Market Index Creation by Value-at-Risk Minimization.

A Methodological and Empirical Proposal.

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Abstract:

Is it possible to create new Market Indices that are less risky than current ones? We propose a methodological approach to deal with this question using Value-at-Risk Minimization on the parametric VaR method. With this approach we can obtain the optimal weights each share must have in the Index to minimize Risk measured by VaR. We apply our method to three different stock markets and estimate Covariance matrices by different length moving averages. We would like to point out two innovations in our paper. First, an error dimension has been included in the backtesting and, second, the Sharpe's Ratio has been used to select the 'best' model from all models presented. Although the estimation methods used are very simple, our results seem very interesting. All our indices are less risky than the Spanish IBEX 35® and the Argentinian Merval (current Market Index) and, surprisingly, more profitable; this does not happen in the American DowJones℠ .This highlights two points. First, our indices could manage market risk without the problems of current risk measures [Basak and Shapiro (2001)]. Second, similar investment strategies could beat the market in some cases, thus questioning the Efficient Market Hypothesis. The possible applications of our Minimum Risk Indices are clear: they could reduce the risk assumed by institutional and mutual funds that nowadays follow Market Indices (these institutions could follow indices such as ours if it is confirmed that they are more profitable and less risky than some market indices). They could also be used as a benchmark for risky assets or as a basis for developing derivatives.

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