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The Varieties of Subjectivism:

Keynes and Hayek on Expectations

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I

Introduction

The relationship between Keynes and Hayek, as Hicks (1967, Chapter 12) notes, is curious. Despite profound differences in their positions on policy questions, Keynes and Hayek held similar views on important matters in other areas. It is widely, though not universally, accepted in modern Austrian and post-Keynesian circles that Keynes and Hayek both embraced subjectivism (see Boehm 1989). Their theories of the business cycle (at least of the early Keynes) built on Wicksellian foundations and their analyses of the downswing had certain features in common (see O'Driscoll 1977, Mason 1991). On these grounds a kind of synthesis between Keynes and Hayek might appear both plausible and desirable.[1]

Notwithstanding areas of commonality, the fact remains that serious tension, perhaps antagonism, characterized Keynes's and Hayek's professional relationship.[2] Moreover, many players on the sidelines during the 1930s felt the need to choose between their theories, a choice many of their present-day followers find necessary to make as well.

We believe the attempt to integrate the subjectivist ideas of Keynes and Hayek entails difficulties not widely recognized. These difficulties help to explain why Keynes and Hayek were rivals on more than just policy in the 1930s. The difficulties concern the differences in the philosophical groundings each thinker presumed in his economics. In this paper we argue

that the philosophical bases of their economic ideas are fundamentally opposed and that these different groundings contribute to their different views of the market process. Any attempt to integrate the ideas of Keynes and Hayek must somehow engage these strong philosophical differences. Those who would place Lachmann and Shackle at the center of the neo-Austrian movement should recognize that the subjectivisms of Keynes and Hayek are distinct species within a genus.

This paper may also serve as a reminder that the undercurrents connecting and distancing the great thinkers of economics are typically complex and subtle. Although we make no claim that our discussion captures all the relevant ways Keynes and Hayek might be linked, we do hold that the differences in their philosophical views are germane to understanding their differences in economics. We will not try to show that the philosophical vision of either thinker logically implies his market theory. We will argue, however, that the respective philosophical positions of Keynes and Hayek conduce toward their market theories. Because we wish to establish and contrast the connections between each thinker's philosophy and economics, we will neglect other reasons for differences in their market theories.

The purpose of this paper, then, is to identify and explain the main differences between the subjectivisms of Keynes and Hayek. In Section II we compare the underlying philosophical notions of the two by examining Keynes's epistemology and Hayek's theory of mind. In Section III we discuss how these different starting points contribute to divergent

views of the market process. Finally, in Section IV we appraise the two theories and draw out the perhaps surprising implication that it was Hayek who pointed the way to a more general theory of the market process. Hayek's theory, not Keynes's, allows us to say when markets will behave in the way Keynes described and when they will instead behave in more coordinated ways. We claim, in short, that a Hayekian theory is needed to understand a Keynesian world.

II

Keynes and Hayek: Philosophical Ideas

A. Keynes's Rationalist Epistemology[3]

Keynes's appeal to "animal spirits" and his judgment that long term expectations are unconnected to underlying economic realities reflect his epistemology. We will show below (Section III: A2) how Keynes relates his ideas about expectations to his theory of probability. First, though, we need to discuss Keynes's epistemology.

The standard definition of knowledge is, as Skidelsky notes, "justified true belief" (1992, p. 83), a view Keynes follows in A Treatise on Probability (CW VIII, pp. 10-11). Keynes principally took a rationalist approach to justification. Keynes distinguished two

types of knowledge, "direct knowledge" and "indirect knowledge" (CW VIII, p. 12). Indirect knowledge of propositions is gotten by "argument" from direct knowledge and indirect knowledge previously acquired. Direct knowledge of propositions --- the "objects of knowledge and belief" (p. 12) --- is obtained from "direct acquaintance" with things. Direct acquaintance is of three kinds: 1) direct acquaintance with one's own "sensations" is "experience," 2) direct acquaintance with "ideas or meanings" is "understanding," and 3) direct acquaintance with the features of meanings and sense-data and with the relations among them -- including the principles of logic -- is "perception."

To "argue" is to "pass to knowledge about one proposition by the contemplation of it in relation to another proposition of which [one has] knowledge -- even when the process is unanalysable" (pp. 13-14). Notice that "argument" has nothing to do with rhetoric or discourse. It is a private monologue, not a public dialogue.[4] Keynes is willing to accept indirect knowledge that is gotten by "arguing" or "passing" from prior knowledge even when the passageway, i.e., the principles of logic by which the passing gets done, is unknown. Thus he allows intuition to play a role in our reasoning that Descartes' principle of clear and distinct ideas forbids. In this particular regard, Keynes is not a Cartesian. According to Keynes, however, you can start with the objects of direct acquaintance. From them you will attain a justified and certain belief in many true propositions. Now pass by "argument" from these "propositions" to others not known directly. From this expanded set of propositions

which are true, certain, and justified beliefs of yours, pass by further "argument" to others still. Keep at it long enough and you will fill volumes with genuine knowledge.

Keynes's treatment of the fundamentals of epistemology is a variety of rationalism. Hayek (1978, p. 288) suggests that Keynes shared "the peculiar brand of rationalism which dominated [his] generation." O'Donnell (1989) argues that Keynes's phrase "Cambridge rationalist" fits Keynes himself (p. 81), that "Keynes's philosophy is a form of foundationalism or justificationalism" (p. 93), and that his "epistemology remained essentially constant throughout his life" (p. 209). His rationalism consisted, O'Donnell argues, principally in granting to intuition a central role in transforming experience into knowledge (p. 93). O'Donnell observes that "while agreeing with empiricism that experience is a precondition of knowledge, [Keynes's epistemology] passed beyond it in maintaining that much knowledge is impossible without *a priori* reasoning or intuition" (p. 93).

Carabelli (1988) argues that Keynes's Treatise on Probability was "a sort of anti-*Discours de le méthode*" because of its emphasis on intuition and uncertainty (p. 149). We do not agree with Carabelli, however, that Keynes stood at any great "distance from the rationalist faith." On the contrary, as O'Donnell (1989, p. 149) shows, despite its various qualifications and hedges, Keynes's "My Early Beliefs" is a reaffirmation of his early rationalism. That his theory of probability should emphasize intuition does not weaken, but strengthens, the claim that Keynes was a rationalist. That it emphasized uncertainty is hardly surprising. All theories of probability, by definition, emphasize uncertainty.[5]

The rationalism to which Keynes swore allegiance was essentially the "constructivist" or "Cartesian" rationalism at whose feet Hayek has laid the blame for the sins of modernism. Hayek has cited Keynes as exemplar of the "constructivist" rationalism he rejects in favor of "critical" rationalism (1967, pp. 89-90). Keynes accepted the essential tenets of constructivism or Cartesianism as Hayek describes them. The "dominant characteristic" of the constructivist "movement" started by Descartes was, Hayek argues, the "rejection as `mere opinion' of all that could not be demonstrated to be true" by reason. According to Hayek, constructivism requires that such demonstrated truths had to be "logically derived from explicit premises that were `clear and distinct,' and therefore beyond possible doubt" (1973, p. 10). What, in this description, needs to be "clear and distinct" are the *premises* from which reason works. In this regard, Keynes was a good Cartesian despite his willingness to "argue" by principles intuited, but unknown. Keynes's reasoning begins, as O'Donnell notes, with "intuitions (or direct knowledge) [which] eliminate infinite regresses through providing putatively true knowledge incapable of further proof" (1989, p. 93).

Keynes describes in "My Early Beliefs" the comical results which a cleavage to this epistemology produced in his circle of friends and colleagues at Cambridge during the years before World War I. Knowledge of the good, said Keynes, "was a matter of direct inspection, of direct unanalysable intuition about which it was useless and impossible to argue" (CW X, p. 437). Such a doctrine disinclines one to dialogue. If two seemingly reasonable persons should disagree, an explanation of the disagreement was needed. Two official explanations

were generally recognized in Keynes's circle. First, the disputants, perhaps, "were not really talking about the same thing" and if their intuitions were trained on different objects, howsoever similar the objects might be, then "by virtue of the principle of organic unity, a very small difference in the object might make a very big difference in the result" (p. 437).

The second explanation appealed to differences in discernment. After all, Keynes maintained (CW X, p. 437), "just as some people can judge a vintage port and others cannot" so too "some people had an acuter sense of judgment" in intellectual matters. These were the official explanations. However, "in practice, victory was with those who could speak with the greatest appearance of clear, undoubting conviction and could best use the accents of infallibility" (pp. 437-38). And the master, Keynes reports, was G. E. Moore who would answer you "with a gasp of incredulity" and ask "**Do** you **really** think **that**" with an expression that "reduced him to a state of wonder verging on imbecility, with his mouth wide open and wagging his head in the negative so violently that his hair shook. **Oh!** he would say, goggling at you as if either you or he must be mad; and no reply was possible" (p. 438). Keynes and his colleagues regarded "all this as entirely rational and scientific in character" since it was "nothing more than the application of logic and rational analysis to the material presented as sense-data." They thought one's "apprehension of good" to be "exactly the same" as one's "apprehension of green" and they "purported" to use "the same logical and analytical technique" in both cases. "Indeed," Keynes relates, "we combined a dogmatic treatment as to the nature of experience with a method of handling it which was extravagantly

scholastic. Russell's Principles of Mathematics came out in the same year as Principia Ethica; and the former, in spirit, furnished a method for handling the material of the latter" (CW X, pp. 438-39). Keynes's justificationism was not an empty reflection of the reigning Official Methodology, but a daily fact of social life.

Keynes rationalism led him to reject tradition. In "My Early Beliefs" Keynes reports that in his youth he and his friends "entirely repudiated a personal liability on us to obey general rules. . . . We were, that is to say, in the strict sense of the term, immoralists" (CW X, p. 446). When Keynes claimed the right to judge each case on its merits, he also claimed the power to do so. Ought implies can. His was the rationalist view of knowledge as justified true belief emergent from the sort of "argument" that one can carry out like Descartes in his "closet," that is, alone and isolated from the inhibitory force of common opinion. And it was this view of knowledge which made the binding force of externally imposed rules seem irrational and objectionable to him.

B. Hayek's Theory of Mind[6]

Keynes was a rationalist. As we shall argue below, his theory of long-term expectation, based on that rationalism, claims that there can be little correspondence between expectations and economic events. Hayek, as we shall see, took quite the opposite approach. In Hayek's theory, economic expectations have a coherence not possible within Keynes's system. This coherence of economic expectations is largely a reflection of his deeper philosophical views

regarding epistemology and the philosophy of mind. Hayek rejected rationalism in favor of an evolutionary epistemology according to which "man is as much a rule-following animal as a purpose-seeking one" (1973, p. 11).

That fundamental uncertainty requires a Keynes-like theory of expectations hinges on the particular conception of subjectivism employed. Keynes's approach to economic expectation represents just one variety of subjectivism within the panorama of available subjectivist theory. We find in Hayek a kind of subjectivism that entails no mass psychology guiding individual behavior and implies no systematic discoordination of economic activity.[7]

Knowledge for Hayek is not justified true belief and it is not obtained from "immediate experience or observation, but in the continuous process of sifting a learnt tradition" (1988, p. 75). An evolutionary selection process, working on "irrational, or, rather, `unjustified' beliefs" induces in us habits and routines that embody more information than we can know. "The process of selection that shaped customs and morality could take account of more factual circumstances than individuals could perceive, and in consequence tradition is in some respects superior to, or `wiser' than, human reason" (1988, p. 75). Hayek begins from a different starting point than Keynes and ends up with a different conclusion.

Hayek's view of knowledge as practice is quite different from what is perhaps the more standard view of knowledge as justified true belief.[8] But it is not without precedents. Hayek quotes John Locke favorably in this connection as one who defined "reason" as "certain definite principles of action from which spring all virtues and whatever is necessary for the

proper moulding of morals" (Locke 1954, p. 111 as cited in Hayek 1967, p. 107, note 2). Karl Popper, to whom Hayek dedicated Studies in Philosophy, Politics, and Economics, criticized the "bucket theory of mind" as falsely equating knowledge with belief states (Popper 1979, pp. 60-63). Hayek cites Popper as a seminal figure in the "critical rationalist" school with which he identified himself (Hayek 1967, p. 94).

For Hayek, knowledge is practice; it is "knowing how" rather than "knowing that" (Ryle 1949). Knowledge is a set of dispositions to act or not act in certain kinds of ways given various contingencies. According to Hayek in "The Primacy of the Abstract" (1978), the mind's interpretation of "sensations and perceptions are these dispositions which they evoke" so that "all the `knowledge' of the external world which such an organism possesses consists in the action patterns which the stimuli tend to evoke" (pp. 40, 41). Since, as we will discuss below, Hayek conceives of cognition as rule-governed classification, "what we call knowledge is primarily a system of rules of action" (p. 41) Moreover, since Hayek does not equate the mental realm with consciousness, these rules, especially in the higher cognitive functions, will be tacit and function in ways that cannot always be made explicit (Hayek 1952, Chapter VI).[9] For Hayek "all sensory experience, perceptions, images, concepts, etc., derive their particular qualitative properties from the rules of action which they put into operation" (p.42).

Importantly, Hayek sees knowledge as a structure of rules embodied in social practice. Knowledge is thus more habit than belief. Some habits have evolved biologically and are

common to the species. Others have evolved socially and may vary from one group to another. Finally, some are idiosyncratic products of an individual's personal history. In any event, in Hayek's system, all knowledge is a fallible interpretation of experience, an interpretation manifested in one's habits of action. For most of us, it is probably more natural to think of knowledge as a belief state than as a way of acting. Hayek, however, claims that "what we call [man's] understanding is in the last resort simply his capacity to respond to his environment with a pattern of actions that helps him to persist" (1973, p. 18).

Hayek's defense of this claim is based partially on a factual proposition, namely, that design and pre-cognition have played only a small role in the creation of social order. Social order results primarily from individuals obeying rules of conduct. These rules were not at first designed nor even consciously known. The order-giving rules of social life were not the product of reason, for language and the capacity to reason that followed its appearance are themselves products of such rule-generated order (1973, pp. 8-21). Thus, the knowledge that made society possible in the first place consisted in rule following, not belief states. Hayek's theory of mind gave him other reasons to equate knowledge with a set of dispositions to act.

Hayek's theory of mind, as developed in The Sensory Order, is an attempt to explain how the operations of the central nervous system could create a mind. It is an investigation of the mind-body problem. He attempts to explain in detail

> how the physiological impulses proceeding in the different parts
>
> of the central nervous system can become in such a manner

> differentiated from each other in their functional significance that their effects will differ from each other in the same way in which we know the effects of the different sensory qualities to differ from each other (1952, p. 1).

His solution is used to explain, in less detail, all mental activity including abstract thought (pp. 142-46).

Hayek, then, has a theory about how people come to live in a sensory order created by the operation of the central nervous system. He finds the general lines of his theory adequate to explain also consciousness and conceptual thought. This story tells him that thought and emotion are dispositions to act and that all mental activity is a product of rules governing the operation of the brain in its capacity to classify sensory inputs. The emotions are "a temporary bias or preference for certain types of responses towards any external situation" (1952, p. 99). Abstract thought is a more complex matter; nevertheless, "all the `higher' mental processes may be interpreted as being determined by the operation of the same general principle" used to explain lower forms of mentation (p. 146). Thinking and acting are rule-governed phenomena, in Hayek's system, and even the most abstract and "rational" thought is, in the end, a patterned behavioral response to environmental stimuli.[10]

To equate knowledge with a disposition to act is not to deny mental activity or reduce it to a stimulus-response mechanism. In the description and explanation of such dispositions one must use mental terms. One must refer to what the actor is thinking and feeling. Hayek,

in other words, is no behaviorist. (Behaviorism and Hayek's relation to it have little bearing on the issues raised in this paper. We think, however, it important for the interpretation of Hayek in this paper to warn the reader against seeing him as a behaviorist; hence this and the following paragraph.)

Behaviorism is the conviction that no particular limits exist to our ability to discard those descriptions and explanations of behavior that use mentalistic language in favor of those that refer only to environmental factors and objective behavior. Hayek rejects this conviction using an argument analogous to Cantor's famous "diagonal argument," according to which the number of elements of a set is always less than the number of elements of the set composed of all its subsets. Hayek concludes that we can "reduce" mental phenomena to physical phenomena only "in principle." But "any attempt to explain particular mental processes must," of necessity, "contain references to other mental processes and will thus not achieve a full reduction to a description in physical terms" (1952, p. 190).[11] Thus, even though Hayek explained knowledge as a disposition to act and mind as matter in motion, he was a defender of *verstehende* psychology (pp. 191-94).

As importantly, Hayek's claim concerning the limits of reductionism instantiates his more general point that there always exists definite constraints on knowledge. First, and as we will discuss below, Hayek claims that perception necessarily is selective as a consequence of the classificatory operation of mental activity; thus, only some but not all properties of the external world are perceived. Second, Hayek held that precise, though unspecifiable, limits

on knowledge exist because "any apparatus of classification must possess a structure of higher complexity than is possessed by the objects which it classifies" which implies that the "brain can never fully explain it own operations" (1952, p. 185). Thus, for Hayek, ignorance is an essential implication of his cognitive theory and not simply a consequence of individuals gazing into a future that is unknowable until it has occurred.

Hayek, as discussed earlier, equated knowledge with practice. This matters for our argument because social practice is largely the product of *blind* evolution. From a Hayekian perspective, we shall argue, the reliability of our knowledge of the future, of our long-term expectations, does not depend so much on the rationality of our projections as on the properties of the economy's selection processes. If Hayek's view holds water, it undercuts the sort of general epistemic critique attempted by Keynes, Shackle, and Lachmann. Alternatively, if Keynes's views on knowledge are substantially correct, then Hayek's faith in the efficacy of social evolution was misplaced.

Our most basic knowledge of the external world is the product of biological evolution.[12] According to Hayek, this process has generated in the higher species a central nervous system consisting of fibers that carry impulses from external and internal receptor sites to the brain. The brain then classifies the impulses coming to it along these fibers. The impulse coming up a given fiber will be classified in one way or another depending on what other impulses are coming in from other fibers, what other impulses have lately arrived, and the prior existing structure of cognitive relations the organism possesses. In this way, the

brain partitions the set of possible impulse clusters into equivalence classes according to certain, but not necessarily all, perceived characteristics of those impulses. The simplest version of a central nervous system matching this description would put any impulse cluster into one of two boxes. We might think of one box as carrying the label "go right" and the other "go left." Biological evolution would tend to select, from among such simple organisms, those whose central nervous systems tended to say "go left" when more nourishing environments existed to the left and "go right" when more nourishing environments existed to the right. Natural selection would tend to favor those spontaneous variations that generated more complex responses ("go left then right") to environmental stimuli. Emergent species would, then, tend to have ever more receptor sites, ever more nerve fibers, ever larger brains, and, in consequence, ever more complex ways of classifying and responding to incoming signals.

In The Sensory Order Hayek argues that the work of perception performed by the central nervous system is a work of classification and thus of interpretation. By denying that some impulses intrinsically have, in themselves, a significantly different "quality" than others (1952, pp.8-12), Hayek is led to conclude that the differentiations that the system makes among incoming impulses can only be based on their being or not being accompanied or preceded by other impulses travelling on other fibers. On this reading, the essential activity of the central nervous system is to construct a good taxonomy of nerve impulses. Such a taxonomy partitions impulse clusters into equivalence classes that will tend to ensure the

survival and reproductive success of the organism. But this, in turn, implies that the properties of the external world perceived by an organism are properties of the operation of its central nervous system. As we put it in an earlier paper, "what we think of as a property of things is, in the first instance, a property of the mind's taxonomic framework" (1993, pp. 307-8).

The taxonomic framework created by the operation of the central nervous system interprets signals according to the mind's existent classificatory apparatus. For Hayek, such signals only attain meaning because they can be so arranged. Thus, while experience is the source of perception, all experience in Hayek's system is perceived and made meaningful only because it can be ordered into pre-existing (or *a priori*) "categories" of the mind. These categories, in turn, may be affected and themselves reorganized or displaced by experience.[13] In this way classification constitutes an interpretation of experience. This now brings us to the central insight that drove Hayek to write on the theory of mind in the first place: "we do not first have sensations which are then preserved by memory, but it is as a result of physiological memory that the physiological impulses are converted into sensations. The connexions between the physiological elements are thus the primary phenomenon which creates the mental phenomena" (1952, p. 53).

In the "Introduction" to The Sensory Order, the physiological psychologist H. Kluever identified Hayek's "most important and original contributions" with his demonstration of the complexity of the relations between "the factor of `experience'" in perception and "the

conditions, structures, or presuppositions which make experience possible" (p. xx). The former are the "sensations" common to many empiricist epistemologies, the later are the "categories" emphasized in Kantian epistemologies. The contribution Kluever attributes to Hayek is that neither element in perception is stable or "given."

Sensations are variable interpretations. To perceive an event in the world is to attribute a meaning to sensory impulses. The meaning given depends on the taxonomy used. Since experience alters the taxonomy used, the "givens" of sensory experience, the basic phenomena of perception, are variable and not constant (1952, 173-76). Similarly, Kluever's "conditions, structures, or presuppositions" of experience are variable. In even pre-human perception there is a kind of Kantian "synthetic *a priori*" or metaphysical taxonomy to organize data. Hayek's theory implies that, *pace* Kant, this synthetic *a priori* is not constant and eternal. It is the variable product of experience, a result of the interplay of action, based on a given structure of experience, with the consequences of action. Some elements of this structure, those "hard wired" by biological evolution, are relatively stable; others less so. As Kluever observes, "Dr. Hayek, therefore, does not take a static view of either the `elements' or the `relational' structure involved in the sensory or any other kind of order" (p. xx).

If none of the elements of perception is perfectly static, all knowledge is subject to revision. But then all knowledge is fallible. All knowledge is a fallible interpretation of a world we cannot know directly, but only through the filter of our perceptions. Whereas the rules governing the classificatory functioning of cognitive activity are in principle finite, the

various permutations of interpretation that can be constructed are limitless. This means that the mind can not only reorder its perceptions of reality but also create new theories about reality. The mind, for Hayek, is thus an instrument of learning and creativity. And this functioning, according to Hayek, serves by "representing both the actual state of the environment" as it is perceived and "the changes to be expected in that environment" so that individuals actually live "as much in a world of expectation as in a world of `fact'" (1952 pp. 118, 121). Thus Hayek is completely at odds with the rationalist tradition that would seek to find some constant and reliable center in thought and perception. In this regard, as in others, Hayek is a vigorous anti-Cartesian.

To bring the discussion of Hayek's theory of mind into contact with the issue of economic expectation it is necessary to discuss his ideas on social evolution. The social processes shaping our knowledge and actions are similar to the biological process discussed in The Sensory Order. This similarity permits many conclusions of Hayek's theory of mind to be carried over to a discussion of economic expectations.

In the human species, according to Hayek (1988), biological evolution has been superseded by cultural evolution. The principles of biological and cultural evolution are pretty much the same. Each is a process of variation, selection, and retention. In cultural evolution, however, the things getting varied, selected, and retained are not genes or organisms, but ways of acting. Cultural evolution is Lamarckian, not Darwinian, because the acquired characteristics of people can be passed on.

The central mechanism in Hayek's theory of cultural evolution is group selection.[14] Rules that induce success among groups are preserved through cultural traditions that permit cooperation among large numbers of persons; these traditions contend with and supersede the innate rules generated by biological evolution.[13] Hayek argued that language, morality and the basic achievements of civilization, namely, an abstract system of justice and a refined division of labor, were all the products of cultural evolution driven largely by group selection. The main phenomenon explained by group selection, as opposed to the more general phenomenon of cultural evolution, is the transition to civilization. Hayek emphasized that "the cultural selection of learnt rules" served to "repress some of the innate rules which were adapted to the hunting and gathering life of the small bands of fifteen to forty persons, led by a headman and defending a territory against all outsiders" (1979 pp. 160-61). The passage from small groups to what Hayek called "the extended order" requires an explanation free of design elements; group selection provides such an explanation.

III

Implications for Market Theory

A. Keynes on the Subjectivism of Expectations

Keynes believed that economic expectations are subjective. The subjectivity of expectations, however, has more portentous consequences for long-run expectations than for short-run expectations. Short-term expectations are tightly moored to realized values. Long-term expectations are not shaped by rational calculation; they rest on no "adequate or secure foundation" (Keynes 1937, p. 218).

1. Short-term and Long-term Expectations Distinguished

Keynes distinguishes sharply between short-term and long-term expectation. Short-term expectation "is concerned with the price which a manufacturer can expect to get for his `finished' output" given his general productive capabilities. It is thus very different from long-term expectation which "is concerned with what the entrepreneur can hope to earn in the shape of future returns if he purchases . . . `finished' output as an addition to his capital equipment" (CW VII, pp. 46-7). From these definitions Keynes draws the inference that a firm's "daily output will be determined by its short-term expectations" (p. 47, emphasis deleted) whereas investment in new capital is a function of long-term expectations. As Keynes explains in Chapter 5 of the General Theory, there is a feedback mechanism working to keep short-term expectations in close conformity with the underlying realities of supply and demand. Thus "it will often be safe to omit express reference to short-term expectation" (p. 50). No such feedback mechanism operates to constrain long-term expectations. Therefore, "express reference to current long-term expectations can seldom be avoided" (p. 50).

Keynes noted that it would be "too complicated" for entrepreneurs to recalculate short-term expectations "*de novo*" from day to day. Besides, "circumstances usually continue unchanged from one day to the next," so it would also be "a waste of time" (p. 51). Entrepreneurs wisely choose to assume that present conditions will continue "except in so far as there are definite reasons for expecting a change" (p. 51). In practice, "producers' forecasts are more often gradually modified in the light of results than in anticipation of prospective changes" (p. 51). In other words, a stable negative feedback loop keeps short-term expectations close to underlying real values.[14] Because this loop operates quickly, we may safely substitute realized results for expected outcomes.

No such feedback mechanism keeps long-term expectations in line with realized values. "[I]t is in the nature of long-term expectations that they cannot be checked at short intervals in the light of realized results" (p. 51). Because long-term expectations concern relatively far off events, a negative feedback loop cannot operate. Too much time and too many changes intervene between choice and outcome for such a mechanism to work. "Thus the factor of current long-term expectations cannot be even approximately eliminated or replaced by realized results" (p. 51).

2. Why Long-Term Expectations Cannot be Rational

Keynes could have avoided "express reference to current long-term expectations" by taking a weighted average of possible outcomes. But he did not believe that entrepreneurs

could simply make a list containing every possible future outcome, assign a probability to each item on the list, and then calculate an expected value. That entrepreneurs cannot form such a Benthamite calculation of long-term values is the point of Chapter 12 of the General Theory. In this chapter Keynes says that "our existing knowledge does not provide a sufficient basis for a calculated mathematical expectation" (CW VII, p. 152).

Keynes's argument is an openly philosophical one concerning the bases of rational action. One might say that, though a calculated *mathematical* expectation of long-term values cannot be gotten, rational forecasts of expected values can be. However inadequate such forecasts may be, a rational mind can make them. This way of speaking is not ruled out by Keynes's theory, but such rational claims as can be made about future values are so vague and dubious that no rational action can be based on them.[15] It is in this sense that we may call rational forecasts of future values "impossible."

Lawson argues that in Keynes convention-following propelled by animal spirits is "rational in the sense that there are known good reasons for the particular actions undertaken" (1993, p. 175). We find little to object to in Lawson's analysis except his use of the word "rational." In Keynes's system "the probable is the hypothesis on which it is rational to act" (CW VIII, p. 339). As one of us has said in the past, "People who are propelled by animal spirits are not guided by estimates of more and less probable; in that sense, their actions are irrational" (Koppl 1991, p. 205).

Keynes recognizes that economists might feel that a "general, philosophical disquisition on the *behavior* of mankind is somewhat remote" from the economic theory of investment. "But," he opines, "I think not." He accuses the "classical" theory, which he claims emphasized the mathematical calculation of expected values, of falling prey to "market place idols." It is "one of these pretty, polite techniques which tries to deal with the present by abstracting from the fact that we know very little about the future" (Keynes 1937, p. 215, emphasis added). Thus, while one might think it somehow philosophical to emphasize man's ignorance of the future, the failure to do so tends to lead economists down the primrose path toward false market idols.

The argument of the General Theory's Chapter 12 comes in two parts. The first part tells us why it is impossible to make a calculated mathematical expectation of long-term values. The second part tells us how entrepreneurs formulate their (irrational) expectations given this impossibility of rational forecasting. How entrepreneurs formulate their expectations depends on the stage of capitalism. One story applies to the days before the advent of the stock market; the other to the days after the advent of the stock market.

Why are entrepreneurs unable to make rational forecasts of long-term values? Below we identify five conditions that Keynes claimed are necessary for the reliable calculation of expected values and, hence, for rational behavior. In the Treatise on Probability,[16] Keynes identified three conditions for the application of the standard probability calculus (the principle of indifference, measurability, and atomic uniformity). Two others (limited

independent variety and weight of argument) refer to the problem of induction and the confidence we may have in probability statements. These conditions, Keynes argued, fail in most applications to social life, thus spelling trouble for rational action. If these conditions were satisfied, according to Keynes, individuals would not necessarily be driven by animal spirits and could invoke the probability calculus in forming their long-term forecasts. Their expectations and behavior would then be based on rational (Benthamite) calculations of expected value. Let us consider Keynes's reasons why such rational calculations are not possible.

Measurability

Application of the probability calculus requires that probabilities be measurable. In the Treatise on Probability, Keynes denied that all probabilities are numerically measurable or even capable of being ranked on a uniform scale of greater and less. Keynes argued in "The General Theory of Employment" that the probabilities relating to the relatively distant future are not measurable, claiming that matters such as "the prospect of a European war" or "the rate of interest twenty years hence" were so uncertain that "there is no scientific basis on which to form any calculable probability whatever. We simply do not know" (Keynes 1937, pp. 213-14). The probabilities of events affecting the value of current additions to capital are not measurable. Therefore, the present value of current investment cannot be calculated.

The Principle of Indifference

Application of the probability calculus requires that the principle of indifference (defined presently) holds. When it does, probabilities can be assigned. Thus, the inapplicability of this principle of indifference counts as another reason why the probability calculus cannot be used for social phenomena.

The principle of indifference asserts that "*equal* probabilities must be assigned to each of several arguments, if there is an absence of positive ground for assigning *unequal* ones" (CW VIII, p. 45). This implies that the principle succeeds if legitimate grounds exist for assigning some particular set of unequal weights. If no such grounds exist for assigning unequal weights, the principle of indifference requires that we assign equal weights.

This principle can be applied, Keynes insisted, only when you are reviewing "*indivisible* alternatives" (CW VIII, p. 65). An alternative is "divisible" if it is the disjunction of two or more mutually exclusive possibilities. An alternative is thus "indivisible" when it is not the disjunction of two or more exclusive probabilities. You cannot apply the principle of indifference if one of your alternatives "is capable of being further split up into a pair of possible alternatives" (p. 66).

Keynes's qualification is severe. It is, he noted, "fatal to the practical utility of the Principle of Indifference" in all those cases "in which it is possible to find no ultimate

alternatives" in terms of which one may describe the phenomenon in question (CW VIII, p. 62).

In the General Theory Keynes rejected the view that future events in the social world can be reduced to any list of indivisible alternatives. We cannot "rationalize our behavior," he explains, "by arguing that to a man in a state of ignorance errors in either direction are equally probable, so that there remains a mean actuarial expectation based on equi-probabilities." It "can easily be shown," Keynes thought, that arguing from the "assumption of arithmetically equal probabilities based on a state of ignorance leads to absurdities" (CW VII, p. 152). The principle of indifference is inapplicable to social and economic phenomena. Therefore, it cannot be applied to the formation of rational calculations of long-term values by entrepreneurs.

Atomic Uniformity

The condition of atomic uniformity requires that causes work additively rather than organically. In classical mechanics forces interact additively; their net effect is the vector sum of their separate effects. When the principle of atomic uniformity holds, the net result of any complex of causes interacting simultaneously can be inferred from a knowledge of the several effects of the causes as they occur when isolated. You just add up these separate effects, and the sum is the joint effect of the simultaneous operation of the different causes.

Keynes uses the term atomic uniformity because he thought the principle works when the phenomena being studied consist of "*legal atoms*, such that each of them exercises it own separate, independent, and invariable effect." When you have such atoms, any changes in the "total state" of things is "compounded of a number of separate changes each of which is solely due to a separate portion of the preceding state." In such a system, each of the "legal atoms" of which the system is ultimately composed can "be treated as a separate cause and does not enter into different organic combinations in each of which it is regulated by different laws." (CW VIII, pp. 276-77).

When the condition of atomic uniformity does not apply, there is some measure of "organic unity" and we may speak of the "Principle of Organic Unity." Today, a special case of the principle of organic unity is well known in the mathematics of chaos, namely, the extreme dependence on initial conditions or the "butterfly effect." In his essay on Edgeworth, Keynes (CW X, p. 262) upheld the principle of organic unity in the sphere of "psychics." He thus rejected the condition of atomic uniformity for social phenomena.

Limited Independent Variety

The condition of "limited independent variety," Keynes argued, is necessary if we are to draw inductive conclusions from experience. The condition amounts to the requirement

that the relevant structural characteristics of the system at hand be identical to those of an axiom system (in the modern sense) whose axioms and undefinables are finite in number.

Keynes (CW, VIII, p. 279) holds that when you are studying some "system of facts or propositions" the number of such facts will generally be larger than the number of "ultimate constituents or indefinables of the system." Moreover, there will be "certain laws of necessary connection" among the propositions of the system. The "truth or falsity of every member [of the system] can be inferred" from a knowledge of these laws "together with a knowledge of the truth or falsity of some (but not all) of the members" (CW VIII, p. 279).[17] The independent variety of a system is the number of "ultimate constituents" plus the number of "laws of necessary connection" operative in the system. When this number is finite, induction is possible and the system is characterized by "limited independent variety" (see Keynes CW VIII, pp. 279-94).

That Keynes rejected the applicability of the assumption of limited independent variety may be inferred from his emphasis on our ignorance of the "*character*" of future changes (Keynes 1937, p. 214) and his insistence throughout Chapter 12 of the General Theory that market instabilities arise from endogenous and psychological causes.

On the Weights of Argument

Even when numerically precise, a probability judgement may be based on scanty evidence. In such cases, our confidence in the probability judgment will be low. The "weight" of an argument is the degree of confidence we may place in it, as determined by the sufficiency of our evidence. The argument that one-sixth is the probability of a seven at the Las Vegas craps tables has an extremely highly weight. The argument that one-sixth is the chance of an economic recovery by year's end has considerably lower weight. "The weight, to speak metaphorically, measures the *sum* of the favorable and unfavorable evidence, the probability measures the *difference*" (CW VIII, p. 77).

Keynes's concept of the weight of an argument makes an explicit appearance in the General Theory (see Runde 1990). "It would be foolish," he says, "in forming our expectations, to attach great weight to matters which are very uncertain" (p. 148). And in a footnote he explains that, "By `very uncertain' I do not mean the same thing as `very improbable'. *Cf*. my Treatise on Probability, chap. 6, on `The Weight of Arguments'" (CW VII, p. 148).

The Five Conditions: Conclusion

Keynes's discussion of measurability, the principle of indifference, atomic uniformity, limited independent variety, and the weights of argument add up to an argument that it is impossible to make rational economic calculations of long-term values. Keynes believed that

we cannot formulate a rational forecast of future values because we are ignorant of the future. We lack and cannot obtain at any price the knowledge necessary to calculate expected present values. Instead of letting ourselves be paralyzed by the inability to make reliable guesses about the consequences of our actions, Keynes argues that we let ourselves be driven by "animal spirits."

3. Animal Spirits: Formation of Long-Term Expectations

For the reasons we have just reviewed, Keynes believed business calculations are profoundly unreliable: "the outstanding fact is the precariousness of the basis of knowledge on which our estimates of prospective yield have to be made" (CW VII, p. 149). The incompetence of long-term expectations posed no fundamental difficulty for capitalism in the halcyon days when enterprises could not be "floated off on the Stock Exchange at an immediate profit" (p. 151). In those days, the decision to invest in a business was "largely irrevocable, not only for the community as a whole, but also for the individual" (p. 150). This marriage of the entrepreneur to his capital might seem, when present values cannot be calculated, to be a drag on investment. But enterprises were not undertaken "merely as a result of cold calculation" (p. 150). Rather, entrepreneurs "embarked on business as a way of life" (p. 150). Thus, the irrational element in human action worked to good effect. Animal spirits prompted men to act in a socially useful way by inducing them to invest.[18]

Then came the stock exchange. "With the separation between ownership and management . . . which prevails today and with the development of organized investment markets, a new factor of great importance has entered in, which sometimes facilitates investment but sometimes adds greatly to the instability of the system" (p. 150-51). The new factor is speculation. The speculator attempts to assess not present values, but near-term stock prices. Since present value calculations are largely spurious, the speculators's estimates can have no foundation in any supposed underlying market reality. Even if some speculator were mysteriously granted reliable knowledge of "true" present values, he would not be able to put it to good use: "it is not sensible to pay 25 for an investment of which you believe the prospective yield to justify a value of 30, if you also believe that the market will value it at 20 three months hence" (p. 155). The professional trader needs to know, Keynes insisted, imminent changes in current asset prices, not long-term values.

When equity shares are liquid, "speculation" dominates "enterprise." The irrational element in human action is no longer directed to a salutary end, investment. It is instead pointed in an unfortunate direction, toward destabilizing speculation. The very animal spirits that were once counter-weight to the precariousness of our knowledge of the future, now exacerbate the instabilities implicit in our fundamental inability to "defeat the dark forces of time and ignorance" (p. 157).

In the old days, the illiquidity of equity shares ensured first that such limited "real knowledge" (p. 153) about capital values as existed was put to use, and second that changes

in economic expectations could not be translated into large fluctuations in economic activity. When equity shares became liquid the situation reversed. The knowledge upon which investment decisions were based was detached completely from honest appraisals of underlying scarcities. The expectations underlying investment decisions became volatile. Simultaneously, change in expectations became a powerful force in determining the level of economic activity. In the stock market, a process of mass psychology induces waves of optimism and pessimism; these shifts, in turn, cause the trade cycle (see Keynes CW VII, Chapter 22).

Long-term expectations are subjective in Keynes's theory. And they are fundamentally exogenous to the economic process.[19] The process of mass psychology that generates them is mostly self-referencing and not causally dependent upon other economic processes. For Keynes, long-term expectations do not and cannot bear any systematic relationship to underlying economic reality.

Keynes's doubts about the stability of markets depend on such matters as whether or not market institutions marry entrepreneurs to their capitals. But his doubts also vitally depend on his epistemology. Keynes was a Cartesian rationalist who saw about him a non-Cartesian social world. In such a world action cannot be rational; it must spring from an irrational source, animal spirits (Koppl 1991, 1992). A Cartesian rationalist may be glad for the impulse to action that animal spirits provide, but he cannot have much faith that the actions so motivated will very often turn out as intended. Keynes fundamental economic

ideas as expressed in Chapter 12 of the General Theory are strongly driven by the contrast between the Cartesian canons of reason and the non-Cartesian structures of the social world.

B. A Hayekian Theory of Expectations

Hayek's ideas about knowledge and the evolution of rules of conduct suggest a theory of expectations. Yet, he did not develop such a theory very explicitly or in much detail. Indeed, in the conclusion to his famous essay on "Economics and Knowledge," Hayek denies that his discussion of the role of knowledge in the market process should lead to any fundamental changes in economic theory. He seems never to have thought it necessary to develop anything labelled a "theory of expectations." In an earlier work (Butos and Koppl, 1993), however, we identified four essential features of a theory of expectations consistent with Hayek's cognitive and philosophical work. First, as noted in Section II B above, all knowledge in Hayek's view is fallible interpretation. Thus, "expectations are formed in the context of ignorance about reality" (1993, p. 314). Second an indivual's knowledge and, therefore, expectations "derive from a mental classificatory apparatus," the taxonomy induced by the operation of the central nervous system (p. 315). Third, this taxonomy is "a mechanism of adaptation" and the changes it undergoes are governed by a goodness of fit criterion (ibid.). Finally, the knowledge and expectations governing an individual are endogenous to its environment (ibid.).

Of these four features of a Hayekian theory of expectations, the last, endogeneity, is perhaps the most important in the current context. In the original biological context of Hayek's theory of mind, it is clear that knowledge and expectation are endogenous. What the individual can know is a function of the taxonomic framework of its central nervous system. The structure of that framework, in turn, is produced by the experience of the organism and its species in its environment. The synthetic *a priori* categories of experience are a product of the environment they are used to interpret.[20]

A parallel insight applies to the knowledge created by social experience. Our expectations about social and economic events are embodied in our habits of action. These habits, in turn, are endogenous to that same social and economic environment.[21] It follows from Hayek's view of knowledge that the evolutionary conditions of the economic environment influence the reliability of economic expectations. Hayek adopts such a perspective in his general defense of property (1973, pp. 107-110) and in his critique of socialism (1988, Chapter 5). He was not, however, very explicit on this point nor, as we have said, did he attempt to develop a separate theory of expectations. It is clear, though, that Hayek did not view the absence of "rational calculation" as a reason for discoordination. Indeed, for Hayek, economic theory "is based not on the assumption that most or all of the participants in the market process are rational, but, on the contrary, on the assumption that it will in general be through competition that a few *relatively* more rational individuals will make it necessary for the rest to emulate them in order to prevail" (1979, p. 75 emphasis

added). And what the emulators will have to adopt are more "rational *methods*" (ibid., emphasis added). In this way, competition tends to breed commercial traditions of rational procedure. Hayek tells us that competition induces such rational habits and procedures even though the great majority of those who are forced to adopt them do not understand why they are useful.

In arguing that competition breeds rationality, Hayek is claiming that the filter of profit and loss weeds out those whose habits tend to generate inappropriate responses to market signals, that is, those with inappropriate propensities to act. Losses tend to filter out inferior expectations. Traders in the stock market, for instance, who study tea leaves are likely to lose money and be removed from the market. Those with techniques to project earnings may do better. Profits will go to those with the better ways to project earnings whether or not they understand why their forecasting procedures are better.

We have seen Hayek argue that "the process of selection that shaped customs and morality could take account of more factual circumstances than individuals could perceive, and in consequence tradition is in some respects superior to, or `wiser' than, human reason" (1988, p. 75). Hayek's position suggests something similar for the market place. The home-grown traditions bred by market competition are shaped by more factual circumstances than market participants can perceive, and in consequence tried and true business practices may sometimes embody greater wisdom than rational calculation can achieve. In short, as Weimer (1980, p. 169) notes, Hayek advances a "rational theory of tradition."

More work is needed to explore whether Hayek's confidence in market coordination is strongly driven by his theory of mind in the way that Keynes's doubts about coordination are strongly driven by his Cartesianism. In any event, there are close parallels between Hayek's theories of mind and market. These parallels suggest at least a kind of "weak driving" of his market theory by his philosophy. As we have noted in the past, Hayek's treatments of mind and market share as central concerns "the role of mechanisms for the transmission of knowledge, the necessity of and dependence on abstract rules, and the self-regulative or adaptive character of the process" (Butos and Koppl 1993, p. 306). In short, in both domains of inquiry, Hayek is studying a spontaneous order.

Whereas Keynes saw the market as field of action in which rational calculation had to cede much ground to animal spirits, Hayek saw the market as the principal cause for what little rationality animates men's actions. It is "in general not rationality which is required to make competition work, but competition, or traditions which allow competition, which will produce rational behaviour" (Hayek 1979, p. 76). Hayek's position is not the strict logical negation of Keynes's, but on the relation of rationality and competition and on the orderliness of markets, the two great subjectivists hold divergent views.[22]

Here the issue is joined. How is knowledge produced and distributed in society? In Keynes's view, knowledge is justified true belief. This rationalist view leads him to see economic expectations as exogenous to the market process and, sometimes at least, volatile. In Hayek's view, knowledge is a propensity to act. This anti-rationalist view leads him to see

economic expectations as endogenous to the market process and, potentially at least, coordinative.[23]

This contrast between Keynes and Hayek goes beyond the likelihood of market discoordination. It is a matter of the sources of order and disorder in markets. Keynes's vision of Cartesian rationality afloat in an non-Cartesian social world encouraged him to the view that the liquidity of assets makes market disorder inevitable (CW VII pp. 155 and 157). Hayek had more confidence in market order in part because his anti-Cartesian philosophy suggested competitive evolutionary processes as the main sources of social order (Hayek 1988). In each case, philosophical ideas about knowledge conduce to economic ideas about markets. These connections between philosophy and economics are important and constitute a difficult set of problems any satisfactory integration of post-Keynesian and Hayekian themes would have to resolve.

IV

Conclusions

Both Keynes and Hayek take up subjectivist positions. But they represent different varieties of subjectivism.[24] The differences in their theories of subjectivist expectations stem

from differences in philosophy. Keynes was a Cartesian of sorts. He was a "constructivist" in Hayek's sense who believed that knowledge is justified true belief. For Keynes, expectations are a belief state and cannot be formulated by "rational calculation." For Hayek, expectations are implicit in the practices, rules, and reaction patterns governing action. These differences in philosophy help to explain the differences in their approaches to subjective economic expectations.

For Keynes expectations of the future are belief states. If these belief states are to guide action reliably, they must embody reliable knowledge. But reliable knowledge of the future cannot be had. We cannot make any "calculated mathematical expectation[s]" of future values (CW VII, p. 152). In a world where people plan for the future, then, most action is irrational action. "Most, probably, of our decisions to do something positive," Keynes believed, "the full consequence of which will be drawn out over many days to come, can only be taken as a result of animal spirits, a spontaneous urge to action rather than inaction" (CW VII, p. 161). Full vent is given by Keynes to behaviors struggling against the dark "forces of time and our ignorance of the future" (CW VII, p. 157). Thus, according to Keynes, on modern asset markets speculators' long-term expectations create an atmosphere that tends to generate *ex nihilo* waves of pessimism and optimism and thus waves of greater and lesser investment spending. Though the economy suffers from "severe fluctuations" in output and employment, "it is not violently unstable" (CW VII, p. 249). Instead, Keynes held that the system "may find itself in a stable equilibrium . . . below full employment" (CW VII, p. 30).

The expectations that underpin liquidity preference and the inducement to invest have resulted in interest rates which are too high and prospective yields on capital which are too low. But these expectations are not revisable via rational calculation because an unknowable future nullifies the force of Cartesian reason. Thus, endogenous mechanisms cannot be relied upon to extricate the system from unemployment equilibrium. Keynes, despite dismissing the applicability of Cartesian rationalism as a force from within the system, still retains it as an epistemological authority. But now such authority enters as an exogenous constructivist element in the form of government intervention.[25]

A Hayekian theory of expectations is notably different from Keynes's theory. Hayek avoids casting expectations as "rational" or "non-rational" by rejecting the Cartesian foundations which often underlie such distinctions. Instead, Hayek builds on a cognitive theory that implies essential and inherent constraints on what individuals can know. For Hayek, defining knowledge according to Cartesian (justificationist) criteria errs by assuming the existence of an infallible epistemological authority. The argument of The Sensory Order is that no such authority exists.

For Hayek, expectations are embodied in habits, practices, norms, and traditions. Expectations, in other words, are embodied in the rules governing action. These rules are a product of social and even, as in the case of the sensory order, biological evolution. In this evolutionary view there is no reason to see in the uncertainty of the future a special cause for discoordination of actions. Expectations, on the contrary, have a tendency toward coherence

and coordination. The evolutionary selection processes at work among thoughts and actions tend to select "fit" expectations and to weed out "unfit" expectations. Hayekian expectations, in sharp contrast to Keynes's long term expectations, are inextricably linked to the market process.

Connecting expectations to the market process carries advantages that are not available when expectations are made exogenous.[26] As we have shown elsewhere (Butos and Koppl 1993), the orderliness of market processes depends on the institutional context within which individuals function. Individuals' expectations (whether they are understood as "belief states" as in Keynes or as "dispositions to act" as in Hayek) and the plans they induce will generate varying degrees of coordination depending on the extent to which the institutional context satisfies certain conditions. When the context is "competitive" (in the sense of Kirzner 1973) and participants are constrained by stable rules, the correspondence between expectation and realization is likely to be close; markets will exhibit outcomes through time that reasonably approximate plan coordination. Alternatively, when the context facing individuals is dominated by "Big Players," i.e., participants whose discretionary actions have a disproportionate affect on the market, individuals' expectations are more likely to generate perverse and incoherent outcomes. Under the influence of Big Players, markets will display characteristics similar to those Keynes describes in Chapter 12 of the General Theory. Thus, it is possible to use Hayek's theory of expectations to indicate when coordination is and is not

likely to emerge. Since Keynes's theory deals only with coordination failures, it can be claimed that Hayek's is the more general.

The differences between Keynes and Hayek appear to run deep. These differences present a difficult set of problems for those who would try to integrate the economic ideas of these two thinkers. The fact that they are both subjectivists should not lead us to ignore their differences. We have attempted to identify elements of such differences and to suggest that they can contribute to explaining Keynes's and Hayek's divergent market theories. Arguably, much work remains in demonstrating more robustly the kinds of linkages connecting their epistemological positions with theories of the market process. This, we believe, may be especially the case for Hayek. Although much work has appeared recently on Hayek,[27] to our knowledge a full reckoning of the relationship between his cognitive theory and his theory of markets has yet to be undertaken.

1. A synthesis of Keynesian and Austrian ideas has been proposed more than once. See, for example, O'Driscoll (1977, p. 113). The title of O'Driscoll and Rizzo's (1985) book, The Economics of Time and Ignorance, alludes to Keynes's remark that the "social object" of investment should be to "defeat the dark forces of time and ignorance that envelope our future" (CW VII, p. 155). They say that "It is evident that there is much common ground between post-Keynesian and Austrian subjectivism" (1985, p. 9). Ludwig Lachmann, to whom O'Driscoll and Rizzo dedicated their book, was famous for his admiration of Keynes's treatment of expectations (Lewin 1994, p. 246). The economics of Shackle and Lachmann have long appealed to both Austrians and post-Keynesians.

O'Driscoll and Rizzo favorably quote Paul Davidson to the effect that post- Keynesians put economic events in real time, recognize the importance of expectations in a world of uncertainty, and the importance of economic and political institutions (1985, p. 9). (See Davidson 1981, pp. 158-64.) This paper goes a long way toward explaining why "cross-fertilization between these two schools is" nevertheless "exceedingly rare" (O'Driscoll and Rizzo 1985, p. 9). For strikingly different views on the affinity between Austrian economics and Post Keynesian vs. neoclassical economics by leading contemporary Austrians, see the "Afterword" essays by Rizzo and White in Caldwell and Boehm (1992). Karen Vaughn (1994) provides an insightful discussion of these matters.

Finally, Burczak (1994), writing from a postmodernist perspective, claims it is possible to "integrate the subjectivist post-Keynesian understanding of the potential for macroeconomic disorder with Hayek's concepts of constituted creative choice and market process" (p. 55). According to Burczak, Keynes and Hayek are both hermeneutical subjectivists. Our argument that Keynes is a rationalist obviously disputes Burczak's claim. Although hermeneutics falls within the anti-rationalist tradition, and on that account might be more closely associated with Hayek, Caldwell (1994) points out that Hayek's methodological writings after 1942 reflect his

"unwilligness to take the interpretive turn" and that "it is probably better to characterize Hayek as a non-hermeneut rather than as a anti-hermeneut, to indicate a path that he chose not to follow rather than as one that he vigorously opposed" (p. 308). Caldwell argues that Hayek wished "to provide a scientific foundation for subjectivism" and that Hayek thought this had been achieved in The Sensory Order; thus "hermeneutics was an unnecessary supplement" for Hayek (p. 311). Although we are in basic agreement with Caldwell's interpretation, the question of whether Hayek is a hermeneut falls outside the scope of this paper.

2. Keynes and Hayek sparred vigorously in the early 1930's beginning with Hayek's scathing review of The Treatise on Money. See Butos (1994) for an overview of these exchanges.

3. Skidelsky 1992 pp. 74-89 provides an excellent review of the issues and literature (up to about 1991) on Keynes's philosophy and its relation to his economics.

4. Following McCloskey (1985), Keynes's view is "modernist."

5. Carabelli's reference to uncertainty may have been an allusion to Keynes's discussion of the weights of argument. If so, it is not clear how Keynes's discussion of weights puts him beyond the pale of rationalism.

6. Hayek's theory of cognition has received little attention by economists. An important exception is Streit (1993). This is surprising given that Hayek's "knowledge papers" of the 1930s and 1940s have a distinct epistemological flavor. From outside economics, however, aspects of Hayek's

Sensory Order has been treated recently by de Vries (1994) and Smith (1994) and somewhat earlier by Agonito (1975). The rehabilitation of interest in Hayek's cognitive theory must be credited to Walter B. Weimer, whose 1982 essay still remains the single best treatment of Hayek's cognitive psychology.

7. Hayek's treatment of the individual's "choice-theoretic" problem may be unique in that other theories, like Simon's "bounded rationality" and Keynes's approaches, emphasize the complexity of the external world confronting the individual and not the cognitive complexity of the acting agent. For Hayek, the mind -- like the market, law, and language -- is a complex phenomenon.

8. For a critique of justificationism, see especially Bartley (1984) and Weimer (1979). It is worth noting that many non-justificationist philosphers of science, such as Bartley, Weimer, and Popper, have acknowledged Hayek's influence on their own work.

9. Also see Agonito (1975), Weimer (1979, 1982).

10. Heiner (1983) explains how rules emerging as a consequence of the constraints on knowledge can generate predictable behavior. For Hayek, of course, such prediction would be of "patterns." Rule governed cognitive

activity operates, according to Hayek, at both the conscious and supra-conscious (tacit) levels. See Hayek (1952, Chapter VI), Agonito (1975), and Weimer (1980, 1982).

11. See Hayek (1952, pp. 25-30) for further criticisms of behaviorism.

12. It is, of course, notoriously difficult to say what the term "external world" might mean. Hayek's theory turns out to imply that an "external world" does exist. In saying that such a world exists, however, Hayek is "merely stating that it is possible to construct an order... of events . . . which enables us to give a more consistent account of the behaviour of the different events in that world" (1952, p. 173).

13. See Nishiyama (1984, pp. xlvi-l) on Hayek's synthesis of the *a priori* and the *a posteriori*. Nishiyama calls this the "most unique significance of his contribution" and "worthy of the name `Hayekian revolution'" (p. xlviii).

14. Vanberg (1986) provides a thoughtful criticsm of Hayek's theory of group selection. We do not address here the issue of whether Hayek's theory violates precepts of methodological individualism.

13. Hayek's ideas thus suggest a sophisticated theory of alienation. From a Hayekian perspective, feelings of "alienation" cannot be eliminated except by abolishing civilization altogether.

14. We thank Roger Garrison for this interpretation of Keynes on short-term expectations.

15. Cf. Hodgson's (1985, p. 13) claim that "according to Keynes, human beings are rational but they live in a world where widespread uncertainty places severe limits on the capacities of individuals to make detailed, rational calculations about the future. These constraints derive not from the limited rationality of individuals but from the ubiquitousness of uncertainty."

16. The fact that we can use Keynes's ideas from the Treatise on Probability to organize a discussion of his ideas concerning long-term expectations is evidence that these probability notions may have been at the root of his ideas on expectations. For arguments that Keynes's philosophical ideas, especially those relating to probability, were indeed the basis for his economic theory of expectations, see O'Donnell (1989, pp. 247-72) and Carabelli (1988). See also Shackle's discussions of probability in Epistemics and Economics (1972).

17. The Treatise on Probability was written under the influence of Russell and Moore. An earlier version was completed in 1908, and the final version was published in 1922. It could not, therefore, have taken into account Godel's famous theorem of 1931 proving the incompleteness of any consistent axiomatic foundations of mathematics. We are not aware of any evidence that Keynes seriously reconsidered his arguments in probability theory or epistemology in the light of Godel's theorem.

18. Keynes thought that without the impulse of animal spirits investors would be paralyzed into inactivity like Hamlet or Buridan's ass. See Koppl (1991).

19. Hicks (1969, p. 313) argues that "expectations do appear in the General Theory, but (in the main) they appear as data; as autonomous elements that come in from outside, not as elements that are moulded in the course of the process that is being analyzed." That Keynes's treatment of long-term expectations in the General Theory leads to odd results is evidenced in his theory of liquidity preference. The speculator, Keynes holds, is driven to hold money or buy consols based on the current level of interest (or price of consols) relative to a "critical rate of interest" toward which the speculator believes the market interest rate must gravitate. This "critical rate of interest," however, appears as a fully exogenous and non-revisable datum to

which each speculator clings, even if, we must suppose, the preponderance of evidence might suggest otherwise. Since each speculator's belief in a "critical level of interest" cannot be falsified, we must infer that no learning can take place. In light of this, it is not surprising that Keynes would conclude that financial markets generate inefficient and perverse outcomes.

20. This is not to say that these synthetic *a priori* categories tell us how the world "really is." Even the basic notion of the orderliness of nature may be "merely a result of the method by which we perceive it" (Hayek, 1952, p. 176). For that which is truly without order could not induce the creation of a mental category for the perception of it.

21. Carl Menger also suggests that the expectations of economic actors are embodied in their habits, not their thoughts. In commercial societies, "almost every product comes into existence under the tacit, and as a rule quite unconscious, supposition of the producer that other persons, linked to him by trade, will provide the complementary goods at the right time" (Menger, 1981, p. 63).

22. It might seem that we have exaggerated the differences between the pictures Keynes and Hayek paint of market action. Both thinkers rejected,

though for different reasons, the model of rational maximizing. For Keynes, rationality must give way to "animal spirits." For Hayek, one might argue, the social environment shapes the actions of humans in roughly the way the biological environment shapes the actions of animals. Thus, it might seem, Keynes and Hayek had similar ideas about market action. The animal spirits of Keynes, however, are radically divorced from cognition, as the history of the term reveals (Koppl 1991). In Hayek, by contrast, evolution shapes thought and action to fit both one another and the environment external to the actor. Thus, in spite of the common repudiation of rational maximizing, there is no very close similarity between Keynes's ideas on animal spirits and Hayek's evolutionary perspective.

23. It may strike the reader that Hayek's mentor, Ludwig von Mises, had a theory of markets quite close to Hayek's even though, by Hayek's own account, Mises professed an "extreme rationalism" (Hayek 1981, p. xxiii). The example of Mises would seem to argue against seeing much connection between epistemology and the theory of markets. But important differences between the epistemologies of Mises and Keynes reduce or eliminate the force of this example.

In an essay originally published in 1933, Mises distinguished between "conception" and "understanding." Conception is "discursive reasoning" whereas "understanding seeks the meaning of action in empathic intuition of a whole." Mises thought these two ways of learning about the world operate

under quite different epistemological principles. His rationalism applied only to conception. With conception, "strict logic rules;" where understanding enters "subjectivity begins." For Mises, "conception is reasoning; understanding is beholding" (Mises 1981, pp. 133-34). This distinction let Mises give to "understanding" the job of learning about the plans of others. Thus we form our expectations about the actions of others through "understanding." Only "conception," which has no business inferring people's purposes, is subject to the strictures of rationalism.

It may even be appropriate to downplay Mises's rationalism. In Hayek's judgement, though he "never fully abandoned" the rationalist "starting point" from which "as a child of his time he could not escape," Mises "largely emancipated himself" over time from "rationalist-constructivist" thinking (1981, pp. xxiii-xxiv). Whatever the merits of these remarks of Hayek, we argue in the body of this paper that Keynes achieved no similar emancipation.

24. Boehm's (1982) observation that subjectivism is an ambiguous notion reflects in our view the existence of varieties of subjectivism, just two of which have been discussed here. The differences among such varieties are substantive; consider, for example, that the subjectivist Lachmann (1986, p. 32) rejected the notion of unintended consequences, a long-standing pillar of (subjectivist) Austrian economics. Sorting out the differences and intersections among subjectivisms seems a necessary step in the continued extension of the subjectivist research program. See, for example, O'Driscoll and Rizzo (1985), Koppl (1994), Lewin (1994), and Vaughn (1994).

25. Keynes's full employment model is made determinate by a fiscal and monetary agency. Coddington (1982) raises the question of asymmetries in the knowledge Keynes assumes private and public actors hold. An alternative

viewpoint is that policymakers render private expectations benign by restructuring the system, especially along institutional lines. In this sense, Keynesian policymakers impose a Cartesian rationalist or constructivist vision upon the system.

26. Hayekian expectations are subjective and endogenous. But not all endogenous expectations theories are subjectivist. Thus, our discussion is not meant to apply to the rational expectations hypothesis. For a comparison of Hayek and rational expectations, see van Zijp (1993) and Butos (1995).

27. We think it fair to say that work on Hayekian ideas has become an identifiable and progressive research program. See, for example, the recent collection of essays in Birner and van Zijp (1994).

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