



Knowledge Questions: Hayek, Keynes and Beyond*

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Abstract. This paper discusses the “knowledge problem” in terms of both the use and generation of knowledge. This is analyzed in the context of Hayek’s failure to respond to the “Keynes Challenge”—the claim that markets fail to produce relevant knowledge—by suggesting that in the aftermath of *The General Theory* he was not well-positioned to address that problem. Ironically, his post-World War II work in cognitive psychology, *The Sensory Order*, offers a theory of the generation of knowledge which can provide a useful analogy for understanding the generation of market-level knowledge.

Key Words: Hayek, Keynes, knowledge

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1. Introduction

I propose to revisit the Hayek-Keynes debate—not so much to rehash old war stories but to make some observations that contemporary Austrians may find useful in their own thinking. In particular, I think that one way to understand Keynes’s argument is to interpret it as a claim that the market economy does not have the capacity to reliably generate relevant market knowledge. A crucial question, then, would be: Did Hayek have available a theory which could have responded to such a claim? No, I don’t think so. Would he come close? Yes, but it wasn’t until much later that a supporting cast of theories providing the basis for such a response would emerge. So, although my hook, if you will, is to couch the question in terms of Hayek & Keynes, my underlying purpose is to talk about the “knowledge problem” familiar to Austrian economists and to generalize it in a way that may suggest some different lines of inquiry.

2. Keynes on Market Failure

As Caldwell (1998) observes, Hayek gave several explanations for not directly responding to *The General Theory*. Among these was his belief as stated in his “Personal Recollections of Keynes and the Keynesian Revolution” that *The General Theory* was just “obviously another tract for the times, conditioned by what [Keynes] thought were the momentary needs of policy” (Hayek [1966] 1995:241). It is perhaps not difficult to understand Hayek’s

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dismissive tone here. After all, during the early 1930's, he and Keynes had slugged it out over the *Treatise on Money*—a book that Keynes thought would finally establish his credentials as a leading monetary theorist. But the *Treatise*, though recognized at the time as a significant work, was not generally received well and it was not long before Keynes's thinking moved beyond the *Treatise* and toward ideas that would find expression in *The General Theory*.¹ By the time Part II of Hayek's review of the *Treatise* was published in February 1932, Keynes had moved on and was already developing his theory of output as a whole. It is no wonder that Hayek would later claim that had he written his review of *The General Theory*, Keynes would probably have changed his mind again.²

But Hayek offered little in direct response against *The General Theory*. We can get a glimmer into Hayek's harsh early reaction to it when he wrote to Haberler in 1936 that he was "of course awfully annoyed" because "through his formulation [Keynes] discredits many important ideas, which now lie in the air, and it will make it hard to try to persuade them without tackling all the other nonsense" (Letter from Hayek to Haberler 3 May 1936, quoted from Howson 2001:372). But even if he were correct to impugn Keynes's economics, Hayek was quite wrong in underestimating Keynes's cachet among economists in general and the enormous appeal that his ideas had among policymakers. It is astonishing, at least in retrospect, that as editor of *Economica* he would reject for publication a paper critical of Keynes by his friend Haberler because "we want to avoid anything which could create the impression that we are conducting a planned campaign against Keynes" (quoted in Howson 2001:372).³ Hayek failed to realize that despite the success of his previous critiques against Keynes, his position was in fact highly tenuous, as events would soon enough bear out. Hayek was still waging a battle with Keynes in 1936; what he did not realize was that this war was already over.

Since the early 1930's, the implicit divide separating Keynes and Hayek turned on something quite fundamental and not easily resolved: the self-correcting or coordinating properties of the market economy (Butos 1994). This was the underlying point of contention in their debate of the early 1930's. And Keynes continued to expand on that argument in *The General Theory*, although he deftly changed the model and deployed different arguments. In *The General Theory*, Keynes elevated uncertainty and its effects on money and investment within the context of modern financial arrangements as the root cause of chronic underemployment. Keynes maintains that "the essential character of the Trade Cycle and, especially the regularity of time-sequence and of duration which justifies us in calling it a cycle, is mainly due to the way in which the marginal efficiency of capital fluctuates" (Keynes 1936:313). Such fluctuations in the MEC and the corresponding effects on the "scale on which new investment is deemed advisable" are dominated by swings in long-term expectations about prospective yields on investment that are, says Keynes, "very precarious" because such expectations are "based on shifting and unreliable evidence" making them "subject to sudden and violent changes" (p. 315).⁴

2.1. Financial Markets

In Keynes's (1936, Ch. 12; 1937) discussion of modern financial markets, the market prices of capital assets come under the full force of investor expectations driven by various

psychological and convention-based beliefs. These are played out in a casino-like atmosphere of beauty contests, games of old maid, and waves of optimism and pessimism. Keynes says that because of the “extreme precariousness of the basis of knowledge on which our estimates of prospective yield have to be made” (1936:149), practical investors, he tells us, will base their expectations of prospective yields on the *state of confidence*. With the separation of ownership from management, the “state of confidence” becomes leveraged, Keynes says, by “the average expectation of those who deal on the Stock Exchange . . . rather than by their genuine expectations of the professional entrepreneur” (p. 151). And these speculators, rather than committing themselves to long term investment, direct their energies to short-term profits made possible by the daily convention-driven revaluation of existing assets and by the ease of trading in organized markets. While such conventions may provide stability for short periods, they are nonetheless, according to Keynes, “arbitrary” whose “precariousness . . . creates no small part of our contemporary problem of securing sufficient investment” (p. 153).

Within this milieu, animal spirits—“the spontaneous urge to action” (p. 161)—which worked so well in the halcyon days of family enterprises and real entrepreneurs, get vented in the context of modern financial arrangements in which assets are transferable among speculators at low cost. According to Keynes entrepreneurs are crowded out by speculators, making the private object of investment inconsistent with the social needs of long term investment and subjecting it to the whims of the marketplace in which the investor’s aim is to maintain liquidity, despite the fact “there is no such thing as liquidity of investment for the community as a whole.” Never mind that the sequence of exchanges for the “bad half-crown” will be necessary for its eventual liquidation and that in the absence of those exchanges the mistakes of the past will become etched in concrete. But if we follow Keynes and assume there are players who are disposed to base their investments on “genuine long-term expectations” (p. 157), Keynes argues that such actions would be “scarcely practicable” since they would “run greater risks” in trying to outwit the crowd, thereby exposing themselves to even “more disastrous mistakes.” Even if such socially minded investors could avoid that pitfall, there is still little basis for relief since, according to Keynes, “it requires *more* intelligence to defeat the forces of time and our ignorance of the future than to beat the gun.” Keynes (pp. 157–158) also mentions other factors that work to diminish any possibility of “socially advantageous” investment: “the game of professional investment is intolerably boring and over-exacting” (except for gamblers) and requires access to more resources to insulate unconventional behavior from the myopia of speculators. Moreover, Keynes tells us that as financial markets become *better* organized the “predominance of speculation increases” at the expense of “enterprise” (p. 158). At every turn it seems that Keynes confronts us with an institutional framework—a modern financial system and market participants—speculators—in which undesirable outcomes at the aggregate level necessarily and routinely emerge. This is indeed a bleak picture of modern financial markets.

2.2. *Knowledge in Keynes*

Uncertainty and its effects fully dominate and control the scope of market processes in *The General Theory*. And when merged by Keynes with his particular take on how financial

markets work, these two elements take on the force of a mallet, repeatedly pounding away at the desirability of upholding in a serious way arguments about the capacity of the market economy to coordinate plans. Keynes's critique is fundamental because it strikes at the very heart of the capitalistic essence of the market economy in that no reliable market mechanisms in longer term asset markets operate to ensure desirable coordinated outcomes. As Garrison (2001) astutely observes in *Time and Money*, acceptable outcomes for Keynes emerge only by design or accident.

One way to characterize Keynes's critique is to see it as an implicit claim that the modern market economy is inherently incapable of generating prices and other forms of information by which uncertainty can be managed or its undesirable side-effects minimized. In particular, Keynes skillfully postulates constraints on the scope and capacities of what transactors can learn and how they adjust; as a consequence, the emergence of a pattern of corrective prices is by assumption short-circuited or precluded from happening. The self-correcting properties of the market are by construction consistently trumped not by uncertainty alone, but by the inability of transactors, given the institutional arrangements in which they operate, to deal with uncertainty effectively. And from this it follows that in the face of uncertainty, the kinds of interactions agents are likely to engage in will be sufficiently constrained, preventing the emergence of prices consistent with relieving market maladies. Markets, in short, are precluded from generating a reconfiguration of prices more nearly consistent with fundamental economic realities because agents cannot learn those realities and adapt their behavior accordingly.

This characterization of Keynes's diagnosis can be bolstered by taking a brief look at his treatment of the marginal efficiency of capital and his liquidity preference theory.

2.2.1. The Marginal Efficiency of Capital. In Keynes's formulation, the MEC⁵ depends on the prospective yield of capital goods and hence is intimately related to long term expectations. Keynes attributes the cyclical downturn and slump to a collapse in the MEC and this collapse arises because long-term expectations of the prospective yield of capital are simply assumed to have turned sour. Because Keynes holds that long-term expectations do not rest "on an adequate or secure foundation" (1937:218), views of the future are "subject to sudden and violent changes," bringing with them and "without warning . . . the forces of disillusion [that] may suddenly impose a new conventional basis of valuation" (pp. 214–215). Keynes, in effect, is claiming that long-term expectations are exogenous to the market process, and thus can take on an indeterminate range of assumed characteristics, including a tendency to change suddenly and without apparent provocation. As Hicks (1969) observes, Keynes's expectations mainly "appear as data, as autonomous elements that come in from outside, not as elements that are molded in the course of the process that is being analyzed" (p. 313). This enabled Keynes to sweep aside two important considerations. First, underlying economic realities are not determinative in affecting long-term expectations, and second, even if such fundamentals might be relevant, no provision is made to allow investors to learn about such matters and modify their expectations accordingly.

In regard to the first point, long-term expectations in Keynes's construction simply refer to an unknowable and fundamentally uncertain future—it is constituted by a sequence beginning at some time-coordinate in the indefinite future and enveloping all that comes

after. However, Keynes's characterization of the "time problem" is not particularly helpful because all economic activity by definition occurs in the context of *some* temporal sequence; and while we can concede that, yes, the future (i.e., any moment after the present one) is in some sense fundamentally uncertain, that does not imply that all future moments are equally uncertain or that all investors will direct their actions and base their expectations to the same degree of futurity. Roger Koppl came up with a name for this—"the horizon principle"—and we used it in one of our exchanges with our post-Keynesian critics as a way of dealing with the relativity of plan futurity (Koppl and Butos 2001). The basic idea here is simple enough: since all futures are not equally uncertain, agents will tend to temporally situate themselves within zones of uncertainty consistent with their respective views about the future, their current knowledge, and attitudes or preferences about an uncertain future. Mistakes and errors will naturally arise, but these also create interstices of exploitable opportunities—fields of action—for entrepreneurs that have the effect of apportioning Keynes's monolithic uncertainty into more manageable servings. In this way, agents with different views of the future and with different tolerances of uncertainty find temporal niches that allow them to respond to underlying economic fundamentals as they arise and, in so doing, to contribute to the formation of coordinating changes in market outcomes.

Second, in Keynes's formulation there is no apparent mechanism that allows agents to actually learn knowledge that might alter their long-term expectations. Because expectations are assumed to be exogenous, no basis exists to systematically relate them to market phenomena. As such, there are no evident disconfirming sets of events that would alter them. Keynes (1937) is explicit in associating increased uncertainty with increased futurity and clearly there is no dispute that "the price of copper twenty years hence" would qualify as uncertain in Keynes's sense. At the same time, though, it is easy to find economically relevant situations against which no probability calculus can in principle be applied that do not refer to a distant future. This distinction is relevant because in Keynes's example, feedback effects and hence the possibility of corrective action hinge on highly distant outcomes, whereas equally uncertain outcomes but of lesser futurity may in fact provide scope for remediation in a more timely fashion.

Long-term expectations, in short, are not only necessarily unhooked from the market process they are meant to refer to, but are also incapable of being falsified by market outcomes. Not surprisingly, Lachmann (1986:98) and Garrison (2001:77) describe Keynes's long-term expectations as a "wild card," available to the analyst for use at propitious moments to ensure certain kinds of outcomes.

2.2.2. The Theory of Liquidity Preference. The role of long-term expectations in affecting the schedule of the marginal efficiency of capital is central to Keynes's explanation for the onset and perpetuation of the slump. But for Keynes an additional element works to compound the difficulties inhering in the MEC. This element is Keynes's theory of liquidity preference and the special way in which expectations are claimed to subvert an equilibrating role for interest rates consistent with full employment.

In Keynes's theory of the speculative demand for money, each speculator's desire for short-term capital gains is expressed by holding either money or bonds based not on "the absolute level of r but the divergence from what is considered a fairly *safe* level of r " (Keynes

1936:201). When Keynes talks of the speculative demand for money, we must understand that to mean that a certain portion of the monetary assets of the investors has been set aside as a reserve for purchasing bonds for speculative purposes, suggesting implicit constraints on the allowable distribution across the spectrum of monetary and non-monetary assets.

These constraints appear in two forms. The first one appears as a given quantity of speculative balances that are apportioned by each investor to either cash balances or bonds. Thus, if we imagine a collapse in expectations about the profitability of long term capital projects, investors do not have the option of readjusting their portfolios by switching out of consuls and into other financial instruments aside from cash balances. By restraining portfolio behaviors, the scope of coordinating reconfigurations of financial asset prices is limited to a single financial asset, bonds. Any hope for coordinating price and yields changes to occur across a spectrum of financial assets is closed, and with it the necessary reallocations within the capital structure.

The second and more important kind of constraint that Keynes imposes on speculators' behavior is inelastic interest rate expectations.⁶ Following Keynes, the collapse in the MEC requires increased investment if full employment is to be maintained and that calls for a reduction in the rate of interest. But, Keynes maintains, the interest rate stays too high. Keynes (1936) claims that the decision of each investor to hold cash balances or bonds rests on some prior determined and otherwise unexplained "safe" rate of interest. The interest rate, consequently, "may fluctuate for decades about a level which is chronically too high for full employment" and may even be immune to central bank manipulation "once it has fallen to a level which on the basis of past experience and present expectations of *future* monetary policy, is considered 'unsafe' by representative opinion" (p. 203).⁷ Although Keynes believed monetary policy was unreliable for various reasons other than interest rate rigidities,⁸ the discussion here suggests that conventions about what constitute a "safe" or "normal" rate of interest are capable of preventing the market rate's adjustment consistent with increasing employment.

Now, if investors cling to some assumed "safe" rate of interest and that this rate is only a convention, we can certainly *imagine* that some set of circumstances have resulted in an interest rate that is chronically too high. At the same time, though, that also requires a fairly strong presumption about the kinds of adjustments investors may make. In particular, Keynes's assumption works to impede speculators learning anything that could call into question their allegiance to some "safe" rate of interest. Because this rate of interest corresponds to a particular price for bonds, any movement upward in the price of bonds and fall in the interest rate would be reversed as speculators, given their predetermined "safe" rates of interest, would sooner or later feel compelled to move out of bonds and into cash balances in order to avoid capital value losses or to cash-in on capital value gains. According to Keynes, the prevailing convention is inconsistent with full employment and no reliable mechanism works to change speculators' expectations about future interest rates or asset prices.

Keynes's claims concerning the conventional basis for the interest rate and his postulating that each investor effectively holds inelastic interest rate expectations are hardly benign. In terms of the discussion here, Keynes unhooks speculators' behavior from the market process by effectively stipulating that they do not have the capacity to learn information

that might induce them to revise what they consider the safe level or conventional basis of the interest rate. Consequently, Keynes introduces expectations in ways that upstage a reliably equilibrating role for interest rates. Given such rigidities, it is hardly surprising that once some exogenous circumstance plunges the system into a slump, the system will exhibit ineffectual corrective tendencies.

Thus, we see that Keynes's theory of liquidity preference presents yet another set of barriers that by assumption short circuit the efficacy of coordinating market mechanisms. The margins across which portfolio adjustment could occur are compressed by assumption. More importantly, Keynes's assumption that investors have inelastic expectations about interest rate movements is simply the flip side of asserting that their capacity to learn is severely limited.

2.3. *The Keynes Challenge*

There are potentially several ways to meet the challenge Keynes presents to the efficacy of the market process, and indeed a large and important literature exists which does just that. But my emphasis here is that in Keynes's system coordinating tendencies do not work because the system and its participants lack the capacity to generate knowledge necessary for a well functioning economy. I wish to suggest that the problem Keynes raises is not one of decentralized knowledge failing to be transmitted and used, but at bottom the failure of the system to produce such knowledge in the first place. Modern financial markets, in short, suffer an inherent and incorrigible failure because they cannot generate the correct prices. This is what I refer to as the "Keynes challenge."

Are there satisfying ways to sort through the uncertainty-based theories of Keynes? One possible approach is to emphasize that while expectations arise in the context of uncertainty, prices in fact convey relevant information about underlying realities and that prices promote the coordination of economic decisions (Garrison 2001:26). We might call these "reasonable expectations" in that by endogenizing expectations this approach provides scope for their revision while avoiding the ratiomania of rational expectations. However, as attractive this approach might be, it does not directly address Keynes's claim that the behavior of agents, their expectations, and the prices which their interactions generate are not only necessarily incompatible with their plans and preferred market outcomes, such as full employment, but incorrigibly so. For Keynes, market coordination works, but the outcomes it produces are based on the wrong prices. The market, in short, expresses the wrong kind of knowledge and the wrong array of prices.⁹

If "reasonable expectations" (as described above) are not applicable here, is it possible to relocate and reframe the problem of knowledge, including the particular question of the "Keynes challenge," that avoids the usually futile exercise of pitting competing *postulates* against each other? Given the centrality of uncertainty to the actual world we live in, casual empiricism does not provide sufficient guidance in addressing the question before us. Thus, even if we recognize that "Paris gets fed," we also observe ongoing market instabilities, especially in financial markets, that give credence to the possibility that knowledge and prices are either not being effectively communicated or generated or both.

My purview of Keynes has been confined to questions about knowledge and expectations; it has not been my purpose to consider in any detail various technical issues in monetary-macroeconomics raised by *The General Theory*. To avoid misunderstanding, I am not suggesting that Keynes's economics as such is fully coherent or correct. Rather, I am arguing that Keynes's claims regarding uncertainty and its effects present a serious challenge for market process theory. By framing the question in terms of the *generation of knowledge*, I believe some light can be shed on Hayek's lack of response to *The General Theory*. At the same time and of considerably greater interest, by looking at Keynes's work and Hayek's contributions in this light, new questions arise which oblige us to go well beyond the old Hayek-Keynes controversy.

3. Hayek and Knowledge

Hayek's "knowledge papers" during the 1930's and 1940's helped set the stage for the renaissance of Austrian economics in the last part of the 20th century. Interest in "the knowledge problem," the thesis that practical and absolute considerations constrain what economics actors can know, has served as a useful starting point for an abundance of important work in exploring, refining, and extending Austrian insights to the theory of the market process. In "Economics and Knowledge" Hayek famously indicated that the

really central problem of economics . . . is how the spontaneous interaction of a number of people, each possessing only bits of knowledge, brings about a state of affairs . . . which could be brought about by deliberate direction only by somebody who possessed the combined knowledge of all those individuals" (Hayek 1948 [1937]:50–51).

The economic problem facing any society, as Hayek would put it later (1948 [1945]), is thus "a problem of the *utilization* of knowledge which is not given to anyone in its totality" (p. 78, emphasis added) whose success mainly depends on making "fuller use . . . of the existing knowledge" by "conveying to the individuals such additional knowledge as they need in order to enable them to dovetail their plans with those of others" (p. 79). For Hayek, the price system is a particular institutional arrangement that signifies to market participants opportunities for action, thereby establishing a context for entrepreneurial discovery and thus for the ongoing remediation of plan discoordination. The price system helps to solve the problem of constraints on knowledge because by accessing it, individuals economize on the kind and amount of knowledge they need to have to pursue their separate objectives.

At the same time, however, there are suggestive hints about the generation of knowledge. For example, we find in the earlier 1937 paper (and somewhat ironically not in the 1945 paper) that hypotheses about knowledge "must necessarily run in terms of assertions about causal connections, about how experience *creates* knowledge" (p. 47, italics added). And in "The Meaning of Competition" (1948 [1946]) he notes that when dealing with the plans of several persons "the problem becomes one of how the 'data' of the different individuals . . . are adjusted to the objective facts of their environment" (p. 93).

These are interesting and potentially seminal insights; all the same, questions about the generation of knowledge are left in the shadows if not explicitly set aside in these and his other papers. Instead, Hayek's central focus in his catallactic theory refers to the market's capacity to communicate dispersed and tacit individual knowledge, not to the circumstances by which completely new knowledge is generated.¹⁰ Thus, in "The Use of Knowledge in Society" (1948 [1945]) when he speaks of the function of the market system as enabling "the utilization of knowledge not given to anyone in its totality" (p. 78), he fosters the notion, as Thomas McQuade and I observed (2002), that there actually is such a thing as that totality independent of the circumstances of its generation, and that the problem is how best to accumulate and use it. Of course, he strenuously denies that direct accumulation is even possible, and clearly represents the price system as communicating "by a kind of symbol, only the most essential information" (p. 86). Although the idea seems to be just below the surface, he does not explicitly identify price symbols as knowledge generated by the market order. And in speaking somewhat loosely of the price system as "a mechanism for communicating information" (p. 86), he exposes himself to the sort of out-of-context readings, evident in the work of Grossman and other modern "theory of information" economists, that construe the issue simply in terms of dispersed information being directly communicated between individuals by means of the price system. In short, Hayek's emphasis is on the market as a discovery process, not as a knowledge-generating process.

I have interpreted Keynes as suggesting that in the context of market institutions, fundamental uncertainty about the future acutely constrains the generation of relevant knowledge and that agents, in responding to such uncertainties, are assumed to be seriously handicapped in learning new knowledge. Even if we suppose that the market process succeeds fully in the efficient use of dispersed knowledge, the process itself will produce outcomes that reflect only the knowledge that has been generated. If we have reason to think that the production of knowledge is in the first instance severely hindered, the observed outcomes may indeed appear as incorrigible Keynesian maladies and pervasive market failures that no process of discovery, as such, can ameliorate.¹¹ If this argument can be sustained, then the economic problem facing the market economy and its participants turns not only on the use of dispersed knowledge but more directly on the conditions and circumstances of its generation.

To the extent that this consideration in fact looms as a significant question for the "Keynes Challenge" (and whether, indeed, it has applications beyond that), I suggest that Hayek was not well situated to respond to this aspect of Keynes. And while Hayek may have actually tired of the debate or believed that *The General Theory* was only a tract for (or of) the times or that Keynes would again change his mind, my speculation is that there is little evidence to suggest that Hayek was positioned in fact to mount an effective rebuttal to the "Keynes problem" as I have defined it. What Hayek could have used, but which unfortunately was not available to him at the time, was a more complete elaboration and understanding of orders and their knowledge-generating capacities. In addition, looking at the market process from this perspective also reveals some potential for framing familiar questions differently and in so doing acting as a platform for further research.

4. Orders and the Generation of Knowledge

My conjecture is that if Hayek had wished to approach Keynes from the perspective emphasized here—that of the generation of knowledge—it is not likely that he could have done so until the early 1950's with the publication of *The Sensory Order*.¹²

The significance of Hayek's cognitive theory for the discussion here is that it provides an illustration of the functioning of a particular structure, the human brain, whose principal attribute is the generation of knowledge. In Hayek's cognitive theory, the conjectures and facts agents formulate in pursuing their objectives derive from internal models that process signals (sensory inputs) and transform them into knowledge. These models, then, serve as "production systems" by which agents generate an interpretation of reality as it is and as it might be. On Hayekian "sensory order" grounds, if what we know about external reality is actually an interpretation, then our subjective knowledge of reality has somehow been constructed by the brain. Hayek's cognitive theory provides an explanation of how this happens. In Hayek's terminology, the brain produces a classification (or interpretation) of external reality along any number of dimensions according to the perceived attributes the mind has constructed. In effect, Hayek's cognitive theory directs our attention toward a conception of learning in which a special kind of emergent characteristic—knowledge—is generated.¹³ While we often and correctly associate learning with mechanisms by which existing knowledge is acquired or grasped, as is the case for Kirznerian entrepreneurs, a Hayekian "sensory order" perspective reminds us that learning also includes the transformation of existing knowledge and the generation of new knowledge.

While Hayek clearly saw individual knowledge as order-dependent (i.e., dependent on the structure of the sensory order), he never generalized this idea to the market order or to other social orders.¹⁴ On that account, then, it is conceivable that Hayek would have rejected the suggestion that we can usefully refer to the generation of knowledge by non-human structures.¹⁵ But in maintaining the uniqueness of human knowledge does not imply rejecting the usefulness of an *analogy* between Hayek's account of the production of a human individual's knowledge and the production of "knowledge" by other structures or entities. By deploying such an analogy a pathway opens up connecting Hayek's cognitive theory with the theory of adaptive classifier systems. Such systems, from the simple to the complex, may exhibit emergent characteristics associated with the generation of particular kinds of knowledge. In this view, knowledge-generating objects differ in terms of their structure, the elements comprising them, their mechanisms, and their capacities for producing various kinds, quantities and forms of knowledge. We recognize that an individual is conscious and reflective, but we don't say that about the price system. At the same time, the individual alone does not generate conventions, but the ongoing interactions of individuals do. We can choose to equate knowledge with the individual but we would still need a vocabulary to talk about what happens catallactically when individuals interact and in so doing generate "knowledge" that would not have existed in the absence of those interactions. This insight is reflected in Stephan Boehm's observation that "knowledge yielded by market processes is knowledge generated through the operation of the market order—that is, it cannot be generated in any other way" (Boehm 1994:169). Whatever we might call the output produced by the market process, it is an emergent phenomenon in which individuals' knowledge have undergone a

transformation as a consequence of the particular interactions they have performed. As an unintended consequence of the seemingly simple exchanges that catallactic theory studies, an array of unique market prices is generated. These interactions have produced something new, something different. For a given institutional context, something happens that could not have been induced from a straightforward aggregation from a single individual to the interactions among many individuals.¹⁶ New knowledge, if that term is to be used, emerges from the creative capacity of the individual and from the interactions among individuals.¹⁷

Hayek's theory of the sensory order provides an analogy that helps us to conceptualize social orders in general as knowledge-generating objects, as complex and dynamic structures in a state of continual adaptation to their environment, and capable of generating classifications of events in that environment.¹⁸ And most importantly, we would expect on the basis of such a perspective that not all social orders will have the same knowledge-generating capacities.

5. How Does Order-Generated Knowledge Matter?

The theme of the discussion thus far has centered on questions about the distribution and production of knowledge, both at the individual and market levels. I have suggested that the so-called knowledge problem, with its emphasis on the dispersion of knowledge, should also include the analysis of the generation of knowledge. In what follows, I will try to highlight how this perspective not only suggests another approach to the "Keynes Challenge" but also broadens the scope of the inquiry concerning the interplay between economics and knowledge in ways that I think are interesting and useful.

5.1. Individual Knowledge

As discussed earlier, Keynes endows agents with long-term expectations that are exogenous to the market process or assumed to be inelastic. The significance of these assumptions is that agents are constrained in their capacity to learn. Even though agents in the course of their market activities might stumble upon new and disconfirming information, by assumption they remain wedded to their prior expectations, hampered in their ability to revise their expectations or formulate alternative sets of plans. Their capacity to use newly discovered information or to generate new knowledge is so compressed as to make them virtual prisoners of their postulated knowledge-endowments.

In *The General Theory*, the combination of uncertainty in the context of modern day institutional (and especially financial) arrangements and the postulated range of agent responses reinforce each other in ways that keep the system mired in a depressed state of equilibrium. Virtually all possible exits out of the morass are foreclosed by Keynes, with the exception of the saving grace of enlightened, non-self-interested civil servants and the intellectual aristocracy who aspire only to ensure a suitable flow of the volume of investment. Although Keynes's economic agents are "doing the best they can," their behaviors are not the byproduct of a cognitive process akin to that found in Hayek's *The Sensory Order*

in which agents not only have the capacity to *discover* existing knowledge but to *create* it as well. Extending the concept of agency to include such capacities argues against Keynes because it raises the possibility that even in the midst of dread, system-wide uncertainty, agents would still see the future as a *field of action* as opposed to an impenetrable void in which, according to Keynes, only sub-optimal conventions serve as useful guides to behavior.¹⁹

5.2. *Social and Market Knowledge*

In directing our perspective to social orders, we would expect that their knowledge-generating capacities will be contingent on the institutional framework in which agents interact.²⁰ Thus, for example, a system of central planning is an order constructed as a single locus of control assisted by some data-gathering organization that can communicate some of the articulable aspects of the particular circumstances of time and place back to the center. There are two major problems with this arrangement. First, a significant amount of the potential input data is in the form of tacit individual knowledge and is not directly communicable in this way. Second, even allowing that the arrangement is capable of capturing at least some of the dispersed knowledge, there is nothing in the structure of the order to enhance its classificatory possibilities or its feedback ability, and so there is no capability for generating higher-level knowledge, i.e., knowledge beyond that which a single sensory order is capable of producing. The absence of a price system and hence the ability to rationally relate via economic calculation decisions to underlying preferences and scarcities under central planning is a crucially important failing implied by the system's knowledge-generating capacities.

The market order not only involves structures which react to input data in the form of tacit knowledge, but also processes its input data through an elaborate classificatory process, out of which are generated results in the form of prices and other attributes of goods which feed back to augment individual knowledge. This is a classification process of quite different nature and scope to that of a sensory order, and it is no surprise that a system of central planning, lacking it either in whole or in part, is significantly less agile in an adaptive sense than a market system. Casting the analysis in terms of the actual knowledge-generating capacities of possible alternate arrangements is in essence an elaboration of the idea of "comparative institutional analysis."

The question of the generation of market knowledge under different institutional arrangements has particular relevance in terms of the "Keynes Challenge." As discussed above, Keynes associated macro maladies with the emergence of modern financial markets in which ownership and management become dichotomized and financial assets are made liquid for speculators. It will be recalled that in the context of uncertainty, the operation of modern financial markets allows animal spirits to be vented in ways that generate volatility and the persistence of sub-optimalities in output and employment. In addressing Keynes's critique one way to proceed is to grant Keynes the sort of financial market instability that he observed during the 1920's and 1930's and analyze that and other episodes in terms of the institutional context in play. That is, it may be possible to view these sorts of Keynesian outcomes as the way the system adapts to the environment in which it operates. As

developed by Koppl and co-authors,²¹ a key feature of that institutional setting is the presence of “Big Players”—market participants such as finance ministers and central bankers who are capable of affecting the market but who are immune to the discipline of the market. In ordinary markets, the input data is in the form of the knowledge of local circumstances held individually by the many market participants. The market order classifies this input to produce market knowledge in the form of prices.

In contrast, if Big Players are active, the input data includes strong components emanating from them, and so the resulting knowledge generated in the form of prices is an adaptation not only to the distributed individual knowledge but to the Big Player’s input. In these circumstances, market participants correctly attach special significance to future inputs from the Big Player compared to the “underlying fundamentals” (the inputs from everyone else). If Big Players engage in discretionary policy, market participants are not likely to learn the new (and ever-changing) environment quickly enough to adapt fully and the market classifications will be only poor representations of the actual circumstances. Although the market order produces knowledge as well attuned to its inputs as its reaction time permits, the epistemic quality of the market signals is lower in a Big Player market. In response to the prevailing incentives, market participants are likely to form expectations heavily based on what others think the Big Player is going to do, thereby providing a rationale for “herding” and other behaviors often associated with Keynes’s observations about modern financial markets. The epistemic effect of discretionary Big Players, in short, carries implications for market orderliness and the coordination of individuals’ plans, suggesting that Keynesian policies can generate a Keynesian economy. In this sense, uncertainty may be an effect, not a cause, of financial and economic instability.

6. Conclusions

Despite framing some of my points in the well-trod Hayek/Keynes path, I have also suggested that conceiving of the “knowledge problem” more broadly provides a multi-faceted entry point for understanding economics and other social phenomena. Many interesting problems, it seems, turn out to be knowledge questions about how agents and markets and other social arrangements not only use knowledge but also how they generate knowledge and the circumstances under which that occurs.

In reflecting on the implications of a “knowledge-generating” perspective, further questions arise that are perhaps more commonly associated with the economics of endogenous knowledge, entrepreneurial and institutional analysis, and more generally with complex and adaptive systems, such as science, capable of exhibiting emergent phenomena, areas of inquiry to which Austrians have already made important contributions or could provide useful insights. At the same time, I would point to the synthesizing aspects of the points I’ve raised in this paper. After all, the question still remains: “how do markets work?” Austrians have long pointed out that an important part of that explanation required making explicit the role of knowledge in the market process, and I see the views expressed here as merely an extension of that more general question.

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Notes

1. According to Robert Dimand (1988), this switch commenced during the summer of 1931, while Patinkin (1976) places it at the beginning of 1932. Rymes (1989:47) notes that Keynes's lectures for Michaelmas Term 1932 were newly termed "The Monetary Theory of Production" from the previous "The Theory of Money," signifying "a change in Keynes's attitude" concerning the importance of money in influencing "production rather than prices."
2. It is useful to note that all of this ferment reflected Keynes' long-standing interest in the problem of unemployment, both as a theoretical problem and as a policy issue. Keynes's views about the capitalist system in the early 1930's did not suddenly undergo a transformation; rather, he began to fashion a medium in the form of *The General Theory* that would give different expression to those views. See, for example, his "The End of Laissez-Faire" (1972 [1926]), pp. 272–294 and the Harris Lectures on "An Economic Analysis of World-Unemployment" (1973 [1931]), pp. 343–367. Also see Salerno (1992), Meltzer (1988), and Skidelsky (1983).
3. As noted by Howson (2001), Hayek intended to submit a piece to Keynes's *Economic Journal*; it is possible that he may have wanted to keep his entrée available. Hayek's article, if indeed he ever wrote it, never appeared in the *Economic Journal*.
4. Most researchers have found Keynes's *Treatise on Probability* (1921) integral to his later views on expectations. See, for example, Meltzer (1988), Runde (1994) and Butos and Koppl (1997).
5. Keynes defines the MEC as "equal to that rate of discount which would make the present value of the series of annuities given by the returns expected from the capital-asset during its life just equal to its supply price" (1936:135).
6. See, for example, Tobin (1958), Leijonhufvud (1968:366–383), Laidler (1999:258–259), and Steele (2001: 134–135).
7. According to Keynes the "fetish for liquidity" and "lender's risk" also keep interest rates too high.
8. See, for example, his Harriss Foundation Lectures of 1931 in Keynes (1973:343–367).
9. See Butos (2001) for a fuller discussion of this point.
10. The remainder of this paragraph draws freely on Butos and McQuade (2002:124).
11. According to Keynes, an exogenous change in long term expectations can induce a collapse in investment demand, plunging the system into an underemployment equilibrium. In Garrison's (2001) "labor-based" macro model, a flexible nominal wage rate serves only to "lock in rather than truly solve the problem" (p. 148).
12. Only "likely" because the manuscript that provided the foundation for *The Sensory Order* had been written in the 1920's and also because salient aspects of Hayek's philosophical analysis of human knowledge had appeared as articles in *Economica* in 1941 and 1942–1944 (later published as *The Counter-Revolution of Knowledge* in 1952).
13. In Hayek's account, sensory impulses are sorted out within the hierarchical and relational structure of the brain. The welter of impulses have no meaning apart from the transformation they undergo at the cognitive level. It is out of this initial "chaos" that a particular order, the *sensory order*, is generated.
14. Thus, it is interesting to note, as Butos and McQuade (2002) observed, that the idea of order-dependent knowledge and of its generation as referring to a different classification is made clear when Hayek emphasizes in *The Sensory Order* the contingency of individual knowledge with respect to the structure in which it is generated. He says explicitly that "a question like 'what is X?' has meaning only within a given order" (1952:4). Later, in "The Primacy of the Abstract," he characterizes human knowledge as "primarily a system of rules

of action” (1978:41) in which appropriate action patterns are invoked by sensed combinations of stimuli—an effective classification of the stimuli, but one very much tied to the actual structure of the classificatory apparatus. But, in applying this idea to orders other than the sensory order, as discussed earlier, he becomes much less clear.

15. Why Hayek seems to have overlooked the order-dependent character of knowledge is open to speculation. As noted earlier, when talking about knowledge in the context of the market he emphasizes the communication of dispersed and tacit individual knowledge, not the generation of completely new knowledge. It seems Hayek assumed that knowledge required a “knowing subject,” that the very idea of knowledge, whether conscious or tacit, was meaningful only in the context of an individual’s cognitive functioning. Consequently, Hayek would be expected to see “the price system as . . . a mechanism for *communicating* information,” as a means for transferring but not producing knowledge, as such (1948 [1945], p. 86, emphasis added). And this is consistent with his suggestive remark in the 1937 paper (“Economics & Knowledge”) that causal analysis “runs in terms of assertions . . . about how experience creates knowledge” (p. 47). In both cases, knowledge is person-specific and exists nowhere else and in no other form. While Hayek would agree that various kinds of knowledge exist in the form of “shared meanings” such as conventions or rules, they do so only because they refer to knowledge that each individual has (tacit or otherwise) or the routines that they follow. I believe Hayek retained this understanding about knowledge throughout his career.
16. As Hayek (1948 [1937], p. 35) mentions: “I have long felt that the concept of equilibrium itself and the methods we employ in pure analysis have a clear meaning only when confined to the analysis of the action of a single person and that we are really passing into a different sphere and silently introducing a new element of altogether different character when we apply it to the explanation of the interactions of a number of different people.”
17. In his later social theory, Hayek seems to understand the nature of a social order as an arrangement, an understanding based on what we can know about the structure of an order in contrast to what an order does. His orientation comes through fairly clearly when he says:

By “order” we shall throughout describe a state of affairs in which a multiplicity of elements of various kinds are so related to each other that we may learn from our acquaintance with some spatial or temporal part of the whole to form correct expectations concerning the rest, or at least expectations which have a good chance of being correct (Hayek 1973:36, emphasis omitted).

Hayek’s concept, however, is a “surprisingly passive view of orders in that it abstracts from any idea of orders as active, knowledge-generating structures. Absent is any hint of the function of orders characterized by forms of knowledge specific to them, dependent on the particular structure of the order and on the properties of its elements and their connections” (Butos and McQuade 2002:124–125). Buchanan and Vanberg (1991) argue for a conception of the market as a creative process. Their conception, specifically directed at critiquing Kirzner’s theory, centers on entrepreneurship as a creative activity, a perspective certainly consistent with a “sensory order” view of the generation of individual knowledge but nonetheless one that does not address *order-generated* market knowledge discussed here.

- 18 *The Sensory Order* directs attention to social orders as knowledge-generating structures. While different orders have different capacities for generating knowledge, a point of particular significance to be discussed in the next section, it may be useful to depict features of the sensory and market (i.e., catallactic) orders in the grid below. Here, the aim is to highlight in a very general way certain aspects of their similarities and their differences. We could imagine expanding the grid to depict other kinds of social orders, encompassing the full range of partial to non-catallactic ones, and each differing in their particular arrangements that govern interactions they support and in their knowledge-generating capacities. In the market order, for example, both conscious and tacit individual knowledge constitute “inputs” which becomes transformed through an elaborate (and non-conscious) process of market interactions out of which is generated a classification in the form of prices and other attributes of goods which feed back to augment individual knowledge. We might think of these kinds of social orders as “systems within systems,” from a single individual to structures of various kinds arising from social interactions of various sorts with each structure exhibiting different degrees of complexity, control mechanisms, and capacities for generating various outputs.

	Sensory order	Market order
Inputs	Sensory stimuli	Individual knowledge
Mechanisms	A classification is generated via an apparatus that organizes and relates impulses within a particular physiological structure	Rules and routines of interacting individuals, i.e., institutions within a given property rights framework of exchange
Outputs	Individual knowledge (conscious, tacit, predispositions, preferences); purposeful behavior	Market knowledge (prices, quantities, goods' characteristics); non-purposeful

19 These and other points are given more detailed treatment in a series of papers and exchanges between Roger Koppl and me and various critics. See, for example, Butos and Koppl (1997), Koppl and Butos (2001), and Butos and Koppl (2003). Also see Butos and Koppl (1999).

20 This and the following paragraph draw heavily on Butos and McQuade (2002:125).

21 See, for example, Koppl (2002), Butos and Koppl (1993), and Koppl and Yeager (1996).

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