

Assemble-to-Order, Make-to-Order, and Quick Response with Reactive Capacity¹

A firm facing the newsvendor problem can manage, but not avoid, the possibility of a demand–supply mismatch: order too much and inventory is left over at the end of the season, but order too little and incur the opportunity cost of lost sales. The firm finds itself in this situation because it commits to its entire supply before demand occurs. This mode of operation is often called *make-to-stock* because all items enter finished goods inventory (stock) before they are demanded. In other words, with make-to-stock, the identity of an item’s eventual owner is not known when production of the item is initiated.

To reduce the demand–supply mismatches associated with make-to-stock, a firm could attempt to delay at least some production until better demand information is learned. For example, a firm could choose to begin producing an item only when it receives a firm order from a customer. This mode of operation is often called *make-to-order* or *assemble-to-order*. Dell Computer is probably the most well-known and most successful company to have implemented the assemble-to-order model.

Make-to-stock and make-to-order are two extremes in the sense that with one all production begins well before demand is received, whereas with the other production begins only after demand is known. Between any two extremes there also must be an intermediate option. Suppose the lead time to receive an order is short relative to the length of the selling season. A firm then orders some inventory before the selling season starts so that some product is on hand at the beginning of the season. After observing early season sales, the firm then submits a second order that is received well before the end of the season (due to the short lead time). In this situation, the firm should make a conservative initial order and use the second order to strategically respond to initial season sales: Slow-selling products are not replenished midseason, thereby reducing leftover inventory, while fast-selling products are replenished, thereby reducing lost sales.

The capability to place multiple orders during a selling season is an integral part of *Quick Response*. Quick Response is a set of practices designed to reduce the cost of mismatches

¹ The data in this chapter have been modified to protect confidentiality.