Ton de Kok

On model validity, analysis validity, and purpose of research

Reality is complex, especially when you aim to understand it. This is even more so, when you aim for quantitative validity of your findings. Such quantitative validity is strived for in the basic sciences: physics, chemistry, biology. In economics, quantitative validity is virtually impossible by the nature of the research objects: human individuals, groups of humans and society. Thus economics is primarily focused on qualitative validity, based on understanding phenomena. In operations management both quantitative and qualitative validity is considered scientifically relevant. In this presentation we focus on quantitative validity of mathematical models. Such validity is a prerequisite for decision support that substitutes for, or complements, human decision making. We discuss generic approaches from literature that are used to arrive at quantitative models for decision support in the context of supply chain optimization. We reveal issues that arise when assumptions are introduced to enable mathematical tractability. And we show how empirical validation yields new insights in mathematical models and their application. This yields a perspective on the purpose of research in operations management.