

Sheet1

ECONOMIC REORDER QUANTITY - PgDn for Help

- (1) Usage Period (Days) basis is 365-day year.
- I (2) # Usage Per Period. (# of units used/sold)
- N (3) Price per Unit (Unit price w/o Discount)
- P (4) Order Cost (Handling, Time, Overhead, etc.)
- U (5) Storage Cost Per Period (Insurance, Rent, ..)
- T (6) Cost of Money (Interest Rate per annum)
- S (7) Discount Rate (Percentage off regular Price)
- (8) Discount Order Size (Required for Discount)

- O (9) Discount Savings for Usage units
- U (10) Order Management Cost Savings
- T (11) Finance Cost for Paying Ahead
- P (12) Storage Cost for Larger Order
- U (13) Net Savings/Loss For Larger Order
- T (14) Economic Order Quantity (Break Even)
- S (15) Discount Order Size (As Input)
- (16) Variation (Economic versus Discount)

Explanation of Input/Output Variables

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1. Usage period is the time used to accumulate usage statistics. It is normally given in days or months. The formulas used for the analysis assume a 365-day year with daily compounding, therefore, the results should be valid for any period specified. This period should normally be the period that you use to order your goods. For example, if you order once a month, this period should be 30 days (i.e., it assumes that the sales information provided is for one month since you order every month).
2. Usage per period is the number of units or packages that are used or sold in the time period specified above. Please note that this IS NOT the number of units ordered! For example, if you order about 100 units every 30 days, but you only sell 80, then this value should be 80, not 100.
3. Price per unit is self explanatory. This is the retail or wholesale price you pay for each unit purchased without any discount. Many times this unit price depends on the numbers of units ordered, therefore it should be based on the number provided in #2.
4. Order Cost Handling is the cost associated with handling and processing each order. It includes employee time cost, materials and other resource usage cost. Remember that every action in business has some cost and some benefit associated

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with it. Consider this variable carefully since it impacts the optimum re-order quantity significantly.

5. Storage Cost is the cost associated with holding the extra units ordered for an additional amount of time. Do not forget to include the apportioned share of the rent, heat, electricity, insurance, depreciation, etc. Do not take the simplistic attitude that you would have stored some units anyway unless the incremental cost for storing the additional units is clearly ZERO.
6. Cost of money is the annual interest rate that the company would borrow money at. Most people believe that if the purchase is made with money the company already has (i.e., no money borrowed) then this is not a true cost. IT IS IMPORTANT to consider this cost since even when using your own money there is an associated cost. If you did not purchase extra units/packages, your money could have been generating interest at some bank. You lose this interesting earning potential when you purchase additional units; this is a real cost!
7. Discount rate - Self Explanatory. The discount that a vendor gives you for ordering a larger quantity. This discount rate should be based on the quantities that are under examination.
8. Discount Quantity is the minimum number of units that need to be ordered to obtain the above vendor discount.
9. Discount Savings for Usage units is the money saved because of the discount taken when buying a large number of units. This is the savings that you would realize for your per period orders, based on the discount you would get for ordering a larger quantity. This is a calculated quantity given by:

$$\text{INP2VAR} * \text{INP3VAR} * \text{INP7VAR}$$

10. Order Management Cost Savings is the money saved for having to process orders less frequently. This of course, is proportioned to the period, the order size and the minimum order required for getting a discount and is given by the following formula.

$$\text{INP4VAR} * (1 - \text{INP2VAR} / \text{INP8VAR})$$

11. Finance Cost for Paying Ahead is the extra cost associated with paying for the extra number of units and then having to wait longer to collect your money through sales. The

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formula used to calculate this quantity is fairly complex as shown below:

$$\frac{(\text{INP8VAR} - \text{INP2VAR}) * (\text{INP3VAR} * (1 - \text{INP7VAR}))}{(\text{INP6VAR} / (365 / ((\text{INP8VAR} - \text{INP2VAR}) / \text{INP2VAR} * \text{INP1VAR})))}$$

12. Storage Cost for Larger Order is the cost associated with having to store a larger order for a longer period of time, (Rent, Electricity, insurance, etc.), as given by the formula:

$$\text{INP5VAR} * (1 - \text{INP2VAR} / \text{INP8VAR})$$

13. Net Savings/Loss For Larger Order is the difference between the total savings realized and the total additional cost incurred. Simply:

$$\text{OUT9VAR} + \text{OUT10VAR} - \text{OUT11VAR} - \text{OUT12VAR}$$

14. Economic Order Quantity is the minimum unit order required in order to break even (Extra Cost = Savings). Given by another fairly complex formula:

$$\text{@SQRT}(2 * (365 / \text{INP1VAR} * \text{INP2VAR}) * \text{INP4VAR} / (\text{INP5VAR} / \text{INP2VAR}))$$

15. Discount Order Size - Self Explanatory, see Input.

$$\text{INP8VAR}$$

16. Variation is the percent variation between (14) and (15).

$$(\text{OUT15VAR} - \text{OUT14VAR}) / \text{OUT15VAR}$$

NAMED CELL RANGES

INP1VAR
INP2VAR
INP3VAR
INP4VAR
INP5VAR
INP6VAR
INP7VAR
INP8VAR

I3	OUT10VAR	I13
I4	OUT11VAR	I14
I5	OUT12VAR	I15
I6	OUT13VAR	I16
I7	OUT14VAR	I17
I8	OUT15VAR	I18
I9	OUT16VAR	I19
I10	OUT9VAR	I12

(Refer to cells for Detailed Descriptions)

30
1000
\$4.00
\$20.00
\$225.00
12.00%
5.00%
1529.7

\$200.00
\$6.93
\$10.52
\$77.91
\$118.50
1470.70
1529.70
3.86%