

# Business Distinguished Scholar Seminar Series 2024

## TO REFURBISH OR NOT: IMPLICATIONS FOR FIRM'S DECISIONS, CONSUMERS, AND ENVIRONMENT

We study the secondary market intervention strategies of a manufacturer which buys used products back from consumers via trade-in programs. The manufacturer then refurbishes the used products to a chosen quality and sells them in the secondary market. The core of our study is to analyze the optimal refurbishing decisions for the manufacturer, how these decisions affect consumer access to the product, and the environmental footprint.

We use a stylized economic model to study a profit-maximizing firm operating in a monopoly market. Our two-period model captures the heterogeneous consumer valuation of the product and seller's hassle cost in the secondary market. We prove that the manufacturer's optimal strategy is "partial intervention with high trade-in price" for most products, with a few rare exceptions. We discover a surprising non-monotonic optimal trade-in price as a response to product design. We show that the manufacturer's strategy broadens consumer access to the products, but it can also exacerbate the total environmental impact. This negative impact can only be mitigated if the environmental benefits gained from using refurbished products significantly outweigh the environmental impact of the refurbishing operation.

Our findings emphasize the need for managers to tailor their approach to different products. We provide practical guidelines for managers navigating these decisions in our case study, which compares high-end vs. low-end smartphones and gasoline vs. electric cars.

 **10 June 2024 (Monday)**

 **3:30-5:00pm (HKT)**

 **English**

 **Zoom Meeting:**

[https://lingnan.zoom.us/j/94358451851?](https://lingnan.zoom.us/j/94358451851?pwd=NIRLSWZRd1I5NzA2STd3T29pN2dwdz09)

**pwd=NIRLSWZRd1I5NzA2STd3T29pN2dwdz09**

**Meeting ID: 943 5845 1851; passcode: 85968231**



## SPEAKER

PROF. GREYS SOSIC, SENIOR VICE DEAN FOR FACULTY AND ACADEMIC AFFAIRS AND PROFESSOR OF DATA SCIENCES AND OPERATIONS, MARSHALL SCHOOL OF BUSINESS, UNIVERSITY OF SOUTHERN CALIFORNIA, USA

Greys Sošić holds the E. Morgan Stanley Chair in Business Administration and serves as a Professor of Data Sciences and Operations at the USC Marshall School of Business. She is the Senior Vice Dean for Faculty and Academic Affairs at Marshall.

Greys specializes in research related to supply chain management, focusing on areas such as sustainable supply chains, competition and cooperation in supply chains, and applied game theory. Her work has been presented at numerous national and international conferences and has been published in journals including Management Science, Operations Research, Manufacturing and Services Operations Management, and Production and Operations Management. Her forthcoming book titled "Supply Chain Network Design: How to Create Resilient, Agile and Sustainable Supply Chains," which is co-authored with D. Dasgupta and N. Vyas, is set to be released in May 2024.

In addition to her research contributions, Greys has held editorial roles at various prestigious academic journals, including Management Science, Operations Research, Manufacturing and Services Operations Management, Production and Operations Management, IISE Transactions, and the Decision Sciences Journal.

