

first, how does the retailer's audit mechanism affect the supplier's social responsibility decision? Second, to what extent does the impact of the audit mechanism hinge on market parameters and consumers' response to social responsibility? We find that the audit by the downstream retailer may induce the upstream supplier to reduce his social responsibility level, and investigate the parametric conditions for the reduction to occur. Our results suggest that, from a managerial point of view, downstream firms should be mindful of noticeable unintended negative consequences of cost auditing on the upstream suppliers' CSR decisions.

3 - Social monetization strategies for the design and planning of supply chain

Cátia da Silva, Ana Paula Barbosa-Póvoa, Ana Carvalho

Currently, there are many concerns about supply chain's sustainability and the impact they can have at an environmental and social level. Decision-makers realized that supply chains are not limited to its economic component and it is necessary to integrate both environmental and social concerns into the decision-making process. In fact, there is a significant number of scientific works that demonstrate the growing concern on the environmental topic, but the social one can still be further explored. Understanding the true social impact for decision-makers is not easy, especially when it is crucial to quantify the impact that their supply chains have. For this reason, social monetization constitutes an important step in the quantification of social impacts in a unit easily understood by decision-makers, who are used to deal with monetary units. This work intends to develop a social monetization method that aims to: i) correlate social indicators with economic indicators and variables; ii) quantify the social impact of the supply chain in monetary units easily understood by decision-makers; and iii) translate both economic and social impacts in the same unit in order to optimize the design and planning of the SC. This is an innovative method as it can simplify the decision-making process and allows the quantification of the supply chains' social performance in an easily understood unit. This work is validated considering a real case study of an international SC.

4 - Hybrid multicriteria model for sustainable technology supplier selection in the banking sector

Marina Segura, Ivan Felipe Barrera, Concepción Maroto

Supplier selection is a key strategic problem in supply chain management. The aim of this research is to provide a new hybrid multicriteria model for evaluating technology suppliers and validate it with a case study in the banking sector. This approach allows companies to perform qualification, selection, ranking and sorting of suppliers on a sustainable basis. Integration of several techniques is necessary to address this complex decision problem with conflicting economic, environmental and social criteria. AHP is useful for problem structuring and weighting criteria collaboratively. MAUT is applied to obtain indicators for product quality and supplier risks, whose utility functions are derived by data-driven models that favour evaluation objectivity and transparency. PROMETHEE is suitable for supplier selection due to its discriminant power among alternatives. Finally, FlowSort is proposed to classify suppliers into ordered groups and the outcomes are compared with results from MAUT. Results show its applicability by increasing process transparency and reducing operational risks in practice.

1 - Incentivizing Truthfulness in Production-as-a-Service Auctions with Budget Constraints

Christina Liepold, Maximilian Schiffer

A major paradigm shift in servitization-based Industry 4.0 innovations is the Production-as-a-Service concept, which allows an operational exchange of idle production capacities, e.g., through a two-sided combinatorial auction orchestrated by an intermediary connecting buyer and seller companies. To foster participation in this auction, it is necessary to define a core-stable exchange, which also guarantees allocative efficiency and incentivizes bidder truthfulness. So far, no optimization-based model has been brought forward to establish and solve such an exchange related to the operational outsourcing of production capacities through Production-as-a-Service. Against this background, we present a combinatorial, intermediated production capacity exchange problem with welfare maximization and buyer-side budget constraints that preserves core-stability and incentivizes bidder truthfulness. The presented model is not incentive compatible without the involvement of the intermediary. To remedy this drawback, we show how a profit-oriented intermediary can improve the overall incentive compatibility in the Production-as-a-Service market. Moreover, we show how to solve the developed mixed integer bilevel linear program with a tailored column and constraint generation algorithm and present managerial insights for a realistic case study.

2 - Contract pricing in a synchromodal transportation setting

Jasper Paesen, An Caris, Christof Defryn, Lotte Verdonck

In the freight transportation industry, long-term contracts between logistics service providers (LSP) and shippers are common. These contracts typically contain long-term commitments related to, e.g., volume, lead time and price. The latter is mostly based on the expected cost of the transport mode that will be used for the transport of a shipment with the addition of a desired profit margin, i.e., cost-plus pricing. As these contracts apply over a longer period, e.g., a year, commitments need to be made long before the execution of the transport service itself. This long-term decision making contradicts with the fundamentals of synchromodality, which assume flexibility to change decisions with respect to route and transport mode in real time.

In this research, we present an extensive numerical experiment that provides insight in the service quality characteristics, i.e., long-term commitments that have a significant impact on a LSP's cost. In addition, interaction effects between long-term commitments of different shippers are expected, which should also be considered when analysing the cost implications. These results will serve as an input for a service-based pricing strategy for synchromodal transport. Such a strategy sets a price based on service quality characteristics of the transport, rather than the used transport mode. In this way, we aim to justify a contract price while the transport mode and route are still unknown.

3 - New cloud computing resources pricing strategies

Luce Brotcorne, Bernard Fortz, Arnaud Laurent

In this talk, we present a new cloud computing resources pricing model, where a Cloud Service Provider (CSP) rents resources during a short period of time (Pay as you go) or over a larger one (subscription) with a slightly cheaper price. The goal of the CSP is to define a pricing strategy for both types of customers to generate revenue and incentivizing the subscribers to release their resources when they don't need it. Environmental costs will be integrated in the CSP objective function.

A bilevel optimization model is provided to integrate the strategic behavior of the customers into the CSP optimization process. Numerical results are discussed on randomly generated instances inspired from real life.

4 - Optimal Tax Policy for Single Homogeneous Commodity on n Markets with Export Costs as a Stackelberg Game

Zrinka Lukač

■ TB-23

Tuesday, 10:30-12:00 - Y307

Pricing and Revenue Management 3

Stream: Pricing and Revenue Management
Invited session

Chair: Luce Brotcorne