

## Comprehensive Make-or-Buy Decision

Foggy Mountain Company manufactures several styles of banjos. Management estimates that during the second quarter of the current year, the company will be operating at 80 percent of normal capacity. Because Foggy Mountain wants to increase utilization of the plant, the company has decided to consider special orders for its products.

Foggy Mountain has just received inquiries from a number of companies concerning the possibility of a special order and has narrowed the decision to two companies. The first inquiry is from CCR Company, which would like to market a banjo very similar to one of Foggy Mountain's. The CCR banjo would be marketed under CCR's own label. CCR has offered Foggy Mountain \$57.50 per banjo for 20,000 banjos to be shipped by June 1. The cost data for the Foggy Mountain banjo are as follows:

### Relevant Costs and Product-Planning Decisions: Cases

Regular selling price per banjo	<u>\$90.00</u>
Costs per unit:	
Raw material	\$25.00
Direct labor (5 hours @ \$6)	30.00
Overhead (2.5 machine hours @ \$4)	<u>10.00</u>
Total costs	<u>\$65.00</u>

According to the specifications provided by CCR, the banjo that the company wants requires less expensive raw material. Consequently, the raw material would cost only \$22 per banjo. Foggy Mountain has estimated that all remaining costs would not change.

The second special order was submitted by Seager and Buffet Company for 7,500 banjos at \$75 per banjo. These banjos would be marketed under the Seager and Buffet label and also would be shipped by June 1. However, the Seager and Buffet model is different from any banjo in the Foggy Mountain product line. The estimated per-unit costs are as follows:

### Relevant Costs and Product-Planning Decisions: Cases

Raw material	\$32.50
Direct labor (5 hours @ \$6)	30.00
Overhead (5 machine hours @ \$4)	20.00
Total costs	<u>\$82.50</u>

In addition, Foggy Mountain would incur \$15,000 in additional setup costs and would have to purchase a \$22,500 special machine to manufacture these banjos; this machine would be discarded once the special order has been completed.

The Foggy Mountain manufacturing capabilities are limited in the total machine hours available. The plant capacity under normal operations is 900,000 machine hours per year, or 75,000 machine hours per month. The budgeted fixed overhead for the year is \$2,160,000. All manufacturing overhead costs are applied to production on the basis of machine hours at \$4 per hour.

Foggy Mountain will have the entire second quarter to work on the special orders. Management does not expect any repeat sales to be generated from either special order. Company practice precludes Foggy Mountain from subcontracting any portion of an order when special orders are not expected to generate repeat sales.

Required

- What is the excess capacity of machine hours available in the second quarter?
- What is the variable overhead rate per machine hour?
- On the basis of the preceding information and your analysis, would you accept CCR's offer?
- What is the unit contribution margin per banjo for the Seager and Buffet order?
- What is the actual gain (loss) incurred by accepting Seager and Buffet's offer?

A. Under normal conditions, plant capacity is 75,000 machine hours per month, or 225,000 hours per quarter. The company has estimated that it will be operating at 80 percent of capacity for the quarter. The excess capacity is 45,000 hours (225,000  0.20).

B. The total overhead per hour is \$4, with a fixed portion of \$2.40 (\$2,160,000 of total fixed overhead divided by 900,000 machine hours). The variable portion is therefore \$1.60 per budgeted machine hour, or \$4 per unit.

C. In examining the special order from CCR, Foggy Mountain should consider the differential costs of making the extra banjos and any opportunity costs.

The relevant costs would include a cost of \$22 (not \$25) for direct materials, \$30 for direct labor, and \$4 for variable overhead (\$1.60 variable overhead rate  2.5 hours), for a total of \$56.

Foggy Mountain would also incur an opportunity cost equal to \$3.10 per banjo, calculated as follows: Producing 20,000 banjos will require 50,000 machine hours. However, Foggy Mountain expects to have only 45,000 excess machine hours in the second quarter (see Requirement A). Therefore, in order to accept the special order, Foggy Mountain would have to reduce its regular sales by 2,000 banjos.

Consequently, if Foggy Mountain accepts the special order, the company will incur an opportunity cost equal to the contribution margin lost on regular sales.

At a sales price of \$90 per unit, the contribution margin on lost sales would be \$31 per unit (\$90 sales price – \$25 raw material cost – \$30 labor cost – \$4 variable overhead cost).

Hence, the total contribution margin lost would be \$62,000 (2,000 banjos  \$31 contribution margin/unit). This increases the relevant costs of the special order by \$3.10 per banjo (\$62,000 contribution margin/20,000 banjos in the special order).

The total cost of the special order would thus be \$56 + \$3.10 = \$59.10. Because CCR will pay Foggy Mountain \$57.50 per unit for the order, Foggy Mountain should reject the special order.

D. The unit contribution is computed as follows:

Selling price	\$ 75.00
Raw materials	(32.50)
Direct labor	(30.00)
Overhead (5 <input type="checkbox"/> \$8.00)	
Machine setup (\$15,000/7,500 units)	(2.00)
Special machine (\$22,500/7,500 units)	(3.00)
Contribution margin	\$ (0.50)

E. The company would lose \$0.50 per unit, for a total loss of \$3,750 (\$0.50  7,500 units), of the additional machine setup costs and the purchase of special equipment. Foggy Mountain would have to charge Seager and Buffet at least \$75.50 to accept the special order.