

## Estimating Parameters of Multivariate Scaled t Distribution of GSPC and its Associated Financial Indices

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### ABSTRACT

*Many researchers were interested in predicting stock markets nowadays. When building prediction models, use of most appropriate multivariate distribution depicts prodigious impotence in terms of prediction accuracy. Therefore, scholars focus on identifying most appropriate multivariate distributions related to stock market. The main objective of this study is to estimate parameters of the multivariate distribution of the financial indices associated with GSPC. If the multivariate distribution of these financial indices and GSPC are properly estimated they can be used as predictor variables of a forecasting model for GSPC. With the evidence form literature, a local optimization method and a global optimization method were used for parameter estimation. Global optimization method outperformed the local optimization method. The location parameter is almost zero and it exhibits that the multivariate distribution is central. With respect to the estimated shape parameter it can be said that the multivariate Scaled t distribution of GSPC contains heavy tails and also less peaked.*

**Key Words:** Multivariate Scaled t distribution, United States stock market index, global optimization

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**Journal of Economic Literature Classification:** C61, G1, G00

### 1. INTRODUCTION

Stock market predictions exhibit great interest among researchers due to profitability at present. The multivariate distribution associated with markets plays a major role when building forecasting models. Therefore, identifying the most appropriate multivariate distributions related to financial indices become important topic among researchers. Many studies aimed at finding the multivariate distributions of financial applications can be found in the literature.

Copula concept which is an analytical method have been used by many researchers to identify multivariate distributions of financial applications when the considered application demonstrates high correlations with other markets of interest (Ucer and Turgutlu, 2009; Hoffman et. al., 2011; Jacek et. al., 2011; Wang and Cai, 2011; Bekrizadeh et. al., 2012; Mahfoud and MassMann, 2012). There are