Private information in economics: how quantum mechanics can help

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Abstract

In this talk we try to show how private information, which is a source for trade in financial assets, can be modelled via the use of a so called information wave function. Private information is a particular form of information by which asset traders can realize so called arbitrage profits. Such profits are in effect risk free profits: i.e. profits which are realized without having to incur any risk. In this talk we want to propose a model in which the concept of 'information wave function' is central. This function will play an essential role in the stochastic differential equation we use to model arbitrage. The model we consider in this talk is sourced for a large part from concepts used in a particular interpretation of quantum mechanics also known under the name of Bohmian mechanics. This interpretation was developed by David Bohm and Basil Hiley. Core work in using the Bohmian mechanics interpretation in a macro-scopic environment, has been provided for by Olga Choustova (2001) and Andrei Khrennikov (1999 and 2004). Some of this work has begun to be used in financial applications. See Haven (2006). The talk is organized as follows. We first look at the link between private information and the 'information wave function'. Then we pursue with our arguments why the 'information wave function' is really needed to model in a more 'natural' way arbitrage in option pricing models. Finally, we discuss how we could possibly parametrize incompleteness and arbitrage.

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