Comparing Alternatives

COMPARING ALTERNATIVES

BASIC METHODS IN COMPARING ALTERNATIVES

1. *The Rate of Return (ROR) of Additional Investment Method.*

The formula for the rate of return on additional investment is,

$$\text{Rate of return on additional investment} = \frac{\text{annual net savings}}{\text{additional investment}}$$

2. The Annual Cost (AC) Method

To apply this method, the annual cost of the alternatives included interest on investment is determine. The alternative with the least annual cost is chosen.

3. The Equivalent Unifrom Annual Cost (EUAC) Method

In this method, all cash flows (irregular or uniform) must be converted to an equivalent uniform annual cost, that is, a year-end amount which is the same year.

4. The Present Worth Cost (PWC) Method

In comparing alternatives by this method, determine the present worth of the net cash outflows for each alternative for the same period of time. The alternative with the least present worth of costs is selected.

1. A company is considering two types of equipment for its manufacturing plant. Pertinent data are as follows:

	TYPE A	TYPE B
Firs Cost	P200,000	P300,000
Annual operating cost	P32,000	P24,000
Annual labor cost	P50,000	P32,000
Insurance and property taxes	3%	3%
Payroll taxes	4%	4%
Estimated life	10	10

If the minimum required rate of return is 15%, which equipment is to be selected?

SOLUTION:

By the rate of return on additional investment method

Type A
Annual costs:

Depreciation = $\frac{P200{,}000}{\frac{(1+.15)^{10}-1}{.15}}$	= P9,850
Operation	= P32,000
Labor	= P50,000
Payroll Taxes=50,000(0.04)	= P2,000
Taxes & insurances=200,000(0.03)	= P6,000
Total annual cost	= P99,850

Type B
Annual costs:

Depreciation = $\frac{P300{,}000}{\frac{(1+.15)^{10}-1}{.15}}$	= P14,776
Operation	= P24,000
Labor	= P32,000
Payroll Taxes=50,000(0.04)	= P1,280
Taxes & insurances=300,000(0.03)	= P9,000
Total annual cost	= P81,056

Annual savings = P 99,850 - P81,056 = P18,794

1. A company is considering two types of equipment for its manufacturing plant. Pertinent data are as follows:

	TYPE A	TYPE B
Firs Cost	P200,000	P300,000
Annual operating cost	P32,000	P24,000
Annual labor cost	P50,000	P32,000
Insurance and proptaxes	3%	3%
Payroll taxes	4%	4%
Estimated life	10	10

If the minimum required rate of return is 15%, which equipment is to be selected?

SOLUTION:

By the rate of return on additional investment method

Annual savings = P 99,850 - P81,056 = P18,794

Additional investment = P 300,000 - P200,000 = P100,000

Rate of return on additional investment = $\frac{P18{,}794}{P100{,}000} \times 100$

= 18.79 % > 15 %

Type B should be selected.

1. A company is considering two types of equipment for its manufacturing plant. Pertinent data are as follows:

	TYPE A	TYPE B
Firs Cost	P200,000	P300,000
Annual operating cost	P32,000	P24,000
Annual labor cost	P50,000	P32,000
Insurance and proptaxes	3%	3%
Payroll taxes	4%	4%
Estimated life	10	10

If the minimum required rate of return is 15%, which equipment is to be selected?

SOLUTION:

By annual cost method

TYPE A
Annual Costs:

Depreciation = P200000/20.3037	= P9,850
Operation	= 32,000
Labor	= 50,000
Payroll taxes=50,000(0.04)	= 2,000
Taxes and insurances=200,000(0.03)	= 6,000
Interest on capital=200,000(0.15)	= 30,000
Total annual costs	P129,850

TYPE B
Annual Costs:

Depreciation = P300000/20.3037	= P14,776
Operation	= 24,000
Labor	= 32,000
Payroll taxes=50,000(0.04)	= 1,280
Taxes and insurances=200,000(0.03)	= 9,000
Interest on capital=300,000(0.15)	= 45,000
Total annual costs	P126,056

Since $AC_B < AC_A$, Type B should be selected

1. A company is considering two types of equipment for its manufacturing plant. Pertinent data are as follows:

	TYPE A	TYPE B
Firs Cost	P200,000	P300,000
Annual operating cost	P32,000	P24,000
Annual labor cost	P50,000	P32,000
Insurance and proptaxes	3%	3%
Payroll taxes	4%	4%
Estimated life	10	10

If the minimum required rate of return is 15%, which equipment is to be selected?

SOLUTION:

By present worth cost method

TYPE A
Annual Costs (excluding depreciation) = P32,000 + P50,000 + P50,000(0.04) + P200,000(0.03) = P90,000
PWC_A = P200,000 +P90,000(5.0188) = P651,692

TYPE B
Annual Costs (excluding depreciation) = P24,000 + P32,000 + P32,000(0.04) + P300,000(0.03) = P66,280
PWC_B = P300,000 +P66,280(5.0188) = P632,646

Since $PWC_B < PWC_A$, Type B should be selected

1. A company is considering two types of equipment for its manufacturing plant. Pertinent data are as follows:

	TYPE A	TYPE B
Firs Cost	P200,000	P300,000
Annual operating cost	P32,000	P24,000
Annual labor cost	P50,000	P32,000
Insurance and proptaxes	3%	3%
Payroll taxes	4%	4%
Estimated life	10	10

If the minimum required rate of return is 15%, which equipment is to be selected?

SOLUTION:

By the equivalent uniform annual cost method

TYPE A
$EUAC_A$ = P200,000(0.1993) + P90,000
= P129,860

TYPE B
$EUAC_B$ = P300,000(0.1993) + P66,280
= P126,070

Since $EUAC_B < EUAC_A$, Type B is more economical