

Lecture No 10 PCM

Tools and Techniques for Economic/Financial Analysis of Projects

Economic Analysis of Projects

- The economic analysis of projects is carried out prior to their financing. Economic analysis seeks to promote the best use of a country's resources, consistent with national and sector development goals.
- The economic analysis of projects attempts to determine whether a particular project provides an acceptable level of economic benefits relative to economic costs.
- For the full economic net benefits to occur financial sustainability must also be assured.

Procedures for the economic analysis of projects

1. Assessing the **rationale** for a project.
2. Defining project **objectives**.
3. Forecasting effective **demand** for project outputs.
4. Choosing most **cost-effective way** of attaining objectives.
5. Whether economic **benefits** > return on economic **costs**.
6. **Sustainability** of project's net benefits over project life cycle.
7. Analyzing the **sensitivity** of project decisions and the risks associated with the project.
8. Identifying the distribution of **project effects**.
9. list the **non quantifiable effects** of the project that may influence project design and the investment decision.

Independent and Mutually Exclusive Project

- **Independent**: A project whose acceptance or rejection does not prevent the acceptance of other projects under consideration. e.g type of cooling system and wood work etc...
- **Mutually Exclusive**: A project whose acceptance prevent the acceptance of other projects under consideration e.g decision of boat or bridge, type of cooling/heating system etc...

Project Evaluation: Alternative Methods

- Payback Period (PBP)
- Internal Rate of Return (IRR)
- Net Present Value (NPV)
- Profitability Index (PI)

All above models are based on TVM time value of money concept.

Time Value of Money

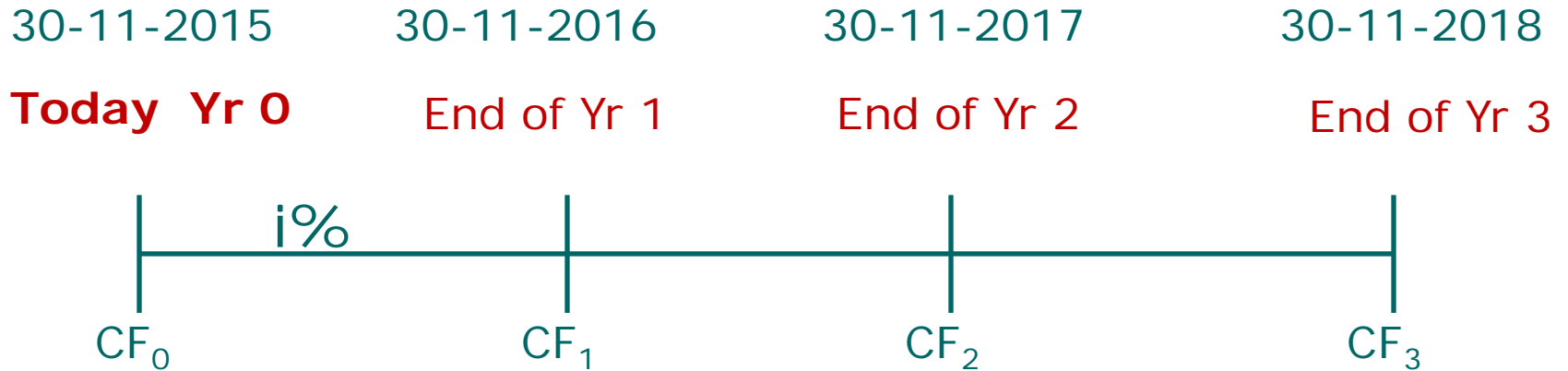
1\$ today is worth more than 1\$ tomorrow (say one year after), because of the investment opportunities available today.

For example invest 2,000\$ today we can earn some profit/interest (say @10% of 2,000\$) on this amount during the year and can have \$2,200 a year after.

Four Ways to Find Time Value of Money

- Using equation.
- Using TVM tables.
- Using Financial calculator.
- Using Spreadsheet.
- Using Internet help.

Time Line a helping tool to understand TVM.

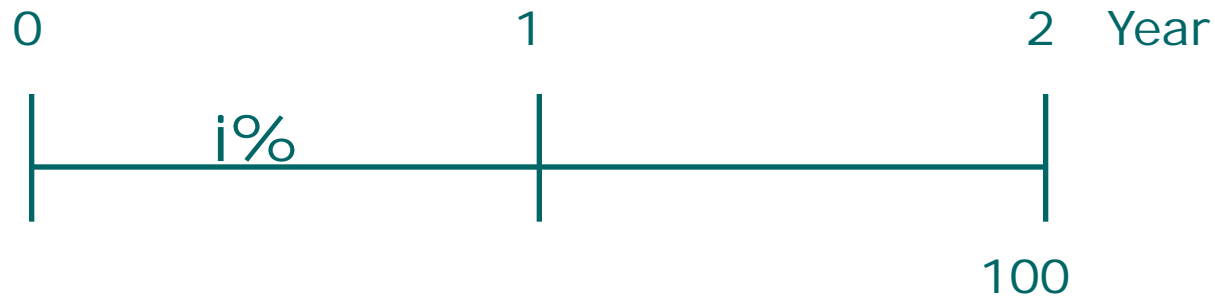


Time 0 is today;

Time 1 is the end of Period 1 or the beginning of Period 2.

Time Value of Money

Time line for a \$100 due at the end of Year 2.



Time Value of Money

Time line for uneven Cash Flows for 3 years



Time Value of Money

Time line for ordinary annuity of \$100 for three years.



Concepts of Ordinary Annuity and Annuity due?

Ordinary Annuity of Rs100 for 3 years.



Annuity Due of Rs100 for 3 years.



Formula For Future Value.

$$\text{Future Value} = PV(1 + i)^n.$$
$$= PV * FVF_{i,n}.$$

FV = Future Value

n = Period

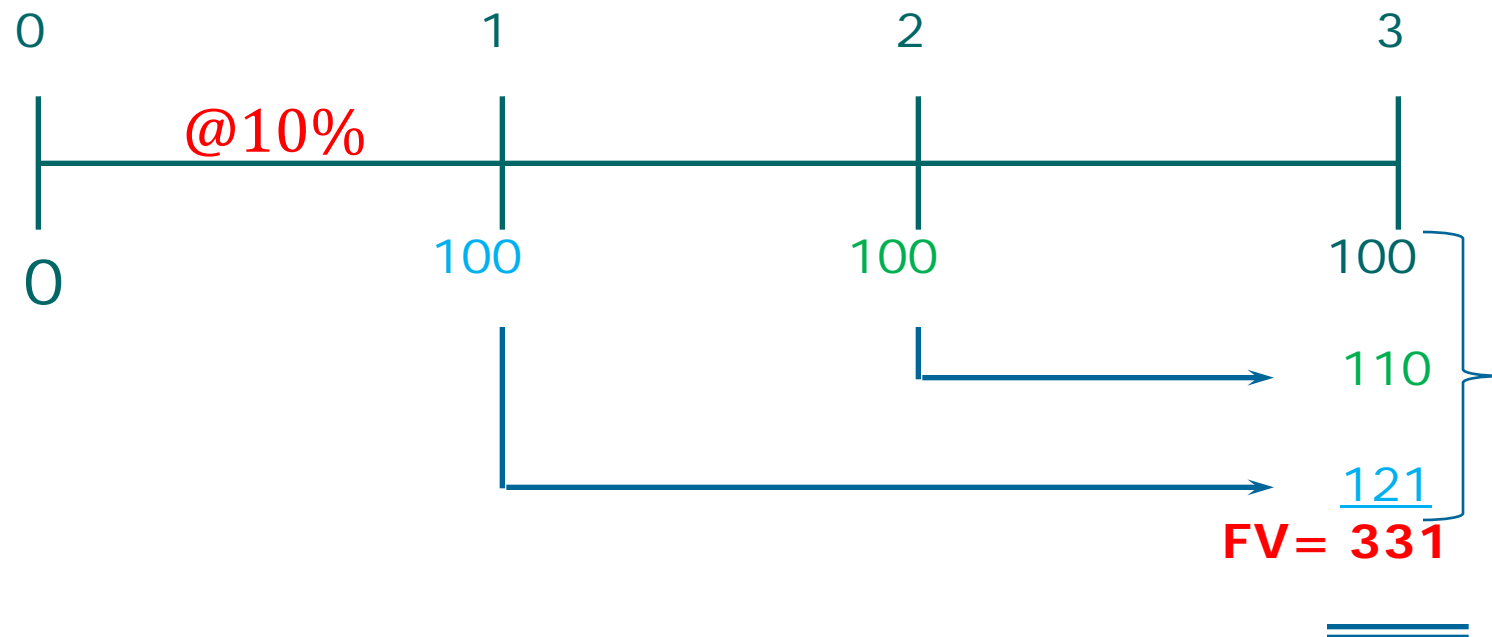
i = Interest rate

$(1 + i)^n$ = FVF $_{i,n}$.

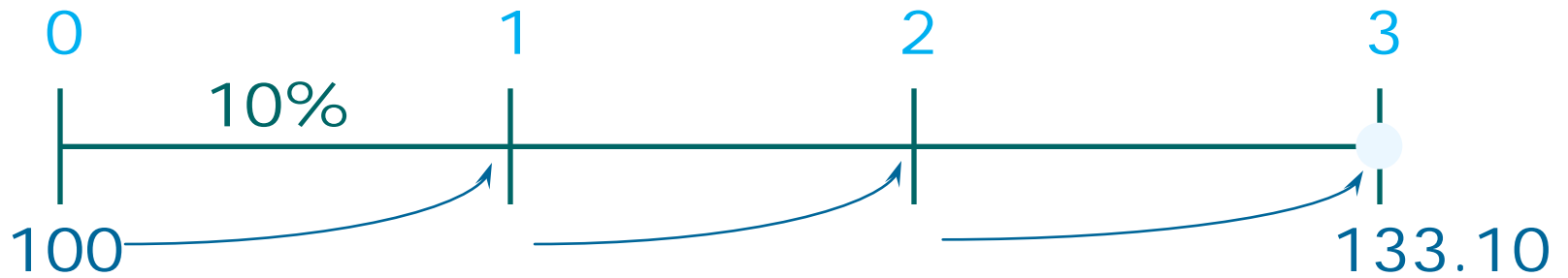
= Future Value Factor for interest rate i and period n .

Four Ways to Find Time Value of Money

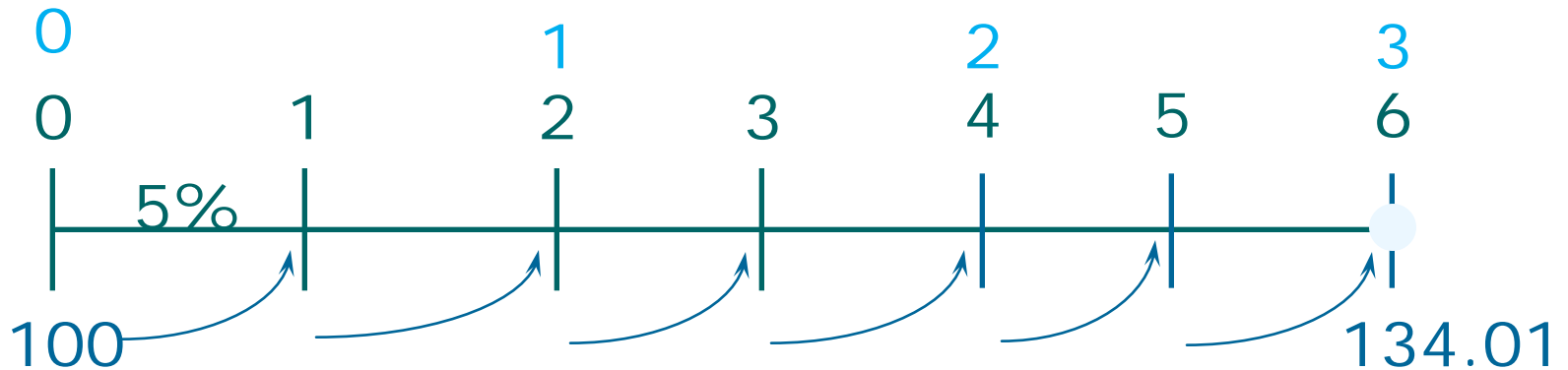
What's the FV of a 3-year ordinary annuity of \$100 at 10%?



Compounding more than once in a year?



Annually: $FV_3 = \$100(1.10)^3 = \133.10 .



Semiannually: $FV_6 = \$100(1.05)^6 = \134.01 .

EAR = Effective Annual Rate of 10%

$$\text{EAR} = (1 + i/m)^m - 1$$

$$\text{EAR}_{\text{Annual}} = (1 + i/m)^m - 1 = 10\%.$$

$$\text{EAR}_Q = (1 + 0.10/4)^4 - 1 = 10.38\%.$$

$$\text{EAR}_M = (1 + 0.10/12)^{12} - 1 = 10.47\%.$$

$$\text{EAR}_{365} = (1 + 0.10/365)^{365} - 1 = 10.52\%.$$