Management Insights

Strategic Supply Chain Structure Design for a Proprietary Component Manufacturer
Yi Xu, Haresh Gurnani, Ramarao Desiraju

Proprietary component manufacturers (PCMs) are often the sole source for critical ingredients used in assembling many consumer products. For example, Intel is a PCM that provides central processing units to personal computer manufacturers such as Dell and HP. By contrast, Sony may sell Trinitron-based monitors in the end-product market while simultaneously supplying the Trinitron tubes to an original equipment manufacturer (OEM) like Toshiba that competes against Sony to sell monitors to end consumers. Furthermore, a PCM such as Bose may choose not to supply its proprietary components or technology to other OEMs, but instead builds and markets its own products (e.g., speakers) to the end consumers. In these examples, the PCM plays the role of a component supplier, dual distributor, or monopoly producer, respectively.

The extent to which the OEM enjoys a capability advantage over the PCM in serving the end consumers, along with the degree of differentiation between the end-products, can determine the PCM's optimal supply chain role. Xu, Gurnani, and Desiraju offer a couple of valuable insights. First, when a PCM invests in component branding, the preference between a dual distributor and a component supplier structure revolves critically around the impact of the PCM's investment. Second, when there is uncertainty in consumer valuation of the end-product, the component supplier structure becomes less attractive as the PCM has to commit to a sub-optimal pricing decision prior to the realization of the product potential.

Joint Pricing and Contingent Free-Shipping Decisions in B2C Transactions
Mingming Leng, Rafael Becerril-Arreola

Free shipping has proved to be significantly effective in improving online retailing operations. In addition to price discounts, many online retailers provide free-shipping service to consumers whose purchases exceed a given dollar amount, that is, contingent free-shipping (CFS) cutoff level. We consider an online retailer's joint pricing and CFS cutoff level decisions in both monopoly (single-retailer) and duopoly (two-retailer) structures. We show that an online retailer's CFS strategy is attractive mostly to consumers with large order sizes; this means that the retailer should use the CFS strategy mainly to entice the consumers whose online purchase amounts are large. In the monopoly structure, the fixed shipping fees have large impacts on an online retailer's profit, and an online retailer should set a low CFS cutoff level in a relatively homogeneous market and a high CFS cutoff level in a relatively heterogeneous market. In the duopoly structure, if two online retailers have identical fixed and variable shipping fees, then their pricing and CFS cutoff level decisions should be equal. Moreover, as a result of the competition, two online retailers should decrease their profit margins but increase their CFS cutoff levels.

The Effect of Earnings-Based Metrics on Vertical Efficiency
Anil Arya and Brian Mittendorf

Accounting earnings are sometimes criticized as being a poor metric of corporate performance. One source of such criticism is the fact that the "matching principle" requires that cash outflows for inventory are not reflected as expenses until the associated items are sold. This is viewed as an open invitation for excessive inventory purchasing, since the capital cost of cash outflows is not properly reflected in earnings. This paper posits that such concerns about accounting earnings can actually prove useful when supply arrangements are characterized by inefficiencies induced by self-interest. When suppliers set excessive wholesale prices to garner greater profits at the expense of their retailers, the supply chain suffers from reduced product flow. A reliance on accounting earnings serves as a salve on this strained relationship since it heightens the retailer's incentive to carry inventory. Such considerations not only have implications for supply chain efficiency but also for accounting regulations that govern inventory valuation.

Shareholders' Wealth-Maximizing Operating Decisions and Risk Management Practices in a Mixed Contracts Economy
Ramesh K. S. Rao, Genaro J. Gutierrez

Operations management practices can increase the wealth of the firm's shareholders in a "mixed-contracts" economy. This is an economy in which shareholders (the providers of financial capital) hold securities (e.g., stocks), and "factors" (the providers of non-financial inputs such as labor, supplies) hold non-traded factor contracts. When the firm has operating risk, which we define as potential for default, it can minimize operating costs by holding adequate riskless

working capital (cash invested is treasury securities). Further, operating management practices, by changing operating risk, can reduce the firm's working capital needs and hence its total investment. This increases the firm's productivity, which we define as the wealth created (NPV) by the firm per dollar of invested capital. Increasing the productivity of capital is important because the released working capital can be reinvested by the shareholders outside the securities markets (e. g, in real estate and entrepreneurial ventures) to further increase their wealth. Thus, in evaluating the transition from one production system or operating plan to another, the manager must consider not only the wealth created inside the firm, but also the implications for the shareholders' total wealth of any resulting change in capital requirements. This finding imputes an enhanced economic relevance for operations management activities and risk management (financial and operational hedging) practices.

Bodies of knowledge for research in Behavioral Operations
Elliot Bendoly, Rachel Croson, Paulo Goncalves, Kenneth Schultz

In the field of Operations Management (OM), there are a wide range of lessons to be learned from the areas of cognitive and social psychology, group and system dynamics that academic researchers in OM typically have no exposure to. Yet these are some of the very areas of knowledge that may prove the most useful in resolving the theory-application gap. OM research can have a major impact on the relationship between management practice and the academic world by being aware not only of the existence of these rich traditions of study, but also having insights into how these areas can be applied to enrich and resolve applicability issues. Bendoly, Croson, Goncalves, and Schultz provide guidance to academics, as well as non-academic researchers in practice, into how these existing bodies of knowledge can strengthen understanding and pave new paths for development.

Anatomy of a Newsvendor Decision: Observations from a Verbal Protocol Analysis
Srinagesh Gavirneni, Alice M. Isen

Managing inventories in the presence of significant randomness in demand is a problem that is ubiquitous in modern supply chains. The challenge faced by decision makers is to find the optimal balance between the costs of having too much or having too little. While this trade-off, in the form of the Newsvendor problem, has been mathematically analyzed by researchers for many years now, it is not known how human decision makers solve this problem. A think-aloud experiment followed by verbal protocol analysis allows us to capture the process used by newsvendor decision makers. We observe that the subjects understand the business forces at play, but find it hard to balance them. They struggle with the problem abstractness, have difficulty coming up with a solution, and try to look for information to which they could anchor their decision. Finally, the risk (overage or underage) that they think about closer to their decision determines the error (order too little or too much) they make in their decision.

The Impact of External Demand Information on Parallel Supply Chains with Interacting Demand
Xiaolong Zhang, Yao Zhao

Sun Tsu articulated at the end Chapter III in The Art of War, the oldest treatise on military strategy: If you know the enemy and know yourself, you need not fear the result of a hundred battles. If you know yourself but not the enemy, for every victory gained you will also suffer a defeat. If you know neither the enemy nor yourself, you will succumb in every battle.

The voluminous research on information sharing in a single serial supply chain seems to validate that sharing demand or supply related information with one's supply chain partners tends to be beneficial for all members in this supply chain. The results of Zhang and Zhao on two parallel (e.g., competing) supply chains reveal that the impact of information sharing can be ambiguous and subtle. Indeed, sharing one's competitor's demand information with one's downstream partner can alter her order process in such a way that does not always benefit all parties in your supply chain. Zhang and Zhao indentify win-win situations in which a manager does not have to fear the potential negative result from a better knowledge of her or his competitor's demand information. Again, the relevance of the quoted military stratagem in the authors' setting involves a layer of intricacy that this paper just began to uncover.

Sizing Inventory when Lead Time and Demand are Correlated
Ping Wang, Walter Zinn, Keely L. Croxton

When determining how much inventory to keep of a particular item, firms need to consider at least two variables: the lead time needed to resupply inventory and the demand for that item. These variables are typically combined into equations that input their averages and variability. The result is a level of inventory that the firm should maintain. A critical feature of these equations is that they assume that lead time and demand are independent. However, this is not always true in practice. For example, a powerful customer might push suppliers to anticipate deliveries to match an increase in demand. Accordingly, in this research Wang, Zinn, and Croxton first share examples showing that supplier lead time and demand are often linked in practice. They then develop equations that should be applied to determine inventory levels in cases where lead time and demand are not independent.