

SEMINAR SERIES
Department of Quantitative Analysis and Operations Management
College of Business Administration
University of Cincinnati

“Lot-Sizing Two-Echelon Assembly Systems with Random Yields and Rigid Demand”

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111 Lindner Hall

We consider a two-echelon assembly system producing a single final product for which the demand is known. The first echelon consists of several parallel stages while the second echelon consists of a single assembly stage. We assume that the yield at each stage is random and that demand needs to be satisfied in its entirety; thus, several production runs may be required. A production policy should specify, for each possible configuration of intermediate inventories, on which stage to produce next and the lot-size to be processed. The objective is to minimize the expected total of setup and variable production costs.

We prove that the expected cost of any given production policy can be calculated by solving a finite set of linear equations whose solution is unique. The result is general in that it applies to any yield distribution. We also develop efficient algorithms leading to heuristic solutions with high precision and provide numerical results for binomial yields.

Professor Abraham Grosfeld-Nir earned his Ph.D. at Northwestern University and is currently teaching at the Academic College of Tel-Aviv-Yaffo. His research includes analytical and empirical models, with real-life applications, when random phenomena are involved. For example, optimal control of manufacturing systems with imperfect yield, uncertain processing time, and partial information about the true state.