IFB256: How to Work with Probabilities in Investing

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Dave

0:00

All right, folks, welcome to Investing for Beginners podcast today we have episode 256. Today, Andrew and I are going to have a conversation about probabilities and the stock market. This is not something that we've touched on before. But it's an very important topic. And it's something we thought it would be appropriate for us to discuss. So Andrew has done a lot of work on this.

And he's going to be kind of our expert today. So we'll go ahead and dive in. So Andrew, would you like to kind of fill everybody in a little bit of what we're going to talk about and kind of go from there?

Andrew

0:33

I'd love to. So you know, probabilities. Why is this important, especially with the stock market. So you look at the stock market, you look at the business world, things are very uncertain. So I could have a certain belief about how I think the business or world will look tomorrow. But a lot of things can change.

And I mean, we've seen that over even the last two years. So as investors, we can't obviously know what the future holds, we can't know how things are going to change. But we can look over time and try to at least be cognizant that there's going to be uncertainty, and you just have to deal with the uncertainty. And a good

way to deal with the uncertainty is to assign probabilities to things. And that helps you make good decisions in the stock market.

Dave

1:23

And that all sounds great. Let's back up just a bit. And when we talk about probabilities as it relates to the stock market, what exactly do we mean?

Andrew

1:31

So think about like, if you're the flip a coin, there's a 5050 chance you flip a heads or tails. That's the most simple probability that we can come up with the stock market is a lot more complex, because things are always moving. So I'm gonna reference a great book, if y'all back there like want to run to your vault and go pick up your copy of Warren Buffett portfolio, we're gonna dust that one off.

This one's by Robert Hagstrom. And it's not his most popular book is is obscure book called The Warren Buffett portfolio. Robert Hagstrom is a guy who's spent a lot of time with Warren Buffett, they've had a lot of conversations, and he's gotten good insights for how Buffett thinks. One of the things I love that he shares in this book is he says that Buffett's a huge probabilities guy. And I think that's not something that's super well known about Buffett. So just as an example, I thought this was so ridiculous and hilarious. And I love it, because I could see myself doing something like this, too. But when Buffett was a boy, he took somehow, I don't know how he got the statistics, but he looked at the lives of the composers of church hymns. So the you know, the songs they play in church, he looked at the life expectancy of those composers. And he compared using statistics, whether they live longer than the rest of the population. So that was something he did just for fun as a boy.

And he's talked about how he uses that similar type of mentality when looking at what stocks should I buy. So this kind of a thinking is not something that's just specific to Buffett as well. If you think about the way that weather forecasters come up with their forecasts, they use a lot of probabilities. And then as things change, they adjust those, but the only way they're going to know what something is like 14 days out is they just use probabilities, insurance companies, that's the way they exist to, they know that a 16 year old driver who just started driving is probably going to be a lot riskier than somebody who's 45 and maybe as a couple of kids.

So probabilities are really all around us. And particularly if you're an investor, they are something that even if you don't realize that you're making bets on probabilities you actually are. So it's a very beneficial thing to think about what those can be and how we can apply them in our investing approach.

Dave

4:01

Okay, so I guess that leads me to how can we apply probabilities to our investing approach? Like how can we take these ideas that you're talking about, which make a lot of sense, and apply them to whether we buy meta Google or Nvidia? How does that help us? Yeah,

Andrew

4:19

perfect. So hat tip to Brian, for all the on this. I think he shared a similar concept on our podcast, but I know he's tweeted about this. But the best probabilities that you can give yourself as an investor is to hold stocks for the long term. So he's put a really great graphic out there that looks at the probabilities of making money in the stock market, depending on how long you are in the stock market. And it's something like 5050 chance in the first couple of days. I think after five years, you have something like a 7030 chance of making money.

As that goes out longer, longer. 10 year period, you have like an eight 80% chance, by the time you get to 20 years, it's like, so far in the history of the stock market, you've made money every time if you've held stocks for at least 20 years. So that's, I think, the best probability that if the rest of this conversation kind of derails, and it gets a little too mathy, you can at least put that in the bank that if you hold stocks for the long term, you're gonna make money. And the reason behind that is because stocks are pieces of businesses, they are ownership stakes in the business. And so if you own enough businesses, and the economy grows, the value of those businesses grow, and your stocks will grow, too.

Dave

5:39

Okay, that sounds awesome. All right, let's move on to let's say that I bought into this idea of using probabilities, where or how do I start? How does it work? Do I look at two companies and assign the probabilities of one is going to be better than the other? Or do I take one company and assign different probabilities to it based on revenue growth or earnings growth, for example, just as an FYI.

Andrew

6:04

So let's go back to what Buffett said, he said this in the book because he talked about exactly how he uses probability. So he says, take the probability of loss times the amount of possible loss from the probability of gain times the amount of possible gain. That's all we're trying to do. It's imperfect, but that's what it's all about. So you think about how we can apply this to stocks, the most you can lose in the stock is all of your money. So again, these are pretty simple concepts. But if you were to borrow money, you could lose more money than you put in, right. So we have to be careful to not borrow money, because you'll start to put those probabilities against you. So you can start with that assumption that the most I can lose is 100%. And then you can kind of build from there to say, maybe a company is very, very risky. And so it has a higher chance of going bankrupt than somebody like Microsoft or Johnson and Johnson, then you want to take that into account.

Because that will help balance what excitement you feel about a stock. So let's say there's, you know, a lot of times when stocks get cheap, you could make a lot of money with it. Because if it rebounds, when people find out that everybody was just scared about the stock, when it rebounds, you can make a lot of money. The flip side of that, though, is if it has higher risk, so what Buffett's trying to do by comparing possible gain with possible loss is, okay, how much does he think we're actually going to gain with this stock? If that risk reward, if those odds are good, then I'm gonna take that bet, because even though I might be wrong, or something might happen, so let's make it simple. Like, you know, there's a 5050 chance we triple our money, but there's also so it's a 50% chance you triple it or 50%, that you lose all of it.

Okay? I mean, those are good odds. And you're gonna want to take that bet, because if you took it two times, and let's say one time, he lost all your money. But the second time you tripled it, then even though you lost the first time, you tripled the second time, you still end up on them still? Correct? Correct. Now, with stocks, you don't want to be doing those kinds of bets, because those are not good investments. But that's the concept. And then you take it from there, and you start narrowing it down to different numbers. What makes it tricky is he doesn't say which numbers in particular, but we can use the example of Wells Fargo as something that he did talk to Robert Hagstrom, about how he used probabilities there. Okay,

Dave

8:52

let's talk about that. Because I'm curious to hear, because I know he was invested in Wells Fargo for a while, and I think he's gotten out of the company since but it would be interesting to see because he bought it at the height of the great financial crisis. Is that correct? Or is that when he started buying it?

Andrew

9:07

He's been in and out of it several times. So this book is pretty old. So it's talking about the first time or it might not even been the first time he was in, but this was at a time where it was the early 90s. Okay, and there was at the time, California was in a pretty big crisis, particularly Orange County. And so the mortgage market in California was a place of a lot of uncertainty. Okay. So, Wells Fargo having a huge exposure that California, he he took all of those risks and tried to make those really obvious to himself and then try to think what's the risk reward of this? So in the case of Wells Fargo, he took a worst case scenario.

He said, Well, let's say a lot of this banks loans end up going under because the crisis in California hits a lot of the bank's customers. And he assigned, he said, Okay, if the bank defaulted on 10% of its loans, he said, even if that were the case, the bank would still break even. So knowing that, I contrast that with how much I think the banks actually worth based on his intrinsic value. And so he says, I think Wells Fargo stock can go up this much, because it's undervalued. And so if you take what the possible losses, what the possible gain is, you put those together, and you have a good picture of okay, I want to buy this stock.

Dave

10:40

That makes a lot of sense. I'm not sure if he assigned probabilities with the American Express investment back in the 60s. But I believe it was kind of the same kind of idea where he, when the company was going through the salad oil crisis, and the stock was beaten down huge. I remember reading something where he said, kind of the same idea where even if American Express lost everything related to the salad oil scandal, they still had enough cash on the balance sheet to still more than breakeven. And his intrinsic value of the company was way higher than what it was trading for. And so for him, I guess it was kind of a no brainer, based on just that kind of simple analysis. So is that kind of what you're talking about?

Andrew

11:23

Yeah, I think so. I mean, it kind of shows even through like, that's 30 years of difference between those two stocks and the philosophies. Pretty similar. It's a very useful mental model.

Dave

11:36

Yeah, it really is. So I know we were talking off air about Coca Cola, did he use something similar when he was evaluating buying coke?

Andrew

11:44

Yeah, that's what I loved is, that was the next example, Robert Hagstrom used. And it's almost like, not like the anecdote, but it's like the other side of this discussion where a company like Coca Cola, he had near certainty about where he thought the company was going to go, in the sense of like, there was not much that could go wrong. I mean, the company had been around for already, even like 100 years, or something by the time he bought it. So up until that point, there hadn't been a lot of things that was going to replace coke.

And there are already a lot of companies that had tried to replace coke. And so basically, what Hagstrom said was, look, he looked at Coca Cola, as I kind of know what this company is going to do, and they're going to continue to be really good. Like they like they have plus, he saw some of the things that management was doing, they were making the company more capital efficient, they had room to grow at the pricing power, that was really, really key. And so he kind of looked at that, and it was one of those bets, where I just feel really, really certain about this. And you don't have to make a lot of crazy calculations to get to that kind of a conclusion.

But he got there, you know, as an investor who had been doing this for a long time, obviously, he studied the company, and he knew, you know, he knew how much the syrup was selling for he knew how much they could grow that. And he kind of had a good idea of what the growth potential was. And I think that's something that's very important that we're not lying to ourselves thinking we know more about the business that we actually do.

Dave

13:19

Right? So would it be safe to say that this idea of using probabilities, also comes down to having a fairly good idea of what the business does? And the direction the business could go? I

Andrew

13:33

would answer that in two ways. So I think, yes, there's a way to do that with like Coca Cola, where you really know a lot about the business. But I think it's very hard to say, how do you duplicate that with another company? And so that's why for me, I mean, I'm naturally a numbers guy, this is the kind of stuff that, you know, gets my heart goes on, and everything gets my blood racing and all the good things, right. I feel like it's easier to apply that kind of a model to something like Wells Fargo, because that's the way my mind operates, which may or may not be the right thing, but to go back to Wells Fargo. How did he know that? If the How did he know the pick? 10%? Because that sounds like a very arbitrary number. Right?

Right. Okay, if 10% of loans default. So the background behind that was he was very familiar with the banking industry. So he was able to look through history and look at what the default rates were for different banks throughout different crisis's. So he knew that 10% is a really high number. I mean, looking at like Bank of America, JP Morgan recently, they were talking about like if 1% of their loans defaulted, that was really, really high. So 10% It's a very safe number to kind of say, okay, in a crisis, things will get really bad. Maybe our loans will default that 10% Because historically that would be really high. So to Me, I like that model of looking at companies.

Because if you can have enough, the hard part's like having enough data and knowing what data is important, but if you have enough of a context to look back on, then you can say that this kind of a scenario is more likely than not. And then you can kind of try to gauge make a decision on, you know, how much uncertainty you think is coming in with the stock you're going to buy based so much you know, about history, and based on what could happen.

Dave

15:30

Okay, that makes a lot of sense. So how does one go about assigning probabilities to different companies or different possible investments? How do we translate this?

Andrew

15:44

That's the million dollar question. I think that's really, really hard. Do you know, that's probably where the alphas that's probably how good investors who, who put a lot of time and work and energy into things can find those kinds of opportunities. But I will say that a key part in this which ties into this perfectly is this idea called the Bayesian models are based in principle or the Bayesian something which has has to do with probabilities. So the idea is, like we were saying that the beginning, things change, right. And so I was trying to think of, there was a great example, in the book I was trying to think of, how can I make this even simpler.

So think about everybody's played, go fish, I hope. So think about when you're playing Go Fish, okay, you have like three sevens in your hand, you know that the probability of a seven coming up next is really low. Because there's only four sevens in the deck, you already hold three of them, and there's 52 cards in the deck. So the probability of seeing the seven is low. On the flip side, you know, if you have maybe zero sevens are one seven, your, your chances are higher, you'll pull a seven than, than they were, if you would have had three sevens. Now we're basically in comes in is, let's say you have the three sevens, and then you pull a seven, now you have four sevens. Now, you know the probabilities have changed, right?

Because you've seen a new piece of information that's changed the probabilities that you knew before. That's what Bayes in is all about. And I think that's where Buffett and Munger because Munger has talked about how like, he loves probabilities, because it's an application of algebra that we learned in high school. Right? That's, I think what it could be one of those things that keeps them interested in the game, after having done this for decades and decades and decades is because however, Buffett saw the market in the 90s, and whatever probabilities he was using, maybe those are different today. So I mean, I have my own ideas of different base rates and probabilities.

And we don't have to go into that. But I think it's, I think it's important to keep in mind, if you're a numbers guy, make sure you also understand that the numbers can change. And you don't have to like, look very hard to figure that out. Even Buffett, when 2020 was happening, and there were all these things changing, he used the word probabilities over and over again. And you have to imagine he was assessing how this world had changed so fast in the year, and trying to apply that. And he did wait a little while until he finally started buying a lot of stocks again. So you know, if the very best took a while to adjust to the new surroundings, then I think we all can do.

Dave

18:25

Right? Yeah, I would agree with that. So I guess a couple of things kind of sprang to mind. So maybe we could take just to kind of a generic company and kind of look at it and see how we would want to maybe assign probabilities to that. Maybe we could pick something like, I don't know. I got one. Okay.

Andrew

18:44

I love it. Because it's real world application with one. I'm cool with that. Yeah. And you know, we've gotten a lot of questions about this industry, too. So I think people will find that useful. So if you think about the auto

industry, that's been something I've been looking at real closely lately, not any of the big automakers, but I've been looking at one other big suppliers, not going to tell you what the company is because we may or may not be buying it, right. But if you look at the auto industry, and it's been interesting, because it's pretty cyclical.

And I've heard that said that people say, that are like one of the early indicators of cyclicality. So if the economy is slowing down, usually you'll see people buying cars really dry up. And that's one of the first signals usually, well, we have a scenario right now where that may or may not be the case, because you had shortages with semiconductors. And so a lot of people who wanted cars weren't able to get cars and then use cars spiked up through the roof. And now the other makers are saying that they're having a lot higher demand. On the backdrop where everybody else is saying, like the economy is crap, and the inflation is high. So you don't really know who or what Believe. And so that's why I think making probabilities can maybe be a really useful tool. Because nobody knows.

And so maybe there's a lot of mispricing there, the more uncertainty generally, the more chance you have at finding the underpriced opportunity. So if you look at since 2018, the auto industry really slowed down with sales, for whatever reason, there is a lot less demand for cars and just as a whole, so then, when you are trying to figure out like this other supplier, its growth in the future will depend on the other industry to give you a back quick background on them. They sell to no matter what car you are, like they sell to everybody, they're like the player in their market. So if you have a luxury trim car, you're going to have the supplier in your car. So they don't care if GM beats Ford, like, it's the industry wins, they win. So you have several scenarios for the next five to 10 years, you could see growth in the auto industry stay the same that it's been the last three, four years, where it's been like, nothing like very flat, and demand has been very muted. So that's one scenario.

The second scenario is it could be something maybe closer to economic, like economic good times where, like in the past when the economy was better than they had those kind of growth rates. Or it could be a new, a brand new paradigm. And I'm just kind of showing the different spectrum of this, it could be a brand new paradigm where Oh, my goodness, like inflation has been so high, which by the way means the economy is hot, which is something I think people don't necessarily understand, quite understand that they don't connect. Yeah, like economy is hot. That's good. Like for a lot of different industries, that means things are going really well.

So if we have like a high CPI, high inflation, high interest rate kind of thing. I mean, do we have a new paradigm where even the last 10 year period was not a good comparison? Because we have a different

economy? And could it even be a higher growth rate than you saw in the last 10 years? So I don't know the answer to that. But if you assign probabilities to each of those possibilities, then maybe you have a better chance of coming up with, let's say, a growth rate for the industry, then, that I think would probably be more accurate than just saying, Oh, they did this last year. So I'm gonna say they're going to do this this year. Right?

Dave

22:39

That makes sense. Yeah, that makes a lot of sense. You can use those probabilities to help you forecast. What could be potential outcomes for the car industry, for example. So whether you're buying some of the big car dealers, or whether you're buying some of the suppliers, or other parts of the food chain, if you will, of the auto industry, all those things are interconnected. And if you use the probabilities to help you determine this is how I think the overall industry is going to perform based on these potential outcomes, then that can help you assign a probability.

So if you say, just for example, that I think there's a 10% chance that the auto industry is going to rebound and double what they're doing, you know, prior to 2018, for example, or you could assign a 50% chance that I think everything's gonna stay the same and be flat, and I could assign maybe another 40%, that things are going to improve, but maybe not double, maybe it's only 10% growth kind of thing. Is that kind of the the math of how you would kind of figure that out a little bit.

Andrew

23:47

That's exactly it. And then if you add up all those probabilities, you get to a certain growth rate, for example, right? So instead of saying, I think the economy's gonna boom, they're gonna get 10% growth, maybe now it's eight or seven or six, because of the other possibilities that you took into mind. And that's something that medicine has talked about, and there's expectations investing book, which you read recently.

Dave

24:13

Yeah, exactly. So he, he talked about that as well assigning different probabilities to growth rates for the revenues of different companies. And he was doing this exact process. One of the things that always troubled me was, how does he come up with those numbers? I still haven't quite figured that out yet. So that's that's to be determined. But now that we've talked about this, I have a better understanding maybe of

how he kind of goes about at least assigning the probabilities and kind of going back to the Bayesian idea to those are up for change.

It's not set in stone. So if we assign if I think that Microsoft, for example, is going to grow at 10%, and I assign a probability of 20% for that, that could change based on information I learned as I'm learning more about the company or the economy or things like that, so I can see how it could be very helpful. I wonder if it's like not even about what number you come up with. But just the exercise of trying to come up with that makes you think of all the possibilities. So they go back to the auto industry as an example, to kind of go through the, that framework of, well, where is the future going to be? Then it made me start asking the question, well, why has it been flat since 2018? And then that led me to see okay, all the other makers have been reducing their spending on advertising.

Andrew

25:31

So that gives you a better picture of like, why things maybe are the way they are? Right? So maybe you don't even get to that kind of analysis. Unless you go through the process of let me really think of all the possibilities. And that helps you just learn more about what's been going on?

Dave

25:50

Yeah, yeah, I like that. Because I think it gives you more of a more of a bird's eye view, if you will, of the whole ecosystem, and all the different possibilities of things that you may not look at, when you're just focusing on let's say, you're studying Ford, for example, and you're so myopically focused on that particular company, that you don't go back to the 30,000 foot view, and see that what's going on at Ford is actually happening at GM, Toyota, and even Tesla. And so all those things can give you a better sense of okay, all right, this makes sense. Now, it's not just happening in Ford, it's also happening at GM as well, like,

Andrew

26:26

oh, okay, now I'm right where I am right with you, I wish I knew how people are coming up with their probabilities. I mean, the best thing I can think to do myself is just try to gather as much information as you can and make smart judgments about it and have somebody to bounce those ideas off and kind of like gut check them and see if they make sense or not. And I wonder if that's the best you can do.

Dave

26:50

With my limited knowledge, that's the best I can do at this time. So that's what I'm going with.

Andrew

26:55

It's interesting to see though, you know, with big data, and people have numbers for everything now, then, who knows, maybe in 10 years, some AI model will say, yes, you can predict with a 33% probability that we'll do

Dave

27:10

this. Exactly. Well, it's probably closer than that. But we'll see. All right. Well, with that everyone, we will go ahead and wrap up our conversation for today. I wanted to thank Andrew for taking the time to do some research on this very fascinating subject and something that I've been interested in for actually quite some time, and I've never been able to quite wrap my head around it. And so I think this helps me a lot. So I appreciate him doing all that work, to help educate us and me about probabilities and how they can help everybody. If you guys are interested in learning more about investing or have any questions about anything that we talked about today, check out our website, e investing for beginners.com. huge, big, great search bar at the top of the page.

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