

Supply Chain and Operations Management Seminar



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Operational Risk Management: Empirical Investigation and Optimal Control

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Abstract

Operational risk is now among the three most significant types of risks in the financial services industry, and its management is mandated by Basel II regulation. This paper studies how bank operational risk event frequency (or error rate) and severity (potential losses) are affected by workload to inform better labor decisions. To achieve this goal, we use a unique operational risk event data set from a commercial bank in China that contains 1,441 operational risk events in two years. We find that workload has a U-shaped impact on operational risk frequency. More specifically, the error rate of operational risk events would decrease first as workload increases and then increase. In addition, we show that workload has an inverted-U shaped impact on bank profit. Based on the causal relationships between workload and operational risk events and profit, respectively, we discuss bank capital allocation impact of changing the staffing level among branches so as to reduce operational risk losses and improve profit. We compare our optimal staffing policy with bank's original policy, and estimate that the new staffing policy would reduce the current number of employees by 7.56%, which would further decrease the number of risk events by 4.51%, cut the total losses by 4.58%, and increase profits by 1.24%.

Bio

Yuqian Xu is an assistant professor of Operations Management at the Gies College of Business, University of Illinois at Urbana-Champaign, and the R.C. Evans Analytics Fellow in the University of Illinois - Deloitte Foundation Center for Business Analytics. Her main research area is *Operations-Finance Interface* in which she investigates both theoretical and empirical problems. Her second stream of research is on *Digital Platforms*, where she studies companies like JD, Alibaba, ZocDoc etc. Her focus of methodology includes applied probability, applied stochastic models, structural modeling, econometrics, and machine learning. In her research work, she has been collaborating with different companies, including IBM, Alibaba, JD.com, Bank of China, ICBC, UnionPay, etc. She has given talks in many different academic, industry, and government conferences and organizations, such as Federal Reserve Bank and China Banking Regulatory Committee. She serves as the Editorial Member of *Probability in the Engineering and Informational Sciences*, and Associate Editor of *Service Science*. She has a B.S. in Mathematics (2011) from the Kuang Yaming Honors School of Intensive Instruction in Science and Arts at Nanjing University, China. She receives her Ph.D. degree (*Beta Gamma Sigma*) in 2017 from NYU Stern School of Business with the Herman E. Krooss Dissertation Award.