



Research School for Operations
Management and Logistics

Machine learning in production and inventory control

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The research is focused on applying machine learning in production planning and inventory control. Choices in production planning have an impact on the requirements in inventory control, and vice versa. Therefore, joint optimization of these policies is very relevant in supply chain management. There are three main research areas considered in this PhD project, all in a supply chain environment with multiple end-items: (i) lot sizing, (ii) lot scheduling and (iii) hybrid production systems that include both make-to-order and make-to-stock production. The main decisions of such policies are how much to stock, how much to produce and when to produce. Furthermore, there could be set-up times or costs that depend on the sequence of production, making the production sequence another decision variable. In the first two research areas, it is assumed that all products follow the same production strategy, but in the third research area we consider a situation with two production strategies. We apply machine learning in these problems. Applying machine learning is an attempt at dealing with the curse of dimensionality, incorporating more uncertainty and realistic problem settings, and improving the explainability of the resulting planning and control policies.