This article investigates the use of a regime-switching model of returns for the asset allocation decision of a fund of hedge funds. In each time period, returns follow a multi-variate normal distribution from one of two possible regimes, corresponding to periods of normal and distressed markets. The prevailing regime in any given period is determined by the value of a two-state Markov chain. The case where serial correlation is absent, and returns in different time periods are i.i.d. Gaussian mixture variables is also considered. The models are tested on empirical data and compared to a benchmark assuming i.i.d. normally distributed returns. The results show that in the mean-variance framework the use of regime switching can improve risk and performance measures. The importance of the sensitivity of optimal portfolio weights to the estimate of the probability of the distressed regime is discussed, and methods for calculating it are presented and illustrated on market data.