

## \_dpg's guide to making money for individual traders

### Intro: Why?

Writers say they write because they just can't do anything else. Not because it's easy or profitable. I believe that. Traders often say the same thing. They want to 'eat what they kill' because that makes their lives feel more authentic or something. I totally get it. Corporate refugee here... an office is a terrible place to spend a life but then I don't want to be a miserable artist or a hunter-gatherer either.

To me trading is a game. Not something I need to do but something I want to play and win. It gives me a childish excitement, and the idea that I can do this instead of a 'real job' is great. But because this isn't a 'lifestyle' or one of those situations where 'the journey is a goal' (wtf?), there has to be an actual way to win or else playing the game is stupid. My 'win' is \$5mm liquid, which I figure is enough to 'buy my freedom' and be able to sit under a shade tree with my dog or on a beach somewhere with a guaranteed income and to sip as many umbrella drinks as I want. If that sounds corny you're just jaded (understandable, but weak). I will actually stop trading when I win. I'm embarrassed to say that I am right now under 10% of the way there (Roth IRA gets traded aggressively [for tax benefit] but I keep several years of expenses totally untouched in after-tax accts. that I do not consider part of gambling "bankroll" so my total liquid net worth is not in trading accounts).

The game has been hard so far. Obviously. I'm writing this after a 43% portfolio drawdown (due to stupidity) and then recovering the whole thing and biting my nails the whole time. You work harder when you lose money and you find ways to make yourself accountable so it doesn't happen again, so I wrote the following rules, which were things I knew already but had trouble following. Some of you will recognize that these are not 'investor' rules or even 'trader' rules, these are 'gambler' rules. Because this game is about gambling, and if you don't know that already then you need to start thinking like a gambler. Odds,

probabilities.

I'm sharing this because other people helped me get here and I want to share like they did, and because despite what some people think, we individual traders are not competing against each other. We could all suck up \$1 billion from an overgrown, mismanaged fund somewhere and nobody would even notice.

One last thing: If you're playing for sub-2x annual gains or if you're accountable to investors, this really isn't for you. I'm playing to grow my bankroll across retirement and taxable accounts at a high enough rate to actually meet a goal and everything below is stuff that I think you have to do in order to 'win' this game. With that said, you might be playing a different game but still find this helpful and that's fine.

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#### A. The three things you need

1. CONVEXITY. you can probably make 20% a year with different types of "short volatility" (dip buying with cash acct., selling ATM cash covered index puts, small short VXX position or selling VXX call spreads, etc.) just like every big fund manager... and because you're more nimble you can probably do it better. But this is a good return for a pension fund, not an individual. You can also make 100%+ a year by gluing yourself to your screen and trading a few smaller niche products. Some gamer-types will be able to succeed at this but it's a lot like a pro sport. You'll burn out fast. To NOT burn out and to make 1000% a year, you NEED a lot of small, smart, uncorrelated bets, each of which has a convex payout. This means buying calls and puts (ATM/OTM) on mid- and large-cap stocks (these options are liquid enough).

2. EDGE. Your edge is always going to come from your size and the fact that you don't have an investment committee breathing down your neck. All the people with PhDs and supercomputers have \$20 bil in AUM and an army of lawyers and can't play the same game that you are, because your \$1 million account can go lots of places they can't and because they have clients who have a specific equity curve in mind (hint: 20% drawdowns are unacceptable) and won't

accept risk. One of the places your account can go is in stock options (stuff smaller than AAPL, BAC, AMZN etc.). The guys with the PHDs think they can make money by arbitraging the difference between option prices (implied volatility) and realized volatility. (You know that they make 20% a year by doing this.) You, meanwhile, make 1000% a year by taking directional, convex bets on something that would be really hard to justify to an investment committee but that is still a real source of edge. They act smart, but you're smarter.

3. RISK MANAGEMENT. The rest is always worthless if you don't understand fractional Kelly betting and how to honestly assess your edge. Betting too much will destroy your account. Betting too little means you make 50% a year instead of 1000%. These numbers are brutal, but true. You need to come face to face with this. Do some simulations. Hire a coder if you need to. Quantify your edge, even if it's fuzzy. Hold yourself accountable for following a sizing system and don't deviate from it. Kelly or fractional Kelly is the answer, and consistently executing is essential.

OK? You need each of these three things.

Without CONVEXITY, you're wasting your time. CONVEXITY multiplies the profit of every right move you make, but doesn't multiply the downside of your wrong moves (fixed risk). If you can be right 50% of the time and get a 2:1 payout, you are minting money.

Without EDGE, you will bleed chips over time. It is impossible to make money without edge. Luckily, individual traders have this a thousand times easier, as long as they have...

RISK MANAGEMENT. This requires you to be humble and always follow your rules. Your edge never gives you a 100% chance of winning on a trade (if you think it does, then you're wrong). You need to devise a system and stick with it completely.

If and only if you have each of these things, you will always be in control, you will never lose a lot of money unexpectedly, and you will make money over time. Of course you will have big drawdowns, but they will be totally

quantifiable. Being long options gives you limited risk, and makes capturing your EDGE and executing with your RISK MANAGEMENT possible. It is tempting to learn from books written by institutional traders, and to adapt their methods to your situation (this is what 99% of individual traders try to do) but it is a huge mistake. You don't have to accept the risks that big traders have to accept (short convexity), and at the same time you can accept the kinds of portfolio risk that would get finance guys fired. This is a huge advantage.

Financial institutions are conservative. They are full of people who are trying to keep their jobs... contrary to the idea that Wall Street people take big risks all the time. This is always where your edge will come from. You can take the risks that bankers are afraid will make them look stupid. Stuff with slightly lower probability of profit. Stuff that the investment committee would laugh at.

Your job is to make money, not impress your boss. If you totally internalize this fact and accomplish these three requirements (CONVEXITY, EDGE, RISK MANAGEMENT), you will succeed.

## B. About CONVEXITY (Difficulty: Easy)

CONVEXITY is the property of something 'convex'. In betting terms, something is convex if it can make a lot more money than it can lose.

Some people will argue that a concave bet (one that can lose way more than it can ever make) can also be a good bet, and that it all depends on the price and the expected value. This is true but meaningless. When you have a risk of unknown losses, you can't put as much money on the line. When you can't put as much money on the line, you can't make as much money. More succinctly, you cannot ever make a lot of money if you take concave bets. You can only ever make a lot of money if you take convex bets. We want to make lots of money. We have to make convex bets.

But...

This means that we have to accept, for every bet, a lower probability of profit, because we will buy options that

only have something like a 25% probability of making money (ATM/OTM). If you don't like that, well that sucks. You have to get over it or you have to be ok with mediocre returns and get a job as a corporate drone.

### C. About EDGE (Difficulty: Average)

Your edge comes from being small, but your edge isn't just "being small." You as a small trader have a role in the trading ecosystem, and that's to take money that someone else is leaving on the table. Big fish leave a lot of money on the table because it's impossible not to, and because they tend to want "price improvement" and other stuff like that. They are fiduciaries and don't want to get sued. You need a signal to help see how and where this money is moving.

The easiest money being left on the table always comes from simply following other people. Coming up with your own "ideas" is an ego trip and is a waste of time and money. Your job is to trade and make money for yourself. Find and take the handouts.

Most signals are garbage at finding this. If it was popular in the 1980s, it's trash. The market fundamentally changes every ten years (and if you're thinking, "but human psychology doesn't change," then just stop... human psychology isn't a signal). In today's market, the best signals come from big fish moving money into or out of stocks anticipating they'll go up or down, and those big fish move money in over-the-counter (OTC) trades through their brokers and other liquidity providers. These trades never touch the public exchanges, and so they have less impact on price. (The sqzme "dark pool" data lets us take educated guesses at whether the big fish are buying or selling, and how much.)

Usually, if someone "knows something," they buy at the ask and push the price up or down, and if you try to follow them, you get a much worse price in the following minutes, hours, and days. But if someone knows something and buys slowly and passively in OTC/dark, you can have plenty of time to join before price goes up or down. (And again, you only have to be 'right' less than half of the time, because you're taking convex bets with options.) Everyone wins.

And it gets even better, because it's not just the big fish investors who leave money on the table for you... the option dealers are helping you too.

Aside: Everyone seems to think that when you buy an option, someone else is taking the opposite side of the trade. This is false. The guy who sells you an option is hedging it and takes no directional risk at all. He doesn't care if he sells you a call and the market goes up, because he's hedged against that.

So for example if you believe that a stock is likely to rally, the price that the option dealer gives you has nothing to do with how likely he thinks a rally is. In fact, you can buy a call from a dealer and BOTH of you can make tons of money (specifically if the stock slowly moves up). Again, everyone wins.

Point is: You're not competing and it's not a zero sum game. You're a small fish. They are big fish. You follow and you eat some scraps, using convex instruments to leverage your signal. If you're right more than half the time, you're killing it.

#### D. About RISK MANAGEMENT (Difficulty: Hard)

This is the hardest part, because it requires you to be actually humble. And most people who try to trade for themselves are not humble by nature.

So here's the thing: If all the probabilities were known, it'd be easy, but they're not. Most people use this as an excuse to not attempt to measure probabilities at all. Most people also fail at trading for themselves.

At the most basic level, an at-the-money (ATM) option will have a delta (probability of ending in-the-money) around 0.50 (50%). If you're taking a directional bet on a stock, you already disagree with this "implied probability" (because you think up or down is more likely than 50%) ... so you may decide to buy the option (or a spread) because you believe it has a positive expected value.

But the difference between incredible success and total failure in being an individual trader is whether you buy 3 contracts or 4 contracts. Not exaggerating. Your edge will not save you from bad position sizing, and you have to accept that.

So first let's limit our discussion to an ATM bullish call spread and look at the probabilities:

Stock XYZ trades at \$100. It was recently \$105, but it fell over the course of the last week. Last time it fell to \$100 (two months ago) there were lots of dark pool buyers, and then price recovered over the next month. Back at \$100 again, there are just as many dark pool buyers as before. With all of this in mind, you guess that there's a >50% chance that the stock will go up over the next month, and you even think it's pretty likely to return to \$105 (though it might have a hard time getting above that).

So you look at the delta of the \$100-strike and \$105-strike call for next month. The deltas are 0.50 and 0.20, respectively. That means the market is pricing a 50% chance of being above \$100 and a 20% chance of being above 105 in a month. So you decide to buy the 100/105 bull vertical, because you believe there's a >50% chance of XYZ being above \$100 in a month, and either a 20% chance, or <20% chance, of being above \$105. The spread costs \$1.65 (\$165) per contract.

You believe that, out of all the possibilities, the average price of XYZ in a month is likely to be \$102.50. Yes it could go down to \$95, or up to \$110, but on average you think \$102.50 is likely. This means you believe that the 100/105 call spread is actually worth \$2.50 (\$250) per contract. This puts your average anticipated profit at \$0.85 (\$85), because that's the difference between the market's price and your expected value.

So, in your mind, you're risking \$165 to make \$85.  $85/165 = 0.5152$ . In "odds," that's 0.5152-to-1 odds. Remember CONVEXITY? *In betting terms, something is convex if it can make a lot more money than it can lose.*

Your bet is already non-convex, since you're risking "1" to make "0.5152." You don't really want that, but whatever, you keep going anyway.

Now, at this point, you're thinking, "I conservatively bet there's a 60% chance of XYZ going up from here." So you go to an online Kelly Strategy Calculator (or your own) and you punch in 0.5152 odds and 60% chance of winning, and you get:

*The odds are against you – you should not bet.*

So you type in a 65% chance of it going up, and you get:

*The odds are against you – you should not bet.*

And now you're really wondering if this is a good idea. You type in a 70% chance of it going up, and finally:

*Your optimal bet is about 11.77% of your capital.*

But you literally have to believe that this stock has a 70% chance of going up before that 100/105 bull spread becomes a potentially profitable bet for you. How confident are you in that?

Going through this process made you realize that not only are you breaking your rules (CONVEXITY) by trying this trade, but you also can't get a good price for the probabilities that you believe in. You might have an EDGE here, but once you ran it through RISK MANAGEMENT, you stopped feeling so good about it.

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So now you're going to look for something that you think can really move, and you find ABC, a utility company that's been going slowly up and to the right for months. But this whole time there's been an undercurrent of tons of dark pool selling, and you think that at any time, it could break to the downside.

ABC trades at \$50, but it was \$42 just two months ago. This ramp has been crazy, and you think it could totally get back to \$45 or lower within the next month. The 45-strike put a month out costs \$0.12 (\$12). You think there's at least a 20% chance that ABC will end up below \$45, and you think it's equally likely for it to end up at \$45, \$42, or anywhere in between (at an average price of \$43.5). This



means you believe the 45-strike put has a 20% chance of being worth \$1.50 (45 - 43.5).

So you're risking \$0.12 (\$12) to make \$1.50 (\$150), which is 150/12 odds (12.5 to 1). This is CONVEX.

Now back to the Kelly calculator: Type in 12.5 odds and 20% probability:

*Your optimal bet is about 13.6% of your capital.*

Now what if you're wrong about the probabilities? Just to be safe, try entering 10% instead of 20%:

*Your optimal bet is about 2.8% of your capital.*

It's a really good sign that the odds are still worth it, but it's obviously going to be hard to calibrate an optimal bet since even small changes in your expected probability or expected value have a huge effect on what's optimal.

And here's where you have to exercise some extra humility, and admit that your self-assessed probabilities of unlikely events are crap, so you need to assert a fixed bet size of something like 2.5% of portfolio per trade, and to have a hard limit on how many trades you can have going at once.

That hard limit on how many trades you can have should be a function of the your average optimal bet size of each of those positions. So for example if you have six positions right now (each is 2.5% of portfolio, making a total of 15% of your portfolio in options positions), and the average optimal Kelly size of those trades is 13.6%, then you're over your limit by one position (get rid of one 2.5% position and you'll be at 12.5%, which is under 13.6%).

The incentive is to choose as many high-quality trades as possible, and to only scale up your total exposure with the quality of your current positions.

In this way, RISK MANAGEMENT is a delicate balancing act between the other rules, CONVEXITY and EDGE. You want to have as much EDGE as possible in your portfolio, and with as much CONVEXITY as you can handle, but you must must must adjust to the reality that the best positions are lower probability bets, and this means getting position sizing

right. There is no other way to capture EDGE+CONVEXITY.

Also, by using Kelly as your guide, you keep yourself accountable to these limits, and you actually incentivize yourself to find bets with more EDGE instead of being lazy.

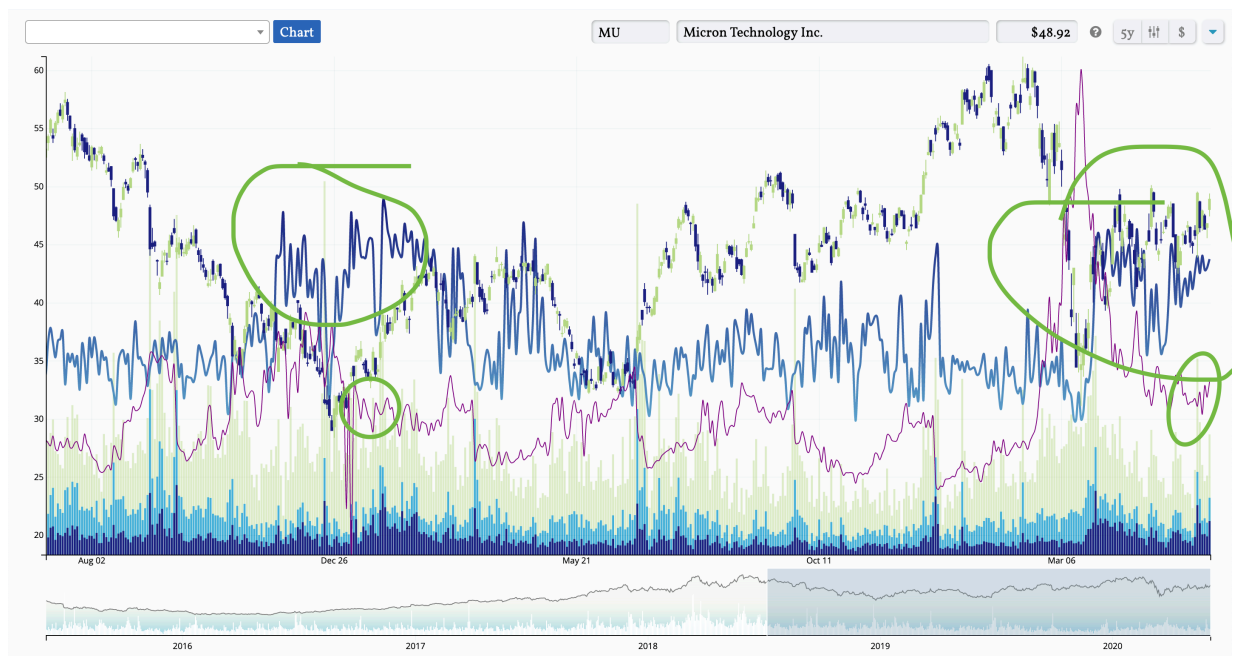
Know that it is not possible to mentally keep your portfolio within the bounds of EDGE-based optimal bet sizes if you don't use Kelly. Again, you have to be humble. Your brain can't handle this, and you will absolutely fail without this attention to RISK MANAGEMENT.

If I were actually writing a book I would go into detail on why Kelly is necessary but if you're skeptical I hope that the decades of betting math papers and books that talk about Kelly sizing will convince you. It's mathematically optimal and it's the basis for all aggressive betting and risk taking.

## E. Example

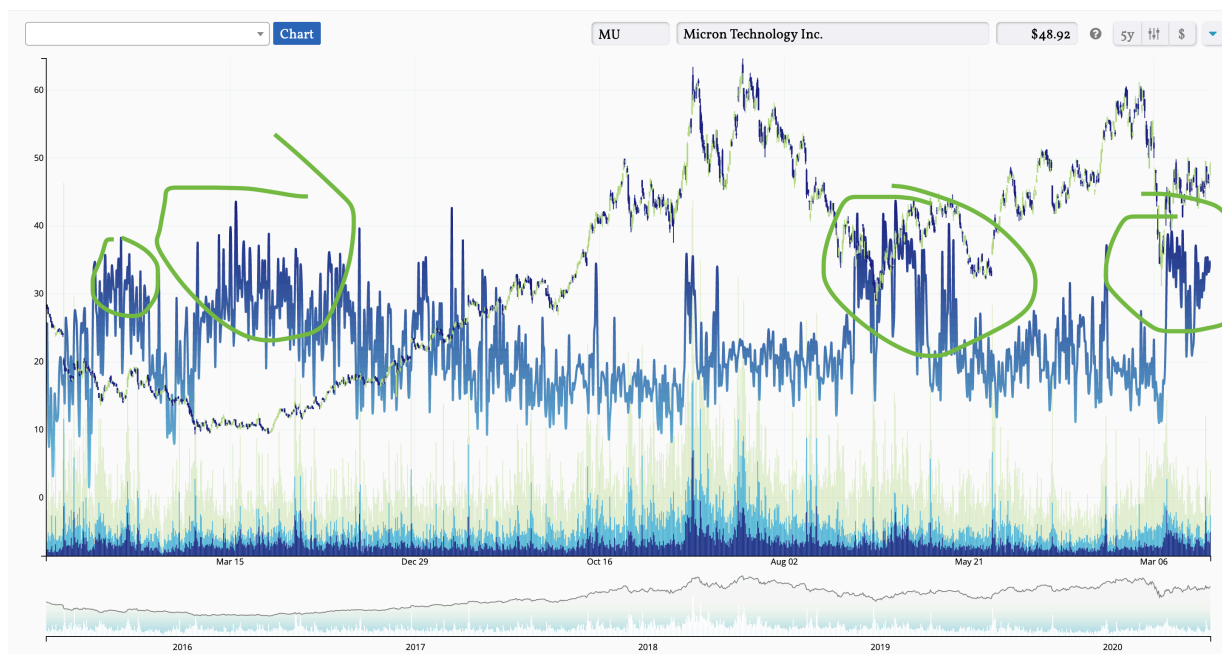
Here's some stuff I'm in right now and why.

This is MU.



Dark pool buying is relatively high. Last time that happened, the stock went up.

Also, long term trends (five year chart) in MU obey trends in dark pool buying.



This is our EDGE. Some institutionals are clearly buyers probably because they have a good valuation model or because they have good information. So we follow.

One week ago I ran this through RISK MANAGEMENT because I had taken profit on something earlier in the week and had room for a new position (also if I determined that this trade would be obviously better than a current position I would close that position and replace it with this one).

Price was around \$47. I evaluated that in a month there would be a very good possibility of achieving \$55+. I put that probability at 20% then I looked at option prices.

\$55 call for Jun26 (1 month) was available for \$0.29 (\$29). Delta (implied probability of ending up above 55) around 11. That's a good start because in my world it should be 20.

I'm guessing it can't get past \$60 in the next month, though, and I don't quite think it'll do that. If it were to get above \$55, I think the average place for it to settle would be \$56.50 (if I thought there was an equal probability of ending at \$55 as \$60, then I'd say the average settle would be \$57.50).

That means I think the \$55 call is worth  $\$1.50 * 0.2$ , which is  $\$0.30$ . This is not good, because the market thinks it's worth  $\$0.29$ .

I reached for too much convexity. To make buying the \$55 strike worthwhile, I'd need to believe the stock had a higher chance of getting way above \$55. So let's scale it back.

I look at the 52.5 strike. It's  $\$0.60$  ( $\$60$ ). I'd guess there's a 40% chance of ending above this, with an average settle of \$55. So, the option, in my mind, has a 40% chance of being worth  $\$2.50$ .  $2.50 * 0.4 = \$1.00$ .

Risking  $\$0.60$  to make  $\$1.00$  doesn't directly violate the CONVEXITY rule, because it still can make a lot more than it loses. But usually if I risk  $\$0.60$  I want to try to make an average of  $\$1.20$  or more (I want my EDGE to say that I will double my money, on average). So I try moving the strike up a bit more. Lucky for me there's a 53.5 strike.

The 53.5 looks like it can be bought for  $\$0.45$  ( $\$45$ ). I think there's something like a 30% chance of ending above. I think the average settle if that happens might be something like  $\$56$ . So, 30% chance of option being worth  $\$2.50$ .  $0.3 * 2.50 = \$0.75$ . Pay  $0.45$  for opportunity to return  $0.75$  is getting real close to enough EDGE for me, but I need a bit more.

Remember how I don't think MU can get over  $\$60$ ? That means that none of my guesses for the values for the options above have any settles above  $\$60$  considered. So how about I sell a  $\$60$  call? Looks like I can easily get better than  $\$0.05$  ( $\$5$ ) for that and probably actually  $\$0.10$  ( $\$10$ ).

So, a 53.5/60 call spread that I think is worth  $\$0.75$  can be bought for  $\$0.35$  or  $\$0.40$ . That gives me the EDGE I want.

See how I bounced around to find a bet that I think offers enough CONVEXITY and EDGE? Now to do the Kelly part, I look at the probability of moneyness (30% probability MU ends above 53.5) and the average value of the option in the event that happens ( $\$2.50$ ) versus the cost ( $\$0.40$  to be conservative).

Average value of a win is \$2.50. Cost is \$0.40. That's 6.25:1 odds. With a 30% probability of moneyness that gives me an optimal Kelly bet of 18.8% of capital.

As a general rule, if Kelly tells you to bet more than 20% of your capital on something, then you probably don't have enough convexity. For something with a 30% chance of not totally losing, a ~20% allocation is huge... which means this is a good bet.

Now I buy enough 53.5/60 call spreads in MU to satisfy the 2.5% limit on how much of my account can be in a bet. Also, because the highest Kelly size of any other bet I have in my portfolio right now is in the 17%, I can slightly raise my limit on how many positions I can have (though not enough to actually add another position). If another one of my bets loses a ton of value tomorrow, I may be able to add another bet if 18.8% - [total % of bankroll in use] is  $\geq$  2.5%.

... So this whole thing is what I went through on Thursday night, and on Friday I bought the position. Today (the following Thursday, almost a week later), MU closed at \$51.22.

The 53.5/60 which cost \$0.40 (\$40) per spread is now worth something like \$1.26 (\$126). Has anything changed in my outlook? No. My original thesis stands. Even if something had changed a bit, I'd be very reluctant to change the position. Recall that I'm trying to 10x my money, not take small winners. That means doing my DD up front, getting myself CONVEXITY and an EDGE, and letting the chips fall.

If I stick to this, I am confident that even if I do not win more than 50% of the time, I will make wayyy more than enough money on my wins to make up for the fixed-risk losses. On this MU bet I am specifically betting on a 70% chance of losing the whole bet. The hardest thing is when the stock moves up to a huge profit then falls back down.

That happens. But you have to suck it up. Because again, you're here to make real money, not to impress people with your PHD in hindsight bias.

F. That's it

Execute. Log your risk. Follow these three rules:

CONVEXITY

EDGE

RISK MANAGEMENT

Have a caipirinha.

Wrote this in a week. By no means is this the 100% best way to do it, but it's many years of thought and a lot of help from other really generous people online and especially sqzme, which is the source of edge that really informed the way I see the market.

P.S. Forgot to mention that the reason I circled the purple line on the above charts is because that's implied volatility, and when it's low, options are cheaper, and when options are cheaper you're more likely to find a good bet whether you're betting on upside or downside.