

## Research and Management Insights

### Conceptualizing Social Responsibility in Operations via Stakeholder Resource-Based View

ManMohan S. Sodhi

Business needs to better understand how to view social responsibility in operations, which is where it interacts with society, and make operational sense of overlapping concepts such as corporate social responsibility (CSR), sustainability, and shared value. ManMohan Sodhi offers ‘stakeholder resource-based view’ (SRBV) to deal with the challenges in implementing social responsibility that managers (and researchers) face including the multitude of objectives. SRBV entails identifying stakeholders, including the senior and middle managers of the company, within any chosen scope of operations – a plant in one location or a part of the supply chain in a particular continent – and then look into how these stakeholders are better off in their own terms as a consequence of these operations. SRBV therefore provides a way to avoid the ‘supply-side’ trap of companies presenting good deeds without requiring that those supposedly helped thus are actually better off. From a CSR perspective, SRBV helps extend company’s social responsibility and values to its operations including to any part of its supply chain. Making the benefits and benefit drivers of different stakeholders explicit by using SRBV can help managers weigh near-term profits against social responsibility.

### Addressing the Challenge of Modeling for Decision-Making in Socially Responsible Operations

Maria Besiou and Luk N. Van Wassenhove

Maria Besiou and Luk Van Wassenhove identify common characteristics of socially responsible operations by presenting four examples of such operations. The authors find that socially responsible operations are characterized by complexity, unfamiliar context and counter-intuitive behavior. Complexity is caused by uncertainty, constraints in resources, and trade-offs between short-term losses and long-term benefits. Stakeholders with conflicting goals, which can be either internal or external

to the system under study, drive unfamiliar context. Complexity and unfamiliar context can lead to counter-intuitive behavior. The authors outline a possible path of action in combining different methodologies to tackle socially responsible operations. Ideally a researcher should start with trying to understand reality in the targeted problem context. Soft operation research (OR models, “synergistic” methods between soft and hard OR (like system dynamics methodology and agent-based modeling) and scenario planning should be used to anticipate surprises or counter-intuitive behavior and identify the most important sub-systems likely to drive behavior of the system as a whole. Finally, “hard” OR/MS can be used in order to optimize design and management of critical sub-systems.

### Carrots or Sticks? Improving Social and Environmental Compliance at Suppliers through Incentives and Penalties

Angharad H. Porteous, Sonali V. Rammohan and Hau L. Lee

Firms are increasingly looking to eradicate social and environmental non-compliances at their suppliers in response to increasing regulations, consumer demand, potential for supply chain disruptions, and to improve their social, environmental, and economic supply chain performance. Porteous, Rammohan, and Lee develop a model of the relationship between the buyer’s supplier incentives and penalties for the supplier’s social and environmental compliance, and the outcomes in terms of reduction of supplier social and environmental violations as well as the buyer’s own operating costs. They find that incentives and penalties are strong tools that can influence supplier behavior and do so in a way that reduces overall costs for the buyer. The strongest predictors of reduced violations are penalty of contract termination after a warning, and the incentives of supplier training, increased business, and public recognition. This suggests that firms can improve social and environmental performance of their suppliers by ceasing business with continually violating suppliers, while using specific incentives to motivate and further build capabilities of higher performing suppliers.

### **Aggregating Smallholder Farmers in Emerging Economies**

Jaehyung An, Soo-Haeng Cho, and Christopher S. Tang

Most farmers are trapped in the poverty cycle owing to their smallholdings. Therefore, aggregating farmers through formal or informal cooperatives (coops) may alleviate poverty because coops can enable farmers to: (1) reduce production cost; (2) increase/stabilize process yield; (3) increase brand awareness; (4) eliminate unnecessary intermediaries; and (5) eliminate price uncertainty. In this paper we examine one question: When will cooperatives be beneficial? For each effect, we find that aggregation is beneficial for a farmer to be part of the aggregation only when the size of the aggregation is below a certain threshold. Also, while certain effects are beneficial to the market as a whole, other effects are hurtful due to higher market price and/or lower production quantity.

### **Incentive for Peer-to-Peer Knowledge Sharing Among Farmers in Developing Economies**

Ying-Ju Chen, J. George Shanthikumar and Max Shen

This paper is motivated by some intriguing phenomena about the recently launched innovative voice-based information service. In this mobile forum, participating farmers can raise questions, interact with others, and post answers to the existing list of questions. The authors construct a game-theoretic model to understand the peer-to-peer interactions in this novel social media. The authors document the farmers' incentive to provide information to their competitors and at the same time pander the information intentionally. The authors also examine various tools that can be used to improve the forum's effectiveness. More frequent monitoring can be detrimental, and improving the staff's knowledge has a non-trivial impact. Moreover, charging for Avaaj Otalo usage may discourage uninformative answers that are purely manipulative, but it may also mitigate the farmers' incentive to share information. The analysis is useful not only for understanding the field experiment results of Avaaj Otalo but also for designing other social media that facilitate peer-to-peer knowledge learning and sharing. Overall, the paper speaks to the sophisticated interactions among strategic farmers in the context of developing economies.

### **The Economic Value of Market Information for Farmers in Developing Economies**

Ying-Ju Chen, Christopher S. Tang

To alleviate poverty, various non-governmental organizations (NGOs) and for-profit companies distribute

information about market price, crop advisory and farming technique to farmers. Ying-Ju Chen and Christopher Tang investigate a fundamental question: will information create economic value for farmers? They consider the case when each farmer determines his production quantity by taking information about the actual market price and the action of other farmers into consideration. By examining the equilibrium outcomes associated with a Cournot competition game, they show that private signals do create value by improving farmers' welfare. However, this value deteriorates as the public signal becomes available (or more precise). In contrast, in the presence of private signals, the public signal does not always create value for the farmers. More importantly, they find that the public signal can reduce welfare inequality when farmers have non-identical private signal precisions.

### **Municipal Groundwater Management: Optimal Allocation and Control of a Renewable Natural Resource**

Karthik Murali, Michael K. Lim, Nicholas C. Petruzzi

Karthik Murali, Michael Lim, and Nicholas Petruzzi investigate the role of market mechanisms in allocating and preserving renewable groundwater reserves between users. For groundwater that is traded in markets and between two users through negotiated contracts, the authors derive optimal extraction and trading policies, and they show that the availability of reallocation mechanisms will alleviate societal and environmental impacts of groundwater extraction in importing municipalities but exacerbate them in exporting municipalities. Nevertheless, the authors identify hydrological conditions under which the net impact of groundwater trading through negotiated contracts can be positive on both counts across both trading municipalities. Moreover, they show that privatizing the management of groundwater reserves can increase (decrease) the volume and frequency of groundwater exports (imports), and they establish conditions under which privatization in an exporting municipality can lead to positive net impacts across trading municipalities on society and the environment.

### **Repurposing Materials and Waste through Online Exchanges: Overcoming the Last Hurdle**

Suvrat Dhanorkar, Karen Donohue, Kevin Linderman

Most companies accumulate a nontrivial amount of waste and surplus materials, such as industrial packaging (e.g. boxes, containers), mixed electronics (e.g. lamps, tapes), unused raw materials (e.g. wood, rubber) and by-products (e.g. chemicals, leather). As companies look for ways to become more environmentally sustainable, a first step towards this goal

may involve developing channels for repurposing such surplus materials, by-products and waste. The authors examine an internet-based solution – Online Material & Waste Exchanges (OMWEs) – to address this challenge. Using novel transaction-level data from an online exchange (MNEExchange.org), the study investigates factors that reduce the buyers' uncertainty and increase the sellers' commitment to the OMWE. The analysis provides important implications for designing regional internet-based repurposing markets. The study shows how geographic location and regional policies and norms drive (and inhibit) exchanges on OMWEs. Further, greater access to product and transaction information reduces the uncertainty and increases exchange success in OMWEs. Finally, higher familiarity between the buyer-seller pair and familiarity with the OMWE system leads to higher likelihood of exchange success. This study lays the foundation for understanding OMWEs and has important implications for developing policies and operations to increase online transactions of by-products, materials and wastes.

**Supply Chain Design and Carbon Penalty:  
Monopoly vs. Monopolistic Competition**

Seung Jae Park, Gérard P. Cachon, Guoming Lai,  
Sridhar Seshadri

Various estimates of social welfare decrease due to carbon emission have been put from \$50 to \$300 per

metric ton of CO<sub>2</sub>. Concerned policy makers have either passed or are contemplating regulations such as establishment of carbon trading systems and carbon taxes to mitigate the loss in welfare. Seung Jae Park, Gérard Cachon, Guoming Lai, and Sridhar Seshadri investigate a natural question whether imposing carbon emission charges will change the structure of the supply chain and thereby negate or enhance the impact of the charges. They find that carbon emission charges can change the supply chain structure significantly when the market competition is intense. In such situations the optimal choice of carbon charges is very important. The optimal charges to firms are larger than that to consumers because the firms are Stackelberg leaders in the supply chain. Hence, their results suggest the importance of imposing the optimal carbon tax to curb emission. In addition, they find that development of a common third-party logistic distribution system can help reduce carbon emission and improve the social welfare, thereby complement carbon regulations.