

**BEING ECONOMICAL WITH THE TRUTH:  
ECONOMIC REDUCTIONISM FROM THE MACHINE AGE**

BY STEVE DALEY

*Junior Sophister*

The discussion about the scientific status of economics is an argument without an end in sight spanning the pages of many academic journals, and the SER is no exception. In this issue, Steve Daley revisits the problem. Drawing on influential authors in the field of both economics and philosophy, he criticises existing methodology and suggests a new way forward for economic science.

*“If your experiment needs statistics, you ought to have done a better experiment.”*

Ernest Rutherford (Bailey, 1967).

The prize of scientific prestige has animated a stream of allegation and counter allegation between economic theorists and econometricians. In spite of over half a century of practical work and theorising, John Maynard Keynes’ deep mistrust of Jan Tinbergen’s early work in econometrics still provokes nods of approval. David Hendry (1980) has repeated Keynes’ likening of econometrics to black magic and alchemy, picking up exactly where Keynes left off a generation ago. It is easy to forget the defensiveness of economic theorists in the midst of social instability in the inter-war period: the Bolshevik Revolution propelled the Marxist critique of capitalism as the synthesis of theory and practice, so elusive to bourgeois economics; while the economic crisis of the Great Depression had forced economists to fight a rearguard defence of economic theory. It is not difficult to appreciate the personal anxieties of men like Keynes with the flight into mathematics, but it is less obvious why this dispute smoulders on into the 21<sup>st</sup> century. This brief essay begins with an introduction to the philosophy of the scientific method and its origins within the physical sciences, and then outlines the inadequate methodology of econometric inference. In particular, I wish to draw attention to the evasion of the experimental philosophy of science. In contrast to standard reflections, I will proceed to

interrogate the inability of economic theorists to modify the mechanistic axioms of natural science, in order to highlight the handicap of economic reductionism, so dominant in the discipline. I hope this emphasis on the scientific method will avoid the tedious conflation of the methodological limitations of economics/econometrics with the necessary constraints of rational enquiry. An apology is warranted, due to essay constraints, in view of the inevitable omission of the crucial elaboration of a holistic approach of social science.

### **The prosperity of inductive reason.**

The Scientific Revolution declared a new confidence in the study of knowledge, demonstrated by a string of breakthroughs in astronomy, physics and other natural sciences from the 16<sup>th</sup> century onwards. In concert with René Descartes, Francis Bacon declared that knowledge ought not aim merely “of causes, and secret motions of things”, but should serve “the enlarging of the bounds of human empire, to the effecting of all things possible” (Gillot and Kumar, 1995). Bacon and Descartes shared an appreciation of the human potential of science, but their conception of the *origins* of knowledge were at odds with each other. Descartes favoured the method of abstract deduction, in which knowledge derives from certain logical truths; in contrast, Bacon emphasised learning from empirical observation, a continual perfecting of non-conclusive reasoning (inductivism).

Gillot and Kumar (Ibid) sketch an ABC of the scientific method in the following simple steps: develop a novel theory; design the theory to yield experimentally testable predictions; and, finally, subject the theory to experimental evidence. This approach emphasises Bacon’s inductive methodology, a synthesis of observation and abstract reasoning to induce ‘experimentally testable’ theories. The philosophy of induction paradoxically soothes and upsets the scientific hunger of economic theory, yet it need not be so. An honest appraisal of the scientific veracity of economics and econometrics must acknowledge the primacy of human reason and its retreat in contemporary scientific enquiry. Sadly, a diminished scientific method has become the *cri de coeur* of economists and econometricians in their perennial methodological spats (Hendry, 1980; Blaug, 1980; Hutchinson, 1981; Darnell & Evans, 1990).

Of fundamental interest to philosophers of science is the ‘demarcation problem’, a dilemma as old as Plato’s partition of *nous* and *psyche*, i.e. rational knowledge *contra* instrumental learning. How do the explanations and theoretical constructions of science amputate foul conjecture from the healthy body of scientific learning? Keuzenkamp (2000) traces scientific suspicion of econometric methodology to ‘Humean scepticism’ outlined in the *Treatise on Human Nature*.

Hume incredulously asks: “why should the sun rise tomorrow morning – apart from the fact that we have never observed it do otherwise?”<sup>1</sup> Karl Popper (1983) repeated Hume’s criticism of inductivism to deny the validity of any generalisation or probabilistic inference from empirical observation, explaining his “demarcation principle [as] a purely logical affair” of falsification. As Keuzenkamp (2000) remarks, “such deductive logic is of no use to scientists, economists or econometricians who seek real-world application.” Regrettably, however, the methodology of econometrics (model specification, regression analysis and hypothesis testing) accommodates all too easily to the merry-go-round of falsifiability.

### **The Surrender Of Scientific Certainty.**

Popper’s “obnoxious rejection of induction” (Ibid) explicitly denied “an objective reality that human beings can understand” – not the total abandonment of the objectivity of nature *per se*, but more so that “the possession of truth is not recognisable.” A blunder that, as W.H. Newton-Smith (1990) makes clear dismisses the notion “that there is a growth of scientific knowledge and that science is a rational activity.” Sadly, this restriction of human intelligence is a common-sense truth in statistical reasoning and in the econometrics literature (Keuzenkamp, 2000). Laplace’s Demon, sketched by the Marquis de Laplace (1749-1827) in *A Philosophical Essay on Probabilities*, presents the stumbling block of scientific advance as the want of “an intelligence sufficiently vast to submit these data to analysis” (Ibid.) However, as Gillot and Kumar (1995) caution: “for the classical physicists... probability was not an intrinsic feature of the world. Rather, it was a consequence of human ignorance.” Isaac Newton summed up the materialist sentiment in his *Principia*:

“Hitherto I have not been able to discover the causes of those properties of gravity from phenomena, and I feign no hypotheses; for whatever is not deduced from the phenomena is to be called an hypothesis; and hypotheses, whether metaphysical or physical, whether of occult qualities or mechanical, have no place in experimental philosophy” (Ibid).

---

<sup>1</sup> Hume’s light-hearted violation of intuitivism had minimal mileage - the accomplishments of the scientific project were measure enough to preserve faith in reason. Ironically, though, econometrics was established just as scientists’ conviction in the method of induction was fading: the world of Newtonian science had just degenerated into turmoil with the discovery of quantum mechanics; and Karl Popper’s caustic attack on science, *The Logic of Scientific Discovery*, was completed within a year of the first issue of *Econometrica* (1933).

The study of econometrics, on the other hand, is littered with sophisticated ‘hypotheses’ justified only by elaborate mathematics deduced in terms of the model specified. The contrast between the exceptional scepticism of medical science towards statistical inference in epidemiological studies, and its regime of randomised clinical trial clearly illustrates the narrow limits of probabilistic inference and mathematical modelling. Spanos’ frank admission that: “no economic theory was ever abandoned because it was rejected by some empirical econometric test” testifies to the theoretical insignificance of statistical hypothesis (Keuzenkamp, 2000). Because mathematics is part ‘invention’, which is logically ‘consistent’, a mathematical model of a real-world system – physical or social – can never capture the system itself (Gillot and Kumar, 1995). This inconsistency undermines the foundations of econometrics, but does not explain why economic theory is unable to escape from the mire of mathematical modelling.

### **Positivism: Sciences Sans Raison.**

Bacon’s inductive method is founded on the belief that nature is governed by underlying mechanical causal interactions. Similarly, Descartes pioneered a purely mechanistic view of all non-human processes that eliminated the vexing tradition of asking ‘why’, reducing organic and inorganic entities into inert, senseless objects. Animals and plants are studied like machines, not because they have anything in common with TVs or PCs, but because they are mere objects of natural laws to be discovered by science. The progressive feature of Cartesian mechanical philosophy was that it possessed a “conception of universal causality in nature...without it, nature is made unknowable to humanity” (Ibid.) The mechanist approach allowed scientific enquiry to progress from explanations of simple objects to more complex processes, much in the same way that a watch could be understood from the aggregated operations of its simple mechanisms.

The method of induction, in the natural sciences, exploited this mechanistic philosophy to discover natural laws by a theoretical process of *reduction*. Lamentably, economic theorists are all too aware of the complications of mechanistic philosophy in the social sciences yet persist in the instrumentalist efficacy of observation and measurement. Theory is merely “an essential ingredient to classify facts,” as inspired by positivist social scientists (Keuzenkamp, 2000). Economists have responded to the inefficiency of reductionism in economic theory by rejecting causation and determinism. Social science is exceptional, because society is the creation of reasoning human subjects, and economics is weakened by this profound difference between the study of nature and the study of society. Keynes plainly differentiated between the physical sciences and the moral sciences

(including economics), but is less at ease with the capacity of inductive reasoning to discover the *causa essendi* (the objective cause) – electing the inferior, imperfect *causa cognoscendi* (Ibid). Meanwhile, the Austrian economist, Friedrich Hayek openly admits his desire to set boundaries to human potential in economics, and dismisses economic policy as mere “pretence of knowledge” that yield only unintended consequences. As Hayek’s colleague, Israel Kirzner, explains:

“Our dissatisfaction with empirical work and our suspicion of measurement rest on the conviction that empirical observations of past human choices will not yield any regularities or any consistent pattern that may be safely extrapolated beyond the existing data at hand to yield scientific theorems of universal applicability” (Ibid.)

In contradiction, I remain upbeat that economic laws can be discovered by inductive reasoning and that a precondition of such scientific enquiry is a holistic focus on the economic sphere as the outcome of social relations. The progress of science (natural and social) owed its vitality to the forward-looking optimism in human potential throughout the ‘machine age’. Today human industry is belittled. Until the spineless fashion of economists to seek refuge from the malaise of modern-day life in the aesthetics of mathematics or the microcosm of micro-theory is reversed, economics will remain, the dismal science.

### **Bibliography**

**Bailey, N.** (1967), *The Mathematical Approach to Biology and Medicine*. London: Wiley.

**Blaug, M.** (1980), *The Methodology of Economics or How Economists Explain*. Cambridge: Cambridge University Press.

**Darnell, A. and Evans, J. L.** (1990), *The Limits of Econometrics*, Edward Elgar. Hants: Aldershot.

**Gillot, J. & Kumar, M.** (1995), *Science and the Retreat from Reason*. London: Merlin Press.

**Hendry, D.** (1980), “Econometrics: Alchemy or Science?” *Economica*, Vol. 47.

**Hutchinson, T.** (1981), *The Politics and Philosophy of Economics*. New York: New York University Press.