Time Value of Money

Present Value of A Single Cashflow

1. Calculate PV of a single CF
2. Different compounding frequencies

PREP nuggets

5% interest

$100

PV

1 year

$105

$FV_1 = PV\ (1+0.05)^1$

1 year

$110.25

$FV_2 = PV\ (1+0.05)^2$

$$FV = PV\ (1+r)^N$$

PREP nuggets

Present Value of A Single Cashflow

1. Calculate PV of a single CF
2. Different compounding frequencies

5% interest

How much do you need to deposit today?

You need $1000 two years from now

1 year

1 year

$907

$1000

PV = $1000 / (1+0.05)²

FV

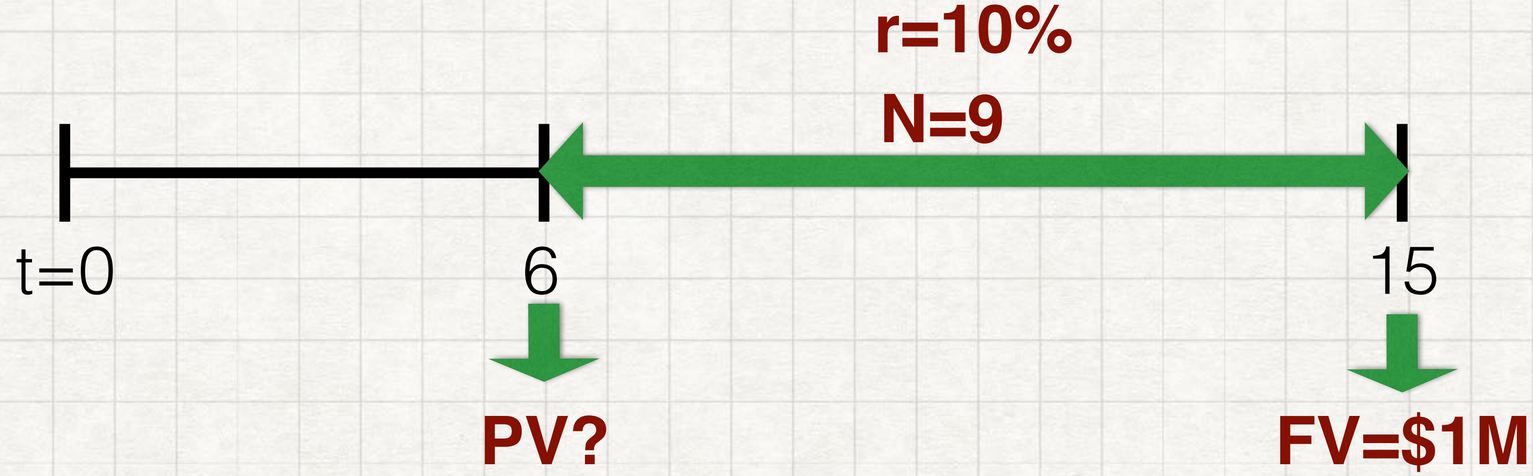
$$PV = \frac{FV}{(1+r)^N}$$

PREP nuggets

Present Value of A Single Cashflow

1. Calculate PV of a single CF
2. Different compounding frequencies

Miguel owns a liquid asset that is estimated to be worth $1M in 15 years time, given a projected growth rate of 10% per year. He is considering to liquidate the asset in 6 years time to pay for a property purchase. How much is the estimated amount that he can get to pay for the property?



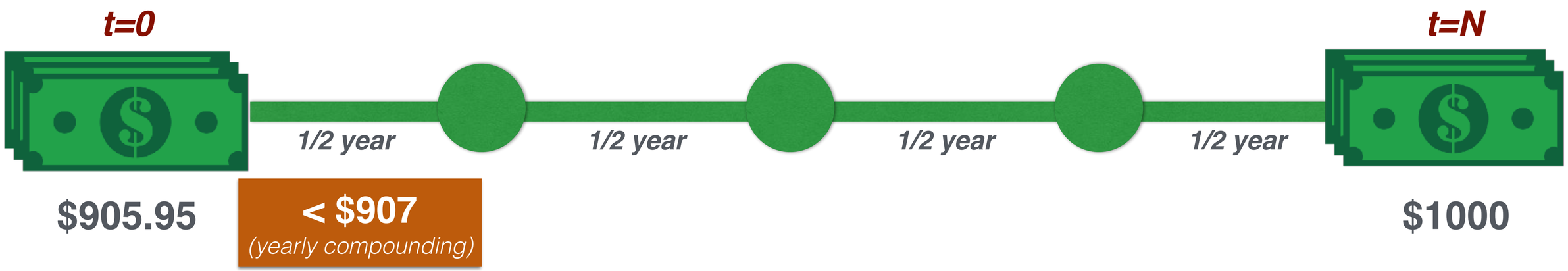
$$PV = FV / (1+r)^N$$

$$= \$1M / (1+0.1)^9$$

$$= \$424,098$$

5% interest annual rate

2.5% interest per period



$$PV = FV / (1+0.025)^4$$

$$PV = \frac{FV}{(1+r)^N}$$

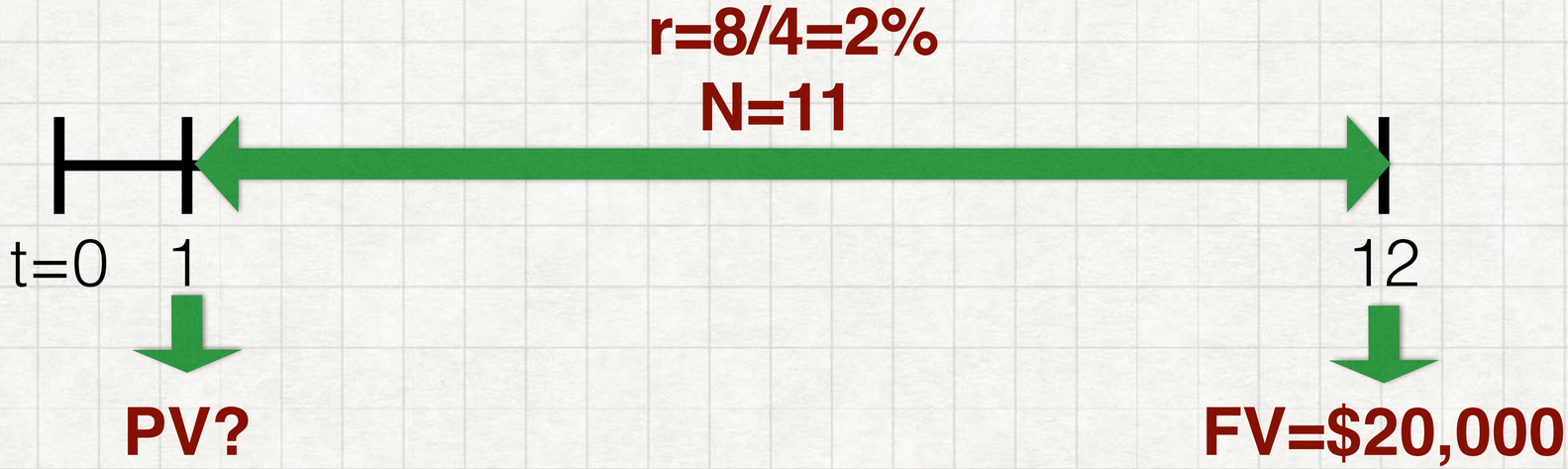
r and N must correspond to the same time period!

PREP nuggets

Present Value of A Single Cashflow

1. Calculate PV of a single CF
2. Different compounding frequencies

3 months from now, Dante intends to place a lump sum to save for his wedding which will take place 3 years from today. He figures he needs $20,000 for the wedding. The bank offers him 8% interest, credited **quarterly**. How much should Dante save to have sufficient money for his wedding?



$$PV = FV / (1+r)^N$$

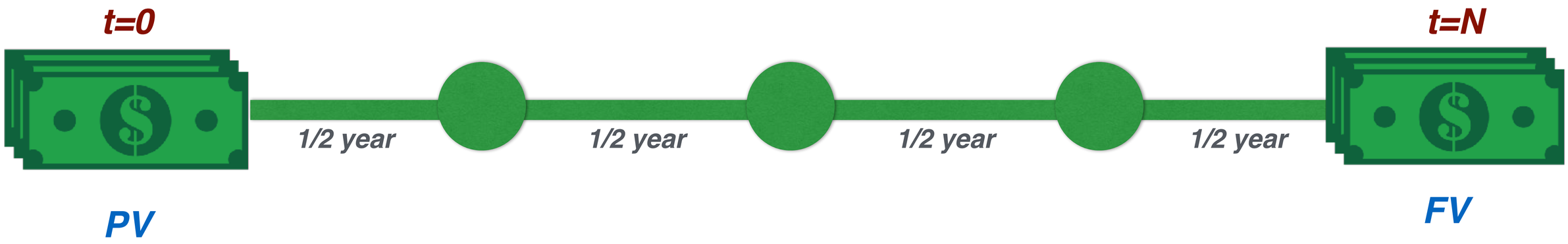
$$= \$20000 / (1+0.02)^{11}$$

$$= \$16,085$$

$$FV = PV\,(1+r)^N$$

PREP nuggets

$$PV = \frac{FV}{(1+r)^N}$$



$$PV = \frac{FV}{(1+r)^N}$$

r and N must correspond to the same time period!

PREP nuggets