Pluralist economics: is it scientific?

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1. Introduction

The purpose of this chapter is to address any nagging doubt that supporting pluralism in economics makes it unscientific. By science I mean a systematic procedure for establishing reliable knowledge, involving evidence-based enquiry and critical thinking.[1] Can pluralism deliver reliable knowledge? What I will argue is that it is inevitable that different ideas will co-exist in economics, not just about theory, but also as to what constitutes reliable knowledge, i.e. different theories of understanding: different approaches understand the evidence of experience differently, apply different types of logic to it and put different emphases on the purpose of the exercise being prediction or explanation. If this is the case, then the search for reliable knowledge inevitably entails plurality. *Support* for such a plurality – pluralism - arises from two main sources. One is that it is helpful to have a variety of analyses to illuminate different aspects of a complex, evolving reality, making economics at a disciplinary level more reliable. The other is the need for economists to be able to recognise the limitations of their chosen approach relative to alternatives, and to explain and defend that approach in debate, making economics within each approach more reliable. As a corollary, restriction of economics to one approach is a less reliable basis for knowledge of the economy.

There is a long tradition of economists aspiring to science on a par with the physical sciences, an aspiration apparently met by the inclusion of economics in the Nobel prize system. Nobel prizes for the physical sciences are awarded for breakthrough discoveries which open up new possibilities for enquiry or change the way scientists think about their subject. But the context is one of disciplines which are viewed as having a shared understanding of the range of possibilities at any point in time and a shared understanding of their subject. Even when there is revolutionary change, either a new paradigm replaces the old one, or the old one is absorbed into a new synthetic paradigm. Thomas Kuhn's (1962) theory of revolutions in the physical sciences involved one dominant paradigm succeeding another.

Kuhn (1962) argued that each paradigm has its own view as to what constitutes reliable knowledge, i.e. what constitutes science. Later Kuhn (1999) explained the flash of insight he experienced as a graduate student that set him off on this path. He had been taught that Aristotle had been wrongheaded on astronomical subjects. But Kuhn tried to read Aristotle himself from the author's perspective and discovered new realms of meaning which revealed Aristotle's wisdom in his own context. Kuhn used this insight to explain why each succeeding dominant paradigm is incommensurate with the previous one, i.e. there is insufficient common ground by which to compare them directly.

Applying Kuhn's ideas to economics has always been controversial, not least because of differences in interpretation. For example Blaug (1992, chap. 2) sees Kuhn's absence of over-riding criteria for good science as unacceptably relativistic, undermining the methodological monism which Blaug supports. On the other hand Fullbrook (2001) argues that this relativism is in fact anti-pluralistic in protecting the mainstream from challenge from alternative paradigms. Indeed economics does not seem to fit Kuhn's pattern of a succession of dominant paradigms, but rather the persistence of a dominant paradigm even in the face of the type of anomaly which was supposed to spark a revolution. Mainstream economics rather has adapted (within its own framework) in order to be persuasive that it is addressing anomalies as they arise. This strategy has been successful in large part because of the rhetorical success of presenting itself as the most scientific approach (see McCloskey 1983). Thus for example Romer (2015, 89) defines science in terms of consensus on 'true' theoretical and empirical statements, while he defines insistence on differences within economics as (unscientific) politics.

But we can in fact use Kuhn's insight to understand the *co-existence* of incommensurate paradigms in economics. Kuhn was always reluctant to discuss the social sciences, considering them immature (implying that consolidation into a single dominant paradigm would only come with maturity). But now even the prospect of unified physical sciences has been questioned. Thus Cartwright (1999, 1) characterises both physics and economics as a 'patchwork'. There is good reason then to expect the co-existence of incommensurate paradigms as the norm rather than a transitional state. In what follows we explore why this is so and consider different approaches to understanding reliable knowledge; this forms the basis for a pluralist position on economics. We then consider what this pluralism entails for generating and using reliable knowledge, i.e. for economic research, for economic policy-making and for teaching economics. In the process we distinguish between methodological pluralism (arguing for the co-existence of several approaches), pluralist methodology (arguing for the use of a range of different methods) and theoretical pluralism (arguing for a range of theories, whether or not within a single approach or employing a single method).

2. Establishing Reliable Knowledge: different paradigms

The thinking in economic methodology which dominated up to the 1970s borrowed from the philosophy of science the idea of drawing a distinction between science and non-science. Central to this philosophy was the notion of empirical testing, such that only those theories which were testable were to be regarded as scientific, everything else being unscientific. Further, testing would identify the best theories. Popper (1959) argued that simply confirming theories with evidence did not produce reliable knowledge – only showing that a proposition was falsified allowed any definitive conclusions. Blaug (1992) was influential in promoting this approach within economics. Theories would be derived by means of applying deductivist (classical) logic to assumptions which were taken to be true. They would then be tested against the evidence, seeking to identify any falsification, and those theories which performed best would be the ones regarded as most reliable. This is a monist methodological approach: there is conventional agreement about the best methodology.

But while this approach served the purpose of developing and presenting economics as a science on a par with the physical sciences,[2] the philosophy of science was moving on from logical positivism. Caldwell (1982) details how the logistical problems with empirical testing made logical positivism unworkable. In particular, according to the Duhem-Quine problem, if evidence contradicts a conclusion based on theory, it is impossible to pin down exactly what accounts for the failure and thus what needs to be changed, ranging from particular datasets to the precise mathematical formulation of theory. Further it was shown to be impossible to rid economic methodology of (untestable) metaphysical content (Boland 1997, 80-82).

Nevertheless mainstream economics continued to espouse some form of logical positivism and the corresponding general approach to methodology. Its merits are taken for granted and only given explicit expression, if at all, in introductory textbooks. Mankiw and Taylor's (2006) textbook is unusual now in making their methodological approach explicit. They offer a clear statement of logical positivism in a way which used to be more commonly found in the introductions to textbooks. They give their purpose as teaching students to 'think like an economist' (Mankiw and Taylor 2006, 19-21). They explicitly classify economics as a science on a par with the physical sciences in that they employ 'the scientific method' of developing theories on the basis of simplifying assumptions and testing them. There are of course debates within econometrics as to different methods of empirical testing, and the sources of evidence have widened in recent years to include survey evidence and the results of experiments. But the methodological approach still stands, based on a logical positivist philosophy of science, distinguishing between science and non-science.

Science according to Mankiw and Taylor is 'dispassionate', echoing the prevalent mainstream view that the economic researcher engages in positive science, but only then do policy-makers derive normative conclusions by applying their separate value systems. Further science according to this view is cumulative, becoming more robust the more theory is developed and the more datasets used for testing. It is now widely understood that mainstream economics actually defines the subject of economics according to this methodology, i.e. according to logical positivist principles of what constitutes reliable knowledge. As Becker (1976, 5) put it: 'what distinguishes economics as a discipline from other disciplines in the social sciences is not the subject matter but its approach'. This has allowed a form of imperialism whereby economics extends into the traditional subject matter of other disciplines by applying the mainstream economic method. Lazear (2000, 99) puts it as follows:

> Economics is not only a social science, it is a genuine science. Like the physical sciences, economics uses a methodology that produces refutable implications and tests these implications using solid statistical techniques. In particular, economics stresses three factors that distinguish it from other social sciences. Economists use the construct of rational individuals who engage in maximizing behavior. Economic models adhere strictly to the importance of equilibrium as part of any theory. Finally, a focus on efficiency leads economists to ask questions that other social sciences ignore. These ingredients have allowed economics to invade intellectual territory that was previously deemed to be outside the discipline's realm.

Because mainstream economics is presented as a technical, positivist exercise, it has increasingly protected itself from popular challenge. This was something which Adam Smith had associated with the physical sciences rather than the social sciences. He had noted that the physical sciences were protected from public challenge:

> Natural philosophers, in their independency upon the public opinion, approach nearly to mathematicians, and, in their judgments concerning the merit of their own discoveries and observations, enjoy some degree of the same security and tranquillity. (Smith 1759, III.2.20).

But moral philosophy (from which political economy was emerging) was different:

> A system of natural philosophy may appear very plausible, and be for a long time very generally received in the world, and yet have no foundation in nature, nor any sort of resemblance to the truth ... But it is otherwise with systems of moral philosophy and an author who pretends to account for the origin of our moral sentiments, cannot deceive us so grossly, nor depart so very far from all resemblance to the truth. (Smith 1759, VII.ii.4.14)

As mainstream economics became synonymous with the deductive mathematical method, in an effort to become more 'scientific', the scope for departing from resemblance to the truth increased. Indeed, as Earle, Moran and Ward-Perkins (2016) argue, the combination of the increasing power of economics in political argument with its presentation as a specialist technical discipline has created what they call an econocracy: something which discourages public engagement. But the evident failings of mainstream economics to predict the recent crisis or to prevent much of its social impact have encouraged more forceful challenges within public discourse. This has encouraged other approaches to reliable knowledge in economics.

It has been a persistent theme in critiques of mainstream methodology to challenge the validity of the assumptions on which the deductivist structure is built (the assumptions of rational, fully-informed choice by atomistic agents). But this has become a major research programme within New Keynesian economics which has gained widespread attention. Departures from these assumptions are explored: behavioural biases, cognitive limitations, asymmetric information and other-regarding behaviour. However this approach has simply refined the assumptions, certainly in the direction of greater realism, but still with rational economic man as the benchmark. Agents are still depicted as constrained optimisers, but facing more complex constraints. Logical positivism and the empirical testing of deductivist theory still prevail. What Colander (2000) has identified as a general pluralist development within mainstream economics is in fact theoretical pluralism, not methodological pluralism.

There have been more fundamental critiques which conclude that even modified rational optimising assumptions are far from being self-evident and are in fact false. All assumptions by definition involve some departure from reality, but the argument is that rational economic man is not a simplification of real individuals but rather a fiction. By implication any conclusions derived deductively from such assumptions are unreliable. A logical positivist would argue that the proof was in the empirical testing. In fact Popper was happy to accept that economics made assumptions

which had not been empirically supported, such that falsification was limited to the propositions deduced from them. But even this has invited further critique. First, the normal practice is to seek *confirmation* from the data, which is less reliable than seeking falsification. Second, it is long established that any test is applied to a complex structure of assumptions and formulations which make it impossible to identify what has been falsified if the evidence contradicts the hypothesis (the 'Duhem-Quine' problem discussed above).

But third, there has been a critique of the whole notion of 'facts' independent of theory at one level or, at another level, what Searle (1995) calls the 'deep background' of the researcher at another level. This social and individual background influences, at a subconscious level and from an early age, how we observe and interpret the real world. Different approaches to reliable knowledge in economics thus start from different understandings of the subject matter (different ontologies). Thus for example the state of unemployment is regarded variously within different communities in economics as damaging dignity, reducing income, encouraging dependency on the state, or as voluntary leisure, depending on how the commentator understands the world. A further example is money which is variously regarded as a technical input into exchange, a subjective perception of liquidity, and as a social relation. Boland (1997, chap. 5) criticises the mainstream strategy of treating metaphysical assumptions (like the maximisation hypothesis) as if they were tautologies, i.e. logically true. As metaphysical presuppositions they are part of an economist's 'deep background' which generally is unacknowledged.

Corresponding to different ontologies are different views as to what constitutes a good argument and relevant evidence, i.e. as to what constitutes reliable knowledge (including what the 'facts' are and what is meant by 'facts'). This is what Kuhn (1970, postscript) defined as the disciplinary matrix by which each paradigm is identified. Each paradigmatic community in economics builds up knowledge from the shared world view.[3] Thus for example an Austrian economist focuses on the individual in a competitive environment, particularly the individual entrepreneur, and builds evidence drawn from case studies which focus on the subjective understanding of the situation. Since the focus is on variety of experience at the individual level, there is a limit to the scope for general theorising. Institutionalists on the other hand focus on the nature and role of institutions over long periods of time. While human agency plays a part, as well as institutional change, the focus is more on persistence of institutions, drawing on time series data. Post Keynesians occupy a middle ground between the two in the sense of focusing on the interplay between structure and agency and between the short run and the long run. Mathematical models may be used as partial (i.e. incomplete) arguments contributing to a broader structure of argument where the closures required of models are examined in the relevant context, in combination with use of other methods.

Lawson (2004) argues that non-mainstream schools of thought reflect different interests, which result in different lines of questioning, rather than different ontologies. But it is hard to support the idea that an Austrian and a Marxist, for example, understand the nature of the economy in the same way (Dow 2004b). Nevertheless distinctions between ontologies (or indeed paradigms) are not absolute, but rather useful as categorisations by which to understand the discipline and as a basis for mutual understanding. The boundaries of paradigms are permeable and evolving, and yet they hold enough in common for communication to be effective in promoting scientific activity. Different ontologies and all they entail render paradigms incommensurate, each has its own take

(none of which can be regarded as 'correct') on a common reality. But it is this common reality which ensures that incommensurability is not complete.

Heterodox approaches have in common an understanding of the economic system as being open, in the sense that non-deterministically evolving structures, interrelations and creativity mean that there is no scope for universal laws with respect to the economic system. Deductive logic applied to assumptions taken to be 'true' in some sense can only at best analyse those segments of an open system which can, with justification, be regarded as somewhat closed. Any element of openness in the real economy limits the reliability of logical positivism as a basis for knowledge (Chick and Dow 2005); certainly it cannot claim to be the most reliable basis for knowledge. As Lawson (1997) explains, logical positivism is a closed-system epistemology which implies a closed-system ontology, even though many mainstream economists would agree that the economy is in some sense open.[4]

An open-system ontology has profound implications for the possibilities for knowledge, not just of economic agents but also for economists. An open system does not yield categorical knowledge but rather uncertain knowledge. It was one of the major contributions of Keynes (1921) to develop a theory of how we (in ordinary life as well as in science) establish grounds for belief under uncertainty, to provide the basis for action. He argued that we aim for reliable knowledge by drawing on a range of types of evidence and argument, including conventional and expert argument.[5] But since the resulting judgements cannot be taken as true, they are subject to discrete shifts, e.g. as expert opinion or conventional opinion shifts. Rather than using classical logic (deduction from a set of axioms) we employ 'human logic', i.e. employing multiple strands of argument, using different methods, and with multiple starting points. We cannot demonstrate our own view to be correct, but rather need to persuade by means of argument which employs reason, evidence and rhetoric. As Keynes (1973b, 470) put it: 'In economics you cannot convict your opponent of error; you can only convince him of it.' Keynes was forceful in argument and argued for meritocracy in government. Nevertheless argument was necessary since inevitably what is regarded as reliable may differ from person to person and from social group to social group.[6]

Indeed, since a closed system of mathematics allows only for very limited argument and application, mainstream economists can be observed to rely on a wide range of methods in what McCloskey (1983) calls their 'unofficial discourse'. In practise they employ a pluralist methodology. But the 'official discourse' of academic publication still requires that arguments conform to the closed-system norm of mathematical deductivism. As we have seen, this requirement of the official discourse is used to demarcate science from non-science, an important element of the power relations which operate within the discipline. Publication, funding, hiring and firing are increasingly built on metrics with respect to the official discourse. It is a major issue, which pluralism would address, that the operation of this official discourse in parallel to the very different unofficial discourse is not widely recognised within the mainstream, far less justified methodologically (Dow 2007).

But while in institutional, sociological terms one view on the official discourse can be enforced, Kuhn argued that there is no basis in philosophy of science for an over-arching authority to establish what constitutes reliable knowledge in any discipline. But the absence of one set of rules for science does not mean no rules, simply a range of sets of rules. Further, since science proceeds

on the basis of scientific communities, there is in practice a limit to the number of approaches which can be sustained. Individual scientists must be able to persuade *some* of their fellows of the worth of their research (even if only for publication and hiring purposes), and so need to be able to communicate within one approach or another. The outcome is what I have termed 'structured pluralism' (Dow 2004a), whereby any discipline operates within a fairly limited range of paradigms, according to the number of communities which can be supported. The alternative of complete relativism is, I would argue, not logistically feasible. Pursuing knowledge is a social activity which requires successful (even if imperfect) communication, which would be precluded by the infinite number of paradigms of complete relativism. With a limited number of paradigms, there is scope for *some* understanding across paradigmatic divides as a basis for *some* communication, such that debate is possible.

In economics there is no question that there is a variety of views as to what constitutes reliable knowledge and no ultimate arbiter (supported by philosophy of science) to decide which is best. Each approach to economics thus adopts systematic procedures to produce knowledge which is reliable according to the approach from which it came. We have just argued against the view that only a monist approach is scientific. The question at issue now is whether it is *more* scientific to focus on only one approach which the majority regard as most scientific or to foster a range of approaches, i.e. pluralism.

At a general level, a biological analogy supports the argument that a pluralist approach is more robust, a better basis for building scientific knowledge. Biological diversity is seen as a robust strategy for addressing unforeseen developments within which one strain or another may be more resilient. The same applies to economics: some schools of thought are more attuned to addressing particular circumstances than others. For example, a Post Keynesian/Minsky approach focuses on the potential for financial and economic instability and was thus well-placed to predict and explain the likelihood of crisis. Economics is more robust if there is a range of approaches on hand with which to address new developments as they arise. But it also provides a range of perspectives by which to understand, analyse and, through policy, change our common economic reality.

We seek below to argue further that pluralism is the best route to reliable knowledge by considering pluralism in turn in the practice of economic research, in policy advice and in education.

3. Being a (methodological) pluralist economist

What does pluralism actually mean for scientific practice? It is important to recognise the different levels at which pluralism can apply. So far we have been discussing methodological pluralism, the argument for a range of methodological approaches to economics. But there is further the question of a pluralist methodology, i.e. one of the range of methodological approaches which advocates using a particular range of methods simultaneously. Mathematical formalism (the requirement that all argument be expressed within a commensurate formal, mathematical system) is one example of a monist methodology, the official discourse of mainstream economics. But other approaches have reasoned grounds for making limited use of formal mathematical models as partial arguments alongside arguments using other methods or for not using formal modelling at all. Models may be used as aids to thought or as the basis for analysing long data series, while empirical work may be addressed to establishing stylised facts rather than predictions. The range of methods used reflects

the understanding of the nature of the subject matter and the methodological approach supported by the relevant school of thought.

Within a pluralist methodology, the question arises as to the role of different methods in scientific enquiry and how to combine the outcomes of applying different methods. First we need to consider the context in which different methods are employed. Within logical positivism there is an apparently straightforward process of deducing propositions from self-evident axioms and testing them against objective data. But neither pure deduction nor pure induction is possible in practice: the subject matter and the truth-value attached to axioms derive from experience, while the derivation of observations from experience is not independent of theoretical priors. An alternative methodology drawing on Keynes's human logic is retroduction, by which experience (using some methods for representing it) combined with imagination yields ideas about possible causal relations which can then be exposed to analysis and further evidence using a range of methods.[7] Rather than linear deduction, which is vulnerable to any problems with the axioms on which it builds, this approach uses what I have referred to as a 'Babylonian' approach,[8] which builds theories on a range of arguments with different starting points. This is a mechanism for increasing weight of argument, a concept developed by Keynes (1921). If deductive argument and evidence are insufficient to demonstrate the truth of a proposition, at least we can have more confidence in the proposition the more relevant evidence we have. This provided the basis for our discussion of a pluralist methodology which produces a range of types of reasoning.

The different arguments within this process can be combined by means of triangulation. As Downward and Mearman (2007) explain, triangulation in fact applies at a range of levels to contribute different perspectives to a retroductive analysis of any economic question. While the concept of triangulation originally derives from methods in navigation and surveying, '[i]n social research in its broadest sense, triangulation implies combining together more than one set of insights in an investigation' (Downward and Mearman 2007, 80). Triangulation can be applied at the level of data, whereby different types of evidence can be drawn from official statistics, survey evidence etc. It can also apply to investigators: different research teams drawing on different disciplines and different skill sets. Similarly, considering a problem simultaneously from the point of view of different theories enhances understanding. Finally there can be triangulation in the sense of drawing on different versions of the same method, or of drawing on different methods (e.g. qualitative and quantitative research).

Understanding what a pluralist methodology means for practice within one paradigm is one thing. Understanding what methodological pluralism means for practice is quite another.[9] It is a matter of awareness of 'otherness' which requires sufficient knowledge of alternative approaches to allow communication (just as some knowledge of a foreign language helps us understand our cultural surroundings better when we visit a foreign country) (see further Kaul 2007). But further it challenges us to be ready to defend our own choice of approach over others. It is through the ability to be aware of alternatives and also the requirement to be able to justify one's approach that pluralism provides a more robust and thus more reliable range of knowledges about the economy. The discipline benefits from having a range of approaches with different comparative advantages for addressing different types of problem. But it also benefits from the scope for creative cross-fertilisation of ideas between approaches. Thus, even if in a pluralist environment mainstream economics were to continue to dominate, it would be a more robust approach for having explicitly

made its case in relation to alternatives (which requires acknowledging and understanding alternatives) than the current situation where its dominance is due to the exercise of power.

Since the subject matter is complex, accounting for the multiplicity of approaches, inevitably any one approach provides only partial knowledge. Since there are no universal extra-paradigmatic criteria, it is a matter of argument which approach provides the most reliable knowledge. Further, the subject matter being open, each approach needs to be able to adapt to changing circumstances and be able to justify these adaptations. At the same time, as understanding of other paradigms develops and as circumstances change, there may be merit in paradigms borrowing from each other, although inevitably these borrowed ideas take on a different form within another paradigm. Fostering a range of approaches therefore ensures that economists continue to be aware of the limitations of their own approaches as well as their capacities, and to be able to introduce new ideas as a result of debate. Where mainstream economists have maintained some awareness of debate outside the mainstream, they have proved to be adept at absorbing ideas and transforming them for compatibility with the mainstream framework. But pluralism continues to be stifled by the general mainstream unwillingness to engage in debate about, and defend, the mainstream approach itself, or even acknowledge that other approaches might have their own legitimacy.

We can summarise the implications of methodological pluralism by drawing up some positive heuristics and some negative heuristics (a list of 'dos' and 'don'ts').

Positive heuristics:

- Respect the legitimacy of alternative approaches and have an understanding of them.
- Be prepared to justify your own approach relative to others.
- Be prepared to adapt your approach as events unfold and as a result of debate.
- Be open to drawing on other approaches for ideas, even if they turn into something else in your approach.
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Negative heuristics:

- Don't dismiss arguments from alternative approaches out of hand.
- Don't insist that all economists follow your chosen approach (but argue).
- Don't attempt to pick elements from different approaches simultaneously without ensuring that they fit into a coherent methodological and theoretical framework.
- But don't always focus on the meta-methodological level.

These heuristics can be seen in terms of courteous academic behaviour; indeed one of the arguments for pluralism is the ethical argument for mutual respect (Screpanti 1997). But it is more than an ethical argument about good behaviour, it is an ethical argument about knowledge. If no one approach can claim truth and the survival of the discipline rests on nurturing a range of approaches, then the ethical argument concerns honesty about the limitations of any one approach. In order to function as economists we must choose one approach or another; our research would be incoherent if we jumped from one approach to another, unless the result was a new synthetic approach. But the onus is on each economist to engage in debate about the relative merits of the different approaches, being able to defend her chosen approach, but also able to understand enough about alternative approaches to engage in more-or-less effective communication.

4. Being a pluralist policy maker

A policy maker is in a different position, generally drawing on economic advice as an outsider to the discipline. A pluralist policy maker is aware of different approaches. She will normally be drawn to one approach which corresponds to her ontology. Further, since ideology is embedded in world view (Fine 1980), the approach employed will reflect a political position. But, as a pluralist, the policy maker would know that there are other claims to reliable knowledge. The concept of weight of argument (which we discussed above in relation to pluralist methodologies) can be applied by the policy-maker to methodological pluralism, i.e. a range of methodological approaches. If arguments from a range of perspectives all point to a particular policy action, the policy maker can take that action with greater confidence. If however the advice conflicts, the policy maker has to weigh up the justifications offered by the advisers, taking account of their ideological underpinnings; if they also are methodological pluralists, the advisers will understand the obligation to make their case. The policy maker in turn has to be able to express publicly a case for the action chosen. The choice of course will reflect political realities. But, rather than separating the policy decision from economic theory as requiring different methods ('arts' as opposed to positive science; see Colander 1992), economics would be more effective if it built theory on institutional and political realities – a return to political economy (Milonakis and Fine 2009).

Pluralism thus provides the policy-maker with a more robust basis for policy making by providing a range of foci on a complex reality, provided by policy advisers better able to present and defend the underpinnings of their advice in relation to alternatives and to be honest about limitations. Some approaches will come to the fore in particular circumstances, just as others will prove to be less relevant. As Eliassen, Hauge and Rajić (2015) discuss, focusing on only one approach carries the risk of huge policy mistakes. Thus for example the liberalisation of formerly-planned economies ran into all sorts of problems because much of the analysis had ignored institutional considerations particular to those economies (as is standard in mainstream analysis, which presents itself as having universal application).

In terms of the process by which the policy maker arrives at a conclusion, Downward and Mearman (2008) show how triangulation applies at this level too. Using the Bank of England as a case study, they show how the decision-making process draws on different types of data, using a range of types of investigator and theory, in a process of triangulation. Indeed triangulation is applied through governance structures, such as policy-making by committee. However a tension arises between requiring investigators and committee members to have a shared ontology, facilitating a unified decision-making process, on the one hand, and seeking full triangulation between different ontologies, potentially requiring conflict resolution, on the other. A truly pluralist approach to policy advice would engage with different paradigms. This would require the effort being made by all to communicate meaning as effectively as possible (given the inevitable degree of incommensurability between paradigms) and to be able to understand each other's paradigm sufficiently to engage in effective debate.

While a unitary policy maker (such as a Prime Minister) holds an ontology which accords with that of the relevant political party, political parties (like research paradigms) have permeable and evolving borders, and yet provide the basis for a (more or less) reasonably cohesive community. But successful democratic government involves recognising other approaches in the form of other

parties, as well as recognising the more general plurality within society. This could involve recognising plurality where some groups are more vulnerable than others and therefore more in need of protection by the state. Or it could involve recognising the greater power wielded by some sections of society, e.g. the financial sector. This power can take the form of lobbying for deregulation, or the more diffuse form of market sentiment. The latter can create the problems which governments have to address (such as the recent crisis) but can also constrain government policy (as in the case of market sentiment favouring austerity policies). Governments themselves are thus subject to the power of external forces to which they must pay attention. Nevertheless, while a particular political approach to policy inevitably reflects awareness of the significance of other groupings' analysis, and government rhetoric may not be consistent with policy practice, government must adopt one approach or another (see further Dow 2012b).

5. Pluralist education in economics

But it is difficult to advise researchers and policy advisers on pluralism if the economics education system is geared to promoting monism. This monism in economics education is all the more insidious in that it discourages critical thinking. Kuhn (1962) explicitly discussed the role of education in propagating paradigms; textbooks provide exemplars to train students to 'think like economists', something which is reinforced by assessment procedures (see further Graupe, this volume). Not only are students launched on their careers as economists ill-equipped to engage in pluralism, but they have actively been discouraged from doing so. The most important implication of our discussion of pluralism in economics therefore is that it requires a pluralist approach to economics education.

As the G-Science (2016) statement pointed out, science involves critical thinking. So scientific education in economics needs to include training in critical thinking. This requires two important and related elements. First it requires the capacity to debate and second it requires knowledge of different schools of thought as input to debate. Both of these require the basic starting point that students are encouraged and trained, indeed required, to form their own views about economics.

A pluralist curriculum which covers different approaches to economics signals that no one approach can lay claim to truth and that all economic theory is contestable (see Betz, this volume, for a case study). It is not necessary to cover all schools of thought, particularly at the earlier stages of the programme. It is sufficient to present at least two approaches to demonstrate that economic knowledge can be built up in different ways, each of which can be defended on its own terms. Preferably there would be more than two approaches in order to avoid the misleading impression that one is 'right' and the other 'wrong' - in any absolute sense rather than from the perspective of one approach or the other.[10] It only requires students to have a sense of 'otherness' to accept a pluralist approach (Panther, this volume). For those students who already have this sense, what is required is an economics programme which does not 'unteach' it.

An effective way of teaching about different schools of thought is to teach through debate (Dow 2003). This was an early demand of the French student group out of which grew the Post-autistic Economics movement. Students can be pointed towards debates in the literature in order to promote understanding of different approaches. But students themselves can learn the facility of

critical thinking by engaging in debates as part of the curriculum, where students are encouraged to take different stances on approach (including as devil's advocate).

As well as covering the content of (some) different schools of thought, the curriculum also needs to provide material on the history of thought and methodology (Dow 2009). History of thought is important in three respects. First, it is hard to understand the modern array of schools of thought without understanding how they arose and developed and who were the key figures in their development. Second it is important to understand, not only why their importance waxed and waned, but that economics should not be thought of as going through an inexorable process of improvement. It is this view within the mainstream, that modern economics encapsulates the best of past thought, which has justified the marginalising of history of thought education as being only of antiquarian interest. Third, the history of thought provides invaluable material for future developments in economics, showing how different ideas were developed to address particular problems in the past and how they worked out.

Even more fundamental is that a pluralist curriculum include material on the methodology of economics. Differences between schools of thought are associated with methodological differences, so students need some understanding of how to appraise different methodologies (as well as economic theories). The capacity and skills for critical thinking need to be learnt for application to methodology. But, further, an understanding of methodology is fundamental to understanding the whole rationale for a pluralist curriculum, and how it can be applied during subsequent careers. As future practicing economists, students will need to be equipped to make their own choice of approach. This requires understanding what each approach involves, but also why one approach may come more naturally than another (because of otherwise unacknowledged ontology and epistemology). They will also need to be equipped to justify their choice of approach and engage in debate with others. All of this requires methodological awareness, something more evident in the other social sciences but increasingly absent in economics.

This is not to argue necessarily for separate courses in history of thought and methodology, although these could be specialist options. Preferably all pluralist teaching should incorporate elements of history of thought and methodology into the fabric of content in particular fields, something which used to be the norm in previous generations of education in political economy. This of course requires that the educators themselves are equipped with an education in history of thought and methodology. There might therefore need to be a transitional phase of specialist courses until it was reasonable to expect teaching staff to be equipped to teach economics in a historical and methodologically-aware way.

Finally, while mainstream economics has been presented as a technical discipline to which values are only added later by politicians, it is accepted in most other schools of thought that economics is a moral discipline. If different values are embedded in different schools of thought, then these need to be brought to the fore and be addressed in debate. Part of a pluralist education means education in the moral responsibilities of economists. One of these responsibilities is to be honest about the values being applied in theory on which policy advice is based. A further responsibility is to be honest about the limitations of economics. If no one approach can be demonstrated as the best, then advice needs to reflect this, requiring the advisor to justify her position in relation to alternatives. This moral responsibility goes well beyond the conventional discussion of

economists' ethics in terms of plagiarism, conflict of interest etc. Many students choose to study economics as a means to understanding the economy in order to change it for the better. Pluralist economics education therefore needs to train students in understanding their moral responsibilities and how to fulfil them.

6. Conclusion

It has been argued here that pluralism should not be dismissed as being unscientific. Far from it. In fact pluralism provides a much richer understanding of the concept of reliable knowledge in economics, and why and how schools of thought differ as to what that means. To restrict economics to one, inevitably limited, monist approach is to restrict the scope for reliable knowledge, reducing the scientific capacity of the discipline. Further, without the obligation which pluralism imposes to explain and defend one's own approach, economic theory from any one approach is weaker and less capable of constructive evolution.

Pluralist practice has many challenges, which we have explored here for economic researchers, advisors and policy-makers. To meet these challenges, economists require an appropriate, pluralist education. This should include exposure to different schools of thought, training in critical thinking and debate, education in the history of thought and in methodological awareness. Thankfully, thinking and practice are advancing rapidly on pluralist economics education, due in large part to the excellent work of the international student movement.

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[1] This definition draws on the G-Science Academies Statement 2016.

[2] This purpose arose towards the end of the nineteenth century, coinciding with the marginalist revolution, and was given further impetus in the period after World War II (Mirowski 1989; Blaug 1999).

[3] There has been a series of accounts of different schools of thought since the 1980s, see e.g. Dow (1985); the most up to date will be the new Rethinking Economics volume *Rethinking Economics - An Introduction to Pluralism,* currently under preparation; see http://www.rethinkeconomics.org/home/rethinking-reader/

[4] This discussion of openness needs to be distinguished from the idea of an open economy, where the closed system may be expanded to include the foreign sector, or the idea of stochastic processes, where the nature of deviations from the norm as pre-specified in the structure of the disturbance term.

[5] See further Runde and Mizuhara (2003) on Keynes's philosophy and economics.

[6] This was the sense in which Keynes regarded probability as subjective.

[7] This is Newton's 'experimental philosophy', which the Scottish enlightenment philosophers used for developing political economy, and which has found its most recent expression in critical realism.

[8] The term follows from Richard Feynman's discussion of the non-Euclidean nature of Babylonian mathematics; see further Dow (2012a).

[9] Triangulation between methodological approaches, or paradigms, is problematic, unless the object is to arrive at a new, synthetic, approach.

[10] This is a matter of debate, whether non-mainstream schools of thought present themselves as the only alternative to mainstream economics (i.e. they too are monist). But a pluralist presentation of an alternative involves argument designed to persuade of its superiority, while respecting that it is reasonable to come to a different view from a different perspective.