the course of trying to implement their plans the buyers will "inevitably" learn that they are holding out for too low a price. It is this general type of error that Hayek implicitly had in mind when he developed the strong analytical tendency. The second type of error, however, is consistent with the compatibility of plans. In this circumstance buyers and sellers "unwittingly pass up superior opportunities...in favor of inferior opportunities" [Ibid.]. An example of this error of overpessimism is the classic case of buyers and sellers exchanging at two different prices on the same market. One buyer and one seller in each pair are passing up a better opportunity, although there is perfect plan compatibility.⁸ The individual "may learn of the new facts as it were by accident, that is, in a way which is not a necessary consequence of his attempt to execute his original plan..." [Hayek, 1948a: 52]. Hayek's use of the word "accident" is unfortunate in this context. Learning new facts, should it occur, is not simply a random event.

It is a response to the incentives provided in disequilibrium by profit opportunities. Hayek could not fail to understand this. What he means is that successful learning is not the essence of the process. Attempts to acquire new knowledge, in response to the lure of profit, are necessary, though not sufficient, to produce the requisite learning.

To appreciate the full importance of the weak analytical tendency we must, for the remainder of this section, go beyond Hayek's own understanding. Let us begin by exploring an analogy with the growth of an acorn into an oak-tree. An acorn does not inexorably grow into a tree. In fact, most do not. The activity of an acorn is not sufficient for that. There must be some cooperation from outside forces like sunlight, rain, etc. Nevertheless, "the acorn is an indispensible condition for the ultimate appearance of the adult oak-tree" [Toulmin and Goodfield, 1962: 85, emphasis added]. A necessary, but insufficient, acorn-process is rendered intelligible by reference to its full development. We can better understand both the source of a process and its detailed steps, if we understand why it would stop. Profit opportunities generate and guide the process of learning while the elimination of such opportunities is the "why" of the process stopping.⁹ It is "a final stage to which the whole process of growth is relative," and in the terms of our analogy, "in which the germ or sapling is no longer becoming but is an adult - oak..." [Taylor, 1955: 51]. The final stage enables us to close the book on the process, and thus to understand its full potential.

The importance of focusing on both the end as full development and the end as conclusion of a process can be further elucidated by turning our attention to the insufficiency of that process. Surprisingly, this very insufficiency contributes to its teleological character. A genuinely and

consistently sufficient process does not become anything. It is whatever it is from the outset. To have a real process of becoming, something necessary for the result must have been missing. To put matters another way, something necessary must be added as things develop. This means that it is impossible to reduce our understanding of a teleological process to non-teleological terms. The "something necessary" that must be added can only be identified by focusing on the final outcome. The process can never be backward-looking. In terms of our understanding of market adjustments, the knowledge available to individuals at early points in the process is not sufficient to produce the final outcome. Genuinely new knowledge must be added. The source of this has been called "alertness" to profit opportunities [Kirzner, 1973]. There must be a creative or entrepreneurial leap beyond the currently-available information. So a teleological market process cannot be reduced to its past, that is, to those things already known. It can be understood only by reference to one possible future. This future must be one in which learning has stopped in order for there to be a natural terminus of the process and hence of the explanation.

If a process is successful in attaining a new equilibrium, we can readily understand the usefulness of the claim that it has a tendency to do so. But of what use is the idea of a weak analytical tendency when economic processes do not attain their complete development? The answer to this question is surprisingly simple. We can understand the actual path of the economy as a failure to attain equilibrium. If we know, in broad terms, what is necessary for equilibrium, then we have a structure within which we can frame an explanation of whatever happens. It is an elucidation of the failure of a process to satisfy those necessary conditions that constitutes an

explanation of the actual outcome. Suppose, for example, a market is characterized by an unsatisfied (excess) demand for butter. We know that, spurred on by the possibility of profit, producers will try to guess consumer demand during the next period. If they do, then equilibrium will be achieved, and there will be no further internal impulses making for change. If they do not, we would probably search for an explanation of their failure to guess accurately. Real-world entrepreneurs would continue to readjust their production plans in the hope of doing better in the next period. As we can see, the explanation of an equilibrium failure proceeds as a failure to attain a certain development. The equilibrium construct points to the relevant factors and, indirectly, to the relevant processes.¹⁰

2. Empirical Tendencies

As we have seen, an empirical tendency is a generalization about what is approximately produced in most concrete situations. For Hayek, "In this sense 'tendency' does not mean...a movement towards a certain magnitude." Instead, "a given phenomenon may tend to (approximate towards) a certain magnitude if in a great number of cases it may be expected to be fairly near that magnitude..." [Hayek, 1941: 27, n.2]. The source of this tendency is the combined operation of the two analytical tendencies previously discussed. The kind of empirical tendency that is brought about depends on the circumstances in which the analytical forces do their work. (This should make clear that the analytical tendencies are not simply heuristic constructs, but refer to forces in the real world.) When changes in the data are few or happen slowly, Hayek believes that there is an empirical tendency toward perfectly competitive equilibrium. This, of course, does not mean that the system

actually attains a perfect equilibrium but that it simply approximates one. When, on the other hand, changes in the data are large in number or happen rapidly, there is an empirical tendency to maximum, but not full, coordination. Full coordination is a complete Hayekian equilibrium in which all plans are mutually compatible and all profit opportunities have been exhausted. In the limiting case of no or few data changes, there would be a state of full or almost-full coordination. This would be the equivalent of perfectly competitive equilibrium (or near to it). But in the general case, maximum coordination can be far from such an equilibrium. The usefulness of the idea of maximum coordination is potentially greatest in exactly such circumstances.

a. Empirical Tendency toward Perfectly Competitive Equilibrium

For Hayek the primary justification for the use of an equilibrium concept is that real-world conditions "approximate towards a state of equilibrium" at least to "some extent" [Hayek, 1941: 27]. While there are serious questions about whether it is possible to observe a state of equilibrium [Machlup, 1967: 56-8], we shall not raise these here. Let us instead examine the precise kind of equilibrium to which Hayek is referring in his empirical claim. For most of his intellectual career this appears to be something like the perfectly competitive equilibrium of Vilfredo Pareto and Leon Walras. The process of competing "tends to bring about (or to approximate)" perfect competition [Hayek, 1948b: 92]. This involves the mutual compatibility of plans [Hayek, 1941: 18], the approximation of prices to costs [Ibid: 27, n.2], and the dissemination of knowledge [Hayek, 1948b: 95-96]. We have learned from "experience" that "something of [this] sort does happen" [Hayek, 1948a: 51]. All theorizing about the various learning

problems associated with the analytical tendencies toward equilibrium must begin from this basic observation. In effect Hayek is saying we already know that learning will, to a great extent, be successful. Consequently, he believes that our models must reflect this knowledge.

The processes of equilibration also depend on this empirical tendency in an important way, as we shall see in greater detail later. The existence of a strong analytical tendency is plausible only when we are close to equilibrium in the first place [Hayek, 1941: 23, n.1]. Informational problems of the individual grow as the distance from equilibrium grows. So the strength of the tendency toward equilibrium decreases the farther we are from equilibrium and vice versa.

Despite the alleged real-world approximation to a perfectly competitive equilibrium, Hayek is not comfortable in basing the normative case for the competitive process on the optimality features of perfectly competitive equilibrium. His approach is instead to make a comparative institutional claim: The process of competition generates an "improvement upon the conditions that would exist without competition" [Hayek, 1948b: 100; 105-106]. Since we are never, in a strict sense, at equilibrium, what we observe is always disequilibrium phenomena. If we make the case for competition based on the optimality properties of equilibrium, the world will, quite erroneously, always appear to be suboptimal. Yet we are only as close to optimality as we are because of the working of the competitive process. Without it, we would be still farther away. Nevertheless, as Hayek does not sufficiently recognize, if we are indeed always near equilibrium, the optimality analysis of a perfectly competitive economy cannot be entirely without merit.

b. Empirical Tendency toward Maximum Coordination

Hayek believes that when we are far away from a full equilibrium less can be said about the direction in which the economy will move in response to disequilibrium. His sentence, "The statement of the conditions under which individual plans will be compatible is therefore implicitly a statement of what will happen if they are not compatible" [Hayek, 1941: 23] is immediately qualified by "This is strictly true only if we are thinking of a single deviation of a particular element in a situation which is otherwise in equilibrium..." [Ibid: 23, n.1].

The strong analytical tendency is a tendency to learn what is near, in time or in knowledge, to what is already believed. It is the kind of knowledge which is bound to be confirmed or refuted in the course of the execution of individual plans, or the kind "which people will acquire in the course of their economic activity" [Hayek, 1948a: 55]. The weak analytical tendency is a tendency to find knowledge which is already available somewhere else in the system, such as the consumption and production plans (or resources) of others. These, however, are generally the plans of those whose future behavior is not very far from their current behavior. In fact, Hayek specifically says he is dealing with the dissemination of available knowledge that is needed to adapt to "minor changes" [Hayek, 1978: 188]. He will not consider the advance of technical knowledge [Ibid.] nor, presumably, any other discovery which is original from the social point of view, such as the first discovery of a resource. These would be a "change in the data" and "equilibrium analysis can really tell us nothing about the significance of such changes in knowledge" [Hayek, 1948a: 55].

In order to deal simultaneously with the changes of a dynamic economy and the requirements of equilibrium theory, Hayek develops a concept of "order." This concept, unlike that of equilibrium, has "the advantage that we can meaningfully speak about an order...being preserved throughout a process of change" [Hayek, 1978: 184]. The "change" Hayek explicitly recognizes consists of unexpected endogenous or adapting changes. When the data change, expectations with regard to the wealth or income of those doing the "wrong" things must be disappointed, in order to encourage them to adapt their behavior to the new circumstances. This does not result simply in wealth or income losses. It also results in a certain increase in plan incompatibility during the trial-and-error process of adaptation [Hayek, 1976: 124-25]. In the long run, however, the competitive market process will produce (a) a high degree of compatibility of plans, based on the coincidence of expectations, and (b) an effective utilization of knowledge [Ibid.: 107].

At this stage it might appear the idea of order is simply another name for the state of near-competitive equilibrium we discussed in the previous section. This would be incorrect. Consider Hayek's reformulation of the idea several pages later. Order has the property that "for any person picked out at random, the prospects that the overall effect of all changes required by that order will be to increase his chances of attaining his ends...not at every moment, but only 'on the whole' and in the long run" [Ibid.: 114-15]. In this formulation Hayek asserts an empirical tendency toward maximum¹¹ coordination that need not be near a perfectly competitive equilibrium.

It is not obvious, however, in what sense coordination is expected to be at a maximum. The actual degree of coordination will depend upon both the amount of unexpected exogenous change and the extent to which adaptive changes

are themselves unexpected. Hayek's claim is that free competition will permit adaptation to exogenous change to occur with less disruption to the elements of coordination (points (a) and (b) above) than any other system. Thus there is more "order" or more coordination in this system than in any other one feasible.

The fundamental change in Hayek's thinking has been to move from a more or less absolute conception of equilibrium to a more radically relativistic one. While the comparative approach is clear in the earlier Hayek [1948b], it is not until much later that he formulates an equilibrium idea that is entirely free of the near-competitive equilibrium benchmark. A competitive order "increases" [Ibid.: 114] the amount of coordination relative to that produced by any other system subject to the same amount of exogenous change. Thus coordination is at a feasible maximum subject to given changes in the external data, even when perfect or full-coordination is not possible.

The empirical tendency toward maximum coordination can constitute a coherent claim so long as all endogenous forces are clearly adaptive or equilibrating. This is why Hayek dismisses all socially-originitive discoveries (e.g., the discovery of a completely new technology, the first discovery of a new resource or new taste, etc.). These are labeled "exogenous" because they move the system away from equilibria implicit in the original data or, in other words, because they change the data itself.

Hayek, we believe, cannot so readily dismiss socially-originitive discovery from his set of concerns. This dismissal poses a problem that he fails to recognize. Both dissemination of available knowledge and originitive discovery stem from the same source: the lure of profits. In this sense they are both examples of endogenous learning. While these two kinds of learning

can, of course, be separated analytically, in the real world they are interconnected. This is especially evident in view of a phenomenon we can call "learning by learning." In the first instance we learn because knowledge possessed by others is communicated to us. But we also learn in the further sense that as knowledge is communicated we simultaneously add to it. This knowledge is enhanced by our own unique perspective, past knowledge, and current particular circumstances. It is possible, therefore, that the real-world process of equilibration is also a process of disequilibration. In other words, processes generated by disequilibria embody two tendencies simultaneously: one that moves toward the equilibrium implicit in the original data, and another that changes the data.

If endogenous forces change the data, then the empirical tendency toward maximum coordination loses its usefulness. This defiance of the clean distinction between equilibrating endogenous forces and disequilibrating exogenous forces makes the comparison of systems, along lines of the degree of coordination, impossible. We could not then compare the actual state of coordination in two systems, each subject to the same data. If the process of adjustment is unique to a particular system then the data is also unique to that system. This is because, in the full reality of a dynamic world, the process of adjustment and the process of data change are the same. From this it clearly follows that more actual coordination is not unambiguously preferable, from a social perspective, to less coordination. A society with rapid advances in technology, many discoveries of new resources, and even frequent changes in tastes may be a wealthier society, despite a lower degree of achieved coordination, than one which is more coordinated, but stagnant.

V. EXTENSIONS AND CONCLUSIONS

Our primary goal has been to examine the presuppositions, structure, and implications of Hayek's ideas on the tendency toward equilibrium. We have felt this to be a necessary task because, despite the widespread discussion of Hayek in recent years, much of his economics is understood only in a very superficial way. In deference to our primary goal, we have generally avoided major criticisms of his ideas. In this final section, however, we shall uncover what we believe to be a fundamental inadequacy in Hayek's approach to the economics of process. We shall then suggest a way to remedy this inadequacy without radically abandoning the basic analytical structure he has created.

Hayek's self-imposed task is to begin to provide a causal explanation of how a state of near-equilibrium could come about or be "produced" as the unintended effect of learning by many individuals. In an effort to accomplish this he formulates what we have called the strong and weak tendencies toward equilibrium. These analytical tendencies have a mutually reinforcing and symbiotic relationship with the empirical tendency toward perfectly competitive equilibrium. Hayek's task to provide a causal account of equilibrium is ultimately undermined, however, by this mutuality. Superficially, it may seem that the learning embodied in the strong and weak tendencies causes a state which is near perfectly competitive equilibrium. As appealing as this claim is, it cannot be sustained. Hayek, it will be remembered, argues that learning is more likely to be correct the closer we are to equilibrium. If this is true, then the relationship between the analytical tendencies and the actual, achieved near-equilibrium state of the

world cannot be causal. The mutually reinforcing nature of the relationship breaks down the asymmetry needed for a genuinely causal connection. If we must have a near-equilibrium state to ensure the efficacy of the analytical tendencies, how did the near-equilibrium come into existence? Hayek offers no causal answer to this question. What he offers is a symmetric relationship: Learning is effective in producing a near-equilibrium when a near-equilibrium is already in existence. Since the two parts of this relationship depend on each other for their existence, it is not a case of one producing the other. It is simply a relationship of consistency masquerading as a relationship of causality.

In order to uncover the causal processes responsible for the existing degree of closeness to equilibrium, we must examine the efficacy of these processes in far-from-equilibrium states. Only if there are significant tendencies toward equilibrium, when we are not already close to equilibrium, can we establish a causal relationship between the specific learning processes embodied in these tendencies and the near-equilibrium state of affairs.

The empirical tendency toward maximum coordination, a more recent development in Hayek's thought, provides the first element in a reconstructed causal story. Why might this more accurately describe the world than the empirical tendency toward perfectly competitive equilibrium that characterizes Hayek's earlier work? Hayek does not provide us with an answer. Perhaps we could infer that he now believes data changes are more rapid or more severe than he previously did. But that would simply be guessing about his subjective state of mind. More important is the internal logic of the analysis suggested here. If learning in states far from perfectly competitive equilibrium is less reliable and more prone to errors than learning near-

equilibrium, then the former "originary" learning is likely to lead to an equilibrium of a more restricted kind. Individuals with rather limited learning capacities will stop revising their beliefs and plans long before a perfect equilibrium is reached. Hayek's maximum feasible coordination can be seen, for our purposes, as one possible way to characterize the stopping point of a truly causal equilibrating process. Causal analysis must start with learning that exists before we get to the result we are trying to explain. But if we go back to examine far-from-equilibrium learning we may feel that this is unlikely to lead to the outcome (near-perfect equilibrium) we previously thought existed and sought to explain. Although the concept of maximum feasible coordination is defective in the way we demonstrated in the last section, it is an important start in moving beyond the early Hayek and toward a more satisfactory economic dynamics.¹²

FOOTNOTES

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¹ As soon as we turn our attention to what is implicit in Hayek we cease to be concerned with what he subjectively believes. We are now concerned with what his ideas objectively mean, that is, their necessary presuppositions, implications, and structure. On the distinction between subjective and objective meaning see Popper [1979: 106-152].

² It is only in this sense that an analytical tendency is not empirical.

³ Hayek is implicitly excluding the possibility of plans containing contingent statements. The individual, in this view, formulates an intention simpliciter, rather than a set of intentions each contingent on a possible state of the world. So he says, "Tomorrow I will buy umbrellas because I believe it will rain then" rather than, "Tomorrow I will buy umbrellas if it rains." If we allow plans to contain certain contingent statements then it is possible for sellers to expect that it will be sunny tomorrow but intend to sell umbrellas if it rains. Under this second, and more modern view, equilibrium does not require homogeneity of expectations about external events.

⁴ See also Kirzner [1973: 215-18] and [1963:258].

⁵ By "intelligible" we mean here understandable in terms of the overall unintended consequence of each individual seeking to correct his mistakes.

⁶ "The statement of the conditions under which individual plans will be compatible is therefore implicitly a statement of what will happen if they are not compatible" [Hayek, 1941: 23].

⁷ It is true that something resembling a cycle could occur under these circumstances. Capital goods industries could expand and then contract. Unemployment, unfinished projects, bankruptcies and the other "tell-tale" signs of a depression would not occur. This is because all unsustainable projects would be set to terminate just at the point when interest rates rise. Whether one calls this a "cycle" is ultimately a matter of terminology. Nevertheless, current usage seems to require that we should not.

⁸ One buyer could buy at a lower price and one seller could sell at a

higher price. They may be, in addition, other opportunities that are incompletely recognized by market participants. Not all producers may know the best available technology for making their products. Not all suppliers may know the kinds of goods and services, of those available, consumers would most urgently want if they were offered the choice. And not all consumers may know the full array of alternatives actually before them. The profit opportunities inherent in such situations are not such that people are bound to learn about them. In general see Kirzner [1973].

⁹ This is related to, but not quite the same, as F.H. Hahn's "weak causal proposition." Hahn's proposition is that "no plausible sequence of economic states will terminate, if it does so at all, in a state which is not an equilibrium" [Hahn, 1984: 47]. The point in the text is that the process will terminate, if it does so at all, in an equilibrium.

¹⁰ The argument in the text is an elaboration of Mises [1966: 250]. See also Hayek [1941: 28].

¹¹ Hayek does not use the word "maximum." Use of this word represents an interpretation on our part.

¹² Elsewhere we [O'Driscoll and Rizzo, 1985: 85-88] have endeavored to loosen the concept of equilibrium in a way that could accommodate more limited far-from-equilibrium learning. We called this "pattern coordination."

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