

## CAPM with Independent Regimes for the Alpha and Beta and an Application in Portfolio Optimization

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### **Abstract:**

We develop the regime-dependent CAPM, in which the alpha and beta follow independent regime-switching processes, and use it in the mean-variance optimization framework. We find that the predicted returns from the model have a larger rank correlation with the realized future returns than those from the classical CAPM and the common-regime CAPM, which assumes common-regime shifts between the alpha and beta. The mean-variance portfolio derived from our model yields a superior out-of-sample risk-adjusted return compared to the portfolios derived from the equal-weight strategy, market index replication, the classical CAPM and the common-regime CAPM.

### **Keywords:**

Alpha, Beta, CAPM, Regime-switching Model.