

Drawdown arithmetic

DRAWDOWN

A drawdown is the fall from your account's high-water mark, and its defining arithmetic is asymmetric: a 20% fall needs a 25% gain on what remains to get back, a 50% fall needs 100%, because the recovery is computed on the smaller base. Position size is the input that sets how fast losing runs dig the hole, which makes drawdown depth a chosen number, not weather.

Lose 20% and make 20% back, and you are still down 4%. The percentages refuse to cancel because they are percentages of different amounts - the fall was measured on the peak, the recovery on the trough.

Why does the required gain outrun the loss?

Divide instead of subtracting. After a fall of d percent, the account holds 100 minus d percent of its peak, and returning to the peak means multiplying what remains by enough to cover the gap. The required gain is the gap divided by the remainder - always larger than the fall, and growing without limit as the fall deepens. At 10% down the climb is 11%. At 20%, 25%. At 50%, 100%. At 90%, 900%.

The curve's steepening is the whole lesson. Shallow drawdowns cost roughly what they took. Deep ones cost multiples, and the multiple is set by arithmetic no method can negotiate with.

What connects the hole's depth to your risk fraction?

Losing runs happen to every method - module 5 will put numbers on how often. What the risk fraction from lesson 1 decides is how deep a given run digs. Eight consecutive losses at one fraction is a shallow dent; the same eight at four times the fraction is a hole from the steep end of the recovery curve. The market supplied the same run to both accounts. The fraction chose the depth.

Fixed-fractional sizing adds its quiet protection here: because each loss is a fraction of a shrinking balance, the falls decelerate in money terms as the run continues. Fixed-amount risking loses that brake.

Is a drawdown a verdict on the method?

The arithmetic cannot say - it only prices the hole. Module 5's measurement lessons separate an ordinary losing run from a method that has stopped working, and module 7 owns what to do while inside one. This lesson's job ends with the honest price list, and the price list is reason enough to choose the fraction with care.

Worked example - figures in USD

An account that stood at \$12,000 is down 20% after a losing run.

1. Price the fall: 20% of \$12,000 is \$2,400 gone, leaving \$9,600.
2. Price the climb: returning to \$12,000 requires a gain of 25% on \$9,600 - the recovery is computed on the smaller base, which is the asymmetry.
3. The percentages are facts about arithmetic, made in either direction - an account that avoids the deep end of the curve never owes the steep climbs.

Diagram: Losses and recoveries are not symmetrical. The deeper the fall, the further the arithmetic runs away from you.

View it in the web lesson: <https://ticksprout.com/learn/fx/risk-management/drawdown-arithmetic>

What this means for you

Work the recovery arithmetic for a few depths until the asymmetry stops surprising you, then look back at your lesson 1 fraction and the losing-run lengths it makes survivable. The drawdown you can tolerate is a decision made now, at full balance, by that fraction - it will never again be as cheap to decide as it is today.

Try it yourself with the compound-drawdown calculator: <https://ticksprout.com/tools/compound-drawdown>

Check your understanding

1. An account falls 50%. What gain restores the high-water mark?

- a. 50%
- b. 100% - the recovery is measured on the halved base
- c. 75%

Answer: b. Half the account must double to get back. Falls and recoveries are percentages of different bases, so they never mirror - the deeper the fall, the more the mismatch grows.

2. The same eight-trade losing run hits two accounts, one risking a small fixed fraction and one risking four times as much. What differs?

- a. The depth of the hole, and with it the steepness of the required recovery
- b. The number of losses
- c. Nothing - the run is the run

Answer: a. The market dealt both accounts identical trades. The fraction converted them into different depths, and the recovery curve converts depth into disproportionately different climbs. The run is the run; the damage was chosen.

3. Why does fixed-fractional risking slow the fall during a losing run?

- a. It doesn't - losses are constant
- b. Each loss is a fraction of an already-smaller balance, so the money lost per trade shrinks as the run continues
- c. Brokers reduce spreads for accounts in drawdown

Answer: b. The fraction stays fixed while its base shrinks, so consecutive losses take less money each time - a decelerating fall. Fixed money amounts fall linearly, and brokers do no such thing.