

What is the Profitability Index?

Worksheet

The profitability index is the ratio of the present value of a project's future cash flows to its initial investment: $PI = \text{PV of future cash flows} / \text{Initial investment}$. A PI above 1 means the project creates value and should be accepted.

$$PI = \frac{\text{PV}(\text{inflows})}{I_0}$$

Questions

1. A project has PV of future cash flows of \$150,000 and an initial investment of \$100,000. What is its PI?
A) 1.50
B) 0.67
C) 1.00
D) 50,000
2. What does a PI of 0.9 indicate?
A) Accept the project
B) Reject the project - it destroys value
C) The project breaks even
D) Invest twice as much
3. PI is especially useful for...
A) Calculating depreciation
B) Ranking projects under capital rationing
C) Computing tax liability
D) Measuring liquidity
4. If NPV = \$30,000 and initial investment = \$150,000, what is PI?
A) 1.20
B) 0.20
C) 5.00
D) 1.00
5. A project requires an initial investment of \$100,000 and its future cash flows have a present value of \$120,000. Find the PI and decide.
6. A machine costs \$80,000. Its future cash flows have a present value of \$95,000. Should the company invest, and what is PI?
7. Two mutually exclusive projects are being ranked under capital rationing: Project A has NPV of \$20,000 and initial investment of \$80,000. Find its PI.
8. Define: What is the profitability index?
9. Define: PI decision rule?
10. Define: How does PI relate to NPV?

Answer Key

1. A) $1.50 - PI = 150,000/100,000 = 1.50$.
2. B) Reject the project - it destroys value - $PI < 1$ means the present value of returns is less than the investment - reject.
3. B) Ranking projects under capital rationing - PI ranks projects by value created per dollar, ideal when funds are limited.
4. A) $1.20 - PI = 1 + NPV/Investment = 1 + 30,000/150,000 = 1.20$.
5. $PI = PV \text{ of future cash flows} / \text{Initial investment} = 120,000 / 100,000 = 1.20$ Since $PI > 1$, the project creates value - accept.
6. $PI = 95,000 / 80,000 = 1.19$ Because $PI > 1$, the machine adds value - accept the investment.
7. $PV \text{ of future cash flows} = NPV + \text{Initial investment} = 20,000 + 80,000 = 100,000$ $PI = PV \text{ of future cash flows} / \text{Initial investment} = 100,000 / 80,000 = 1.25$
8. The ratio of the present value of future cash flows to the initial investment, showing value created per dollar invested.
9. Accept if $PI > 1$ (value-creating); reject if $PI < 1$; indifferent if $PI = 1$.
10. $PI = 1 + (NPV / \text{Initial investment})$ - both use the same present-value cash flows but PI expresses them as a ratio.

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