Chapter 16

Revenue Management with Capacity Controls

The operations manager constantly struggles with a firm's supply process to better match it to demand. In fact, most of our discussion in this text has concentrated on how the supply process can be better organized, structured, and managed to make it more productive and responsive. But if supply is so inflexible that it cannot be adjusted to meet demand, then another approach is needed. In particular, this chapter takes the opposite approach: Instead of matching supply to demand, we explore how demand can be adjusted to match supply. The various techniques for achieving this objective are collected under the umbrella term *revenue management,* which is also referred to as *yield management.* Broadly speaking, revenue management is the science of maximizing the revenue earned from a fixed supply.

This chapter discusses two specific techniques within revenue management: *protection levels/booking limits* and *overbooking.* (We will see that protection levels and booking limits are really two different concepts that implement the same technique.) Those techniques perform revenue management via capacity controls; that is, they adjust over time the availability of capacity. Prices are taken as fixed, so protection levels and overbooking attempt to maximize revenue without changing prices.

We begin the chapter with a brief introduction to revenue management: its history, its success stories, and some "margin arithmetic" to explain why it can be so powerful. We next illustrate the application of protection levels and overbooking to an example from the hotel industry. The final sections discuss the implementation of these techniques in practice and summarize insights.

16.1 Revenue Management and Margin Arithmetic

Revenue management techniques were first developed in the airline industry in the early 1980s. Because each flown segment is a perishable asset (once a plane leaves the gate, there are no additional opportunities to earn additional revenue on that particular flight), the airlines wanted to maximize the revenue they earned on each flight, which is all the more important given the razor-thin profit margins in the industry. For example, a typical airline operates with about 73 percent of its seats filled but needs to fill about 70 percent of its seats to breakeven: on a 100-seat aircraft, the difference between making and losing money is measured by a handful of passengers.