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:

**Effects of Product Modularity and Supply Chain Modularity:**
**Evaluating the Benefits using Simulation Study and Survey Instrument**

Typically, the more customized is the product, the more challenging is the management of physical and information flow throughout the SC; particularly, in new product development processes in engineer-to-order industries (e.g., shipbuilding). Various authors recommend how to integrate different SC entities. However, integration efforts may increase costs for coordination, which could be avoided when modular products development is pursued. This thesis aims at exploring these benefits of product modularity (in connection with SC modularity). A conceptual model is to be developed to illustrate the trade-off among several SC configurations, e.g., an integrated SC or a loosely coupled SC. Benefits shall be evaluated both conceptually and quantitatively. First, case studies shall describe the effects. Second, quantitative benefits are to be extracted by carrying out a simulation using real data where the conceptual model could be applied. Third, based on the results, a survey instruments shall evaluate the benefits on SC performance factors on a broader basis (the model can be expanded as to take organizational dimensions or moderating factors such as trust into account). The survey can be conducted in Germany, Italy, and an Asian economy.

**Selected research tasks:**
- To perform in-depth literature review and to gain a new view on the matter
- To explore the relation between modular product and SC modularity, and connected direct and indirect factors (as well as moderating factors)
- To conduct case studies in order to have a clear view on the concept of modularity in the engineer to order SC of shipbuilding and construction
- To test hypothesis through simulation using Arena Simulation software.
- To evaluate the survey using SPSS Amos.

**Requirements:**
This Master thesis is particularly suitable for a student who has a strong interest in the overlapping field of supply chain management and product modularity. The ability to work independently as well as simulation skills and survey skills is required. The thesis should be written in American English.

**Begin:** January 2013
**Advisor:** Dr. Martin Stößlein (martin.stoesslein@tum.de)