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Economics, Econometrics and Statistics from the perspective of the principle of Least Action of Physics

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Abstract

The thesis of this paper is mathematical formulation of the laws of Economics with application of the principle of Least Action of classical mechanics. This paper is proposed as the rigorous mathematical approach to Economics provided by the fundamental principle of the physical science – the Principle of Least Action. This approach introduces the principle of Action into main stream economics and allows reconcile main principles Austrian School of Economics and the laws of market, such Say's law and marginal value and interest rate theory, with the modern results of mathematical economics, such as Capital Asset Pricing Model (CAPM), game theory and behavioural economics. This principle is well known in classical mechanics as the law of conservation of action that governs any system as a whole and all its components. It led to the revolution in physics, as it allows to derive the laws of Newtonian and quantum mechanics and probability. Ludwig von Mises defined Economics is the science of Human Action. Action is introduced into Economics by the founder of Austrian School of Economic, Carl Menger. Production or acquisition of any goods, services and assets are results of purposeful acts in the form of expenditure of work and energy in the form of flow of money and material resources. Humans take them to achieve certain desired goals with given resources and time. Any economic good and service, financial, productive or real estate asset is the result of such action.

Keywords: action, energy, marginal value, expenditure, utility