

# INDUSTRIAL & SYSTEMS ENGINEERING SEMINAR

**Wednesday, September 12**

3:15 PM – Refreshments before the seminar

3:30 PM – Graduate Seminar

**Mechanical Engineering Room 4125 A & B**



## **The Role of Cost Modeling in Competitive Bid Procurement**

**Professor Damian Beil**  
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Industrial buyers often create cost models to estimate the minimum price a supplier would accept for a contract. Cost modeling is expensive to deploy, involving skilled employees' time and travel. It should only be used when the firm is confident that it will get its money's worth out of the exercise. In this paper we explore the value of cost modeling in competitive bid procurement, to understand if, how and when cost modeling should be deployed. The answer is not obvious, since the bidding competition itself acts as a tool to discover suppliers' cost information --- suppliers may have to bid close to their minimum acceptable price in order to win the competitive bid. The value of cost modeling depends on the amount of parity (or disparity) that exists between the minimum prices suppliers are willing to accept for the contract, information which the buyer does not have a priori. We show that although bid competition sometimes duplicates the information gleaned by cost modeling, the latter can still be beneficial when it helps the buyer set an effective reserve price. We then analyze how the buyer can gain the most benefit through cost modeling. Specifically, we characterize which supplier(s) to learn about, which portion(s) of the costs to learn, and how deeply the buyer should learn. Interestingly, learning about the supplier whose cost is the most uncertain is not necessarily optimal, nor is learning about the cost portion that contributes most to the total cost. We also show that conventional intuition that the benefit of additional information has a diminishing rate of return does not always apply.

BIO: Damian Beil is an Associate Professor at the Stephen M. Ross School of Business at the University of Michigan. In his research, Damian develops mathematical models to analyze complex problems in procurement. His work includes studies of how procurement auctions should be designed to account for costly supplier qualification screening, heterogeneous supplier quality levels, the need for expressive bidding, availability risks, and cost risks. At Ross, Damian received the 2009 Arnold M. & Linda T. Jacob Faculty Development Award and the 2007 BBA Teaching Excellence Award. He serves as an Associate or Senior Editor for Operations Research, Production and Operations Management, and Naval Research Logistics. Damian received his PhD in Operations Research Center from MIT.

**FOR MORE INFORMATION ON PROFESSOR BEIL'S RESEARCH,  
PLEASE VISIT: <http://www-personal.umich.edu/~dbeil/>**