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 thesis on the topic 

**Online Algorithms for Commodity Procurement**

An increasing number of companies purchase commodities (metals, oil, etc.) on spot markets, characterized by high flexibility but also subject to high price risks due to annualized spot price volatilities of up to 40%. To mitigate the inherent price risks, data-driven online strategies utilizing historical price data can be employed for operational hedging using inventory. Unlike offline algorithms that can access the entire price data of a decision period and subsequently optimize decisions, online algorithms produce updated decisions step-by-step as new price observations become available during the planning horizon. The scope of this thesis is to give an overview of existing data-driven online strategies for commodity procurement. Subsequently, a suitable online strategy optimizing the decisions for each period is selected, applied to a given dataset, and evaluated. Existing data-driven approaches as well as price input data are provided to benchmark the online algorithms.

**Key project tasks:**
- Literature review on relevant fields of study
- Development & implementation of a mathematical model for the identified solution approach
- Systematic comparison of selected model performances
- Analysis of results and implications

**Requirements:**

The thesis is suitable for students at the TUM School of Management with a focus on finance, operations, SCM, or informatics. The ability to work independently, as well as analytical skills, are required. Ideally, candidates have experience with Python. The thesis should be written in English.

**Begin:** as soon as possible

**Supervisor:** Moritz Rettinger

**Application:** Email with curriculum vitae and transcript of records to logtheses.log@mgt.tum.de