

Contrasted Mean and Median Models in Egyptian Stock Markets

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Abstract : Emerging Markets return distributions have shown significance departure from normality were they are characterized by fatter tails relative to the normal distribution and exhibit levels of skewness and kurtosis that constitute a significant departure from normality. Therefore, the classical Markowitz Mean-Variance is not applicable for emerging markets since it assumes normally-distributed returns (with zero skewness and kurtosis) and a quadratic utility function. Moreover, the Markowitz mean-variance analysis can be used in cases of moderate non-normality and it still provides a good approximation of the expected utility, but it may be ineffective under large departure from normality. Higher moments models and median models have been suggested in the literature for asset allocation in this case. Higher moments models have been introduced to account for the insufficiency of the description of a portfolio by only its first two moments while the median model has been introduced as a robust statistic which is less affected by outliers than the mean. Tail risk measures such as Value-at Risk (VaR) and Conditional Value-at-Risk (CVaR) have been introduced instead of Variance to capture the effect of risk. In this research, higher moment models including the Mean-Variance-Skewness (MVS) and Mean-Variance-Skewness-Kurtosis (MVSK) are formulated as single-objective non-linear programming problems (NLP) and median models including the Median-Value at Risk (MedVaR) and Median-Mean Absolute Deviation (MedMAD) are formulated as a single-objective mixed-integer linear programming (MILP) problems. The higher moment models and median models are compared to some benchmark portfolios and tested on real financial data in the Egyptian main Index EGX30. The results show that all the median models outperform the higher moment models were they provide higher final wealth for the investor over the entire period of study. In addition, the results have confirmed the inapplicability of the classical Markowitz Mean-Variance to the Egyptian stock market as it resulted in very low realized profits.

Keywords : Egyptian stock exchange, emerging markets, higher moment models, median models, mixed-integer linear programming, non-linear programming

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