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Research and Management Insights

Does International Economic Integration Lead to a Cleaner Production in China?

Liguo Lin, Jon J. Moon, Haitao Yin

Based on an analysis of a sample of Chinese firms in Shanghai, Liguo Lin, Jon J. Moon, and Haitao Yin demonstrate that firms with international linkages, in the form of foreign direct investment or international trade, tend to operate in a more environmentally friendly manner than firms with no international linkage. The practical implication is important considering that the natural environment in developing countries has deteriorated rapidly during the process of globalization and the deterioration has at least partially been attributed to international economic activities as Pollution Haven Hypothesis scholars have posited. The authors argue that stakeholder pressure is the primary motivation for firms with international linkages to pursue environmental excellence. This highlights the importance of stakeholder management in improving corporate environmental operation. The authors further point out that future research should investigate whether firms with no international linkage would also achieve environmental improvement through a mimetic effect and a competition effect from their peers with international linkages.

An Empirical Study of the Bullwhip Effect in China

Jun Shan, Shitao Yang, Shilei Yang, Jin Zhang

Many multinationals entered China with the belief that the differential in labor cost would be sufficient to offset the increase in logistics costs. China's total logistics costs as a percentage of its GDP stand at over 18%, however, and have been around this level since 2001. This figure is high compared to developed countries. To understand why logistics costs in China are so high, Jun Shan, Shitao Yang, Shilei Yang, and Jin Zhang investigate the bullwhip effect there using financial data for the period 2002-2009 from over 1,200 Chinese firms listed on the two stock exchanges in that country (Shanghai Stock Exchange and Shenzhen Stock Exchange). The authors find that more than 2/3 of the publicly listed firms in their study exhibit the bullwhip effect. In addition, the authors also examine the factors associated with the intensity of the bullwhip. The good news is that the intensity of the bullwhip effect on average has declined, although the declining trend seems to stall after 2007.

The Effects of Competitive Environment on Supply Chain Information Sharing and Performance: An Empirical Study in China

Baofeng Huo, Xiande Zhao, Honggeng Zhou

Baofeng Huo, Xiande Zhao, and Honggeng Zhou provide managerial insights for supply chain managers to enhance supply chain performance by selecting the most effective approach of information sharing (IS) in the supply chain under different competitive environments. Specifically, when companies face increased international competition, they increase IS among internal functions and with external supply chain partners. To effectively improve supply chain performance, companies need to develop internal IS first and then external IS since internal IS provides foundations for external IS. The authors' findings also indicate that internal IS and IS with customers are more effective in improving supply chain performance than IS with suppliers. When companies face increased competition in local market, they do not significantly increase formal IS through the use of information systems in the supply chain, they choose to share information informally using informal methods.

First Step in Social Media - Measuring the Influence of Online Management Responses on Customer Satisfaction

Bin Gu, Qiang Ye

With the growing influence of online social media, firms increasingly take an active role in interacting with consumers in social media. For many firms, their first step in online social media is management responses, where the management responds to customers' complaints or complements about a firm's products and services. In this study, Bin Gu and

Qiang Ye measure the impact of management responses on customer satisfaction using data retrieved from a major online travel agency in China. Controlling for regression toward the mean and unobserved variations in individual preference for hotels, the study finds that online management responses are highly effective among low satisfaction customers but have limited influence on others. Moreover, the study shows that the public nature of online management responses introduces a new dynamic among customers. While online management responses increase future satisfaction of the complaining customers who receive the responses, they decrease future satisfaction of complaining customers who observe but do not receive management responses. The result is consistent with the peer-induced fairness theory.

The Roles of Bank and Trade Credits: Theoretical Analysis and Empirical Evidence

Gangshu (George) Cai, Xiangfeng Chen, Zhiguo Xiao

A retailer can be capital constrained. It thus needs to borrow from a bank (bank credit), and/or from the supplier who allows delayed payment (trade credit). Gangshu Cai, Xiangfeng Chen, and Zhiguo Xiao investigate the retailer's optimal borrowing strategy under demand uncertainty and moral hazard. Supposing the retailer can borrow only one credit type, the authors find the retailer prefers trade credit, if the trade credit market is more competitive than the bank credit market; otherwise, the retailer's preference depends on the risk levels that the retailer would divert trade credit and bank credit to other risky investments. If both credit types are viable and the bank credit market is more competitive than the trade credit market, the retailer first borrows bank credit prior to trade credit, but then switches to borrowing trade credit prior to bank credit as the retailer's internal capital declines. In contrast, if the trade credit market is more competitive, the retailer borrows only trade credit. Based on a panel of 674 firms in China over the period 2001-2007, the authors show the two credits are complementary if the internal capital is substantially low, but become substitutable as the internal capital grows.

Firms' R&D Cooperation Behavior in a Supply Chain

Zehui Ge, Qiying Hu, Yusen Xia

Do you feel perplexed about how to choose an adequate partner and a proper path to a relatively high performance in a cross industry R&D alliance? Inspired by the Chinese firms' practice, Zehui Ge, Qiying Hu, and Yusen Xia investigate R&D cooperation behavior in a supply chain. The authors consider increasing spillover (enhancing knowledge sharing) and cartelization (coordinating R&D efforts to form a cartel) as two basic ways of cooperation. The main findings are as follows. First, both the upstream and downstream firms can achieve win-win via cartelization only if each firm's technological contribution level is comparable to its partner's. Second, an increasing spillover always benefits both firms without any cartel, but only benefits the firm whose technological contribution level is relatively low when under the cartel. Finally, the path of first increasing spillovers to be perfect and then forming a cartel has a higher chance of achieving the highest performance of the chain.

The Comparison of Two Vertical Outsourcing Structures under Push and Pull Contracts

Yulan Wang, Baozhuang Niu, Pengfei Guo

Yulan Wang, Baozhuang Niu, and Pengfei Guo study the outsourcing structure selection problem in a three-tier supply chain consisting of an original equipment manufacturer (OEM), a contract manufacturer (CM) and a supplier. The OEM can either control the component procurement function by itself (called a control outsourcing structure) or delegate such function to its CM (called a delegation outsourcing structure). The authors show that if a pull contract is adopted under which the OEM makes quantity commitment in advance, a control structure is preferred by both the OEM and the CM. Nevertheless if a push contract is adopted under which the OEM makes ordering decision after demand realization, the OEM prefers the control structure and the CM prefers the delegation structure. Moreover, no matter which outsourcing structure is adopted, the pull contract outperforms the push contract from the OEM's viewpoint.

Scheduling of Multi-skilled Staff Across Multiple Locations

Yong-Hong Kuo, Janny M.Y. Leung, Candace A. Yano

Motivated by customer service operations at international airport terminals, Yong-Hong Kuo, Janny Leung, and Candace Yano address a staff scheduling problem involving heterogeneous staff and tasks with multi-dimensional skill requirements. Some skills requirements (e.g., language) are associated with a *set* of tasks in the same location. Staff members need to move between tasks, and require rest and meal breaks. The authors develop an optimization methodology that enables problems of practical size to be solved quickly. A generalization of the model simultaneously optimizes task assignments and shift starting times. Using the model, the authors explore how flexibility in shift starting times, flexibility afforded by greater skill levels, and movement flexibility contribute to the quantity and quality of task coverage. From realistic examples they conclude that flexibility in shift starting times is a key factor: optimizing shift starting times within a modest interval along with the task assignments yields significant improvements in task coverage. They also find that when slack capacity is limited, there is a delicate tradeoff—which their model can optimize–between capacity loss due to moves and coverage improvements from moving staff to better-matching tasks.

Flexible-Duration Extended Warranties with Dynamic Reliability Learning

Guillermo Gallego, Ruxian Wang, Julie Ward, Ming Hu, Jose Luis Beltran

In addition to providing higher margins than hardware, post-sales services like extended warranties (EWs) help to extend the useful life of products, generate a profitable revenue stream of consumables and accessories over the product's lifetime, and provide an opportunity to improve customer loyalty and brand image. However, not many customers buy EWs, e.g., the attach rate for electronic products at market level is typically a single-digit percentage. Service providers may want to consider introducing flexible-duration EWs. A flexible EW with monthly payment and month-by-month coverage commitments can appeal to customers who are uncertain about how long they will keep the product as well as to customers who are uncertain about the product's reliability. *Guillermo Gallego, Ruxian Wang, Julie Ward, Ming Hu, and Jose Luis Beltran* focus on the two factors that make flexible EWs attractive: the customers' uncertainty in the timing of replacement and their ability to learn about product reliability. They illustrate that flexible EWs can result in increased attach rates and increased profits in a homogeneous market as well as in a heterogeneous market with multiple segments differing in various dimensions.

Service Completion Estimates for Cross-Trained Workforce Schedules under Uncertain Attendance and Demand

Fred F. Easton

Many service businesses offer a range of different products, each requiring different operator skills to produce. Such firms often rely on cross-trained workers to attenuate the effects of uncertain demand and employee attendance. However, their flexibility is only available while they are on duty. Unfortunately, most existing workforce scheduling models for cross-trained employees overlook the joint variability in attendance and demand, resulting in overstated schedule performance estimates. Fred Easton proposes estimating service completions from the convolution of the probability distributions for employee attendance and service demand, and using the resulting expectations to direct workforce scheduling decisions toward profit-maximizing solutions. Comparing workforce scheduling decisions for hundreds of different hypothetical service environments, the author finds that the solutions based on convolution estimates are more profitable, favor proportionately more cross-trained workers and fewer specialists, and tend to recommend significantly larger (smaller) staffing levels for services under high (low) contribution margins than workforce schedules developed with independent expectations of employee attendance and service demand. Although the proposed metric's computational burden increases rapidly with the number of different services and the number of workgroups producing them, the author's results also suggest promising strategies to reduce that effort without significantly degrading the quality of the model's recommended solutions.

Optimal Uniform Pricing Strategy of a Service Firm When Facing Two Classes of Customers

Wenhui Zhou, Xiuli Chao, Xiting Gong

It is common that different customers value the same service and their waiting times differently. In addition, in many applications service firms can only set a uniform price that must apply to all customers. In such scenarios, how should a service firm take into account the heterogeneity of customers to make optimal uniform pricing decision? Wenhui Zhou, Xiuli Chao, and Xiting Gong investigate this problem using a queueing system with two classes of customers. They find that, different ranges of system parameters will lead to dramatically different optimal classes of customers to serve. Thus, to make an informed decision, it is crucial for the firm to understand its potential market base and the characteristics of its customers. They also find that the optimal price is in general not monotonic with respect to the potential market sizes, because their changes may lead to a major shift in the firm's decision on which customer class to serve. However, unless such a shift occurs, the optimal price is weakly decreasing in the potential market sizes. Their findings shed light on service firms' optimal uniform pricing decisions when facing heterogeneous customers.

Pricing and Operational Performance in Discretionary Services

Chunyang Tong, Sampath Rajagopalan

A unique aspect of discretionary services such as web design is that service value increases with service time and the valuation varies across customers. Management of such discretionary services poses interesting challenges because while customers value additional service time, longer service times can degrade service responsiveness and result in fewer customers being served and lower revenues. Chunyang Tong and Sampath Rajagopalan investigate the performance of the optimal pricing scheme as well as commonly used pricing schemes (fixed fee, time-based pricing and two-part tariff) for such services. Service time is an outcome of the pricing scheme adopted and counter to conventional wisdom in the queuing literature that greater variance in service times degrades system performance, the firm can benefit from a more heterogeneous valuation among customers. Both fixed fee and time-based schemes do well relative to the optimal pricing scheme in terms of revenue and they can exhibit better performance than the optimal pricing scheme on some important system metrics such as service value provided and utilization. Two-part tariff can do as well as the optimal scheme in terms of revenue performance.

Interruption and Forgetting in Knowledge-Intensive Service Environments

Craig M. Froehle, Denise L. White

Ubiquitous connectivity and pervasive communications technologies have made interruptions an increasingly common barrier to productivity for knowledge workers like physicians, educators, researchers, and other "white-collar" professionals. While the effects of interruptions on productivity have been extensively studied in manufacturing, less is known about their effects on services. Many knowledge-intensive tasks require gathering information upon which to act, such as a lawyer reviewing the details of a case before outlining a legal course action. When interrupted, the task-specific information gathered in the worker's mind starts being forgotten at some rate; the longer the interruption, the more is forgotten. Once the interruption is dismissed, this forgetting effect means that the effort remaining to complete the original task is greater than it had been prior to the interruption. Craig M. Froehle and Denise White examine the effect of interruption-induced forgetting on productivity by studying and modeling a radiology services setting. They find that interruptions can significantly reduce the output of the system, even at modest rates of forgetting, suggesting that models of knowledge workers should explicitly consider these forgetting effects. In practice, sequestering one of the workers – protecting her from being interrupted – can restore much of the system's productivity while still being responsive to interrupting service requests.