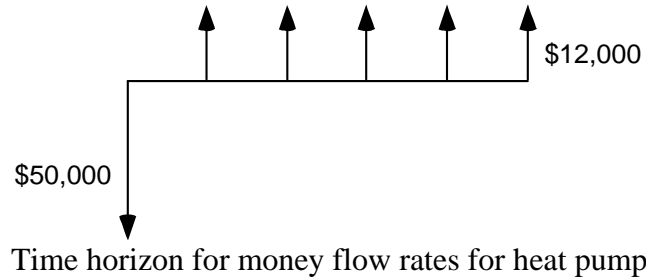


ME 575: Worksheet on Financial Objectives

Suppose you can buy a heat pump for \$50,000. The pump is estimated to save \$12,000 per year for the five year life of the pump. An interest rate of 10% is assumed.

A time line showing the money flow rates is given below (size of arrows not to scale).



The initial expense of the pump, \$50,000, is already in the present, so this does not need to be changed. It will be considered negative, however, since it is money paid out.

1. Is the heat pump a good investment?
2. How long should the heat pump last to have a ROCE (Return on Capital Employed) of $>20\%$.
3. How would equipment depreciation or a salvage value of the heat pump affect this analysis?

Financial Objectives

Without depreciation

| years | Capital | Present Value | NPV | ROCE |
|-------|----------|---------------|----------------|-------|
| 0 | \$50,000 | \$ - | \$ (50,000.00) | -100% |
| 1 | \$50,000 | \$ 10,909.09 | \$ (39,090.91) | -78% |
| 2 | \$50,000 | \$ 20,826.45 | \$ (29,173.55) | -58% |
| 3 | \$50,000 | \$ 29,842.22 | \$ (20,157.78) | -40% |
| 4 | \$50,000 | \$ 38,038.39 | \$ (11,961.61) | -24% |
| 5 | \$50,000 | \$ 45,489.44 | \$ (4,510.56) | -9% |
| 6 | \$50,000 | \$ 52,263.13 | \$ 2,263.13 | 5% |
| 7 | \$50,000 | \$ 58,421.03 | \$ 8,421.03 | 17% |
| 8 | \$50,000 | \$ 64,019.11 | \$ 14,019.11 | 28% |
| 9 | \$50,000 | \$ 69,108.29 | \$ 19,108.29 | 38% |
| 10 | \$50,000 | \$ 73,734.81 | \$ 23,734.81 | 47% |

With depreciation

| years | Capital | Present Value | NPV | ROCE |
|-------|----------|---------------|----------------|-------|
| 0 | \$50,000 | \$ - | \$ (50,000.00) | -100% |
| 1 | \$40,000 | \$ 10,909.09 | \$ (39,090.91) | -98% |
| 2 | \$30,000 | \$ 20,826.45 | \$ (29,173.55) | -97% |
| 3 | \$20,000 | \$ 29,842.22 | \$ (20,157.78) | -101% |
| 4 | \$10,000 | \$ 38,038.39 | \$ (11,961.61) | -120% |
| 5 | \$10,000 | \$ 45,489.44 | \$ (4,510.56) | -45% |
| 6 | \$10,000 | \$ 52,263.13 | \$ 2,263.13 | 23% |
| 7 | \$10,000 | \$ 58,421.03 | \$ 8,421.03 | 84% |
| 8 | \$10,000 | \$ 64,019.11 | \$ 14,019.11 | 140% |
| 9 | \$10,000 | \$ 69,108.29 | \$ 19,108.29 | 191% |
| 10 | \$10,000 | \$ 73,734.81 | \$ 23,734.81 | 237% |