OBAIS Seminar Series

A Generalized Minimax Portfolio Optimization Model

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Abstract: We introduce the Conditional Minimax Model (CMM), a combinatorial optimization problem in portfolio management. The CMM includes as special cases both the minimax LP model formulated by Martin Young in 1998 and the well-known expected value rule of decision analysis. Any feasible solution to CMM includes a partition of a discrete sample space into K subsets we call planning horizons, where K is a specified positive integer. For K=2, the planning horizons can be considered as indicating “ordinary conditions” and “extraordinary conditions”, respectively. The objective is to maximize the weighted sum of worst-case returns, where each weight is the sum of probabilities in a planning horizon, over all possible partitions. We formulate CMM as a nonconvex mixed integer model and solve several instances based on actual data, using the global optimization software package BARON. We discuss the prospects for developing optimal algorithmic approaches as well as heuristics.

Biography: George G. Polak is a Professor in the Department of Information System and Supply Chain Management in the Raj Soin College of Business at Wright State University in Dayton, Ohio. He has a B.S. in Mathematics from the University of Chicago, and a M.S. and Ph.D. in Mathematics from Carnegie Mellon University. His doctoral dissertation concerned optimization of telecommunications networks under stochastic demand for services. Since then, his research interests have included combinatorial optimization, supply chain network design, portfolio optimization, constraint programming, and global optimization. Dr. Polak's research has appeared in journals such as Production & Operations Management, Annals of Operations Research, IIE Transactions, Production Planning and Control, Naval Research Logistics, and the European Journal of Operational Research.

George completed post-doctoral studies in the Department of Quantitative Analysis and Operations Management at the University of Cincinnati in 1998-99, and has worked extensively with faculty members in the department for many years. His article co-authored with Michael Magazine, entitled "Job Release Policy and Printed Circuit Board Assembly," received the Best Paper Award in Design and Manufacturing from the Institute of Industrial Engineers in 2003. At Wright State University, he was awarded the Belinda A. Burns Faculty Scholarship Award in 1999, named Outstanding Faculty Member of the Year Award by the MBA Association in 1995, and named Outstanding Faculty Member, MS in Logistics and Supply Chain Management program, for the 2012 Winter Cohort. Dr. Polak served as Sponsored Sessions Chair for the Spring 1999 National INFORMS Meeting in Cincinnati, and as President of OMEGA RHO, the Operations Research Honor Society, in 2005.

Seminar note: This research is joint work with Dr. David F. Rogers and Chiaojiang Wu, Carl H. Lindner College of Business, University of Cincinnati

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