Metaphilosophy and Methodology in Economics

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Introduction

Much of the philosophical literature on economics has focused upon methodology rather than epistemology; and surely one explanation is that economists have simply accepted as their grounds for knowledge one of the major philosophical positions provided by the wide-ranging debates in the philosophy of science. In these discussions of methodology, much has been made of the controversy between methodological pluralism and methodological monism; but the arguments have often been vague and unclear – due to a tendency to conflate alternative metaphilosophical positions with alternative methodologies. It certainly is the case that a particular methodology can be adopted by and yet interpreted quite differently from different metaphilosophical perspectives. For example, logical positivists, empiricists, scientific realists, and modern realists would undoubtedly be unanimous in their endorsement of seeking empirical evidence to support the evaluation of a theory; and yet the significance of this evidence and the recommendations for what conclusions are to be drawn will vary widely amongst them.

Henry Woo [1989] has recently argued that economists should take methodology seriously because methods carry with them implicit norms, definitions of what counts as fact, criteria for theory appraisal, and ontological commitments. The suggestion that will be made here is that we should take philosophical foundations (metaphilosophy) seriously just because they make explicit these very underpinnings of methodology. Each philosophical position will tend to favor particular methodologies over others – and to favor particular methods and criteria within any methodology over their alternatives. The reason for taking methodology seriously in its own right is that methodology is a theory of how human beings can best go about increasing their understanding of the great mystery in which we find ourselves and the nature of our condition within it. Methodology is a metatheory that lies at the very heart of the epistemic enterprise.

To clarify these issues, a taxonomic theory of methodology will be presented here. Basically it is a simple theory: a suggested partitioning procedure to distinguish different methodologies according to their own specific characteristics and independent of the metaphilosophical views of those who are employing and/or criticizing them. But first, it is important to differentiate the metaphilosophical issues to ensure that the two do not become confused or conflated.

Metaphilosophical Assumptions

There are three broad areas of inquiry within analytic philosophy: (1) metaphysics, (2) epistemology, and (3) ethics. Metaphysics provides answers to the question of what entities and relationships comprise the world. Epistemology provides answers to the questions of how it is possible for minds to learn the answers to the metaphysical questions – and what is the most efficacious means for attaining those answers. Ethics, broadly interpreted, answers the question of what is the most efficacious way for minds (or entities who possess minds) to conduct themselves given the metaphysics and the current state of epistemology. Obviously, there will be a significant degree of interdependence amongst the responses to these questions. A coherent set of answers across the three domains produces a world view, where the coherence is provided in large measure by the metaphilosophy.

Modern Western philosophical tradition has focussed predominantly upon the domains of metaphysics and epistemology to provide the bases for the development of a world view. This inquiry has at its foundations the following two ‘primitive’ questions:

[1] Does anything exist other than the phenomenological contents of our experiences?

[2] Are there any incorrigible grounds for knowledge about the answer to question [1]?

Although historically there have been philosophical systems based upon a negative answer to question [1] (e.g. idealism and solipsism), all modern philosophical inquiry that
attempts to understand the growth in scientific knowledge has accepted that the answer to [1] is 'yes'. Further, modern philosophy has adopted a qualification to that affirmation which I will term protorealism: that the 'other' which exists outside of our experience is an underlying reality (or ultimate reality, hereafter designated by UR) which is (a) largely independent of the states, wills or intentions of any minds which experience it and (b) is the underlying cause of our experiences. Given this affirmative answer a second question immediately arises:¹

[1+] What is the nature of the relationship between this UR (underlying reality) that exists outside our experiences and the phenomenological contents of our experiences?

In the Western philosophical tradition, the answer to question [2] has almost always been 'yes' - a predisposition which is reflected in the classical definition of knowledge as 'justified true belief'. Once again, the affirmative answer leads directly to another question:

[2+] What criteria select from our experiences just those items which incorrigibly correspond to the UR?

Of course, it is possible to answer question [2] negatively and assume that there are no indubitable foundations upon which to base knowledge claims about the nature of the human condition. This response also leads to a second question:

[2–] Given that there are no grounds for incorrigible knowledge, what alternative principles guide (or explain) human behavior vis a vis the world - and in particular the development of the belief systems which are usually considered to be knowledge?

The answers to these 'deep' questions serve to delineate the major metaphysical positions of Western philosophy. Where the assumptions follow [2+], it should be noted that there will inevitably be a correlation between the answers given to [1+] and [2+]. The metaphysical assumptions will pick out the criteria for truth. That is, we will not find an nxm matrix of positions from the n answers to [1+] and the m answers to [2+]. Rather we will find a smaller set of distinct positions or metaphilosophies.

In the philosophical positions arising from [2–] are found the major positions considered to be antagonistic to science. The denial that there is any alternative principle leads to radical skepticism which in turn often supports anarchic existentialist ethics. To suggest that the meaning of experience (to the experiencer) is the appropriate principle underwrites the general hermeneutic tradition in philosophy. Alternatively, if the principle is assumed to be socio-cultural consensus, then a variety of relativist positions can be generated. As will be discussed below, a position to be termed modern realism is available which also accepts a negative answer to question [2], but avoids relativism while retaining a realist metaphysics and epistemology.

It is important to understand the 'primitive' nature of the assumptions implicit in the answers to the five questions indicated above. First, the answers selected are a matter of judgmental choice. Second, an explicit commitment must be made since the answers provide the metaphilosophical structure necessary for the development of a coherent world view. Third, no answers can be proven either true or false by reference to experience or to logical argument. Their source is a judgmental-experiential gestalt, an intuitive predisposition that is related to what we expect from and desire as our world view.

The basis for selecting amongst the possible answers is fundamentally pragmatic: which of the resulting philosophical systems is the most efficacious for achieving the philosophical goals of the individual philosopher? For example, I personally would argue that the answers underwriting modern realism are the best, i.e. that modern realism provides a more comprehensive account of the human condition than any alternative metaphilosophical system currently available for consideration. An argument to this end will not be developed here as it is incidental to the purpose of this paper.³

It might be questioned whether metaphysical considerations are necessary to the epistemology of the social sciences, since such metaphysics is presumably trivial. Unlike the natural sciences, all the events and the entities which take part in economics are presumably observables and arise in the macrostructure of the universe. Theories developed in such a macro-domain will be expressed exclusively in terms of observables and, as such, are unencumbered with the difficulties associated with unobservable and/or purely theoretical entities that arise in physical theories. Surely, one might argue, it is the ontic status of this hypothetical and unobservable microstructure that is problematic and necessitates metaphysical considerations.
There are several important errors of oversight in this view. First, the metaphysical and epistemological assumptions are not independent, so that if one simply adopts a particular epistemological position, it is often the case that one is also adopting a metaphysical stance which is unacknowledged and perhaps undesirable. Second, economics has largely taken its view of science from the natural sciences and hence imports the associated metaphysical primitives and their consequences—in particular, attitudes with respect to the relationships between theories, reality, and concepts of truth (which was Wau’s point alluded to earlier). Third, even if economic theories are only descriptive of the macro world at the present time, economics may well want to (should?) develop models of human behavior with greater explanatory power—in much the same way that the descriptive and clearly ‘macro’ science of astronomy has increasingly merged with astrophysics with its focus and deep dependence upon microphysics. One plausible pathway into micro considerations in economics would be through an attempt to give a realist account of rationality (to replace the vapid tautology that rational individuals maximize their self-interests), which would lead to considerations of cognitive psychology and models of mind/brains performing decision-making tasks. Directly, we are at the interface of neurophysiology and microphysics. In summary, a clear understanding of philosophical foundations of economics requires a clear metaphysical commitment.

**Metaphilosophical Positions in the Philosophy of Science**

As previously mentioned, the mainstream of Western philosophical thought, especially in the 20thC, has been associated with affirmative answers to questions [1] and [2]; and it may be instructive to indicate just how specific combinations of answers to [1+] and [2+] are related to the major philosophical positions in the philosophy of science and, therefore, in the philosophy of economics. In this account there is no attempt to be complete; i.e. there will be philosophical positions which can be constructed from particular answers which shall not enter the discussion. In particular, the focus will be upon those positions that adopt the general view of protorealism.

The sequence in the presentation roughly follows the chronological development of these positions as responses to problems in the philosophy of science. They also represent a progression along a continuum reflecting the tradeoff between the certainty of knowledge and its usefulness and scope for generating new understanding. Because this presentation is for illustrative purposes only, its format and contents will be terse. For reference, the questions are:

[1] Does anything exist other than the phenomenological contents of our experiences?

[1+] What is the relationship between the UR and the phenomenological contents of our experiences (to be designated by UP)?

[2] Are there any incorrigible grounds for knowledge about the answer to question [1]?

[2+] What criteria select from our experiences just those items which incorrigibly correspond to the UR?

Questions [1] and [2] are answered affirmatively by all the positions given below.

**Rationalism:**

Answer [1+]: The relationship between the UR and UP is complex and prone to errors.

Answer [2+]: Introspection can produce in the mind propositions of incorrigible truth which can be manipulated by pure reason (logic).

**Methodological issues:** To determine the structure of argumentation which can provide clear grounds for arbitration when confronted with contradictory intuitions.

**Problems:** Difficulty in obtaining consensuses on the propositions of [2+] and the lack of criteria for arbitration amongst alternatives.

**Logical Positivism:**

Answer [1+]: The relationship between the UR and UP is completely unascertainable and speculations on the matter lie outside the proper domain of knowledge.

Answer [2+]: Selected contents of experience (viz. facts) produce true propositions the consequences of which can be developed by the use of deductive logic (the propositional calculus) which is truth preserving.

**Methodological issues:** To establish the criteria for determining facts.

**Problems:** The content of knowledge is limited purely to descriptions, so that the development of theories and, hence, almost all of 20thC science lies outside positivist
epistemology.

Logical Empiricism:

Answer [1 +]: Particular events (viz. facts) in the
UP are isomorphisms of the UR.

Answer [2 +]: Facts, the consequences of which
can be developed by the use of inductive
logic and mathematics (e.g. the predicate
calculus), can be used to produce
hypotheses the truth value of which are
testable with other factual observations.¹⁰

Methodological issues: To establish the criteria
for determining facts; and to provide
criteria for acceptance or rejection of
theories.

Problems: All unobservables and theoretical
variables have no epistemic status other
than to serve as ‘heuristic devices’; it was not
possible to give a coherent account of
explanation within the epistemology;¹¹ the
logic of testing hypotheses to establish true
laws (i.e. verification or confirmation) was
incomplete: and the epistemic privilege
given to fact was being questioned by
demonstrations that most facts were
theory-laden.

Scientific Realism:¹²

Answer [1 +]: The UP is a close homomorphism
of the UR, i.e. all order and empirical
invariance in the UP were produced by the
underlying laws governing the UR.

Answer [2 +]: Logico-mathematical
formulations which capture empirical
invariances are the fundamental truths.¹³

Methodological issues: to establish criteria for
the acceptance or rejection of theories; To
arbitrate amongst theories faced with the
general underdetermination provided by
empirical data; to distinguish between real
theoretical entities and artifacts of the
mathematical formalisms in which theories
are expressed.

Problems: The continuous replacement of
mathematical theories by newer more
successful formalisms indicates that
mathematical precision does not guarantee
the truth (contra [2 +]). Deep
contradictions and paradoxes exist amongst
the foundational mathematical formalisms
describing the micro-structure and
macro-structure of the UR.¹⁴ There is also
the recurring problem of theory ladenedness
of empirical observations as experimental
situations become increasingly complex: are
the invariances used to create and arbitrate
amongst theories merely artifacts of the
experimental setup?

And these problems are not the only ones
which scientific realism faces when confronted
by careful philosophical analysis. For instance it
seems dubious to base one’s commitment to
truth on a formal language (viz. mathematics)
which is known to be fundamentally incomplete.
i.e. in which it is impossible to write down all
true propositions or decide the truth or falsity of
all propositions without inviting inconsistency.
Second, mathematics permits operations and
transformations not possible for real structures,
and some formalisms rely upon such ‘non-real’,
physically impossible transformations to
generate their theories; while the interpretation
of such operations difficult to reconcile with
realism. Third, the underdetermination of
theories relative to the empirical data which
must be used to test them, requires an appeal to
ancillary and seemingly arational value
judgments such as simplicity, elegance, and
fecundity in order to select a particular theory
(mathematical formalism) from amongst the
many possible alternatives. Finally, the whole
system stands upon a fundamental metaphysical
assumption which is hardly immune from
criticism; for who is to say just how close the
homomorphism is between the UR and our
experience of it? Or how much of the regularity
in our experience is due to the nature of human
consciousness rather than actual properties of
the UR?

There is another deep problem, which
applies to all the positions indicated above,
which arises as a result of the assumption that
there are incorrigible grounds for knowledge a
problem that has some direct relevance for
economic philosophy. One of the subtle
concomitants of the existence of fundamental
truth is that one becomes committed to a theory
of rationality in which truth must be preserved:
i.e. that rational behavior is a
logico-mathematical procedure. What is excised
from rational behavior under this definition is
the entire range of decision-making which we
term judgment and which forms the foundation
of our epistemic enterprise, e.g. in selecting the
metaphilosophical principles being discussed
here. Once again a very clear discussion of this
consequence is provided by Hooker [1989],
where many of the detail arguments are
developed in [Brown 1988].

We also lose the ability to capture the
process of theory creation (or creativity in general) within the epistemology. The intuitive judgment to explore an entirely new formalism is clearly not a matter of logico-mathematical deduction, and yet if mathematical formalism represents the truth about the UR, then this creative, innovative process of discovery lies outside the metaphysics of truth upon which all of the above positions are based. Popper [1968: 31] concluded as much in his book ironically titled The Logic of Scientific Discovery: the creative process must necessarily remain outside of science and its methodology.

There have been three major reactions to the problems of scientific realism indicated above. The most natural and least obvious has been a de facto retreat back to some form of liberal logical empiricism, with vague reliance on the Copenhagen interpretation of quantum physics to provide legitimacy. Of course, the not inconsiderable problems of the logical empiricist position must again be addressed. The alternatives seem to form a Scylla and Charybdis in which there is no safe intermediary position. A second response is to move to some sort of anti-realist relativism – by denying that any foundations for knowledge exist. In economics this reaction is found in recent arguments for rhetoricism with their frequent appeal to the principles of deconstructivism. [McCloskey 1983, Klammer 1985, Weintraub 1987]. The third response is to reexamine the metaphysics of scientific realism to discover if there is not some way to preserve a realist account of the world which overcomes the problems that exist in its current formulation. This last approach is the one which leads to modern realism. For comparison, a brief synopsis of this broad philosophical position is given below.

Modern Realism

Answer [1+]: The degree of closeness of the homomorphism between the UR and the UP is unknown; however, the evolution of cognitive abilities in conscious species suggests a longrun principle for convergence.

Answer [2]: There are no incorrigible grounds for knowledge. The human condition is characterized by radical fallibilism – all human mental activity from basic perception to philosophical concepts are theories as to what is the best way for human minds to understand their relationship with the UR.

Answer [2–]: The principle governing the development of belief systems which are considered to be knowledge is supplied by pragmatic principles in the shortrun and evolutionary selection in the longrun. Successful societies and cultures will be those whose theories are closest to the truth – a determination ultimately made through direct interactions with the UR rather than by the invoking of human-devised criteria. In this context all cognitive activity, including logic and language, can be understood as theories. There is no a priori privileged epistemology or methodology.

The major philosophical positions outlined above arise from metaphilosophical principles – which, in the perspective of modern realism, are simply theories (or metatheories) of how homo sapiens should go about understanding their position in the world and improving (optimizing) their niche in the vast complexity of the UR. It is now appropriate to examine the nature of methodologies and their relationship with metaphilosophy.

A Taxonomy for Methodologies: Theory Creation

Epistemology, broadly interpreted, must specify:

[a] the process by which knowledge arises in terms of the ontological categories which it describes;

[b] the criteria which distinguish between candidates for knowledge and other linguistic items of communication: and

[c] the criteria for accepting candidates as knowledge by the communications community.

The last two, [b] and [c], are the proper subject of methodology and can be reformulated in strictly methodological terms:

[b] to specify how candidates for knowledge should be created and presented, i.e. to establish the syntactic rules for the epistemology and, in particular, theory creation; and

[c] to specify the criteria by which to judge and/or arbitrate amongst knowledge claims in order to determine whether any candidate is to be accepted as knowledge.

It might seem that the first question can be subsumed under the second and be eliminated, since no theory could be accepted if it were not already a proper candidate. However, it would be a serious conflation to adopt this parsimony and much methodological information would be
lost. Theories are not formulated on Friday, tested on Tuesday and falsified on Wednesday – although naive accounts of the scientific method often leave this impression. The candidature of theories can cover decades without ever being accepted as knowledge; and macroeconomic theories are an excellent example. The theory of rational expectations is a proper candidate for economic knowledge, but it is hardly to be considered firm knowledge about how the world works. In contrast, the Lauffer-curve of a decade ago was never a proper candidate and was never given serious consideration (except by those who were either ill-informed or infatuated with its implications).

The taxonomic theory being developed here identifies four general methodologies for theory creation, each prescribing a distinct set of principles for governing the particular methods that might be selected. It should be noted that the all-too-common conflation of the concepts ‘methodology’ and ‘method’ is to be avoided. Methodologies are theories as to what principles should be employed in fulfilling [b] and [c]; whereas methods are the particular procedures or algorithms which instantiate those principles. The four methodologies can be described summarily as:

A] induction from experience;
B] colligation from experience;
C] deduction from hypothesis; and
D] introspection.

The first, induction from experience, is the archetypal model of how science is supposed to be conducted, the so-called ‘scientific method’: data are gathered, patterns are noticed, inductive generalizations are made, and a theory is developed which incorporates the generalizations, which in turn capture the patterns previously noted, which retrodictively ‘predict’ the original data to an acceptable degree of accuracy. Within these broad principles there will be a range of methods for achieving each of them: methods of partitioning and collecting data, the logic that is to be used, the language in which the generalizations are to be framed, and the formal structure (viz. the logico-mathematical formalism) in which the theory is expressed.

For example, in the application of methodology [A], logical positivists (strictly interpreted) will limit induction to the definition of taxonomic classifications of facts. Logical empiricists will permit induction to specify new variables, providing that they are expressed in terms of observables capable of empirical verification. Realists will demand more of their inductive theories, requiring them to provide causal explanations such that it is possible to infer new understanding of the original empirical data.

The second methodology mentioned, colligation from experience, is an alternative to the first in situations where it is unclear or uncertain what kind of pattern or interaction of patterns is characterizing the domain of interest. Colligation represents a natural response to situations involving high degrees of complexity. This methodology has appeared most frequently in explications of historical information, but examples can be found in physics. For example, until the very recent emergence of chaos theory, the predominant methodology associated with research on turbulence has much more in common with colligation than it does with induction (or any of the other methodologies). Colligation is characterized by principles for uncovering patterns – or searching for invariances amidst predominantly disorganized data – especially in the evolution of dynamic systems with a very large number of variables, apparent states, and state transitions.

Where the methodology of induction will normally partition the world in terms of specific classes of entities and/or events, colligation partitions the world into sequences of events or system-states. The inductive process is now focussed upon finding some ‘template’ which preserves important features (invariances) across all the sequences. The template is by its very nature a generalization of the processes to which it has been applied; and it will often suffice as the theory as well, since the template instantiates claims as to what all the dynamic sequences of interest have in common. As a result of the complexity of the domain, the template often is explicated as a narrative which combines observations, taxonomic theories, and causal hypotheses into its total form. Although it is possible that a template will have within its structure certain causal explanatory relationships, the theories which this methodology produces are in general descriptive. The epistemic value of this methodology and its theories should not be underestimated: in domains where induction is completely unable to get started because of complexity and/or inability to partition events for observation and measurement, it provides the increased understanding which comes with
the recognition of ordered patterns in what might otherwise be considered random events.

I will mention the fourth methodology only briefly in passing before turning attention to the third, which undoubtedly has had the greatest impact upon the discipline of economics. Within the methodology of introspection there will be found a range of methods that include rationalist reflection, meditational techniques, and shamanic trances. The basic principle which they all have in common is revelation - from the fabric of the experience itself there arises a theory about how the world works. In this methodology, not only are logical operations not required, but they are often considered to be inimical to the process of theory creation. One of the critical principles is that the recognition of the theory must be accompanied by a feeling of certitude, the emotional ambience of having been in touch with a profound and incorrigible reality. The efficacy of this methodology in discovering how things work is certainly to be questioned (which, of course, it has); but in terms of discovering what the meanings are for human beings of aspects of our experience this methodology may have much more to offer than traditional Western scientism has acknowledged. That the hermeneutic and relativist traditions are much more forgiving of epistemologies incorporating this methodology is quite understandable.

It might also be added that introspection can be combined with colligation to produce templates for distinguishing between revelations that are little more than reflections of personal predispositions or psychological anomalies of the individual and those which have a much more general significance across the human species. Charles Tart [1969, 1972, 1975] recommended that this methodology be employed to investigate the apparent alternative realities experienced by individuals who ingested certain psychotropic chemicals (e.g. LSD, mescaline, peyote). Stanislav Grof actually conducted a major long-term research effort along these lines with people having profound experiences under LSD [Grof 1978]; but the socio-political climate reduced these efforts to historical notes long before they had to be taken seriously by philosophers. Of course, numerous other methods to obtain revelational materials also exist, e.g. Ouija boards, trance writing, hypnosis, channelling, sensory deprivation, etc.

Another variation on the methodology of introspection is 'brainstorming' in which immediate social interaction and reaction to intuitive (viz. revelational) material is used to identify the consensually acceptable core of each contributor's personal and subjective perspective. In the view being presented here, brainstorming is a method for theory creation within the introspective methodology.

The third major type of methodology is deduction from hypothesis or the hypothetico-deductive 'method' - an approach that has been at the foundation of economics since the inception of its serious candidature as a 'science'. The primary principle of this methodology is to propose a set of assumptions or postulates which are to be taken as true and beyond question within the construct of the theory. To these postulates one applies deductive logic to develop systematically the 'web of truth' which the original postulates generate. The method lies at the foundations of most pure mathematics: one defines the axioms of a particular mathematical domain and then one generates the theorems which characterize that domain. In mathematics, the choice of the axioms is governed largely by aesthetic principles: to find those sets which produce interesting and intellectually stimulating domains. In epistemology the criteria for axiom (viz. postulate, assumption) selection will be pragmatic: what axioms are most efficacious for developing our knowledge and understanding of the epistemic domain of interest? It is in specifying more precisely the grounds for selecting or defining acceptable postulates that much of the historic debate in economic methodology has been focussed, for each metaphilosophy will support its own preferred criteria for specifying what is an acceptable axiom.

One question that might arise at the very beginning of this discussion is whether the hypothetico-deductive method(ology) is proper science. It seems clear that logical positivists and empiricists (strictly interpreted) must declare in the negative unless the postulates are statements of empirical fact in the first place. A slightly weaker requirement was suggested and used by Reichenbach [1969] in developing a deductive proof of the necessary truth of Einstein's theory of special relativity: the foundation axioms must be acceptable (capable of incorporation) without modification in all the alternative theories to the one being developed (i.e. the unique conclusions of the theory must not derive
from its use of special axioms). In general, scientific realists place far more relaxed constraints upon the axioms to be employed: as long as they produce a rich and meaningful mathematical 'theorem space', i.e. if they underwrite a rich and powerful formalism with roughly real-world attributes, the axioms are acceptable for the creation of theories. (The acceptance and arbitration of those theories is, of course, another matter which has not been considered in any of the discussions so far, but will be considered soon.)

At this point I should like to inject a speculative comment which will not be pursued further in this article but should provide an indication of a major line of philosophical investigation. It appears that the entire process by which perception and cognition of the world is made possible for conscious minds requires an incrementally alternating cycle amongst the above four methodologies, which are themselves embedded in the mind_brain structure as primitive mental functions. Further, at the level of creativity and innovation, it seems that the hypothetico_deductive method must always be used at certain stages in the creative process. It is the unwillingness of logical empiricists to accept this methodology as a fundamental strategy for gaining knowledge which partially explains why empiricist accounts of perception and cognition are invariably trivial and/or simplistic and why they can give no account whatsoever of the creative act itself.

As to the criteria for creating acceptable postulates (axioms), the following alternatives can be suggested:

[a] generalizations drawn from empirical experience and supportable by experimental evidence;[*]

[b] a priori propositions obtained from introspection upon what must be so if the world is to make any sense at all (or if one is to make any sense at all of the world);

[c] propositions which are known to generate fecund theorem spaces in other domains of human interest;

[d] propositions derived from 'what if...?' speculations, e.g. as might be proposed during exercises in lateral thinking: [DeBono 1970];

[e] purely intuitional speculations such as might arise as the result of any of the revelational methods;

[f] propositions which are deemed necessary if there is to be any meaning or purpose to human activities; or

[g] propositions which describe what should be (or would be) in an ideal world.

Propositions of types [b] and [c] can be found at the foundations of most philosophical inquiry. It might well be noted that those who would reject philosophical considerations and propositions as lying outside true and proper epistemic activity (viz. science) are simply echoing the empiricist structures on what constitute proper postulates (viz. those based purely upon empirical facts per [a]). Conservative scientific realists might well support a similar restrictive demarcation that allows only type [c] propositions to be added to those satisfying the empiricists' standards.

Modern realists, on the other hand, will be far less restrictive on these matters, first because they admit of no foundational sources of truth that necessarily prescribe or limit the cognitive activities proper to human beings understanding themselves. And second, each method suggested by [a] through [g] is seen as a theory in itself of what constitutes an appropriate methodology. Of course, modern realists will come in many different varieties and can be visualized as having a place on a spectrum from 'scientific' to 'agnostic' (in its generic sense). The former would see the homomorphism between the UR (viz. ultimate or underlying reality) and the UP (our phenomenological experience of it) as being close; whereas the latter would be amenable to considering UR to be a vast mystery accessible on different levels of consciousness and yielding quite limited and partial homomorphisms as the contents of our phenomenal experience.

It should be observed in passing that criteria [f] and [g] will openly introduce norms and values into the epistemology; and [g], in particular, can be a subtle way of circumventing the 'ought cannot be derived from is' proscription. The oughts are woven into the foundational axioms and then the truth_preserving property of theorem generation produces a complex structure of what logically must be but which also embodies socio_ethical ideals. An example reasonably close to home would be the axiom that 'all men are rational'. Since 'being rational' is usually paired with 'being irrational', and there is little doubt human beings should be rational rather than irrational, the economic theorems generated from the rationality axiom can easily be interpreted to possess prescriptive implications.
A Taxonomy for Methodology: Theory Acceptance

We have examined the methodological distinctions for the task of theory creation; it now remains to examine the alternative methodologies for theory acceptance, selection and arbitration. One can identify three fundamental methodologies that can be used to achieve this task:

[1] establish the theory’s superior predictive success;
[2] demonstrate that the theory results in an improvement in the coherence of existing knowledge and/or the depth of understanding of the domain of interest;
[3] demonstrate that the theory is consistent with the currently accepted paradigm or world view.

It takes only a modicum of reflection to note that these methodologies of theory acceptance will be correlated quite closely with the particular methodologies of theory creation previously indicated. For example, [A] and [1] will be virtually inseparable especially as interpreted within a logical empiricist metaphilosophy.

Scientific realists will be more amenable to accepting [2] in conjunction with [A], although the degree to which [1] may be preempted or has been preempted (in practice) will be a matter for considerable argument amongst methodologists. An example repeated often (e.g. Feyerabend 1975) is the failure of Newton’s theory of gravitation to predict the tides which had been intended as a critical empirical test of his theory of gravitation. But this failure was not sufficient to overturn a theory which provided such marvellous coherence across the whole of human phenomenological experience. A more recent example has been the disturbing disconfirmation of quantum chromodynamic theory (viz. of quarks and quark families) [Krisch 1987]; but QCD theory provides such a deeply satisfying and coherent picture that it is not about to be thrown out. Rather, it will continue to be used until either (a) an equally satisfying theory is found which also explains the anomaly, (b) the theory is rectified (as in the case of Newtonian gravity) by internal adjustments which account for the anomalous empirical predictions, or (c) alternative explanations are found for the empirical results (e.g. arising in the experimental procedures).

Methodologies [B] and [2] also go together; since, given the descriptive and/or narrative nature of the template and its implicit theory, it is virtually impossible to create a situation in which accurate predictions could be expected much less achieved. It might also be suggested methodology [3] is often implicitly involved: a colligation theory which required a completely novel paradigm or world view (e.g. an historical theory which depended upon the presumption that certain human beings were immortal and reincarnated over the centuries as great leaders) would be very unlikely to be acceptable.

Methodology [3], however, is most explicitly useful in conjunction with [D], although it certainly is not impossible for an introspective methodology to produce revolutionary and paradigm-threatening theories.6 However, within the socio-cultural environments in which revelational methodologies are common (e.g. shamanic societies), it is [3] which provides a conservative insurance against producing epistemological turmoil with every new revelational experience. Methodology [3] is also characteristic of eclectic epistemologies or world views where it embodies and authorizes a permissive quality disturbing to most empiricists and realists.26

Methodology [C] can be associated with either [1] or [2]. In the case of establishing theorems based upon their predictive success, it should be observed that it is not logically possible to refute or falsify theorems produced by the hypothetico-deductive methodology, for the truth-value of all deduced theorems is guaranteed. There are two interpretations available to account for contradictions between the results suggested by theorems and empirical results from the domain of those theorems. One can assume that the fundamental postulates from which the theorems were derived do not apply to the domain of interest; or, alternatively and more commonly, one can conclude simply that the theorem itself does not apply in the empirical situation of the test. Systems of theorems developed within methodology [C] and accepted by methodology [1] are seen as producing derivative theories of the form “Theorem X applies in situation S.” Empirical data has no bearing on X itself, only upon the hypothesis that it does or does not find application in S.27

It is a truism that methods (and hence methodologies) arise to serve purposes, and there may be a number of different motives,
themselves subsidiary to the overall epistemic goal, underlying the use of the hypothetico-deductive method in the first place – motives which will deny empirical predictive success prime place of importance – and elevate theory-acceptance criteria [2] or [3] to that position. For example:

(a) During the early stages of development of a new domain, one can use the axiomatic methods to create models as learning tools and to suggest possibilities for continuing research. This heuristic motive is also implicit in the preconscious but intentional use of [C] during creative problem solving.

(b) Of course, within the culligation methodology, [B], it may also be appropriate to use [C] to construct aspects of the template.

(c) In domains with high orders of empirical complexity, simplified models based upon idealized postulates can indicate the expected magnitude or order of expected causal changes that are themselves of epistemic value even though it is recognized that predictive accuracy is impossible.

(d) Given the 'what if...' orientation of subsidiary methods [e] to [g] for creating the original postulates, the resulting system of theorems can be used to produce benchmarks or descriptions of ideal states which by their variance from empirical observations indicate the possibilities for change through human intervention.

It seems apparent from the above descriptions that all four of these motives not only have a legitimate place in our general epistemic program, but they also play a significant part within economics as an evolving discipline and domain of epistemic interest. What also seems to be clear is that economists have often been unclear as to what their motives are and how those motives should be reconciled within the metaphilosophy to which they have pledged allegiance, often without carefully considering its consequences. For example, it takes an elaborate and potentially confusing casuistry to reconcile using a methodology [C2] or [C3] for any of these purposes, regardless of its success, in conjunction with a philosophical commitment to logical empiricism.

One conclusion to be drawn is that given the nature of the domain which economics encompasses and the potential for normative actions within that domain, that neither logical empiricism nor scientific realism provide a sufficiently open metaphilosophy to underwrite the natural motivations and methods which economics requires and favors.

The taxonomic theory proposed above suggests that there are in principle twelve possible methodologies which can be defined as combinations of the four theory-creation and three theory-acceptance methodologies. Within the framework of the taxonomic theory presented here, methodological monism would entail selecting one of these twelve as being the only valid set of principles for establishing a body of knowledge. The metaphilosophies of logical positivism and logical empiricism would therefore most probably be monist, insisting upon [A1]. It is possible that conservative scientific realists might lean very close to a monist position, but in general realists will be pluralists (within this taxonomy) in that they will acknowledge the importance of [A2], [C2] and [C2] to general epistemology.

The non-acceptance of methodologies [B] and [D] as valid sources of knowledge will usually distinguish scientific realism from the various relativist metaphilosophies. Both hermeneuticians and modern realists may well be ambivalent as to the merits of either or both of these methods. The metaphilosophical criteria for selecting acceptable methodologies can also be applied to decide what constitutes the proper demarcation between science and non-science. By replacing the acceptable-unacceptable labels with the designations of hard (or physical) or soft (or social) methodologies, it is possible to suggest that there are two levels or kinds of epistemology. As with the monistpluralist debate, with which it can easily become conflated, this distinction suffers from confusion. It is the particular metaphilosophy which is responsible for demarcating acceptable and unacceptable, science and non-science, hard and soft – not the nature of the methodology per se.

Some Concluding Comments

The application of the methodological taxonomy to the discipline of economics is beyond the scope of this article; but some broad implications can be sketched.

One of the major difficulties with economic epistemology is the lack of a well-behaved domain of primary observations. As with all the
social sciences, economic behavior occurs in complex interpersonal interactions in which the basic data is mixed with a wide range of factors of (seemingly) little interest and/or are distributed over spatio-temporal ranges for which tight controls are impossible. Repeatability of empirical outcomes, so critical to the natural sciences, is almost always impossible. The result is that the methodology \( A \) (induction from experience) can rarely if ever be employed with the rigor demanded of modern scientific research – in spite of the spirited arguments of Rosenberg [1976] to the contrary. As a result, almost all economic research has depended upon methodologies \( B \) and \( C \), with the mainline tradition in the 20thC. focussing entirely on the latter, the hypothetico-deductive methodology.

It is a curious fact that the term ‘positivist’ has been so widely associated with economists and the methodological positions which they advocate, when in fact the one methodology available in the logical positivist metaphilosophy is impossible to conduct. What is usually meant, of course, by those who have chosen this identification for themselves, is ‘not normative’. Even the most epistemologically conservative economists would seem to be logical empiricists of one flavor or another. Their methodological prescriptions emphasize the importance, if not necessity, of demonstrating the empirical truth of the foundtion axioms from which their ‘theories’ (in fact, theorems) are deduced. Slightly more liberal, yet within the logical empiricist tradition, are those who would argue that as long as the theorems produced yield accurate predictions then the demonstration of the truth of the axioms is inconsequential.²³

It should be noted here that attempts to establish the empirical validity of the major axioms of modern economics have met with very little success. Caldwell [1982] remarks upon the ambiguity and dubiousness of actual attempts to demonstrate the empirical foundations for economics; while Schoemaker [1982] reviews the wide range of empirical evidence which contradicts the basic postulates upon which economics is based.

Scientific realism with its characteristic emphasis upon explanation as opposed to prediction has made a relatively shallow impression in economics, as compared to its central importance in the development of 20thC physics and biochemistry. But there is a very good reason for this fact that goes beyond the frequent charge that economists are epistemic conservatives who have only recently discovered the Popperian wisdoms as they assume the status of historical footnotes. The methodology of scientific realism demands more of explanation than simply retrodictive success; it must provide an increased understanding of the causal structure of the process which it is supposedly explaining.

However, the hypothetico-deductive methodology provides little or no basis from which to inform the causal structure. One begins with simple axioms, one constructs theorems by logical deduction – the question of causality is not necessarily present. The only way to be a realist is to insist upon ‘realistic’ axioms; but that means finding some criteria for their realism. And the substantive criterion of empirical support is simply not available from the economic domain. So realist theories of economic activity which set out to explain the causal structure producing economic experience as historical events are very thin on the ground.

One conclusion to be drawn is that conventional, mainstream economics is a \( C \)-type hypothetico-deductive methodology, having largely eschewed \( B \) (colligation) as being [too soft] if not unscientific on the basis of a metaphilosophical allegiance. The predominant methodology for acceptance of the resulting theories-cum-theorems has been \( 1 \) (predictive success), achieved through tests for the closeness of fit – in which econometrics has assumed its vital if not dominating role in economic research. But, as has already been suggested, there is a philosophical ambiguity in the \( C \)-type methodology since deduced theorems are in principle immune to demonstrations of predictive failure. In practice it is possible to just look around for another set of data, another econometric test.

In the hiatus ‘beyond’ logical empiricism there are a few realist-leaning exceptions, usually associated by the term ‘descriptivism’, and perhaps typified by the institutionalists at the macroeconomic level and the behavioral economists at the microeconomic level. Of course, the ground is also very fertile for various hermeneutic and relativist philosophies, especially as the major epistemological criteria for accepting empiricist realist economic theories, predictive accuracy, has been unfulfilled relative to the unpredictability and inexplicability (even in the narrow retrodictive
sense) of the great stagflation of the 1970's. Post-Keynesians have refocused upon societal goals and telic variables; while a wide spectrum of 'normativists', from humanists to neo-Marxist and radical socialists, have demanded that economics concern itself with the human condition and values (while unfortunately providing much more political diatribe than alternative structural frameworks).

Meanwhile, those committed to relativism have found that economics provides a field day for their anarchic, deconstructivist methodology. For those who are comfortable within the current socio-economic and cultural environment, rhetoric provides a fertile and amusing vehicle for illuminating the epistemic insecurity of economics. For those less content with the way human history is unfolding in the modern world, relativism provides the platform for launching charges that modern economics is little more than a self-justifying apologia for capitalist privilege.

Modern realism has as yet had little influence upon the social sciences and economics in particular; but it offers an alternative metaphilosophy which is far more lenient and resilient to the attacks from relativism without eschewing the broad principles of realism. Its metaphilosophy would endorse the use of the colligation methodology [B] in order to develop broad patterns of explanation, believing that all theories are fallible no matter how circumscribed the methods which produce them. The current over-emphasis on econometrics to provide goodness of fit and model specification in support of the hypothetico-deductive methodology would be mediated with greater use of less rigorous simulation techniques.

In conclusion, economists need to examine their metaphilosophical commitments and determine whether they are appropriate for economics given the nature of its domain of interest - and recognizing what contemporary society requires from economics as a discipline and a contributor to human knowledge. Given this decision, the available methodologies must be reassessed. In this process perhaps there will arise a new generation of economists for whom the devotion to the illusory 'certain truth' guaranteed by the hypothetico-deductive methodology will be displaced by a motivation to increase our understanding of how economic motivations actually explain the way human beings and their institutions develop to produce the socio-economic phenomena that are so central to our life on this planet.

References