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ENTREPRENEURSHIP AND KNOWLEDGE

BY

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ENTREPRENEURSHIP AND KNOWLEDGE

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We live in a world full of contradiction and paradox, a fact of which perhaps the most fundamental illustration is this: that the existence of a problem of knowledge depends on the future being different from the past, while the possibility of the solution of the problem depends on the future being like the past.

-- Frank Knight

I. Introduction.

Readers of the popular press are no doubt aware of a certain resurgence of interest during the last couple of years in the concept of entrepreneurship. To some extent, a similar interest in the entrepreneur has also arisen within the narrower confines of professional economic thought. In particular, the entrepreneurship theory of Joseph Schumpeter -- a name long synonymous with entrepreneurship -- has become the focus of increasing interest.¹

One factor contributing to the resurgence of the Schumpeterian

1. The Schumpeterian theory is presented most clearly in The Theory of Economic Development, trans. Redvers Opie, Cambridge: Harvard University Press, 1934 (Galaxy Edition, Oxford University Press, 1961), the first German edition of which was published in 1911. See also Schumpeter's Capitalism, Socialism, and Democracy, New York: Harper and Bros., 1942 (Harper Colophon edition, 1976), esp. pp. 63-106.
2. On which see generally Israel Kirzner, "The 'Austrian' Perspective on the Crisis," in D. Bell and I. Kristol, eds., The Crisis in Economic Theory, New York: Basic Books, 1981, pp. 111-122.
3. Richard Nelson and Sidney Winter, for example, take a strikingly similar viewpoint in An Evolutionary Theory of Economic Change, Cambridge: Harvard University Press, 1982, a work they describe as "Neo-Schumpeterian."

theory has been the resuscitation, by the "modern Austrian school"² and others,³ of the perspective on economic competition that Schumpeter himself held -- a perspective somewhat different in crucial ways from the conventional neoclassical view. Of these more recent writers, Israel Kirzner has seized most clearly upon the notion of entrepreneurship, developing a disequilibrium theory of market process in which a conception of the entrepreneur plays a key role.⁴

What makes the theories of Kirzner and Schumpeter stand out as members of a distinctive genus is, if I may put it a bit contentiously, precisely the "extra-neoclassical" element both bring to the analysis. Rather than seeing the entrepreneur as a manager, as a bearer of risk, or even as a residual claimant in a world of Knightian "uncertainty,"⁵ these writers locate the entrepreneurial function in the (qualitative) change in economic categories that agent somehow carries out.

4. See especially his Competition and Entrepreneurship, Chicago: The University of Chicago Press, 1973, as well as the more recent "Uncertainty, Discovery, and Human Action," in Israel Kirzner, ed., Method, Process, and Austrian Economics: Essays in Honor of Ludwig von Mises, Lexington, Mass.: D.C. Heath, forthcoming.
5. See Frank H. Knight, Risk, Uncertainty, and Profit, Chicago: The University of Chicago Press, 1971 (originally published in 1921), whose views on many other matters are quite congenial to those of Schumpeter and of Kirzner. By the way, the epigram at the beginning of this essay is from p. 313 of Risk.

This essay is an attempt to analyze and to defend this Schumpeter/Kirzner view of entrepreneurship. It is also -- perhaps more importantly -- an attempt to reformulate the theory in a way that addresses a number of (what I believe to be) confusions and misconceptions about the relationships among knowledge, uncertainty, and entrepreneurship in economic theory.

II. Schumpeter and Kirzner.

Let me begin in somewhat provocative fashion: there is no difference whatever between the Schumpeterian conception of entrepreneurship and the Kirznerian. More precisely: many of the differences usually thought to distinguish the two concepts quickly dissolve upon close examination; and the divergence that remains turns out to involve not a disagreement about entrepreneurship itself but differences in ancillary areas of theory.

The first major issue that appears, on a naive reading, to separate the two authors is the issue of "equilibration" versus "disequilibration." Schumpeter's entrepreneur is an active force who, in wresting the means of production from their accustomed channels, upsets the state of equilibrium. Kirzner's entrepreneur is a passive equilibrator, a kind of Maxwell's Demon who scurries about restoring order to a disequilibrium world. In this reading, the two entrepreneurs have clearly distinct, albeit complementary, roles.⁶

In fact, however, there is actually no difference vis-à-vis equilibrium between the role of the Schumpeterian and that of the Kirznerian entrepreneur. The apparent difference lies entirely in the fact that Schumpeter and Kirzner define equilibrium in different ways. Under the Schumpeterian definition of equilibrium, both the Schumpeterian and the Kirznerian entrepreneur have a disequilibrating effect; and under the Kirznerian definition, both have an equilibrating role.

There are in economics two principal -- and quite distinct -- conceptions of the meaning of equilibrium. We might call these the "allocative" (or perhaps "substantive") conception and the "coordinative" (or "procedural") conception.⁷ The former, which reigns throughout neoclassical microeconomics from the Marshallian lowlands to the Walrasian heights, views an equilibrium position as a specific point in allocation space, as a particular vector of prices and quantities. By contrast, the latter -- which has been articulated most clearly by F. A. Hayek -- construes the problem of equilibrium in an explicitly temporal context, and sees the equilibrium state not as any

6. Cf., for example, Robert F. Hébert and Albert N. Link, The Entrepreneur, New York: Praeger, 1982, p. 99.

7. The terms "substantive" and "procedural" are meant to be reminiscent of Herbert Simon's distinction between substantive and procedural rationality. ("From Substantive to Procedural Rationality," in S. J. Latsis, ed., Method and Appraisal in Economics, Cambridge: Cambridge University Press, 1976, p. 129.) Although I have some problems with Simon's distinction, the words adumbrate (at least in spirit) what I have in mind.

particular allocation but as a condition in which the various plans-for-action of economic agents are compatible with one another. In a procedural equilibrium, no one's expectations are disappointed in the course of carrying out the plans.⁸ The two are not unrelated, of course; a coordinative equilibrium will always imply some allocation of resources. But a coordinative equilibrium is not defined in terms of that or any other allocation point, and the failure to achieve a particular allocation (e.g., an "optimum" of some sort) does not imply disequilibrium.

It seems clear that Schumpeter's conception of equilibrium, which he called "the circular flow of economic life," is implicitly a procedural definition. He describes it this way.

The data which have governed the economic system in the past are familiar, and if they remain unchanged the system will continue in the same way. The changes which the data undergo are not so familiar; but in principle the individual follows them as well as he can. ... [H]e removes the discrepancies between the data and his conduct which emerge if the given conditions change and people try to continue operating in the same way.⁹

Disequilibrium occurs when there are discrepancies between the data on which the agent bases his plans and the realized data; equilibrium consists in the continual carrying-out of plans without disappointment.

8. F. A. Hayek, "Economics and Knowledge," *Economica*, N. S. Vol. IV, 1937, reprinted in *Individualism and Economic Order*, Chicago: The University of Chicago Press, 1948 (Gateway Edition, 1972), p. 41.

9. The Theory of Economic Development, p. 27.

As Stephen Littlechild has pointed out, Kirzner does not share this definition of equilibrium, but rather upholds a substantive "concept of equilibrium 'as a sort of optimum position.'"¹⁰ Much of the confusion on this point arises from Kirzner's tendency to employ the word "coordination" in describing the equilibrating process, and even to cite Hayek's discussion of plan coordination.¹¹ To Kirzner,

where an unexploited mutually beneficial exchange opportunity for A and B exists, the resulting "inefficiency" can be described as an absence of coordination. ... By A's not buying B's apples, and B's not selling them to A, each party is, because of ignorance of the other's "existence," acting as if the other did not in fact exist. A knows his own tastes and assets; B knows his. But because these bits of knowledge are not coordinated, the actions taken by A and B are uncoordinated.¹²

But this is clearly not what Hayek meant by coordination. A and B are perfectly coordinated in oblivion of one another. Nothing intrudes to disturb the plans of either -- nothing, that is, until their mutual existence is recognized. Thus, by changing the data on which their original plans were based, the Kirznerian entrepreneur who brings A and B together actually "discoordinates" the two parties temporarily, even if he thereby brings about a better allocation of resources.¹³ Hayek is

10. S. C. Littlechild, "Radical Subjectivism or Radical Subversion?" in M. J. Rizzo, ed., Time, Uncertainty, and Disequilibrium, Lexington, Ma.: D. C. Heath, 1979, p. 44. The internal quote is from Hayek, "Economics and Knowledge," op. cit., p. 53.

11. Competition and Entrepreneurship, esp. pp. 212-222.

12. Ibid, p. 216, emphasis original.

quite clear on this point. "We may ... very well have a position of equilibrium only because some people have no chance of learning facts which, if they knew them, would induce them to alter their plans."¹⁴

There is a second issue normally held to distinguish the Schumpeterian from the Kirznerian entrepreneur. This is what we might call the major/minor issue: an agent is a Schumpeterian entrepreneur only when he effects major breaks from the past, only when the knowledge he introduces into the economic system is truly "new"; but an agent can qualify as a Kirznerian entrepreneur through imitation, arbitrage, or indeed any fact of economic perception, even if it is the perception of what is "already known."

But here again, I would argue, the difference lies less in the conception of entrepreneurship itself than in definitions and ancillary concepts. In particular, the major/minor issue ultimately comes to rest in an implicit divergence in the view of knowledge each author takes.

13. Similarly, under Kirzner's (allocative) definition, the Schumpeterian entrepreneur is also equilibrating. "For us," writes Kirzner, "the crucial element in entrepreneurship is the ability to see unexploited profit opportunities whose prior existence meant that the initial evenness of the circular flow was illusory -- that, far from being a state of equilibrium, it represents a state of disequilibrium inevitably destined to be disrupted." (Ibid, p. 127.)

14. "Economics and Knowledge," p. 53.

The rest of this essay is devoted to explicating what I mean by this.

III. Logic and empiricism.

Hayek has provided us with a distinction that is too little known in economic thought. It is a distinction between two realms of theorizing -- between economic theory as a Pure Logic of Choice (PLC) and economic theory as a broadly empirical endeavor.¹⁵ The former consists of theorizing based on the logic of "instrumental" or means/ends rationality,¹⁶ and it takes the form of conclusions derived logically (which is to say, tautologically) from various axioms or postulates. Mathematical general equilibrium theory is a good example of this.

Hayek's articulation of a coordinative, non-allocational conception of equilibrium was motivated by his view that "the tautological propositions of pure equilibrium analysis as such are not

15. Ibid, esp. pp. 33-39.

16. Or "substantive" rationality. Cf. note 7 supra.

17. "Economics and Knowledge," p. 35.

directly applicable to the explanation of social relations...."¹⁷ In Hayek's view, equilibrium theory must involve the empirical element. But, while he cites Popper on falsificationism, he does not mean by this merely the testability of propositions.¹⁸ Rather, Hayek appears to conceive of "empirical" more broadly, as an explanatory mechanism alternative to the PLC.

The pure logic of allocation is in many ways the defining characteristic of neoclassical economics, at least as it has been practiced since the 1930s. But in its original formulation,¹⁹ the allocation problem was cast in terms of a single individual. The problem with the substantive conception of equilibrium lies in the attempt to extend the PLC beyond the individual level; for the conclusions of a deductive process to be meaningful, Hayek argues, all the propositions involved must be simultaneously present in a single mind. In deducing conclusions about the allocation of resources in an economy, then, one is necessarily representing the economy as if it were somehow given to a single mind, to an "omniscient dictator."²⁰

18. Indeed, Hayek was ahead of his time in recognizing the difficulties of empirical testing in the social sciences. See generally, *The Counter-Revolution of Science*, Glencoe, Ill.: The Free Press, 1952.
19. Lord Robbins is normally held responsible for crystallizing this view of economics-as-logic-of-allocation in his *An Essay on the Nature and Significance of Economic Science* (London: MacMillan, 1932), although he was probably influenced in this by the Austrian economist Ludwig von Mises. See Spiro J. Latsis, "A Research Programme in Economics," in Latsis, ed., op. cit., and also generally Israel Kirzner, *The Economic Point of View*, Princeton: D. van Nostrand, 1960.

This is the real content of the "perfect knowledge"²¹ assumption in equilibrium theory.

For Hayek, the empirical enters economics not in the attempt somehow to test the results of formal equilibrium theory but in recognizing the empirical (procedural) -- as distinct from the purely rational (substantive) -- basis of the economic agent's knowledge. "The significant point here," he writes, "is that it is these apparently subsidiary hypotheses or assumptions that people do learn from experience, and about how they acquire knowledge, which constitute the empirical content of our propositions about what happens in the real world."²²

And therein lies the ultimate source of divergence between the theory of Schumpeter and that of Kirzner. Both are "extra-neoclassical" in that they wish to go beyond the portrayal of

20. "Economics and Knowledge," p. 53. This helps explain why the idea of central economic planning, as discussed during the famous "socialist calculation debate," was far more congenial to the proponents of mathematical general equilibrium theory than it was to Hayek. On this see Richard R. Nelson, "Assessing Private Enterprise: An Exegesis of Tangled Doctrine," Bell Journal of Economics, vol. 12, Spring, 1981, esp. p. 95.

21. To anticipate a distinction I will make below, one might call this the "perfect structural knowledge" assumption.

22. "Economics and Knowledge," p. 46.

economic agents as passive reactors. But Schumpeter starts from a model of economic behavior that is empirical in Hayek's sense, whereas Kirzner begins from the Pure Logic of Choice.²³

IV. Entrepreneurship and the logic of allocation.

As recent interest in "supply-side" economics has reminded us, there has long been a tension in economics between the conception of economics-as-a-science-of-wealth and economics-as-a-science-of-allocation, a tension that, in the last century, has pretty much resolved itself in favor of the latter. But there remains an important distinction among allocative conceptions.

In his Theory of Political Economy, William Stanley Jevons put the matter this way. "The problem of economics," he wrote, "may, as it seems to me, be stated thus: -- Given, a certain population, with various needs and powers of production, in possession of certain lands and other sources of material: required, the mode of employing their

23. As I will suggest shortly, both do, to different extents and in different senses, move away from their respective starting points -- for the better in Kirzner's case, and probably for the worse in Schumpeter's.
24. W. S. Jevons, The Theory of Political Economy, London: MacMillan, Fourth edition, 1911, p. 267.

labour which will maximize the utility of the produce."²⁴ This is certainly an allocation problem -- an operations research problem, even. But it is a social allocation problem; moreover and relatedly, it is arguably an "objective" allocation problem, with a transpersonal set of "givens" that imply a true, correct solution to the social allocation problem.

This is not entirely unlike Lord Robbins's later assertion that "economics is the science which studies human behaviour as a relationship between ends and scarce means which have alternative uses."²⁵ But notice that Robbins's problem is at once more general and more restricted. It is more general in that it is willing to cast any sort of human behavior -- not just that associated with "needs" and "production" -- in a means/ends light. And it is more restricted in that it wishes to study human behavior -- which is to say, the logic of operation of the individual human -- rather than the "objective" allocation problem of a society.

It is the 1930s version of the problem formulation far more than the 1871 version that is generally credited with setting the research agenda for modern neoclassical microeconomics.²⁶ But what is often overlooked is the extent to which the Jevonsian as well as the

25. Nature and Singnificance, op. cit. Cf. note 19 supra.

26. Cf. Latsis, "Research Programme," op. cit.

Robbinsian problem continues to underlie neoclassical equilibrium analysis. Indeed, the familiar theorems of modern-day "welfare economics" can be understood precisely as an attempt to reconcile the two problems: under certain conditions, individual human optimization behavior will lead to a social allocation "just as good" as would have obtained had a Jevons-like problem been "given" to a single mind. This reconciliation hinges on the fundamental congruence of the Robbinsian (human-mind) and Jevonsian (super-mind) problems as instances of the Pure Logic of Choice. Specifically, the reconciliation requires that the two problems have identical premises (the "perfect knowledge" requirement) and identical systems of deducing conclusions from premises (the rationality postulate).

If one relaxes the perfect knowledge requirement (as almost all economists insist they wish ultimately to do), then difficulties quickly set in. Consider a neoclassical economy that happens to be in (allocative) equilibrium, which means that all agents have adjusted their marginal rates of substitution to prevailing price ratios. Suppose this economy is disturbed by exogenous changes in relative prices or other parameters. If there is truly perfect knowledge, the system will instantly snap back into equilibrium, since all will know where the optimum point is and will head straight for it. But if agents do not, let us say, have a thorough acquaintance with the whole of the demand and supply curves they face, then adjustment to equilibrium may be slow or even impossible.²⁷ As Kenneth Arrow pointed out in an early, though still very relevant, discussion of this problem, the agent in disequilibrium has greater informational

requirements than his counterpart in equilibrium.²⁸ He must know not only his own costs and the prevailing price but also the demand curve he faces, since, out of equilibrium, the agent can no longer be a price-taker. One result is that a wide dispersion of prices is likely out of (allocative) equilibrium; moreover, "a premium is placed on the acquisition of information from sources other than the prices and quantities of the firm's own sales."²⁹

It is precisely this sort of information that the Kirznerian entrepreneur injects into the system -- information that is not

27. The speed -- and possibility -- of adjustment will depend on the price adjustment model one chooses. Roman Frydman, for example, has constructed a model in which, absent social norms or institutions to place bounds on agents's expectations (on which see section V below), agents using only local information cannot converge to equilibrium -- even when certain kinds of non-local information is provided them. See Frydman, "Toward an Understanding of Market Processes: Individual Expectations, Learning and Convergence to Rational Expectations Equilibrium," American Economic Review, forthcoming.
28. One might almost say that the agent in disequilibrium has infinitely greater informational requirements. To say that in equilibrium the price system provides sufficient information to guide economic behavior is, as Hayek has pointed out, a nonsensical statement. In equilibrium one by definition needs no information to guide behavior, since one's behavior is already completely adjusted. If prices convey information only in equilibrium, they convey no information at all.
29. Kenneth Arrow, "Toward a Theory of Price Adjustment," in M. Abramovitz, et al., eds., The Allocation of Economic Resources, Stanford: Stanford University Press, 1959, reprinted in Y. Brozen, ed., The Competitive Economy, Morristown, N. J.: General Learning Press, 1975, p. 59.

contained in the "Robbinsian" problem of the individual agent-as-maximizer.

Indeed, Kirzner defines entrepreneurship, at the level of the individual, as that aspect of economic behavior which is logically prior to, and which cannot be explained in terms of, means/ends rationality. Entrepreneurship involves "the element in action that is beyond the scope of 'rationality' as an explanatory tool...."³⁰ The point is itself a logical one: "rational" action in the economic sense presupposes a framework of means and ends -- decision variables and preferences -- within which the "rational" action takes place; the choice of framework thus cannot itself be explained as the outcome of a maximization process.³¹ To the extent that "imperfect knowledge" is taken to mean the possibility of divergence -- and change -- among the means/ends frameworks of economic agents, then, as a logical matter, one must have entrepreneurship in this sense.

Now, while the imperfection, or at least the diversity, of knowledge is necessary for entrepreneurship, it is important to recognize that Kirzner's conception of the entrepreneur has nothing to do with uncertainty -- or at least nothing to do with uncertainty in

30. Kirzner, "Uncertainty, Discovery, and Human Action," op. cit.

31. One might argue that the choice of framework could itself be the result of a rational choice at a higher level. But this leaves the choice of this higher framework -- and eventually the "highest" framework -- unexplained. Cf. Ibid.

the sense familiar in neoclassical economics. The reason is quite simple: uncertainty in the familiar sense -- which includes much if not all of what Knight meant by "uncertainty"³² -- can be incorporated quite comfortably into the individual-level logic of choice.³³

What is "uncertainty" in the conventional neoclassical sense? To Arrow, whose view may be taken as definitive on such matters, uncertainty "means that we do not have a complete description of the world which we fully believe to be true. Instead, we consider the world to be in one or another of a range of states. Each state of the world is a description which is complete for all relevant purposes. Our uncertainty consists in not knowing which states is the true one."³⁴ This sort of uncertainty creates no problems that require us to step outside the logic of individual means/ends rationality. If \underline{a} is a vector of possible actions the individual may engage in; $\{x_i\}$ is the set of states of the world the agent believes possible; $\{p_i\}$ is the

32. Knight, Risk, Uncertainty, and Profit, passim.

33. Kirzner has drawn more than a little criticism for divorcing the concept of the entrepreneur from that of uncertainty. Such criticism, it seems to me, rests in part on the failure to see uncertainty (in the conventional sense) as well within the bounds of the PLC, which failure in turn rests, it seems to me, on the failure of many otherwise "subjectivist" economists, including Kirzner's teacher von Mises, to recognize the subjective nature of probability. On this see R. N. Langlois, "Subjective Probability and Subjective Economics," C. V. Starr Center for Applied Economics Discussion Paper 82-09, New York University, March 1982.

34. Kenneth Arrow, The Limits of Organization, New York: W. W. Norton, 1974, p. 33.

agent's (subjective) probability distribution over the possible states; and $U(\underline{a}|x_i)$ is a function relating the agent's utility (his ends) to his actions \underline{a} (his means) and to the possible states of the world, then, in the PLC, the agent's problem is

$$\max_{\underline{a}} \sum_i p_i U(\underline{a}|x_i),$$

i.e., to maximize the expected utility of this actions.

It is important to notice how restricted a conception of uncertainty is involved here. As is so often the case, moreover, it is instructive to compare the economist's definition of a term with the meaning that term holds in the common-sense realm of daily life. Brian Loasby puts it this way. "When someone says he is uncertain, what he ususally means is not just that he doesn't know the chances of various outcomes, but that he doesn't know what outcomes are possible. He may well be far from sure even of the structure of the problem that he faces."³⁵

35. Brian J. Loasby, Choice, Complexity, and Ignorance, Cambridge: Cambridge University Press, 1976, p. 9. The view of uncertainty Loasby here describes has long been urged upon the profession by G. L. S. Shackle, to little avail. While this broader view is nonexistent in neoclassical thought, it does tend to crop up in the work of theorists who take a more behavioralist view, particularly those who study technological change. In addition to Loasby, see, e.g., Burton Klein, Dynamic Economics, Cambridge: Harvard University Press, 1977, and Donald Schon, Beyond the Stable State, London: Temple Smith, 1971.

What is often overlooked in the mathematical economics of information and uncertainty -- in which models like the one above have something of a canonical status -- is that such a model implies certain-knowledge as much as it allows for uncertainty. The agent is implicitly presumed to have an exhaustive list of possible actions and states of the world³⁶ and, equally importantly, a means/ends framework relating the actions and the states of the world to his ends. We might say that the agent has certain-knowledge of the structure of the problem he faces or, to put it another way, that he has perfect structural knowledge. Imperfections in the agent's knowledge extend only to specific parameters of the problem -- the x_i -- which are obscured from his vision. In the neoclassical world -- which is to say, within the pure logic of means/ends rationality -- the economic agent may have imperfect parametric knowledge of this sort, but never imperfect structural knowledge; he may acquire parametric information, but never structural information.³⁷

36. Which may of course include a "black box" outcome to account for states not explicitly foreseen.

37. On this distinction see R. N. Langlois, "Systems Theory, Knowledge, and the Social Sciences," Knowledge: Creation, Diffusion, Utilization, vol. 4, no. 2, December 1982. Of course, one may represent the agent as uncertain as between a number of distinct problem structures (Cf. Jacob Marschak and Roy Radner, The Economic Theory of Teams, New Haven: Yale University Press, 1972, pp. 12-13); but this just pushes the structural knowledge one level higher. (Cf. note 32 supra.)

Entrepreneurship, then, has to do with changes in structural knowledge, with the acquisition of structural information. And it is in this sense that entrepreneurship has nothing to do with uncertainty. The proper dimension for parametric knowledge is certainty-uncertainty; but for structural knowledge, the proper spectrum is knowledge-ignorance. As Kirzner well puts it: "To escape ignorance is one thing; to deal with uncertainty is another."³⁸

V. Entrepreneurship and the empirical element.

This is all very straightforward at the individual level of the PLC. The difficulties arise when we ask how individual action is reconciled with the "social" allocation problem.

The answer is that the reconciliation is effected in Kirzner much the same way as in neoclassical economics. What ties the two realms together is ultimately the structural overlap of the individual's allocation problem with the "social" allocation problem. Arrow's disequilibrium problem is now solved -- or at least more likely to be solved -- since entrepreneurship allows the agents in disequilibrium to acquire knowledge not contained in the rational choice problem each

38. "Uncertainty, Discovery, and Human Action," op. cit. See also Jack High, "Alertness and Judgment: A Comment of Kirzner's Present View of Entrepreneurship," in Kirzner, ed., Method, Process, and Austrian Economics, op. cit.

faces. But this is precisely to say that, for Kirzner, entrepreneurship closes a loophole in neoclassical theory; far from abandoning the PLC, Kirzner's theory is an attempt to extend it to situations of (allocational) disequilibrium.

Indeed, Kirzner casts the relationship between the individual and the market level in the following terms. At the individual level, entrepreneurship consists, as we've seen, in the element of action that is beyond (or at least prior to) economic rationality; but this corresponds, at the market level, to "the element in action that constitutes the discovery of error."³⁹ The term "error," with its connotations of right-and-wrong, has the unmistakable feel of the objective about it. It is not therefore too surprising that many have interpreted Kirzner as postulating -- like the neoclassical economist -- a true, objective allocation of resources, a sort of Platonic form that stands ready for the entrepreneur to discover.⁴⁰

As a result, Kirzner has come under attack for ignoring the creative and imaginative aspects of entrepreneurship. Even though the individual-level definition of the entrepreneur -- with its stress on the pre-rational formulation of the choice problem itself -- is

39. "Uncertainty, Discovery, and Human Action," op. cit.

40. Cf. Littlechild, "Radical Subjectivity," pp. 38 and 44-45. As I will suggest shortly, I think another interpretation is possible -- one which Kirzner himself has hinted at. But embracing this alternative interpretation will require abandoning the PLC.

certainly compatible with the imaginative and the creative, the association at the market level of entrepreneurship with "error" seems to reduce the entrepreneurial function to one of mere "alertness" to what already exists. In his most recent essay on entrepreneurship, Kirzner has attempted to address such criticism by distinguishing between what we might, in a manner of speaking, call "cross-sectional" and "time-series" entrepreneurship -- that is to say, between entrepreneurship in a single time-period and entrepreneurship over time. It is in the latter case -- in which time is permitted to elapse -- that, to Kirzner, entrepreneurship appears creative. "In the single period case alertness can at best discover hitherto overlooked current facts. In the multiperiod case entrepreneurial alertness must include the entrepreneur's perception of the way in which creative and imaginative action may vitally shape the kinds of transactions that will be entered into in future market periods."⁴¹

Yet, when we look in detail at the connection between the individual and the market level, we see the familiar mechanics at work. The entrepreneur must deal with uncertainty in the broadest sense, which means "the essential freedom with which the envisaged-future may diverge from the future-to-be-realized. Entrepreneurial alertness means the ability to impose constraints on that freedom, so that the

41. "Uncertainty, Discovery, and Human Action," op. cit.

42. Ibid, emphasis added.

entrepreneur's vision of the future may indeed overlap, to some extent, with that to-be-realized-future that he is attempting to see."⁴² What holds everything together is the overlap of the entrepreneur's vision with -- I hesitate to put it this way -- the "real" future. Once again, it is the conscious correspondence of the individual's problem-structure with the "social" problem-structure that provides the glue in the Kirznerian system: for, to Kirzner, it is "alertness that provides the only 'pressure' tending to constrain man's envisaged-future towards some correspondence with the future-to-be-realized."⁴³

Kirzner recognizes that he comes close at times to a kind of determinism. And he is insistent that he means no such thing. But the reason, it seems to me, that his critics have a hard time believing him is the language that attends his discussion of the entrepreneur at the market -- as distinct from the individual -- level. Here the job of the entrepreneur is to eliminate "inconsistency," to correct "error," and to effect "coordination" -- all defined not in terms of the ability of agents to carry out their plans successfully but in relation to some conceivable better allocation of resources of which, absent the entrepreneur, the economy would remain ignorant. The deterministic flavor, in short, comes from Kirzner's secret ingredient: the allocative definition of "coordination."

43. Ibid, emphasis altered.

Much of the determinism -- along with a good deal of the confusion -- disappears as soon as we switch to the Hayekian conception of coordination and alter our diction appropriately. The nature of entrepreneurship remains unchanged. Now, however, the entrepreneur no longer "coordinates" but simply connects; no longer "corrects errors" but merely exploits potentialities; no longer eradicates "inconsistency" but just eliminates price differentials. Such a switch of terminology may not be entirely as innocent as it seems, though; for in executing the switch we necessarily abandon the Pure Logic of Choice in favor of the empirical element.

In the empirical realm, the entrepreneur is still the force responsible for detecting and effecting better allocations of resources, for profitably putting together parties previously in ignorance of one another. But we can now see that this is a progressive function, not a "coordinating" function. This takes a lot of weight off the entrepreneur's back. Once we stop defining progress as coordination,⁴⁴ we realize that his ability correctly to foresee the future is not the glue that holds the system together.

44. There is no better illustration of the comingling of these two ideas in Kirzner than the closing encomium to the entrepreneur in "Uncertainty, Discovery, and Human Action." Here Kirzner bids us "understand how entrepreneurial individual action, and the systematic market forces set in motion by freedom for entrepreneurial discovery and innovation, harness the human imagination to achieve no less a result than the liberation of mankind from the chaos of complete mutual ignorance." (Emphasis added.) Mutual ignorance is probably a bad thing, and economic progress (in the sense of increased diversity and complexity in the economic system) is surely bound up with its elimination. But such ignorance is scarcely "chaos."

Although Kirzner's theory is fundamentally a logical one, it is possible to give empirical content to his concept of entrepreneurship at the individual level.⁴⁵ Indeed, in permitting the passage of time and speaking about future-oriented entrepreneurship, Kirzner is himself implicitly allowing the empirical to enter his theory, at least in homeopathic doses. The problem, as we've seen, lies in connecting the empirical entrepreneur with a non-empirical conception of the "social" economic problem; and the answer, not surprisingly, lies precisely in constructing an empirical model of the market process.

This is what Schumpeter has done. His "circular flow of economic life" is not the solution to a pre-existing "given" allocation problem; it is an economic world that has been "socially constructed"⁴⁶ by the interaction and learning of individual agents. It is a coordinated structure, an equilibrium in the sense that nothing agents learn merely in the course of carrying out their plans -- nothing they learn from the interaction of their plans with those of others -- will force them

45. See Benjamin Gilad, An Interdisciplinary Approach to Entrepreneurship: Locus of Control and Alertness (Ph.D. Dissertation, New York University, 1981), who connects Kirzner's conception of "alertness" with the psychological conception of incidental or unintentional learning. This gives the concept "empirical" content in Hayek's sense, i.e., it transforms alertness from a logical proposition to a proposition about the actual acquisition of knowledge by economic agents. But this doesn't make it "empirical" in the psychologist's sense (i.e., a behaviorist sense); indeed, as Gilad points out (pp. 18-19), Kirzner's is implicitly a cognitive or "rationalist" learning theory.

46. Peter Berger and Thomas Luckmann, The Social Construction of Reality, Garden City, N.Y.: Doubleday, 1966, esp pp. 45-85.

to alter those plans. It is not an allocative equilibrium, except insofar as the system exploits all profit opportunities the agents are bound to discover in carrying out their plans.⁴⁷ And, far from being unique, it is only one of an infinite number of conceivable states of mutual coordination.⁴⁸

Reconciling the subjective (individual) level and the objective (market) level is always a matter of demonstrating the overlap of the individual's allocation problem with the market-wide problem. But in Schumpeter, this overlap is brought about not by conscious rationality in the sense of logical deduction from explicit premises but by a very "empirical" sort of rationality;⁴⁹ thus it is not the conscious attention of the rational maximizer (neoclassical model) nor of the entrepreneur (Kirznerian model) that holds the system together. To Schumpeter, the glue is habit and convention; in his world "everyone will cling as tightly as possible to habitual economic methods and only

47. Which may very well mean that "Menger's Law" -- the imputed valuation of higher-order goods according to the value of the final consumption goods they make possible -- holds in the coordinative equilibrium. Cf. Schumpeter, Theory of Economic Development, p. 24.
48. It should be unnecessary to add that a coordinative equilibrium of this sort is a conceptual device and a reference point; talking about such a point does not imply that the equilibrium is ever actually achieved in the real world.
49. This is not a contradiction of terms. Schumpeter uses the word rational "in Max Weber's sense," in which "'rational' and 'empirical' here mean, if not identical, yet cognate, things." Ibid, p. 57.

submit to the pressure of circumstances as it becomes necessary. Thus the economic system will not change capriciously on its own initiative but will be at all times connected with the preceding state of affairs."⁵⁰

It is not that the circular flow obviates "economic rationality"; rather, it is this structure of habit and convention -- this social memory -- that makes "economic rationality" possible: "for in the accustomed circular flow every individual can act promptly and rationally because he is sure of his ground and is supported by the conduct, as adjusted to this circular flow, of all other individuals, who in turn expect the accustomed activity from him...."⁵¹ In effect, the circular flow allows Schumpeter to create an empirical correlative to the Robbinsian economizer.

Just as in Kirzner, entrepreneurship in Schumpeter consists in a changing of frameworks. But now the change is in a framework that is "objective" in the sense that it is interpersonally shared, at least in part (more on this shortly). Moreover, in Schumpeter the entrepreneur must change not from one conscious maximization problem to another but from a largely tacit framework to a somewhat more explicit one. The

50. Ibid, p. 8.

51. Ibid, p. 79. Once again, Schumpeter seems to mean by "rational action" something like "effective action," not action that is consciously rational in the logical sense.

entrepreneur "must really do to some extent what tradition does for him in everyday life, viz. consciously plan his conduct in every particular. There will be much more conscious rationality in this than in customary action, which as such does not need to be reflected upon at all."⁵² Yet this does not mean that entrepreneurship is a calculative activity. Because of "the impossibility of surveying exhaustively all the effects and counter-effects of the projected enterprise,"⁵³ because of what we would now call "bounded rationality," the entrepreneur cannot rely on the rational in undertaking economic change. "Here the success of everything depends upon intuition, the capacity of seeing things in a way which afterwards proves to be true, even though it cannot be established at the moment, and of grasping the essential fact, discarding the unessential, even though one can give no account of how this is done."⁵⁴

Perhaps the best way to understand the Schumpeterian system is to cast it in evolutionary terms.⁵⁵ The economy is a social-knowledge

52. Ibid, p. 85.

53. Ibid, loc. cit.

54. Ibid, loc. cit.

55. Cf. Nelson and Winter, op. cit.

system in which habit and convention provide the analogue of genetic memory; consumer preferences (which needn't be strictly "exogenous") are the ultimate selection criteria, as reflected in profit or loss; and, as Schumpeter himself put it, entrepreneurship provides the function of mutation.⁵⁶ One important result of looking at matters in this way is that it helps solve the problem of determinism that was so troubling in Kirzner's system. In an evolutionary system, as Michael Polanyi suggests, changes in structure achieved by the effort of human thought "can be described as the actualization of certain potentialities."

To see a problem and to undertake its pursuit is to see a range of potentialities, believed to be accessible. Such heuristic tension appears to be generated in the alert mind, much as forces in physics are generated by the accessibility of stabler configurations. But this tension appears to be deliberate: it is a response striving to comprehend a result believed to be predetermined. It makes choices that are hazardous but always controlled by the pursuit of their intention. These choices resemble quantum mechanical events in being uncaused and at the same time guided by a field that leaves them largely indeterminate. But discoveries differ from inanimate events in three ways: (1) the field evoking and guiding them is not that of a more stable configuration but of a problem; (2) their occurrence is not spontaneous but due to an effort toward actualization of certain hidden potentialities; and (3) the uncaused action which evokes them is usually an imaginative thrust toward discovering these potentialities.⁵⁷

Entrepreneurship thus consists in "creative releases" which "are controlled, and yet never fully determined, by their potentialities. They may succeed or fail."⁵⁸

56. Capitalism, Socialism, and Democracy, op. cit., p. 83.

I do not mean by this to suggest that the evolutionary interpretation is incompatible with Kirzner's theory of entrepreneurship. In fact, there is a good case that Kirzner's conception of entrepreneurship on the individual level is more consistent with this evolutionary version of the social-allocation problem than is Schumpeter's own. The reason is that, ironically, Schumpeter is in the end more of a rationalist than Kirzner. And recognizing the pervasive tension in Schumpeter between the empirical and the rational⁵⁹ is the key to understanding many of the themes for which he is most famous, including his fascination with the large corporation and his entire mocking-yet-troubling portrayal in, Capitalism, Socialism, and Democracy, of the "demise" of capitalism.

To Schumpeter, the reason that entrepreneurship requires intuition and creativity -- the reason that entrepreneurship at the individual level is an "extra-rational" activity -- is the "bounded rationality" of the economic agent. The economic problem the agent faces in stepping from the circular flow is too complex for a rational solution. But this, to Schumpeter, may be only a temporary problem. "The more accurately, however, we learn to know the natural and social world, the

57. Michael Polanyi, The Tacit Dimension, Garden City, N.Y.: Doubleday, 1966, p. 89.

58. Ibid, p. 90.

59. That is, between the empirical-rational in the Weberian sense and the rational in the sense of logical deduction from explicit premises.

more perfect our control of facts becomes; and the greater the extent, with time and progressive rationalisation, within which things can be simply calculated, and indeed quickly and reliably calculated, the more the significance of this [entrepreneurial] function diminishes."⁶⁰ In the not-too-distant future, modern rational methods -- like operations research -- will be able rationally to calculate the optimal way of acting under all circumstances, making the entrepreneur obsolete.

My description of this as a "bounded rationality" theory of knowledge was not accidental. For it is essentially the same view of knowledge implicit in the work of Herbert Simon, a view deeply rooted, in Simon's case, in a fascination with the computer. Simon often writes as if the economic problem really does consist in a well-defined maximization problem, albeit one whose substantive solution the brain can only aspire to. The human problem of bounded rationality is like the computer's problem of computational complexity; and the acquisition of knowledge takes place by a logical procedure of search, and "satisficing" (Simon's term) is really a sort of optimizing in view of finite search capabilities and costly computational resources. "As every mathematician knows," Simon tells us, "it is one thing to have a set of differential equations and another to have their solutions. Yet

60. Theory of Economic Development, p. 85. One sometimes reads that the demise of the entrepreneur in favor of the large corporation was a notion Schumpeter came to between the writing of Theory of Economic Development and Capitalism, Socialism, and Democracy -- and that the notion was informed by his observation of the rise of large corporations during that period. As this and other passages show, however, the idea was already present in the first work; and it is my own view that this notion is attributable more to Schumpeter's theory of knowledge than to his observations about the rise of large firms.

the solutions are logically implied in the equations -- they are 'all there,' if we only knew how to get at them"⁶¹

Hubert Dreyfus has provided a persuasive critique of this cognitive theory and of its use, by Simon and others, in the field of so-called artificial intelligence;⁶² it is also, I believe, a critique that applies with few modifications to the "bounded rationality" view of economic theory. Drawing often on Polanyi, Dreyfus suggests that much of knowledge consists in an ineffable tacit component that is complementary, but not reducible, to explicit knowledge. It is tacit knowledge that guides the mind in problem-solving, sorting the essential from the inessential in a way that brings the mind close to a solution without determining that solution.

Dreyfus's critique of artificial intelligence involves the suggestion that all the truly intelligent work -- the tacit contextual sorting -- is always (necessarily) done by the human programmers, creating a pattern-recognition or game-playing machine that can function only in the tightly circumscribed, pre-programmed situation for which it was designed. What this suggests is that the function of "grasping the essential, discarding the unessential," as Schumpeter put

61. Herbert Simon and Andrew Stedry, "Psychology and Economics," Handbook of Social Psychology, Reading, Ma.: Addison-Wesley, 1968, ch. 40, p. 299.

62. What Computers Can't Do: The Limits of Artificial Intelligence, New York: Harper Colophon Books, revised edition, 1979.

it, can never be a purely rational activity. And this is something that Kirzner recognizes clearly; for him, the necessity of entrepreneurship rests on the almost Gödelian observation that the choice of a framework in which to be rational can never itself be a rational activity.

In emphasizing that the rationality postulate is unable to explain the selection of the relevant ends-means framework, we are not suggesting that the selection occurs without deliberation, but merely that the results of that deliberation cannot be predicted on the basis of the postulate of consistency; that deliberation is essentially creative. One may predict the answer that a competent mathematician will arrive at when he tackles a given problem in computation (in the same way that one may know in advance the answer to the problem that will be yielded by an electronic computer); but one cannot, in the same way, predict which computational problem the mathematician will deliberately choose to tackle (as one may not be able to predict which problems will be selected to be fed into the electronic computer.)⁶³

This is entirely parallel to the Dreyfus/Simon debate, with Kirzner in effect siding with Dreyfus and Schumpeter with Simon.

VI. The major/minor issue redux.

The conclusion should now be clear: the most consistent and fruitful way to look at the entrepreneurial theory of market process would involve connecting a Kirznerian version of the entrepreneur at

63. "Uncertainty, Discovery, and Human Action," op. cit.

the individual level with a Schumpeterian conception of knowledge-storage and coordination in the market.

But does this really solve the major/minor problem? Schumpeter's implicit conception of a social-knowledge structure allowed him to distinguish between "old" and "new" knowledge. Once some activity has been "empirically tested,"⁶⁴ it becomes, in effect, socially known; and carrying out such an activity is no longer entrepreneurship. In Kirzner's highly personalistic version, however, there is no real conception of "social knowledge": one is an entrepreneur by perceiving whatever he did not himself already know, even if everybody else already knew it.

My own inclination is to draw the line somewhere in between. Schumpeter is wrong, it seems to me, in playing down the importance of and creativity involved in the "continuous stream of innumerable minor adjustments, modifications, and adaptations"⁶⁵ that constitutes a large part of social learning. Imitation -- even of a technique that has been "empirically tested" elsewhere -- is scarcely nonproblematical; and imperfect imitation is often itself an important source of new knowledge.⁶⁶ (In fact, this sharp distinction between the known and the unknown is another example of Schumpeter's tendency to slip from an

64. Theory of Economic Development, p. 83.

65. Nathan Rosenberg, Perspectives on Technology, Cambridge: Cambridge University Press, 1976, p. 166.

empirical to a rationalist theory of knowledge; it is implicitly a confusion of "knowledge how" with "knowledge that," of "knowledge of the particular circumstances of time and place" with scientific knowledge.⁶⁷⁾ But it seems to me almost equally extreme to define entrepreneurship in totally personalistic terms -- even if, given the dispersion of knowledge in society, the personally new and the "socially new" may well coincide most of the time.

But perhaps the best way to understand the major/minor distinction is to return to the idea of evolutionary knowledge. As Thomas Kuhn has taught us,⁶⁸ the evolution of knowledge often has a distinctive structure to it. There are some large problems (in Polanyi's sense) whose solution (what Kuhn calls a "paradigm" in the strictest sense) brings in its wake a host of related smaller problems needing solution. Perhaps the distinction that people are searching for when they wish to see the Schumpeterian entrepreneur as undertaking major-and-

66. Cf. Armen Alchian, "Uncertainty, Evolution, and Economic Theory," Journal of Political Economy, vol. 58 (June 1950), reprinted in R. Heflebower and G. Stocking, eds., Readings in Industrial Organization and Public Policy, Homewood, Ill.: Richard D. Irwin, 1958, p. 216.

67. See Hayek, "The Use of Knowledge in Society," American Economic Review, vol. XXXV, no. 4 (September 1945), reprinted in Individualism and Economic Order, op. cit.; see also generally Thomas Sowell, Knowledge and Decisions, New York: Basic Books, 1980.

68. The Structure of Scientific Revolutions, Chicago: The University of Chicago Press, 1962.

disequilibrating activities and the Kirznerian entrepreneur as engaging in small-and-equilibrating tasks is not a fundamental distinction about the nature and role of the two entrepreneurs but a distinction, inherent in the nature of economic change, between "extraordinary entrepreneurship" and "normal entrepreneurship" -- both of which are carried out by a single, unified type of entrepreneur.