TRANSCRIPT

What you need to know about volatility

Presenters: James Savage and Jonathan Lord

James Savage: And thank you, Trey, for that wonderful introduction. And yes, good morning, or good afternoon, of course, depending on where you are located. For those of you that don't know, my name is James Savage. I'm accompanied by my friend and colleague Jonathan Lord, and we are from Fidelity's trading strategy desk, and if you're not too familiar with our team, we are ten traders that are here to assist clients like yourself with your trading strategy. We host a number of sessions each day, covering topics related to volatility, options, technical analysis, Active Trader Pro, Fidelity.com tool demonstrations, and both morning and after-market briefings, which seem to be some of our most popular types of sessions lately. And just like today, we're live, we turn our cameras on, so you can see us, interact with us, and we have the ability, especially in our more kind of smaller coaching sessions to stop and answer questions along the way. So if this type of format seems of interest to you, definitely want to encourage you to sign up. We run them, as mentioned, Monday through Friday, about four to six on average sessions per day, so there's a good chance you'll be able to at least maybe find one of those that you're interested in joining. Now as far as today, just to give maybe a little bit of a backstory to the material that we're going to be covering, this is

part of a new options trading classroom that we have created here. We call it our intermediate options trading webinar series. For those of you that have maybe attended one of our options classes in the past, where we had it more geared towards a beginner, this is meant to be the next step. So a natural progression from learning just the terminology with options, some of the more, I guess we'll say kind of simpler strategies, such as buying calls, buying puts, et cetera. And now we're taking you into a further look at options pricing. This session is week number two, "What you need to know about volatility," then we go into some of the multi-leg strategies and finally generating some of those options trading ideas. Now we're going to, we plan on opening this up in next month in June. So if you're interested, maybe you're at that beginner level, thinking about going to the, what could be considered the intermediate level. We'd love to have you join the classroom. But going into at least today's topic and the agenda we have for today, of course, not only are we going to talk about what you need to know about volatility, we have to make sure we at least explain what is volatility, and go over some of the, kind of the terms that we can separate and define volatility to a little bit more of a greater depth. We're also going to talk about how volatility, and how it relates to options pricing. This is geared towards very much a options trader and how you'd be able to use volatility within your options trade and your options plan. And then finally, we're going to spend

some time going over some volatility date and how it could help you make your decision, and spending a little bit of time going over some of the Fidelity resources that we have, both on Fidelity.com and within Active Trader Pro. Now, we plan to spend the majority of time within the slides today, but just no, we're going to be using screenshots from the tools that we have here at Fidelity. So if you do decide to look at them in a later point in time, should look familiar, because we're doing those direct screenshots. But now that I've hopefully maybe set the stage for what we're going to be covering today, Jon. Let me give you the opportunity to introduce yourself and take the floor, and explain to us, well what is exactly, volatility.

Jonathan Lord: Appreciate that introduction. Great to be here, great to see everyone, again, top of mind right now, a lot of volatility happening in the marketplace. If you're an options trader, you definitely want to have a grasp of this, what is volatility, how does it affect options pricing, how do we measure volatility, right? Again, we may be able to feel volatility, I can obviously see if the market is moving, in terms of percentage moves over days, certain things over time, you may notice it or sort of feel that, certainly if you're losing sleep over one of your positions, again, you know what volatility is, but how would we measure that, look at it from a relative basis, backwards, forwards-looking, and that's what we're going to talk about today, some things like historical

volatility, implied volatility looking forward. There are other measures for volatility, we can use other tools on the chart itself to understand volatility with regards to maybe an average true range. Maybe we're looking at Bollinger bands, all of these factors. But what we were going to be talking about and focusing on today will be utilizing these two measurements, and one of them coming from specifically the options market, looking forward on expectations of volatility. But we also want to have something to compare that to, and that's going to go backwards, looking at the historical volatility. So we're going to start it here, again what is volatility, we should probably lay that foundation, right? And volatility certainly something we may have seen in other areas, right? Think about your, the weather, right, I was just taking to James earlier, I'm down here in Texas. It's 63 today, right now. We have, and on Sunday, it's going to be 99 degrees, right? The volatility right, I don't know what to expect. You got this sort of expansions between these ranges. And so that's really what volatility is, it's sort of setting these bounds though as to what kind of expectation you can have. Again, I was looking earlier, the record low, 39 degrees, right? So a year prior, you might have had some kind of range of expectations, right, that, and then the probabilities of what it might be in between. And that's what we're looking for, measurement of volatility. So we have these relative volatile measures, right, so uncertainty -- again, not uncertainty, we're going to focus on this multiple times, it cuts both ways.

There is no bias for direction with regards to volatility. This does not say, anytime we quote to you some kind of percentage, I want to make sure that that it's hammered home, right? It is not specifically to a directional bias here. But we do need to, you know, focus on a volatility in terms of lower versus higher comparison between, you know again, those risk versus reward here. So we can obviously see, hey look, a low-volatility position is going to have less movement, well that would be considered less risk, right? And again, less risk, oftentimes we could focus on maybe less reward, possibility. Again, anything can happen in the marketplace. We're going to talk to you about a lot of percentages and statistics, and putting those numbers on your side. Just know, again, all of this is going to be expectations. Expectations can be very wrong along the way. So high volatility, again, just the opposite of that, right? We're expecting more movement, more wider ranges in terms of those bounds of expectation. I always use, I have two dogs. One is older, who walks straight, every time we go on our walks, easy, no problem, goes and walks in a straight line. And I've got this new puppy who's about seven months old and goes the other way, right? When we're walking, every squirrel, every sound along the way, there's movement, right? So we can measure these things and kind of understand, hey look, the character of a stock might be more or less volatile. We could also use that same analogy over into the marketplace, right. We may see more volatile biotech stocks, right, that have one drug, they're

waiting on an FDA approval. You may see something that sells towels, maybe less, right, might be less risky, less price movement. And again, over time, we may see periods of volatility, higher or lower, within those things, but just out of pure comparison sake, you can understand where movement may come in with regards to different sectors and industries. So we also have the comparison of course to itself, right, so we're comparing two securities, their volatility. What about also, it's to itself? Is this a lower volatility than it's been in the past, right? Maybe we've seen huge moves in the stock that have now quieted down. Do we expect that to come back, do we expect that prior volatility to resume? So we can compare it again, between multiple different things, but we need to have that comparison, and we need to have a figure that we can utilize to do that, and that's going to be historical volatility and implied volatility. So let's get started here with some of these other, just again, ideas that go into this, right? So we will utilize expected moves with regards to a percentage movement volatility. So again, if they have 10% volatility on a $50 stock, then the one-year expected price move is plus or minus five dollars, back to that no bias for direction, right? We have our ranges where we might expect price to be. We're going to do, talk a lot about normalizing these things together as well. Everything's going to be kind of focused on an annualized basis. We know that you can trade an option for a week, right? You can trade an option for years, so you can get leap options, [00:09:00]

various time frames in between, right? We know that, but we have to normalize that so that we have a way to compare these across the board. So, when we show these volatility measures, we're going to normalize them to those year, or annualized basis, and the other thing we'll do is we'll focus on some standard deviation calculations. So again, these are your two type, historical and implied volatility. We'll start moving through in how maybe we might compare these two, maybe those tools along the way as well, be handing that back to James here shortly to talk about those, but we'll start with historical volatility, what has actually happened, right? We've seen it, we've experienced it. We know based off of price movement of the stock itself, again, what kind of volatility we might have. And again, that goes back to that comparison. We can utilize on our option statistics and see how historically volatile has this stock been on a certain time frame. We use, these are for your standard numbers, right, so a 10-day, 20-day, 30-day, 60 days. And keep in mind, these are days of trading, actual trading days. So five days in the week you'll be trading. So we got two weeks of data here, gives us a, again, just purely, here's what has actually happened in the marketplace. We'll get into implied volatility and how that's actually just calendar-based, so make sure we're all comparing our apples to apples, I should say. So real quick, again, this is a realized statistical actual number, we know that, we can look at it, and that'll also help us with regards to the ranges, right, how expensive to

historical volatility are we looking at, or how cheap is it, with regards to those things. And then again we can make our decisions with regards to how we want to do then, trade the option. Do we want to buy that option for, again, buy a call option, do want to sell the put option? What decisions do we need to make if we're bullish on the stock, risk-reward here? So these will help us along the way, we'll get into some of that. Again, we have some of these other measures of volatility. This is the one that we're going to utilize for comparison's sake. Again, [00:11:00] the one standard deviation is that other normalization process. We'll get into what that means, but we're doing -- utilizing one standard deviation and at annualized rate, so that when we compare these two things, we are at least, we are on the same page, right, we're not having to do any calculation, we don't have to get our calculator out. So real quick, again, just to hammer this home, right, we've kind of talked about this a couple of times, but so you take that volatility in the marketplace. So again, what is the up-and-down from a day's perspective, it's used to put through a calculation to get that standard deviation, and we come up with, we've got a 30.24% annualized movement based off of the last 20 days of trading, so we have a 68% likelihood, we'll get into that two-thirds when we get into the standard deviation numbers. But the stock will be within that price range, again, looking forward, 30%. And we can adjust that, we'll have, we'll show you like there is a profit-loss calculator that could adjust that timeframe

based off of your option. But these are, again, just wanted to get into this real quick, because historical volatility is going to be a great way to compare to our next thing, which is this implied volatility. James is going to talk to us a little bit about what that is, how that's calculated, and why we might think that's important.

James Savage: That's right, so as Jon mentioned, we can sometimes maybe even think about volatility in two different types. Right, we just went over historical volatility, but I think when most traders are talking about volatility, and if they don't clarify whether it's historical or implied, they're referring to implied volatility, or IV for short. And what this does is this is what measures the market's expectation of volatility in that security going forward into the future. And this is based on those premiums, on option contracts for that security. So this is based on the supply and demand. We'll talk a little bit later about why that is the case. But just know that the implied volatility, now this is what the market is using to measure that future expectation of volatility, as opposed to historic, which was just looking at the realized, the actual volatility that occurred. Now just like historical volatility, IV is an annualized percentage as well, it's a one standard deviation annualized percentage. So when we look at the, here we've got our number 62.35 circled, this is the annualized expected movement based on a hypothetical 30-day option contract. And I'd like to

point out now, this screenshot is directly taken from our options statistics page, and this you can find within Active Trader Pro, and the same information on fidelity.com. When you see these numbers, this is meant to be kind of a more general understanding of the volatility on the underlying. Now each option contract has its own implied volatility number. Right, so each one, whether you're looking at at-the-money, out-of-the-money, in-the-money calls, puts, they all have their own implied volatility number based on the price. And you can even see an implied volatility based on the ask price, based on the bid price, and even based on a middle price, which is oftentimes what a lot of traders are going to use, the implied volatility based on the mid price, so between the bid and the ask. But when you're looking at something like this, IV30, IV60, IV90, this can be very helpful just to give you a general understanding of that particular underlying, whether it's an index, an ETF, or a stock, because this is based on a -- you could say, it's a theoretical volatility, because it's based on a hypothetical 30-day option contract, that's roughly going to be equivalent to at the money. So, if you were looking at this number, and you were to also compare it to an option contract, that's 30 days out, roughly at the money, what would you expect to see? Something very similar, an IV, not necessarily exact, but very, very similar. And when you're looking at the other dates, IV60, IV90, well, it's as simple as just saying oh, now we're looking at a hypothetical 60-day option contract, or a 90-day option

contract. And that's all, and it's just giving you an idea of whether you were looking to, again trade your own underlying, if you can see any difference in implied volatility as we go further and further out, and we can see in this case in our example here, as we go out from 30 to 60 days, the implied volatility ticks up a little bit, and then it kind of ticks back down, just ever so slightly when we add additional 30 days, almost no change we can say between 60 and 90. Now, these implied volatility figures, because they're based on the options prices and the option contracts, the premium, just as premiums change, right, we can expect implied volatility to change. So this is a dynamic number, and this will change based on the supply and demand for those option contracts. And again, we'll be talking about this later, so don't think that when you see an IV number, that's always going to remain constant. This is an ever-changing number based on the factors that are kind of going into that options price. Now just to maybe quickly compare them a little bit, before we start diving into implied volatility, which is really what we're going to be kind of doing going forward, but just to, kind of a quick maybe recap once more just between these two. And if we were to compare again between IV and HV, right, historical volatility uses actual pricing data, which is why it's looking at trading days. Implied volatility is using calendar days. And hopefully this might make sense if we think, well if we're measuring actual volatility, we can only measure it on days when the underlying was trading, so

Monday through Friday. And if we think about, well future volatility, we know that things can happen on Saturday and Sunday, good or bad news could occur that could affect where the stock, where the underlying or ETF or index starts trading at, that following say, Monday morning. That's why when we are looking at implied volatility, it is calendar days. I sometimes like to think about that as a way to kind of remind myself, because even myself, I sometimes get them mixed up, and I just have to, just more think it through, and that will help you understand well why one is trading days, and why one is the calendar days, and really, one is measuring what occurred, the actual realized volatility, and then the implied volatility is going to be measuring the expected movement going forward. So as you can imagine, right, as an options trader, its' helpful to know what occurred, but the expectation is what's going to matter on your future trade because that is going to be part of the price of the option, and remember, price is what pays. When our options are being traded, what's typically our goal is to make money, whether that's income, whether that is using the options for leverage. Even if you're using it to try to protect yourself from an adverse movement, but it is ultimately that price of the option that's going to matter, and that is where implied volatility is going to come in. So Jon, I think now that hopefully we've at least maybe set some kind of understanding of implied volatility and the difference between HV and

IV, and now I think it'd be a good time to really kind of connect how implied volatility kind of affects options pricing.

Jonathan Lord: Absolutely, this is extremely important to understand, because it is one of the central factors to options pricing. We know time is very important, again, we know that there's, where the stock is trading will tell us what is the intrinsic value, or if it's out of the money, it will have no intrinsic value, right? But there's this other factor which is the time value of extrinsic value, and this is what IV sort of does, it is the output of that calculation, that option pricing model that says, look we know how much time is left, that's really easy, I can get a calendar, I can tell you exactly how much time we have until expiration. But there's this implied volatility, this other factor that has to do with supply and demand, and in that calculation to understand how expensive options pricing is. We'll get into a little bit more of that here shortly. But do want to start out with that concept of standard deviations, again, because that's central to that, these two calculations, it's essential understanding the risk versus reward aspect of this, as we kind of mentioned earlier, you get this, sort of all these numbers are kind of getting thrown out. You say, oh, well this is one standard deviation move, it's what this is calculating, showing you these numbers, but what does that even mean, and how is that important to your option trading, and maybe, does that mean I shouldn't trade it at all, right?

And we're going to show you, hey, there's obviously some uncertainty with these market places, right, with regards to how implied volatility is, plays into options pricing, where there might be opportunity on one side of the other, selling volatility, buying volatility, right, those things, if we can get a feel for those things, that'll help you along that way. And we've all been -- if you've traded options long enough, you'll have felt this, you've opened up a trade, and suddenly without the stock price moving, you've noticed your option price is moving quite a bit, right? And some of that - all of that is going to come back to, well, you might be seeing, obviously time erode, but you're probably seeing some adjustments with regards to the volatility, dropping, increasing, and changing the price of those options. So let's get into, real quick, what is a standard deviation? Again, we don't want to belabor this as a statistics 101 class, we're not going to get too far into it, we're going to kind of hit some of the high notes with regards to some of these calculations, just so you understand what these mean when we say, hey, what is a standard deviation, right? So again, we're showing this as a percentage move of the stock price, with a one standard deviation move. Over the next year, what we're focusing on, again, what is one standard deviation move, we like to say the livelihood of that stock. I always think of it too as sort of that confidence level, how confident am I that it's going to be within this range? Well 68%, if we're rounding, it's two-thirds of the time, right? And again, that's better than a coin

flip, certainly, along the way. But that is what we're trying to focus on, how confident are we? And two thirds of the time, hey, you know what, if you have an ABC choice on a test, you're going to get some of those right, right? Again, that's why we do the trade, that's why we, again understand the statistics, but we do know that, look surprises happen all the time, and that's what I want you to get out of this, is that if something is having a movement, like a one standard deviation, a two or at three, or in some cases if you go back historically, these black swan events that are supposed to happen once every billion years, right, that keep happening every five, ten years, again, because it's statistically significant. So this has a one standard deviation move, is pretty significant. It's a move that is outside of what our expected range, or that bound is. But it happens a lot. It happens, if you ever somebody that trades using Bollinger bands, and that is a two standard deviation calculation, right? So how much deviation from that mean you have, you'll know that this happens a lot, it happens quite a bit where price just gets outside of those ranges, right? And that's something we have 95% likelihood, and you would think, well 95% confidence, 95 times out of a hundred, it would stay within this range, and you may see that, right, and three standard deviation, moves even further, and then you keep going up in these deviations to where you get to where it's 99.8, keep going on the decimal, right? But these are going to be the main ones you will focus on, that 68%, remember, when you say one

standard deviation, just think about that in context of confidence level, right? 68% of the time, that's pretty good, but that leaves a lot of uncertainty with regards to where a price could move outside of those ranges. And if it does get there, we would think of this as statistically significant to us. And that's why we pay attention when we have this kind of moves, or why we might use that to our advantage over the long run, and start maybe selecting price based off of those calculations, right, or strike price to that degree. So here's a visualization of that. We've heard, you may have heard the bell curve, obviously the average, is where you would start out with the middle point. Again, this may also just be current price here in this instance, right? So you can see sort of the ranges, how much confidence do we have that, again, and price will be between these barriers. And so a stock trading at 100, so right here in the middle, with a 20% IV, it's just a great way to kind of focus on this, saying hey, 68% of the time, we would expect it to be between these two levels, right? So 80 and 120. Again, not with bias towards direction, we're just giving you that range. This is me on the golf course, driving, or whatever, we'll say, if I hit 68 balls, they're probably -- or 100 balls, 68 of them would probably land within this range. Every once in a while, again, that slice comes in, or that big draw, right, the other direction. So again, things can happen, statistical significance. Again, I'm not a great golfer, so this is a great example, of how wide my net would be versus s pro maybe who's a little less volatile, right, has

a tighter range with regards to this sort of shape of their curve. And this expands and contracts over time as well. And so if you feel like it's too expansive, you feel like the width of this is too far, again, you may see that as an opportunity to take or sell into that volatility. If you think it's too tight in terms of the price range that it's going to go through, you think, hey volume is being underpriced here, volatility is being underpriced here, and again, that might change your decision in terms of what you actually trade. So again, not going to belabor this too far, just, we kind of hit a few of these examples, right, where we say, hey, here's the IV, over the one year, course of one year, here would be our expected move within that price range. So we'll keep moving along here. Again, we've got some great examples of this to dive into some more things. And then, again, I said that was statistics 101. James is going to tell us a little statistics or 202 maybe, and just a little bit more about the expected move calculation before we keep moving on here.

James Savage: And I think some of the regulars that attend our sessions might feel that I'm a little bit hypocritical right now, because I usually tell folks, you don't need to worry about the math too much when it comes to technical analysis, or even options trading. Now it can be helpful just understanding the math and where it comes from, but I usually try to tell folks, don't worry too much about the calculations, and now what do I do, I have a fairly complex

calculation with square roots in front of us here. So still though, you don't need to worry too much about these calculations. I will spend some time maybe going over a little bit about what is here. So you could use this going forward, and I think this is kind of a neat slide for many folks, because we get this question all the time, and that is that when you're looking at this volatility number, this IV number that we see, now we know it's annualized, but you're not necessarily trading a contract that's one year out, right? You could be picking a contract for a week. You could be just looking at that implied volatility and think to yourself, well what does that mean for one day? Is the stock volatile, is it high, is it low? What can this mean for me, and how can I really just gain more information from this IV number, and what traders can do is that they can deannualize volatility. You can annualize it, and you can deannualize it. All we need to do is multiply or divide by the square root of time here. And I'll talk a little bit about that shortly. So, what we have an example of, is if you are trading, you're looking at a stock with an IV of 20. How could this help us with understanding a daily expected movement? And this is one of my favorite ways to deannualize volatility. And we can do it a few different ways. We can deannualize it to find a daily expected move, or maybe an expected move until the expiration of a particular option contract. Now when we were going to, I guess we could say, kind of deannualize it to come up with a daily expected movement, we'll be taking the example down below

here. So first you're going to be looking for your stock price. Very easy to find, right? It's going to go to a chart, go to a quote, and you've got your stock price. Next, we'll take a look at the implied volatility, again, very easy, because we can find that we've got our tools that will allow us to find the implied volatility. So using an example and keeping numbers nice and simple, if we have our stock price at 100, our implied volatility at 20%, well our days to expiration, our square root of the days to expiration, if we're looking to do a daily expected move, is just going to be one. We're only looking for one day in this case. And then we're going to need to divide that by the square root of trading days within a year. And it can be a little bit tricky, and you know, the reason why we incorporate some of these square roots is that because volatility is proportional to the square root of time, and not time directly. Now, you don't necessarily need to know that. What matters, I think for most traders, is this simple rule that they will, and you might have heard this referred to as the, some respects as the rule of 16, where we can use this number of 16 which is the end result of the square root of trading days in a year. And this is because within a year, there's roughly about 250 days, you could even be a little more precise there. And if we square root that number, it comes out to a figure of about 15.8. Now it's a little tough working with the decimals in your calculation. So what we do is we can round that up to 16, and rounding it doesn't really result in a big enough error to make a meaningful difference to

traders. We're looking to get, you know, roughly the number of the percent movement of the expected movement. So using this calculation that we have here [00:30:00] with a $100 stock, 20 IV, we're multiplying that by one. So think of you doing this on your own. You're just taking whatever the stock price is, multiply that by the implied volatility, and then divide it by 16. And that is going to give you the expected movement. So in this case, what we're going to come out with is 1.25, or $1.25. And this will let you know that if you're maybe following this particular stock, and it moves up a dollar, would you say that that is greater or less than what the options market is pricing in? And we could say, well, it's less. You know, a movement that's going to be for this $100 stock within the range of 98.75 and 101.25 is to be expected. This is what the market participants, the options market participants are kind of pricing in. So if we saw a movement of say $5, we could say, well this, probably catching some of these option participants off guard because now we're moving greater than what the, in this case, the daily expected move is, based on what we originally started with, which is that annualized implied volatility percentage. So again, to maybe make this a little bit easier, you know, for folks kind of going forward, is that we can use just this number of 16 to help us with figuring out that daily expected, and what a lot of traders will do, even myself what I'll do, is if we look at that traders tip, going with that calculation of, we were working with a 16 %, we can say, kind of annualized

volatility, 0.16, that results in about a 1% daily expected movement. So what some traders will do, is say if it's at 16, well they could expect the 1% movement. If it's at 32, what type of movement would you expect? Well, a 2% movement. And I guess you could keep going with that math here. So they'll use these numbers, these multiples to help them just get an understanding of where the position, where the stock, where the underlying is at that point of time. And this is something that I know can be a little bit tricky at first. I imagine if you're especially being introduced to this for the very first time, you'll probably want to research on this a little bit later, but this is something that could be a benefit for you in your trading. Now there's one more thing that I really wanted to kind of cover where it comes to, how we can kind of combine this nausea we have of implied volatility into options pricing. Now as Jon mentioned, kind of earlier here, implied volatility is an output of the kind of changing supply and demand, right? We saw if demand increases, IV will increase, if supply increases, IV will decrease, so it's an output of that options demand. However, implied volatility is an input into the options pricing model. So what we're looking at here on the left side is six checkmarks, right? So these are the six pricing components that bring us to an options theoretical price, you might have seen these before, the stock price, the strike price, the expiration date, the interest rate, dividends, and then finally implied volatility. So these six pricing components can put into an

options pricing model, and this could be -- maybe you've even heard of some of these, something like the Black Scholes model, or the binomial tree model. And we're not here to talk about the differences between the different pricing models, but just know that these six components will go into the option pricing model, and out will spit our options theoretical price. Now the good news is, here at Fidelity, both on Active Trader Pro and on Fidelity.com, we do have a calculator that uses an options pricing model where you can enter some of this information and you can spit out an options theoretical price. It's probably one of the most kind of important tools for an options trader to assist with making sure that based on their outlook, they're going to see the expected result for that trade, are they going to be profitable, or are they going to be at a loss? And this type of theoretical price is of course still going to be something that could be a little bit tricky to come up without a options pricing model. And I also want to focus on just looking at these six components here. And this, I think, can be a good reminder of why implied volatility, why we're doing an implied volatility webinar today, because it's certainly one of the most kind of complex parts of the pricing component. So the far more difficult component of the other, of the total six here. And we can think about the stock price, it's easy to find, right? You can, it's easy to know what the stock price is, we can look at a chart. We know our strike price because we have our option contract, we can look at our quote. Our expiration

date, well, we can find that easily, and we know how many days we can look at a calendar. Interest rates, we can find out that and I think many of you are, especially in today's environment, we're familiar with where the interest rate is. Dividends, something that again we can look easily through our stock or ETF research page. But implied volatility is kind of a tricky thing because it's not necessarily very easy to find out, and even have an understanding of, where's the IV levels in relation to where they have then. So Jon and I have been talking about historical volatility and implied volatility up until now, and it's helpful, but unless you have an understanding of maybe where it has been, that's what you're going to need kind of help make the outlook in the forecast of where it is going to go. So, you know, I think this might be a good spot to talk a little bit more about how we can use some of the volatility data that we have to make our trading decisions, because we know as an options trader, it is important to have an outlook, specifically on three major things, and that is, where's that underlying going to go, outlook on price. The timeframe that it's going to happen, so that's our outlook on time, but we also need to make sure we have an outlook on volatility, because volatility sometimes can make or break that trade. It could be the reason why maybe you don't make as much money as you thought you would make, or maybe you guessed the direction right, and I talked with some traders recently about this where they were right in the direction, they thought the stock would go up, and it did, but they still

lost money on their bullish trade because they failed to take into consideration implied volatility. So we can kind of see how we can use this data to ultimately help make our trading decisions.

Jonathan Lord: Absolutely, so we've gone through, what are these volatility measurements, how do we measure them, and what are the inputs that we do, and what kind of adjustments can we make, what does the standard deviation mean, what is the actual, again, what are some of the calculations to see it on different time frames. So how do we derive that volatility metric? What changes, what things go into it, in order to of course adjust the volatility of an option, right? We know price obviously is moving at the same time, time is moving forward, at least in my experience. But implied volatility, again, it's sort of again that X-factor, it is what is moving options price outside of that. So what sort of levels, or what is going on in the marketplace to change that? And probably some questions already about things like the .VIX, which is a measurement of the S&P 500 using its options in order to calculate an expected volatility, or expectations in the marketplace. And that's why this is a little bit more focused on maybe the concept of an index versus a stock. You can certainly see that implied volatility doesn't always have to be a measurement of fear, it can certainly rise, a lot of times, into you know, big moves to the upside as well. But most of the time with the marketplace in

rising VIX levels, or rising IV levels, are going to be based off of that concept of fear or of expectations, or of price starting to fall where most of the environment is net long, because of the way that we're investing the marketplace, right? We've got 401ks, all of these funds are net long those positions. So when we start to see uncertainty in the air, often want to see about protection, that, or you might see speculation that it's going to drop. We've all, if you haven't heard of this sort of terminology where, you know, stocks or markets tend to, kind of could take the staircase up, right, little steps, along the way, and then they take the elevator or the elevator shaft in some cases, all the down back, right, or they may be seeing that sort of solitude action in the marketplace, up a little bit, down, but we just don't see straight up markets, right? We don't see oftentimes, and very rarely do we see movements where it's just up, up, up, up, right? You're going to have, along the way, volatility. And that's kind of the price you pay to invest in the marketplace, right? You have to either make decisions and decide, well do I want to be involved in that volatility, and take some of that risk? Of course, risk/reward, risk/loss, or not? And so, again, that nervousness, again, from this perspective, again, we're looking at it, an index maybe perspective of, hey, owners get nervous, what do they do? Well they go out and they buy options, right? So buying, we think about that supply and demand, right, when we're going out, we're buying, we're expanding, we're expanding those implied

volatility levels. And that doesn't matter if it's calls or puts, right? That, buying of options, that speculations, that purchases, just purchasing of options, what it's doing is, it's expanding the implied volatility levels. We might see the opposite then on maybe a, just a slowly rising market. Again, you might see this, and you might see people are selling options for income. It's a little bit quieter, they feel a little safer taking in some of that income, right, so they will see, hey, there's selling pressure, it's lowering that IV. And we may find that these things interact together, right? We find times where markets get really nervous, stock's dropping, what happens? Well, starts to level off and suddenly everybody's starting to sell because hey, we've seen a key level hold, right, some support or resistance. Again, those level will oftentimes create the sort of back-and-forth between these two. So we track that, we measure that. We measure that through the implied volatility of either your options or averaged out on your stock, or we can use again, we can use like the VIX as a way to sort of get that feeling for that levels, and as James said, you start doing the division, you can kind of get, hey, what are the expectations currently with a percent move. I think back in 2017, we had that year where it was like, we basically didn't have any 1% move days, right? It was just incredibly quiet, the VIX was getting down to the eight, nine levels, right, along that timeframe, whereas now, again, this volatility we're seeing now, we're seeing 30, and so just doing that calculation, you start to get that feeling for, okay, what is the

expectation of volatility in the marketplace? And do I expect that to quiet down, or do I expect that to expand even further? Again, supply and demand is going to show us where those expectations currently are with the marketplace. Are they buying options, are they selling options? Are they taking in income, are they speculating, or buying protection in order to, again, get some of that here. So, again, it's sort of that same concept. You see the storm on the horizon. What's happening? Well people are buying those umbrellas, right, they're coming. The storm starts to move backwards, hey what are they doing, well, sell the umbrella back, right? So again, these concepts of fear, of expectations of the marketplace, we can measure that. And remember, this is future expectations. What happened in the past is already past, it's prologue. We are now moving forward, we're starting to look at, hey, what is the expectation of the marketplace going forward, and you know, a lot of times, price will start to affect that. We'll get into some other things here real quick, the implied, again, impact of that supply and demand. Here's another sort of example, I think it's pretty funny, where, the expectations, again, sunglasses and snow cones. What do you expect, a few more expensive, again, that demand, right, Alaska and Florida. A lot of people will, you can also think of it in that perspective of, when you start to see implied volatility rising, again, maybe you see, it's the same concept of, again, maybe that sunglass store, you start, and in Alaska, you start to see a line out

front, right, all of sudden, right? What's going on there, you start to pay more attention, you start to think, do I need sunglasses now? So these sort of, these lines, you start to focus on these things, and they can be sort of self-fulfilling, as you see implied volatility rise or lower. Again, it's all about those expectations of the marketplace. We need to keep an eye on it, cause that'll tell us a lot about positioning and expectations going forward. No guarantees though. Again, at the end of the day, each trade, each day, and each sort of timeframe, again, is unique to itself. We may find that, again, it's that black swan event, that seven standard deviation move, or maybe it's that other one that stays within those ranges that the statistics calculated. So again, high probabilities, more demand, we end up creating higher premiums, higher premiums expand and contract. The higher premiums, of course, will expand that implied volatility, expands that range, that bell curve we talked about earlier with my golf swing, right. Now I'm starting to slice a little bit more. It's starting to expand that range out, and so that's what increases the possibility, and increases those premiums. And then you can take advantage of that. That goes back to that question, do I want to be a buyer or seller of premium? Am I bullish or bearish? These all can go into that equation when you're making a decision on what to trade, how long we want to trade it for, and also which side of the market, buyer or seller, you want to be. Applying it to, of course this SPX options, SPX being index option to take advantage, again,

exposure to the large cap, right, so if you don't trade SPX here, again, disaster possibility looming, clouds on the horizon, coming in. Hey, I need to get that umbrella here, I need it now, I don't care what cost it is, I just got my hair fixed, the investor purchasing options, again, to protect that position, or they may be speculating on that downside move, right, they may just be saying, I think this thing's going down, right? We see it, we see that elevator shaft move, right, again, up the staircase, drop substantially, it happens quick, we all know it, we all feel it, it's part of the investor's mindset, right, and part of behavioral finance that says, drops in market, we want to try to protect that capital, we get fearful very quickly, we don't get fearful when things are slowly moving higher, right? So the demand of course increases when SPX falls, due to that continued downside concern, what we're kind of seeing right now, big price movements, right, we're seeing three and four percent at times, volatility, we're seeing days where it's substantially down turn into up days, right? A lot of stuff going on, a lot of options speculation here. And then of course, the less concern about downside risk, when you start to see prices continuing higher. So selling premium, again, to increase returns, means you get more supply, which means IV decreases. That's when you start to see that decrease in price. People are selling options, or selling premium, and that will adjust those prices. So again, keep in mind, as you see these things moving, if you buy an option, how does that react to implied volatility? If you are a seller of

premium, what do you want? Well you don't want to wire that there, right? You want it to contract. If you're buying premium, if you're buying a call or put option, you're okay with implied volatility expanding. That'll you're your cost of your option increase, even if you don't even get the price movement. So again, big impacts. We're going to show you how to, also calculate that. There is some figures here, or to also get a feel for price as it is relative to other levels. Going to kick it back to you James, because we have, just a real quick talk discussion on another way to sort of measure this. I know we're getting close to the end here. We've got a few things we wanted to hit, volatility skew though, is an important concept that I think people should be aware of.

James Savage: Yeah, so volatility skew is something that I will say is really kind of borderline an advanced topic related to volatility, but I would be remiss if I didn't at least bring up this topic, at least in this discussion today. And volatility skew, I know we've got some, quite a lot of information on the slides here, but I'll make sure to kind of keep more of a high level, because this is where things start to get fairly tricky. Now, volatility skew could be defined, kind of, we'll say separated, into two different types. There is vertical skew, and horizontal skew. Vertical skew, meaning skew among strikes. Think of on your options chain, up and down your strikes. The horizontal skew, think of that across your options chain, so you're going across expirations. So, things

like, implied volatility being a different level, we can even say at the same strike across different expirations. And I'll talk about the horizontal skew first. So imagine you were looking at an at-the-money strike price. And as you go further and further out, you see implied volatility increase, and maybe one week, or month, you see it jump up, and then the following month, you see it jump back down. Well oftentimes, there could be different implied volatilities, or significantly different implied volatilities, across different expirations due to possibly an earnings event that could be causing maybe an increase, or an increase of demand, right, so an increase in the implied volatility as a result of the increase in demand, and then maybe a decrease of demand in an options expiration shortly following the earnings, just to give a bit of an example there. So if anyone ever mentions horizontal skew, they're talking about implied volatility levels, that are going to be different across expirations. Now then there is vertical skew, which is oftentimes, folks are talking about skew even if they don't make the distinction between horizontal and vertical, they're typically referring to vertical skew. What could be skewed towards either calls or puts. Now what that means is that there can be certain, we could say expirations that might have much higher implied volatility that based on, well we can say other expirations. And this, I think is going to be really apparent when you might be looking at a, say a particular stock, or we can even use maybe the general market. Now ever since 1987, some of you might be

thinking about the market crash there, Black Monday, where there was a severe downward movement in the market, and it got folks thinking about that type of black swan event. So in the market, generally, sort of like the S&P, we would see what's called put skew. So in this type of vertical skew, there is skew towards the puts. So what that would mean is if we were looking at an options chain, and we went, say, maybe ten points out of the money on the puts, and ten points out of the money in the calls, we might expect to see higher implied volatility and higher prices on the put side than on the call side, and that's referred to as the put skew there. And to may contrast that, we saw a few stocks a little over a year ago that were showing some kinds of explosive moves on the upside. They were moving almost vertically, and some actually vertically on a chart. And if you had looked out the options chain, when stocks were moving in such a fashion, and you said, maybe you went, again, just an example, ten points out of the money on the calls, ten points out of the money on the put side, and you noticed that the prices on the call side were higher, and the IV was higher than the puts. So if the prices and the IVs higher on the call side, well that would be a reflection of call skew. And really, what this could help is, this could help you as a trader identify the different directions that the market is expecting the underlying to move, so where folks are possibly positioning themselves. Are they positioning themselves more, do they expect to be a little more volatile to the downside, or more volatile to the

upside? And that's really where this could be helpful for you. Now Jonathan, these maybe final five minutes, we can do kind of a bit of a lightning round at this point here, just to talk about some of the resources that we have. And really, I'm going to focus just on the, kind of the next two slides. Maybe I'll save the final slide for you. And this is just a quick screenshot of, and I'm talking about the bottom right, of our options statistics window within Active Trader Pro. So when I talked about understanding the kind of relative cheap and expensiveness of options, it helps to look at where they have been. So in this, if we're focusing just on the IV, we can see that blue range going from as low as 25.58 to as high was 48.45. And if we look where our figure is, at 39.34, we can again see this on the bottom right here, we know that we're relatively, based on what we're seeing here, kind of in the middle, right? We're not on the low side, what could be referred to as the cheap side. And we're not necessarily on the high side of 48 where we could say we're on the expensive side. We're somewhere in the middle. But one thing that this doesn't do, and this could be good just to get a quick, fast reading of relatively where we are over the one year, what this doesn't do, and what we have on kind of the next slide here is our IV index. And what this allows us to do, what our IV index allows us to do, is show us kind of where we are within that context, and all of the changes in implied volatility over a period of, say, 52 weeks. So, that will helps put us into context, and I know Jon, you're kind of a fan of taking a look

at that as well, and where we can sometimes expand on just that IV scale that we were just showing. And here we can see, fortunately we kept the, you know, the colors generally kind of the same here, even though they're somewhat I would say kind of flipped, where in this case, the implied volatility index mean is now in orange, and the blue is our historical volatility. And we can see that by just looking at the high of the 52 weeks and the low of the 52 weeks, it might give us some length basis that really need to be filled in. And this IV chart allows us to see at what times volatility low, relatively high. And by that, what we're doing, and what we can do is compare with this chart, this IV index chart, implied volatility from where it currently is to where it had been, and where it currently is to what the actual volatility had been at the time, so we can kind of compare and contrast when implied volatility changed, and when we saw an actual realized volatility change. So when it comes to formulating your outlook on where you think volatility can go, I would say, for someone who's new getting started, the IV index is almost necessary. You're going to need some frame of reference to know where implied volatility has been in order for you to help make your outlook on where it will be going. And then, you know, Jon, I know oftentimes in these sessions, we don't talk about the Greeks too often, but we've been speaking about volatility all day, and you know, talking about the tools, and there fortunately is a way that you

could have an idea of, well, should volatility start changing, how is it going to affect your option price? And fortunately, there is a tool to help you with that.

Jonathan Lord: Absolutely, so the final here is we will finish up with this concept of vega, which is considered one of the options Greeks, vega not a Greek letter, but again, vega gives us that measurement of the direct impact of the options price due to changes in implied volatility, and we can measure that, we have a way to do that. So vega will give us here, again, on our option chain, as you see, great example here, the, in this case, we have a stock trading at 166. You could see the pricing there, we've got sort of some longer-dated options. And as you could see, the vega is on this 0.6226. So what does that mean, why is that important? Well again, it gives us that ability to see, what will happen if we get a 1% move in that implied volatility? If those expectations, if there's trades happening where lots of buying of options, or again, down the other way, a decrease in implied volatility, or maybe there's some kind of event that's coming up, maybe we see, what will happen if there's some kind of movement, what about my theory if I, as James said earlier, have got a thesis on what I think is going to happen with stock price, maybe I have one as well on what I think is going to happen with the implied volatility. This would be a way to calculate that to get maybe some of that impact along the way. So this will show you again, real quick, the example predicting hey, we got an 8%

drop in the implied volatility. As we mentioned here, 0.6626, we'll again, just doing it because we know it's times 100 with contracts, so we'll get this $62.26, just with the price of the implied volatility move. I don't even need the stock to move, we have a measure for that called delta. But all I need to see is implied volatility change. And again, if that starts to happen, and we start to see that, again, there's also other factors happening, price is moving, time value is eroding. But at the end of the day, what is that price movement, and are we, again if we're b buyers or sellers, that will also impact, you know, again, that number, what do you we want to utilize for us or against us? So just calculating that into, hey, we got an 8% move, we see that this number, 0.6226, we multiply that by that 100, of course that's at $62, and again that 8% change in implied volatility gives us a 498.08 per contract change in value, just with that. Again, this is in a vacuum. So again, we're expecting the contracts price to move, we'll go from 18.15 as it is here, drop all the way 13.17. I'll take that, especially if there's, depending on which side of the market you're on, right, that was the case of the drop here, increase would go the other way. Hey, you get to add in another 500 bucks just because of changes in market expectations. That's why you need to know this, that's why you need to have this in your back pocket when you're trading to understand what price movement, what things that might happen there, in effect. So again, that is our finals thoughts.

END OF AUDIO FILE

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