

	Base Year	Year 1	Year 2	Year 3
Production (distilled gallons)	500,000	600,000	700,000	800,000
Aged gallons sold	400,000	400,000	400,000	400,000
Warehouse Inventory at Beginning of Year				
4-year-old bbls	10,000	10,000	10,000	10,000
3-year-old bbls	10,000	10,000	10,000	10,000
2-year-old bbls	10,000	10,000	10,000	12,000
1-year-old bbls	10,000	10,000	12,000	14,000
New bbls added	10,000	12,000	14,000	16,000
Total bbls to be aged in year	<u>50,000</u>	<u>52,000</u>	<u>56,000</u>	<u>62,000</u>
(bbls = barrels)				

Warehousing rental costs to age the base-year production of 10,000 barrels per year are \$1 million per year. Additional warehouse rental cost of \$40,000 per year must be incurred to age each additional 20,000 barrels (100,000 distilled gallons). All costs incurred in warehousing are treated as handling or carrying costs and are written off when incurred. Bottled Old Turkey is sold to distributors for \$15 per gallon. These income statements summarize the firm's current operating performance:

	Base Year	Year 1	Year 2	Year 3
Revenues	\$6,000,000	\$6,000,000	\$6,000,000	\$6,000,000
Less:				
Cost of goods sold:				
10,000 bbls @ \$100/ bbl	1,000,000	1,000,000	1,000,000	1,000,000
Oak barrels	750,000	900,000	1,050,000	1,200,000
Warehouse rental	1,000,000	1,040,000	1,120,000	1,240,000
Warehouse direct costs	<u>2,500,000</u>	<u>2,600,000</u>	<u>2,800,000</u>	<u>3,100,000</u>
Net income (loss)				
before taxes	\$ 750,000	\$ 460,000	\$ 30,000	\$ (540,000)
Income taxes (30%)	<u>225,000</u>	<u>138,000</u>	<u>9,000</u>	<u>(162,000)</u>
Net income after taxes	<u>\$ 525,000</u>	<u>\$ 322,000</u>	<u>\$ 21,000</u>	<u>\$ (378,000)</u>

Management is quite concerned about the loss that is projected for the third year of the expansion (the current year). The president has scheduled a meeting with the local bank to review the firm's current financial performance. This bank has been lending the firm the capital to finance the production expansion.

Required:

- Instead of writing off all the warehousing and oak barrel costs, prepare revised income statements for years 1 through 3, treating the warehousing and barrel costs as product costs.
- Which set of income statements (those given or the ones you prepared) should the president show the bank at the meeting? Justify your answer.

Case 2-2: Mowerson Division

The Mowerson Division of Brown Instruments manufactures testing equipment for the automobile industry. Mowerson's equipment is installed in several places along an automobile assembly line for component testing and is also used for recording and measurement purposes during track and road tests. Mowerson's sales have grown steadily, and revenue will exceed \$200 million for the first time in 2001.

Mowerson designs and manufactures its own printed circuit boards (PCBs) for use in the test equipment. The PCBs are manually assembled in the Assembly Department, which employs 45 technicians. Because of a lack of plant capacity and a shortage of skilled labor, Mowerson is considering having the printed circuit boards manufactured by Tri-Star, a specialist in this field. Quality control restrictions and vendor requirements dictate that all PCBs be either manufactured by Mowerson or contracted to an outside vendor. The per-board cost of outside manufacture is higher than the in-house cost; however, management thinks that savings could also be realized from this change.

Jim Wright, a recently hired cost analyst, has been asked to prepare a financial analysis of the outside manufacturing proposal. Wright's report includes the assumptions he used in his analysis, along with his recommendation. His financial analysis appears next, and his notes and assumptions follow the analysis.

Required:

- a. Discuss whether Jim Wright should have analyzed only the costs and savings that Mowerson will realize in 2002.
- b. For each of the 10 items listed in Wright's financial analysis, indicate whether
 - (i) The item is appropriate or inappropriate for inclusion in the report. If the item is inappropriate, explain why it should not be included in the report.
 - (ii) The amount is correct or incorrect. If the amount is incorrect, state what the correct amount is.
- c. What additional information about Tri-Star would be helpful to Mowerson in evaluating its manufacturing decision?

Annual Cost Savings Analysis for Tri-Star Contract

Savings

1. Reduction in assembly technicians $(\$28,500 \times 40)$	\$1,140,000
2. Assembly supervisor transferred	35,000
3. Floor space savings $[(1,000 \times \$9.50) + (8,000 \times \$6.00)]$	57,500
4. Purchasing clerk, 1/2 time on special project	6,000
5. Purchase order reduction $(2,000 \text{ orders} @ \$1.25 \text{ each})$	2,500
6. Reduced freight expense	7,500
Total savings	\$1,248,500

Costs

7. Increased production cost $[(\$60.00 - 52.00) \times 100,000 \text{ units}]$	\$800,000
8. Hire junior engineer	20,000
9. Hire quality control inspector	22,000
10. Increased storage cost for safety stock $(\text{Expected value of } 4,200 \text{ units} @ \$2.00/\text{unit})$	8,400
Total costs	850,400
Net annual savings	<u>\$ 398,100</u>

Notes and assumptions

Personnel. Assembly department technicians will be reduced by 40 at an annual savings (salary plus benefits) of \$28,500 each. Five assemblers will remain to assist the field service department with repair work on the printed circuit boards; assemblers have always assisted in repair work. The supervisor of the assembly department will remain with Mowerson because he has only two years until retirement; a position will be created for him in the machining department, where he will serve as a special consultant.

Because of the elimination of purchasing and stocking of component parts required for PCB assembly, one purchasing clerk will be assigned half-time to a special project until his time can be more fully utilized.

A junior engineer will be hired to act as liaison between Mowerson and the manufacturer of the PCBs. In addition, a third quality control inspector will be needed to monitor the vendor's adherence to quality standards.

Floor space. For the past two years, Mowerson has rented, on a month-to-month basis, 1,000 square feet of space for \$9.50 per square foot in a neighboring building to accommodate the overflow of assembly work. The 8,000 square feet currently being used in Mowerson's main plant by the assembly department will be used for temporary stockroom storage. However, this space could be reclaimed for manufacturing use without overloading the stockroom facilities. This floor space is valued at \$6 per square foot.

Production costs and volume. Mowerson's cost for manufacturing printed circuit boards is as follows:

Direct material	\$24.00
Direct labor	12.50
Variable overhead	6.25
Fixed overhead	9.25
Total cost	\$52.00

The direct material cost includes normal scrap and other such material-related costs as incoming freight and issuing costs. Mowerson's annual cost for incoming freight attributed to PCBs is \$7,500. Tri-Star will charge \$60 per board, including the cost of delivery.

Mowerson's production volume of printed circuit boards for the past two years has been 80,000 and 90,000 boards, respectively. Projected production volumes for the next three years are:

2002	100,000
2003	120,000
2004	130,000

Storage costs. Because Mowerson will not have direct control over the manufacture of the PCBs, the level of safety stock will be increased over the current level of 1,800 boards. The supervisor of the assembly department has provided the accompanying probabilities associated with reductions in Tri-Star's ability to produce and/or deliver PCBs.

Percentage of Time Tri-Star Deliveries Will Be Late	Probability (1)	Safety Stock of PCBs (2)	Expected Value (1) × (2)
4%	0.30	2,500	750
6	0.40	4,000	1,600
8	0.25	6,000	1,500
10	0.05	7,000	350
New safety stock level			4,200

The variable cost to store the PCBs is \$2 per board per year.

Other. The variable cost of executing a purchase order at Mowerson is \$1.25 for items such as postage, forms, and telephone. Since Mowerson will no longer have to purchase all the component parts required for the printed circuit boards, there will be a reduction of 2,000 purchase orders prepared annually.

Recommendation. Based on the annual savings of \$398,100 projected above, Mowerson should enter into an agreement with Tri-Star to manufacture the printed circuit boards.

Source: CMA adapted.