# Chapter 10

# Accounts Receivable and Inventory Management

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## Learning Objectives

**After studying Chapter 10, you should be able to:**

- List the key factors that can be varied in a firm's credit policy and understand the trade-off between profitability and costs involved.
- Understand how the level of investment in accounts receivable is affected by the firm's credit policies.
- Critically evaluate proposed changes in credit policy, including changes in credit standards, credit period, and cash discount.
- Describe possible sources of information on credit applicants and how you might use the information to analyze a credit applicant.
- Identify the various types of inventories and discuss the advantages and disadvantages of increasing/decreasing inventories.
- Describe, explain, and illustrate the key concepts and calculations necessary for effective inventory management and control, including classification, economic order quantity (EOQ), order point, safety stock, and just-in-time (JIT).

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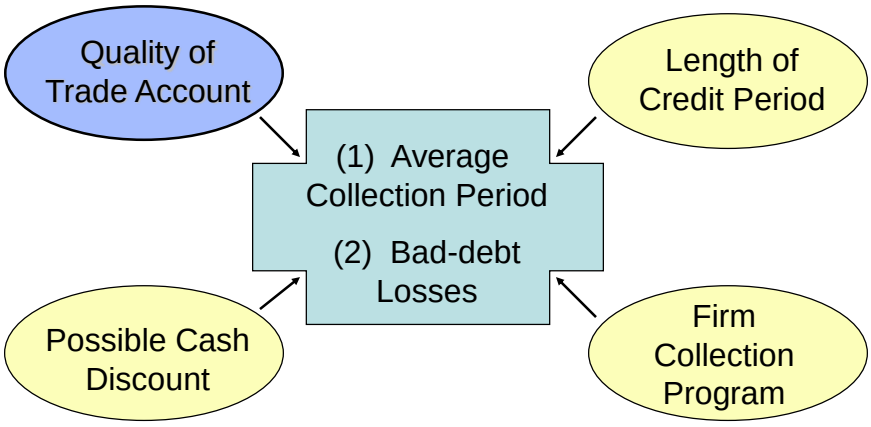
# Topics

- Credit and Collection Policies
- Analyzing the Credit Applicant
- Inventory Management and Control



# Credit and Collection Policies of the Firm



## Credit Standards

Credit Standards -- The minimum quality of credit worthiness of a credit applicant that is acceptable to the firm.

Why lower the firm's credit standards?

The financial manager should continually lower the firm's credit standards as long as profitability from the change exceeds the extra costs generated by the additional receivables.



## Credit Standards

Costs arising from relaxing credit standards:

- A larger credit department
- Additional clerical work
- Servicing additional accounts
- Bad-debt losses
- Opportunity costs

## Example of Relaxing Credit Standards

Basket Wonders is not operating at full capacity and wants to determine if a relaxation of their credit standards will enhance profitability.

- The firm is currently producing a single product with variable costs of $20 and selling price of $25.
- Relaxing credit standards is not expected to affect current customer payment habits.



## Example of Relaxing Credit Standards

- Additional annual credit sales of $120,000 and an average collection period for new accounts of 3 months is expected.
- The before-tax opportunity cost for each dollar of funds “tied-up” in additional receivables is 20%.

Ignoring any additional bad-debt losses that may arise, should Basket Wonders relax their credit standards?

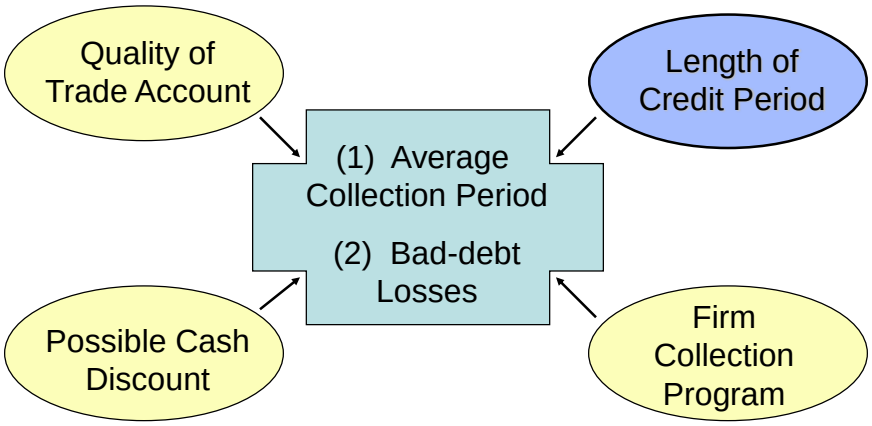
# Example of Relaxing Credit Standards

| | | |
|---|---|---|
| Profitability of additional sales | ($5 contribution) x (4,800 units) = | $24,000 |
| Additional receivables | ($120,000 sales) / (4 Turns) = | $30,000 |
| Investment in add. receivables | ($20/$25) x ($30,000) = | $24,000 |
| Req. pre-tax return on add. investment | (20% opp. cost) x $24,000 = | $4,800 |

Yes! Profits > Required pre-tax return



# Credit and Collection Policies of the Firm



## Credit Terms

Credit Terms -- Specify the length of time over which credit is extended to a customer and the discount, if any, given for early payment. For example, *"2/10, net 30."*

Credit Period -- The total length of time over which credit is extended to a customer to pay a bill. For example, *"net 30"* requires full payment to the firm within 30 days from the invoice date.



## Example of Relaxing the Credit Period

*Basket Wonders* is considering changing its credit period from *"net 30"* (which has resulted in 12 A/R "Turns" per year) to *"net 60"* (which is expected to result in 6 A/R "Turns" per year).

- The firm is currently producing a single product with variable costs of $20 and a selling price of $25.
- Additional annual credit sales of $250,000 from new customers are forecasted, in addition to the current $2 million in annual credit sales.

# Example of Relaxing the Credit Period

– The before-tax opportunity cost for each dollar of funds "tied-up" in additional receivables is 20%.

Ignoring any additional bad-debt losses that may arise, should Basket Wonders relax their credit period?



# Example of Relaxing the Credit Period

| | | |
|---|---|---|
| Profitability of additional sales | ($5 contribution)x(10,000 units) = | $50,000 |
| Additional receivables | ($250,000 sales) / (6 Turns) = | $41,667 |
| Investment in add. receivables (new sales) | ($20/$25) x ($41,667) = | $33,334 |
| Previous receivable level | ($2,000,000 sales) / (12 Turns) = | $166,667 |

# Example of Relaxing the Credit Period

| | | |
|---|---|---|
| New receivable level | ($2,000,000 sales) / (6 Turns) = | $333,333 |
| Investment in add. receivables (original sales) | $333,333 - $166,667 = | $166,666 |
| Total investment in add. receivables | $33,334 + $166,666 = | $200,000 |
| Req. pre-tax return on add. investment | (20% opp. cost) x $200,000 = | $40,000 |

Yes! Profits > Required pre-tax return

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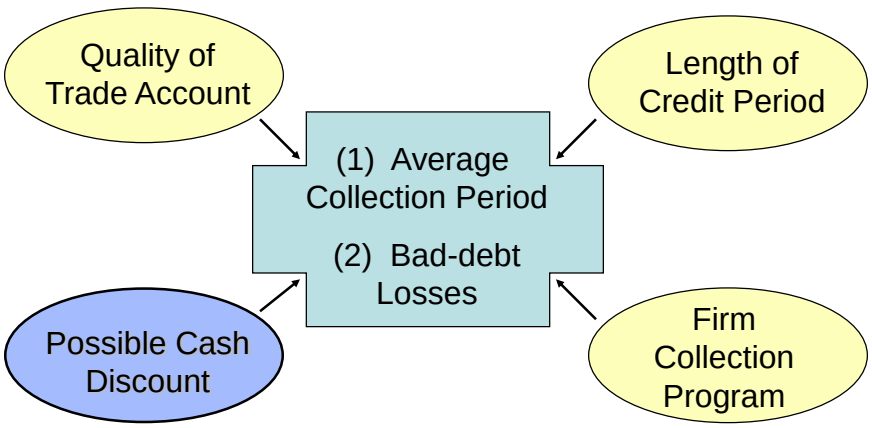
# Credit and Collection Policies of the Firm

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## Credit Terms

Cash Discount Period -- The period of time during which a cash discount can be taken for early payment. For example, *"2/10"* allows a cash discount in the first 10 days from the invoice date.

Cash Discount -- A percent (%) reduction in sales or purchase price allowed for early payment of invoices. For example, *"2/10"* allows the customer to take a 2% cash discount during the cash discount period.



## Example of Introducing a Cash Discount

A competing firm of Basket Wonders is considering changing the credit period from *"net 60"* (which has resulted in 6 A/R "Turns" per year) to *"2/10, net 60."*

- Current annual credit sales of $5 million are expected to be maintained.
- The firm expects 30% of its credit customers (in dollar volume) to take the cash discount and thus increase A/R "Turns" to 8.

# Example of Introducing a Cash Discount

– The before-tax opportunity cost for each dollar of funds "tied-up" in additional receivables is 20%.

Ignoring any additional bad-debt losses that may arise, should the competing firm introduce a cash discount?



# Example of Using the Cash Discount

| | | |
|---|---|---|
| Receivable level (Original) | ($5,000,000 sales) / (6 Turns) = | $833,333 |
| Receivable level (New) | ($5,000,000 sales) / (8 Turns) = | $625,000 |
| Reduction of investment in A/R | $833,333 - $625,000 = | $208,333 |

# Example of Using the Cash Discount

Pre-tax cost of the cash discount: .02 x .3 x $5,000,000 = $30,000.

Pre-tax opp. Savings (20% opp. cost) x $208,333 = $41,666. on reduction in A/R

Yes! Savings > Costs

The benefits derived from released accounts receivable exceed the costs of providing the discount to the firm's customers.

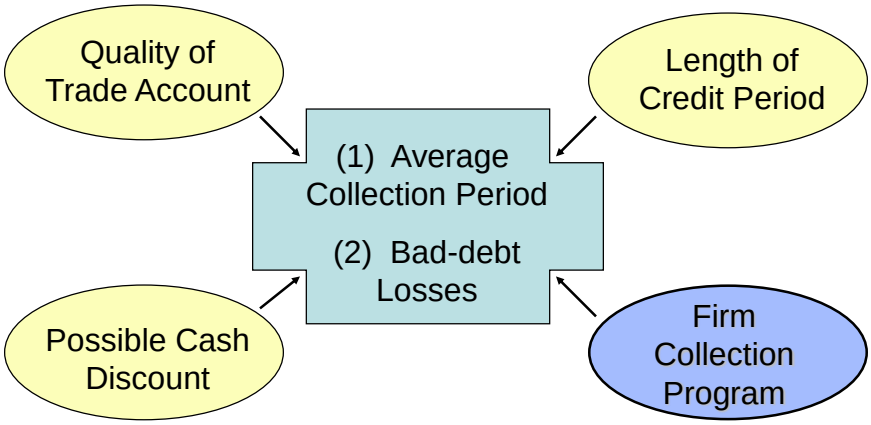


# Seasonal Dating

Seasonal Dating -- Credit terms that encourage the buyer of seasonal products to take delivery before the peak sales period and to defer payment until after the peak sales period.

- Avoids carrying excess inventory and the associated carrying costs.
- Accept dating if warehousing costs plus the required return on investment in inventory exceeds the required return on additional receivables.

# Credit and Collection Policies of the Firm

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# Default Risk and Bad-Debt Losses

| | Present Policy | Policy A | Policy B |
|---|---|---|---|
| Demand | $2,400,000 | $3,000,000 | $3,300,000 |
| Incremental sales | | $ 600,000 | $ 300,000 |
| Default losses | | | |
| Original sales | 2% | | |
| Incremental Sales | | 10% | 18% |
| Avg. Collection Pd. | | | |
| Original sales | 1 month | | |
| Incremental Sales | | 2 months | 3 months |

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# Default Risk and Bad-Debt Losses

| | Policy A | Policy B |
|---|---|---|
| 1. Additional sales | $600,000 | $300,000 |
| 2. Profitability: (20% contribution) x (1) | 120,000 | 60,000 |
| 3. Add. bad-debt losses: (1) x (bad-debt %) | 60,000 | 54,000 |
| 4. Add. receivables: (1) / (New Rec. Turns) | 100,000 | 75,000 |
| 5. Inv. in add. receivables: (.80) x (4) | 80,000 | 60,000 |
| 6. Required before-tax return on additional investment: (5) x (20%) | 16,000 | 12,000 |
| 7. Additional bad-debt losses + additional required return: (3) + (6) | 76,000 | 66,000 |
| 8. Incremental profitability: (2) - (7) | 44,000 | (6,000) |

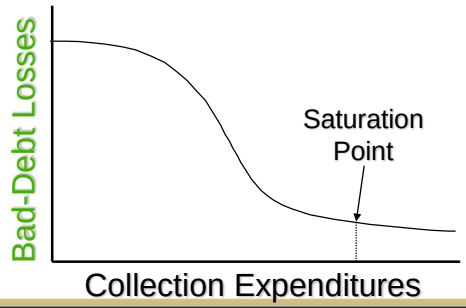


# Collection Policy and Procedures

## Collection Procedures

- Letters
- Phone calls
- Personal visits
- Legal action

The firm should increase **collection expenditures** until the marginal reduction in **bad-debt losses** equals the marginal outlay to collect.

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# Analyzing the Credit Applicant

- Obtaining information on the credit applicant
- Analyzing this information to determine the applicant's creditworthiness
- Making the credit decision



# Sources of Information

The company must weigh the amount of information needed versus the time and expense required.

- Financial statements
- Credit ratings and reports
- Bank checking
- Trade checking
- Company's own experience

# Credit Analysis

A credit analyst is likely to utilize information regarding:

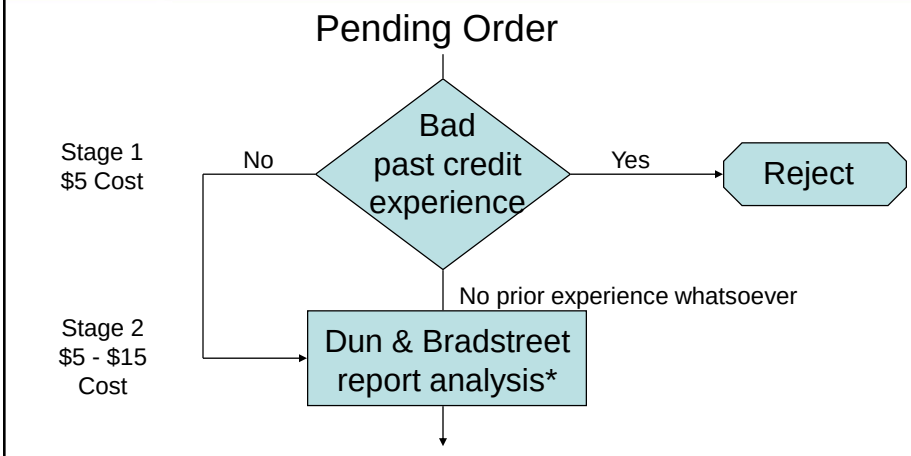
- the financial statements of the firm (ratio analysis)
- the character of the company
- the character of management
- the financial strength of the firm
- other individual issues specific to the firm



# Sequential Investigation Process

The cost of investigation (determining the type and amount of information collected) is balanced against the expected profit from an order.

# Sample Investigation Process Flow Chart (Part A)




** For previous customers only a Dun & Bradstreet reference book check.*

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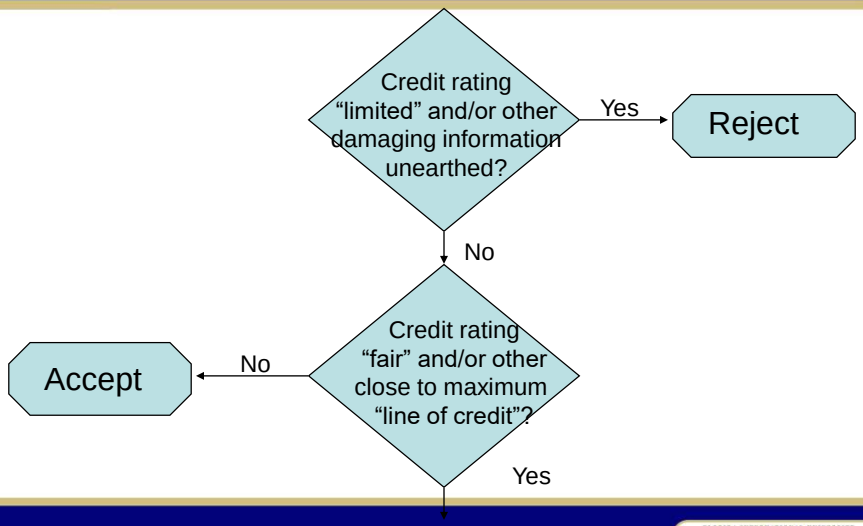
# Sample Investigation Process Flow Chart (Part B)

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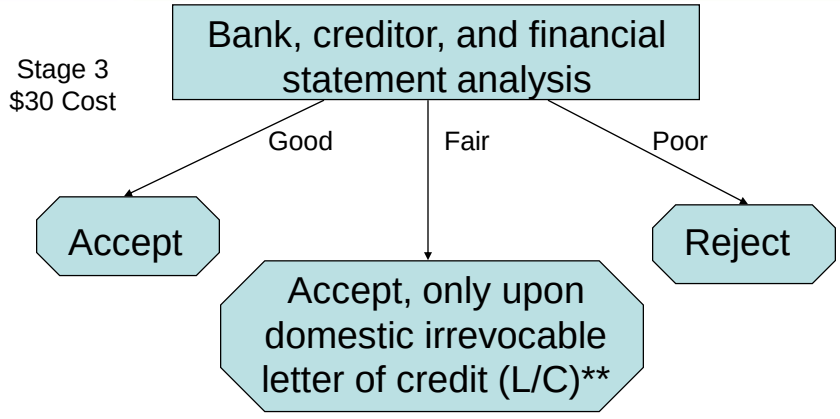
# Sample Investigation Process Flow Chart (Part C)




*** That is, the credit of a bank is substituted for customer's credit.*

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# Other Credit Decision Issues

Credit-scoring System -- A system used to decide whether to grant credit by assigning numerical scores to various characteristics related to creditworthiness.

Line of Credit -- A limit to the amount of credit extended to an account. Purchaser can buy on credit up to that limit.

- Streamlines the procedure for shipping goods.

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## Other Credit Decision Issues

Outsourcing Credit and Collections

The entire credit and/or collection function(s) are outsourced to a third-party company.

- Credit decisions are made
- Ledger accounts maintained
- Payments processed
- Collections initiated

Decision based on the *core competencies* of the firm.



## Inventory Management and Control

Inventories form a *link* between production and sale of a product.

Inventory types:

- Raw-materials inventory
- Work-in-process inventory
- In-transit inventory
- Finished-goods inventory

# Inventory Management and Control

Inventories provide flexibility for the firm in:

- Purchasing
- Production scheduling
- Efficient servicing of customer demands



# Appropriate Level of Inventories

***How does a firm determine the appropriate level of inventories?***

Employ a cost-benefit analysis

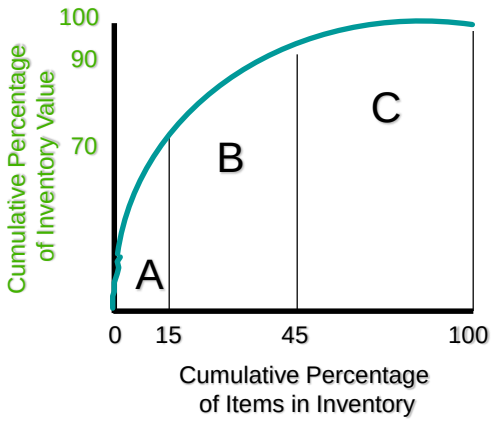
Compare the *benefits* of economies of production, purchasing, and product marketing against the *cost* of the additional investment in inventories.

# ABC Method of Inventory Control

*ABC method of inventory control*

Method which controls expensive inventory items more closely than less expensive items.

- Review "A" items most frequently
- Review "B" and "C" items less rigorously and/or less frequently.






# How Much to Order?

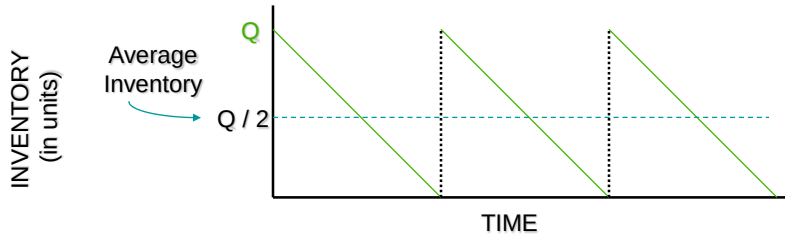
The optimal quantity to order depends on:

- Forecast usage
- Ordering cost
- Carrying cost

Ordering can mean either the purchase or production of the item.

# Total Inventory Costs

Total inventory costs
(T) = C (Q / 2) + O (S / Q)




C: Carrying costs per unit per period
O: Ordering costs per order
S: Total usage during the period



# Economic Order Quantity

The quantity of an inventory item to order so that total inventory costs are minimized over the firm's planning period.

The EOQ or *optimal quantity* (Q*) is:

$$Q^* = \sqrt{\frac{2(O)(S)}{C}}$$

## Example of the Economic Order Quantity

*Basket Wonders* is attempting to determine the economic order quantity for fabric used in the production of baskets.

- 10,000 yards of fabric were used at a constant rate last period.
- Each order represents an ordering cost of $200.
- Carrying costs are $1 per yard over the 100-day planning period.

What is the economic order quantity?



## Economic Order Quantity

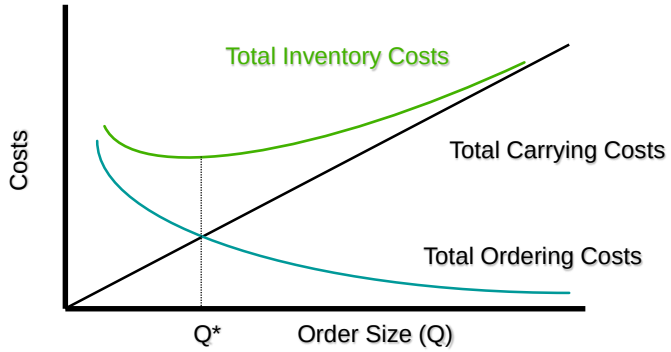
We will solve for the economic order quantity given that ordering costs are $200 per order, total usage over the period was 10,000 units, and carrying costs are $1 per yard (unit).

$$Q^* = \sqrt{\frac{2\,(\$200)\,(10{,}000)}{\$1}}$$

$$Q^* = 2{,}000 \text{ Units}$$

# Total Inventory Costs

EOQ (Q*) represents the minimum point in total inventory costs.






# When to Order?

## Issues to consider:

Lead Time -- The length of time between the placement of an order for an inventory item and when the item is received in inventory.

Order Point -- The quantity to which inventory must fall in order to signal that an order must be placed to replenish an item.

Order Point (OP) = Lead time X Daily usage

# Example of When to Order

Julie Miller of *Basket Wonders* has determined that it takes only 2 days to receive the order of fabric after the placement of the order.

When should Julie order more fabric?

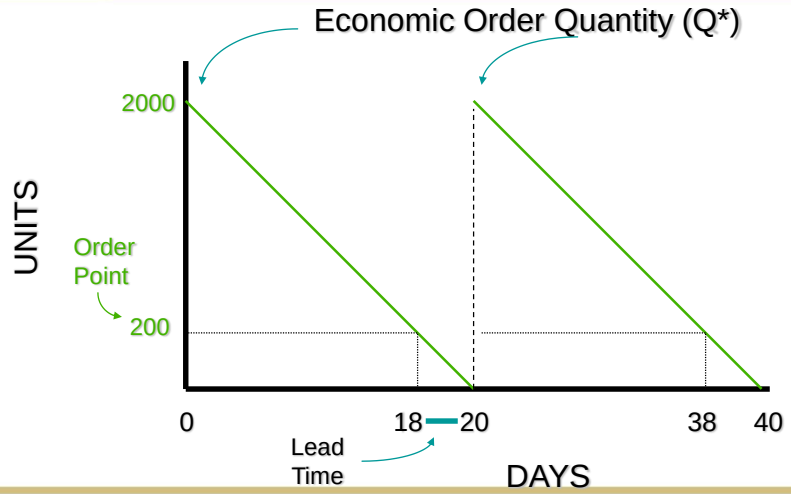
Lead time = 2 days

Daily usage = 10,000 yards / 100 days
= 100 yards per day

Order Point= 2 days x 100 yards per day
= 200 yards



# Example of When to Order



# Safety Stock

Safety Stock -- Inventory stock held in reserve as a cushion against uncertain demand (or usage) and replenishment lead time.

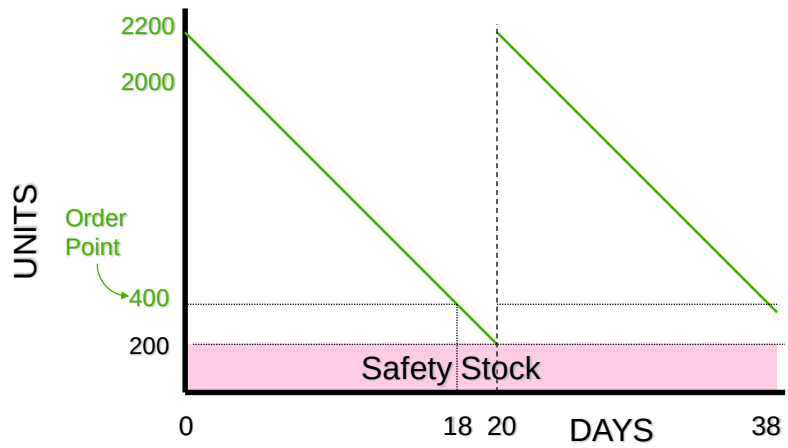
Our previous example assumed *certain* demand and lead time. When demand and/or lead time are *uncertain*, then the order point is:

Order Point =

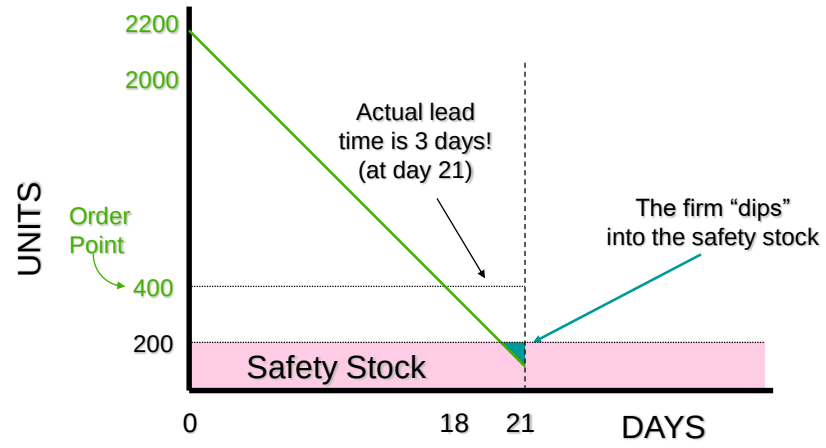
(*Avg.* lead time x *Avg.* daily usage) + Safety stock



# Order Point with Safety Stock



# Order Point with Safety Stock






# How Much Safety Stock?

What is the proper amount of safety stock?

Depends on the

- Amount of uncertainty in inventory demand
- Amount of uncertainty in the lead time
- Cost of running out of inventory
- Cost of carrying inventory

## Just-in-Time

Just-in-Time -- An approach to inventory management and control in which inventories are acquired and inserted in production at the exact times they are needed.

Requirements of applying this approach:

- A very accurate production and inventory information system
- Highly efficient purchasing
- Reliable suppliers
- Efficient inventory-handling system



## Supply Chain Management

Supply Chain Management (SCM) – Managing the process of moving goods, services, and information from suppliers to end customers.

- JIT inventory control is one link in SCM.
- The internet has enhanced SCM and allows for many business-to-business (B2B) transactions
- Competition through B2B auctions helps reduce firm costs – especially standardized items