

on hand) and in only a few periods is negative (i. e. backlog). The light dots denote the actual backorders.

Here, it can also be observed that in some periods multiple orders are simultaneously outstanding. In many inventory models it is assumed for this case, that the replenishment orders arrive in the same sequence in which they were released (no order crossing). This condition is always met if the replenishment lead time is deterministic and there is only a single supplier. In this case all orders older than the replenishment lead time ℓ , i. e. orders that were released earlier than period $(t - \ell)$, have arrived by period t and are part of the net inventory. With random lead times or multiple suppliers, however, orders may cross.

B.3.2 Modeling of the Time Axis

For the analysis of an inventory policy the modeling of the time axis is important in several respects. Not only does the length of the review period (review interval) matter, but also assumptions concerning the structure of the customer order arrivals must be made.

The **review period** is the length of the interval between two consecutive inventory reviews. In the literature, periodic and continuous review are discussed. With **periodic review** the inventory records are updated in regular intervals, say, at the end of each day or every two weeks. Depletions of the inventory which happen within a review period are only recognized at the next review instant with a more or less large delay. It is only then possible to react on an unusually great demand through the placement of a replenishment order. The additional stock-out risk that results from this delay must be absorbed through an increased safety inventory.

The same situation as with periodic review arises when the demand per customer order is greater than unity. If a customer purchases, say, ten units of a product, then the inventory records are only updated after the removal of the *complete demand*. Even if immediately after that event a replenishment order is released, it is possible that the inventory may have fallen far below the minimum level used as the criterion for the placement of a replenishment order. This may be observed even in a super market when a customer buys three jars of yoghurt of the same flavor. Once he has removed the jars from the shelf, he walks around the market to select further products. By the time he arrives at the cash counter where the product removal is registered by a scanner, the inventory may have already fallen below the reorder point. The additional stock-out risk which results from this delay must also be taken into account in the determination of the control parameters of some inventory policies.