

## **A talk delivered to the staff of the Institute of Econometrics of the University of Łódz on Monday 7th May 2012.**

The first thing that I must say is how impressed I have been by the manner in which my schedule has been organised. The organisation has been in the hands of the younger members of the Dept. Zuzanna Wosko has been remarkable in this respect, and I have imposed even more tasks on her by asking her to arrange a social gathering for this evening.

Another feature of my visit that I should mention is that I have received no instructions whatsoever to guide me in what I should present to yourselves or even to the students whom I shall meet this afternoon. One consequence of this is that I shall be telling you things this morning that you might not wish to hear.

As regards the students, I have thought that it would be appropriate to provide them with a partial history of the subject of econometrics, to tell them how it has developed over the years that I have been associated with it and to provide them with a schema in which they might be able to locate the things that they will be learning. I have made the assumption, which may be incorrect, that these are beginning students so my title has been “Econometrics: An Historical Guide for the Uninitiated.”

One cannot undertake this sort of exercise—which is to give an account of the subject—without reaching an appraisal of its current state and without forming an opinion on where it is heading. An assessment of its successes and its failures is an inevitable by-product, which will arise whether or not it has been ones intention to pass judgement on such matters.

My experience of econometrics began in the late 1960’s when, as a student, of history, philosophy and sociology, I made a mid-course switch to some more technical subjects. I began to train myself in mathematics, I learnt a programming language and I became interested in electrical engineering. I was the ring-leader of a small group of students who demanded that the University should provide them with a course of econometrics.

One reason for making such a demand was pure dissidence. We knew that no one was capable of teaching the subject; and this was a marvellous opportunity for embarrassing the academics who had been doing such damage to our own self-esteem.

I have to confess that I did not know what econometrics was or, at least, that I had a mistaken opinion about it. I had glanced at a book by Oscar Lange titled “Econometrics” and I had imagined that this was representative of the genre.

Lange was dealing primarily with matters of national economic planning: with the logistics of organising a centrally planned economy and with the analysis of the trajectory of a growing economy—growth economics as it was called.

This was also the era of the Soviet economist Evsei Grigorievich Liberman, whose aim was to liberalise the system of Soviet economic planning. Many people who were acutely aware of the dysfunctional nature of Soviet central planning believed that the problems could be overcome by the application of

the emerging computer technology. They saw the matter as essentially a technical one, and they were willing to overlook the fundamental problems that were bedevilling the society as a whole, which included the venality of the apparatchiks.

I was certainly no exception to this self-deception, and I honestly believed that Britain's own economic problems could be largely overcome by the adoption of a rational central planning system and by the application of science and technology. I strongly believed, in other words, in the machine analogy of society

This was a common belief of the time. For example, the Chancellor of the Exchequer—whose role equated to that of a Finance Minister—complained that the task of steering the economy was like that of driving a car with a faulty accelerator and untrustworthy brakes, with only the rear view mirror to guide his steering. Notwithstanding such a bitter complaint, there was no question that the analogy was an appropriate one

The mission of the economic technologists, and, in particular, of the econometricians, was to develop the technology so that it could become fit for the purpose. The belief that this was the appropriate agenda was reinforced by my experience at the University of Southampton, to which I went in order to pursue a course of econometrics and operations research.

The head of the Department of Economics was Ivor Pierce, who was an economist nearing the age of retirement. He was able to declare that he had accomplished much of his own personal research agenda, which had been to specify the fundamental relationships of the macro-economic system. It was now up to the econometricians to continue the work by endeavouring to metrificate or to parameterise these relationships.

He offered an enticing investment opportunity to the Government. At the cost of the salaries of a handful of econometricians, a significant number of percentage points could be added to the value of Gross National Product. Surely, this was an opportunity that was too good to miss.

This was also the era of the emerging macro-econometric models. We are now talking of the early 1970's. A discouraging fact, which became increasingly apparent as the years passed, was that the Southampton econometric model would never emerge—at least not in any form resembling that of its early promises.

This was also the era of the so-called Box–Jenkins revolution, during which process it became increasingly apparent that, by dint of capturing the inertial dynamics of the economic variables, the simple unconditional linear stochastic models of the ARMA variety could achieve predictive powers that far exceeded those of the large macro-econometric models.

This debacle did not arrest the remarkable progress of econometrics. The subject grew to include much more than the theory of single linear regression equations and of systems of linear equations with jointly dependent variables. It grew to encompass the entirety of mathematical statistics and much else besides.

In the process, econometrics had become increasingly distinct from

economics—even from mathematical economics. I might say that econometricians have become alienated from economics.

Many years have passed since the 1980's, which is the latest period that I need to describe in any detail. The developments of the intervening years bring us into familiar territory. Econometrics and its methods, at an elementary level, have become an integral part of the mainstream of the teaching in Economics Departments; and this is notwithstanding its alienation from mainstream economics.

The latter seems, to my mind, to have narrowed its focus and to have become excessively preoccupied with game-theoretic issues. A great deal of time is now devoted to investigating propositions concerning imaginary worlds that bear little resemblance to the real world.

There are equal doubts about the meaningfulness of much of the ordinary econometric methodology. To investigate complex social interactions through the medium of aggregate statistical indices with the help of trivial linear time-invariant regression models often appears to be a weak and a lazy form of social enquiry. On the other hand, the preoccupations of the theoretical econometricians, including my own, have become increasingly inaccessible to non-specialists, who are liable to express their impatience, if they do not entirely ignore the work of the theorists.

Such discontent with econometrics and econometricians has been reflected in the withdrawal of the grant giving agencies of support both for econometric theory and practice. Thus, the U.K. Econometric Study Group, of which I have attended the annual conferences over a period of more than 20 years, is no longer supported by the Economic and Social Research Council.

How have econometricians reacted to these circumstances? There are a variety of reactions that we can observe. One of them is to reaffirm their faith in the face of the critical onslaught. This may account for the emergence of a kind of econometric theology, which its proponents describe as methodology. Emphatic and inflexible prescriptions have been given regarding the appropriate way to determine the specifications of econometric equations. Such prescriptions have found their way into computer software packages, which delights the faithful and irks the dissenters.

Another reaction, which some would regard as discreditable, but which is my own reaction, has been to declare oneself no longer to be an econometrician in a narrowly defined sense. In fact, I would urge that, far from representing an unprincipled retreat, this is the only fruitful way forward.

Having spent half a lifetime mediating statistical theory, I feel entitled to call myself simply a statistician. The range of subjects that are available to well trained econometricians is vast. It includes epidemiology, demography, environmetrics, sociometrics and much else besides.

My own acts of apostasy bear a strong relationship to some of my enthusiasms as an undergraduate. I have had an abiding interest in what can be described as statistical signal processing. This brings me into the domain of electrical and mechanical engineering; and it includes the theory of image processing and the theory of digital communications engineering. The mathe-

matics that one might learn in connection with time series analysis, if this is pursued both within the time domain and the frequency domain, should equip anyone who is nominally an econometrician to enter these fields.

One of the deficiencies of the classical econometric theory is its inability to deal with the ever-changing relationships amongst economic variables. To overcome the difficulty, econometricians have often resorted to the use of structural breaks whereby one local linear time-invariant structure is replaced by another when it is no longer able to encompass the current realities.

A fruitful way of reflecting the evolving nature of economic variables is to pursue a wavelets analysis, which entails both a time domain aspect and a frequency domain aspect. A wavelets analysis employs banks of linear filters or a sort that are familiar to electrical engineers.

In fact, the so-called  $M$ -band wavelet analysis is closely related to the technology of transmultiplexing, which is the means by which broadband communication channels are exploited so as to carry the maximum quantity of information. This entails a combination of time-division multiplexing and frequency-division multiplexing. The lecture that I shall be giving in the Krakow will be dealing with this topic.

In case any of this sounds like a desertion of the field of econometrics I should hasten to make a denial. Econometrics will continue to be a subject of prime importance regardless of its episodes of scientific success or failure. In this respect, it is unlike most other sciences. It is the perennial importance of social and economic affairs that guarantees this outcome. Only when it is pursuing a successful and a well-defined agenda, can econometrics afford to be an inward looking discipline. At other times, it ought to take an electric and a free-thinking approach.