

A NEW NATURAL SCIENCE OF ECONOMICS

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ABSTRACT

The purpose of this paper is to develop a theoretical framework for a new natural science of macroeconomics. We use the classification “natural science” to describe our new theory of macroeconomics because the theory’s hard core is based on Rod Swenson’s formulation of the law of maximum entropy production (LMEP), a universal natural law, which has recently been described in the literature as the fourth law of thermodynamics [1]. LMEP (or the fourth law) provides the key to understanding the lawful behavior of open, far from equilibrium, spontaneously organizing and self-reinforcing physical systems of exchange, what Swenson calls autocatakinetic systems.

We utilize the profound intuition supplied by the fourth law (and the corollary, Swenson’s universal ordering principle) to first classify modern human economies and financial markets as autocatakinetic systems and then to argue that human economies and financial markets are mutually nested and embedded together with the myriad other natural living and non-living autocatakinetic systems (animals, plants, ocean systems, ecosystems, etc) making up the larger earth’s biosphere, which is itself an autocatakinetic system writ large. The classification of the human economy and financial markets in such a way -- i.e. as naturally emergent and nested physical sub-systems mutually embedded with the myriad other autocatakinetic systems making up the earth’s biosphere -- provides a principled foundation for the development of a uniquely parsimonious, natural law based theory explaining the origin, evolution and historical behavior of human economies and financial markets; and in so doing, it suggests profound policy implications for world leaders facing urgent global challenges such as climate change and systemic instability in the global economy.

Keywords: law of maximum entropy production (LMEP), macroeconomics, autocatakinetic systems, far from equilibrium

References:

- [1] Swenson, Rod. "The fourth law of thermodynamics or the law of maximum entropy production (LMEP)." Chemistry 18, no. 5 (2009): 333-339.