# Science: A Modest Proposal

INTRODUCTION;

In this essay I shall argue, in redefining the qualitative restrictions on the term "scientific", that economics is a science, whose status as such depends crucially on the systematic evaluative mechanism provided by econometrics.

ECONOMICS: A MORAL SCIENCE:

Economics is a system of logic developed to study the interactions of human relationships and the institutions which arise from them. The economist generalises from the individual choices of the representative agent into an approximating behavioural theory.

Economics, as a discipline, developed over 100 years ago as the offspring of Political economy. the latter itself inherited its basic doctrines from Moral Philosophy. Because of the "practical relevance" constraint,reproduced from theories of Political Economy, economic theorising has tended to lose much of the scientific status usually associated with the more abstract, natural sciences.(1) It is felt that social inclination towards social involvement is too strong and so, much of the objectivity of the discipline is lost. However, from the Moral Philosophers, economists learned of man's inherent instinct to survive and excel. This notion is incorporated into the central proposition about economic behaviour; the consumer always wants more.It is precisely because economics purports to derive theories of human behaviour from this proposition about human behavior, that it becomes a science.

Keynes' own interpretation was that "economics is a (moral) science of thinking in terms of models combined with the art of choosing the models most relevant to the contemporary world."(2) On this account, econometrics, performing the latter function in this definition, is inseparable from economic theorising within the confines of economic science.The notion of choice, however, explictly mentioned in this definition,implies that economics, as a branch of logic, is a subjective moral science as it concerns itself with "introspections and judgements of value.

The introduction of choice arises from the fact that, unlike other sciences, the base from which economic data are generated is changing through time. As a result, all economic decisions are characterised by uncertainty.Sims has argued that, although meteorology comes close, no other science has the explicit need to confront uncertainty in the models it develops.(4) "Economic models are finite dimensional approximations to infinite dimensional Data Generating Processes(D.G.P)".(5) Itis for this rearon that comparison of economics with the natural sciences is a meaningless excercise. Although both disciplines are characterised by Frisch's "lure of unsolvable problems",and the search for an algorithm of regularities, by their nature and objectives, they are independent intellectual pursuits.

Accepting Mills' wider definition, we see that "science is the accumulation of new knowledge about the world"(6). In the natural sciences, the base from which this information is extracted,characterised by structurally immortal formulae and equations, is constant.

By Duhem's thesis, there is no such thing as a crucial experiment in the natural sciences i.e. one that necessarily changes the outcome of all other experiments by changing the nature of the subject. In economics however, the base is continually shifting . It is meaningless to view an economy as an engineer views a system because in economics, even the basic form and parameters of the characteristic equations of an economy can be regarded as variables through time.Hence the objective in the natural sciences of filling in the values for structurally constant equations would be nonsense in economics and would

destroy the usefulness of economic models as "instruments of thought".

Our natural inclination,then, to deem unscientific any discipline which does not compare well with the natural sciences, is a habit of mind that has arisen from the trust we have learned to place in the latter and the reliability of its prediction. This is destructive of scientific progress. In particular, economics becomes a non-science. The correct interpretation to take is a broader normalist perspective. Much less time should be spent on the essentialists' demand for scientific definitions and classifications. Economics is a dynamic science concerned with analysing real world situations. Indeed Kournai explictly rejects any discipline that does not confront problems of uncertainty and expectation.

This dynamic approach to science, implies that, at least in economics, prediction should be secondary to understanding. Blaug has shown how, in physics, understanding is not a necessary (or sufficient ) condition for prediction. ( e.g. Newtonian physics has great predictive ability, but little explanatory power). The changing nature of structural parameters implies that attempts to understand the underlying black box D.G.P are more important than forecasting. This is exacerbated by the "practical relevance constraint"; what you don't know can hurt you. On this account, short run disequilibrium economics will be far more scientific than long run equilibrium theories. Practical relevance dictates that reaction and repair are far more important than improvement.

How, then, is econometrics useful in all of this? We have already demonstrated that econometrics is, broadly, the process by which we choose the model most relevant to the real world. Progress in economics, as a science, will depend in part, on the improvement in the choice of models.(7) This unification of economics and econometrics is the potential of economic science. Emmer has pointed out however, that the discipline itself is not unified. We cannot move smoothly from one area of discipline to another.(8) In contrast, the observations about which economists make statements are unified. An explicit role therefore is outlined for econometrics: to aid in the unification of the subdiscipline of economic science in terms of the methodological approach taken to the acceptance/rejection criteria for economic theorizing.

ECONOMETRICS: A PATH TO UNITY

Consistent with this notion of unification is Frisch's 1933 address to the Econometric Society: econometrics is " the unification of the theoretical qualitative to the empirical quantitative ".(9) In fact, without some evaluative process, then almost any relationship thrown out by economic theory could be defended. The overconcentration on theoretical issues in economics (evidenced by the increasing use of mathematics in the academic journals, a development which, as Leontief put it, "serves to make economics barely distinguishable from any branch of pure maths") has led to a loss of focus on the central constraint in economics: practical relevance.

The purpose of any econometric analysis, and the resulting predictions, is to aid policy-making. As a result theoretical and empirical studies have tended to be "macro" in nature. However, Buchanen has argued that, because macroeconomics moves away from the central theory of human behaviour, it becomes unscientific. The use of aggregation (applying aggregate data to hypothesized relationships which are assumed to be generated from the behaviour of the representative agent) is particularly questioned.

Granger, on the other hand, provides the saving grace to macroeconomics the claims that economic theory is highly compatible with aggregation since theoretical relationships can be drowned out at the micro-level, by individual specific factors which average to zero over the range of the population. In any case, the temptation with microeconomics is to assume structural constancy of the relationships of the "representative agent" through time. We have shown that economic parameters are not constant through time, so that by adapting econometrics to be systematically progressive through time, we maintain the

scientific status of economics, while also maintaining practical relevance and real world applicability.

That is economics, being an observational rather than an experimental science, is evidenced by Leamer's claim that economic processes leading to observation are uncontrolled. It is more constructive, however to regard them as controlled by nature. The focus of econometrics,then, correctly falls onto the approximation of "black box" relationships with a view to understanding the nature of that control.

This is the potential of econometrics. In reality there has been no "unification". Indeed the econometric practices of the 1970s, in response to the breakdown of many established macroeconomic relationships led Leontief to conclude that "economics is an unsatisfactory and slightly dishonest state of affairs".(10) The illegitimate use of data-mining and the ad hoc specification to find the "line of best fit" have led to skepticism about economic discipline and it's findings.

In general, two wide-ranging methods have been used to accumulate knowledge in economics; (a) induction (or generalising from the specific) and (b) deduction (moving from the general to the specific). Both of these procedures are subject to limiting problems.

Since all knowledge is taken to be empirical, the latter, which is by definition the combination of two or more inductive inferences to make a new statement, cannot create new knowledge. Induction, however, is equally constrained in terms of prediction. If an event occurs 100 times per day for X-years and no perceivable change has occured to alter this, can we logically say that inductive inference extends to the future? We cannot because to do so would be to make an inductive inference based on our 100X observations thus begging the question.(11) These problems serve to set limiting bounds on the degree of confidence we can have in a predictive statement.

Specifically, we can outline three problems with current methodology, each of which has been tackled in the debate between the American and British schools; (a) the overuse of a priori assumptions,

(b) predictive failure of the models and (c) dynamic misspecifation.

Quine has shown how theoritical restrictions placed on models in the form of maintained hypotheses effectively means that we face the world with the whole of scientific knowledge.This makes it difficult to confront the model with the data(12). Although some restrictions must be placed on models, "cook-book" econometricians have tended to abuse this justification.

Predictive failure is evidenced by the macroeconomic void created by the stagflation of the 1970's. If econometrics is to be useful to policymakers, it must be able to forecast disturbances to maximise the speed of recognition and repair.

Finally ad-hoc specification, particularly in terms of assumed lags, is arbitrary and unjustifiable. Econometric specifications have tended to ignore the role of self-fulfilling prophesies and the ubiquitous impact of the observer on the nature of the environment itself. This reverse causality constrains the usefulness of th econometric model.

Fortunately the saving graces for econometrics have arisen from the Sims-Hendry-Leamer debate.They each purport to inject solid evaluative acceptance/rejection criteria into the discipline.

Sims' starting point, consistent with his distaste for the use of priors, is explicitly atheoretical(13). Rather than allowing assumed marginalisation and conditioning procedures, his VAR approach assumes, as in the DGP, that all variables are endogenous. In any regression equation, variables are ordered according to relative importance, pending the outcome of causality tests. It is unclear whether predictive ability will be enhanced but certainly, econometrics becomes more objective.

Leamer's EBA confronts the problem of "priors" in a framework of uncertainty. All priors must be stated and tested with regard to the data. In

particular fragility tests and sensitivity tests are carried out to measure inferential changes from model specification changes. With all priors stated and tested, and alternative specifications evaluated, it is left to the user to determine the degree of belief he wishes to place in the model's predictions.

In terms of confronting the dynamic nature of the real world, the Hendry approach comes closest to injecting hard Popperian evaluative standards into econometrics. He claims that the stationary stochastic assumptions of the VAR and EBA approaches, assume constancy of some underlying model. This contradicts economic nature. His starting point is that useful econometric models must adequately describe the data to which they relate. Such models are only approximations. "Economics should be regarded as a destructive process with constructive intent".Models, then are purely matters of design and not of absolute truth. Testing of marginalisation and conditioning then, maximises the practical relevance constraint by applying real world changeability.

CONCLUSION:

Economics is a dynamic science involving unavoidable degrees of subjectivity and introspection. Econometrics, as an integral part of economic science, must be equally dynamic to allow progress in that science in terms of the systematic accumulation of knowledge about the real world. Recent attempts to incorporate uncertainty into econometric model design then, can only be seen as an extension of the scientific status of economics.

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**References**

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