COMPOUND INTEREST AND SAVING · PART 7 OF 8 · AGES 13+

# Common Compound Interest Mistakes

Five slips that catch students and adults alike, each with the wrong working, the right working and the reason. All rates are examples.

## 1 Adding the same interest every year

**WRONG**

~~1,000 at 5% a year for 3 years: 1,000 + 3 × 50 = 1,150.~~

**RIGHT**

1,000 × 1.05³ = 1,157.63.

That is simple interest. With compounding, each year's interest is worked out on the new balance, so it grows: 50, then 52.50, then 55.13.

## 2 Forgetting to turn the % into a decimal

**WRONG**

~~5% for 3 years: 1,000 × (1 + 5)³ = 216,000.~~

**RIGHT**

5% = 5 ÷ 100 = 0.05, so 1,000 × (1 + 0.05)³ = 1,157.63.

In the formula, r must be a decimal. Using 5 instead of 0.05 means a 500% rise every year, which no sensible answer for 3 years at 5% could show.

## 3 Mixing a yearly rate with monthly periods

**WRONG**

~~6% a year, added monthly, for 2 years: 1,000 × 1.06^24 = 4,048.93.~~

**RIGHT**

Monthly rate = 0.06 ÷ 12 = 0.005, so 1,000 × 1.005^24 = 1,127.16.

The rate and the number of periods must match. Counting in months means using the monthly rate r/n; using the yearly rate means counting in years.

## 4 Comparing unlike rates (APR, gross, AER)

**WRONG**

~~Account A pays 4.9% a year, added monthly. Account B pays 5% AER. B pays more, because 5 > 4.9.~~

**RIGHT**

A's AER = (1 + 0.049 ÷ 12)^12 − 1 = 5.01%, so A pays slightly more.

Compare like with like: AER with AER (APY with APY), APR with APR. A gross rate leaves out compounding, and an APR is a borrowing cost that can include fees.

## 5 Ignoring inflation

**WRONG**

~~My savings grew by 3% this year, so they buy 3% more.~~

**RIGHT**

With 4% inflation: 1.03 ÷ 1.04 − 1 ≈ −0.96%, so they buy about 1% less.

A bigger number is not the same as more buying power. The real return is roughly the interest rate minus inflation, and exactly the ratio of the two multipliers.

### Sense-check every answer

Estimate first: 3 years at 5% should add a little more than 15%. Compound interest is always a little more than simple interest at the same rate, never hundreds of times more.

NEXT IN THE SERIES

**8. Compound Interest Quiz: Test Yourself**


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