Basic Methods for Making Economy Studies

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1. The Rate of Return (ROR) Method

Rate of return is a measure of the effectiveness of an investment of capital. It is a financial efficiency. When this method is used, it is necessary to decide whether the computed rate of return is sufficient to justify the investment.

$$\text{Rate of Return} = \frac{\text{net annual profit}}{\text{capital invested}}$$

2. The Annual Worth (AW) Method

In this method, interest on the original investment (sometimes called minimum required profit) is included as a cost. if the excess of annual cash inflows over annual cash outflows is not less than zero the proposed investment is justified - is valid.

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3. The Present Worth (PW) Method

Is based on the concept of present worth. If the present worth of the net cash flows is equal to, or greater than zero, the project is justified economically.

4. The Future Worth (FW) Method

The future worth method for economy studies is exactly comparable to the present worth method except that all cash inflows and outflows are compounded forward to a reference point in time called the future.

5. The Payback (Payout) Period Method

The payback period is commonly defined as the length of time required to recover the first cost of an investment from the net cash flow produced by that investment for an interest rate of zero.

$$\text{Payout period (years)} = \frac{\text{investment} - \text{salvage value}}{\text{net annual cash flow}}$$

1. An investment of P270,000 can be made in a project that will produced a uniform annual revenue of P185,400 for 5 years and then have a salvage value of P10% of the investment. Out-of-pocket costs for operation and maintenance will be P81,000 per year. Taxes and insurance will be 4% of the first cost per year. The company expects capital to earn not less than 25% before income taxes. Is this a desirable investment? What is the payback period of the investment?

SOLUTION:

By ther rate of return method

Annual Revenue = P185,400

Annual Costs:

$$\text{Depreciation} = \frac{P270{,}000 - P27{,}000}{\frac{(1+.25)^5-1}{.25}} = \frac{P243{,}000}{8.2070} = P29{,}609$$

Operations and Maintenance = 81,000

Taxes and Insurance = P270,000(0.4) = 10,800

Total annual cost =P121,409

Net annual profit =P 63,991

$$\text{Rate of Return} = \frac{P63{,}991}{P270{,}000} \times 100 = 23.70\%$$

Since the rate of return is less than 25 %, the investment is not justified.

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SOLUTION:

By the annual worth method

Annual Revenue = P185,400

Annual Costs:

$$\text{Depreciation} = \frac{P270{,}000 - P27{,}000}{\frac{(1+.25)^5-1}{.25}} = \frac{P243{,}000}{8.2070} = P29{,}609$$

Operations and Maintenance = 81,000

Taxes and Insurance= P270,000(0.4) = 10,800

Interest on capital = P270,000(0.25) = 67,500

Total annual cost =P188,909

Excess -P3,509

Since the excess of annual cash inflows over annual cash outflows is less than zero (-P3,509), the investment is not justified

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SOLUTION:

By the present worth method

PW of cash inflows = $185{,}400\left(\frac{(1+.25)^5-1}{.25\,(1+.25)^5}\right) + 27{,}000\,(1+.25)^{-5}$

= P506,370

Annual costs (excluding depreciation) = P81,000 + P270,000 (0.04)

= P 91,800

PW of cash outflows = $270{,}000 + 91{,}000\left(\frac{(1+.25)^5-1}{.25\,(1+.25)^5}\right) = P516{,}880$

PW of cash outflows - PW of cash inflows = P516,880 - P506,370 = - P10,510

Since the PW of the net cash flows is less than zero (-P10,510), the investment is not justified

1. An investment of P270,000 can be made in a project that will produced a uniform annual revenue of P185,400 for 5 years and then have a salvage value of P10% of the investment. Out-of-pocket costs for operation and maintenance will be P81,000 per year. Taxes and insurance will be 4% of the first cost per year. The company expects capital to earn not less than 25% before income taxes. Is this a desirable investment? What is the payback period of the investment?

SOLUTION:

By the future worth method

FW of cash inflows = $27{,}000 + P185{,}400\,\frac{(1+.25)^5-1}{.25}$

= P1,548,580

Annual costs (excluding depreciation) = P81,000 + P270,000 (0.04)

= P 91,800

FW of cash outflows = $P91{,}800\,\frac{(1+.25)^5-1}{.25} + P270{,}000(1+.25)^5$

= P1,577,390

FW of cash inflows - FW of cash outflows = P1,548,580 - P P1,577,390 - = - P28,810

Since the FW of the net cash flows is less than zero (-P28,810), the investment is not justified

1. An investment of P270,000 can be made in a project that will produced a uniform annual revenue of P185,400 for 5 years and then have a salvage value of P10% of the investment. Out-of-pocket costs for operation and maintenance will be P81,000 per year. Taxes and insurance will be 4% of the first cost per year. The company expects capital to earn not less than 25% before income taxes. Is this a desirable investment? What is the payback period of the investment?

SOLUTION:

By the payback period

Total Annual Cost = P81,000 + P270,000 (0.04) = P 91,800

Net annual cash flows = P185,400 - P91,800 = P93,600

$$\text{Payback Period} = \frac{\text{investment} - \text{salvage value}}{\text{net annual cash flows}} = \frac{P270{,}000 - P27{,}000}{P93{,}600}$$

= 2.6 years