

Exercise 12-12 (20 minutes)

The costs that can be avoided as a result of purchasing from the outside are relevant in a make-or-buy decision. The analysis is:

	<i>Per Unit Differential Costs</i>		<i>20,000 Units</i>	
	<i>Make</i>	<i>Buy</i>	<i>Make</i>	<i>Buy</i>
Cost of purchasing.....		\$23.50		\$470,000
Cost of making:				
Direct materials	\$ 4.80		\$ 96,000	
Direct labor	7.00		140,000	
Variable manufacturing overhead	3.20		64,000	
Fixed manufacturing overhead ...	<u>4.00 *</u>		<u>80,000</u>	
Total cost	<u>\$19.00</u>	<u>\$23.50</u>	<u>\$380,000</u>	<u>\$470,000</u>

* The remaining \$6 of fixed manufacturing overhead cost would not be relevant because it will continue regardless of whether the company makes or buys the parts.

The \$150,000 rental value of the space being used to produce part R-3 is an opportunity cost of continuing to produce the part internally. Thus, the complete analysis is:

	<i>Make</i>	<i>Buy</i>
Total cost, as above.....	\$380,000	\$470,000
Rental value of the space (opportunity cost)	<u>150,000</u>	
Total cost, including opportunity cost	<u>\$530,000</u>	<u>\$470,000</u>
Net advantage in favor of buying		<u>\$60,000</u>

Profits would increase by \$60,000 if the outside supplier's offer is accepted.

Exercise 12-13 (30 minutes)

	<i>A</i>	<i>B</i>	<i>C</i>
1. (1) Contribution margin per unit.....	\$18	\$36	\$20
(2) Direct labor cost per unit.....	\$12	\$32	\$16
(3) Direct labor rate per hour.....	8	8	8
(4) Direct labor-hours required per unit (2) ÷ (3)	1.5	4.0	2.0
Contribution margin per direct labor-hour (1) ÷ (4)	\$12	\$ 9	\$10

2. The company should concentrate its labor time on producing product A:

	<i>A</i>	<i>B</i>	<i>C</i>
Contribution margin per direct labor-hour...	\$12	\$9	\$10
Direct labor-hours available.....	<u>× 3,000</u>	<u>× 3,000</u>	<u>× 3,000</u>
Total contribution margin	<u>\$36,000</u>	<u>\$27,000</u>	<u>\$30,000</u>

Although product A has the lowest contribution margin per unit and the second lowest contribution margin ratio, it has the highest contribution margin per direct labor-hour. Since labor time seems to be the company's constraint, this measure should guide management in its production decisions.

3. The amount Banner Company should be willing to pay in overtime wages for additional direct labor time depends on how the time would be used. If there are unfilled orders for all of the products, Banner would presumably use the additional time to make more of product A. Each hour of direct labor time generates \$12 of contribution margin over and above the usual direct labor cost. Therefore, Banner should be willing to pay up to \$20 per hour (the \$8 usual wage plus the contribution margin per hour of \$12) for additional labor time, but would of course prefer to pay far less. The upper limit of \$20 per direct labor hour signals to managers how valuable additional labor hours are to the company.

Exercise 12-13 (continued)

If all the demand for product A has been satisfied, Banner Company would then use any additional direct labor-hours to manufacture product C. In that case, the company should be willing to pay up to \$18 per hour (the \$8 usual wage plus the \$10 contribution margin per hour for product C) to manufacture more product C.

Likewise, if all the demand for both products A and C has been satisfied, additional labor hours would be used to make product B. In that case, the company should be willing to pay up to \$17 per hour to manufacture more product B.

Exercise 12-14 (15 minutes)

1. Monthly profits would increase by \$9,000:

	<i>Per Unit</i>	<i>Total for 2,000 Units</i>
Incremental revenue	<u>\$12.00</u>	<u>\$24,000</u>
Incremental costs:		
Variable costs:		
Direct materials.....	2.50	5,000
Direct labor.....	3.00	6,000
Variable manufacturing overhead.....	0.50	1,000
Variable selling and administrative	<u>1.50</u>	<u>3,000</u>
Total variable cost.....	<u>\$ 7.50</u>	15,000
Fixed costs:		
None affected by the special order.....		<u>0</u>
Total incremental cost.....		<u>15,000</u>
Incremental net operating income		<u>\$ 9,000</u>

2. The relevant cost is \$1.50 (the variable selling and administrative costs). All other variable costs are sunk because the units have already been produced. The fixed costs are not relevant because they would not be affected by the sale of leftover units.

Exercise 12-15 (10 minutes)

Contribution margin lost if the Bath Department is dropped:

Lost from the Bath Department.....	\$700,000
Lost from the Kitchen Department (10% × \$2,400,000) ..	<u>240,000</u>
Total lost contribution margin	940,000
Less avoidable fixed costs (\$900,000 – \$370,000)	<u>530,000</u>
Decrease in overall net operating income	<u><u>\$410,000</u></u>

Exercise 12-16 (15 minutes)

<i>Item</i>	<u><i>Relevant Costs</i></u>	
	<i>Make</i>	<i>Buy</i>
Direct materials (60,000 @ \$4.00)	\$240,000	
Direct labor (60,000 @ \$2.75)	165,000	
Variable manufacturing overhead (60,000 @ \$0.50)	30,000	
Fixed manufacturing overhead, traceable (1/3 of \$180,000)	60,000	
Cost of purchasing from outside supplier (60,000 @ \$10)		<u>\$600,000</u>
Total cost.....	<u>\$495,000</u>	<u>\$600,000</u>

The two-thirds of the traceable fixed manufacturing overhead costs that cannot be eliminated, and all of the common fixed manufacturing overhead costs, are irrelevant.

The company would save \$105,000 per year by continuing to make the parts itself. In other words, profits would decline by \$105,000 per year if the parts were purchased from the outside supplier.