EPSTEIN INSTITUTE SEMINAR ISE 651

AN ASYMPTOTIC PERSPECTIVE ON RISK POOLING: LIMITATIONS AND RELATIONSHIP TO TRANSSHIPMENTS

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ABSTRACT

In this talk we provide a novel perspective on risk pooling approaches by characterizing and comparing their asymptotic performance, highlighting the conditions under which one approach dominates the other. More specifically, we determine the inventory policy and the expected total costs of systems under physical and information pooling as the number of locations grows. We show that physical pooling dominates information pooling in settings with no additional per-item and per-location costs for operating the centralized system. In thepresence of such costs, however, information pooling becomes a viable alternative to physical pooling. Through asymptotic analysis, we also address the grouping problem, the division of a given set of non-identical locations into an ordered collection of mutually exclusive and collectively exhaustive subsets of predetermined sizes and demonstrate that homogeneous groups, comprising locations with similar demand volatility, achieve a lower expected total cost. Finally, the convergence of the expected total costs and the base stock levels under the two pooling approaches is demonstrated through a simple numerical illustration. Our analysis supports the assertion that it is important to consider not only the individual characteristics of each location in isolation, but also the interactions among them, when designing pooling systems.

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SPEAKER BIO

Yale T. Herer, B.S. (1986), M.S. (1990), Ph.D. (1990), - Cornell University. Yale joined the Faculty of Industrial Engineering and Management at the Technion - Israel Institute of Technology in 1990 immediately after the completion of his graduate studies. In 1996 Yale joined the Department of Industrial Engineering at Tel-Aviv University. He has worked for several industrial concerns, both as a consultant and as an advisor to project groups. In 1996 Yale received the IIE Transactions best paper award. Yale is a member of the Institute for Operations Research and Management Sciences (INFORMS), Institute of Industrial Engineers (IIE), and the Operations Research Society of Israel (ORSIS). His research interests include inventory control, especially when integrated with routing and/or distribution. He is also interested in production control and production system design.

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