



YMC 2006



Young Mathematicians Conference 2006

August 4th-6th at The Ohio State University.

ON THE CONCEPT OF THIRD ORDER STOCHASTIC DOMINANCE

Javier I Gomez

RUSIS 06' [Mentor: Javier Rojo]

Abstract of Poster Prestation: Rice University Summer Institute of Statistics 2006

National Science Foundation

National Security Agency

Stochastic ordering, a concept proposed in 1955 by Lehmann, plays relevant roles in the theory and application of statistics. Being a major contributor to the fields of finance and economics, stochastic dominance of various orders among probability distributions is seen to be equivalent to concepts arising in utility theory. Thus, for example, second order stochastic dominance is equivalent to a corresponding ordering of portfolios of investments when the investor's utility function is concave and increasing. By taking into consideration wealth preference and risk aversion, probabilistic and statistical concepts and ideas are used to develop general rules to help an investor make the best decision between investment alternatives and according to his/her utility function. Portfolio comparison deals with the problem of optimizing the return of an investment for a given level of risk. In this paper, our idea is to extend the works previously done concerning first and second order stochastic dominance and extend it to third order stochastic dominance. Following the ideas of Rojo and El Barmi (2003) in connection with second order stochastic dominance, we propose new alternative estimators by modifying the empirical distribution function so that it satisfies the third order stochastic dominance requirement. In addition, we examine procedures for hypothesis testing for third order stochastic dominance by computer simulation. Finally, a simulation study examines bias and Mean-Squared Error of the proposed alternative estimators for a variety of models. The effect of sample size on the performance of the estimator is also investigated. [GJ14230039]

[Joint work with Alan M. Falleur]

Contact: jigomez@utep.edu

Received: July 22, 2006