

Lévy-Ito Models in Finance

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We propose a class of financial models in which the prices of assets are Lévy-Ito processes driven by Brownian motion and a dynamic Poisson random measure. Each such model consists of a pricing kernel, a money market account, and one or more risky assets. The Poisson random measure is associated with an n -dimensional Lévy process. We show that the excess rate of return of a risky asset in a pure-jump model is given by an integral of the product of a term representing the riskiness of the asset and a term representing the level of market risk aversion. The integral is over the state space of the Poisson random measure and is taken with respect to the Lévy measure associated with the n -dimensional Lévy process. The resulting framework is applied to the theory of interest rates and foreign exchange, allowing one to construct new models as well as various generalizations of familiar models. Co-authors: G. Bouziaris (Goldsmiths), S. Jaimungal (Toronto), L. Sánchez-Betancourt (Oxford). ArXiv:1907.08499.