

European versus American Economics, Artificial Intelligence and Scientific Content

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I INTRODUCTION

BRUNO FREY and REINER EICHENBERGER (1992) have made the provocative argument that European and American academic economics differ greatly in several ways, most interestingly in the Americans' overemphasis on technique and highly abstract analysis. They offer a simple explanation of these differences in terms of the level of competition. Because Europe is broken up into many small submarkets by language, regulation and tradition, it is often the case that European graduates' best (or only) academic possibilities are at their home universities. Although I agree with their general proposition, I believe that there are other forces at work, both economic and intellectual.

Further, reference to an interdisciplinary debate on the possibility of artificial intelligence sheds surprising light on the differences between European and American economics. A major faction in that debate believes that a purely abstract computer program, if complex enough, can think like the human brain.

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The refutation of this view connects nicely to the role of mathematics and abstraction in economics.

II. EUROPEAN VERSUS AMERICAN ECONOMICS

According to FREY and EICHENBERGER, the reduced competition causes European academic economics to be of lower quality. More interestingly, it changes the focus of research, causing European academic economists to put more effort into learning about local political and economic institutions, while American economists put more effort into learning the how to solve formal puzzles in standard neoclassical theory which have 'very little to do with how well the real world is explained' (1992, p. 217).

This European/American difference in quality and emphasis clearly exists for academic economists, but apparently not for economists employed by business, research institutes or governments. In these non-academic settings, the differences seem much smaller, even though American competition for the positions in these non-academic organizations is just as open as for academic positions. Perhaps competition for non-academic positions in Europe is more open than competition for academic positions. If so, European non-academic economists might be quite outstanding – perhaps even superior to European academic economists. I don't believe that this is the case, but I wonder why not?

1. Small Markets

Returning to a comparative study of academia, one of the causes for the difference is clearly the smaller markets in Europe versus North American, mentioned by FREY and EICHENBERGER. Virtually the only way for an economist from California to compete for an academic position in Massachusetts is by the very public means of publications and citations. Direct, personal experience plays a far smaller role. Among other things, this reduces the role of personality and personal connections. But, this market scale effect is not the only difference between Europe and North American academia.

2. The Ultimate Consumers of Economics

The ultimate consumers of economic analysis are not professional economists. The consumers include students, who want to improve their future decision-

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making ability, and governmental or private policy-makers. Though I find economics beautiful, I am forced to admit that mine is decidedly a minority taste. There may be some other economists with a similar view, but not many of our final consumers seem to share it. Unlike poetry or even mathematics, there is little ultimate demand based on aesthetic appreciation of economics.

A major reason for the fact that American economics is less likely to be related to actual economic problems than is European economics is that the connection between the ultimate consumers and the American economics profession is more attenuated in America than in Europe. As FREY and EICHENBERGER note, leading European economists are much more likely than their American counterparts to be closely involved with one of the final demanders of economics; governmental policy-making and politics. The difference cannot be explained by Europe's state-owned universities, since the vast majority of American universities are also state-owned and operated. But, it is one of the causes of American economics being less tied to real problems. This disconnection between ultimate consumers and producers allows the American economics profession to be so much more self-contained, self-referring and controlled by its own criteria.

3. Internal Professional Norms

As FREY and EICHENBERGER state, the internal professional criteria lean in the direction of formalizations that do not necessarily have much application to economic problems. This weakens the profession, because the ultimate consumers lose interest and reduce their support for economics in general. But, there is no logical requirement that the internal criteria of academic economics weight formal abilities and demonstrations as highly as it does currently. Internal criteria can change and they appear to be changing.

III THE ARTIFICIAL INTELLIGENCE DEBATE

Perhaps surprisingly, the differences between European and American economics can be shown clearly by reference to a debate going on among many disciplines on the possibility of a thinking machine – artificial intelligence¹. This debate on artificial intelligence is needlessly confused because the term

1 For the origin of the debate, see SEARLE (1980) and the ensuing commentary in the same issue.

'thinking' is ill-defined. However, at least part of thinking must be 'knowing' in the scientific sense. Many proponents of what is now called the 'strong artificial intelligence view', including HERBERT SIMON (SEARLE, 1984, p. 29), an American Nobel prize-winner in economics, believe that by designing a complex enough computer program one could create a machine that thinks the way people think.

1. Chinese Room Thought-Experiment

SEARLE's counter-argument is the justly famous Chinese Room thought-experiment (*Gedankenexperiment*). Imagine Prof. SEARLE in a room shuffling Chinese characters according to rules. He might well satisfy the Turing test for understanding Chinese, but even so, he is totally ignorant of Chinese. Exactly like a computer running a program, he can manipulate symbols. But, SEARLE in the Chinese room cannot know anything about Chinese for the same reason that a purely abstract arrangement of symbols has no scientific meaning. It cannot say anything about the concrete world because there is no connection between the symbols and anything concrete. All mathematical expressions are scientifically empty and meaningless. To give scientific meaning to a mathematical expression, one must adopt semantic rules connecting the mathematical terms to something concrete and observable².

As an example from economics, consider the present value equation that states that the value of a financial instrument is equal to the sum of the discounted value of the expected future payments

$$\text{SECURITY PRICE} = \sum_{t=0}^T \text{PAYMENTS}_t e^{-rt}.$$

By itself, this formal expression has no scientific content. It is analogous to SEARLE's Chinese Room. The formal expression can be given scientific content by semantic rules, for example connecting the discount rate to a particular interest rate reported in the *Wall Street Journal*, connecting the future payments

2 One might think that the debate would be settled, but it is not. For more recent writings on both sides, see SEARLE (1985), the debate between SEARLE and the CHURCHLANDS (1990), PENROSE (1989), HERNAD (1989), HORGAN (1994) and the debate between KEPLER and WOLPERT (1993).

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to those stated on the instrument itself and connecting the present value to the reported market price of the instrument.

A computer program by itself lacks a means of connecting the symbols it manipulates with objects or conditions in the world. For a program, the analogue to semantic rules is a physical machine with sensors that can translate physical phenomena into symbols. Clearly a computer with sensors can know something about the world. It can associate symbols with concrete objects (e.g., a rock) or conditions (e.g., temperature, weight, movement). It is not like SEARLE in the Chinese room.

Analogously, the most complex mathematical expression imaginable is just as scientifically empty as a simple one – until someone connects the symbols with real objects or conditions. As many economists have noted, some very abstract economic theorizing has gotten so disconnected from observation, that it has come close to SEARLE's Chinese room. This is the basis of the current discomfort with some abstract economic theorizing and even with complex, but not terribly abstract, economic modelling that, as a practical matter, would seem to defy a close connection to observable phenomena. This brand of formal and complex theorizing in economics is, of course, more American than European. In terms of the artificial intelligence debate, American economists are not concerned enough with semantics.

2. In Economics, the Chinese Room is a Matter of Degree

SEARLE's Chinese Room thought-experiment and the debate surrounding it focuses on a position that is incorrect as a matter of logic. Thus, the argument turns on issues of logical impossibility. But, in thinking about economics one must go beyond this absolutism and see semantics and meaning as matter of degree. In spite of its sometimes high level of abstraction, most economic theorizing and formal modelling can, in principle, be confronted with evidence and applied to an actual problem. Thankfully, it would be rare to see a theoretical model that was completely, and in principle, without implications, like a computer program. Thus, it is vital to realize that the problem of whether a theoretical statement has scientific and practical usefulness is a matter of degree.

IV AMERICAN ECONOMICS AND THE CHINESE ROOM

American economics is too often like SEARLE's Chinese Room. This can happen in two ways. First, the analysis can simply be at such a high level of

abstraction that one could not, for practical purposes, attach semantic meaning to the theoretical terms or results. The second way is for an ostensibly applied model to be hopelessly complex, relying on many assumptions and a specific structure that cannot practically be checked. In this second sense, even empirical results can be so fragile and model-dependent that they are uninformative (SUMMERS, 1991).

1. Economists are not in the Center of Policy Analysis and Public Debate

An unfortunate result of this is a clear decrease in the role of professional economists in important American policy analysis and debate in the past few years. Though I know of no systematic evidence, I have personally observed the trend in several areas.

The first is energy economics and the recurring crises in the Middle East. In the 1973 and 1979 oil crises, American academic economists, such as MORRIS ADELMAN, PHILIP VERLEGER and MILTON FRIEDMAN were prominent in the American news media, commenting upon the crises and debating alternative responses. Of course, the U.S. adopted price controls, against the advice of most academic economists, but at least they were in the debate. During the War with Iraq in 1991, similar economic issues were again taken up in the public debate. This time, academic economists, or even professionally trained non-academic economists, were seldom seen³. Their place was taken by non-economist and non-academic consultants and analysts.

The second area where professionally trained and academic economists have become far less prominent is an area of major personal interest, health policy. Here again, we can compare dates. National health insurance has been the subject of intense debate in the U.S. twice in my professional lifespan. The first time was in the early 1970s. Academic economists, such as MARTIN FELDSTEIN and MARK PAULY, were very important to this early debate and in the designing of the plans.

The current debate over national health insurance (which is called health care reform this time) is dominated by non-economists. The task force of over 500 that drafted the original Clinton plan included very few economists and most of those were not academics. The drafters of the plan intentionally kept it away even from the Clinton Administration's own economists (WALDMAN and

3 DAVID HENDERSON, featured on national television and the *Wall Street Journal*, was a rare exception.

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COHN, 1994, p. 30; *The Economist*, 1994, p. 23). There has been relatively little attention paid to the economic effects of the various plans. Expert academic health economists are rarely seen, even in the highbrow news media. Instead, the debate seems to be dominated by political analysts. To the extent academics have been involved, they are largely not economists.

2. Policy-Related Consulting and Outside Support Helps

In some areas of American economics, there are counter-acting forces that keep the discipline connected to actual economic issues and problems. These are areas where there are more direct customers of economics who counteract the self-referring nature of the discipline and keep the analysis closer to real economic problems and issues.

One example is the field of industrial organization, (industry economics) including the study of antitrust and regulation. Here, there is demand for economic studies derived from litigation, regulatory proceedings and policy-making. This demand ties the field to reality, preventing the boom in formal game theory from taking the field too far from its roots in practical policy concerns (FISHER, 1989; SHAPIRO, 1989).

Another example is the area of public finance, especially as relates to taxation. Here, there is a permanent demand for analysis and advice on the effects of different systems of taxation, deficit finance, etc.

The field of labor economics, including the analysis of crime and welfare systems has also been kept closer to real economics problems, partly by outside forces. There is demand here for analyses and plans to reform labor law, the criminal justice system and especially the welfare system.

The final example is the field of law and economics. Here, the final demand derives from the needs of lawyers, the judiciary and, to some extent, the legislature. One can view industrial organization, especially in its focus on antitrust, as a precursor of a more general application of economics to legal problems. Most academic law and economics work is quite clearly applied and is even meant to be understood by lawyers and judges.

V EUROPE QUALITY AND INTERNAL CRITICISM

As FREY and EICHENBERGER note, European academic economics suffers from low quality, but not so much from empty formalism. The lack of competition that FREY and EICHENBERGER discuss is certainly part of the explanation, as is

a closer connection of the discipline to final demanders. However, I would add an issue of intellectual causation. It strikes me that, quite aside from the lack of competition, European economics suffers from a lack of internal criticism. It seems that in Europe, papers are presented at major conferences or even published, without first being subject to serious criticism from colleagues. Note here that the colleagues need not be active competitors for jobs. Indeed, the best critics may be those who are not direct competitors. Part of the problem here stems from language barriers. But, as more and more European economics is written in English, even though it is not the first language of most European economists, the language barrier will become less important. Another cause of weaker criticism in Europe is the small size and strongly hierarchical nature of European economics departments, which makes it more difficult to obtain good criticism from one's own department.

VI CONVERGENCE OR AMERICANIZATION?

FREY and EICHENBERGER predict that, as national and local barriers come down in Europe, European academic economics will simply become more similar to American academic economics. This will be the result of a bigger market and more competition for academic jobs. They predict Americanization, not convergence. But, there are other forces at work on the profession on both continents that may lead to convergence instead.

1. Consumer Influence is Growing

First, the curious detachment of the ultimate consumers in America seems irrational and destined to end. Already, there is a trend in American higher education favoring more practical degrees and majors. Universities must compete more actively for students, who are paying an increasing part of the cost. The old days of almost 100 percent subsidies from taxpayers, who didn't seem to care about the content of academic research or instruction, appear to be ending. For years it seemed as if American higher education was supported by an indulgent, but ignorant and distant uncle. The uncle is becoming more critical, careful and tight-fisted with his gifts.

This same trend is evident, perhaps to a smaller extent, in the growth of MBA programs in Europe. These programs typically charge much higher tuition than traditional economics degree programs. Thus, attention to students' actual demands will be more important. And, as already noted, European economics

is already connected much more strongly to a different source of final demand for economics, governmental policy-making.

2. Internal Professional Norms are Changing

There is growing evidence of dissatisfaction with the *status quo* in American academic economics. The stress on abstract modelling, disconnected from actual economic reality and problems, has come under increasing criticism (KLAMER and COLANDER, 1990; MAYER, 1993; MCCLOSKEY, 1985; ALLAIS, 1989; FISHER, 1989; BAUMOL, 1990; BRONFENBRENNER, 1991; SUMMERS, 1991).

Perhaps most interesting is the work of the Commission on Graduate Education of the American Economic Association, which was appointed in 1988 by the then-President of the Association, ROBERT EISNER. The Commission was stimulated by a U.S. National Science Foundation symposium on the state of (American) economics at which many participants said that economics had become too divorced from real world questions.

The Commission on Graduate Education thoroughly reviewed American graduate education in economics. The Commission found a great deal of dissatisfaction with graduate education from all concerned. Specifically, the report noted that

‘ it is an underemphasis on the “linkages” between tools, both theory and econometric, and “real world problems” that is the weakness of graduate education in economics ’ (KRUEGER et al , 1991)

The Commission recommended more emphasis on the application of economics to real world problems in graduate teaching.

Thus, there appears to be a change brewing in the internal norms of American economics. To the extent that the norms do change, American economics can retain its high quality and competitiveness, while drawing back from a non-scientific and uninteresting formalism.

3. Convergence is more likely than Americanization

As a result of both a change in internal norms and more attention by consumers of economics, I expect the American system to move in the direction of the European system, at the same time as the European system moves in the

direction of the American one. Academic economists can and do compete internationally by doing applied work. They can even compete in institutional knowledge. To some extent they do, even in American academia.

But, the incentives are to study the institutions of a particular industry or sector, rather than a particular locality. The geographical mobility already existing in North American economics and clearly coming in Europe does undermine the incentives for academic economists to study purely local issues. In this dimension, European economics is sure to become Americanized.

In the other dimensions of study, however, I would predict convergence of academic economics, rather than Americanization. Convergence is especially likely if the European ultimate consumers continue to pay attention to the output and if the internal norms and preferences of the economics profession move in the direction of linking economic theory and statistical tools with real world economic problems, as seems likely. This convergence is likely to improve the quality of European academic economics without leading it towards a scientifically sterile overemphasis on technique and abstract analysis.

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