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Mathematics and the language of economics

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In recent years there has been growing discontent with economists' "formalism": the use of mathematics in economics has become increasingly contested inside and outside the profession. Economist Paul Krugman, for instance, expressed the view that blame for the crisis falls, among others, on economists since they "mistook beauty, clad in impressive-looking mathematics, for truth" (New York Times, 6 September 2009).

The mathematical modelling that is being criticised came to dominate economics in the middle decades of the twentieth century. This change involved a change in the dominant forms of economic argument and hence had profound implications for the language of economics, creating a barrier to communication with other social scientists and a hurdle that many students find difficult to jump over. Though its roots go back much further, it was a process that gathered pace in the 1940s and by the 1970s virtually all fields of the discipline had been affected. Though mathematical modelling took different forms, requiring different types of mathematics, economics widely came to be seen as a type of engineering.

Economists sometimes write as though it makes no difference whether economic arguments are expressed in mathematics or in words. However, this is not the case. Verbal arguments are an integral part of the theory, not just explanations of what is going on in the mathematics: the stories economists tell are not simply pedagogic devices but are central to the process of economic reasoning. This resulting combination of mathematical and verbal reasoning results in a use of language that is very different from that found in the "older" style of economic argumentation that was innocent of mathematics. A key figure was Paul Samuelson, considered by some to be the leader of the rising generation of mathematical economists, who defended the use of mathematics by arguing that it was a language, and by explicitly challenging the dominant view on the relationship of mathematics to verbal reasoning.

This paper will explore the relationship between the use of mathematics and the language of economics by considering some exemplary cases. They are taken primarily from the 1940s and 1950s, because this is the period in which the rising use of mathematics, which many of the older generation of economists could not understand, was contested. However, they concern models that are still widely used in modern economics, and hence relate to the use of language in contemporary economics.

After her studies of economics and history Verena Halsmayer is completing her Ph.D. in the history and philosophy of science at the University of Vienna (DK program "The Sciences in Historical, Philosophical and Cultural Contexts", FWF grant W1228-G18).