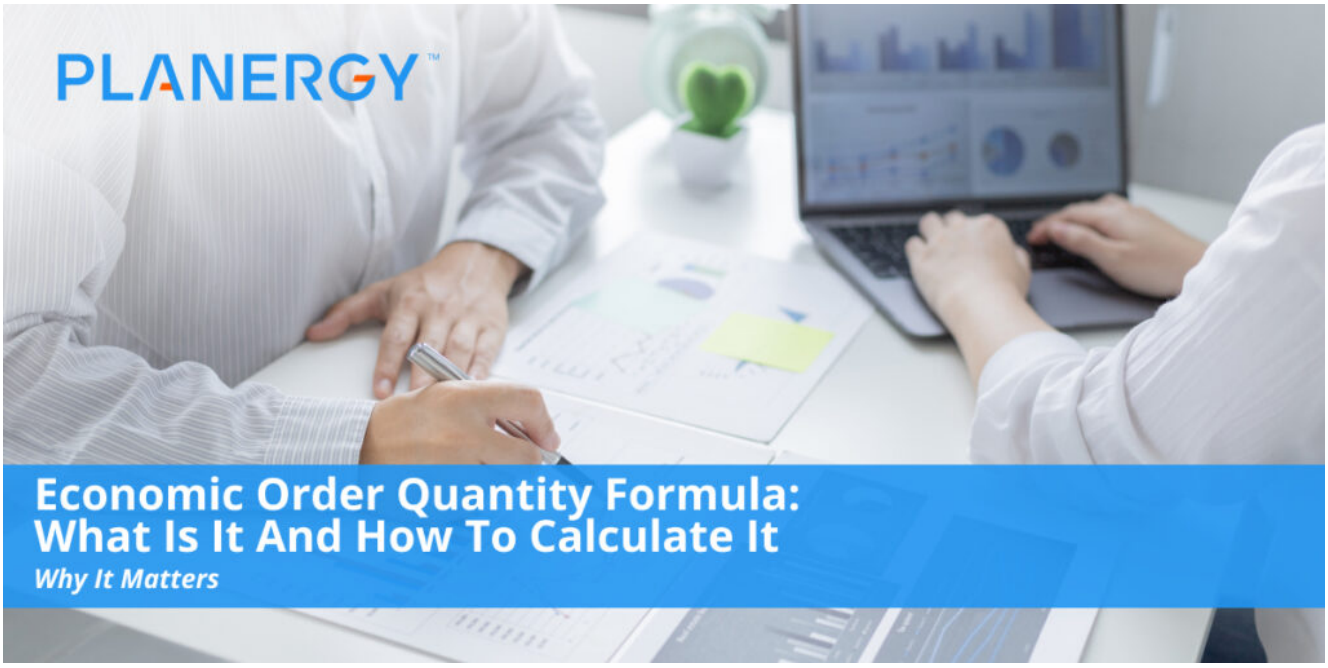
# Economic Order Quantity Formula: What Is It And How To Calculate It




When ordering products, many companies place their orders based on what they need at that exact moment instead of using a reorder quantity formula. While this approach gets the job done, it isn't the optimal way to do it.

Instead, organizations should speak to improve the way they order and pay for products with the use of the economic order quantity formula.

The economic order quantity or EOQ may also be referred to as the optimum lot size.

This calculation helps to find the optimal order quantity or ideal order quantity for a company to minimize their logistics costs while taking advantage of their warehousing space and avoiding stock-outs and overstocks costs. It is a necessary part of inventory management.

Economic order quantity comes from a formula that includes annual demand, holding costs, and order costs. The formula tries to strike a balance between the amount you sell, and the amount of money you spend to manage your inventory.

# Why You Need to Calculate Your EOQ

Calculating the EOQ for your business provides several benefits that impact your bottom line.

It’s an excellent way to understand how much product you need to purchase to maintain an efficient supply chain while keeping your costs down.

## Minimize Your Inventory Cost

Storing your extra inventory can increase your storage costs. Your inventory costs can also go up depending on what gets damaged, how you order, and what products never sell.

If you’re constantly reordering products that don’t do well, the EOQ can help you determine how much to order to cover a specific time period.

## Minimize Stockouts

The EOQ lets you see how much you need to reorder and how frequently you need to place those orders. By calculating how much you need based on how much you sell in a given period of time,  you can avoid running out of stock without having too much inventory on hand for too long.

You may find that it is more cost-effective to order in smaller quantities. Or, you may find the opposite situation to be true. Calculating EOQ helps determine the best approach.

## Improve Efficiency

Overall, spending time to calculate your EOQ helps you make better decisions when it comes to managing and storing your inventory.

The truth is that many businesses place orders based on a gut feeling of how much they need to order instead of ordering the product that is actually needed.

Using your EOQ is a smart way to better understand how much you need based on three important cost variables.

As a business owner, you can easily order the correct quantities and reduce your ordering and carrying costs.

This will help improve your profits or balance your business. You can make more accurate decisions quicker with less time and effort. It also helps in choosing the correct vendors because you can use the information to purchase packages that will reduce costs while allowing you to earn higher profits.

> *The EOQ is an important, but potentially flawed metric. Its accuracy depends on your business model.*

# What You'll Need to Calculate Your EOQ

As mentioned above, the EOQ formula consists of three variables: you're holding costs, and demand, and order cost.

## Holding Costs (H)

Holding costs, which may sometimes be referred to as carrying costs, refers to the total amount of money you spend holding onto your inventory.

Minimizing your inventory costs is an important part of your supply chain management strategy.

How much do you spend holding and storing your inventory per unit per year? To properly calculate EOQ, you first have to determine your annual holding cost. Use the formula below to do that.

(Storage Costs + Employee Salaries + Opportunity Costs + Depreciation Costs) / Total Value of Annual Inventory = Inventory Carrying/Holding Cost

## Annual Demand (D)

How much demand is there for a product every year? look at your historical data so you can determine how much of a product you sell year over year.

## Order Cost/Setup Cost (S)

Your annual ordering cost or set up cost refers to the amount an order costs every time you buy it. This is calculated on a per order basis and includes the shipping and handling costs.

# The EOQ Formula

The formula to calculate your economic order quantity is:

EOQ = Square root of: [2SD] / H

S = Setup costs, per order, including shipping and handling fees

D = Demand rate (the amount of a product sold every year)

H = Holding costs (per unit, per year)

Let’s take a look at an example.

If you have:

- $1 in holding costs per unit = H
- Demand rate of 15,000 units per year = D
- Setup cost of $500 = S

You’d get this equation for your EOQ:

Square root of (2)(500)(15,000) / 1 = 3872.98, so you’d round up to 3873.

Let’s take a look at another example:

Company ABC is a clothing boutique. They want to look specifically at a line of women’s shirts they’re carrying, to decide if there is enough demand to justify a larger order.

The boutique sells 1,000 of these shirts every year. It costs the company $5 to hold each shirt in inventory, and the fixed cost to place an order is $2.

The formula is the square root of (2 x1,000 shirts x $2 order cost) / ($5 holding cost.) This comes out to 28.3 with rounding.

That means their ideal order size to minimize their costs while also meeting customer demand is a bit over 28 shirts. Since you cannot order .3 of a shirt, the minimum order could either be 28 or 29.

# Assumptions of EOQ Formula

It’s worth noting that while the EOQ model is a great metric for businesses, there are assumptions made.

These assumptions may influence your final numbers. If these assumptions are not true of your business, you may have some variances.

## Constant Demand

The EOQ assumes that demand for products remains constant throughout the year. It does not take seasonal fluctuations or changes in demand into account.

## Constant Holding and Ordering Costs

And also it seems that holding and ordering costs remain constant. This may not always be the case. there is a change in your employee salary, adjustments to your transport expenses, or increasing rent for your warehouse, these can all affect the cost and calculations that go into the EOQ.

## No Discounts

The EOQ fails to consider vendor discounts. Sometimes, it makes more sense for you to buy a product in bulk from a vendor to take advantage of a discount.

In this situation, buying items in fewer installments actually optimizes costs, regardless of what the EOQ indicates.

It assumes fixed costs, so if you have variable costs, it may be harder to get an accurate depiction of your profitability just by looking at the EOQ.

# Factors that Affect EOQ

Several factors affect the EOQ. These include:

## Purchase Order Lead Time

This is the amount of time between placing the order until the order arrives. The EOQ assumes that the lead time is understood. If the lead time changes, this can influence your numbers. If the lead time changes, you may also need to ensure you have enough safety stock to avoid stockouts until the new order arrives.

## Purchasing Cost Per Unit

The cost per unit, or unit cost, never changes over the time period, even though the quantity of the order has changed. The EOQ always assumes that you're paying the same amount per product every time.

## Reorder Point

Your reorder point is the time when you need to reorder another set of stock or replenish your existing stock. The EOQ always assumes that you order the same number of units at each reorder point.

## Stockouts

There isn't a chance of running out of stock. You have to consistently maintain enough inventory to avoid your out-of-stock costs. This means that you must always strictly monitor your customer demand and inventory levels with care.

## Demand

This refers to how much the customer wants the product over a specific period of time. It assumes you'll have consistent demand and need the same amount of inventory throughout the year.

## Quality Costs

The EOQ doesn't focus on quality cost but instead, focuses on carrying costs.

## Relevant Ordering Cost

This is the cost per purchase order.

## Relevant Carrying Cost

This is all of the costs involved in the entire maintenance and carrying the stock for the specific period.

Despite the fact that economic order quantity may not consider all of the factors that affect every business, it is still a powerful tool to help business owners make better decisions.

What makes the EOQ so powerful is that it is dynamic and can be revisited as needed when your business grows.

If there's a change in any of your inventory costs, you can always adjust the formula to generate a new EOQ that better suits the current conditions.

Calculating your business's EOQ helps to strike a balance for your order and inventory costs. These kinds of things are easy to overlook in your day-to-day business operations.

You shouldn't take the EOQ formula as a be-all-end-all, but it is useful in informing effective inventory control and management.

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