

# For more mathematics and theory in economics

## Introduction to the Special Issue

Andrej Srakar, PhD, Asst. Prof., Institute for Economic Research (IER) and School of Economics and Business, University of Ljubljana, Slovenia, [srakara@ier.si](mailto:srakara@ier.si),  
[andrej.srakar@ef.uni-lj.si](mailto:andrej.srakar@ef.uni-lj.si)

Economics seems to be on a crossroad and in dire need of changes. The prevailing paradigm, so-called neoclassical economics and neoclassical synthesis (and all derived and related streams of research) has been emptied of content. Simple empirical analysis of data is not enough to gain broader insight into economic phenomena. Economics studies one of the sectors/subsystems of contemporary society which is prone to all the necessary features of any social phenomena, evidenced throughout the history of social sciences. For example, one cannot study any human activity without simultaneously changing the very object it studies – this is impossible by definition. Yet, most of present day economics studies the economy as one would study a physical, say, astronomical object – assuming the object of the study will not change due to the research itself. Absurdity of this »worldview« is apparent and will not even be discussed here – it is simply a consequence of centuries of, for example, philosophical, sociological and anthropological literature and thought. If it would be otherwise, we managed to reverse the history and start it anew – but, as this is impossible, the above is impossible (and wrong) as well. The reader is suggested to visit any library in the world and study the history of human thought to »verify« the above consideration.

That being said, we must not throw away the baby with the dirty water. Contrary to common considerations, the very apparatus of mainstream economics is not the one to blame. It is the »ideology« of the researchers which sometimes seem more like believers – logical consequence of avoiding to confront representatives from other social sciences in an open scientific debate. The emptiness of present day economics seems a logical consequence of the above – when any system closes from its environment, this is first step to its dissolution. Renowned German 20th Century social theorist, Niklas Luhmann, has taught us that any system is both closed and open at the same time – a fact which tries to be avoided and neglected very often, with dire consequences.

But, as said, the blame is not on the apparatus. The fundamental economic problem is the issue of scarcity and how best to produce and distribute these scarce resources, this is the »A« (or »E«) of economics. To answer to this problem, usage of mathematical modelling is simply a necessity and the most logical and primary tool to use. But economics is, again by definition, applied mathematics and tools to be used depend on the problem to be solved and its assumptions. If they are wrongly set, likelihood of producing wrong results is extremely high. If one pretends human beings are basically machines trying to maximize their utility (as indeed mainstream economics does), well, go to, say, the sociologists and ask for their opinion. Despite economists will try to avoid this and convince you that sociologists (as just one example) are »dumb and incompetent«, you would receive interesting responses. Some of the sociologists will teach you about symbolic interactionism of Mead, Blumer, Cooley and Thomas. Most symbolic interactionists believe a physical reality does exist by an individual's social definitions, and that social definitions do develop in part or in relation to something "real". People thus do not respond to this reality directly, but rather to the social understanding of reality. But, we do not want to listen to those arguments and maintain running the

Lagrangians and Hamiltonians to solve our basic optimization problems. Namely, the above (Mead's theories) are, a commonly heard phrase: »not economics«.

But you can go and ask further. Some sociologists will tell you about structural functionalism and Emile Durkheim. According to a simple definition, this stream of social thought is a framework for building theory that sees society as a complex system whose parts work together to promote solidarity and stability. Some others will explain stories about social constructivism, a theory of knowledge in sociology and communication theory that examines the development of jointly-constructed understandings of the world that form the basis for shared assumptions about reality. This stream of thought centers on the notion that meanings are developed in coordination with others rather than separately within each individual. Yet others will tell you about actor-network theory, a theoretical and methodological approach to social theory where everything in the social and natural worlds exists in constantly shifting networks of relationships and nothing exists outside those relationships. They will also tell you about literally hundreds of diverse and rich schools of thought like (sociological) phenomenology, social systems theory (of hundreds of backgrounds), social psychology, critical theories of various provenience, largely related to derivatives of Marxism, of social complexity theories, about social Darwinism, positivism and antipositivism, social complexity theories, about Birmingham school of cultural studies, about social balance theory, action theory, control theory, elite theory, field theory, figurationism, world-systems theory, there is even a Chicago school in sociology (but the joy ends when hearing its other nickname: ecological school...).

Visit to the sociological »zoo« (pun intended) will bring you many challenging insights. Well, challenging is not the right word: they are pathbreaking and, even more, seem of large danger to present day economics. I dare to claim none or almost none of the above has found its way into economics, and, in particular, economic modelling. Why? Are all sociologists really so dumb and incompetent? Is everything of the above wrong? Unworthy of consideration? Is it unimportant for economics? It does speak about both society and humans<sup>1</sup>, which are the primary object of economic thought as well – just like for sociology...

Truth seems to be very different. Economists have so far, in slightly more than two centuries of economic thought, not performed their task. Better said, present day direction of economics needs to be changed and put back to synergy (and dialogue) with other social sciences. A dialogue long forgotten and abandoned in the present day arrogance seeing economics as higher than others just because of some problematic methodological claims to its scientific status. At the end of the day it is not your status, power, media influence, wealth that matter – »science« (research) is about findings, is about »truth« and about research honesty.

I used sociology and sociologists above as just one example. One could repeat the exercise with anthropology, with political sciences, with large part of philosophy, with large part of psychology, even with study of religions and culture, with study of communications. You would find (super) vast area which has been left completely aside, unstudied and unmodelled in economics. Yet, it does study the same primary object as economics – society and human beings. But, surprisingly, probably none of the above mentioned streams of knowledge has any mention about humans being simple utility-maximizing machines. If you would mention this to them, they will consider you as: dumb and incompetent. Better said, you would not pass even your first exam of the undergrad study.

---

<sup>1</sup> I will try to avoid discussions about society not composed of human beings (say, in Luhmann's social system theory) – topic more than worthy of debate, but surpassing this short introduction.

The above is only beginning of a hopeful new approach and change in the direction of present day economic research. Clear exposure of present day economics as done above only shows the urge to develop new directions and new perspectives. Better to say, new economic paradigm, which will be open to other approaches and streams of thought and finally begin to integrate them properly into economic thought and modelling. As just one example I shortly mention my own recent development: it has become a long standing feature of economic models to be grounded in microfoundations, i.e. to present the economic activity as a simple sum of solutions to individual utility maximization problems. This is in clear contrast and contradiction to the emergent properties of social systems: emergence occurs when an entity is observed to have properties its parts do not have on their own. It seems a simple step to model such emergent properties: present day topological data analysis, related to machine learning, seems to easily allow modelling of the above considerations. Naturally, such modelling has not been tried and done before. But it easily solves seemingly one of the largest puzzles of contemporary economic modelling. And we could easily continue: present day mathematics allows numerous perspectives, such as algebraic and differential topology and geometry, category theory, several complex variables, tropical algebra and stochastic differential equations (all of those are largely just names for very broad fields of mathematics which only allow the search to begin) which could be used to integrate the approaches of social sciences more properly into economic modelling.

It was all of the above that lead to this special issue. We started from one of the best known monographs on economic methodology from recently deceased Dutch-born British economist Mark Blaug which marked the development of economic thought and celebrates its 40th anniversary in 2020. His book is an examination of the nature of economic explanation introducing current thinking in the philosophy of science and reviewing the literature on methodology. It discusses the troublesome question of the logical status of welfare economics, giving the reader an understanding of the outstanding issues in the methodology of economics. This is followed by a series of case studies of leading economic controversies, which shows how controversies in economics may be illuminated by paying attention to questions of methodology. Its final chapter draws the strands together and gives a view of what is wrong with the economics of Blaug's time.

Our intention was to strive for something similar in the context of the period and present we live in. The special issue consists of six papers. David P. Ellerman discusses how mathematics obscures conceptual errors in the Arrow-Debreu general equilibrium model with a focus on labor theory of property as a neglected and unmodelled element of the Arrow-Debreu framework, exposing its severe methodological problems. Aleksandar Kešeljević argues that economics, with extensive use of mathematical formalism and statistical techniques, adopted the methodology of natural sciences in order to appease the misunderstanding, theoretical disagreements and rifts between the economists. Romar Correa draws on the insights of Wynne Godley (and Francis Cripps) and Martin Shubik, joining the two perspectives within the ambit of General Systems Theory. He formulates and tests for the stability of models of the capitalist system and compares and contrasts General Equilibrium and Nash Equilibrium solutions of the capitalist economy. Maik Huettinger critically discusses the main academic studies evaluating the impact of the Transatlantic Trade and Investment Partnership (TTIP) agreement, analysing to what degree the econometric models which are predominantly used, are actually able to predict what they promise. Jesús Muñoz Bandala discusses Keynes's relationship with mathematics and statistics and finds that Keynes was not opposed to the use of mathematics, but he preached instead a rational use of it. Finally, Irene Sotiropoulou discusses a quest for

appropriate quantitative methods in social and solidarity economy. Special issue concludes with a book review from Ivan Rubinić of *The Wealth of (Some) Nations* by Zak Cope.

Above articles and good response to our call for papers demonstrate our initial claim. There is a big »demand« for change in the present day economic paradigm and in particular its relationship to mathematics as its cornerstone. We live in times of huge upsets, political turmoil, migrant crisis, aftermath of the Great Recession, times of the COVID-19 pandemic and the new large recession it brings. Economics has been unable to provide many answers to the mentioned problems. Main solutions of the present day relate to revival of theories and streams of thought from history: socialism and communism, Keynesianism, but also fascism and even nacism. Surely, this is no path worth following. It is a hope that above considerations and articles of this special issue will be able to provide some light into present day dark times and provide background for the development of a new paradigm in economics and social science in general, being grounded in both improved mathematics and theory.