Modeling investment returns with a multivariate Ornstein-Uhlenbeck process

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A multivariate Ornstein-Uhlenbeck process is used to model the returns on different investment instruments. Model parameters are estimated under the principle of covariance equivalence. Fitted models can be used to price insurance products and analyze the risk associated with different asset allocation strategies. To illustrate the results obtained, an annuity is studied when assets are allocated between equity and two types of bonds. To show the importance of using a multivariate model, annuity prices are compared to those obtained from independent univariate processes.