

Cambridge

AS - Level

Business studies

CODE: (9609)

Unit 04- Chapter 24

Inventory management



Introduction

All businesses hold inventories of some kind. Banks and insurance companies will hold supplies of stationery and retailers have goods on display and in their warehouses.

Manufacturing businesses will hold inventories in three distinct forms:

1 Raw materials and components: These will have been purchased from outside suppliers. They will be held in storage until they are used in the production process. These inventories can be drawn upon at any time and allow the firm to meet increases in demand by increasing the rate of production quickly.

2 Work in progress: At any one time the production process will be converting raw materials and components into finished goods. During this process there will be 'work in progress' and for some firms, such as building and construction businesses, this will be the main form of inventories held.

3 Finished goods: Having been through the complete production process, goods may then be held in storage until sold and despatched to the customer. These inventories can be displayed to potential customers and increase the chances of sales. They are also held to cope with sudden, unpredicted increases in demand so that customers can be satisfied without delay.

Inventory management

Why do inventories need to be managed effectively? Without effective management several serious problems can arise for firms:

- There might be insufficient inventories to meet unforeseen changes in demand
- Out-of-date inventories might be held if an appropriate rotation system is not used, for example for fresh foods or for fast-changing technological products, such as tablet computers.
- Inventory wastage might occur due to mishandling or incorrect storage conditions.
- Very high inventory levels may result in excessive storage costs and a high opportunity cost for the capital tied up.
- Poor management of the supplies purchasing function can result in late deliveries, low discounts from suppliers or too large a delivery for the warehouse to cope with.

Inventory-holding costs

These include:

- Opportunity cost: Working capital tied up in goods in storage could be put to another use. It might be used to pay off loans, buy new equipment or pay off suppliers early to gain an early-payment discount. The capital could be left in the bank to earn interest. The most favourable alternative use of the capital tied up in inventories is called its 'opportunity cost'.
- Storage costs: Inventories have to be held in secure warehouses. They often require special conditions, such as refrigeration. Employees will be needed to guard and transport the goods. Insurance of inventories is recommended in case they are stolen or damaged by,

■ **Risk of wastage and obsolescence:** If inventories are not used or sold as rapidly as expected, then there is an increasing danger of goods deteriorating or becoming outdated. This will lower the value of such inventories.

Costs of not holding enough inventories

Does the existence of these holding costs mean that firms should carry as few inventories as possible? This may well be the case, if the business is able to successfully operate the just-in-time system that is discussed below.

These costs are often called 'inventory-out' costs:

■ **Lost sales:** If a firm is unable to supply customers from goods held in storage, then sales could be lost to firms that hold higher inventory levels. This might lead to future lost orders too. In purchasing contracts between businesses, it is common for there to be a penalty-payment clause requiring the supplier to pay compensation if delivery dates cannot be met on time.

■ **Idle production resources:** If inventories of raw materials and components run out, then production will have to stop. This will leave expensive equipment idle and labour with nothing to do. The costs of lost output and wasted resources could be considerable.

■ **Special orders could be expensive:** If an urgent order is given to a supplier to deliver additional materials due to shortages, then extra costs might be incurred in administration of the order and in special delivery charges.

■ **Small order quantities:** Keeping low inventory levels may mean only ordering goods and supplies in small quantities. The larger the size of each delivery, the higher will be the average level of inventories held. By ordering in small quantities, the firm may lose out on bulk discounts, and transport costs could be higher as so many more deliveries have to be made.

Optimum order size

Purchasing inventories is not as easy as it sounds. The purchasing manager must ensure that supplies of the right quality are delivered at the right time in sufficient quantities to allow smooth and unbroken production

KEY TERM

Economic order quantity: the optimum or least-cost quantity of stock to re-order taking into account delivery costs and stock-holding costs.

The '**economic order quantity**' (EOQ) can be calculated for each product but at AS/A Level it is sufficient to just know the forces that influence the size of this optimum order size. These can be summarised in Figure 24.2

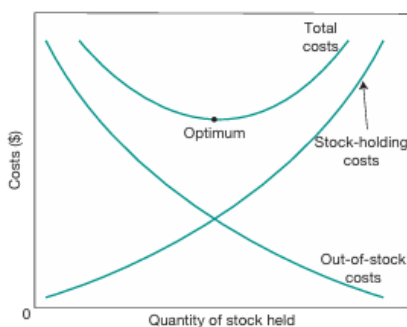


Figure 24.1 Total inventory-holding costs

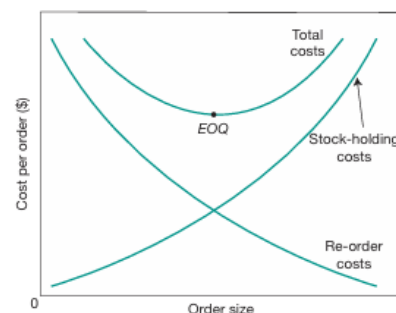


Figure 24.2 Factors influencing the economic order quantity

Controlling inventory levels – a graphical approach

Inventory-control charts or graphs are widely used to monitor a firm's inventory position. These charts record, over time, the numbers of goods held, inventory deliveries, buffer levels and maximum inventory

■ **Buffer inventories:** The greater the degree of uncertainty about delivery times or production levels, then the higher this buffer level will have to be. Also, the greater the cost involved in shutting production down and restarting, the greater the potential cost savings from holding high buffer levels of inventories.

■ **Maximum inventory level:** This may be limited by space or by the financial costs of holding even higher inventories. One way to calculate this maximum level is to add the EOQ of each component to the 'buffer' level for that item.

■ **Re-order quantity:** This will be influenced by the economic order quantity concept

■ **Lead time:** The longer this period of time, then the higher will have to be the reorder stock level. The less reliable suppliers are, the greater the buffer stock level might have to be

■ **Re-order stock level:** This is the level of stocks that will trigger a new order to be sent to the supplier. In practice, it is very common for computers to be used to keep a record of every sale and every delivery of stock

KEY TERM

Buffer inventories: the minimum inventory level that should be held to ensure that production could still take place should a delay in delivery occur or should production rates increase.

KEY TERM

Re-order quantity: the number of units ordered each time.

KEY TERM

Lead time: the normal time taken between ordering new stocks and their delivery.

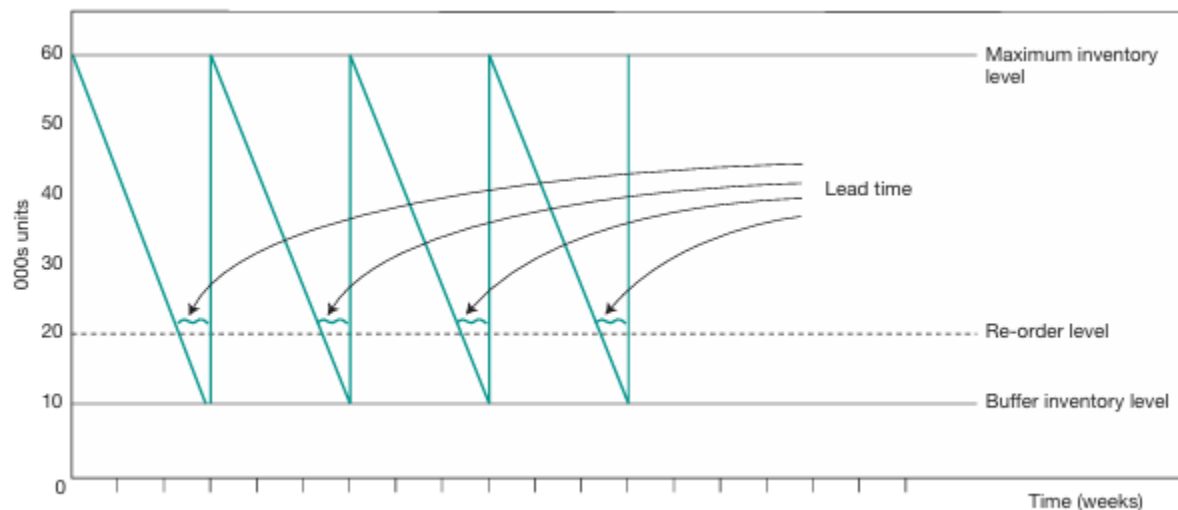


Figure 24.3 A typical inventory-control chart

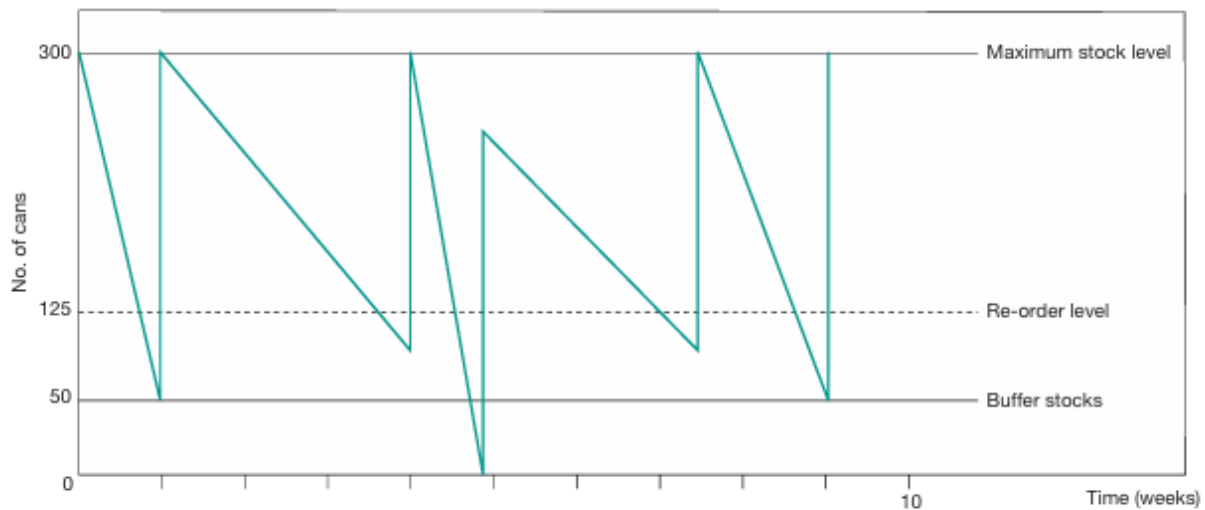


Figure 24.4 Inventory-control chart for Popsquash soft drinks

Just-in-time (JIT) inventory control

JIT requires that no buffer inventories are held, components arrive just as they are needed on the production line and finished goods are delivered to customers as soon as they are completed. The principle is easy to understand, but much less easy to put into practice.

- **Relationships with suppliers have to be excellent:** Suppliers must be prepared and able to supply fresh supplies at very short notice – short lead time
- **Production staff must be multiskilled and prepared to change jobs at short notice:** There is no point in a worker continuing to produce the same item all the time if this leads to inventories building up
- **Equipment and machinery must be flexible:** Old fashioned manufacturing equipment tended to be designed to produce one range of very similar products. It might have taken days to adapt it to making other types of products. This equipment would be most unsuitable for JIT-based systems. The machinery would have to produce large batches of one type of component before being converted to making another item.
- **Accurate demand forecasts will make JIT a much more successful policy:** If it is very difficult for a firm to predict likely future sales levels, then keeping zero inventories of materials, parts and finished goods could be a very risky strategy
- **The latest IT equipment will allow JIT to be more successful:** Accurate data-based records of sales, sales trends, reorder levels and so on will allow very low or zero inventories to be held. Similarly, if contact with suppliers can be set up with the latest electronic data exchanges, then automatic and immediate ordering can take place, when it is recorded that more components will shortly be required.

KEY TERM

Just-in-time: this inventory-control method aims to avoid holding inventories by requiring supplies to arrive just as they are needed in production and completed products are produced to order.

■ **Excellent employee–employer relationships are essential for JIT to operate smoothly:** Any industrial-relations problem could lead to a break in supplies and the entire production system could grind to a halt. It is no coincidence that many of the businesses that have adopted JIT in Japan and in Europe have a no-strike deal with the major trade unions.

■ **Quality must be everyone’s priority:** As there are no spare inventories to fall back on, it is essential that each component and product must be right first time. Any poor-quality goods that cannot be used will mean that a customer will not receive goods on time. The advantages and disadvantages of JIT are summarised in Table 24.1

Advantages	Disadvantages
<ul style="list-style-type: none"> ■ Capital invested in inventory is reduced and the opportunity cost of inventory holding is reduced. ■ Costs of storage and inventory holding are reduced. Space released from holding of inventories can be used for a more productive purpose. ■ Much less chance of inventories becoming outdated or obsolescent. Fewer goods held in storage also reduces the risk of damage or wastage. ■ The greater flexibility that the system demands leads to quicker response times to changes in consumer demand or tastes. ■ The multiskilled and adaptable staff required for JIT to work may gain from improved motivation. 	<ul style="list-style-type: none"> ■ Any failure to receive supplies of materials or components in time caused by, for example, a strike at the supplier’s factory, transport problems or IT failure will lead to expensive production delays. ■ Delivery costs will increase as frequent small deliveries are an essential feature of JIT. ■ Order-administration costs may rise because so many small orders need to be processed. ■ There could a reduction in the bulk discounts offered by suppliers because each order is likely to be very small. ■ The reputation of the business depends significantly on outside factors such as the reliability of supplying firms.

Table 24.1 The advantages and disadvantages of JIT inventory control

JIT evaluation

JIT requires a very different organisational culture to that of other inventory-control systems that are often referred to as ‘JIC’ – holding inventories ‘just in case’ they might be needed.

JIT may not be suitable for all firms at all times:

- There may be limits to the application of JIT if the costs resulting from production being halted when supplies do not arrive far exceed the costs of holding buffer inventories of key components.
- Small firms could argue that the expensive IT systems needed to operate JIT effectively cannot be justified by the potential cost savings
- In addition, rising global inflation makes holding inventories of raw materials more beneficial as it may be cheaper to buy a large quantity now than smaller quantities in the future when prices have risen. Similarly, higher oil prices will make frequent and small deliveries of materials and components more expensive.

Revision questions

Q1 Case Study 82: Great Gifts (GG) 9707/22/M/J/14/Q2 (a) (ii)

Explain the following terms: JIT. [3]

Q2 Case Study 94: Affordable Builders (AB) 9707/23/M/J/15/Q2 (d)

Explain the following terms: inventory. [3]

Q3 Case Study 95: Enterprise Electricals (EE) 9707/23/M/J/15/Q1 (b)

Explain the following terms: inventory control. [3]

Q4 Case Study 129: Jones Sticky Labels (JS) 9609/23/O/N/17/Q1 (a) (i)

Explain the term 'lead time' (line 11). [3]

Q5 Case Study 147: Wood's Logs (WL) 9609/21/M/J/19/Q1 (d)

Explain one benefit for WL of holding inventory. [3]

Q6 Case Study 16: (Tech New) 9707/02/M/J/07/Q2 (b)

(i) Using the information in table 2, explain one method of stock control that TN could use to improve its management of stock. [6]

(ii) Answer only requires one method of stock control but does require use of Table. [2]

Q7 Case Study 27: (Medlqulp) 9707/21/O/N/09/Q1 (c)

Analyze the possible usefulness of JIT (just in time) to MQ. [8]

Q8 Case Study 43: Loader Lorries (LL) 9707/21/M/J/11/Q1 (a) (i)

Using the information in figures 1 and 2, analyze the differences between the two approaches to managing inventories (stock). [8]

Q9 Case Study 45: Turbo Tractors (TT) 9707/22/M/J/11/Q1 (d)

Using table 2 and other information, analyze the usefulness of just-in-time inventory (stock) control to TT. [8]

Q10 Case Study 47: Quality Coaches (QC) 9707/23/M/J/11/Q1 (c)

Using the information in table 2, analyze ways in which QC could reduce inventory (stock) costs. [8]

Q11 Case Study 31: (Taylor's Tables) 9707/21/M/J/10/Q (a) (i)

Apart from the need for training, discuss the difficulties that TT should consider if it decided to produce furniture for schools. [10]

Q12 Case Study 89: Classic Clothes (CC) 9707/23/O/N/14/Q1 (d)

Discuss the advantages and disadvantages to CC from introducing just in time. [10]

Q13 Case Study 92: Tangerine Tablets (TT) 9707/21/M/J/15/Q2 (c)

Using table 4, recommend improvements to TT's inventory control. Justify your answer. [10]

Q14 Case Study 141: Clothing Line (CL) 9609/22/O/N/18/Q1 (c)

Discuss which stakeholders of CL are likely to be most affected by the introduction of just-in- time inventory (JIT) management. [11]