# What is Net Present Value (NPV)?

Worksheet

NPV = (Cash Flow_t (1 + Discount Rate)^t) Initial Investment. If NPV > 0, the investment is profitable. NPV allows comparison of projects with different timings and sizes.

$$@text{NPV} = @sum_{t=1}^{n} @frac{@text{CF}_t}{(1+r)^t} - I_0$$

## Questions

1. An investment has positive NPV. This means

A) It loses money
B) It adds value and should be accepted
C) The payback period is reached
D) Future cash flows are uncertain

2. What does a discount rate of 10% mean?

A) A 10% price reduction
B) The minimum return required from an investment (10%/year)
C) The inflation rate
D) The risk-free return

3. If NPV = $5,000, should you invest?

A) Yes, invest anyway
B) No, reject - it destroys value
C) Calculate IRR first
D) Wait for more data

4. Higher discount rate NPV becomes

A) Higher
B) Lower
C) Unchanged
D) Unpredictable

5. A company invests $50,000 in equipment generating $15,000/year for 4 years. Discount rate = 8%. Calculate NPV.

6. Project A: $80,000 investment, $25,000/year for 5 years, 10% discount rate. Calculate NPV.

7. Project B: $200,000 investment, $60,000/year for 5 years, 12% discount rate. Calculate NPV.

8. Define: What does NPV stand for?

9. Define: NPV formula?

10. Define: When should you accept an investment based on NPV?

# Answer Key

1. B) It adds value and should be accepted - Positive NPV means the investment's present value of returns exceeds its cost, adding value.

2. B) The minimum return required from an investment (10%/year) - The discount rate is the hurdle rate - the return investors demand to compensate for risk and opportunity cost.

3. B) No, reject - it destroys value - Negative NPV means the investment returns less than the required rate - it destroys value and should be rejected.

4. B) Lower - Higher discount rate = heavier penalty on future cash flows NPV decreases (makes it harder for investments to pass).

5. PV Year 1: $15,000 1.08 = $13,889 PV Year 2: $15,000 1.08 = $12,860 PV Year 3: $15,000 1.08 = $11,907 PV Year 4: $15,000 1.08 = $11,029 Total PV = $49,685 NPV = $49,685 $50,000 = $315 (slightly negative, borderline reject)

6. PV = $25,000 [1 (1.10)^5] 0.10 = $25,000 3.791 = $94,775 NPV = $94,775 $80,000 = $14,775 (accept: positive NPV adds value)

7. PV Year 1-5 annuity: $60,000 3.605 (5-year, 12% annuity factor) = $216,300 NPV = $216,300 $200,000 = $16,300 (accept: strong positive NPV)

8. Net Present Value - the value today of all future cash flows minus the initial investment.

9. NPV = (CF_t (1+r)^t) Initial Investment

10. When NPV > 0 - it adds value to the company and exceeds the required return.