

# Hedgehog Logic: The Problems of Econometric Methodology

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*Econometrics, with the right assumptions, would have us believe a hedgehog is really a hairbrush. Stephen Kinsella seeks to define a science and the paradigm of econometrics. He takes a philosophical look at how econometrics achieves its goal of the overriding aim of human betterment. He concludes that econometrics has to improve the scope of its date, if it is to help economics bring about a better world.*

*Hedgehog*, n.: A small nocturnal mammal of the family Erinacidae, having a pig like snout and a coat of spines, eating small invertebrates, and rolling itself into a ball for self defence. (Oxford Concise English Dictionary)

*Hairbrush*, n.: A brush containing bristles for arranging and smoothing the hair. (Ibid.)

## Introduction

*If a proposition be true, all the facts harmonise with it.* - Aristotle

A hedgehog has bristles with which to defend itself against its predators. A hairbrush is a device used to alter the shape of one's hair. Yet, according to econometrics, a hedgehog is a hairbrush, given certain assumptions. These assumptions, their inadequacies, faults and weaknesses, I shall seek to elucidate in the course of this essay. After defining what I believe is a science, I shall attempt to briefly discuss the paucity of factual foundations for the erection of such pleasingly aesthetic mathematical models and esoteric theories, and move on to consider whether there is any truth to the charge facing us as economists- that of irrelevance.

## The Structure of a Science

Jeffrey Donaldson (1997) states: "Economics is a moral science. It deals with normative issues upon which it seeks to give practical advice. It deals with *human betterment*."<sup>1</sup> It seeks, through objective understanding, to improve the human condition" (Donaldson, 1997, my emphasis). The set of tools that economic theory uses to test the waters of reality is known as econometrics, defined as "The systematic study of the application of statistical methods to the analysis of economic phenomena" (Kennedy, 1996). Econometrics has at its core the seed of its own

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<sup>1</sup> It is my personal belief that economics is concerned with the issue of human betterment. What is the 'efficient allocation of resources', if it is not the satisfaction of every person?

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destruction- the concept of "Reasoned Errors". (Huxley, 1981) At its most basic level, some 'dependent variable' Y is held to be functionally related to a set of 'independent variables', X, so that movements or variations of the latter give rise to predictable variations in the former.

Critics of econometric methodology, among them Nobel prize winning economists Leonie and Lucas, highlight the problem of the reduction of reality into these simple variables. The very fact that economists eschew detail and dimensionality to produce these variables disturbs them. Lucas states, "The theory upon which most econometric analyses are based presupposes the existence of stable parameter values" (rpt. Buurque, 1993, Chapter 2). This, he concludes, leads the social scientist astray as they hunt for proofs for their "foregone conclusions". (Leontieff 1985) The end result is a fallacious set of results, as Lord Keynes would say, "mere concoctions", arising from the "continued failure to obtain successful results by way of sticking to accepted theory" (Buurque, 1993).

Thomas Kuhn's classic 'The Structure of Scientific Revolutions' (1962) describes the development of a science, if that is what we wish to call economics, in terms of three distinct phases, which take place after the acquisition by practitioners of a field of study of a 'Paradigm' - a model or pattern of work that solves some, but not all, of the problems that those knowledgeable in the area deem acute. Our discipline, the development of the theory of supply and demand, the basic underpinning of much of economics, the implicit assumption of self-interest in all individuals leading to human betterment (and therefore society's) through the market system could be described as our central paradigm. Through this paradigm, suggests Kuhn, the profession would solve problems it would "scarcely have imagined" before its adoption, and would certainly never have undertaken without this "commitment" to the paradigm. Would Leon Walras have developed General Equilibrium theory without an implicit reliance upon the validity of the price mechanism as an information system?

Kuhn then turns to problems the scientist encounters during research within the paradigm, dubbed "normal science". Here, the scientist focuses on those problems the paradigm has not solved explicitly. Kuhn finds three distinct types of problem to be solved: first, that "class of facts that the paradigm has shown to be particularly revealing to the nature of things," second, "attempts to increase the accuracy and scope with which these facts are known," third, "those facts that can be compared directly with predictions from the paradigm theory." It is clear that the discipline of econometrics lies within the ambit of the second class of problems to be solved those efforts to articulate the paradigm with respect to the real world. In

this way, the efforts of practitioners are co-ordinated, as through the paradigm they move in the same general direction intellectually.

### Problems within Econometrics

*A beautiful theory killed by a nasty, ugly little fact.* – Thomas Huxley

In econometrics, however, the problem arises when one attempts to verify another's findings, to reach agreement through repeatable empirical or experimental work. It has been remarked that few practising economists actually check each other's findings. Summers' (1991) challenge to the scientific community to find one theory disproved by econometric methodology resonates through my thoughts as I write this. If econometrics cannot do this, why does it provide "the underpinning for a vast area of economics"? (*The Economist*)

The economy is a "supercomputer" powered by our profit-maximisation motive, and we automatically solve the problem of the efficient allocation of all resources (Varian, 1998). So goes the mantra of the free market economist. The problem lies in the fact that real positive stripped down economics applies theoretically to some sectors of the highly advanced American private enterprise economy, the centrally planned Soviet system, the economy of an isolated primitive tribe, and those unfortunate inmates of concentration camps. When one, as an econometrician attempts to collect data from the real world, one is stifled by the amount of data one cannot access, whether because the field data has not been collected in a scientific way, has been collected for another purpose (for example, market research data) has not been collected at all. One is thus forced to estimate, approximate and then calculate one's variables by inferring their true value from proxies and surrogate data. Leontieff (1987) states that "in the study of a complex economy and the variables underlying it, indirect statistical inference, however refined methodologically, simply will not do."

### Methodological Queries

*Beauty is the first test: there is no permanent place in the world for ugly mathematics.* – Godfrey Harold Hardy

Does this branch of economics, then, use technique and verbiage to cover up the fact that discipline it produces observations that are in and of themselves useless? Yes and no. There are some who believe that the subject is overly verbose; a regression model by simply adding a one period lag becomes 'dynamic', for

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example. But there are also areas of economics that have been altered beyond recognition by the application of these techniques, most notably the area of mathematical economics, where a range of powerful tools have been developed that would yield tremendous results, should an “appropriate set of facts” appear. It has been remarked that, in this ‘science’ happenstance data can support confident causal conclusions. (Freidman et al, 1994) Because of the absence of control, unobserved variables may impact on one’s data in ways one cannot measure.

Indeed, omitted variable bias is a severe problem within the discipline. It is the cause of the econometrician to find that the hedgehog is the hairbrush. By leaving out other important factors, either because they are unknown or unknowable, the regression will see that one is very strongly related to the other, in this case through the common factor of bristles. The econometrician must also contend with reverse causality – In what direction does one variable affect the other? In my example, if the hedgehog had bristles before the hairbrush, would that affect the outcome of the test? The problem of data mining is rampant in the discipline, heuristically looking at any favourable trends in the data, and rationalising their use as predictive elements, just because they happen to fit the user’s foregone conclusions. (The Economist) These lead the econometrician to doubt findings at all stages, the precision and robustness of the model they are using is a factor in the decision to use any econometric tool, but there is always the existence of doubt before proof. That is why one seeks to prove it in the first place.

### The search for Truth: its role in Econometrics

A wise man once wrote “I maintain that Truth is a pathless land, and you cannot approach it by any path whatsoever, by any religion, by any sect” (Krishnamurti, 1929). The guru cited above was, in this writer’s opinion, talking about Absolute Truth, the unknowable, and the ungraspable essence of the cosmos. Econometrics, by approximating Y, the ‘true’ line, and ‘True Beta’ (A beta coefficient is a measure of how well the other variables affect the ‘True Y’), while knowing that it can never reach that line, or grasp it directly seems to suggest that Hinduism had an effect upon its founders. Truth is unknowable, yet we seek it regardless. What else is there to do?

Lawson (1997) writes: “It is the implicit goal of every science to seek the objective truth.” Where is the happy medium? By adopting the rules of the econometrics paradigm, we resign ourselves to a career where we are sure that, in every situation, and for any data set, we will be unsure. Bertrand Russell, the great atheist philosopher of the early twentieth century provides a succinct and ironically

accurate solution – “All exact science is dominated by the idea of approximation” (Russell, 1932).

So is there a way forward from this point, given that it is our stated objective in economics to advance human betterment through the efficient allocation of scarce resources? It is important to recognise the faults of the practitioners in not gathering precise enough data. To be a relevant, vibrant science contributing to the sum of human knowledge, we must refine our method and procedures to ensure data is captured appropriately, safe in the knowledge that the technical sophistication exists within the discipline with the ability to investigate our social reality successfully.

### Conclusion

Has econometrics failed in its stated self-definition of providing the systematic statistical proof or disproof of economic theories through investigation in the real world? Several of the authors cited above seem to think so. Few would argue that econometric models of the future are all they should be. Some, like Leontieff (1985), feel it is “unable to advance, in any perceptible way, a systematic understanding of the structure and operations of a real economic system.” If one ascribes to the definition of the discipline supplied above, this would mean it has failed outright in its stated aims. But something must be done. There is a crisis of data gathering within the community. Efforts to expand the empirical and experimental nature of the discipline are now possible through the use of the Internet and computers. Larger and more powerful mathematical models have been a trend for many years. Let it continue. Econometrics may be no substitute for good sense - a hedgehog will never be a hairbrush - but as a set of guiding tools it may have enduring value.

*Happiness does seem to require the addition of eternal prosperity.*

– Aristotle (op.cit.)

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