

Commentary

A Philosophical Paradox of Economic Theory

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This article discusses the obvious paradox of economic theory. What is the point of a theory that cannot work and should not work in practice? If economic theory did work, a multitude of economic models could be used to predict any variable with economic and financial consequences for humans or organizations. Knowledge of future realized values of such economic and financial variables, ranging from stock market values to the number of nurses needed in Norway in 2030, gives the power to make a profit. Given information on Apple's stock market values in a multitude of future time periods, the information holder has the ability to buy stock when it is cheap and sell when it is expensive. Such a strategy builds risk-free profits, in principle infinitely high. We all know what happens in markets where one or a set of agents obtains infinite profits: the rest of the market will lose infinite profits, and the market breaks down. Perhaps we can say it like this: *If economic theory had worked, no economy would exist.*

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1. Introduction

Economic theory is in most ways shaped like natural science. It applies fairly sophisticated mathematical models with the aim of understanding the mechanisms of human economic behavior and (typically) using these models for prediction purposes. A relevant example is the so-called Black and Scholes (and Merton) formula ^{[1][2]} in finance. This model, based on stochastic differential calculus, predicts the value or price of European options. If such a model had worked perfectly, and the model owner constituted a limited part of the market, such inside information would give him the opportunity to time his sales and buying decisions to gain risk-free profits. Within a large enough time horizon, this could, in principle, lead to infinite profits. Surely, the rest, or the uninformed part, of the market would have to lose similar

amounts. Such a market must break down. On the other hand, if the whole market had access to a perfect option pricing model, everybody would buy at the same time and sell at the same time. In such a situation, the price will rise almost infinitely when everybody buys and move instantaneously to zero when everybody sells. This is again a situation resulting in complete market failure.

This situation is not restricted to financial economics. In classical microeconomics, the main output is the demand and supply curves for goods from consumer and producer theory; see [3]. Perfect predictions on what goods consumers will buy or producers will produce give an obvious advantage for suppliers of raw materials and consumer goods, an advantage that again should produce infinite risk-free profit options. The same, of course, also applies to macroeconomics [4]. Knowledge of future interest, inflation, unemployment, or labor market demand gives profit options beyond risk-free return.

Similar arguments can be applied to less important economic subjects. For instance, sports economics [5], where the main target is to predict the outcomes of sports competitions. A working model with such outputs will, of course, bring perfect opportunities in the betting market.

Hence, in general, economic theory aims to build models where the obvious model output is to predict future outcomes of various relevant economic variables. If such models work (i.e., produce perfect predictions), all markets they describe should break down. This leads us to the paradox.

2. The paradox

If economic models work perfectly, no markets and hence no economic activity will exist.

This is somewhat special, isn't it? A science with the ultimate objective of destroying itself is obviously special¹. Anyway, all this talk about applying economics in practice is, of course, problematic in this perspective. Applying economic models to predict the future is definitely not a good idea. The fact that all economic crises come as surprises to all experts underlines my point.

3. Conclusions

In science, Kepler [6] showed us how to predict planetary movements. We can predict with perfection where Jupiter and Saturn will be located 100 years from now. Newton and Galileo [7] told us how to predict the motion of objects given initial speed and gravitational acceleration. Einstein [8] told us that even small masses contain enormous energy ($E = mc^2$). These are laws we can rely on. Economists, however,

are not to be trusted. The explanation is, of course, evident and has been well known for hundreds of years. The difference between planets, balls moving around, and Plutonium versus human agents is the lack of intelligence. Nature, apart from creatures, contains no intelligence. This lack of intelligence makes it possible to believe in science, while economic theory, clearly handling agents of intelligence, is not to be trusted—practically.

A funny personal example may clarify my points. I have taught financial theory many times. It is always funny (or perhaps depressing) to engage in student debate on why they chose such a topic. Most of them signal that they want to learn financial economics to get rich. The disappointment after such a course, filled with assumptions of no arbitrage ^[9], leaves them with the impression that money cannot be made. Still, looking around, we see a lot of people making money. Again, economic theory does not work and should not work.

So, how can a serious person (like me and others) continue spending time and effort investigating economic behavior? After all, this paradox makes it hard to justify. Luckily, the great Israeli economist Ariel Rubinstein has some thoughts on the subject—although from a slightly different perspective. In his excellent book, "Economic Fables" ^[10], Rubinstein argues that the aim of economic theory is NOT to explain reality. Reality is far too complex for such an objective. On the other hand, economic theory is nice, logical, and well structured, which, as he sees it, should be enough to justify its existence. Economic theory can be considered as fables: nice stories that are not necessarily true. In my opinion, this is an explanation I can buy. Economic theory puts both students and researchers on tough tests, which provide a good environment to rank students and researchers. After all, the main point of education may not be to teach students (or researchers) practically usable knowledge. Maybe Spence's ^[11] arguments really hold? Maybe the objective of academia is not to derive models to be used in practice? Perhaps the main point of economic theory (and, as a consequence, social science in total) is to teach students difficult stuff to make them able to learn what is needed in the labor market. As such, economic theory serves its purpose for me.

Statements and Declarations

Conflicts of Interest

The author declares that he has no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

This article contains no data.

Ethics

Ethics approval was not required for this study, as it contains no experimental or observational data from humans or animals.

Footnotes

¹ Still, it is not that unusual; all medical science, for instance, has a similar target.

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Declarations

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