

Analysis of stochastic orders derived from economy / estudio de ordenaciones estocásticas derivadas de la economía

Autores: Sergio Martínez Fernández

Directores de la Tesis: María Concepción López Díaz ([dir. tes.](#)), Miguel López Díaz ([codir. tes.](#)), Manuel Francisco Montenegro Hermida ([tut. tes.](#))

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Tribunal Calificador de la Tesis: Félix Belzunce Torregrosa ([presid.](#)), Pedro Nicolás Terán Agraz ([secret.](#)), Miguel Angel Sordo Díaz ([voc.](#))

Programa de doctorado: Programa de Doctorado en Matemáticas y Estadística por la Universidad de La Laguna; la Universidad de Oviedo; la Universidad de Zaragoza; la Universidad del País Vasco/Euskal Herriko Unibertsitatea y la Universidad Pública de Navarra

Materias:

- Matemáticas
 - Probabilidad
 - Aplicación de la probabilidad
- Ciencias económicas
 - Econometría
 - Estadística económica

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Resumen

Decision making in an uncertainty environment is one of the main objectives of Probability and Statistics. Traditionally, this problem has been approached with the comparison of the distributions of random variables or vectors by means of associated parameters. Thus, decisions are taken with a unique value that summarizes the information of the compared distributions. Stochastic orders appear as a tool to compare distributions of probability, using all the available information. A stochastic order tries to order probabilities in accordance with a criterion which is usually more demanding than the comparison with a unique parameter. Then, conclusions are usually stronger and more reliable.

The aim of this Dissertation is the design and the analysis of new stochastic orders to be applied in economic decision criteria. Four research lines are studied, those which analyze financial derivatives, investments valuation, binary classification systems and the consumer choice problem.

In order to compare investments in financial derivatives, the new integral stochastic orders condor, butterfly and call ratio backspread are defined by means of the classes of functions which represent the benefits of the derivatives with the same name. The orders are analyzed in detail. Financial applications of the proposed models are also developed, comparing investments in derivatives whose underlying assets are stock exchange indexes and share prices. In the case of the call ratio backspread stochastic orders, a statistical test is proposed.

To compare investments affected by the time value of money, as those involving cash flows at different moments in time, we introduce an integral stochastic order whose generator is given by the mappings which satisfy the time value of money property. The order is analyzed in depth, concluding that it is stronger than other multivariate stochastic orders that compare cash flows.

Relevant integral stochastic orders share a common mathematical model. These orders are defined by generators which are made up of increasing functions on appropriate directions. In order to provide a unified study of those orders, we introduce a new class of integral stochastic orders. Geometrical and algebraic characterizations of directional stochastic orders are developed by means of convex cones and matrices, respectively.

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detail. Special emphasis is placed on the antisymmetric property of the new ordering. The proposed stochastic order weakens the concave order.

This Dissertation shows how economic concepts are important sources to develop new stochastic orders.



Ayuda