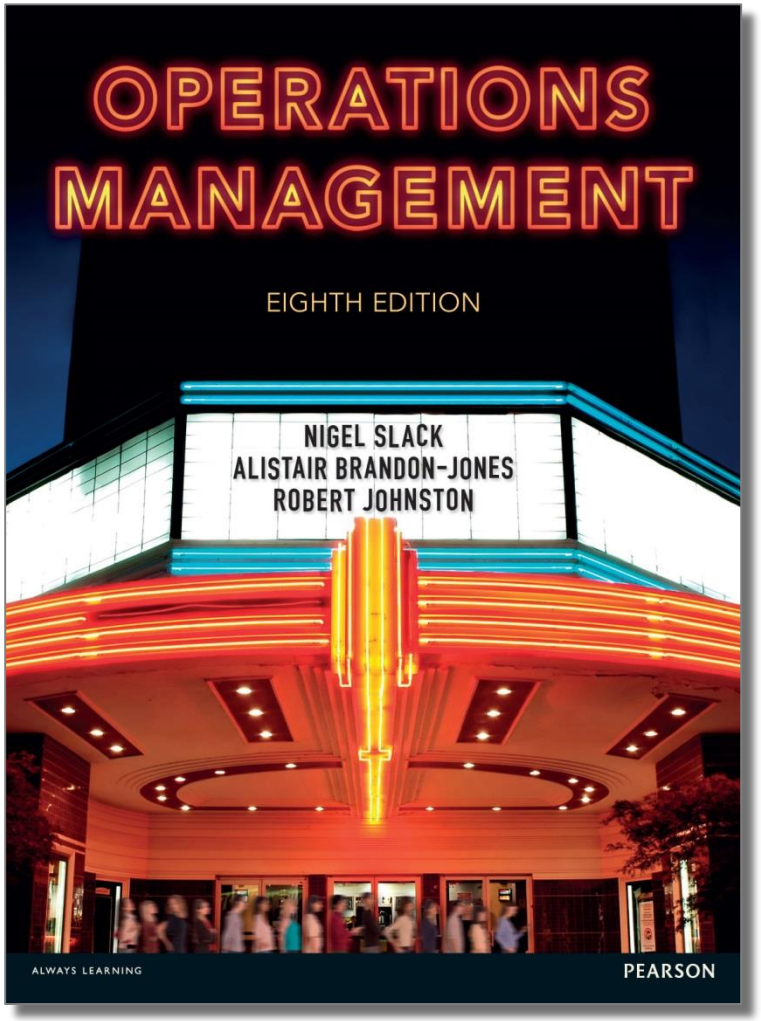
OPERATIONS MANAGEMENT

8th edition



Chapter 13

Inventory management

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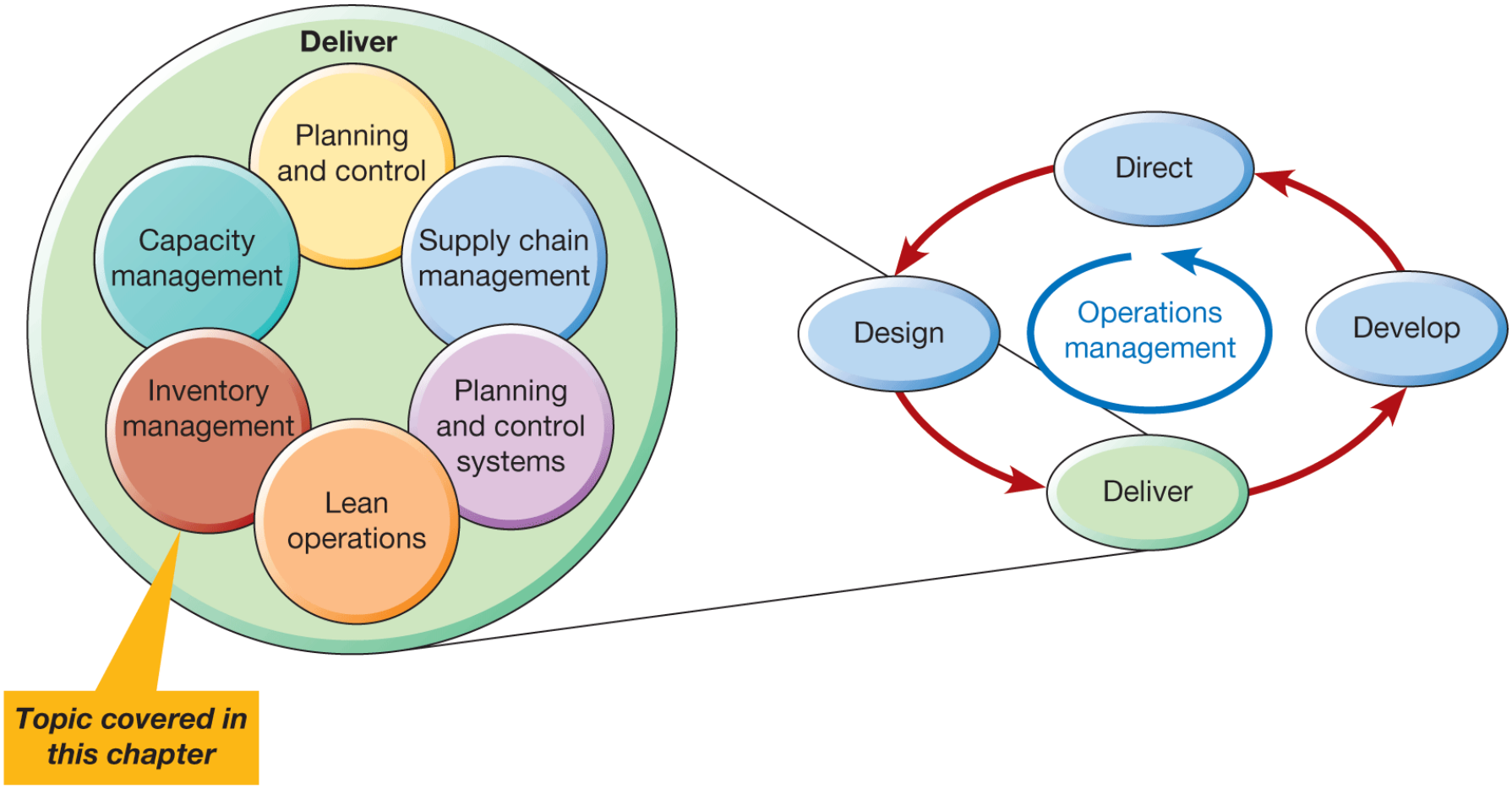
Figure 13.1
This chapter examines inventory management

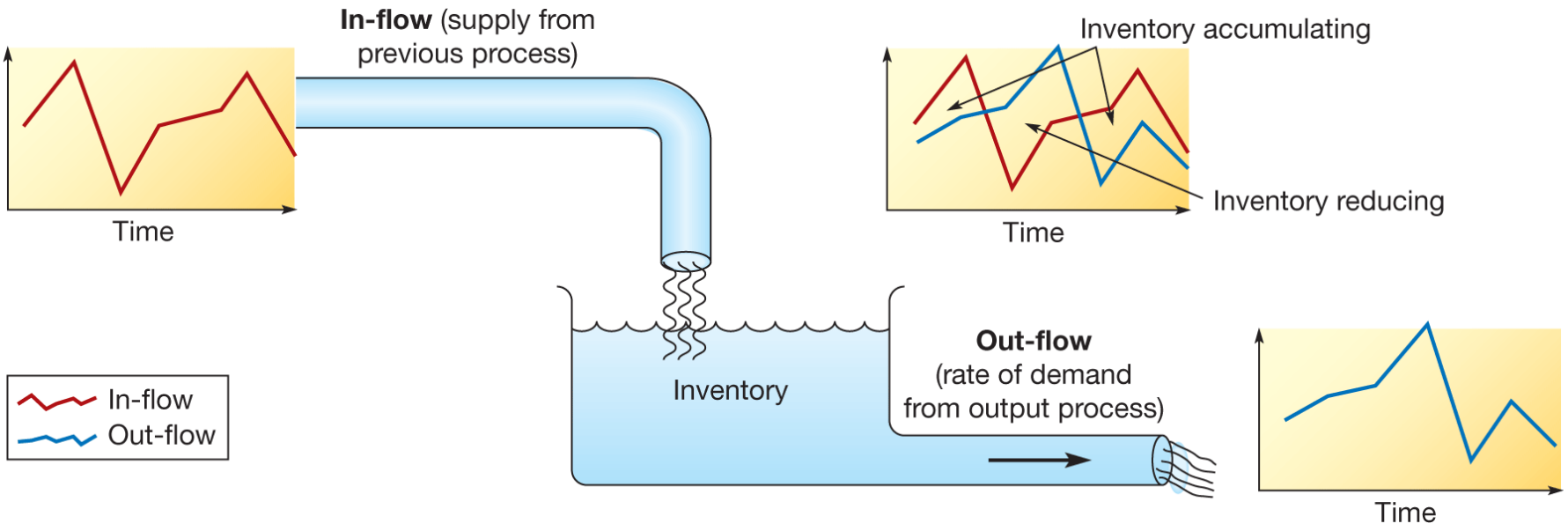


Key questions

In Chapter 13 – Inventory management – Slack et al. identify the following key questions…

- What is inventory?
- Why should there be any inventory?
- How much to order? The volume decision
- When to place an order? The timing decision
- How can inventory be controlled?

Inventory management



Process, operation or supply network	'Inventories'		
	Physical inventories 	Queues of customers 	Information in databases 
Hotel	Food items, drinks, toilet items	At check-in and checkout	Customer details, loyalty card holders, catering suppliers
Hospital	Dressings, disposable instruments, blood	Patients on a waiting list, patients in bed waiting for surgery, patients in recovery wards	Patient medical records
Credit card application process	Blank cards, form letters	Customers waiting on the phone	Customer's credit and personal information
Computer manufacturer	Components for assembly, packaging materials, finished computers ready for sale	Customers waiting for delivery of their computer	Customers' details, supplier information

Table 13.2
Some reasons to avoid inventories

	'Inventories'		
	Physical inventories 	Queues of customers 	Digital information in databases 
Cost	Ties up working capital and there could be high administrative and insurance costs	Primarily time cost to the customer, i.e. wastes customer's time	Cost of set-up, access, update and maintenance
Space	Requires storage space	Requires areas for waiting or phone lines for held calls	Requires memory capacity. May require secure and/or special environment
Quality	May deteriorate over time, become damaged or obsolete	May upset customers if they have to wait too long. May lose customers	Data may be corrupted or lost or become obsolete
Operational/ organizational	May hide problems (see the chapter on 'lean' – Chapter 15)	May put undue pressure on the staff and so quality is compromised for throughput	Databases need constant management; access control, updating and security

Table 13.3
Some ways in which physical inventory may be reduced (1 of 2)

Reason for holding inventory	Example	How inventory could be reduced
As an insurance against uncertainty	Safety stocks for when demand or supply is not perfectly predictable	• Improve demand forecasting • Tighten supply, e.g. through service level penalties
To counteract a lack of flexibility	Cycle stock to maintain supply when other products are being made	• Increase flexibility of processes, e.g. by reducing changeover times (*see* Chapter 15) • Using parallel processes producing output simultaneously (*see* Chapter 6)
To take advantage of relatively short-term opportunities	Suppliers offer 'time-limited' special low-cost offers	• Persuade suppliers to adopt 'everyday low prices' (*see* Chapter 12)

Table 13.3
Some ways in which physical inventory may be reduced (2 of 2)

Reason for holding inventory	Example	How inventory could be reduced
To anticipate future demands	Build up stocks in low-demand periods for use in high-demand periods	• Increase volume flexibility by moving towards a 'chase demand' plan (*see* Chapter 11)
To reduce overall costs	Purchasing a batch of products in order to save delivery and administration costs	• Reduce administration costs through purchasing process efficiency gains • Investigate alternative delivery channel that reduce transport costs
To fill the processing 'pipeline'	Items being delivered to customer	• Reduce process time between customer request and dispatch of items • Reduce throughput time in the downstream supply chain (*see* Chapter 12)

Figure 13.4
Inventory management has a significant effect on return on assets

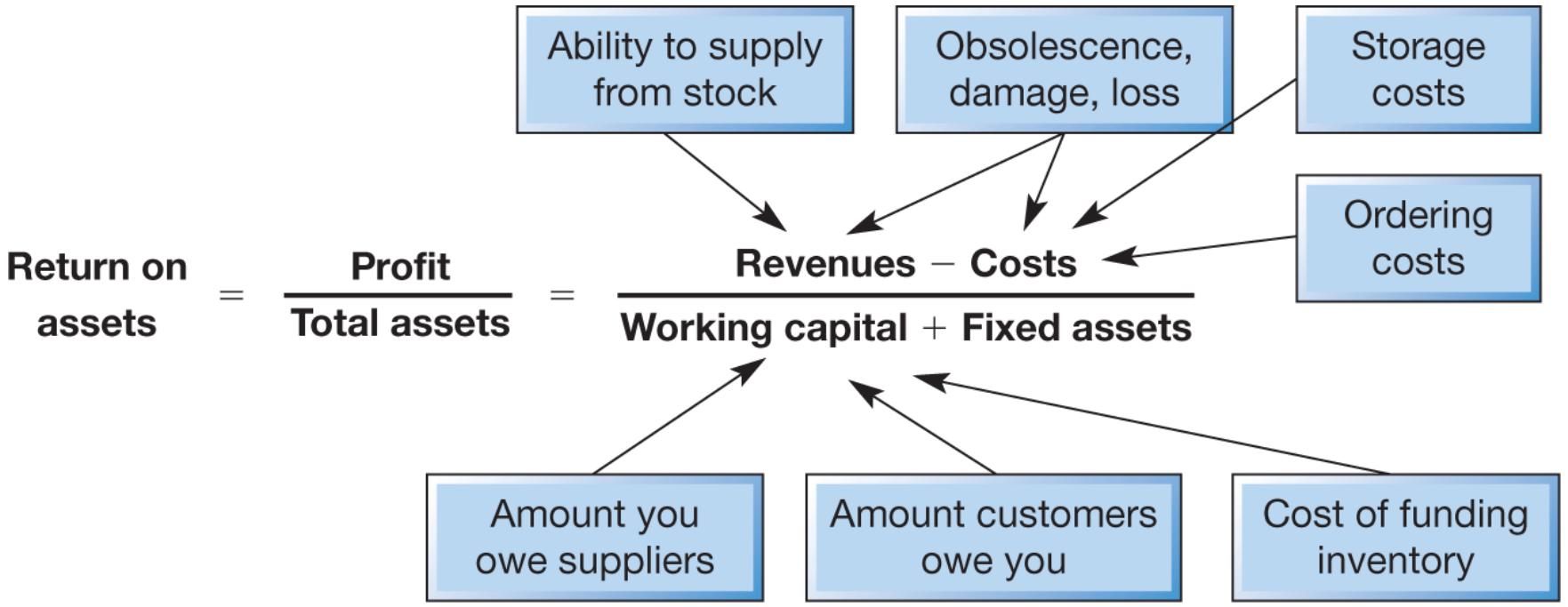


Figure 13.5
Inventory profiles chart the variation in inventory level

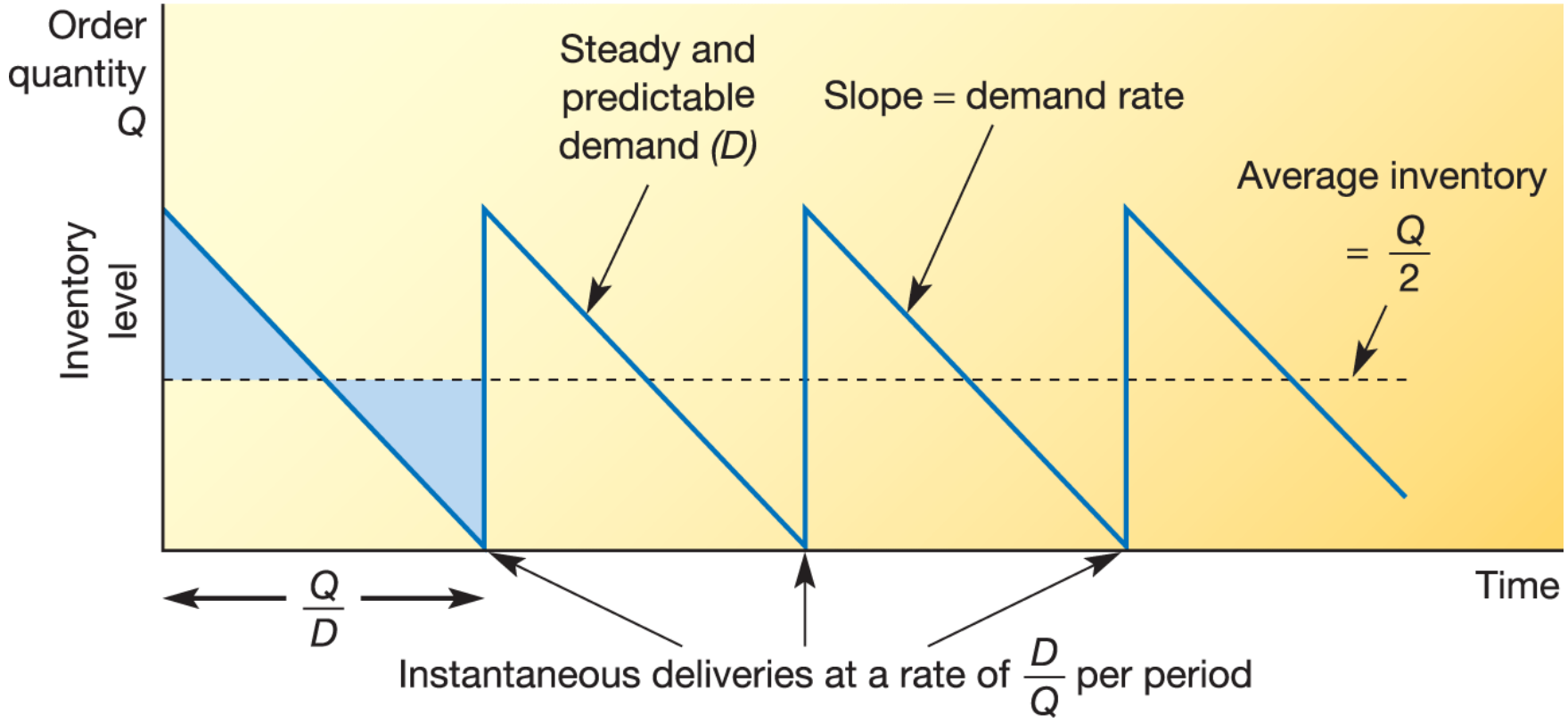
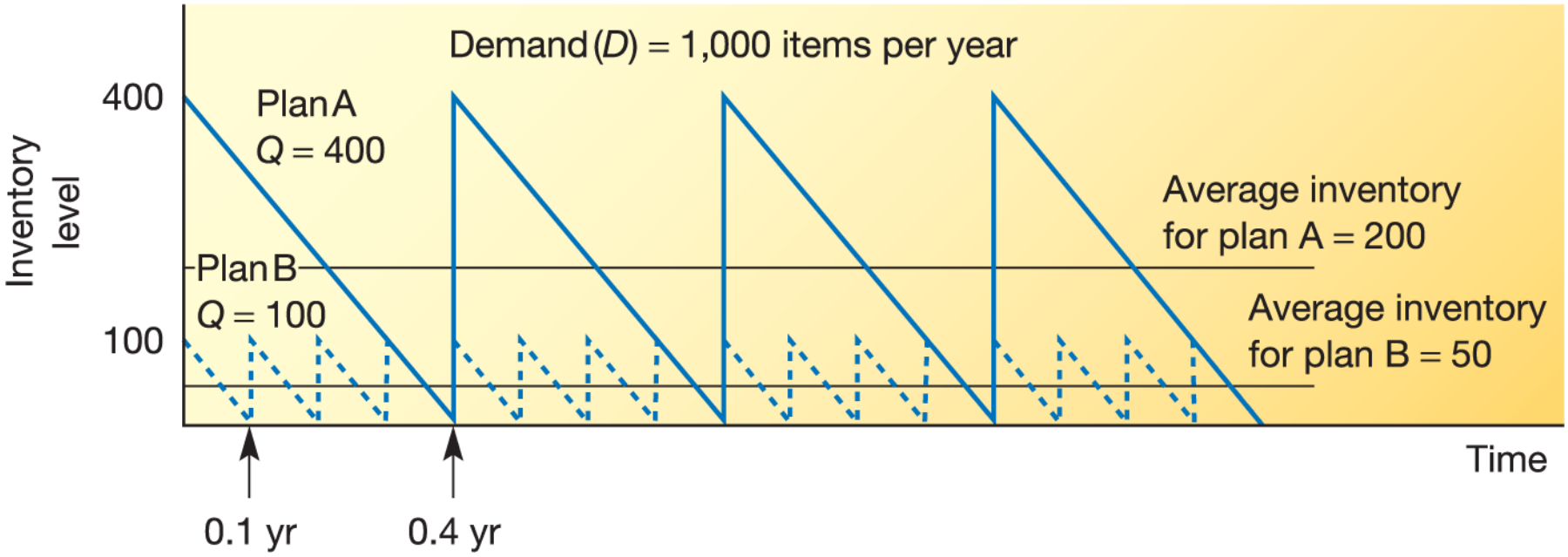


Figure 13.6
Two alternative inventory plans with different order quantities (*Q*)



Traditional view of inventory-related costs

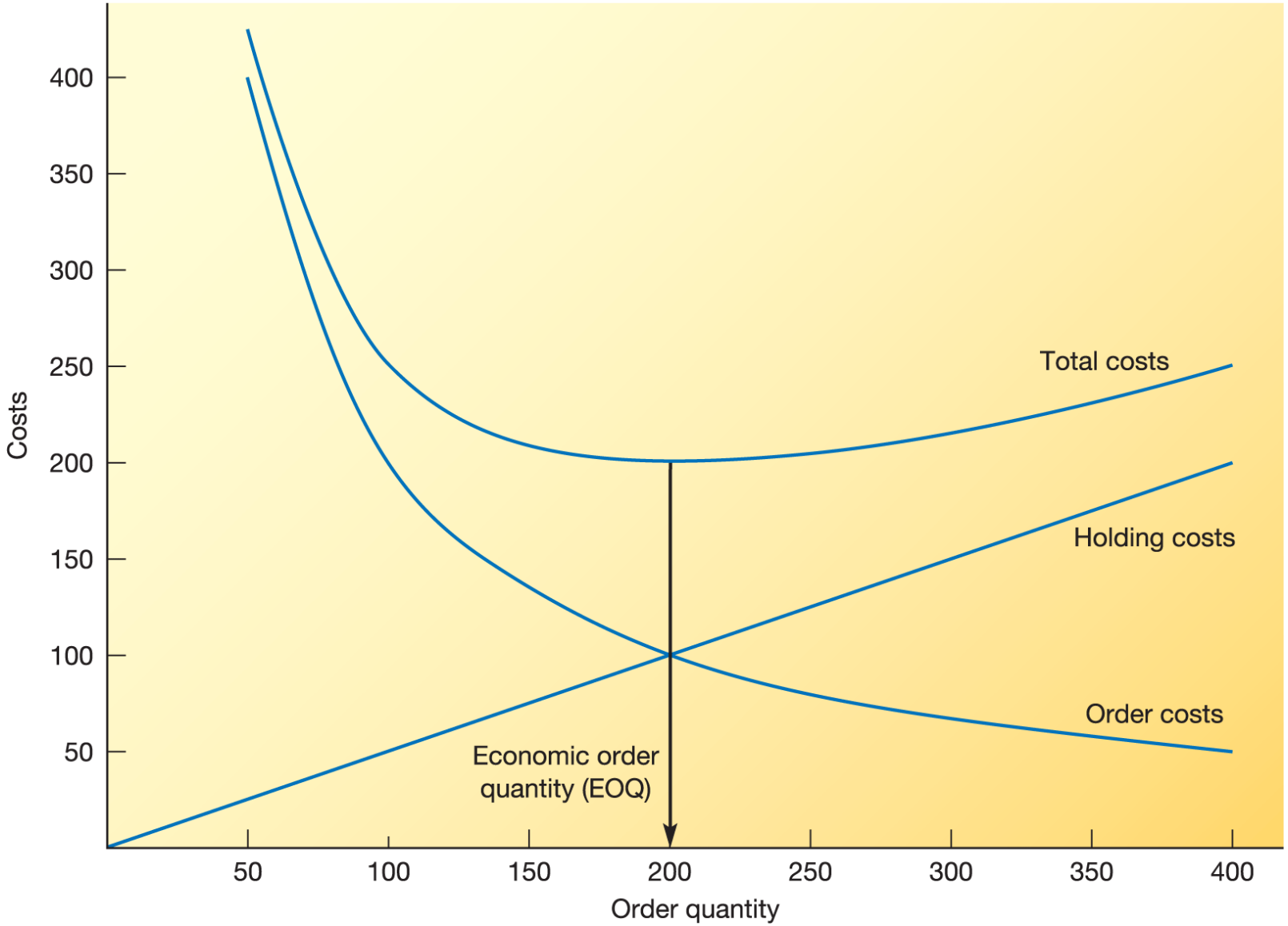


Figure 13.3
Cycle inventory in a bakery

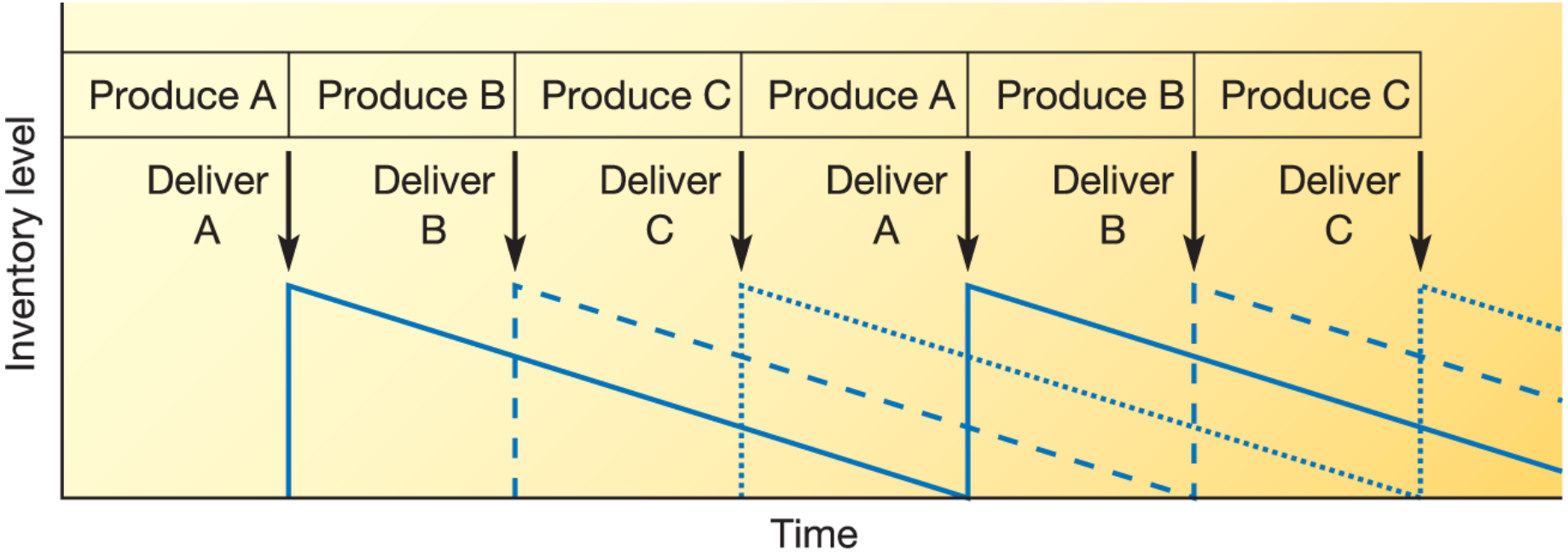


Figure 13.8
Inventory profile for gradual replacement of inventory

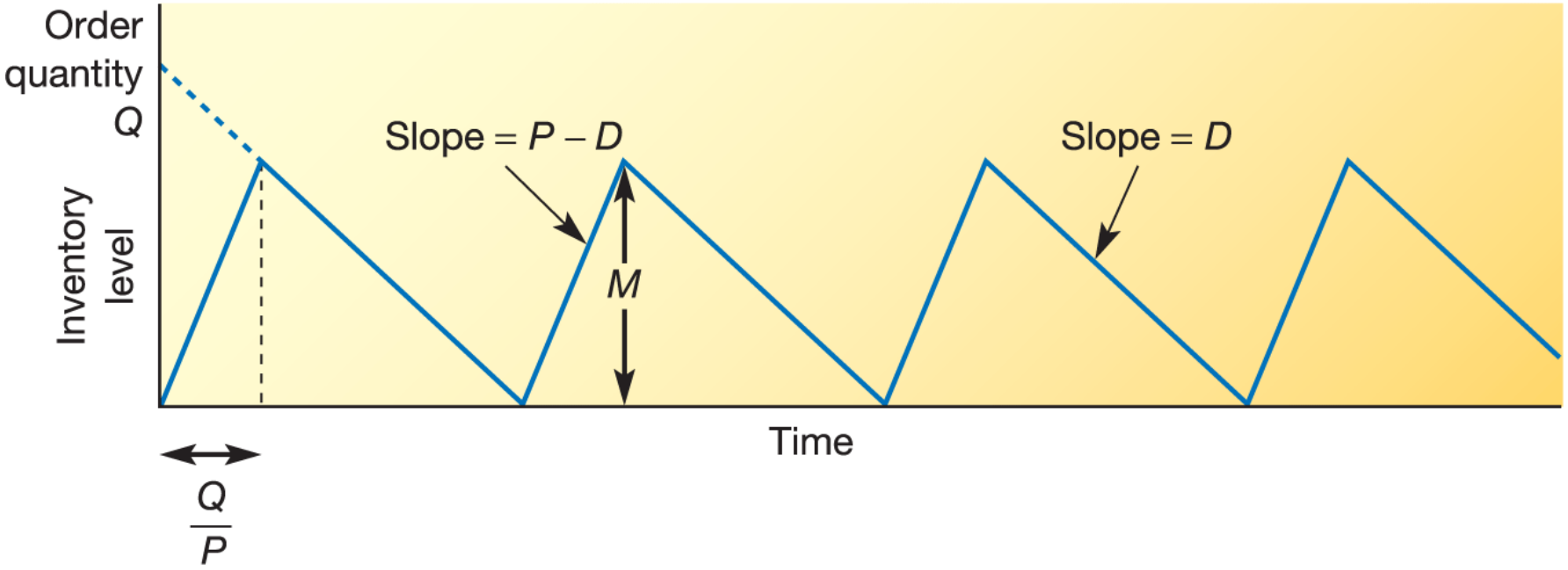


Figure 13.10
Re-order level (ROL) and re-order point (ROP) are derived from the order lead time and demand rate

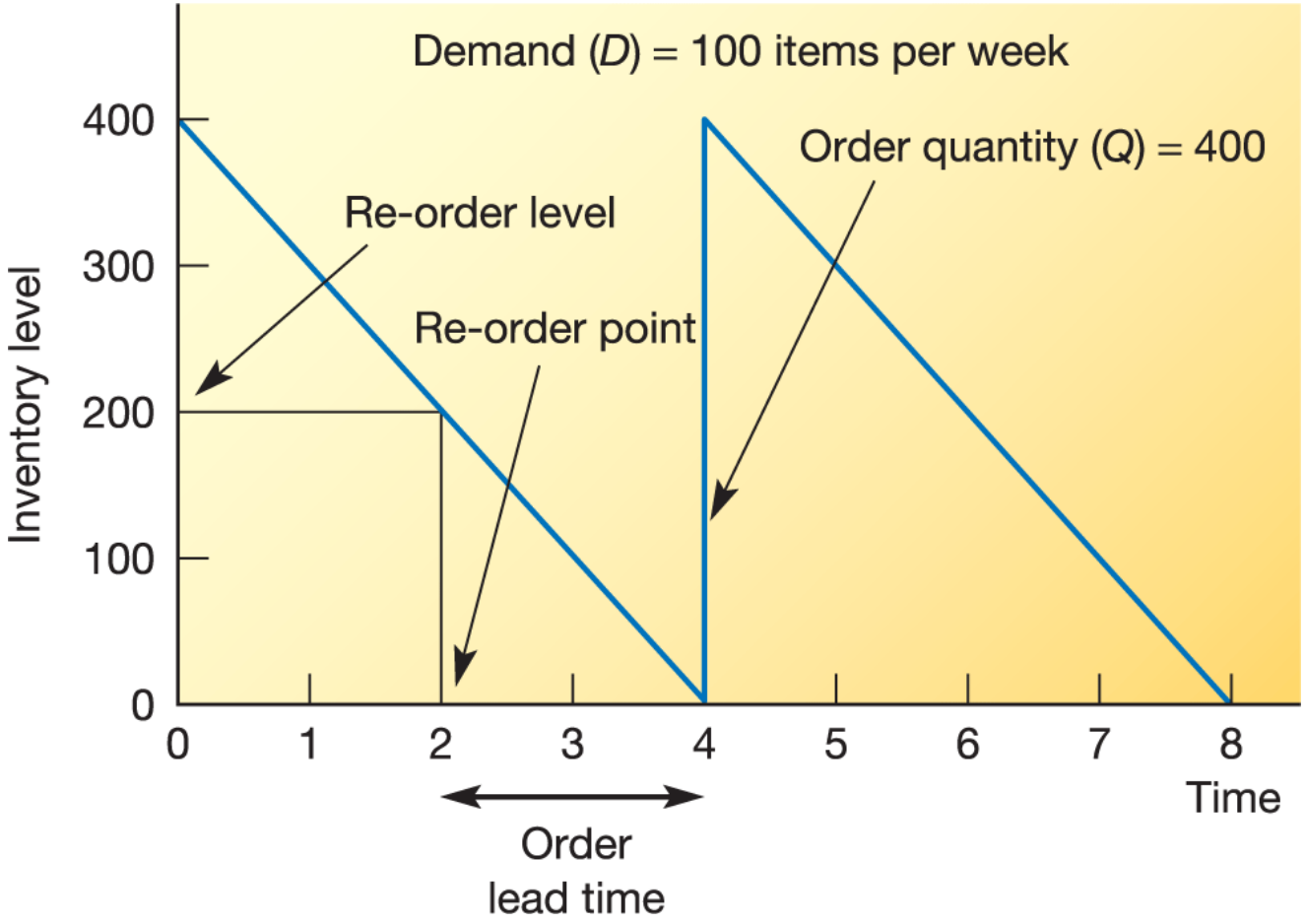


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Figure 13.11
Safety stock (*s*) *helps to avoid* stockouts when demand and/or order lead time are uncertain

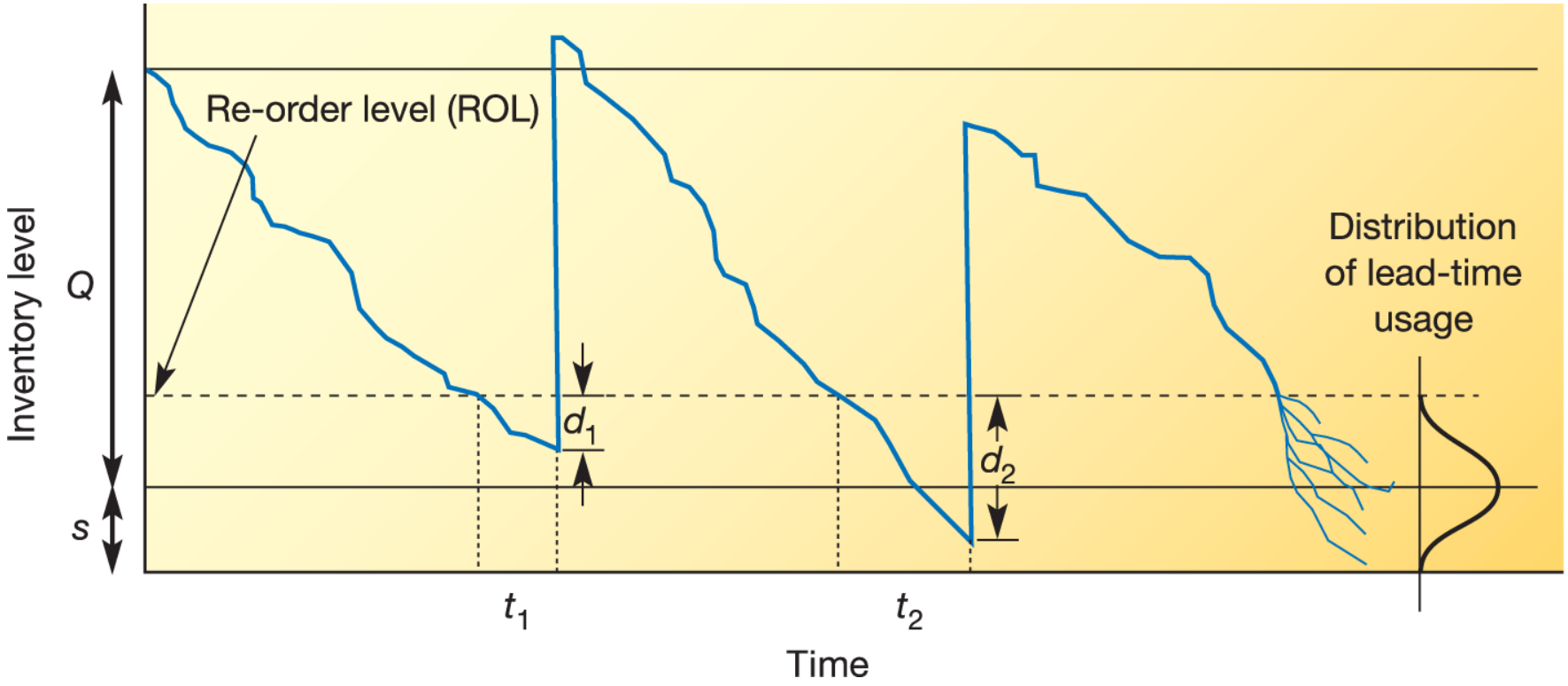

Figure 13.12
The probability distributions for order lead time and demand rate combine to give the lead-time usage distribution

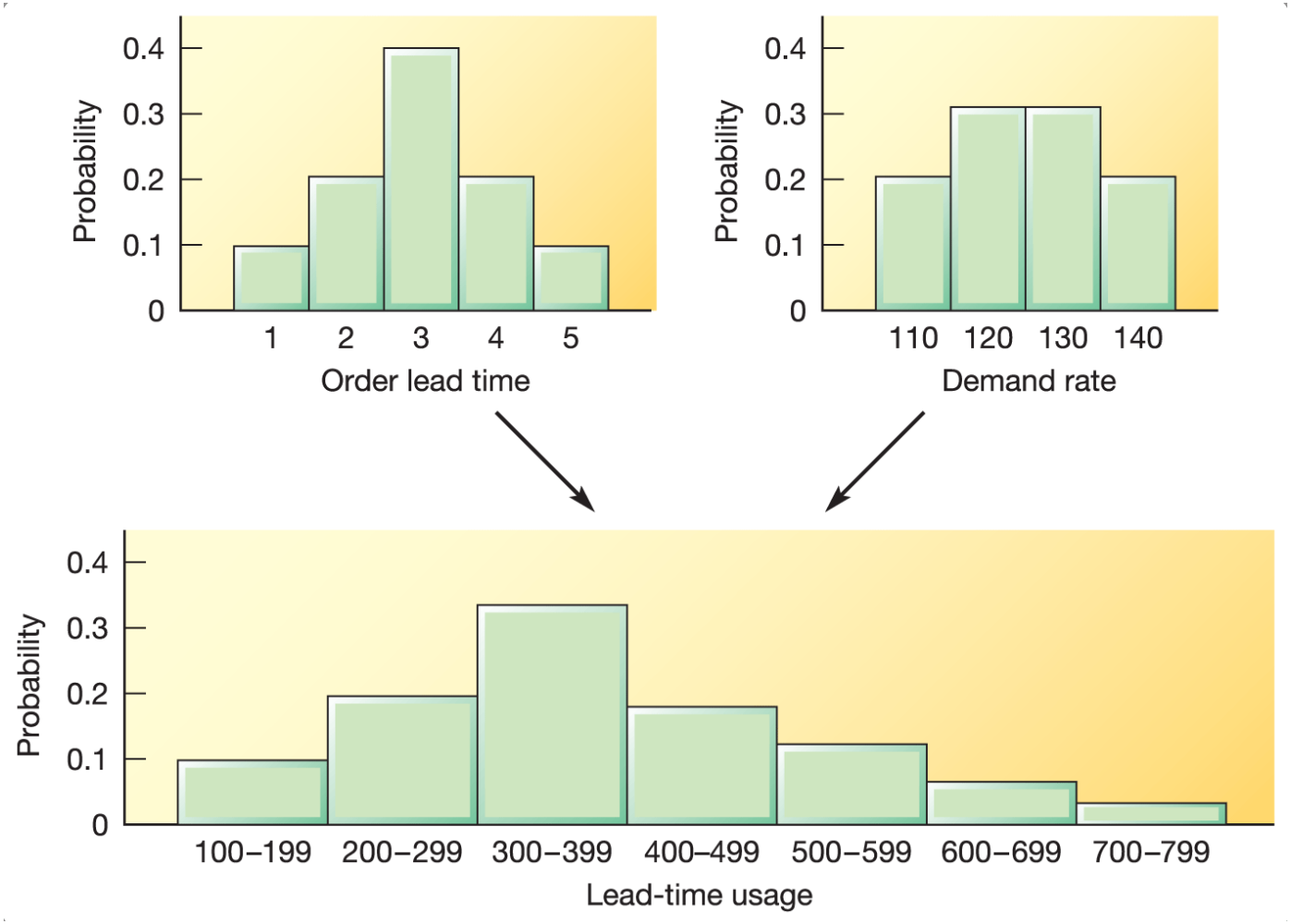

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Figure 13.13
A periodic review approach to order timing with probabilistic demand and lead time

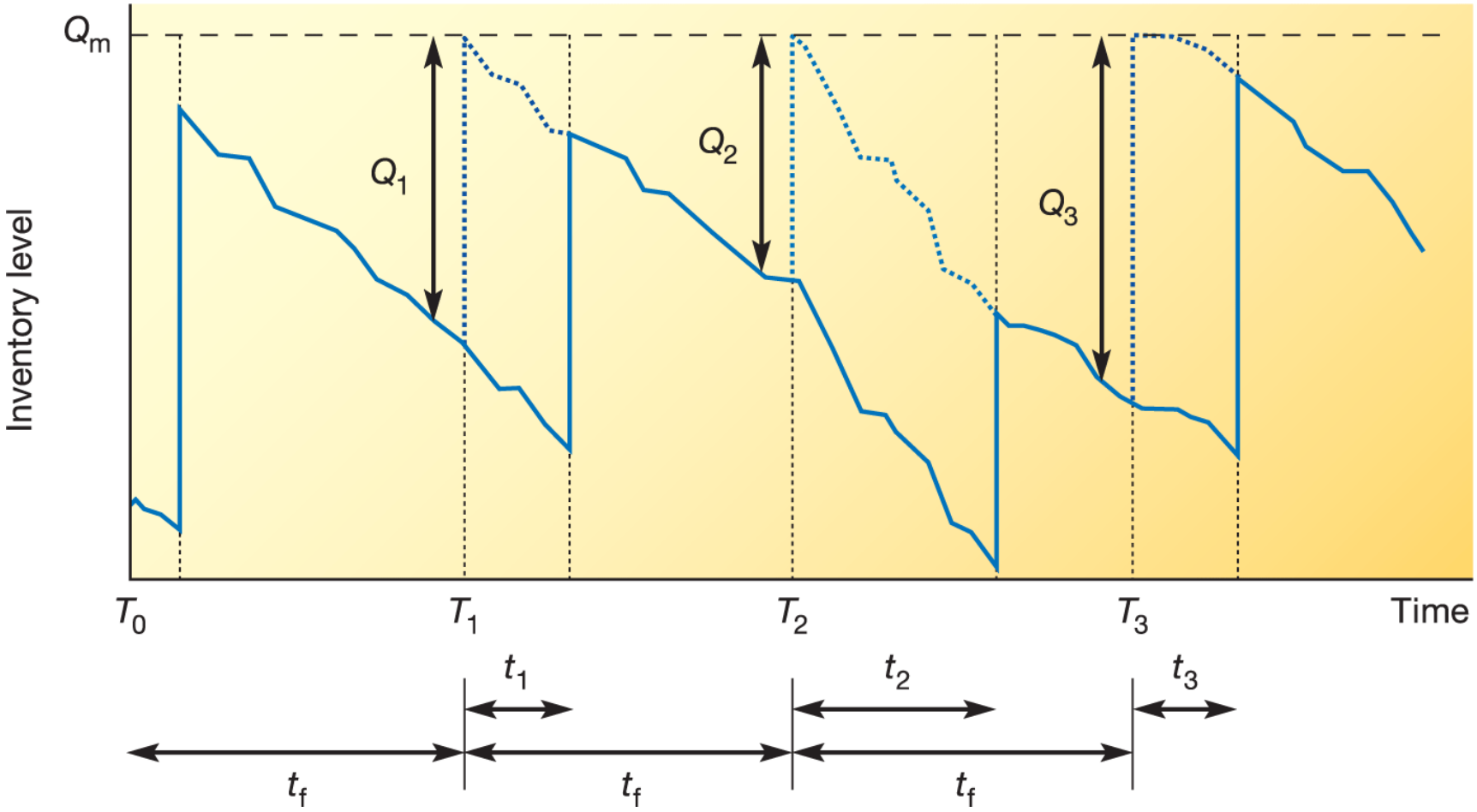
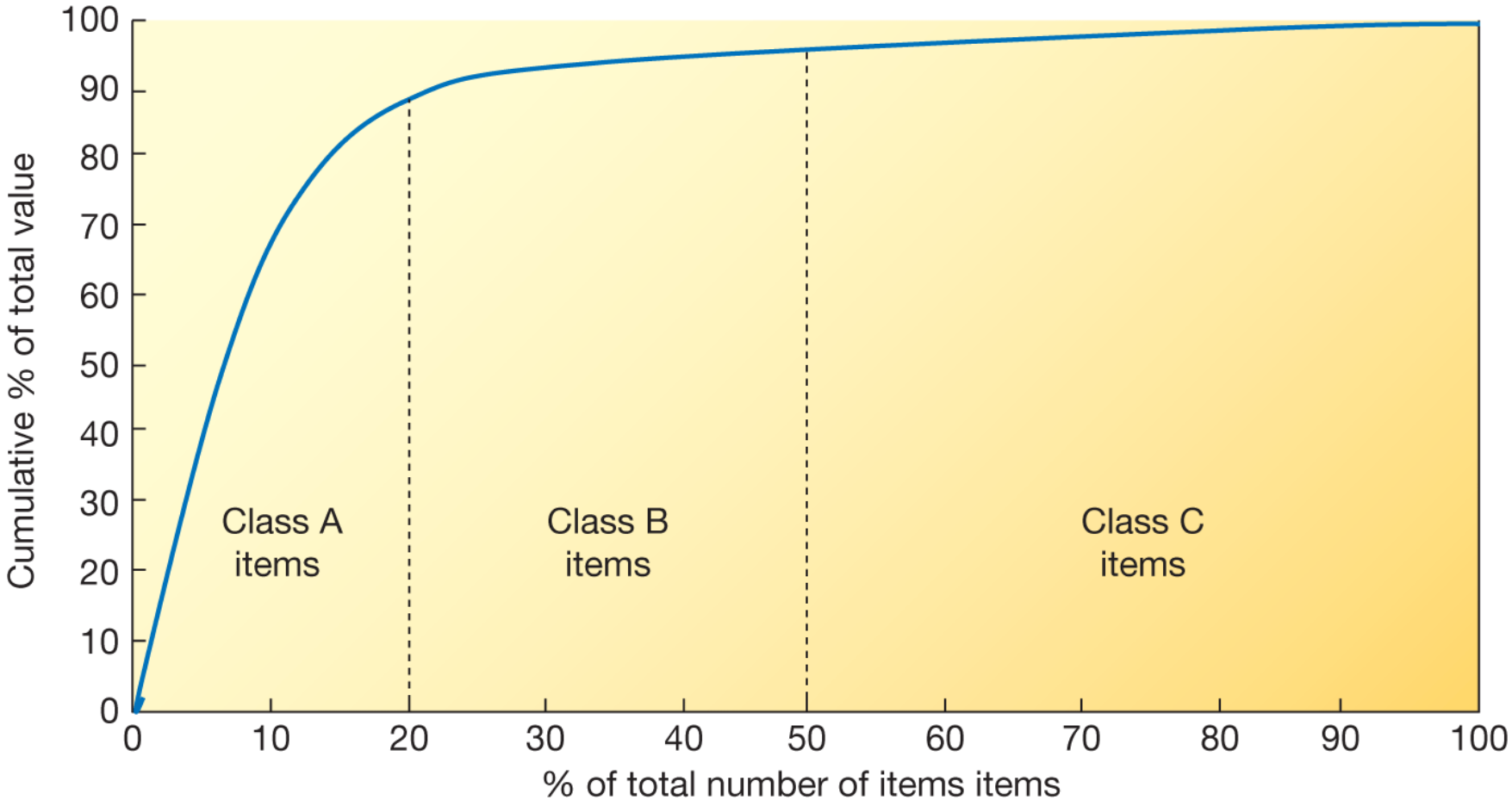


Figure 13.15
Pareto curve for items in a warehouse



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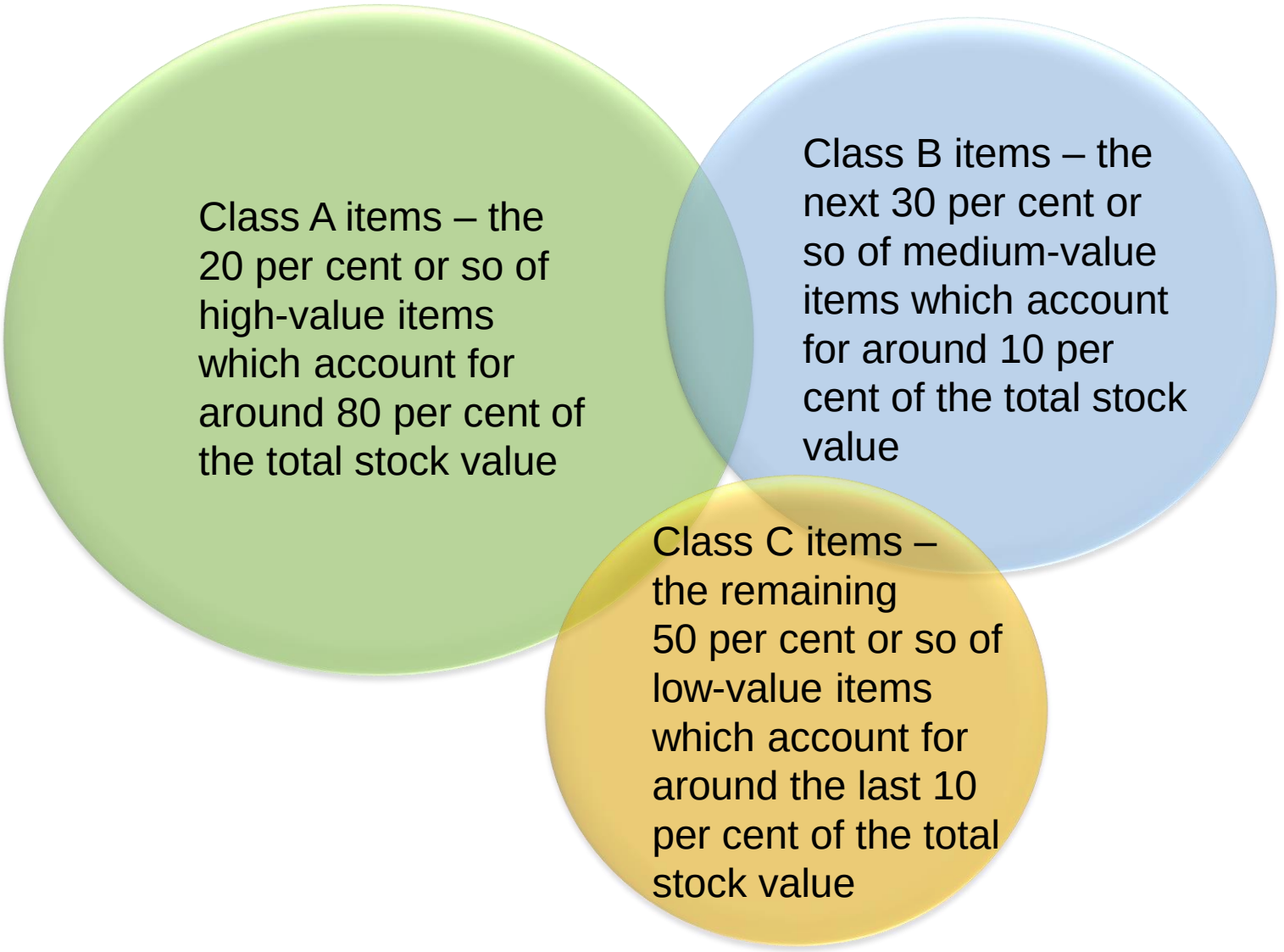

Criticism of the EOQ approach

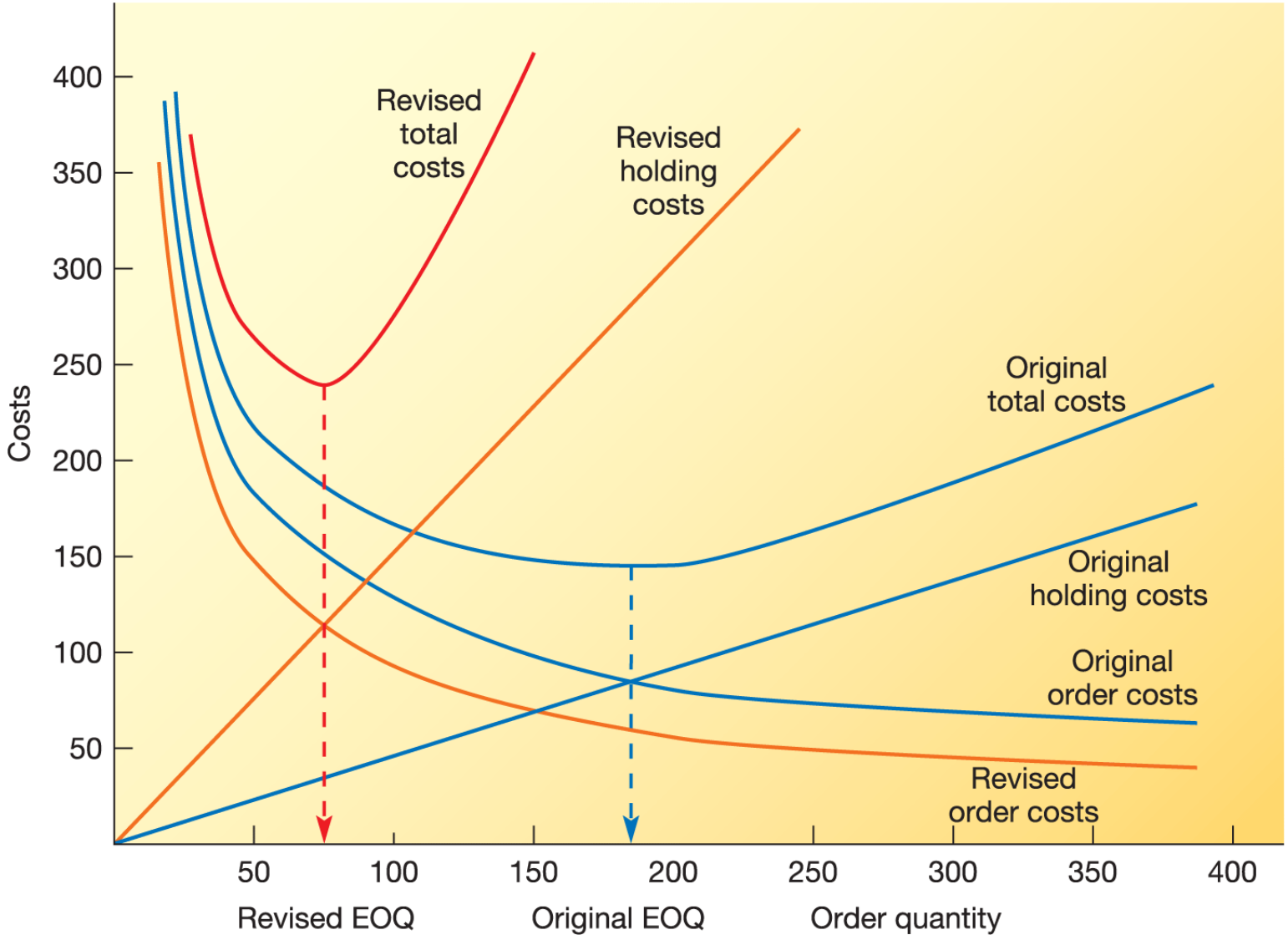

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Figure 13.14
The two-bin and three-bin systems of re-ordering