The Importance Of Expected Value

$$EV = (prob.\ win.)(gain) - (prob.\ losing)(loss)$$

A poker player needs to be skilled at working with uncertainties. He can't see his opponent's cards and he doesn't know what cards are coming next on the flop, turn and river.

A poker noob is disadvantaged by this natural information blindness but a card shark understands how to exploit this fact of the game to his advantage.

There are numerous parallels between trading and poker and operating within the realms of uncertainty is one of them.

And just as a master card player is comfortable working within the realms of possibilities and not absolutes, so to does a master trader need to have a firm grasp on how to turn uncertainty into profit.

The key to for both the card player and market trader is his deep understanding expected value.

Poker, like trading, is a game of expectation.

By expectation I mean that all of trading can be boiled down to negative and positive expectation. These terms can be defined as:

Negative Expectation: If you take actions ABC in a particular set of circumstances and then repeat these actions thousands of times, running the full range of probabilistic outcomes, and you end up with a net unprofitable result, then actions ABC can be said to have negative expectation (-EV).

Positive Expectation: The above but in reverse. If you take XYZ in a particular set of circumstances and then repeat this action thousands of times, running the full range of probabilistic outcomes, and you end up with a net profitable result, then XYZ can be said to have positive expectation (+EV).

Simply put — if you took action X an infinite amount of times, would you make money on a cumulative basis? If the answer is yes, then it's positive EV. If no, then it's negative EV.

Here's an often used example:

A statistics-ignorant gambler asks you if you'd like to play a game.

The rules are simple. You roll a normal six-sided die as many times as you'd like. If you roll any of the numbers from 1 to 5, then you pay the gambler $10. But, if you roll a 6, then he pays you $56.

Do you take the bet? Well let's run the numbers and see if there's positive EV in the game.

Since there are six sides to the die, you have a ⅚ chance of rolling a 1 through 5. This means that there's an 83.3333% likelihood that you'll have to pay the gambler $10 on each roll of the die. Sounds like a crappy deal, right?
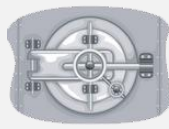
But let's look at the other side of the equation. You *only* have a ⅙ chance of rolling a 6. This translates into a 16.6667% chance that you'll win on each roll of the die. But the 16.6667% of the time that you roll a 6, you get paid 56 bucks.

So an 83.3333% chance of losing $10 on every role equals an expected loss of $8.33 ($10 x .833333). A 16.6667% chance of winning $56 equals an expected gain of $9.33 ($56 x .166667). Combine your expected loss with your expected win and you arrive at a positive EV of $1 per roll. This is definitely a bet that you want to take because over the long haul it's a winning proposition. It's simple math.

Positive EV doesn't tell you anything about how your wins and losses will be distributed. You could be extremely unlucky and go 40 rolls without ever hitting a six, in which case you'd be down $400. But even then, the game is still positive EV and you'd want to keep playing. If you play it enough your average return will equal $1 per roll.

The point I'm trying to make is far more philosophical than statistical. Trading is a game of expectations and all actions should be viewed as either being net P&L accretive or dilutive when carried out repeatedly.

When you fully know this truth, you will stop trying to create *false-certainty*. You won't worry about the future price action of a stock or currency. Instead, you will game different scenarios, weigh probabilities, and then structure your trade/investment in a way that makes it positive EV. This is exactly what we do at Macro Ops with our own investment strategy.

90% of traders and investors (both retail and professional) mainline the endless stream of quasi-journalistic BS because they're on a foolish hunt for certainty. They're consumed with trying to obtain perfect information so they can "know" what to buy… when in fact, "knowing" what to buy is not only impossible, it's completely unimportant.

They are focused on all the wrong things. That process is net dilutive. It's negative EV.

Most successful traders enter more losing trades than winning ones. This is a fact. The greatest traders I've ever met, and I have met some great ones, have had average win ratios in the high 30-40% range… and yet they have still managed to extract many millions and even billions from the markets. This is because they understood expected value (and risk management).

How do you increase your EV?

First, you need to start thinking in terms of Monte Carlo outcomes. Meaning, you need to consider all actions and their outcomes as if endlessly repeated. You don't care how one trade works out... or three... or ten. A trade that makes you a boatload of money can still be a -EV trade… which is a trade you should never take because it *eventually* leads to a blown stack.

Second, you need to get good at scenario gaming… meaning you need experience.

Scenario gaming is not forecasting, but rather understanding the possibilities and then using your analysis, judgement, and process to assign probabilities to each scenario.

Here's a a few of the questions that make up effective scenario gaming:

- What are the most probable outcomes?

- How much is the market mispricing this asset?
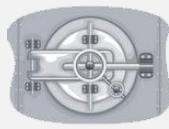
- How could I be wrong in my analysis?

- What would signal that I'm wrong?

- If I'm absolutely wrong, how much will I lose?

- What are potential tail risks to this scenario and how do I protect against them?

- How can I structure this trade to maximize my EV (build asymmetric opportunities)?

- How does this risk line up with other risk in my portfolio?

- If everything on my book went against me and stopped me out tomorrow, how much would I lose?

- Is this total risk within my limits (is this acceptable maximum risk)?

- Is this trade the best use of my capital right now (is it my highest EV opportunity)?

You need to run through this process every time you're considering a trade. Game that action through your mental Monte Carlo process and objectively assess whether that action is likely to be positive EV over time. Pretty easy right? Of course not, and it takes a lot of experience before you become effective at evaluating EV scenarios. It's a skill gained through years and years of practice and effort — successful trading is not easy.

And the journey is never complete. Every trader/investor should be constantly trying to figure out how to better assess EV in order to maximize their profits over time.

The goal is to turn yourself into the house. You want to become the casino with the edge (the positive EV on every trade) so you know that it is a statistical fact that you will make money over time. The larger your edge, the more money you will take in.