negative entry. However, in preparing the cash flow statement, we will explicitly observe the sign convention: A positive sign indicates a cash inflow; a negative sign or parentheses indicate a cash outflow.

SOLUTION

Given: Preceding cash flow information.

Find: After-tax cash flow.

Before presenting the cash flow table, we need to do some preliminary calculations. The following notes explain the essential items in Table 10.2.

TABLE 10.2 Cash Flow Statement for the Automated Machining Center Project (Example 10.1)

	A	B	C	D	E	F	G
1							
2	**Income Statement**						
3	End of Year	0	1	2	3	4	5
4							
5	Revenue		$ 100,000	$ 100,000	$ 100,000	$ 100,000	$ 100,000
6	Expenses:						
7	Labor		$ 20,000	$ 20,000	$ 20,000	$ 20,000	$ 20,000
8	Materials		$ 12,000	$ 12,000	$ 12,000	$ 12,000	$ 12,000
9	Overhead		$ 8,000	$ 8,000	$ 8,000	$ 8,000	$ 8,000
10	Depreciation		$ 17,863	$ 30,613	$ 21,863	$ 15,613	$ 5,581
11							
12	Taxable Income		$ 42,137	$ 29,387	$ 38,137	$ 44,387	$ 54,419
13	Income Taxes (40%)		$ 16,855	$ 11,755	$ 15,255	$ 17,755	$ 21,768
14							
15	Net Income		$ 25,282	$ 17,632	$ 22,882	$ 26,632	$ 32,651
16							
17	**Cash Flow Statement**						
18	**Operating Activities:**						
19	Net Income		$ 25,282	$ 17,632	$ 22,882	$ 26,632	$ 32,651
20	Depreciation		$ 17,863	$ 30,613	$ 21,863	$ 15,613	$ 5,581
21	**Investment Activities:**						
22	Milling machine	$(125,000)					
23	Salvage Value			=-(G23-(-B22-SUM(C10:G10)))*0.4			$ 50,000
24	Gains Tax						$ (6,613)
25	Working capital						
26							
27	**Net Cash Flow**	$(125,000)	$ 43,145	$ 48,245	$ 44,745	$ 42,245	$ 81,619
28							
29							
30		PW(15%)=	$ 43,152		=NPV(15%,C27:G27)+B27		
31		IRR =	27.62%				
32				=IRR(B27:G27,15%)			
33							
34							

- **Calculation of depreciation:**
  1. If, contrary to expectations, the asset is held for eight years, we can depreciate a seven-year property in respective percentages of 14.29%, 24.49%, 17.49%, 12.49%, 8.93%, 8.92%, 8.93%, and 4.46%. (See Table 9.3.)
  2. If the asset is sold at the end of the fifth tax year (during the recovery period), the applicable depreciation amounts would be \$17,863, \$30,613, \$21,863, \$15,613, and \$5,581. Since the asset is disposed of in the fifth tax year (the last year's depreciation), which would ordinarily be \$11,163, is halved due to the half-year convention.
- **Salvage value and gain taxes:** In year 5, we must deal with two aspects of the asset's disposal: salvage value and gains[3] (both ordinary as well as capital). We list the estimated salvage value as a positive cash flow. Taxable gains are calculated as follows:
  1. The total depreciation in years 1 to 5 is

     $$\$17{,}863 + \$30{,}613 + \$21{,}863 + \$15{,}613 + \$5{,}581 = \$91{,}533$$

  2. The book value at the end of period 5 is the cost basis minus the total depreciation:

     $$\$125{,}000 - \$91{,}533 = \$33{,}467$$

  3. The gains on the sale are the salvage value minus the book value:

     $$\$50{,}000 - \$33{,}467 = \$16{,}533$$

     (The salvage value is less than the cost basis, so the gains are ordinary gains.)
  4. The tax on the ordinary gains is $\$16{,}533 \times 40\% = \$6{,}613$. This is the amount placed in the table under "Gains Tax."
- **Investment analysis:** Once we obtain the project's after-tax net cash flows, we can determine their equivalent present worth at the firm's interest rate. The after-tax cash flow series from the cash flow statement is shown in Figure 10.3. Since this series does not contain any patterns to simplify our calculations, we must find the net present worth of each payment. Using $i = 15\%$, we have

$$\begin{aligned}\text{PW}(15\%) &= -\$125{,}000 + \$43{,}145(P/F, 15\%, 1)\\ &\quad + \$48{,}245(P/F, 15\%, 2) + \$44{,}745(P/F, 15\%, 3)\\ &\quad + \$42{,}245(P/F, 15\%, 4) + \$81{,}619(P/F, 15\%, 5)\\ &= \$43{,}152\end{aligned}$$

[3] Even though gains from equipment disposal have an effect on income tax calculations, they should not be viewed as ordinary operating income. Therefore, in preparing the income statement, capital expenditures and related items such as gains tax and salvage value, are not included. Nevertheless, these items represent actual cash flows in the year they occur and must be shown in the cash flow.