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By introducing the concept of data partitioning, nonlinear stochastic models are investigated. These models are validated with monthly stock price dataset. In addition, the results of these models are compared with GBM models. Furthermore, the developed results are further improved by developing nonlinear stochastic models with mixing jumps. These developments are re-examined and re-tested for two sets of stock price datasets with different sizes. (Received September 15, 2008)