At the Chair of Logistics and Supply Chain Management of TUM School of Management, we are looking for an interested and qualified student to conduct his/her Master’s Thesis on the topic:

(De-)Synchronizing Replenishments in Cyclic Inventory Routing

The Inventory Routing Problem solves the lot-sizing and vehicle routing problems in an integrated fashion. This resembles the vendor managed inventory approach, which achieves great savings through correct (de-)synchronization of retailer replenishments. However, the synchronization possibilities are constrained by various factors, as for instance by capacity limitations or initial inventory levels. The aim of this thesis is to design cyclic delivery schedules for the Inventory Routing Problem in which a potential (de-)synchronization is not hindered by initial inventory levels. It should assess the advantage of cyclic planning over rolling horizon planning.

Selected research tasks:
- Literature Review
- Modeling and Solving the Problem using a commercial solver (Xpress, Cplex or Gurobi)
- Identifying suitable KPIs to evaluate delivery schedules and the influence of initial inventories
- Conducting an extensive numerical evaluation on instance sets found in the literature (resources for computation will be offered)
- Comparing the long-run costs of cyclic vs. rolling horizon planning

Requirements:
The thesis is for Master students of the study-program TUM-BWL. The ability to work independently as well as analytical skills are required. Knowledge of mathematical programming and optimization is required. The thesis should be written in English.

Begin: Ongoing
Advisor: Sebastian Malicki
Application: Email with curriculum vitae and transcript of records to logtheses.wi@tum.de