

All courses are prepared using many books and websites. Mainly:

“knowledge is found to be shared, but with respecting its sources”

COURSE 8: Inventory Management

What Is Inventory Management?

Inventory management refers to the process of ordering, storing, and using a company's inventory. These include the management of raw materials, components, and finished products, as well as warehousing and processing such items.

For companies with complex supply chains and manufacturing processes, balancing the risks of inventory gluts and shortages is especially difficult. To achieve these balances, firms have developed two major methods for inventory management: just-in-time and materials requirement planning: just-in-time (JIT) and materials requirement planning (MRP).

How Inventory Management Works

A company's [inventory](#) is one of its most valuable assets. In retail, manufacturing, food service, and other inventory-intensive sectors, a company's inputs and finished products are the core of its business. A shortage of inventory when and where it's needed can be extremely detrimental.

At the same time, inventory can be thought of as a liability (if not in an accounting sense). A large inventory carries the risk of spoilage, theft, damage, or shifts in demand. Inventory must be insured, and if it is not sold in time it may have to be disposed of at clearance prices—or simply destroyed.

For these reasons, inventory management is important for businesses of any size. Knowing when to restock certain items, what amounts to purchase or produce, what price to pay—as well as [when to sell](#) and at what price—can easily become complex decisions. Small businesses will often keep track of stock manually and determine the reorder points and quantities using Excel formulas. Larger businesses will use specialized enterprise resource planning (ERP) software. The largest corporations use highly customized software as a service (SaaS) applications.

Appropriate inventory management strategies vary depending on the industry. An oil depot is able to store large amounts of inventory for extended periods of time, allowing it to wait for demand to pick up. While storing oil is expensive and risky—a [fire in the UK in 2005](#) led to millions of pounds in damage and fines—there is no risk that the inventory will spoil or go out of style. For businesses dealing in perishable goods or products for which demand is extremely time-sensitive—2019 calendars or fast-fashion items, for example—sitting on inventory is not an option, and misjudging the timing or quantities of orders can be costly.

KEY TAKEAWAYS

- Inventory management refers to the process of ordering, storing, and using a company's inventory. These include the management of raw materials, components, and finished products as well as warehousing and processing such items.
- For companies with complex supply chains and manufacturing processes, balancing the risks of inventory gluts and shortages is especially difficult.
- To achieve these balances, firms have developed two major methods for inventory management: just-in-time and materials requirement planning: just-in-time (JIT) and materials requirement planning (MRP).

Inventory Accounting

Inventory represents a [current asset](#) since a company typically intends to sell its finished goods within a short amount of time, typically a year. Inventory has to be physically counted or measured before it can be put on a balance sheet. Companies typically maintain sophisticated inventory management systems capable of tracking real-time inventory levels. Inventory is accounted for using one of three methods: first-in-first-out (FIFO) costing; last-in-first-out (LIFO) costing; or weighted-average costing.

An inventory account typically consists of four separate categories:

1. [Raw materials](#)
2. Work in process
3. Finished goods
4. Merchandise

Raw materials represent various materials a company purchases for its production process. These materials must undergo significant work before a company can transform them into a finished good ready for sale.

Works-in-process represent raw materials in the process of being transformed into a finished product. Finished goods are completed products readily available for sale to a company's customers. Merchandise represents finished goods a company buys from a supplier for future resale.

Inventory Management Methods

Depending on the type of business or product being analyzed, a company will use various inventory management methods. Some of these management methods include just-in-time (JIT) manufacturing, materials requirement planning (MRP), economic order quantity (EOQ), and days sales of inventory (DSI).

Just-in-Time Management

Just-in-time (JIT) manufacturing originated in Japan in the 1960s and 1970s; Toyota Motor Corp. ([TM](#)) contributed the most to its development. The method allows companies to save significant amounts of money and reduce waste by keeping only the inventory they need to produce and sell products. This approach reduces storage and insurance costs, as well as the cost of liquidating or discarding excess inventory.

JIT inventory management can be risky. If demand unexpectedly spikes, the manufacturer may not be able to source the inventory it needs to meet that demand, damaging its reputation with customers and driving business toward competitors. Even the smallest delays can be problematic; if a key input does not arrive "just in time," a bottleneck can result.

Materials Requirement Planning

The [materials requirement planning \(MRP\)](#) inventory management method is sales-forecast dependent, meaning that manufacturers must have accurate sales records to enable accurate planning of inventory needs and to communicate those needs with materials suppliers in a timely manner. For example, a ski manufacturer using an MRP inventory system might ensure that materials such as plastic, fiberglass, wood, and aluminum are in stock based on forecasted orders. Inability to accurately forecast sales and plan inventory acquisitions results in a manufacturer's inability to fulfill orders.

Economic Order Quantity

The economic order quantity (EOQ) model is used in inventory management by calculating the number of units a company should add to its inventory with each batch order to reduce the total costs of its inventory while assuming constant consumer demand. The costs of inventory in the model include holding and setup costs.

The EOQ model seeks to ensure that the right amount of inventory is ordered per batch so a company does not have to make orders too frequently and there is not an excess of inventory sitting on hand. It assumes that there is a trade-off between inventory holding costs and inventory setup costs, and total inventory costs are minimized when both setup costs and holding costs are minimized.

Days Sales of Inventory

[Days sales of inventory \(DSI\)](#) is a financial ratio that indicates the average time in days that a company takes to turn its inventory, including goods that are a work in progress, into sales.

DSI is also known as the average age of inventory, days inventory outstanding (DIO), days in inventory (DII), days sales *in* inventory or days inventory and is interpreted in multiple ways. Indicating the liquidity of the inventory, the figure represents how many days a company's current stock of inventory will last. Generally, a lower DSI is preferred as it indicates a shorter duration to clear off the inventory, though the average DSI varies from one industry to another.

Qualitative Analysis of Inventory

There are other methods used to analyze a company's inventory. If a company frequently switches its method of inventory accounting without reasonable justification, it is likely its management is trying to paint a brighter picture of its business than what is true. The SEC requires public companies to disclose [LIFO reserve](#) that can make inventories under LIFO costing comparable to FIFO costing.

Frequent inventory write-offs can indicate a company's issues with selling its finished goods or inventory obsolescence. This can also raise red flags with a company's ability to stay competitive and manufacture products that appeal to consumers going forward.