**FIS2005** **http://www.mdpi.org/fis2005/**

# Information field model for agents of financial market

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**Abstract:** We use methods of classical and quantum mechanics for mathematical modeling of price dynamics at the financial market. The Hamiltonian formalism on the price/price-change phase space is used to describe the classical-like evolution of prices. This classical dynamics of prices is determined by "hard" conditions (natural resources, industrial production, services and so on). These conditions as well as "hard" relations between traders at the financial market are mathematically described by the classical financial potential. At the real financial market "hard" conditions are not the only source of price changes. The information exchange and market psychology play important (and sometimes determining) role in price dynamics. We propose to describe this "soft" financial factors by using the pilot wave (Bohmian) model of quantum mechanics. The theory of financial mental (or psychological) waves is used to take into account market psychology. The real trajectories of prices are determined (by the financial analogue of the second Newton law) by two financial potentials: classical-like ("hard" market conditions) and quantum-like ("soft" market conditions). We remark that the pilot wave (Bohmian) interpretation of quantum mechanics is not the conventional one. There are a few critical arguments against Bohmian quantum formalism, e.g. : a). Bohmian theory gives the possibility to provide the mathematical description of the trajectory $q(t)$ of an elementary particle. However, such a trajectory does not exist according to the conventional quantum formalism. b). Bohmian theory is not local, namely via the pilot wave field one particle "feels" another on large distances (without any exchange of physical energy). However, these disadvantages of theory become advantages in our applications of Bohmian theory to financial market.

**Keywords:** quantum mechanics, financial market, information field of expectations, Bohmian mechanics, information pilot wave