

Models of financial markets with asymmetric information: additional utility and entropy of information

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We consider models of financial markets with agents on different information levels: *non-informed traders* whose information follows the natural evolution of the underlying price processes, and *insiders* who possess some extra information which is completely revealed to the non-informed traders only at the end of the trading interval. Relevant additional information may be given by some knowledge about the price at a later time, about the maximal price, or the last passage of a certain level by the price process. We show that the expected additional logarithmic utility of an insider is given by the entropy of the additional information in a quite general framework, and study similar notions for different utility functions. We discuss the existence of equivalent martingale measures, and explain how the semimartingale property of price dynamics is linked to properties of the *information drift*. We investigate the problem, how additional information may be blurred to rule out arbitrage. Our techniques are embedded in general semimartingale theory, include *grossissement de filtrations* methods, and necessary extensions involving notions of *Malliavin's calculus*.

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