

Supply Chain Management, 6e (Chopra/Meindl)

Chapter 9 Sales and Operations Planning: Planning Supply and Demand in a Supply Chain

9.1 True/False Questions

1) Predictable variability is change in demand that cannot be forecasted.

Answer: FALSE

Diff: 1

Topic: 9.1 Responding to Predictable Variability in the Supply Chain

AACSB: Application of knowledge

Objective: LO 9.1: Manage supply to improve synchronization in a supply chain in the face of predictable variability.

2) Faced with predictable variability of demand, a company's goal is to respond in a manner that maximizes profitability.

Answer: TRUE

Diff: 1

Topic: 9.1 Responding to Predictable Variability in the Supply Chain

AACSB: Application of knowledge

Objective: LO 9.1: Manage supply to improve synchronization in a supply chain in the face of predictable variability.

3) The advantage of carrying enough manufacturing capacity to meet demand in any period is very low inventory costs, because no inventory needs to be carried from period to period.

Answer: TRUE

Diff: 1

Topic: 9.1 Responding to Predictable Variability in the Supply Chain

AACSB: Application of knowledge

Objective: LO 9.1: Manage supply to improve synchronization in a supply chain in the face of predictable variability.

4) The disadvantage of building up inventory during the off season to keep production stable year round is the expensive capacity that would go unused during most months when demand was lower.

Answer: FALSE

Diff: 1

Topic: 9.1 Responding to Predictable Variability in the Supply Chain

AACSB: Application of knowledge

Objective: LO 9.1: Manage supply to improve synchronization in a supply chain in the face of predictable variability.

5) A firm can vary supply of product by controlling production capacity and inventory.

Answer: TRUE

Diff: 1

Topic: 9.2 Managing Supply

AACSB: Application of knowledge

Objective: LO 9.1: Manage supply to improve synchronization in a supply chain in the face of predictable variability.

6) A firm that uses flexible work hours from the workforce to manage capacity to better meet demand is using a seasonal workforce.

Answer: FALSE

Diff: 2

Topic: 9.2 Managing Supply

AACSB: Application of knowledge

Objective: LO 9.1: Manage supply to improve synchronization in a supply chain in the face of predictable variability.

7) Scheduling the workforce so that the available capacity better matches demand is using time flexibility from the workforce.

Answer: TRUE

Diff: 2

Topic: 9.2 Managing Supply

AACSB: Application of knowledge

Objective: LO 9.1: Manage supply to improve synchronization in a supply chain in the face of predictable variability.

8) The use of a part-time workforce to increase the capacity flexibility by enabling the firm to have more people at work during peak periods is designing product flexibility into the production processes.

Answer: FALSE

Diff: 2

Topic: 9.2 Managing Supply

AACSB: Application of knowledge

Objective: LO 9.1: Manage supply to improve synchronization in a supply chain in the face of predictable variability.

9) A firm that uses a temporary workforce during the peak season to increase capacity to match demand is using a seasonal workforce.

Answer: TRUE

Diff: 1

Topic: 9.2 Managing Supply

AACSB: Application of knowledge

Objective: LO 9.1: Manage supply to improve synchronization in a supply chain in the face of predictable variability.

10) The use of dual facilities to manage capacity may be hard to sustain if the labor market is tight.

Answer: FALSE

Diff: 3

Topic: 9.2 Managing Supply

AACSB: Application of knowledge

Objective: LO 9.1: Manage supply to improve synchronization in a supply chain in the face of predictable variability.

11) A firm that builds dedicated facilities to produce a relatively stable output of products over time in a very efficient manner and purchases peak production capability from other companies is using subcontracting.

Answer: FALSE

Diff: 3

Topic: 9.2 Managing Supply

AACSB: Application of knowledge

Objective: LO 9.1: Manage supply to improve synchronization in a supply chain in the face of predictable variability.

12) The use of a seasonal workforce requires that the workforce be multi-skilled and easily adapt to being moved from line to line.

Answer: TRUE

Diff: 2

Topic: 9.2 Managing Supply

AACSB: Application of knowledge

Objective: LO 9.1: Manage supply to improve synchronization in a supply chain in the face of predictable variability.

13) Pricing decisions based only on revenue considerations often result in an increase in overall profitability.

Answer: FALSE

Diff: 2

Topic: 9.3 Managing Demand

AACSB: Application of knowledge

Objective: LO 9.2: Manage demand to improve synchronization in a supply chain in the face of predictable sustainability.

14) When performing aggregate planning, the goal of all firms in the supply chain should be to maximize individual firm profits.

Answer: FALSE

Diff: 2

Topic: 9.3 Managing Demand

AACSB: Application of knowledge

Objective: LO 9.2: Manage demand to improve synchronization in a supply chain in the face of predictable sustainability.

15) Determining how profits will be allocated to different members of the supply chain is a key to successful collaboration.

Answer: TRUE

Diff: 2

Topic: 9.3 Managing Demand

AACSB: Application of knowledge

Objective: LO 9.2: Manage demand to improve synchronization in a supply chain in the face of predictable sustainability.

16) In general, as the fraction of increased demand coming from forward buying grows, offering the promotion during the peak demand period becomes more attractive.

Answer: FALSE

Diff: 2

Topic: 9.3 Managing Demand

AACSB: Analytical thinking

Objective: LO 9.2: Manage demand to improve synchronization in a supply chain in the face of predictable sustainability.

17) Offering a promotion during a peak period that has significant forward buying creates even more variable demand than before the promotion.

Answer: TRUE

Diff: 1

Topic: 9.3 Managing Demand

AACSB: Analytical thinking

Objective: LO 9.2: Manage demand to improve synchronization in a supply chain in the face of predictable sustainability.

18) Promoting during a peak demand month may decrease overall profitability if a significant fraction of the demand increase results from a forward buy.

Answer: TRUE

Diff: 3

Topic: 9.3 Managing Demand

AACSB: Analytical thinking

Objective: LO 9.2: Manage demand to improve synchronization in a supply chain in the face of predictable sustainability.

19) As forward buying becomes a smaller fraction of the demand increase from a promotion, it is less profitable to promote during the peak period.

Answer: FALSE

Diff: 3

Topic: 9.3 Managing Demand

AACSB: Analytical thinking

Objective: LO 9.2: Manage demand to improve synchronization in a supply chain in the face of predictable sustainability.

20) When faced with seasonal demand, a firm should use a combination of pricing (to manage demand) and production and inventory (to manage supply) to improve profitability.

Answer: TRUE

Diff: 2

Topic: 9.3 Managing Demand

AACSB: Analytical thinking

Objective: LO 9.2: Manage demand to improve synchronization in a supply chain in the face of predictable sustainability.

9.2 Multiple Choice Questions

1) Predictable variability is

- A) change in demand that can be forecasted.
- B) change in demand that cannot be forecasted.
- C) change in demand that has been planned.
- D) change in demand that has been scheduled.

Answer: A

Diff: 1

Topic: 9.1 Responding to Predictable Variability in the Supply Chain

AACSB: Application of knowledge

Objective: LO 9.1: Manage supply to improve synchronization in a supply chain in the face of predictable variability.

2) A firm can handle predictable variability by managing

- A) supply using capacity, inventory, trade promotions, and backlogs.
- B) supply using capacity, inventory, subcontracting, and backlogs.
- C) demand using short-term price discounts and trade promotions.
- D) B and C only

Answer: D

Diff: 1

Topic: 9.1 Responding to Predictable Variability in the Supply Chain

AACSB: Application of knowledge

Objective: LO 9.1: Manage supply to improve synchronization in a supply chain in the face of predictable variability.

3) Seasonal demand can be met by

- A) maintaining enough manufacturing capacity to meet demand in any period.
- B) building up inventory during the off season to meet demand during peak seasons.
- C) offering a price promotion during periods of low demand to shift some of the demand into a slow period.
- D) all of the above

Answer: D

Diff: 2

Topic: 9.1 Responding to Predictable Variability in the Supply Chain

AACSB: Application of knowledge

Objective: LO 9.1: Manage supply to improve synchronization in a supply chain in the face of predictable variability.

- 4) The advantage of maintaining enough manufacturing capacity to meet demand in any period is
- A) very low inventory costs because inventory needs to be carried from period to period.
 - B) very low inventory costs because no inventory needs to be carried from period to period.
 - C) very high inventory costs because no inventory needs to be carried from period to period.
 - D) very high inventory costs because expensive capacity would go unused during most months when demand was lower.

Answer: B

Diff: 2

Topic: 9.1 Responding to Predictable Variability in the Supply Chain

AACSB: Application of knowledge

Objective: LO 9.1: Manage supply to improve synchronization in a supply chain in the face of predictable variability.

- 5) The disadvantage of maintaining enough manufacturing capacity to meet demand in any period is
- A) much of the expensive capacity would go unused during most months when demand was lower.
 - B) the expensive capacity would be used consistently throughout the year.
 - C) most of the expensive capacity would still be used during most months when demand was lower.
 - D) very low inventory costs because no inventory needs to be carried from period to period.

Answer: A

Diff: 2

Topic: 9.1 Responding to Predictable Variability in the Supply Chain

AACSB: Application of knowledge

Objective: LO 9.1: Manage supply to improve synchronization in a supply chain in the face of predictable variability.

- 6) The advantage of building up inventory during the off season to meet demand during peak seasons and keep production stable year round is
- A) very low inventory costs because no inventory needs to be carried from period to period.
 - B) much of the expensive capacity would go unused during most months when demand was lower.
 - C) in the fact that a firm could get by with a smaller, less expensive factory.
 - D) in the fact that a firm could get by with a larger, more expensive factory.

Answer: C

Diff: 2

Topic: 9.1 Responding to Predictable Variability in the Supply Chain

AACSB: Application of knowledge

Objective: LO 9.1: Manage supply to improve synchronization in a supply chain in the face of predictable variability.

7) The disadvantage of building up inventory during the off season to meet demand during peak seasons and keep production stable year round is

- A) very low inventory costs because no inventory needs to be carried from period to period.
- B) very high inventory costs because inventory needs to be carried from period to period.
- C) in the fact that a firm could get by with a smaller, less expensive factory.
- D) in the fact that a firm could get by with a larger, more expensive factory.

Answer: B

Diff: 2

Topic: 9.1 Responding to Predictable Variability in the Supply Chain

AACSB: Application of knowledge

Objective: LO 9.1: Manage supply to improve synchronization in a supply chain in the face of predictable variability.

8) The advantage of offering a price promotion during periods of low demand to shift some of the demand into a slow period is

- A) a demand pattern that is less expensive to supply.
- B) very high inventory costs because inventory needs to be carried from period to period.
- C) in the fact that a firm could get by with a smaller, more expensive factory.
- D) much of the expensive capacity would go unused during most months when demand was lower.

Answer: A

Diff: 2

Topic: 9.1 Responding to Predictable Variability in the Supply Chain

AACSB: Application of knowledge

Objective: LO 9.1: Manage supply to improve synchronization in a supply chain in the face of predictable variability.

9) Companies typically divide the task of supply and demand so that

- A) Marketing manages demand and Operations manages supply.
- B) Marketing manages supply and Operations manages demand.
- C) Marketing manages demand and supply.
- D) Operations manages demand and supply.

Answer: A

Diff: 1

Topic: 9.1 Responding to Predictable Variability in the Supply Chain

AACSB: Application of knowledge

Objective: LO 9.1: Manage supply to improve synchronization in a supply chain in the face of predictable variability.

- 10) With supply and demand management decisions being made independently,
A) it is increasingly difficult to coordinate the supply chain, thereby increasing profit.
B) it is increasingly difficult to coordinate the supply chain, thereby decreasing profit.
C) it is easier to coordinate the supply chain, thereby decreasing profit.
D) it is easier to coordinate the supply chain, thereby increasing profit.

Answer: B

Diff: 2

Topic: 9.1 Responding to Predictable Variability in the Supply Chain

AACSB: Application of knowledge

Objective: LO 9.1: Manage supply to improve synchronization in a supply chain in the face of predictable variability.

- 11) _____ variability is change in demand that can be forecasted.

- A) Capacity
B) Predictable
C) Inventory
D) Backlog

Answer: B

Diff: 1

Topic: 9.1 Responding to Predictable Variability in the Supply Chain

AACSB: Application of knowledge

Objective: LO 9.1: Manage supply to improve synchronization in a supply chain in the face of predictable variability.

- 12) A firm can vary supply of product by controlling

- A) inventory.
B) pricing.
C) demand.
D) revenue.

Answer: A

Diff: 1

Topic: 9.2 Managing Supply

AACSB: Application of knowledge

Objective: LO 9.1: Manage supply to improve synchronization in a supply chain in the face of predictable variability.

- 13) A firm can vary supply of product by controlling

- A) revenue.
B) pricing.
C) demand.
D) capacity.

Answer: D

Diff: 1

Topic: 9.2 Managing Supply

AACSB: Application of knowledge

Objective: LO 9.1: Manage supply to improve synchronization in a supply chain in the face of predictable variability.

14) In this approach to managing capacity, a firm uses flexible work hours by the workforce to manage capacity to better meet demand.

- A) Time flexibility from workforce
- B) Use of seasonal workforce
- C) Use of subcontracting
- D) Use of dual facilities—specialized and flexible

Answer: A

Diff: 2

Topic: 9.2 Managing Supply

AACSB: Application of knowledge

Objective: LO 9.1: Manage supply to improve synchronization in a supply chain in the face of predictable variability.

15) In this approach to managing capacity, a firm uses a temporary workforce during the peak season to increase capacity to match demand.

- A) Time flexibility from workforce
- B) Use of subcontracting
- C) Use of dual facilities—specialized and flexible
- D) Use of seasonal workforce

Answer: D

Diff: 2

Topic: 9.2 Managing Supply

AACSB: Application of knowledge

Objective: LO 9.1: Manage supply to improve synchronization in a supply chain in the face of predictable variability.

16) In this approach to managing capacity, a firm subcontracts peak production so that internal production remains level and can be done cheaply.

- A) Time flexibility from workforce
- B) Use of subcontracting
- C) Use of dual facilities—specialized and flexible
- D) Use of seasonal workforce

Answer: B

Diff: 2

Topic: 9.2 Managing Supply

AACSB: Application of knowledge

Objective: LO 9.1: Manage supply to improve synchronization in a supply chain in the face of predictable variability.

17) In this approach to managing capacity, a firm has flexible production lines whose production rate can easily be varied.

- A) Time flexibility from workforce
- B) Use of subcontracting
- C) Designing product flexibility into the production processes
- D) Use of seasonal workforce

Answer: C

Diff: 2

Topic: 9.2 Managing Supply

AACSB: Application of knowledge

Objective: LO 9.1: Manage supply to improve synchronization in a supply chain in the face of predictable variability.

18) A firm can vary supply of product by controlling

- A) production capacity and inventory.
- B) production capacity and price promotions.
- C) price promotions and inventory.
- D) production capacity and inventory promotions.

Answer: A

Diff: 2

Topic: 9.2 Managing Supply

AACSB: Application of knowledge

Objective: LO 9.1: Manage supply to improve synchronization in a supply chain in the face of predictable variability.

19) The capacity management approach that uses flexible work hours from the workforce to manage capacity to better meet demand is

- A) time flexibility from workforce.
- B) use of seasonal workforce.
- C) use of subcontracting.
- D) use of dual facilities—dedicated and flexible.

Answer: A

Diff: 2

Topic: 9.2 Managing Supply

AACSB: Application of knowledge

Objective: LO 9.1: Manage supply to improve synchronization in a supply chain in the face of predictable variability.

20) The capacity management approach that uses a temporary workforce during the peak season to increase capacity to match demand is

- A) time flexibility from workforce.
- B) the use of seasonal workforce.
- C) the use of subcontracting.
- D) the use of dual facilities—dedicated and flexible.

Answer: B

Diff: 1

Topic: 9.2 Managing Supply

AACSB: Application of knowledge

Objective: LO 9.1: Manage supply to improve synchronization in a supply chain in the face of predictable variability.

21) The capacity management approach where a firm purchases peak production from another firm so that internal production remains level and can be done cheaply is

- A) time flexibility from workforce.
- B) the use of seasonal workforce.
- C) the use of subcontracting.
- D) the use of dual facilities—dedicated and flexible.

Answer: C

Diff: 2

Topic: 9.2 Managing Supply

AACSB: Application of knowledge

Objective: LO 9.1: Manage supply to improve synchronization in a supply chain in the face of predictable variability.

22) The capacity management approach where a firm builds facilities to produce a relatively stable output of products over time in a very efficient manner and facilities to produce a widely varying volume and variety of products, but at a higher unit cost is

- A) time flexibility from workforce.
- B) the use of seasonal workforce.
- C) the use of subcontracting.
- D) the use of dual facilities—dedicated and flexible.

Answer: D

Diff: 1

Topic: 9.2 Managing Supply

AACSB: Application of knowledge

Objective: LO 9.1: Manage supply to improve synchronization in a supply chain in the face of predictable variability.

23) The capacity management approach where a firm has production lines whose production rate can easily be varied to match demand is

- A) time flexibility from workforce.
- B) the use of seasonal workforce.
- C) the use of subcontracting.
- D) designing product flexibility into the production processes.

Answer: D

Diff: 2

Topic: 9.2 Managing Supply

AACSB: Application of knowledge

Objective: LO 9.1: Manage supply to improve synchronization in a supply chain in the face of predictable variability.

24) Which approach to capacity management may be hard to sustain if the labor market is tight?

- A) Time flexibility from workforce
- B) Use of seasonal workforce
- C) Use of subcontracting
- D) Use of dual facilities—dedicated and flexible

Answer: B

Diff: 2

Topic: 9.2 Managing Supply

AACSB: Application of knowledge

Objective: LO 9.1: Manage supply to improve synchronization in a supply chain in the face of predictable variability.

25) Which approach to capacity management makes use of spare plant capacity that exists in the form of hours when the plant is not operational?

- A) Time flexibility from workforce
- B) Use of seasonal workforce
- C) Use of subcontracting
- D) Use of dual facilities—dedicated and flexible

Answer: A

Diff: 2

Topic: 9.2 Managing Supply

AACSB: Application of knowledge

Objective: LO 9.1: Manage supply to improve synchronization in a supply chain in the face of predictable variability.

26) Which approach to capacity management makes use of overtime, which is varied to match the variation in demand?

- A) Time flexibility from workforce
- B) Use of seasonal workforce
- C) Use of subcontracting
- D) Use of dual facilities—dedicated and flexible

Answer: A

Diff: 1

Topic: 9.2 Managing Supply

AACSB: Application of knowledge

Objective: LO 9.1: Manage supply to improve synchronization in a supply chain in the face of predictable variability.

27) Which approach to capacity management would schedule the workforce so that the available capacity better matches demand?

- A) Time flexibility from workforce
- B) Use of seasonal workforce
- C) Use of subcontracting
- D) Use of dual facilities—dedicated and flexible

Answer: A

Diff: 1

Topic: 9.2 Managing Supply

AACSB: Application of knowledge

Objective: LO 9.1: Manage supply to improve synchronization in a supply chain in the face of predictable variability.

28) Which approach to capacity management would use a part-time workforce to increase capacity flexibility by enabling the firm to have more people at work during peak periods?

- A) Time flexibility from workforce
- B) Use of seasonal workforce
- C) Use of subcontracting
- D) Use of dual facilities—dedicated and flexible

Answer: A

Diff: 2

Topic: 9.2 Managing Supply

AACSB: Application of knowledge

Objective: LO 9.1: Manage supply to improve synchronization in a supply chain in the face of predictable variability.

29) The key to which capacity management approach would involve having both volume (fluctuating demand from a manufacturer) and variety flexibility (demand from several manufacturers) to be sustainable?

- A) Time flexibility from workforce
- B) Use of seasonal workforce
- C) Use of subcontracting
- D) Use of dual facilities—dedicated and flexible

Answer: C

Diff: 3

Topic: 9.2 Managing Supply

AACSB: Application of knowledge

Objective: LO 9.1: Manage supply to improve synchronization in a supply chain in the face of predictable variability.

30) Which approach to capacity management would require that the workforce be multi-skilled and easily adapt to being moved from line to line?

- A) Time flexibility from workforce
- B) Use of seasonal workforce
- C) Use of dual facilities—dedicated and flexible
- D) Designing product flexibility into the production processes

Answer: D

Diff: 2

Topic: 9.2 Managing Supply

AACSB: Application of knowledge

Objective: LO 9.1: Manage supply to improve synchronization in a supply chain in the face of predictable variability.

31) Which approach to capacity management would use production machinery that can be changed easily from producing one product to another?

- A) Time flexibility from workforce
- B) Use of subcontracting
- C) Use of dual facilities—dedicated and flexible
- D) Designing product flexibility into the production processes

Answer: D

Diff: 2

Topic: 9.2 Managing Supply

AACSB: Application of knowledge

Objective: LO 9.1: Manage supply to improve synchronization in a supply chain in the face of predictable variability.

32) Which approach to capacity management would only be effective if the overall demand across all the products is relatively constant?

- A) Use of seasonal workforce
- B) Use of subcontracting
- C) Use of dual facilities—dedicated and flexible
- D) Designing product flexibility into the production processes

Answer: D

Diff: 3

Topic: 9.2 Managing Supply

AACSB: Application of knowledge

Objective: LO 9.1: Manage supply to improve synchronization in a supply chain in the face of predictable variability.

33) Which of the following is an approach that firms can use when managing inventory to meet predictable demand variability?

- A) Time flexibility from workforce
- B) Use of seasonal workforce
- C) Use of subcontracting
- D) Using common components across multiple products

Answer: D

Diff: 2

Topic: 9.2 Managing Supply

AACSB: Application of knowledge

Objective: LO 9.1: Manage supply to improve synchronization in a supply chain in the face of predictable variability.

34) When most of the products a firm produces have the same peak demand season, in order to meet predictable variability with inventory, it must

- A) use common components across multiple products.
- B) use a seasonal workforce.
- C) build inventory of high demand or predictable demand products.
- D) use subcontracting.

Answer: C

Diff: 2

Topic: 9.2 Managing Supply

AACSB: Application of knowledge

Objective: LO 9.1: Manage supply to improve synchronization in a supply chain in the face of predictable variability.

35) Supply chains can influence demand by using

- A) production capacity and inventory.
- B) pricing and other promotions.
- C) price promotions and inventory.
- D) production capacity and inventory promotions.

Answer: B

Diff: 2

Topic: 9.3 Managing Demand

AACSB: Application of knowledge

Objective: LO 9.2: Manage demand to improve synchronization in a supply chain in the face of predictable sustainability.

36) The pricing and promotion decisions are often made by

- A) marketing and sales.
- B) marketing and operations.
- C) operations and sales.
- D) marketing, operations, and sales.

Answer: A

Diff: 2

Topic: 9.3 Managing Demand

AACSB: Application of knowledge

Objective: LO 9.2: Manage demand to improve synchronization in a supply chain in the face of predictable sustainability.

37) The promotion and pricing decisions made by marketing and sales typically have the objective of

- A) maximizing profitability.
- B) minimizing profitability.
- C) minimizing revenue.
- D) maximizing revenue.

Answer: D

Diff: 3

Topic: 9.3 Managing Demand

AACSB: Application of knowledge

Objective: LO 9.2: Manage demand to improve synchronization in a supply chain in the face of predictable sustainability.

38) Pricing decisions based only on revenue considerations often result in

- A) a decrease in overall profitability.
- B) an increase in overall profitability.
- C) a decrease in overall revenue.
- D) a decrease in supply chain revenue.

Answer: A

Diff: 2

Topic: 9.3 Managing Demand

AACSB: Application of knowledge

Objective: LO 9.2: Manage demand to improve synchronization in a supply chain in the face of predictable sustainability.

39) When planning, the goal of all firms in the supply chain should be to maximize supply chain profits because

- A) this leaves them less profit to divide among themselves.
- B) this leaves them more profit to divide among themselves.
- C) this outcome leaves them more profit to pay tax on.
- D) this outcome will increase their charitable giving.

Answer: B

Diff: 1

Topic: 9.3 Managing Demand

AACSB: Application of knowledge

Objective: LO 9.2: Manage demand to improve synchronization in a supply chain in the face of predictable sustainability.

40) One key to successful collaboration when the supply chain is performing aggregate planning is

- A) determining how losses will be allocated to different members of the supply chain.
- B) determining how profits will be allocated to different members of the supply chain.
- C) determining how labor will be allocated to different members of the supply chain.
- D) determining how customers will be allocated to different members of the supply chain.

Answer: B

Diff: 2

Topic: 9.3 Managing Demand

AACSB: Application of knowledge

Objective: LO 9.2: Manage demand to improve synchronization in a supply chain in the face of predictable sustainability.

41) An increase in consumption of the product either from new or existing customers is

- A) market growth.
- B) stealing share.
- C) forward selling.
- D) forward buying.

Answer: A

Diff: 1

Topic: 9.3 Managing Demand

AACSB: Application of knowledge

Objective: LO 9.2: Manage demand to improve synchronization in a supply chain in the face of predictable sustainability.

42) Customers substituting the firm's product for a competitor's product is

- A) market growth.
- B) stealing share.
- C) forward selling.
- D) forward buying.

Answer: B

Diff: 1

Topic: 9.3 Managing Demand

AACSB: Application of knowledge

Objective: LO 9.2: Manage demand to improve synchronization in a supply chain in the face of predictable sustainability.

43) Customers moving up future purchases to the present is

- A) market growth.
- B) stealing share.
- C) forward selling.
- D) forward buying.

Answer: D

Diff: 1

Topic: 9.3 Managing Demand

AACSB: Application of knowledge

Objective: LO 9.2: Manage demand to improve synchronization in a supply chain in the face of predictable sustainability.

44) In general, as the fraction of increased demand coming from forward buying grows, offering the promotion during the peak demand period becomes

- A) less attractive.
- B) more attractive.
- C) more profitable.
- D) less significant.

Answer: A

Diff: 2

Topic: 9.3 Managing Demand

AACSB: Analytical thinking

Objective: LO 9.2: Manage demand to improve synchronization in a supply chain in the face of predictable sustainability.

45) Offering a promotion during a peak period that has significant forward buying

- A) creates a desirable demand pattern.
- B) creates a demand pattern less costly to serve.
- C) creates a demand pattern even more costly to serve.
- D) shifts demand from the peak period to the slow period.

Answer: C

Diff: 3

Topic: 9.3 Managing Demand

AACSB: Analytical thinking

Objective: LO 9.2: Manage demand to improve synchronization in a supply chain in the face of predictable sustainability.

46) Average inventory

- A) increases if a promotion is run during the peak period.
- B) increases if a promotion is run during the off-peak period.
- C) decreases if a promotion is run during the peak period.
- D) decreases if a promotion is run during the off-peak period.

Answer: B

Diff: 2

Topic: 9.3 Managing Demand

AACSB: Analytical thinking

Objective: LO 9.2: Manage demand to improve synchronization in a supply chain in the face of predictable sustainability.

47) Promoting during a peak demand month may decrease overall profitability if

- A) a small fraction of the demand increase results from a forward buy.
- B) any of the demand increase results from a forward buy.
- C) a significant fraction of the demand increase results from a forward buy.
- D) none of the above

Answer: C

Diff: 3

Topic: 9.3 Managing Demand

AACSB: Analytical thinking

Objective: LO 9.2: Manage demand to improve synchronization in a supply chain in the face of predictable sustainability.

48) As the product margin declines, promoting during the peak demand period becomes

- A) less profitable.
- B) more profitable.
- C) less of a risk.
- D) more desirable.

Answer: A

Diff: 3

Topic: 9.3 Managing Demand

AACSB: Analytical thinking

Objective: LO 9.2: Manage demand to improve synchronization in a supply chain in the face of predictable sustainability.

49) Which factor favors promotion during low-demand periods?

- A) High forward buying
- B) High ability to steal market share
- C) High ability to increase overall market
- D) High margin

Answer: A

Diff: 3

Topic: 9.3 Managing Demand

AACSB: Analytical thinking

Objective: LO 9.2: Manage demand to improve synchronization in a supply chain in the face of predictable sustainability.

50) Which factor favors promotion during low-demand periods?

- A) High margin
- B) High ability to steal market share
- C) High ability to increase overall market
- D) Low margin

Answer: D

Diff: 2

Topic: 9.3 Managing Demand

AACSB: Analytical thinking

Objective: LO 9.2: Manage demand to improve synchronization in a supply chain in the face of predictable sustainability.

51) Which factor favors promotion during peak-demand periods?

- A) High margin
- B) Low ability to steal market share
- C) High ability to increase overall market
- D) Low margin

Answer: C

Diff: 3

Topic: 9.3 Managing Demand

AACSB: Analytical thinking

Objective: LO 9.2: Manage demand to improve synchronization in a supply chain in the face of predictable sustainability.

9.3 Essay Questions

1) Discuss how a firm can respond to predictable variability of demand in the supply chain.

Answer: Faced with predictable variability, a company's goal is to respond in a manner that maximizes profitability. A firm must choose how to handle predictable variability by utilizing techniques in two broad categories:

1. Manage supply using capacity, inventory, subcontracting, and backlogs.
2. Manage demand using short-term price discounts and trade promotions.

The use of these tools enables the supply chain to greatly increase its profitability because it is able to match supply and demand in a much more coordinated fashion. One way to meet seasonal demand requires carrying enough manufacturing capacity to meet demand in any period. The advantage of this approach is very low inventory costs, because no inventory needs to be carried from period to period. The disadvantage, however, is that much of the expensive capacity would go unused during most months when demand was lower.

Another approach to meeting demand would be to build up inventory during the off season to keep production stable year round. The advantage of this approach lies in the fact that a firm could get by with a smaller, less expensive factory. High inventory carrying costs, however, make this alternative expensive. A third approach would be for a firm to work with their retail partners in the supply chain to offer a price promotion during periods of low demand. This promotion shifts some of the demand into a slow period, thereby spreading demand more evenly throughout the year and reducing the seasonal surge. Such a demand pattern is less expensive to supply. A company needs to decide which alternative maximizes their profitability.

Often companies divide the task of supply and demand management between different functions. Marketing typically manages demand and Operations typically manages supply. At a higher level, supply chains suffer from this phenomenon as well, with retailers independently managing demand and manufacturers independently managing supply. With supply and demand management decisions being made independently, it is increasingly difficult to coordinate the supply chain, thereby decreasing profit. Therefore, maximizing profitability depends on these decisions being made in a coordinated fashion and requires supply chain partners to work together across enterprises.

Diff: 3

Topic: 9.1 Responding to Predictable Variability in the Supply Chain

AACSB: Application of knowledge

Objective: LO 9.1: Manage supply to improve synchronization in a supply chain in the face of predictable variability.

2) Discuss the approaches that can be used to manage capacity to meet predictable variability of demand.

Answer: When managing capacity to meet predictable variability, firms use a combination of the following approaches:

- *Time flexibility from workforce:* In this approach, a firm uses flexible work hours from the workforce to manage capacity to better meet demand. In many instances, plants do not operate continually and are left idle during portions of the day or week. Therefore, spare plant capacity exists in the form of hours when the plant is not operational. Many plants do not run three shifts, so the existing workforce could work overtime during peak periods to produce more to meet demand. If demand fluctuates by day of the week or week of the month and the workforce is willing to be flexible, a firm may schedule the workforce so that the available capacity better matches demand. In such settings, use of a part-time workforce may further increase the capacity flexibility by enabling the firm to have more people at work during peak periods.
- *Use of seasonal workforce:* In this approach, a firm uses a temporary workforce during the peak season to increase capacity to match demand. This approach may be hard to sustain if the labor market is tight.
- *Use of subcontracting:* In this approach, a firm subcontracts peak production so that internal production remains level and can be done cheaply. With the subcontractor handling the peaks, the company is able to build a relatively inflexible but low-cost facility where the production rates are kept relatively constant (other than variations that arise from the use of overtime). Peaks are subcontracted out to facilities that are more flexible. A key here is the availability of relatively flexible subcontractor capacity. The subcontractor can often provide flexibility at a lower cost by pooling the fluctuations in demand across different manufacturers. Thus the flexible subcontractor capacity must have both volume (fluctuating demand from a manufacturer) as well as variety flexibility (demand from several manufacturers) to be sustainable.
- *Use of dual facilities—dedicated and flexible:* In this approach, a firm builds both dedicated and flexible facilities. Dedicated facilities produce a relatively stable output of products over time in a very efficient manner. Flexible facilities produce a widely varying volume and variety of products but at a higher unit cost. Each dedicated facility could produce at a relatively steady rate, with fluctuations being absorbed by the flexible facility.
- *Designing product flexibility into the production processes:* In this approach, a firm has flexible production lines whose production rate can easily be varied. Production is then changed to match demand. The production lines are designed such that changing the number of workers on a line can vary the production rate. As long as variation of demand across different product lines is complementary, (i.e., when one goes up, the other tends to go down), the capacity on each line can be varied by moving the workforce from one line to the other. Of course, this requires that the workforce be multi-skilled and easily adapt to being moved from line to line. Production flexibility can also be achieved if the production machinery being used is flexible and can be changed easily from producing one product to another. This approach can only be effective if the overall demand across all the products is relatively constant. Several firms producing products with seasonal demand try and exploit this approach by carrying a portfolio of products that have peak demand seasons distributed over the year.

Diff: 2

Topic: 9.2 Managing Supply

AACSB: Application of knowledge

Objective: LO 9.1: Manage supply to improve synchronization in a supply chain in the face of

predictable variability.

3) Discuss the approaches a firm can use to manage inventory to meet predictable variability of demand.

Answer: When managing inventory to meet predictable variability, firms use a combination of the following approaches:

- *Using common components across multiple products:* In this approach, a firm designs common components used in multiple products, with each product having predictably variable demand that results in relatively constant overall demand. Use of common components across these products will result in the demand for the components being relatively constant.
- *Build inventory of high demand or predictable demand products:* When most of the products a firm produces have the same peak demand season, the previous approach is no longer feasible. A firm must then decide which inventory to build during the off season. The answer is to build products during the off season that have more predictable demand, because there is less to be learned about their demand by waiting. As more is known about demand closer to the selling season, production of more uncertain items should take place. This strategy helps the supply chain better synchronize supply and demand.

Diff: 2

Topic: 9.2 Managing Supply

AACSB: Application of knowledge

Objective: LO 9.1: Manage supply to improve synchronization in a supply chain in the face of predictable variability.

4) Discuss the importance of collaboration within a supply chain when performing aggregate planning.

Answer: Supply chains can influence demand by using pricing and other forms of promotion. Marketing and sales often make the promotion and pricing decisions, and they typically make them with the objective of maximizing revenue. However, changing the demand pattern can change the cost the company incurs to meet that demand. Thus, pricing decisions based only on revenue considerations often result in a decrease in overall profitability. The same is true when thinking of the supply chain. The retailer sets the price and runs promotions to generate demand. This is regularly done without taking into account the impact on the rest of the supply chain. Therefore, the combination of pricing and aggregate planning (both demand and supply management) can be used to maximize supply chain profitability.

When performing aggregate planning, the goal of all firms in the supply chain should be to maximize supply chain profits because this outcome leaves them more to divide with each other. For profit maximization to take place, companies need to devise a way to collaborate and, just as important, determine a way to split the supply chain profits. Determining how these profits will be allocated to different members of the supply chain is a key to successful collaboration.

Diff: 2

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AACSB: Application of knowledge

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5) Discuss the impact of promotion on demand within a supply chain.

Answer: Companies want to explore if and when to potentially offer a promotion. Four key factors influence the timing of a trade promotion:

- Impact of the promotion on demand
- Product margins
- Cost of holding inventory
- Cost of changing capacity

Companies should identify whether each factor favors offering a promotion during the high- or low-demand periods. They start by considering the impact of promotion on demand. When a promotion is offered during a period, that period's demand will go up. This increase in demand results from a combination of the following three factors:

1. *Market growth*: An increase in consumption of the product, either from new or existing customers.
2. *Stealing share*: Customers substituting the firm's product for a competitor's product.
3. *Forward buying*: Customers move up future purchases to the present.

The first two factors increase the overall demand, whereas the third simply shifts future demand to the present. It is important to know the relative impact from the three factors as a result of a promotion before making the decision regarding the optimal timing of the promotion. In general, as the fraction of increased demand coming from forward buying grows, offering the promotion during the peak demand period becomes less attractive. Offering a promotion during a peak period that has significant forward buying creates even more variable demand than before the promotion. Product that was once demanded in the slow period is now demanded in the peak period, making this demand pattern even more costly to serve.

Average inventory increases if a promotion is run during the peak period and decreases if the promotion is run during the off-peak period. Promoting during a peak demand month may decrease overall profitability if a significant fraction of the demand increase results from a forward buy. As forward buying becomes a smaller fraction of the demand increase from a promotion, it is more profitable to promote during the peak period. As the product margin declines, promoting during the peak demand period becomes less profitable.

Other factors such as holding cost and the cost of changing capacity also affect the optimal timing of promotions. When faced with seasonal demand, a firm should use a combination of pricing (to manage demand) and production and inventory (to manage supply) to improve profitability. The precise use of each lever varies with the situation. This makes it crucial that enterprises in a supply chain coordinate both their forecasting and planning efforts. Only then are profits maximized.

Diff: 2

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6) Discuss key issues when managing predictable variability of demand within a supply chain.

Answer:

1. *Coordinate planning across enterprises in the supply chain.* For a supply chain to successfully manage predictable variability, the entire chain must work toward the one goal of maximizing profitability. Everyone in a supply chain may agree with this in principle, but in reality, it is very difficult to get an entire supply chain to agree on how to maximize profitability. Within a company, marketing often has incentives based on revenue, whereas operations has incentives based on cost. Within the supply chain, different enterprises are judged by their own profitability, not necessarily by the overall supply chain's profitability. It is clear that without working to get companies to work together, the supply chain will return suboptimal profits. Therefore, firms in the supply chain need to collaborate through the formation of joint teams. Incentives of the members of the supply chain must be aligned. High-level support within the organization, including support from the chief executive officer, will also be needed because this coordination often requires groups to act counter to their traditional operating procedures. Although this collaboration is difficult, the payoffs are significant.

2. *Take predictable variability into account when making strategic decisions.* Predictable variability has a tremendous impact on the operations of a company. A firm must always take this impact into account when making strategic decisions. However, predictable variability is not always taken into account when strategic plans are made, such as what type of products to offer, whether or not to build new facilities, and what sort of pricing structure a company should have. The level of profitability is greatly affected by predictable variability and, therefore, the success or failure of strategic decisions can be determined by it.

3. *Preempt, do not just react to, predictable variability.* Companies often have a tendency to focus on how they can effectively react to predictable variability. This role often falls on operations, which tries to manage supply to best deal with predictable variability. The management of supply as well as demand provides the best response to predictable variability. Actions like pricing and promotion that manage demand are preemptive and often in the domain of marketing. It is important for marketing and operations to coordinate their efforts and plan for predictable variability together well before the peak demand is observed. This coordination allows a firm to preempt predictable variability and come up with a response that maximizes profits.

Diff: 3

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