The Practice and Prospects of Econometrics

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What is a science? As Kane (1989) notes, its nature precludes perspicuous definitions, but Nagel furnishes a useful starting point: "It is the desire for explanations which are at once systematic and controllable by factual evidence that generates science"(1961:4; cited in Kane,1989). The search for a standard methodology of economic research is a consequence of assuming that economics is or will be a science. This assumption is fiercely contested, and what follows is an outline of the terms of this debate.

The discussion begins with a definition of what actually constitutes science, and then proceeds to examine the question of whether economics can legitimately be called scientific. Section two introduces econometrics as a discipline. Finally, section three looks at the practice of the discipline. It is concluded that, although there are many criticisms of economics that render it unscientific, the methods of measuring and forecasting the economy are at present the best we have, and by taking into account certain limitations, they can be made operational.

How scientific is economics?

This section examines in what sense the adjective "scientific" can be applied to economics. Two opposing viewpoints can be usefully delineated. Put simply, one contends that the discipline of economics is scientific, and the other argues the diametric opposite. What is noteworthy is that, often, the proponents of these two perspectives use a common benchmark to support their position - the natural sciences. It will be argued here that the uncritical use of the natural sciences as a metaphor for certainty and "truth" is both unjustified and unhelpful.

Nagel (1961) discusses this point at length. He believes that if the natural sciences are exact, then perhaps physics has the strongest claim to the designation "scientific". And yet there remain areas in physics that to this day remain unresolved. Each year, new atomic and sub-atomic particles are discovered, such as the axion, the latest explanation for the "missing" part of the Universe's mass. On a more general level, the cursory overview of the natural science reveals tracts of unexplored phenomena. In medicine, for example, how often is a new breakthrough in cancer research announced, only to be usurped a few months afterwards by the "latest" piece of research. Bacterial ailments have been conquered, but viral ones remain unchallenged.

Both the natural sciences and the social sciences are confounded by the problem of observation affecting measurement. In tandem with this, both categories lack opportunities for controlled experimentation. In short, it is a fundamental misconception to believe that the natural sciences achieve a level of purity and objectivity that the social sciences can never achieve.

Having said this, never the twain shall meet unless practitioners within the economics discipline attempt to sustain a scientific methodology. Econometric methods are at the core of this endeavour.

The nature of econometrics

The Econometric Society was founded on 29 December, 1930 (de Marchi and Gilbert,1989). At this time, there was seen to be a need to promulgate the merit of statistical methods in applied economics. In addition, standards had to be set and mechanisms for data collection put in place. The new econometricians had a strong sense that it was part of their mission to help make economics operational: "mathematicizing economics thus was seen as a necessary part of the larger enterprise" (de Marchi and Gilbert,1989). Hopes were high that the new departures would greatly benefit the discipline. It is arguable, however, that this benefit has not accrued.

A definition of econometrics is useful at the outset. It can be be described as the application of statistical methods to economic data. Yet such *simpliste* interpretations gloss over major points of contention. Contrast the views of Koutsoyiannis (1977) with those of the contemporary English school.

Koutsoyiannis places most emphasis on the reliability of results, contending that it is important that parameter estimates be both statistically significant and theoretically meaningful. If the estimates turn up with signs or size not conforming to the a priori criteria generated by established economic theory, then they should be rejected. In this case, the econometric result obtained is, to a large extent, contingent on existing theories. This is hardly an experimentalist approach and certainly not "scientific".

Other practitioners, such as Leamer and Hendry, claim the advantage for their approach. They use quantitative techniques to discover theories. However, while at first sight this approach appears more tenable, in practice it is equally culpable. This is because underpinning it is the belief that alternative theories may exist, but a satisfactory model must be consistent with at least one theory. This essentially leads us back to the same problem mentioned above.

The practice of econometrics

Most economic theory is developed as deterministic. The role of data is largely relegated, in practice, to the quantification of parameter values and acceptance or rejection of theoretical relationships. There is no role for discovery, least of all for data instigated discovery, and no concept of modelling the data.

The number of variables relevant to economics is vast. Shackle (quoted in Wright,1989) defines economics as "the aggregation of the incompatible and the quantification of the unquantifiable." It follows that in the application of econometric techniques, a certain amount of approximation is inevitable.

To take one example, consider the standard Keynesian equation Y=C+I+G+X-M. In the measurement of these aggregates, *ad hoc* estimation procedures are employed. Investment expenditure figures are based on spending on (a) construction and (b) machinery and equipment. Within each category, proxies are used to measure the amount of investment undertaken[1]. Consumption expenditure is not directly estimated at all, but rather is taken to be the residual in the equation when all other aggregates have been estimated. It is obvious that these figures will be specious.

Leamer (1983) believes that: "The concepts of unbiasedness, efficiency, consistency, maximum likelihood estimation, in fact all the concepts of traditional theory utterly loose their meaning by the time an applied researcher pulls from the bramble of computer output,

1 For instance the number of bags of cement sold is used to estimate construction investment, while imports of producer capital goods are used to approximate investment in equipment.

the one thorn of a model he likes best, the one he chooses to portray as a rose." The econometricians shabby art is humorously and disparagingly labelled "data mining", "fishing", "grubbing", "number crunching." Conse says of the process: "If you torture the data long enough, nature will confess." This again is a sad and unscientific state of affairs.

Combining these difficulties of quantification and aggregation with the lack of objectivity exhibited by practitioners renders economics a completely subjective discipline. This is the opposite of what the probabilists of the 1940's tried to achieve under Haavelmo and the Cowles Commission. Haavelmo shaped a coherent framework applying statistics to economics, thereby enabling agreement to be reached on methods. This agenda has been only partly implemented.

Finally, it is worth commenting briefly on the impact that technological advances have had. That such advances have indeed changed the nature of econometrics is unquestionable. Computers enable the creation of large databases, and the processing of data that in previous years was simply too cumbersome to be manageable. Inevitably, therefore, the formulation of the questions and the character of the answers has changed. However, the enduring methodological concerns of the relationship of theory to econometric estimates, of nutonomy, of the comparison of competing hypotheses, and of the status of inference in econometrics remain.

Conclusion

This essay has discussed the scientific status of economics, and the contribution which econometrics makes to this status. It was argued that the labelling of economics as scientific by virtue of the application of econometrics is a misnomer.

The criticisms of economics mentioned above are deficient in so far as they do not proffer an alternative methodology. This is because an alternative answer does not really exist. The economic methods we have at our disposal today. If we recognize the limitations of economics and its weak base instead of treating economic indicators as the absolute truth, then economics has a role to play in our society. It is when these limitations are ignored that we are in serious danger of of making a grave mistake in relation to our economy.

References

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