

Principia Economica

Charles Larkin – Senior Sophister

The historical origins and methodology of economics are explored in this essay by Charles Larkin. The effects of the methodology of econometrics on the foundations of economics are examined, and he concludes that the methodology of economics has endangered the foundations of the discipline of economics.

Economics, if one were to look back to its very beginnings, would find it to be one of the oldest “sciences” in the Western World, a distinctive accolade for any form of human inquiry into the world in which mankind inhabits. Plato, in particular Aristotle, began that branch of logic that is today called economics. What we today call economics is quite different to what was recognisable to Aristotle. The Age of Enlightenment forever changed economics with Adam Smith’s *magnum opus* in *Wealth of Nations* (1776), which created the foundations of modern economics and would eventually give rise to econometrics. The question at hand is whether this speciality within economics, in and of itself, substantiates the claim that economics is a science. To answer this pressing question we shall look into the history of Econometrics as an academic discipline, second, we shall endeavour to understand the epistemological aspects of science, which eventually gave rise to economics and finally we shall investigate the anthropological aspects of human learning. The analysis of these three areas combined will be the *instantia crucis* that allows one to determine that econometrics not only does not contribute to substantiating the scientific claim of economics, but also endangers the very epistemological and methodological foundations upon which Political Economy is based. One’s analysis shall begin with a short historical account of Econometrics.

The Late Renaissance and early 1600s changed the study of economics forever.¹ The thinkers of the time gave rise to a new view of the political economy that fully endorsed

¹ The rise of trade and the Reformation redefined the moral, ethical and religious views of Europe. Commerce expanded, Humanism developed and the theories of experimentation began to show fruit with Galileo, Copernicus and the other early masters of the physical sciences. Economics undergoes its dynamic quantum leap at this moment in time – the developments of Hobbs, Pascal, Descartes and the British Empiricists all make an impact on Political Economy.

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the use of the ‘*nonoverlapping magisteria*’² (Gould, 1997: 19). Baconian thought resulted in the development of the Mercantilist economics, Cartesian thought influenced the Physiocrats³ and Descartes’ own *Regulae*, in Rule 14, stipulates the unending and profound influence that geometric and mathematical methods can have upon the ‘*loftier sciences*’ (Redman, 1997: 30)⁴. This was also the period of time in which the great grandfather of statistics and econometrics was born – Political Arithmetic.⁵ Petty’s *Political Arithmetic* (1899) and Graunt’s *Observations on the London Bills of Mortality* (1899) formed the basis for all the statistical numbers used in economics and science. The development of this science gave rise to a familiar cry amongst the economists of the age (Redman, 1997: 142-149). Patkin (1976), discusses Keynes’ personal view of econometrics and how he was less than enamoured with its method, but he also includes the key correspondence on the issue of national accounts. Keynes, Kuznets, and Clark all lobbied for and tried to develop better, more accurate national statistics. The United States developed them during the Great War and Britain during the Second World War (Patkin, 1976: 1092-1111). The issue that synthesises Keynes to the 1600s is that his complaints of misconstrued, poorly collected, analysed and defined data were those of not only the leading economist of Petty’s age, Charles Davenant, but are also found in Adam Smith’s *Wealth of Nations*. Smith finds a distinctive value for Political Arithmetic (as does Keynes who developed the method of measurement of GDP in his $Y=C+I+G$ model), but only in so far as it is not abused, or thought to contain explanatory properties which it does not contain (Redman, 1997: 142-157), Hendry (1980), shows the

² By this Gould means that there is a distinctive separation between what is within the realm of science and what inhabits the realm of theology and religion. The two magisteria are not to overlap or attempt to conflict with one another and therefore exist in an uneasy harmony, both aware of world they uneasily share.

³ Cartesian thought helped to develop the systematic mathematically deductive process that is found in Quesnay’s *Tableau Oeconomique*, an important work that influenced Smith.

⁴ It is important to point out that Pre-Classical Economics reaches its height with Cantillon in his highly systematic theory. His *Essai* outlined the questions of dual value, uses statistics to develop his arguments and anticipates theories of population not seen again until Malthus. (Roll, 1992: 108) This helped to set the stage for the further advancements that Smith would make in his *Wealth of Nations* (1776).

⁵ Sir William Petty with John Graunt developed what would become econometrics, and surprisingly the capabilities of both Political Arithmetic and Econometrics as forms scientific inquiry are similar.

limitations of the use of statistical inference, and the regression method.⁶ One of the first instances of the linear representation of economic information was John Playfield (1748-1819); it is with him that econometrics had set itself apart as one of the founding methodologies of Political Economy (Redman, 1997: 151). The final development in econometrics, until the synthesis of economics, mathematics and probability under W.S. Jevons, was to be found in Thomas Bayes – the founder of Bayesian probability.⁷ His developments would eventually provide not only a large explanatory factor in econometrics, but also in economics.

The conclusion of the discussion of the history of econometrics will bring us through the Classical view to the present “crisis” in economics. Adam Smith, as mentioned above, developed the foundations of all Political Economy, and he himself used Political Arithmetic in his *Wealth of Nations* and firmly established economics as an academic discipline. Ricardo and Mill develop upon Smith but they differ slightly in their methodology and intellectual models. Marshall, Edgeworth and Jevons brought to fruition the mathematical and statistical view of economics.⁸ Keynes’ development of Macroeconomics, and the post-war drive towards “demand management” took economics from its knees in the Great Depression to its “Golden Age” in the post-war world until the 1970s. This brings us to the present situation in economics; the ‘crisis’ in

⁶ Hendry (1980) illustrates the ability for the linear regression model to be manipulated to such a degree that the whole method of econometrics can be shown to be of little value. Hendry truly begs the question of whether or not econometrics is any more than a series of totally unfounded assertions based on a method still trying to turn lead to gold.

⁷ This was in response to David Hume speculative conclusion that “...sensory evidence cannot render a generalisation or prediction certain.” (Redman, 1997: 200) The epistemological foundations for Bayesianism were to be logical interpretation was fully refined in the works of Keynes and Carnap. Keynes attempted to expand the *inductive* abilities of probability, but since this science results from the study of games (a human creation) its adequacy for weighting evidence in natural and social science is still in question. The axiomatic basis of probability limits its explanatory ability and to philosophers of the Vienna School, namely Karl Popper, found this support of the inductive method as useless as induction itself. (Redman, 1997: 202)

⁸ The application of Newton’s “fluxions” (calculus) at the close of the Nineteenth Century was the height of economic systemisation prior to the marginalist school in America.

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economics that British economists spoke of in the 1970s, and American economists in the 1980s (Redman, 1991: 154-167). This “crisis” gave rise to many questions in economics and has placed the epistemological and methodological foundations of Political Economy under scrutiny.

The epistemological⁹ foundation of economics is to be found with Adam Smith. Smith who was first and foremost a philosopher, a philosopher of the Scottish school who had entered an academic world dominated by the Royal Academy and two opposing, yet fundamentally important points of view on scientific thought – the Baconian and the Newtonian. These formed the basis of Smith’s thought and Smith’s *rhetoric*.¹⁰ (Redman, 1997: 207-220). The Baconian philosophy of science was to create once-and-for-all the wall between religion and science and implement the ‘nonoverlapping magisteria’ model that exists to this day. Bacon’s *Novum organum* was his “textbook” to the goals, methods and knowledge which the new scientists of the Renaissance were to embrace. Bacon outlines four failings of scientific thought, that not only influence Smith’s philosophy of science, but are also, unfortunately, the failings of many modern economists.¹¹ (See Hutchinson in *Economics in Disarray* (1984)).

⁹ By this I mean the study of knowledge and thought processes that gave rise to Smith’s philosophy, of which *The Wealth of Nations* was a branch.

¹⁰ It is important for reasons of clarity to introduce the arguments of Donald McCloskey (1983) who views the problematic case of Modernist Method as it is used in economics. (McCloskey, 1983: 484) The problem with the modernist method as McCloskey illustrates it, was not the blind mathematical system that McCloskey believes it to produce. Hume in his *Enquiry concerning Human Understanding* denies Newtonianism, which is the true source of what he terms as modernism. The deductive-inductive method of Smith differs largely to what he decries. “The way Hume sees it, only a fool could dispute the authority of experience.” (Redman, 1997: 73)

1. ¹¹The idols of the tribe, the human tendency to find too much regularity in the nature.
2. The idols of the cave, the natural narrowness of human thought that results from the human tendency towards parochialism.
3. The idols of the marketplace, the limits of human language which plague all the sciences and all aspects of life.
4. The idols of the theatre, which illustrates how dogmas and schools of thought cripple pure enquiries into the nature of the world. (Redman, 1997: 14-15) [The lack of a “nonoverlapping magisteria” is what Bacon is referring to in this final point.]

Newton was the other great mind to influence Smith, though it is unlikely that Smith understood calculus or the *Principia*. Smith had read *Opticks* and the *Principia*, and the two works differ sharply, which influences a great deal of his work. Newton used the deductive-mathematical method in the *Principia*, whereas in the *Opticks*, Baconian experimentation is blatantly present. This may explain the “linguistics” of Smith who evoked the use of scientific rhetoric, such as the “terminology” of the *Principia* but never actually endeavours to singularly use an axiomatic deductive method, for his own philosophy of science does not embrace this concept. Smith’s goal was to apply the principals of the physical world and sciences to moral ethics, of which economics was one facet. Smith outlines how generalisations are formed in the *Theory of Moral Sentiments*:

‘The general maxims of morality are formed, like all other general maxims, from experience and induction. We observe in a great variety of particular cases what pleases or displeases our moral faculties, what these approve or disprove of, and, by induction from this experience, we establish those general rules. But induction from this experience, we establish those general rules. But induction is always regarded as one of the operations of reason. From reason, therefore, we are very properly said to derive all those general maxims and ideas’ (qtd. in Redman, 1997: 187)

This outlines the inductive-deductive method that Smith would later use in the *Wealth of Nations*, a process of investigation and collection of facts (econometrics and mathematical economics), used in tandem with the deducing of an inference from those facts but only in a very minor way ¹² (Redman, 1997: 184-189). This is where one finds the beginnings of econometrics not being able to contribute to making economics a science, but that the violent way in which the mathematical and econometric method was forced upon economics shakes it to its very epistemological core. Terrence Hutchinson (1984), illustrates this in a concise and all-encompassing manner in his article ‘Our Methodological Crisis’. The abstract deductive method so fundamentally changes economics, allowing for unsubstantiated generalisations that the rise of economics as an

¹² Smith had a strong dislike for the deductive method, therefore inductive, experience based thought is the pervasive method in all his works.

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intellectual playground where the importance of policy-making advancements is lost. Smith understood this fully, and so did Newton and Hume (who is made out to be the evil creator of modernism in McCloskey's (1983) article)¹³. Smith knew of the complexity of man and that a mechanistic and systematic view would collapse the foundation of his work. A view lost on a theoretical construct of General Equilibrium as Hutchinson (1984), clearly states.

Econometrics, as stated above, was a welcome tool for economics to Smith. He felt that though it was still hard to learn to walk before one could run, it was a valuable tool if it was not to supplant the importance of all the various subsystems of thought that make up his view of the economy. Unreliable data and unreliable methods were the criteria under which empirical work was to be judged – difficult criteria to be judged by for any present day econometrician. The key to the epistemology and methodology at the heart of economics is an understanding of Adam Smith himself. As a Scottish philosopher he was imbued with the Scottish view of academic inquiry (Redman, 1997: 110-112). The focus was on rhetoric, the historical study of the foundations of mathematics, a broad and liberal education that involved a command of multiple subjects, a method that involved a “common man’s” understanding of moral philosophy, this is the cornerstone of Scottish academia (Redman, 1997: 110-111). This mindset was made manifest in Smith’s works. His use of Newtonian phraseology and rhetoric resulted in many economists finding a basis for mathematical form in Smith, as Jevons developed in the

¹³ Again this is a manifestation of McCloskey’s confusion between Newtonianism and modernism. Newton himself in the below quote realised the limitations of his method acknowledging there are some phenomena that even physics cannot explain. Newton in the *Principia* states:

I deduce the motions of the planets, the comets, the moon, and the sea. I wish I could derive the rest of the phenomena of Nature by the same kind of reasoning from mechanical principals, for I am induced by many reasons to suspect that they may all depend upon certain forces by which the particles of bodies, by some causes hitherto unknown, are either mutually impelled towards on another, and cohere in regular figures mutually impelled towards one another, and cohere in regular figures or are impelled towards on another, and cohere in regular figures, or are repelled and recede from one another. (*Principia* qtd. in Redman, 1997: 48)

Hume himself felt that his good friend Adam Smith’s *Theory of Moral Sentiments* was off the mark in trying to apply the principals of the physical sciences to that of morality. (Redman, 1997: 187)

late Nineteenth Century. This loses sight of Smith's evolutionary and self-adapting system of thought that was the counter opposite to the axiomatic deduction of Newton, and closer to Bacon and perhaps Darwin's *Origin of Species*. Smith created a complex of subsystems that includes experimentation, reason, history, natural history, a generalist's perspective, moderation and balance, connecting principals, moral axioms, natural laws, concepts of systems, fairness, rhetoric and statistical methods. Smith's method allows for mathematics and econometrics but only as long as it understands that it is part of the philosophical system under which the supremely complex human artifice of commerce is studied. This makes the simplistic models not only highly difficult to create but also discounts them, for they come dangerously close to missing the point of Political Economy. Keynes puts the danger of an overly Newtonian view of economics in a very clear manner:

'Unlike physics, for example, such parts of the bare bones of economic theory as are expressible in mathematical forms are extremely easy compared with the economic interpretation of the complex and incompletely known facts of experience, and lead one but a very little way towards establishing useful results'. (Keynes qtd. in Morishima, 1984: 71).

Kenneth Boulding in his presidential address to the American Economic Association made clear that the simplistic trends of economics has resulted in it removing itself from the scope of human activity and lost its basis in the greatness and weakness of the human condition (Boulding, 1969: 1-11). The shaky ground upon which the overly mathematical, parochial and myopic method of econometrics and mathematical economics has allowed economics to venture is clear. It is a result of a persistent misinterpretation of Smith since the time of Jevons and as a result, it has shaken the very foundations of the study of economics. The final section will endeavour to explain why this happened.

The anthropology of human learning allows one to partially understand how Smith's warnings were ignored by so many for so long. The brain's versatile toolbox developed over the millennia the skills to outwit and outsmart the local flora and fauna. In the process humans and our evolutionary ancestors developed the ability to analyse, categorise and to communicate. The intuitive mechanisms of the mind work well, up to the point of abstract concepts, like economics. At this point the human mind leaves the

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Stone Age and enters the world we inhabit, and the world that Adam Smith and Isaac Newton inhabited. As primates, we are social by nature and also visual. The development of abstractions for understanding was a mark of higher human thought. The use of geometry and mathematics are those higher levels of thought, which ease the understanding of difficult concepts (Patkin, 1997: 42-45). The issue at hand is the problem that this produces. In the presence of a theoretical concept *Homo Sapiens* is like a child with a hammer – everything becomes a nail. The inherent ease of mathematics and geometry on the Cartesian Plane in assisting the economist in deducing the complexities of an oligopolistic market via game theory offers great advantages, but also great dangers.¹⁴ The history of modern mathematics is based upon the axiomatic deductive methods of Descartes and Newton. The deduction from basic axiom to theorems is possible for an infinity of possibilities. The application of such a tool to economics is important and useful but also counter to its foundations. As stated above, Smith used an inductive method. Smith's work then became the axiom upon which all economics was based, but his first principals were not axiomatic, which resulted in mathematic progress but hit epistemological brick walls. Mathematics helps to decode the universe as we can see and understand it, and it is an intrinsically important tool, without which science does not exist (Tyson, 1997: 80-82). This shows why Smith does not reject econometrics or mathematics. The brick walls are hit when the language of mathematics is stopped short by the might of Nature in physics. Economics, in being a human creation while studying the human artifice of commerce, is therefore affected by the time and mores of society, and subject to its own Heisenberg Uncertainty Principal.¹⁵ By the observer being a participant in what he or she is observing, it results in the wall economics approaches being filled with holes, and therefore allowing theories and conceptions to fly through, though they have no grounding in the world of human commercial interaction (Boulding, 1969: 2). The use of mathematics and econometrics ceases to be part of the co-operative Smithian subsystem but begins to chip away at the other pillars upon which economics stands.

¹⁴ The Smithian warning against over-application is quickly ignored and the rise of econometrical and mathematical methods that serve no practical purpose and reconsider ineffective theories multiple times in different ways take place.

¹⁵ A concept taken from Theoretical Physics, it is the belief in the process of observing, the observer corrupts what he or she is attempting analyse.

The innate facts about human learning allow this to happen almost unnoticed. Man is a linguistic creature, but of the 6,000 languages that exist only 1,000 phonemes (basic sound units) exist, and automatic limitation upon what we can convey through mere words (Nowak, 2000: 42). Again, this allows econometrics and mathematics to easily fill the void, which is either too difficult or too wordy to describe about how humanity interacts in the act of commerce. Risk and uncertainty, and group collusion are highly complex and difficult concepts to verbalise, economics utilises mathematics, geometry and econometrics in a manner that supports political economy, but to over simplify or infer from statistics what cannot truly be inferred results in the foundation of the economics being damaged. John von Neumann created the programmable computer via syntax and a limited linguistic set (Nowak, 2000: 47). Man is similarly gifted, but as with the computer, there are limits to its application. Economics must realise those limits in order to save itself from the current “crisis” it faces.

The objective of this essay was to discuss whether or not econometrics contributed to economics as a science. Econometrics does not add to economics as a science, in fact, if taken to the extreme it endangers the very foundations of political economy. We illustrated this thesis by first discussing the history of economics, how it developed and where it has gone, with the goal of illustrating how economics was intrinsically linked to moral philosophy. Second, the discussion entered into the mind of Smith, the epistemological development of economics and how Smith’s own times influence his work. This showed how econometrics does not make economics a science, but was always an intrinsic part of political economy. The final section ventured into how humanity learns. This was to illustrate how easily Smith’s, Newton’s and Hume’s warnings can be ignored. Those warnings, particularly Smith’s places the very subject in danger, as his inductive subsystems that were the foundations of economics are put at risk but a myopic view created in the last few decades by econometrics. Smith personifies economics; he also personifies Alexander Pope’s *Essay on Criticism*:

*‘A little knowledge is a dangerous thing;
Drink deep, or taste not the Pierian Spring;
There shallow draughts intoxicate the brain,
And drinking largely sobers us again’* (qtd. in Gould, 1997: 24)

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Economics is scientific in as far as it is a systematic inquiry into the human artifice of commerce, but economics must drink deep of the Pierian Spring. To not fully take in all that the muses have to offer the economist (both mathematical and otherwise), and the econometrician may, by intoxication caused by parochialism conjoined with myopia, strike out and destroy the pillars around them that support the temple of political economy. If the economist and econometrician drink largely they come within distance of understanding that there is truly a grandeur to this view of life.

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