Volatility vs. downside risk: performance protection in dynamic portfolio strategies

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Since the introduction of the implied volatility index VIX on the S&P500 at the CBOE in the US in 1993, we have assisted to increasing interest in risk control strategies and volatility targeting approaches by global Fund managers. At CBOE futures and option contracts on VIX were also listed in 2004, providing a remarkable information instrument to investors. As a result fund managers may employ effective derivatives-based volatility control strategies and specifically in the US portfolio strategies based on combinations of market indices and derivatives have been proposed: one such example is the S&P500 protective put index. Early in 2016, relevant to this contribution, CBOE launched an Index called TYVIX/VIX featuring an investment rotation strategy based jointly on signals coming from the VIX and the 10-year Treasury Yield implied volatility (TYVIX). These are rule-based portfolio strategies in which no optimization is involved. While rather effective in reducing the downside risk, these portfolio approaches do not allow an optimal risk-reward portfolio policy and may not be sufficient to control financial risk originated by extreme market drops. Market evidence furthermore shows that both volatility regime switches and heavy, negatively skewed, markets' instabilities impact volatility-based market indices. To overcome these limits we consider an optimization-based approach to portfolio management jointly focusing on volatility and tail risk controls and able to accommodate effectively the return payoffs associated with option strategies, whose cost as market volatility increases may become excessive. The model is multiperiod and based on a mean absolute deviation formulation. Results from different historical datasets confirm that optimal volatility controls produce better risk-adjusted returns if compared with rule-based approaches. Moreover the portfolio return distribution is dynamically shaped depending on the adopted risk management approach.