Implications of Strategic Consumer Behavior in Operations Management
Robert Swinney, Stanford GSB
OIT Faculty Seminar, October 13, 2010

This talk will discuss some consequences of forward-looking (or strategic) consumer behavior in operations management. I will present an overview of the problems I am working on in this area, focusing on two specific recent papers, one focusing on inventory and supply chain management, and the other focusing on product design and procurement:


A fast fashion system combines quick response production capabilities with enhanced product design capabilities, to both design “hot” products that capture the latest consumer trends and exploit minimal production leadtimes to match supply with uncertain demand. We develop a model of such a system, and compare its performance to three alternative systems: quick response-only systems, enhanced design-only systems, and traditional systems (which lack both enhanced design and quick response capabilities). In particular, we focus on the impact of each of the four systems on “strategic” or forward-looking consumer purchasing behavior, i.e., the intentional delay in purchasing an item at the full price to obtain it during an end-of-season clearance. We find that enhanced design helps to mitigate strategic behavior by offering consumers a product they value more, making them less willing to risk waiting for a clearance sale and possibly experiencing a stock-out. Quick response mitigates strategic behavior through a different mechanism: by better matching supply to demand, it reduces the chance of a clearance sale. Most importantly, we find that while it is possible for quick response and enhanced design to be either complements or substitutes, the complementarity effect tends to dominate. Hence, when both quick response and enhanced design are combined in a fast fashion system, the firm typically enjoys a greater incremental increase in profit than the sum of the increases resulting from employing either system in isolation. Furthermore, complementarity is strongest when customers are very strategic. We conclude that fast fashion systems can be of significant value, particularly when consumers exhibit strategic behavior.

“Product Quality Choice and Inventory Risk with Strategic Consumers,” with Sang-Hyun Kim (Yale)

Firms developing new products must often make a trade-off between production costs and product quality: higher quality products are more valued by consumers, but also more costly to manufacture. We examine this trade-off in the context of uncertain demand and forward-looking consumers that anticipate that a product will be reduced in price over time. A firm chooses the quality (which must remain fixed for the entire selling horizon), price (dynamically set in two periods), and a production quantity for a product with random market size; consumers choose whether to buy the product at its full price or wait for a potential price reduction. We demonstrate that, generally speaking, demand uncertainty leads to lower product quality while strategic consumer behavior leads to higher product quality. The latter result stands in contrast to the case of deterministic demand, in which forward-looking customer behavior typically leads to lower product quality. Hence, we show that the simultaneous consideration of a product design decision (i.e., quality) and an operational decision (i.e., inventory when demand is uncertain) can reverse existing results.