

## Lecture Series of the Research Institute for Supply Chain Management

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Friday 29, November 2024, 12:30 pm



Building TC, Room TC 4.27  
Welthandelsplatz 1,  
1020 Vienna

### **NENAD NOVAKOVIC, BENJAMIN SCHUSTER: "CRYPTOBEER: MITIGATING THE BULLWHIP EFFECT WITH CRYPTOGRAPHY SMART CONTRACTS"**

This study investigates how smart contracts, combined with cryptographic algorithms, can help reduce the bullwhip effect in supply chains. While blockchain offers transparency in managing material, information, and financial flows, it also presents challenges around data sensitivity. Our approach leverages zkay, a cryptography-enhanced programming language, to create a decentralized simulation called cryptoBeer. In cryptoBeer, order quantities are visible only between direct trading partners, while average downstream order data is accessible to other tiers for improved planning. The results indicate that using exponential smoothing forecasts with secure multiparty computation (SMPC) reduces both costs and the bullwhip effect more effectively than other forecast and visibility configurations. This demonstrates that integrating secure data sharing in smart contracts can lead to more stable and cost-efficient supply chains.

**Nenad Novakovic** is a Senior Controller at ÖBB Technical Services with a Master's degree in Supply Chain Management from WU, batch 2021. Originally trained as a software developer, he transitioned into economics and supply chain management. Fluent in five languages, he combines his professional expertise with a strong commitment to endurance training and fitness.

**Benjamin Schuster** studied at WU Vienna and specialized in logistics and transport during his bachelor's degree. Schuster Benjamin began his career in the Supply Chain Strategy department at Metro Vienna, where he gained valuable experience in operational and strategic planning. He currently works as an SAP and Microsoft consultant with a focus on analytics and reporting, with a strong emphasis on data science, machine learning, data modeling, and advanced reporting solutions.

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