Key Concepts and Skills

• Understand the key issues related to credit management
• Understand the impact of cash discounts
• Be able to evaluate a proposed credit policy
• Understand the components of credit analysis
• Understand the major components of inventory management
• Be able to use the EOQ model to determine optimal inventory ordering

Credit and Receivables

• Granting credit generally increases sales
• Costs of granting credit
  – Chance that customers will not pay
  – Financing receivables
• Credit management examines the trade-off between increased sales and the costs of granting credit

Components of Credit Policy

• Terms of sale
  – Credit period
  – Cash discount and discount period
  – Type of credit instrument
• Credit analysis – distinguishing between “good” customers that will pay and “bad” customers that will default
• Collection policy – effort expended on collecting receivables
The Cash Flows from Granting Credit

<table>
<thead>
<tr>
<th>Credit Sale</th>
<th>Check Mailed</th>
<th>Check Deposited</th>
<th>Cash Available</th>
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Cash Collection

Accounts Receivable

The Investments in Receivables

- The investment in accounts receivable for any firm depends on the amount of credit sales and the average collection period.

\[
\text{Accounts Receivable} = (\text{Average daily sales})(\text{Average collection period})
\]

Terms of the Sale

Made up of three distinct elements:

1. The period for which credit is granted.
2. The cash discount and the discount period.
3. The type of credit instrument.

The Basic Form

- Basic Form: 2/10 net 45
  - 2% discount if paid in 10 days
  - Total amount due in 45 days if discount not taken

- Buy $500 worth of merchandise with the credit terms given above
  - Pay $500 \( (1 - .02) = $490 \) if you pay in 10 days
  - Pay $500 if you pay in 45 days
The Credit Period

**The Invoice Date** – is the beginning of the credit period

**Invoice** – a bill for goods or services provided by the seller to the purchaser

**Factors Affecting the Length of the Credit Period:**

The operating cycle has two components: the inventory period and the receivables period. The buyer's inventory period is the time it takes the buyer to acquire inventory (from us), process it, and sell it. The buyer’s receivables period is the time it then takes the buyer to collect on the sale. Note that the credit period we offer is effectively the buyer's payables period.

By extending credit, we finance a portion of our buyer's operating cycle and thereby shorten that buyer’s cash cycle. If our credit period exceeds the buyer's inventory period, then we are financing not only the buyer’s inventory purchases, but part of the buyer’s receivables as well.

Furthermore, if our credit period exceeds our buyer's operating cycle, then we are effectively providing financing for aspects of our customer's business beyond the immediate purchase and sale of our merchandise. The reason is that the buyer effectively has a loan from us even after the merchandise is resold, and the buyer can use that credit for other purposes. For this reason, the length of the buyer's operating cycle is often cited as an appropriate upper limit to the credit period.

1. The buyer's inventory period and
2. Operating cycle

There are a number of other factors that influence the credit period. Among the most important:

- Perishability and collateral value
- Consumer demand
- Cost, profitability, and standardization
- Credit risk
- Size of the account
- Competition
- Customer type
Cash Discounts

Cost of Credit

- Finding the implied interest rate when customers do not take the discount
- Credit terms of 2/10 net 45
  - Period rate = 2 / 98 = 2.0408%
  - Period = (45 – 10) = 35 days
  - 365 / 35 = 10.4286 periods per year
- EAR = \((1.020408)^{10.4286} - 1\) = 23.45%
- The company benefits when customers choose to forgo discounts

Trade Discount

- Given to buyers but is not really an incentive for early payment
- For example:
  - Credit terms of 2/10 EOM (end-of-month)
  - 2% discount if paid by 10th
  - But, considered overdue if paid after 10th
- Thus, the credit period and the discount period are effectively the same, and there is no reward for paying before the due date

The Cash Discount and the ACP

Suppose a firm currently has terms of net 30 and an average collection period (ACP) of 30 days. If it offers 2/10, net 30, then perhaps 50% of its customers will pay in 10 days and the remaining customers will pay in 30 days

- What will the new ACP be?
  - New ACP = .50 \times 10 \text{ days} + .50 \times 30 \text{ days} = 20 \text{ days}

If the firm’s annual sales are $15 million (before discounts), what will happen to the investment in receivables?

- ACP fell from 30 days to 20 days
- Average daily sales are $15 \text{ million} \div 365 \text{ days} = $41,096 \text{ per day}
- Receivables will fall by $41,096 \times 10 = $410,960

To the extent that a cash discount encourages customers to pay early, it will shorten the receivables period and, all other things equal, reduce the firm’s investment in receivables
Credit Instruments

- **Open Account** – implies that the only formal instrument of credit is the invoice, which is sent with the shipment of goods and which the customer signs as evidence that the goods have been received.
- **Promissory Note** – is a basic IOU and might be used when the order is large, when there is no cash discount involved, or when the firm anticipates a problem in collections.
- **Commercial Draft** – used to obtain a credit commitment from a customer before the goods are delivered.
- **Sight Draft** – when immediate payment is required on the draft.
- **Time Draft** – used if immediate payment is not required.
- **Trade Acceptance** – when the draft is presented and the buyer “accepts” it, meaning that the buyer promises to pay it in the future.
- **Banker’s Acceptance** – when a bank accepts draft, meaning that the bank is guaranteeing payment.

Analyzing Credit Policy

Credit Policy Effects

Revenue Effects

- Delay in receiving cash from sales
- May be able to increase price
- May increase total sales

Cost Effects

- Cost of the sale is still incurred even though the cash from the sale has not been received
- Cost of debt – must finance receivables
- Probability of nonpayment – some percentage of customers will not pay for products purchased
- Cash discount – some customers will pay early and pay less than the full sales price

Evaluating a Proposed Credit Policy

- **P** = Price per unit
- **v** = Variable cost per unit
- **Q** = Current quantity sold per month
- **Q’** = Quantity sold under new policy
- **R** = Monthly required return
NPV of Switching Policy

- Your company is evaluating a switch from a cash only policy to a net 30 policy. The price per unit is $100, and the variable cost per unit is $40. The company currently sells 1,000 units per month. Under the proposed policy, the company expects to sell 1,050 units per month. The required monthly return is 1.5%.

- What is the NPV of the switch?

  Incremental cash inflow = (P – v)(Q' – Q)
  
or (100 – 40)(1,050 – 1,000) = $3,000

  Present value of incremental cash inflow = [(P – v)(Q' – Q)]/R
  
or 3,000 ÷ .015 = $200,000

  Cost of switching = PQ + v(Q' – Q)
  
or 100(1,000) + 40(1,050 – 1,000) = 102,000

  NPV of switching = -[PQ + v(Q' – Q)] + [(P – v)(Q' – Q)]/R
  
or 200,000 – 102,000 = 98,000

  Should the company offer credit terms of net 30?
  
  ☑ Yes, the company should switch

A Breakeven Application

What increase in unit sales is necessary to break even? To calculate BEP set NPV equal to zero and solving for (Q' – Q):

NPV = 0 = -[PQ + v(Q' – Q)] + [(P – v)(Q’ – Q)]/R

Q' – Q = PQ/[(P – v) + R – v]

= 100,000/[(100-40)/.015-40]

= 25.25 units
Optimal Credit Policy

The Total Credit Cost Curve

- Carrying costs
  - Required return on receivables
  - Losses from bad debts
  - Costs of managing credit and collections
    - Restrictive Credit Policy: Low Carrying Costs
    - Relaxed Credit Policy: Higher Carrying Costs

- Shortage costs (An Opportunity Cost)
  - Lost sales due to a restrictive credit policy

- Total cost curve
  - Sum of carrying costs and shortage costs
  - Optimal credit policy is where the total cost curve is minimized

Organizing the Credit Function

Large firms often extend credit through a captive finance company, which is simply a wholly owned subsidiary that handles the credit function for the parent company
Credit Analysis

When Should Credit be Granted?

A One-Time Sale

\[ NPV = -v + (1 - \pi)P / (1 + R) \]

Where:

P = Price per unit
v = Variable cost per unit
\pi = Probability of default
R = Required return on receivables

Your company is considering granting credit to a new customer. The variable cost per unit is $50; the current price is $110; the probability of default is 15%; and the monthly required return is 1%.

\[ NPV = -50 + (1 - .15)(110)/(1.01) = 42.57 \quad \therefore \quad \text{offer the credit} \]

• What is the break-even probability?

\[ 0 = -50 + (1 - \pi)(110)/(1.01) \]
\[ \pi = .5409 \text{ or } 54.09\% \]

Repeat Business

The firm will receive \((P - v)\) forever \((PV = (P - v)/R)\)

\[ NPV = -v + (1 - \pi)(P - v)/R \]

In the previous example, what is the NPV if we are looking at repeat business?

\[ NPV = -50 + (1 - 0.15)(110 - 50)/.01 = 5,050 \]

Repeat customers can be very valuable (hence the importance of good customer service). It may make sense to grant credit to almost everyone once, as long as the variable cost is low relative to the price.

If a customer defaults once, you don’t grant credit again.
Credit Information

Sources of Credit Information

- Financial Statements
- Credit reports about the customer’s payment history with other firms
- Banks
- The customer’s payment history with the firm

Credit Evaluation and Scoring

- Five Cs of Credit:
  - Character – willingness to meet financial obligations
  - Capacity – ability to meet financial obligations out of operating cash flows
  - Capital – financial reserves
  - Collateral – assets pledged as security
  - Conditions – general economic conditions related to customer’s business
- Credit Scoring – assigning a numerical rating to customers based on credit history

Collection Policy

Monitoring Receivables

- Keep an eye on average collection period relative to your credit terms
- Use an aging schedule to determine percentage of payments that are being made late

Collection Effort

- Delinquency letter
- Telephone call
- Collection agency
- Legal action

Inventory Management

The Financial Manager and Inventory policy

- Inventory can be a large percentage of a firm’s assets
- There can be significant costs associated with carrying too much inventory
- There can also be significant costs associated with not carrying enough inventory
- Inventory management tries to find the optimal trade-off between carrying too much inventory versus not enough
Inventory Types

• Manufacturing firm
  – Raw material – starting point in production process
  – Work-in-progress
  – Finished goods – products ready to ship or sell
• Remember that one firm’s “raw material” may be another firm’s “finished goods”
• Different types of inventory can vary dramatically in terms of liquidity

Inventory Costs

• Carrying costs – range from 20 – 40% of inventory value per year
  – Storage and tracking
  – Insurance and taxes
  – Losses due to obsolescence, deterioration, or theft
  – Opportunity cost of capital
• Shortage costs
  – Restocking costs
  – Lost sales or lost customers
• Consider both types of costs, and minimize the total cost

Inventory Management Techniques

The ABC approach

• Classify inventory by cost, demand, and need
• Those items that have substantial shortage costs should be maintained in larger quantities than those with lower shortage costs
• Generally maintain smaller quantities of expensive items
• Maintain a substantial supply of less expensive basic materials
The Economic Order Quantity Model – EOQ

- The EOQ model minimizes the total inventory cost

The Carrying Costs

- Total carrying cost = (average inventory)(carrying cost per unit) = (Q/2)(CC)

The Storage Costs

- Total restocking cost = (fixed cost per order)(number of orders) = F(T/Q)

The Total Costs

- Total Cost = Total carrying cost + total restocking cost = (Q/2)(CC) + F(T/Q)

EOQ:

$$Q^* = \sqrt{\frac{2TF}{CC}}$$
Example: EOQ

- Consider an inventory item that has carrying cost = $1.50 per unit. The fixed order cost is $50 per order, and the firm sells 100,000 units per year.
  - What is the economic order quantity?

\[
Q^* = \sqrt{\frac{2(100,000)(50)}{1.50}} = 2,582
\]

Extensions to the EOQ Model

Safety Stocks
- Minimum level of inventory kept on hand
- Increases carrying costs

Reorder Points
- At what inventory level should you place an order?
- Need to account for delivery time

Managing Derived-Demand Inventories

Material Requirements Planning
- A set of procedures used to determine inventory levels for demand-dependent inventory types such as work-in-progress and raw materials

Just-in-Time Inventory
- A system for managing demand-dependent inventories that minimizes inventory holdings