ABSTRACT

Information-Based Asset Pricing

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A new framework for asset price dynamics is introduced in which the concept of noisy information about future cash flows is used to derive the corresponding price processes. In this framework an asset is defined by its cash-flow structure. Each cash flow is modelled by a random variable that can be expressed as a function of a collection of independent market factors. With each such market factor we associate a market information process, the values of which we assume are accessible to market participants. Each market information process consists of a sum of two terms; one contains true information about the value of the associated market factor, and the other represents noise. The price of an asset is given by the expectation of the discounted cash flows in the risk neutral measure, conditional on the information provided by the market filtration. In the case where the cash flows are the random coupon/dividend payments, explicit models are obtained for the bond/share-price processes. Dividend growth is taken into account by introducing appropriate structure on the market factors. The prices of options on coupon/dividend-paying assets are derived. The information-based framework has two other significant consequences: (i) it provides a stable hedging strategy for an option on credit-risky bond; and (ii) it generates a natural explanation for the origin of unhedgeable stochastic volatility in financial markets. (The talk is based on work carried out in collaboration with L.P. Hughston and A. Macrina.)