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Date
7/11/2024

Mini Assignment - 6

Q: Prepare a Comparative analysis of Various Project Evaluation methods

⇒ Project Evaluation Methods

1) Traditional methods

- (i) pay-back period method
- (ii) Post-pay-back method
- (iii) Accounting rate of return

2) Modern methods

- (i) NPV (NPV: Net Present Value)
- (ii) IRR (IRR: Internal rate of return)
- (iii) PI Methods (Profitability Index)

(i) Pay-back period

→ pay back period is time required to recover the initial investment in a project

$$\text{pay-back period (PBP)} = \frac{\text{Initial Investment}}{\text{Annual Cash Inflow}}$$

* Accept / Reject Criteria

→ If actual pay-back period is less than pre-determined pay-back period, then project accepted, If not project rejected.

Advantage

- Simple to Compute: Easy understandable even for non specialist
- Risk reduction: Shorter payback means less investment risk

Limitations

- Ignores post-pay back profit: Does not account for cash flow beyond the payback period
- Disregards the time value of money: Fails to consider the present value of future cash flow.

Accounting rate of Return (ARR)

$$ARR = \frac{\text{Average Annual profit}}{\text{Average Investment}}$$

→ Here average rate of return is being considered for project evaluation.

* Accept or Reject Criteria

→ If the actual accounting rate of return is more than the predetermined required rate of return, the project would be accepted. Otherwise rejected.

Advantage

- * Easy to calculate and simple to understand.
- * Based on accounting information rather than cash flow.
- * It considers total benefit associated with project.

Limitation

- Different methods used for Accounting profit, so it leads to some difficulty in calculation of project.
- Ignores the reinvestment potential of project.
- Ignores the time value of money.

NPV Net present Value

* Net present value (NPV) is the calculation of the present value of an investment's expected future cash flow minus the initial investment cost.

$$NPV = \left[\frac{C_1}{1+k} + \frac{C_2}{(1+k)^2} + \dots + \frac{C_n}{(1+k)^n} \right] - C_0$$

Accept/Reject Criteria

→ The project should be accepted if $\boxed{NPV > 0}$

Advantage

- Time value of money: Incorporates the concept that money available now is worth more than the same amount in future.
- Profitability gauge: Directly measures how much value will be added to the business

Limitation

- Estimation challenges: Requires accurate forecasts of future cash flow and discount rates.
- Complexity: more difficult to calculate and understand than simpler metrics.

(IRR) Internal rate of return

→ IRR is the discount rate that makes the net present value (NPV) of all cash flow from a particular project equal to zero

$$\left[\sum_{t=0}^T \frac{C_t}{(1+r)^t} - C_0 = 0 \right]$$

$$IRR = \text{Base factor} + \left[\frac{\text{Positive NPV}}{\text{Difference in +ve and -ve NPV}} \times DP \right]$$

Advantage

- Rate of return expression: Provides a clear percentage return, making it easy to compare with required rate of return or other investment opportunities
- Decision simplicity: Useful for ranking projects when choosing the best options

Limitations

- Multiple solutions: Can result in multiple IRRs for projects with alternating cash flow, leading to confusion
- Reinvestment assumption: Assumes that all cash flow can be reinvested at IRR, which might not be practical.

Profitability Index (PI)

→ The Profitability Index (PI) is a financial tool used to evaluate the relative profitability of an investment by measuring the value created per unit of investment.

$$PI = \frac{PV \text{ of future CF}}{\text{Initial Investment}}$$

→ if $PI > 1$, the project generates value.

Advantages

- Efficient measurement: Indicates the efficiency of an investment in terms of value creation per dollar invested.
- Project Comparison: Useful for comparing projects of different scales and capital requirements.

Limitations

- Dependency on NPV: Accuracy relies on the precise calculation of NPV, which itself requires accurate cash flow forecasts.
- Not definitive alone: High PI does not necessarily mean that a project is viable without considering other factors like absolute cash flow, company strategy, and market conditions.

Other Methods

#Real Option Analysis (ROA)

It is a financial technique that allows organisation to evaluate investment opportunities by considering the flexibility of delaying, expanding or abandoning projects in light of future uncertainties.

#Equivalent annual annuity (EAA)

The EAA is a financial metric used to evaluate investment project by calculating the annual cash inflow that a project would generate if it were structured as annuity over life span.

Summary

⇒ In comparing traditional and modern project evaluation methods, traditional methods like pay-back period, post-payback method, and accounting rate of return provide basic, quick assessment, but often overlook the time value of money and risk factors. In contrast modern methods offer more comprehensive, accurate evaluation by incorporating time value of money, risk and long-term

profitability, making them more suitable for complex and large-scale investment decisions.

Thus, while traditional methods are simpler, modern methods like Net present value (NPV), Internal Rate of Return (IRR), and Profitability Index (PI) methods provides more deeper insights into a project financial viability and future potential.