Mathematicising Economics:
Time for Revision of Emphasis?

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$\mathcal{A}$t the beginning of the 20th century, as social sciences were developing an independence from natural sciences, economists were realising the need to test the theories that had been developed to date. In a letter to Walrus in 1908, Moore stated that economics had its scientific status vilified because of the absence of inductive demonstrations of its fundamental tenets. Boulding (cited in Samuelson, 1982) said of economics "any subject which is empirical in the sense that it is interested in the interpretation of actual human experience must have two parts, the construction of logical frameworks - the 'pure' part, and the interpretation of reality by fitting the logical framework to the complex of empirical data - the 'applied' subject." Thus econometrics was begun with this main aim. In this paper I aim to show that econometrics as it is today is not enhancing the scientific status of economics and indeed may be hindering its development.

What have we proved?

The initial step in econometrics is to use mathematics to formulate a model. The first problem I see with econometrics is that mathematics lends itself to the over-simplification of economic models. Emmer (1967) in a discussion on the form of an economic theory points to the problem of time. He states that static models are much more common than dynamic models and even when conceptual time is built into the theory (e.g. short/long run in microeconomics), economic reaction to an event is assumed to take place instantaneously. According to Emmer, this problem rests "almost entirely on the compulsive urge of economists to present theory in a language of rectangular Cartesian co-ordinates" (1967). This problem is compounded by the compulsive urge of economists to assume linear relationships between quantities. While linear algebra and regression analysis are widely used branches of mathematics, I do not see how linearity (or indeed any 'neat' mathematical relation) can be assumed in economics. Maybe the differences between estimated coefficients in different analyses of a linear hypothesis could be explained by the data having come from different parts of the non-linear curve. As the physical sciences experiment with curved space and chaos theory it is surely time for econometrics to re-evaluate its mathematical *ceteris paribus*.

After a model is hypothesised,

data is collected and used to test it. However data is continually being collected and the problem of whether the reasoning and idea for the model came before the data or otherwise is always difficult to assess. Leaving aside this well-known problem of data mining, let's assume that economic theory is developed from the current body of theory, logic and intuition. Economic data evolves and increases as a society does; it is often manipulated politically and may even disimprove. The British recession has been blamed by some on cutbacks in the government statistical office in the mid-1980's.

Does econometrics therefore simply test to see which theory fits current data? Worse, does economics respond to changes in data with changes in its theory? How else can economists justify the swings in opinion from, for example, Keynes to Friedman? A crucial difference here was the slope of the LM curve, one claiming a vertical line and the other a horizontal one. Econometrics and economic data have not produced a definitive answer. Perhaps the slope is closer to forty-five degrees than anything else or maybe it is not linear at all. The point here is that with changing and imperfect data, what can econometrics prove other than vague trends between quantities? When more than two variables are involved, the problem of multicollinearity impinges. As this is impossible to measure accurately I must agree again with Emmer - "I am inclined to think that most economic theories have hardly passed beyond the status of hypotheses." When one considers the dismal results of complex economic

models in predicting the future, the question of what we have proved must be posed. Even the basic two dimensional curves, such as the Phillip's curve, vary in slope and shape with data and time. To finish, I think that a by-product of econometrics has been the increasing reliance of economics on mathematics, a branch which came into being as a tool of economics, and has become an important entity in itself, addressing questions on regression analysis and data quality, but which I would argue has not helped economics.

An Alternative

How then can economics progress? I will argue in favour of two disciplines, psychology and history, and within this framework, for the continued use of econometrics as a link between the data generating process and economics, albeit in a different way. In the 1960's in America, the economy was booming and Keynesian economics was being hailed as the answer. The Vietnam war and the 1973 oil crisis soon finished this honeymoon period. A parallel can be drawn with Great Britain in the 1980's: for a few years Lawson could do no wrong and yet the economy nose-dived to a recession shortly after he resigned. Economists will debate at length on what went wrong but few would disagree that both consumer and business confidence dipped sharply. The resulting decrease in spending only served to exacerbate the problems. No doubt economists, being as they are, were talking of a recession as soon as,

if not before the first signs of a slow-down appeared.

The question to consider is whether there would be a difference if the gloomy predictions never started? I believe that if these harbingers of doom did not exist, confidence would not decrease - why should it? It decreases because people are persuaded that things are getting worse, that the boom won't last forever etc. However if people are told nothing is wrong with the economy then what is wrong with the economy? Expenditure and investment remain strong and whatever may need to be done to tune the economy can be done. Currently raising income tax rates, for example, is an admission of an impending recession and so a recession is inevitable. It is in this realm that psychology is so important. If the government can convince the nation to work with it, rather than simply observing its actions, it can make a substantial difference to economic planning. The employment of surveys and discussions can be used to psychologically train businessmen and consumers to think that, as an integral part of the economy, it is up to themselves to make it work. This approach is used to an extent in the 'Buy Irish' campaign and to combat tax avoidance, but the 'science of the psychology of the economy' is in its infancy. With econometrics, perhaps simple models of these 'variables' (confidence, attitudes, beliefs) can be developed.

In conjunction with this new science, economic history must be put to better use. Basmann (1970) in an essay bemoaning the sharp divide between that subject and econometrics, said "it cuts straight through the heart of a natural unit of scientific activity namely, predictive testing of proffered economic 'laws'." Rather than leaning solely on economic data, we should use newspapers from the time and the opinions of the economists and hence, to an extent, that of the nation may be determined. This would be invaluable for testing our new economic models. Therefore, as I have suggested, economics will begin to rely less on maths and become a social science. The data problem now becomes an historical problem, but as the attitudes of people become better known and understood, economic theory may be more soundly based than ever it has been.

Conclusion

In summary, due to the problems of economic data and the relevant mathematics of econometrics, economics has been disrupted as a science as a result of econometrics. I have advocated a new approach, in effect redefining economics as a social science based on history and psychology. I conclude with a rhetorical question posed by Shackle (1972) on the state of economics presently: "being sure that he does not know everything, being certain only that nothing is certain, ought he to be silent."

References

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