

## How Much Should You Allocate to Your Best Idea? Apply the Kelly Criterion to Investing.

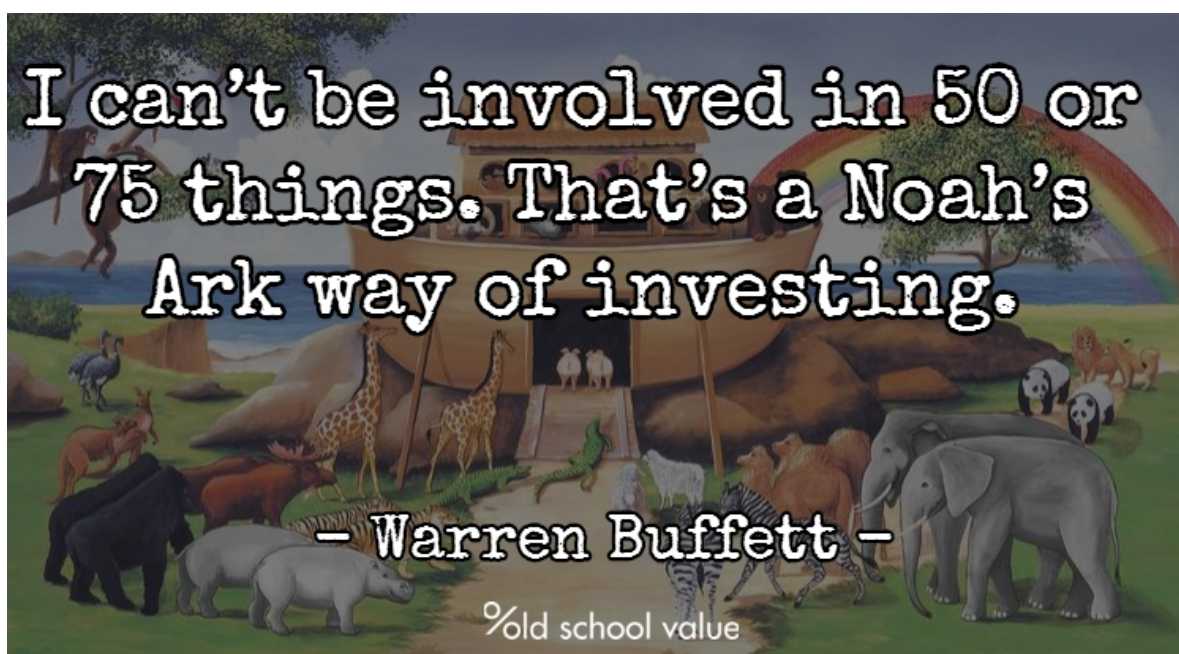
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Decisions, decisions, decisions.

As an investor, you're making decisions all the time.

After all the analysis is done, you still have to decide how much capital to deploy for the idea.

One thing great value investors run away from is the widespread concept of [diversification](#) with many holdings.



*I can't be involved in 50 or 75 things. That's a Noah's Ark way of investing – you end up with a zoo that way. I like to put meaningful amounts of money in a few things. – Warren Buffett.*

Charlie Munger has touched on this point too.

*The wise ones bet heavily when the world offers them that opportunity. They bet big when they have the odds. And the rest of the time, they don't. It's just that simple.*

Another great investor that supports this view is Monish Pabrai.

In his book [The Dhandho Investor](#)

, he dedicates a whole chapter on a formula to sharing how to tailor the amount of capital you should put to work in a certain idea.

That formula is called the [Kelly Criterion](#).

## Introducing the Kelly Criterion

Developed by John Kelly, who worked at Bell labs, the Kelly Formula was created to help calculate the optimal fraction of capital to allocate on a favorable bet.

The great thing about the formula is that it's flexible enough to work where information or skills can give you an advantage by estimating the outcome probabilities.

- horses
- blackjack
- and obviously the stock market

As simplified by [Pabrai in his book](#), the Kelly criterion applied to the stock market is:

### ***Edge / Odds = Fraction of capital that should be allocated***

- The edge is calculated by the **total expected value**, obtained by adding up the multiplication of each scenario's possible outcome by its corresponding **probability**.
- The odds are directly the positive outcome that can be obtained.

But first, it's important to realize that there is a big difference between "probability" and "expected value".

*Probability measures how certain a particular event will happen in a specific instance.*

*Expected Value represents the average outcome of a series of random events with identical odds being repeated over a long period of time. – [source](#)*

If you flip a coin 10 times where you get one point for heads and zero for tails, the deviation from the expected value of 0.5 is going to be small.

But in percentage terms, the difference is huge.

Now if you did 1,000 coin flips, the absolute deviation will be larger. That is, there will be more flips outside the 0.5 expected value.

However, the percentage deviation will be much smaller.

Do you see what I'm getting at?

Over a small sample size, the Kelly Criterion doesn't work well, especially if you don't trade often.

The formula is intended to work best for the **long term growth of your bankroll over thousands of trades**.

That's where it's different and difficult to apply to investing.

Unless you are day trader making tens or hundreds of trades a day, you won't reach the number required for optimal allocation.

## Kelly Criterion Examples

With the above discussion in mind, here's an easy example taken from [The Dhandho Investor](#).

You're offered a coin toss where heads you get 2 dollars and tails you lose 1 dollar.

How much should you allocate to this bet?

Primarily, the Kelly formula can provide you with a range of upper and lower bounds to determine the size of our investment.

Let's take it one step further and apply it to a stock portfolio.

### The Kelly Formula in Action with AAPL

Do you remember the AAPL roller-coaster last year?

At the low point, the stock was selling for about 400 dollars.

[Even Jae decided to jump in and buy AAPL.](#)

So with the analysis at the time, how much of your portfolio could you have allocated to AAPL a year ago?

When talking about stocks, there is a need to think in terms of the price differential compared to the actual values displayed by the market.

In other words: alpha.

Scenario	Probability
2	50%
-1	50%
Total expected outcome	0.50

<b>Edge</b>	.50
<b>Odds</b>	2
<b><i>How much of total capital should be allocated (Edge / Odds)</i></b>	<b>25%</b>

Kelly Formula Scenario

Scenario	Probability	Alpha
Apple is worth 400	10%	0
Apple is worth at least 600	89%	200
Apple will go bankrupt	1%	-400
		Sum of each scenario's alpha time its probability
<b>Total Expected value or Edge</b>	<b>174</b>	
<b>Odds</b>	<b>200</b>	This is the total amount for a positive result
<b>Recommended allocation</b>	<b>87.0%</b>	Edge / Odds
<b>Price at the time</b>	<b>\$ 400.00</b>	

Kelly Formula Example with AAPL

Now, please remember the Kelly criterion isn't necessarily a "Do-as-I-say" formula. It is best used as a guideline to find upper and lower values.

This is a clear example of where there are difference with investing. The Kelly Criterion clearly sends the message that this is a stock you should bet a lot on. But I wouldn't allocate 87% of my capital to this idea.

It just shows that the odds are heavily in my favor.

In the book [Hedge Fund Market Wizards: How Winning Traders Win](#)

one of the hedge fund traders talks about allocation using the Kelly formula.

*if you bet half the Kelly amount, you get about three-quarters of the return with half the volatility. So it is much more comfortable to trade. I believe that betting half Kelly is psychologically much better. – source*

So instead of betting 87%, it's more realistic to bet less than half. With AAPL at those prices last year, hindsight tells you that even a 30% allocation would have been very good.

But as always, the dots connect and your circle of competence will play a major role in determining the probabilities of outcomes.

The more you know the business and industry, the more precise the numbers will be. It's always wiser to be conservative in your outcomes and probabilities, since it implies that even an adverse scenario can produce good results.

## Summing Up

When the odds are heavily in your favor, don't panic, but profit from the opportunity Mr. Market is giving you. You don't want to follow the Kelly formula by the book. Use it as an indicator of how good the odds are and apply 25% to 50% of the recommended sizing.

And follow Pabrai's recommendation.

| *Place few bets, big bets, infrequent bets.*

### Pros of the Kelly Criterion:

- Tells me right away if my odds of making a profit are good
- Provide a range of upper and lower values for my capital allocation decisions
- Comparisons across opportunities are possible

### Cons:

- Recommendation relies heavily on the accuracy to determine probabilities and outcomes
- Data is not easily obtainable as we need to calculate our intrinsic value estimate to determine alpha
- Potential mental mistakes in minimising potential losses and maximising potential wins

Certainly a great tool to assist in your capital allocation decisions.

### Questions for You

1. Would you use the Kelly Criterion?
2. How do you size your positions at the moment?

## References and Additional Reading

### About Brian Flores

In the words of Buffett and Klarman, Value Investing is like an inoculation. With me, it also clicked right away. I greatly enjoy learning and collaborating with others to discover new horizons.

