

Peer Review

Review of: "A Philosophical Paradox of Economic Theory"

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The author presents interesting paradoxes affecting Economic Theory and its branches. In particular, Economic Theory is unable to predict future values of the variables it studies. For instance, compared to physics, physics accurately predicts things like the exact position of Jupiter and Saturn in a month's time, whereas Economic Theory will never do anything similar even after significantly relaxing the level of precision. Focusing on Financial Economics, if one were able to predict the price of the available securities on a future date, every investor would know the assets to be bought and those to be sold, and every investor could become very rich. Nevertheless, this idea leads to an obvious contradiction, because the excessive enrichment of some investors trivially implies the impoverishment of others.

Since one cannot predict in Economics, the author is wondering whether the theory we teach to our students is useful. At any rate, we could be teaching something that they will never use in their professional life. Finally, the author reaches a partially consoling conclusion which becomes more or less like this: What we teach makes our students develop their analytical skills. Consequently, in the future, they will be in a better position to deal with the real problems they will have to face.

I sincerely appreciate the interest of the author in the questions he is addressing. These questions are very important for many of us, and every analysis is more than welcome. Moreover, his arguments are very consistent, and his conclusions sound good. I deeply agree with many of his reflections. Having said this, since Hegel's Dialectics teaches us that after a Thesis an Antithesis is needed in order to elaborate a Synthesis, let me present my Antithesis to facilitate the reader's elaboration of its own Synthesis.

Not all scientific disciplines deal with the same level of certainty. For example, in medicine, a given treatment is usually accompanied by a success rate lower than 100%. A value smaller than 100% implies that some ill people will not be healed, but this does not imply that this treatment will be discarded, unless a much more effective one (with a higher success rate) is available. In any case, there will almost never be absolute certainty. This situation applies beyond medicine. Even physics may be facing random

frameworks. This is the case, for instance, when studying the evolution of anticyclones and/or squalls. More surprisingly, the notion of Probability plays a central role in Quantum Mechanics, a critical basis of recent technological developments (computers, mobiles, AI, etc.).

Economic Theory, and Financial Economics as a particular sub-field, explain the phenomena in terms of probability, and therefore total certainty is never guaranteed. The Laws of Large Numbers are an essential support. Our conclusions will become true if the experiments are repeated a sufficiently large number of times. If a coin is tossed ten times, nobody can guarantee that the result will not be ten heads, but this event should arise once every 1,048,576 repetitions. The rest of the times, the result should be different.

Financial Economics is unable to accurately predict the exact evolution of prices, but Financial Economics may be quite useful to our students. They will understand how to obtain returns and profits perfectly adapted to their level of risk and economic growth. Of course, one is focusing on the long term (Law of Large Numbers), and the probability of error is slightly higher than zero. Total certainty cannot be achieved. Similarly, if our students have to deal with derivatives in their professional life, then the Black-Scholes-Merton model (cited by the author) will allow them to know how to hedge their positions when facing turmoils, or how to obtain better returns (in the long term) under analogous risk levels. If they have to manage a pension fund (for instance), they will do a good job for their clients.

The economic evolution is very often affected by random and maybe ambiguous settings. Our solutions will be affected by probabilities even if they are robust. Nevertheless, a good and profound knowledge of Economic Theory may become quite useful for society and may generate progress and welfare that will significantly improve the lives of many people.

Declarations

Potential competing interests: No potential competing interests to declare.