The aim of the underlying research is to check the validity of different risk estimation models in evaluating the ex-ante performance of investment portfolios. This topic has a crucial importance in determining the minimum capital requirements for trading book portfolios exposed to market risk as well as in regulatory monitoring the performance of internal risk models of banks. The recently published new standards of Basel III provide a revised framework for gauging market risk with a shift from Value-at-Risk (VaR) to Expected Shortfall (ES), a new risk measure for better capturing tail risk. In the study different multi-asset portfolios will be traced out by selecting various company shares from among the FTSE 100 constituents. Our intention is to model and simulate empirically plausible cases. Therefore, the estimation of the marginals and that of the dependency structure of the return distributions is based on a real-data set. It comprises the daily closing prices of the FTSE 100 constituents for the time period stretching from January, 2000 until December, 2015. As a profitability measure, the expected return is used, and the risk is gauged by Expected Shortfall. The dependence structure is modeled relying on various Vine-copula models. Based on the results of back-testing it is intended to identify certain elements that help us create better risk estimation models.