UNIVERSITY OF PASSAU
Faculty of Business Administration and Economics

A cordial invitation to the third talk of the
Brown Bag Seminar
Recent Developments in Data Science:

Production planning with stochastic and non-stationary yield in the semiconductor industry

By
Prof. Dr. Justus Arne Schwarz

Date:	13.06.2022 (Monday) 12:00 – 13:30
Location:	HS 6 WIWI
Link and further information:	Course 39740 Seminar: Doctoral Seminar "Recent Developments in Data Science" in Stud.IP

Abstract:

Our research is motivated by the planning problem of a global manufacturer of semiconductors. During the introduction of a new product or machine, the yield of a production process tends to start low and increases with the production quantity. This is known as the ramp-up phase. Due to long production lead times the company has to choose the production quantity during the ramp-up phase ex-ante. We formalize the company's problem as a Newsvendor problem with stochastic and non-stationary yield. We derive analytical and numerical insights on the optimal ramp-up quantity and the expected profit. We prove that the expected profit is a discrete concave function of the production quantity for stationary yield and characterize the optimal production by a critical-fractile. A numerical study shows that the optimal production quantity using the proposed model is close to the ex-post optimal production quantity for real data sets.

Speaker:

Prof. Dr. Justus Arne Schwarz

Prof. Dr. Justus Arne Schwarz is a full professor for production management at the University of Regensburg. He graduated with a diploma in industrial engineering from the Karlsruhe Institute of Technology and an M.S. in engineering and technology management from Portland State University. He received a Ph.D. from the University of Mannheim in 2016 for his thesis on the analysis of buffer allocations in time-dependent and stochastic flow lines. He then served as assistant professor in the area of operations management at the Business School of the University of Mannheim. Moreover, he led a subproject of the Productive 4.0 project that was funded by the EU and the Federal Ministry of Education and Research. He completed several research stays as visiting scholar at the Koc University and the Massachusetts Institute of Technology.