Management Insights

An Operations Perspective on Product Take-Back Legislation for E-Waste: Theory, Practice and Research Needs
Atalay Atasu, Luk N. Van Wassenhove

In an era where the diffusion of product take-back legislation has gained momentum, several major problems related to take-back policy require attention. Atalay Atasu and Luk N. Van Wassenhove highlight pressing problems and research needs in the context of product take-back legislation for e-waste. Using examples from existing take-back laws, they show that operational factors significantly influence efficiency of take-back legislation in achieving desired policy objectives. They identify a grey zone between theory and practice of take-back policy choices, wherein several implementations related decisions take place. They posit that there is need for operations management research investigating such take-back implementation choices, their effect on production systems and resulting impact on different stakeholders.

The Influence of Service Orientation on B2B e-service Capabilities: An Empirical Investigation
Pedro Oliveira, Aleda V. Roth

Business-to-business (B2B) electronic-services, or a company's portfolio of service offerings available to its customers virtually through the Internet channel, are an area of increasing interest for managers. Pedro Oliveira and Aleda Roth contribute to managerial practice by developing both the construct and measures of *B2B e-service capability*, a term that captures a generic set of five combined operational abilities: 1) e-service recovery, 2) e-customization, 3) ease of navigation, 4) service portfolio comprehensiveness, and 5) information richness. These five dimensions are associated with B2B service delivery, including its portal design, technology architecture, and mix of product and service offerings, and are posited to be necessary for delivering effective B2B e-services. Pedro Oliveira and Aleda Roth also find that service orientation and the customer receptivity to technology influence B2B e-service capability. Their findings hold for *both* goods producers and service providers and are supported by the analysis of 181 businesses that deployed B2B e-services with their business customers.

Trust and Information Sharing in Supply Chains
Neda Ebrahim-Khanjari, Wallace Hopp, Seyed M.R. Iravani

Trust is the glue that binds human organizations together. Without trust, individuals cannot share information, cooperate on tasks or execute agreements. Since all of these are vital activities in supply chains, trust is a critical element of supply chain management. But the vast majority of research on supply chains does not consider trust or other social characteristics of the people who run them. Neda Ebrahim-Khanjari, Wallace Hopp, and Seyed Iravani address this gap by examining the role of trust in the sharing of information between wholesale salespersons and retailers. Their results indicate that the ability of a salesperson to gain the trust of a retailer can be a powerful driver of salesperson effectiveness and overall supply chain performance. One way manufacturers can help foster trust is by extending the length of assignments to allow salespersons to cultivate relationships with retailers and to provide incentive to do so. However, the authors also find that, when trust is taken into consideration, a conventional linear commission-based compensation scheme may too weak to maximize salesperson performance from the manufacturer's perspective.

A Reply to Williamson's "Outsourcing …"
Paul Zipkin

Is supply-chain management misguided, naïve and therefore dangerous? A recent article by a distinguished economist seems to suggest so. Paul Zipkin believes supply-chain management is stronger, saner and more mature than it may appear to an outsider.

Value of and Interaction between Production Postponement and Information Sharing Strategies for Supply Chain Firms
Hasan Cavusoglu, Huseyin Cavusoglu, Srinivasan Raghunathan

Manufacturers adopt various strategies to reduce their uncertainty about demand. Two popular uncertainty-reduction strategies are production postponement and information sharing. A careful assessment

of the economic value of and interactions between such strategies is critical before manufacturers embark upon them. Using a model of a two-level supply chain, Hasan Cavusoglu, Huseyin Cavusoglu, and Srinivasan Raghunathan show that from the manufacturer's perspective, while information sharing is always valuable, production postponement can sometimes be detrimental. They also find that production postponement and information sharing strategies may substitute, complement, or conflict with each other. Thus, implementing both strategies may be worse than implementing one of them. An information sharing arrangement in which the retailer shares demand information with the manufacturer may benefit or hurt the retailer. Specifically, the retailer never shares her demand information voluntarily if the manufacturer has already adopted production postponement because production postponement and information sharing strategies always conflict with each other from the retailer's perspective. In such cases, the manufacturer should design an incentive mechanism to induce the retailer to share the demand information.

Returns Policy and Quality Risk in E-business
Lu Hsiao, Ying-Ju Chen

Recent years have witnessed a rapid growth of Internet channels due to the advance of information technology. From the consumers' viewpoint, however, this e-business revolution gives rise to an additional concern regarding the quality risk. Consequently, Internet sellers typically offer returns policies, and these returns policies vary across industries and stores. Lu Hsiao and Ying-Ju Chen investigate the interplay between the returns policy, the pricing strategy, and the quality risk. They demonstrate that consumer returns are offered only when the high-segment consumers incur a higher hassle cost, and both the quality risk and the valuation of the low segment are moderate. Moreover, it is possible to wisely design the returns policy that eliminates all inappropriate returns. The seller with a high quality risk may offer a refund that exceeds the selling price, which provides a theoretical ground and specific operating regime for the satisfaction guaranteed policy used in some e-tailers. On the other hand, when the quality risk is relatively low, further improvement on mitigating the quality risk may not necessarily benefit the seller. Finally, the authors observe that the restocking fee may be non-monotonic in product quality; thus, a more generous returns policy does not necessarily indicate a lower quality risk.

Grocery Perishables Management
Yanchi Li, Brenda Cheang, Andrew Lim

Perishable products, such as fruits, produce, meat and milk, are central to the profitability of supermarkets. Supermarket managers are facing pricing and replenishment decisions every day – how much to replenish when a product is out of stock, how to make a proper discount for the nearly-to-expire products so as to stimulate demand and maximize the revenue. Yanchi Li, Brenda Cheang, and Andrew Lim provide a quantitative approach to handle the pricing and inventory replenishment decisions for perishables. The proposed approach requires essentially only the historical sales data as a starting point and therefore rather easy to implement; from the sales data, supermarket managers can construct a realistic demand function, which may be of any shape if only it is realistic, and then they can turn to our solution method for the optimal pricing and replenishment decisions. Their study finds that (1) managing perishable products well does not mean aiming to eliminate any expiration; (2) pricing dynamically helps extending the shelf life of the products; and (3) sometimes it is better to dispose of the existing old inventory and to have new inventory on the shelf in order to better serve customers.

Quick Response under Competition
Yen-Ting Lin, Ali Parlaktürk

Quick response allows additional inventory replenishment opportunities when better demand information becomes available. Supply chains pose important questions concerning quick response. For example, should a manufacturer offer quick response to some, or all, of its competing retail clients? On the other hand, should a retail client adopt quick response service? How does demand uncertainty affect the value of quick response to the supplier and its retailers? Yen-Ting Lin and Ali Parlakturk find that a manufacturer maximizes its profitability by offering quick response to none, some, or all of its retailers as demand uncertainty increases. Furthermore, having quick response ability hurts a retailer when demand uncertainty is not sufficiently high due to how it affects the retail competition. Overall, the authors show that the degree of demand uncertainty and competition are critical determinants of the value of quick response both for a supplier and a retailer and managers should take them into account in their quick response decisions.

Manufacturer-Retailer Negotiations in the Presence of an Oligopolistic Input Market
Anil Arya, Thomas Pfeiffer

In some cases, the manufacturer has the wherewithal to make the product reliant entirely on its own inputs

and, with that done, utilize a retailer to move the product to final consumers. Anil Arya and Thomas Pfeiffer study a natural variant wherein the manufacturer itself relies on procuring vital inputs from markets which may not necessarily be perfectly competitive. Incorporating this practical feature has profound implications for negotiations between the manufacturer and retailer since it shifts their focus from being exclusively on output markets to one that balances strategic concerns in both input and output realms. In particular, the added need to discipline input prices leads the manufacturer and retailer to write contingent contracts that are cost-plus and prescribe lump-sum slotting allowances. Such terms ensure that the retailer's demand is linked to the input price, and this serves to foster competition between the input providers.

Sourcing from Multiple Suppliers for Price-Dependent Demands
Qi Feng, Ruixia Shi

In the face of uncertain demand and supply, how should firms dynamically price the product and replenish stock from multiple suppliers? Qi Feng and Ruixia Shi show that a high inventory level always calls for a low price. However, it may not be profitable to reduce the quantity from each supplier when the inventory level becomes higher. Also, selecting the low-cost supplier before the high-cost ones may not be the most profitable strategy. The authors characterize the profit improvement obtained from deploying dynamic pricing as opposed to static pricing and that from deploying multiple sourcing as opposed to single sourcing. They show that dynamic pricing and multiple sourcing strategies reveal similarities as well as differences in raising profit. On the one hand, both are more valuable when procurement cost is high or when demand is more sensitive to price. On the other hand, dynamic pricing induces a long-term profit improvement, while the benefit from supply diversification decreases over time.

Optimal Inventory Control with Dual-Sourcing, Heterogeneous Ordering Costs and Order Size Constraints
Wei Zhang, Zhongsheng Hua and Saif Benjaafar

Motivated by a variety of dual-sourcing procurement activities in practice, such as global or local procurement, make or buy, Wei Zhang, Zhongsheng Hua and Saif Benjaafar consider a dual-sourcing inventory problem, where procuring from one supplier involves a high variable cost but negligible fixed cost while procuring from the other supplier involves a low variable cost but high fixed cost, as well as an order size constraint. When the variable costs satisfy a certain condition, the authors partially characterize the structure of the optimal policy which determine when to order from each supplier and how much. The proposed policy indicates that it is possible to source from both suppliers when the beginning inventory level is low, and that the decision to source from the low cost supplier is not monotonic in the inventory level. The proposed policy performs well when the condition on variable cost is not satisfied.

Ordering, Pricing, and Lead-Time Quotation under Lead-Time and Demand Uncertainty
Zhengping Wu, Burak Kazaz, Scott Webster, Kum-Khiong Yang

Zhengping Wu, Burak Kazaz, Scott Webster, and Kum-Khiong Yang provides answers to the questions of how to stock, price, and quote a lead-time for a seasonal product under demand and lead-time uncertainty. Demand for the seasonal product is influenced by the firm's decision on price and quoted lead-time. They conclude that lead-time and demand uncertainty have opposite effects on the choice of the optimal price. Specifically, increased demand uncertainty leads to a reduction in the optimal price, and lead-time uncertainty results in an increase in price. Contrasting earlier research which has concluded that reducing demand uncertainty benefits the firm but not consumers, the authors show that at least one segment of consumers, lead-time sensitive and price insensitive, benefit from a reduction in demand uncertainty. Similarly, it is known that a reduction in capacity increases the choice of the optimal price and quoted lead-time in the absence of demand uncertainty. For a product with a small market size, however, a reduction in capacity in the presence of demand uncertainty causes the firm to reduce the selling price in order to retain the customer base, and benefits the price sensitive and lead-time insensitive consumers.

A Choice Based Dynamic Programming Approach for Setting Opaque Prices
Chris K. Anderson, Xiaoqing Xie

Opaque pricing is a form of pricing where certain characteristics of the product or service are hidden from the consumer until after purchase. In essence, opaque selling transforms a differentiated good into a commodity. Opaque pricing has become popular in service pricing as it allows firms to sell their differentiated product at higher prices to regular brand loyal customers while simultaneously selling to non-brand loyal customers at discounted prices via opaque channels. Chris K. Anderson and Xiaoqing Xie use sales

data from a hotel selling on an opaque channel as well as sales data from the opaque channel (for all hotels in the market) to estimate a choice model. They then use to choice model in conjunction with dynamic programming to determine the optimal pricing policies on the opaque channel. The choice model allows the characterization of consumer tradeoffs when purchasing opaque products while the dynamic programming approach allows the characterization of the optimal pricing policy as a function of inventory and time remaining.

NERJIT: Using Net Requirement Data in Kanban-Controlled Jumbled-Flow Shops
Ali Ardalan, Rafael Diaz

The continuous advances in production technologies, information technologies, and innovative operational procedures have paved the way for application of Just-In-Time (JIT) production concepts, which were originally developed for mass production systems, in intermittent production systems. Ali Ardalan and Rafael Diaz present a modification to JIT procedures to make them more suitable for jumbled-flow shops. They suggest providing real-time information about net-requirements for each product to each work-center operator for setting production priorities at each work center. Simulation experiments conducted for this study show that using net requirements in JIT (NERJIT) reduces customer wait-time by 45 to 60 percent while reducing inventory slightly. The analysis of work-centers' input and output stock-point

inventories shows that using the information about net-requirements results in production of items that are in current demand. NERJIT results in smaller input stock-point inventory and availability of products with higher priority in the output stock-points of work-centers.

Unpacking Team Familiarity: The Effects of Geographic Location and Hierarchical Role
Bradley R. Staats

In settings from scientific exploration and software development to consulting and service delivery, organizations are turning to teams of knowledge workers to execute projects that are vital to the organizations' success. One factor that has been shown to improve these knowledge teams' productivity is *team familiarity:* team members' shared prior work experience. In this paper, Bradley Staats parses overall team familiarity to consider effects of geographic location and the hierarchical roles of team members. Using data from a global software services firm, he finds that team familiarity gained when team members work together in the same location has a more positive effect on team performance than team familiarity gained while members were collaborating in different locations. Additionally, he finds that hierarchical team familiarity (a manager's experience with front-line team members) has a greater effect on project efficiency than does horizontal team familiarity (front-line team members' experience gained with one another) while the opposite is true with respect to project quality (horizontal team familiarity has a greater effect than hierarchical team familiarity). Identifying which relationships matter in what circumstances offers a valuable managerial lever to affect team performance. By taking a more fine-grained view of experience accumulation, organizations may improve knowledge-workers' productivity.