

# Investasi di Pasar Modal

Review

# Define these markets

- Markets in general
- Markets for **physical assets**
- Markets for **financial assets**
- **Money** versus **capital** markets
- **Primary** versus **secondary** markets

# The Economic Theory of Choice: An Illustration Under Certainty

- Konsumsi: Pemakaian sumber daya yang ada untuk mendapatkan kepuasan atau utility
- Investasi: Penundaan konsumsi sekarang untuk digunakan di dalam produksi yang efisien selama periode waktu tertentu
- **Ilustrasi:**  
Untuk dua tahun ke depan (setiap awal tahun) seorang Investor mempunyai Income \$10,000. Tingkat bunga tabungan 5% dan tingkat bunga pinjaman 5%.

# The option open to the investor:

1. To save nothing and consume \$10,000 in each period.
2. To consume everything now and not worry about tomorrow. The maximum he can consume in the first period is \$19,524.
3. To save all income in the first period and consume everything in the second. The maximum he can consume in the second period is \$20,500.

The point from the Illustration is **time value of money.**

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# Time Value of Money

- Future value
- Present value
- Rates of return

Time lines show timing of cash flows.

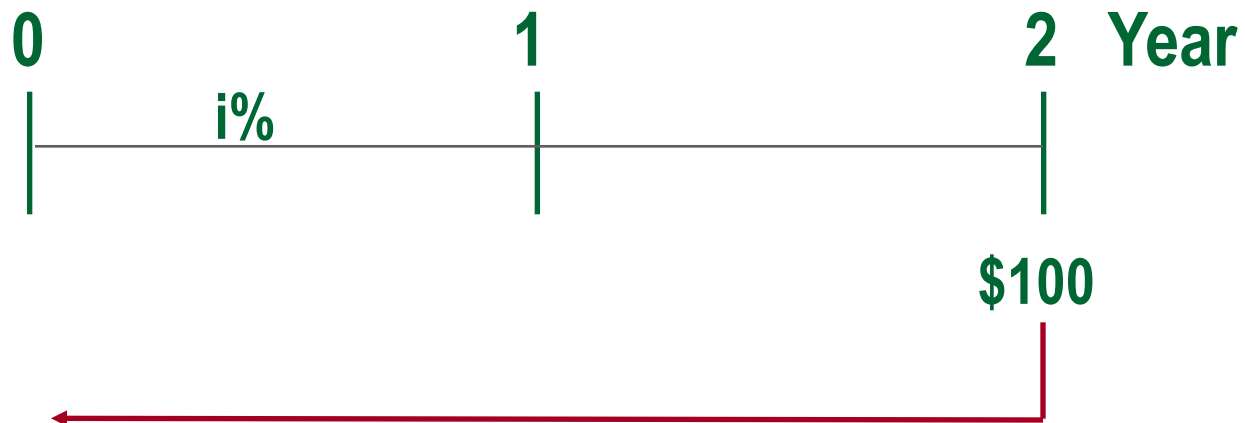


Tick marks at ends of periods, so Time 0 is today; Time 1 is the end of Period 1; or the beginning of Period 2.

# Pola Cash Flow

Time line for a \$100 lump sum due at the end of Year 2. (diterima sekali pada akhir tahun 2)

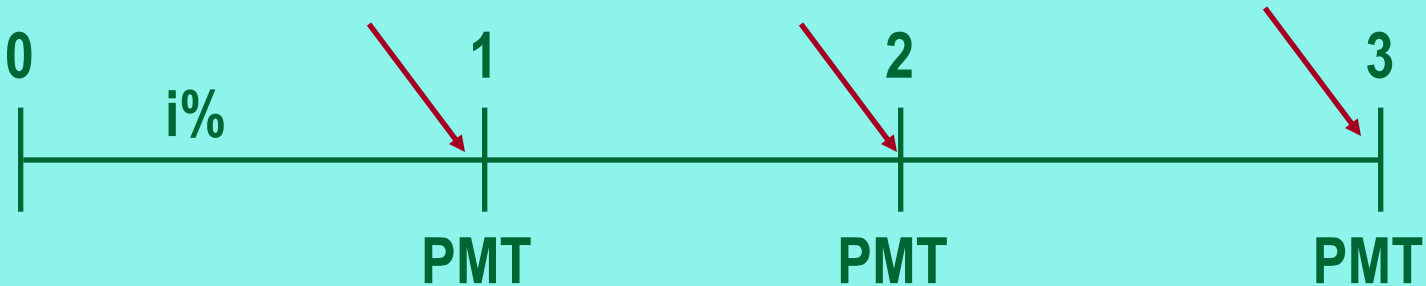
Single Sum



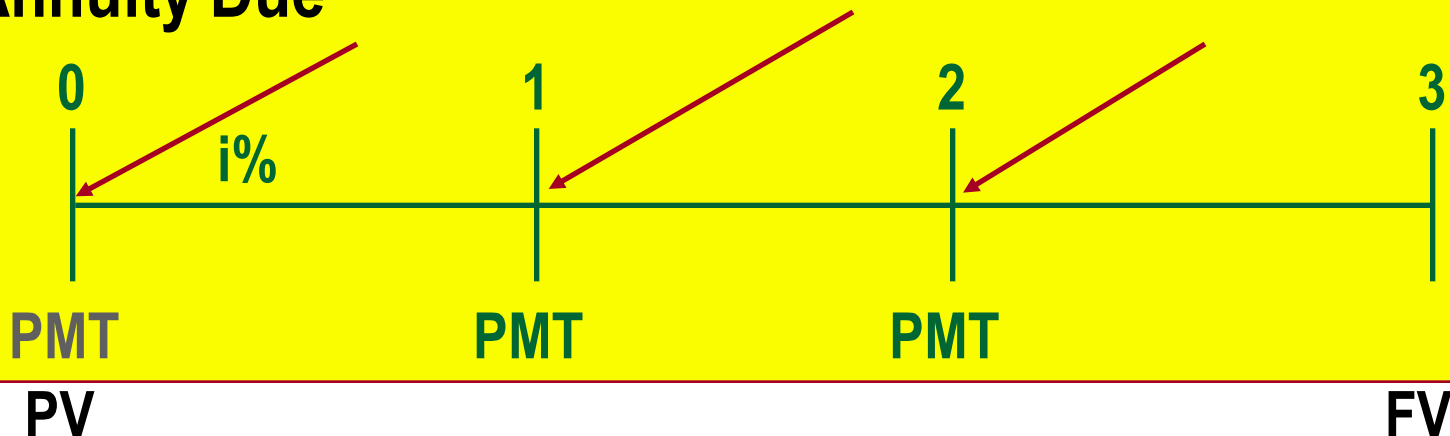
Several Sums?

# What's the difference between an ordinary annuity and an annuity due?

## Ordinary Annuity



## Annuity Due





Time line for an **ordinary annuity** of \$100 for 3 years.



Time line for an **annuity due** of \$100 for 3 years.



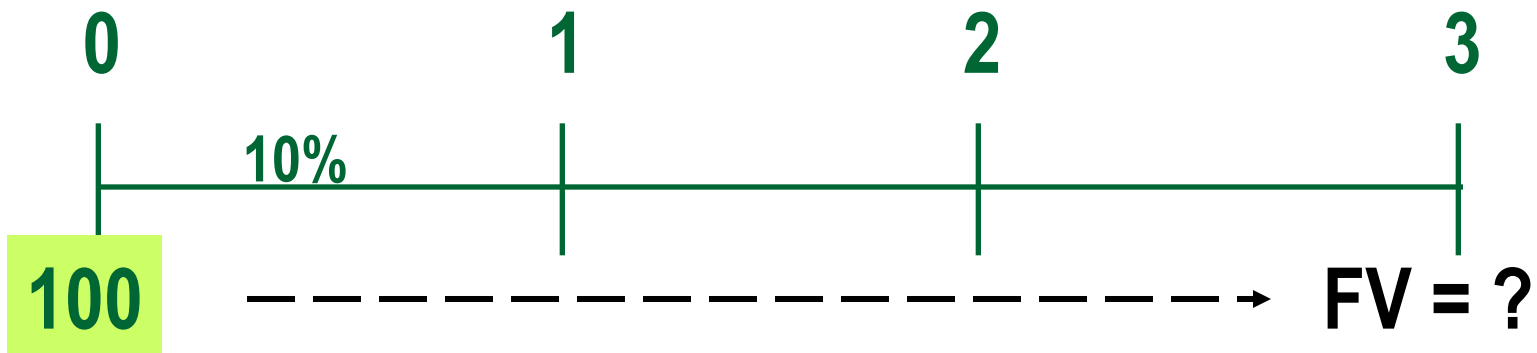
Time line for **uneven CFs**:  $-\$50$  at  $t = 0$  and  $\$100$ ,  $\$75$ , and  $\$50$  at the end of Years 1 through 3.



Cash Outflow

## Future Value

What's the FV of an initial \$100 after 3 years if  $i = 10\%$ ?



**Finding FVs (moving to the right on a time line) is called compounding.**

## Future Value

### After 1 year:

$$\begin{aligned}FV_1 &= PV + INT_1 = PV + PV(i) \\ &= PV(1 + i) \\ &= \$100(1.10) \\ &= \mathbf{\$110.00}.\end{aligned}$$

### After 2 years:

$$\begin{aligned}FV_2 &= PV(1 + i)^2 \\ &= \$100(1.10)^2 \\ &= \mathbf{\$121.00}.\end{aligned}$$

## Future Value

**After 3 years:**

$$\begin{aligned}FV_3 &= PV(1 + i)^3 \\ &= \$100(1.10)^3 \\ &= \$133.10.\end{aligned}$$

**In general,**

$$FV_n = PV(1 + i)^n.$$

## Present Value

What's the PV of \$100 due in 3 years if  $i = 10\%$ ?

Finding PVs is **discounting**, and it's the reverse of compounding.



Solve  $FV_n = PV(1 + i)^n$  for PV:

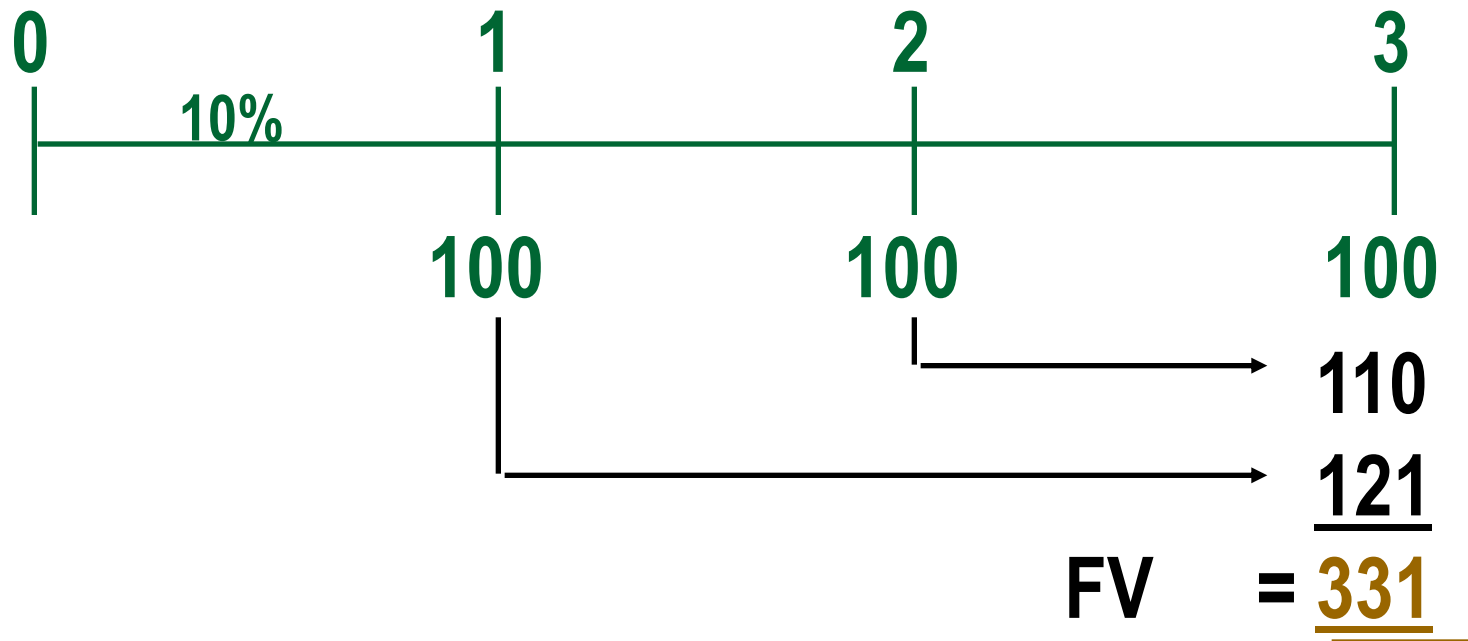
$$PV = \frac{FV_n}{(1+i)^n} = FV_n \left( \frac{1}{1+i} \right)^n$$

$$\begin{aligned} PV &= \$100 \left( \frac{1}{1.10} \right)^3 \\ &= \$100 (0.7513) = \$75.13. \end{aligned}$$



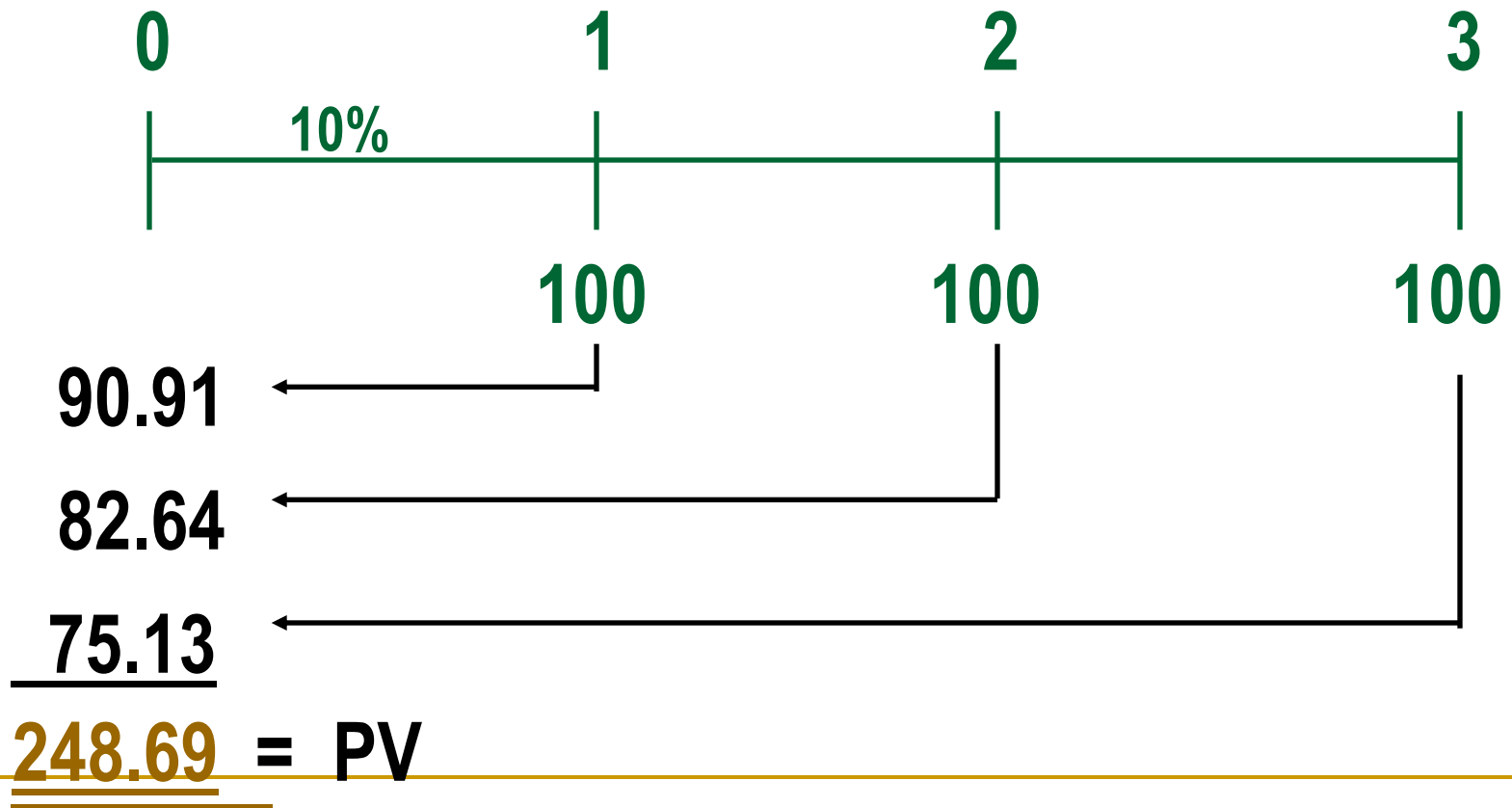
## Future Value

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



## Present Value

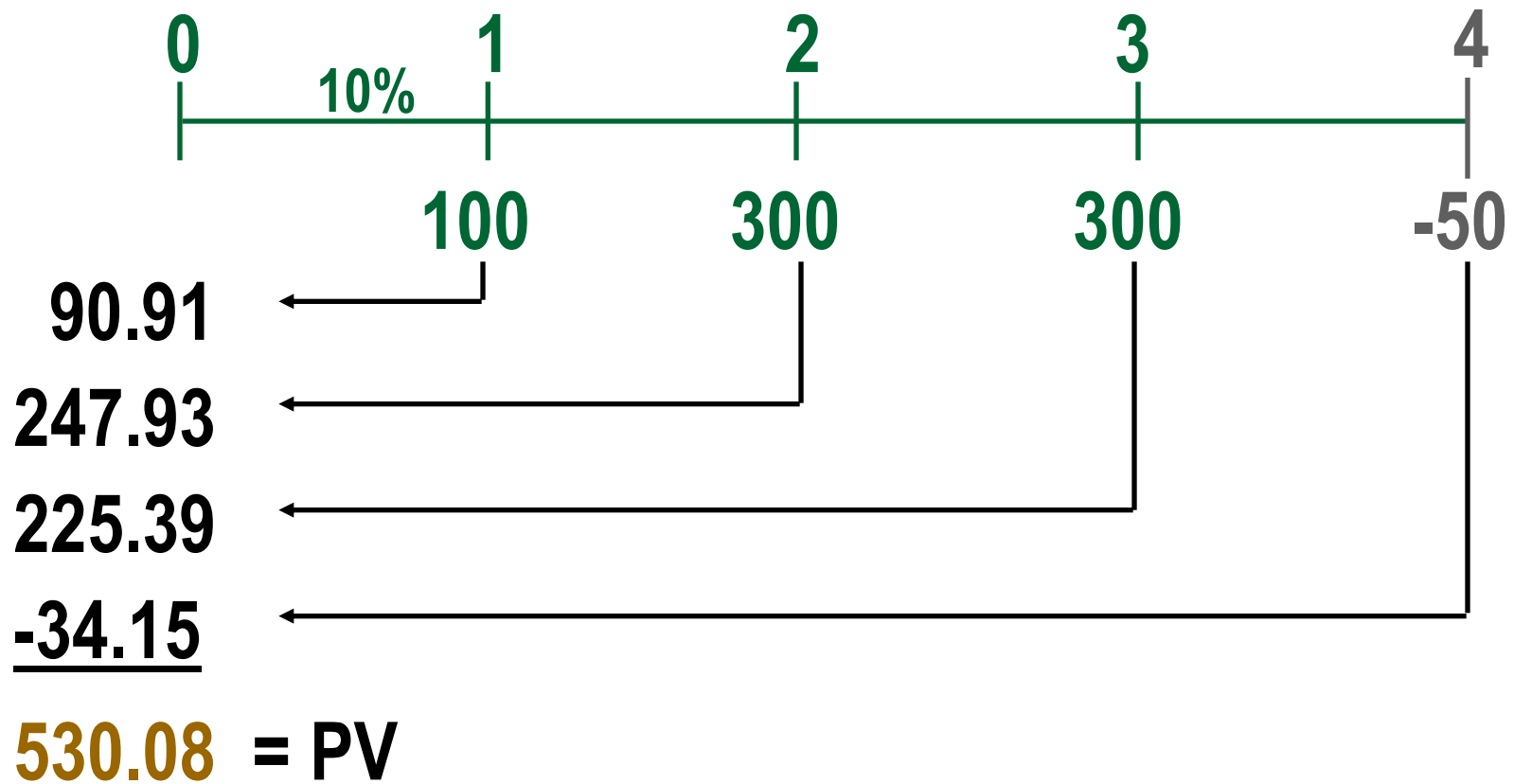
What's the PV of this ordinary annuity?



Find the FV and PV if the annuity were an annuity due.



What is the **PV** of this uneven cash flow stream?



# Rate of Return

What interest rate would cause \$100 to grow to \$125.97 in 3 years?

$$\begin{aligned} \$100(1 + i)^3 &= \$125.97. \\ (1 + i)^3 &= \$125.97/\$100 = 1.2597 \\ 1 + i &= (1.2597)^{1/3} = 1.08 \\ i &= 8\%. \end{aligned}$$

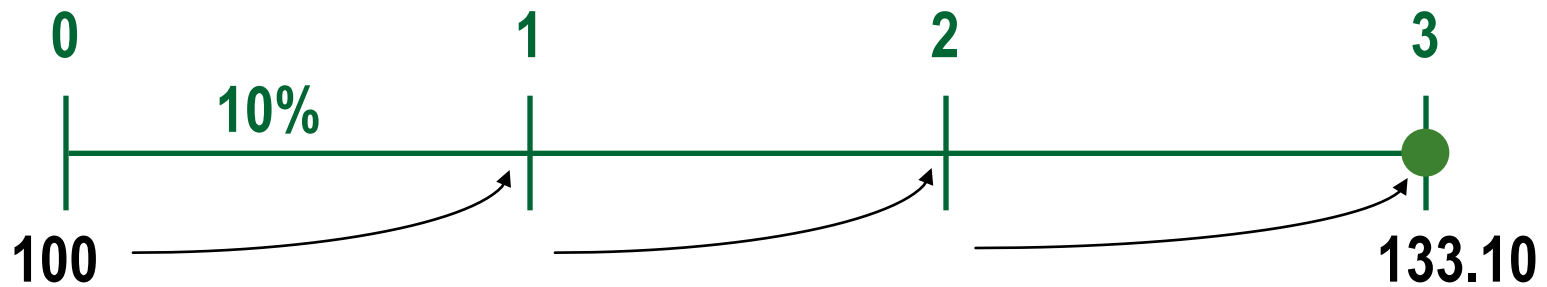
Untuk periode panjang, cara seperti ini sulit dilakukan. Cara yang mungkin adalah dengan, misalnya, menggunakan excel → trial and error atau dengan kalkulator (seri BF)

Will the FV of a lump sum be larger or smaller if we compound more often, holding the stated 10% constant? Why?

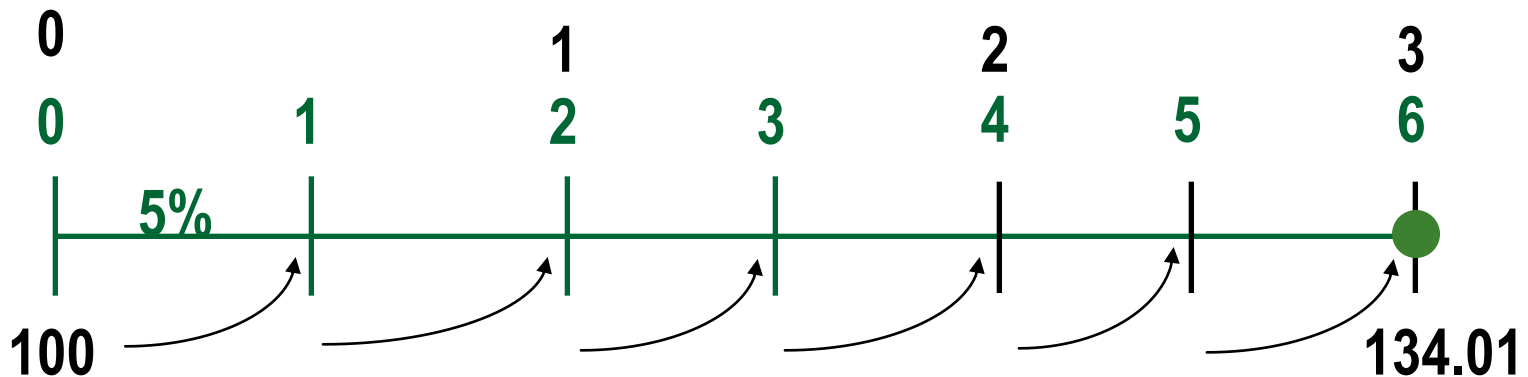
**LARGER!** If compounding is more frequent than once a year--for example, semiannually, quarterly, or daily--interest is earned on interest more often.

Ilustrasi → next slide

## Future Value

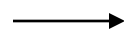


**Annually:  $FV_3 = \$100(1.10)^3 = \$133.10$ .**



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

Present Value ??



sebaliknya

**We will deal with 3 different rates:**

**$i_{\text{Nom}}$  = nominal, or stated, or  
quoted, rate per year.**

**$i_{\text{Per}}$  = periodic rate.**

**EAR = effective annual rate.**



- $i_{\text{Nom}}$  is stated in contracts. Periods per year (m) must also be given.
- Examples:
  - 8%; Quarterly
  - 8%, Daily interest (365 days)

- Periodic rate =  $i_{\text{Per}} = i_{\text{Nom}}/m$ , where  $m$  is number of compounding periods per year.  $m = 4$  for quarterly, 12 for monthly, and 360 or 365 for daily compounding.

- Examples:

8% quarterly:  $i_{\text{Per}} = 8\%/4 = 2\%$ .

8% daily (365):  $i_{\text{Per}} = 8\%/365 = 0.021918\%$ .

- Effective Annual Rate (EAR = EFF%): is the annual rate which causes PV to grow to the same FV as under multi-period compounding.

Example: EFF% for 10%, semiannual:

$$\begin{aligned} FV &= (1 + i_{\text{Nom}}/m)^m \\ &= (1.05)^2 = 1.1025. \end{aligned}$$

EFF% = 10.25% because

$$(1.1025)^1 = 1.1025.$$

Any PV would grow to same FV at 10.25% annually or 10% semiannually.

- An investment with monthly payments is different from one with quarterly payments. One must put on EFF% basis to compare rates of return. Use EFF% only for comparisons.
- Banks say “interest paid daily.” Same as compounded daily.

How do we find EFF% for a nominal rate of 10%, compounded semiannually?

$$\text{EFF}\% = \left( 1 + \frac{i_{\text{Nom}}}{m} \right)^m - 1$$

$$= \left( 1 + \frac{0.10}{2} \right)^2 - 1.0$$

$$= (1.05)^2 - 1.0$$

$$= 0.1025 = 10.25\%.$$

**EAR = EFF% of 10%**

$$\mathbf{EAR_{Annual} = 10\%}$$

$$\mathbf{EAR_Q = (1 + 0.10/4)^4 - 1 = 10.38\%}$$

$$\mathbf{EAR_M = (1 + 0.10/12)^{12} - 1 = 10.47\%}$$

$$\mathbf{EAR_{D(360)} = (1 + 0.10/360)^{360} - 1 = 10.52\%}$$

FV of \$100 after 3 years under 10% semiannual compounding? Quarterly?

$$FV_n = PV \left( 1 + \frac{i_{\text{Nom}}}{m} \right)^{mn} .$$

$$FV_{3S} = \$100 \left( 1 + \frac{0.10}{2} \right)^{2 \times 3}$$

$$= \$100(1.05)^6 = \$134.01.$$

$$FV_{3Q} = \$100(1.025)^{12} = \$134.49.$$

# Can the effective rate ever be equal to the nominal rate?

- Yes, but only if annual compounding is used, i.e., if  $m = 1$ .
- If  $m > 1$ , EFF% will always be greater than the nominal rate.



## When is each rate used?

**$i_{\text{Nom}}$ :** Written into contracts, quoted by banks and brokers. Not used in calculations or shown on time lines.

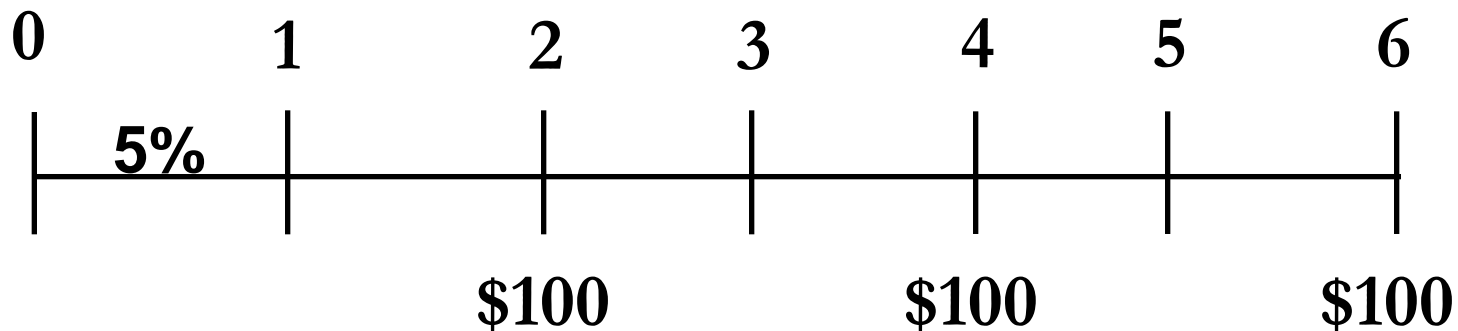
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**$i_{Per}$ :** Used in calculations, shown on time lines.

If  $i_{Nom}$  has annual compounding,  
then  $i_{Per} = i_{Nom}/1 = i_{Nom}$ .

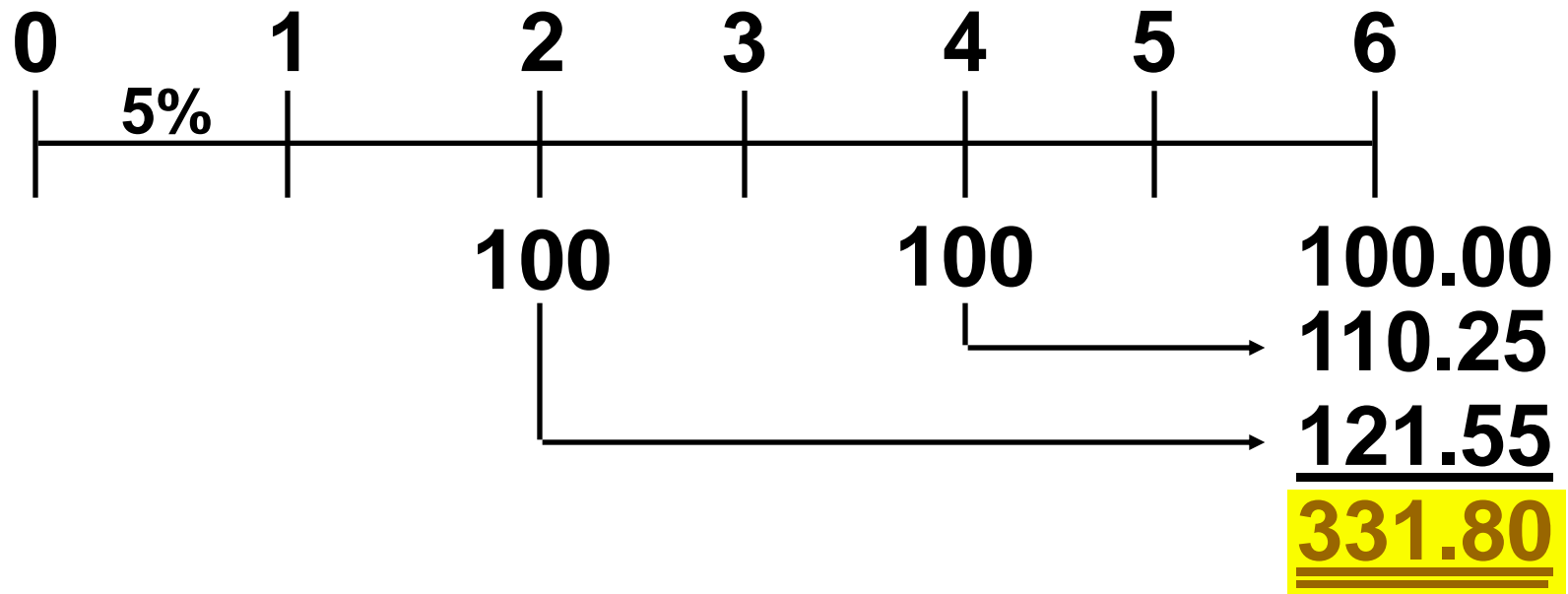
**EAR = EFF%:** Used to compare returns on investments with different payments per year.

What's the value at the end of Year 3 of the following CF stream if the quoted interest rate is 10%, compounded semiannually?



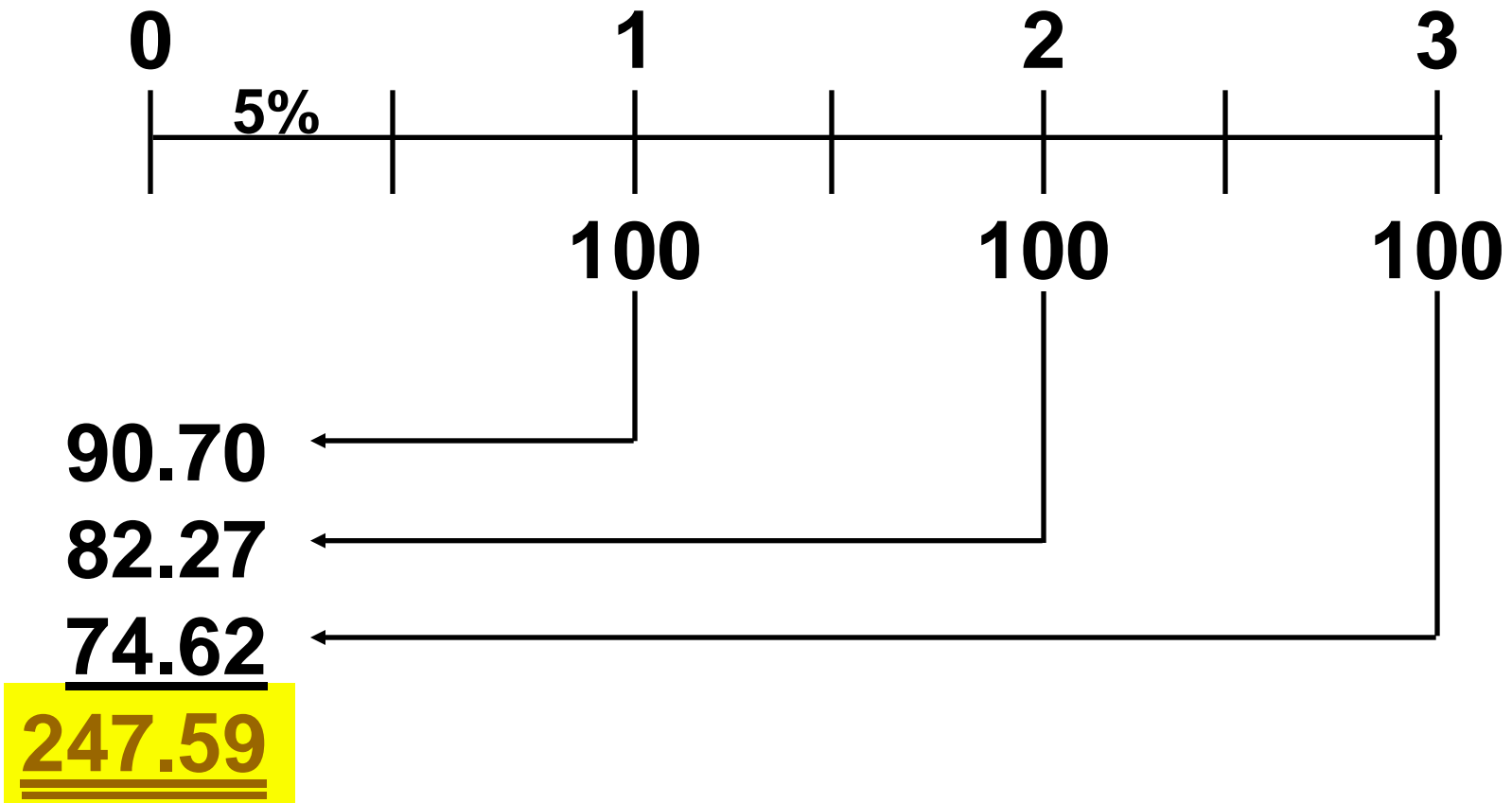
- Payments occur annually, but compounding occurs each 6 months.
- So we can't use normal annuity valuation techniques.

# Compound Each CF



$$\begin{aligned} FVA_3 &= \$100(1.05)^4 + \$100(1.05)^2 + \$100 \\ &= \underline{\underline{\$331.80.}} \end{aligned}$$

What's the PV of this stream?



## Three Primary Ways Capital Is Transferred Between Savers and Borrowers

- Direct transfer
- Through an investment banking house
- Through a financial intermediary (lewat pasar modal)

# Jenis Investment:

- Tabungan
- Deposito
- T-bill

- Stock
- Bond
- Investasi di pasar turunan (derivative)
  - Option
    - Put option
    - Call option
  - Futures



- Fokus pembahasan



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- What do we call the price, or cost, of debt capital?

## The interest rate

- What do we call the price, or cost, of equity capital?

$$\text{Required return} = \text{Dividend yield} + \text{Capital gain}$$

# What four factors affect the cost of money?

- Production opportunities
- Time preferences for consumption
- Risk
- Expected inflation

# Stock (saham)

- Jenis saham
  - Preferred Stock (saham preferen): merupakan saham yang mempunyai sifat gabungan (*hybrid*) antara obligasi dan saham biasa. It is a class of stock with preferential rights over common stock.
  - Common Stock (saham biasa) : is the residual corporate interest that bears the ultimate risk of loss and receives the benefits of success. In every corporation common stock represents the basic ownership interest.

# Common Stock

Each share carries the following rights:

1. To share proportionately in profits and losses.
2. To share proportionately in management (the right to vote for director).
3. To share proportionately in corporate assets upon liquidation.
4. To share proportionately in any new issues of stock of the same class - called the pre-emptive right.

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Perbedaan antara bunga efektif dan bunga flat?