SM96 | 11.19.2022
Financing the Energy Transition | Episode 3
Don Casturo, Founding Partner & CIO and Matt Schwab, Head of Investor Solutions at Quantix Commodities

This week, we welcome Don Casturo and Matt Schwab of Quantix Commodities into the SmarterMarkets™ studio. Don is Founding Partner & CIO and Matt is Head of Investor Solutions at Quantix. Don and Matt sit down with SmarterMarkets™ host David Greely to discuss the role of commodity futures indices in financing the energy transition.

Matt Schwab (00s):
No one really knows how this is going to play out. What we know is that the economy as a whole for everything from the electricity we are consuming right now to the cars that we drive to, ultimately the ships that move things around in and the planes that take us, are all going to move to a greener electrified source. And so when we talk to people, we say, well, look, I don't want to make a bet on whether Tesla or the Chevy Volt wins. I want to make a bet that the whole economy is moving this way.

Announcer (30s):
Welcome to SmarterMarkets, a weekly podcast featuring the icon and entrepreneurs of technology, commodities, and finance ranting on the inadequacies of our systems and riffing on ideas for how to solve them. Together we examine the questions, are we facing a crisis of information or a crisis of trust and will building smarter markets be the antidote?

David Greely (56s):
Welcome back to financing the energy Transition on SmarterMarkets. I am Dave Greely, Chief Economist at Abaxx Technologies. Our guests today are Don Casturo and Matt Schwab of Quantix Commodities, where Don is the Founding Partner and CIO and Matt is Head of Investor Solutions. We will be discussing the role of commodity futures indices and financing the energy transition. Hello Don and Matt. Welcome to SmarterMarkets. Really glad to have you both here. I can't think of two better guests to discuss the role of commodity futures and commodity future indices in financing the energy transition. For our listeners the three of us met working in commodities at Goldman, where Don ran the trading desk for the Goldman Sachs commodities index and Matt was creating systematic trading strategies. Before we dive into talking about the energy transition today though, I would like to back up and talk about the role of traditional commodity indices like the GSCI in putting investment capital to work in the commodities markets. I think many people understand that commodity futures indices benefit investors by providing a diversified exposure to commodity prices, which can for example help hedge inflation risk in a stock and bond portfolio, but many people don't see how that connects through to getting investment capital to companies and to projects. Don, I was hoping you could start us off today by connecting those dots for our listeners.

Don Casturo (02m 17s):
Sure, Dave and thanks for having me. I'll start that answer by going back to, our Goldman experience and working with sort of the forefathers of the GSCI and the inspiration for why that was created Goldman's commodity business primarily before the advent of the GSCI primarily was catering to end users in the commodity markets and end users in the commodity markets. Well, supply equals demand production rule off equals consumption with some inventory changes. That's true in the spot markets, but it's not true in the forward markets because what happens in forward markets is producers bear genuine price risk if the price goes down there. Worse off, most consumers of the commodities are the individuals of the world you know, the 7 billion people that use these things even the stuff they buy directly from the entities that buy directly from the commodity producers and create products for people, they largely can pass their prices on to the end users, which means the person who has the exposure to prices going up in commodities are the 7 billion people on the planet who really aren't organized enough to hedge forward and provide capital to, to markets unless there's some, some work done on their behalf to make it easier for that to happen.

Don Casturo (03m 31s):
And that really was what was behind the creation of the GSCI, was to put things together in a basket and create a swap that could be marketed to pension funds that represented these individuals around the world and give them a mechanism to provide needed capital

to the end user on the producing side to hedge their exposure on a go forward basis. I balancing out the supply and demand on a forward basis that you see happening in the spot market all the time, that would allow those producers to make investments and deploy capital to make required investments to make ensure forward supply of commodities and for production of commodities needed a sort of more transparency in terms of what the forward price was gonna look like and that really was what the GSCI was created for and to give that offsetting flow and a stable base of forward capital to incentivize forward production.

David Greely (04m 23s):
Yeah, I also think about, you know, you'd look at a lot of the oil producers and you know, they'd have a big concentrated risk that they needed to hedge, but all of us out here putting gasoline in our cars every day, uh, we're not hedging our gas prices in any, in any real extent. So it's a very lopsided market and, you know, in terms of the commodity investing, Don, you started Quantix in 2018 and you know, that was kind of a lost decade for commodities investing, but now your timing looks spot on and I was curious, why did you start quant and how are investors attitudes towards investing in commodity futures changing now?

Don Casturo (04m 58s):
Yeah, I, really had a belief back in 18 that we were due to get an uptick in interest in commodity markets and it wasn't just based on a gut feel sort of thing. If you look at commodity markets, historically, there's a genuine cyclicality to their performance that is largely based on the business cycle, what happened in the global financial crisis and what a tremendous shock that was to markets across all asset classes. There have been other anecdotes like that in history where when you get big shocks like that and you have to go through a global economic recovery, what has actually happened when that happens is you get an accumulation of resources and excess and output gaps growing, uh, that need to be burned off before you get to the next stage of the cycle. We had a very prolonged recovery period post to financial crisis, given the depth of that shock.

Don Casturo (05m 46s):
And in, during those recovery periods, asset classes like equities and bonds tend outperform because you get super accommodated central bank policy that tries to stimulate demand and you get the anticipatory assets performing given the depth of the financial crisis. That was a very prolonged recovery period historically in those recovery periods commodities don't perform well around 2018 I was starting to get the sense, hey, we're approaching the end of that recovery where things are starting to stick, output gaps are closing, inventories are getting drawn down. This is typically the type of environment that commodities will tend to start sickly outperforming other asset classes and I want to put myself in a position where, given my background and expertise, we we're well positioned to provide commodity investment products to investors who I think would be generally more interested as they become more relevant where we were in the economic cycle, what happened with the pandemic was obviously unexpected, but that just put that whole story into overdrive because you had even further lack of investment because commodity temporarily dipped, but structurally were still very strong but further discouraged even more investment and then when the demand actually recovered even stronger, we were in a market like we were seeing today where there is inadequate supply, uh, of a lot of these commodities because of the lack of investment that has occurred over the past decade.

David Greely (07m 03s):
Yeah and now we're seeing, you know, the highest inflation that we've seen since the 1970s. You've got energy in the headlines every day with prices high, the situation in Europe and I'm curious, have investors attitudes caught up to what's happening in markets, are people looking to commodity futures, indices investing again, and how?

Don Casturo (07m 24s):
Well a couple things I would say and to answer that, I think the fed using the word transitory and their initial response to inflation uptick, I think through many investors off and they were buying into that and sort of not really acknowledging that there was real genuine structural issues behind what was going on in commodity markets that were independent of pandemic recovery, de-globalization, decarbonization are two things I often talk about that were well entrenched before the pandemic and pandemic recovery, again, exacerbated maybe by them, but they were structurally in place that were causing commodity markets to rise and continue to be a force to be a tailwind to commodity markets independent of the pandemic but that were, but Central Banks using transitory, I think threw people off. It meant that they didn't wake up to the commodity story until there was already a substantial rally in place.

Don Casturo (08m 15s):
I think in 2021, some retail investors did get on board with the space you've seen some, the launch of some commodity ETFs and attracted some capital to space. I think the institutional guys though, and this isn't the consistent with how they generally behave, are still coming back in examining the space and wanting to reenter. I mean, when you refer to a last decade, that's such a long period of time and if you talk about how these institutions work with their investment committees and how they wanted to avoid capital, it takes them a little longer to put the wheels in motion, but we're starting to see some positive signs recently that that's going to happen and quite honestly, I think they're the right to consider it more, more in that those terms because this economic cycle that I'm talking about that provided the tailwind for commodities, the recovery stage where that was the last decade was indeed a decade, 10 years. So this next phase can last quite a bit longer than anything, you know, that would, that would necessitate the word transitory. So I think these institutions that are looking at space recognize this good, this period of commodity, relative commodity strength can last for quite some time and the fact that they're engaged now is, um, is in both encouraging, but I think, a sign that we will see more interest in the space.

David Greely (09m 29s):
Yeah and that decarbonization piece of the commodity story right now that you mentioned, Don, I think that's a great segue to turn to you, Matt, because you know, at Quantix you recently introduced a commodities futures index, not based on the traditional commodities like the GSCI, but more constructed for the energy transition commodities, those commodities that'll be more important as we're trying to decarbonize and move towards net zero. So I wanted to ask you, you know, why did you create this new index and how is it similar and different from a traditional commodities futures index, like say the GSCI?

Matt Schwab (10m 02s):
Well, thanks a lot Dave. So I think the first step is to kind of maybe look at the indices and traditional commodity indices reflect the commodities which are important today, right. That is the weights reflect the world's current production of commodities and what we wanted to do was to build an index to reflect the commodities that'll be important as we move from today's world to tomorrow's and on a more minor level, I think it's part of a broader investment trend in a lot of indices, which are into indices that have particular investment thesis. You could say ESG, you know, even simple things like equity value and things like that. So traditional commodity indices look at the universe of commodity futures and screen a bunch of them out based on things like liquidity or their currency denomination. They then weight them by some measure, but volume or production, which are pretty closely related, but not completely.

Matt Schwab (10m 56s):
The Bloomberg Index or what some of us still sometimes call Dow Jones AIG commodity index then applies some diversification constraints, right, so what we wanted to do is to start with the commodities that are the most important, as I said earlier, as we move from our current carbon based economy to an electrified green energy powered economy. So the first step of course is no one's really sure what technologies will win. There's a lot of research, but there's also a lot of assumptions and that has implications and so what's an implication you know, for example, plugin hybrids, let's say plugin hybrids win and green hydrogen wins. Well then you're going to have surges in PGM demand because plugin hybrids use auto catalysts and they're used in cracking to make green hydrogen. Now let's say that, you know, Tesla wins and hydrogen remains, you know, technologically in the future.

Matt Schwab (11m 49s):
Okay, so that's bad for PGMs. Now not only do you know, you can make assumptions, but what we wanted to do is take a humble approach and include commodities exposed to all the various potential technologies. The other crucial thing is that we wanted to include commodities that are not only the commodities that we'll be using in the end state, but commodities that we will be part of the transition from the current carbonized economy to a greener electrified decarbonized economy. So what does that mean, obviously you need to include base metals, right, you have got use all the aluminum to, to build those turbines and all the copper to wire those turbines into the grid, but that's gonna take time. So what's the world going to do for carbonization until then, well, one, as we've seen the administration, move a bit in this direction is probably increased use of ethanol.

Matt Schwab (12m 39s):
You know, so ethanol is part of that transition. A natural gas, obviously as we've seen in in the change in attitudes in Europe to including natural gas, is potentially something that can get green financing even with all that. However, if the world really wants to decarbonize, you need to increase the price of carbon to incentivize, say, aluminum producers to move to greener energy sources and so we include carbon credits and things like that. So you end up with a universe of commodities that are some in traditional indices,

copper, alley, that kind of thing, but some which aren't ethanol UK and European gas carbon credits and so, you know, in the end what we hope we did is we built an index that reflects the world at that we are moving to and the movement in that process and, you know, draws investor capital into these commodities for the reasons that Don talked about in terms of the growth of the GSCI, so that the markets and, and thus ultimately production can expand.

David Greely (13m 40s):
Yeah, and I want to get back to some of the, the approach to the commodities in the index, but I think an important point for a lot of folks is, you know, how do you think about investing in the energy transition through a commodity futures index versus say through the equities of companies, like are these complimentary approaches or how do you distinguish them in your own mind?

Matt Schwab (14m 01s):
Well, it's an interesting one. I think commodity equities, you can best think of that as defined by those two words, commodity and equities, right and the reason for that is, and it depends a lot on the specific commodity equity, but if you look at a lot of commodity producers, their returns are generally a mix of equity, market risk, and commodity specific risk, right, so, some of those are more driven by commodities, i e. their equity commodity beta is bigger than their equity beta and some are actually more driven by equities and they're very logical reasons for that associated with things like management risk, broader economic trends and so on and so forth, but, you know, leaving that aside, investors who are investing in new energy producers, whether those are, you know, private equity green fields, solar farms, or investing in, you know, the large greener energy producers can think about it as this kind of a commodity investment as a kind of a hedge, right?

Matt Schwab (15m 04s):
So what do I mean, so every company that produces or buys solar panels is short a whole bunch of commodities, copper, nickels, silver, silicon and so investing in the relevant commodities can be thought of as a way of mitigating some of those risks and data from the IEA has said that over the last couple of years, the increase in commodity prices has actually eliminated been greater than the increase in technological efficiency, for example for solar, but it's not just investors that kind of have this short commodities risk and again, we're all kind of used to maybe thinking about ourselves as being short gasoline or if you heat your house in the northeast short heating oil, but we don't necessarily think about it as being short copper, but you know, if the copper price goes up, copper price goes up to eight bucks, every additional wire costs more and the way that that wiring gets paid for is ultimately out of all of our electricity bills.

David Greely (16m 05s):
Right and I wanted to come back to the point, you know, when you're thinking about building an index, as you said, for the future, you know, not as much for the commodities of today, but the commodities that we're transitioning towards so that the investment that's needed, you know, producers can manage the risk of these investments, manage the price risk, de-risk their projects, hopefully open up some financing. One of the big issues though, right, is that many of the energy transition commodities don't have liquid futures markets yet. So how does this shape your approach to building this type of index and in your opinion, like which commodities are new futures markets most needed for?

Matt Schwab (16m :44s):
So I guess it's twofold. It means that, you know, ultimately indices are meant to be investible and so what we need to do is we definitely need to take liquidity into account when determining weights for the current commodities. So what is an example of that you know, an obvious commodity that will probably be useful in the future is uranium, unfortunately the uranium future's volume last I checked is zero. So you need to take liquidity into account, but you need to constantly monitor liquidity in these markets and the technology because as technology changes we would expect some of the markets to become more liquid and new markets to get created and I guess I'd use as an example of that kind of dynamic process, cobalt. So the index doesn't include cobalt, and we know that cobalt is one of the commodities that where the world is, if you will, shortest of you know, the world has on current trends I think is, as you know, Dave, certainly, you know, somewhere on the order of 15% is to 20% as much cobalt as it needs.

Matt Schwab (17m 46s):
So cobalt's not in the index historically it's a relatively illiquid future, but you know, kind of very positively, open interest in cobalt futures has almost doubled since the end of June. So that's something we monitor and if liquidity reaches a certain level, it's something that it could end up being included. So to your question about, you know, which commodities need futures markets, you know, there, I guess I'd say two things. First there are a lot of commodities which have futures markets, but they need to get a lot bigger platinum palladium, probably even silver, but if I could list one commodity that needs a growing futures market right now, it would be

lithium where there are futures, but, they're very, very small and the reason for that is according to the IEA sustainable development scenario, in less than 20 years, we're gonna need about 40 times as much lithium as we consume today just for, for green demand.

Matt Schwab (18m 40s):
And that's about eight and a half times more than we currently produce. So lithium is a primary commodity, right and for people who aren't familiar with it, you know, a primary commodity is commodity that you dig, you know, you sink the shaft for the mine or whatever just to get that commodity mostly and then you got secondary commodities like cobalt that kind of come out when you're digging for other stuff. So lithium is a primary commodity. Commodity means you need to pride finance lithium minds and so the way you finance lithium mines is you get a loan from a bank and a bank isn't gonna lend without a hedge, right, so no liquid market for lithium, no hedge, no increase in production, and ultimately not enough lithium for batteries.

David Greely (19m 27s):
And I think we're all used to seeing lithium batteries in our houses even today and the need for them in electric vehicles and everything else as we try to decarbonize is going to be massive. I wanted to turn back to you, Don, cause I'm curious, you know, the developing nature of many of these energy transition markets, I imagine it affects the way you think about managing a portfolio and thinking about the evolution of the index. So like as a portfolio manager perspective, how do you think about trading in these energy transition markets and you know, including them in your index as they grow?

Don Casturo (20m 02s):
Yeah, I think that the first thing I want to point out in that regard is that energy transition, the word transition applies moving from one thing to another and I think for so many investors, they focus on just where we're going and forget about the effects of what that might be and where we've been or what we're trying to get away from. So yes, there is a lot of considerations in terms that Matt has talked about, about what we need to do to incentivize more production of the things of what we want to go to and the evolution of financial products to allow that to happen. You've asked questions about not just the indices, but the futures that drive those indices need to become liquid enough to be able to provide that source of de-risking for the producers to allow them to get hedges off to engage in production products for the transition.

Don Casturo (20m 46s):
But what is equally important in terms of portfolio construction is to think about the effect of what's going on and the things we're trying to get away from and what I think, you know, the world sort of got an example of in recent commodity market moves is that dis-incentivizing of bringing capital into traditional fossil fuels before we actually were ready and had credible alternatives to drive alternative energy sources has meant that we're short of supply of something, whether it's because we don't have the new stuff yet and we still don't have enough of the old stuff and you know, I think the fact that you need to consider this transition needs to be done almost in perfect harmony to minimize the disruption to markets overall and if it's not, we we're still going to see bouts of volatility and potential spikes in old world sort of fossil fuel carbon sources like we have over the, over the past 12 to 24 months.

David Greely (21m 39s):
That's such a great point, especially when people are thinking about, you know, inflation hedging in a portfolio and you know, which commodities you want to have and I'm curious, I mean, you've given us a taste of this, but how do you recommend your clients think about investing in traditional commodities versus the energy transition commodities, you know, if they come and say well, which index should I be in or should I be in a mix of both?

Don Casturo (21m 59s):
Well, yeah, I, we think there's opportunities in in each, and you know, I think for a number of investors, and this is part and parcel for why we're having supply issues and because we're not getting the investments you can't even have that conversation. They're not even allowed to invest in fossil fuels, right, so whether you think they're going up or not, because there's not enough supply when the world's still demanding them, the investor can't take advantage of that because they're restricted from doing so. So for many investors, it's not even a conversation, but you know, am I even making a political statement. If that's the mindset and you have these restrictions in place, what you need for the world to grow is some reliable source of energy and okay if we're trying to move to a less carbon intensive way of energizing ourselves and then capital needs to flow for those alternatives to be developed and, and I really as the driver for, for coming up with the energy transition index and being thoughtful about how we can help facilitate capital coming into those spaces to allow for that, that that alternative production to, to create a itself.

David Greely (23m 04s):
Yeah, that's a really interesting and important topic, right. There's traditionally there had been a view that ESG was a way of screening things out and as you said, we need to like start screening things in order to get the capital to the right places. From your perspective, are you still seeing more of the screening out of investments or are you seeing people looking for positive places to put their capital, like the energy transition?

Don Casturo (23m 31s):
I think the message is getting through like that, that you can't just screen things out, you need to be proactive and try to promote the things you want to screen in and you know, we're having very productive and encouraging dialogues where people are getting that and Matt has talked to a number of intentional investors about what we're trying to accomplish here and you know, I think that they really are receptive to the idea that, yeah if want to accomplish a school of decarbonization like you, there's some investment that needs to happen and in order to incentivize greater production, deploying capital to the commodities themselves makes a lot of sense.

David Greely (24m 09s):
And I'd love to follow-up with you on that, Matt. I mean, what has the reception been among investors to this new energy transition index and what are some of the big questions you're being asked by investors?

Matt Schwab (24m 20s):
Yeah, I mean, I think, you know, first of all, I kind of, I definitely underscore what Don said, you know, the reception has been surprisingly quick. I mean, I think intuitive people and this is, you know, these are commodity investors, non-commodity investors, these are small RIAs, these are some of the largest institutional investors in the world. They kind of understand the demand growth story you know, when you say something like, all right, we need 8.5 times more of commodity X than we currently produce, and we go to finance that expansion in production, people intuitively get that and they understand that, you know, what, if the price of a commodity is X and we need a lot more, the only way we're gonna get a lot more is if the price of it goes higher and I think also people, as we said understand as Don said, that kind of capital move, right?

Matt Schwab (25m 11s):
That when you say, right, but if we're gonna build these minds, somebody needs to finance that and you know, banks aren't in the business of just taking random commodity price risk. People intuitively understand that, okay, we need to provide risk capital into those markets so they can grow and expand. I think in terms of the big questions, the biggest is probably one Dave that you asked earlier variant of why aren't certain commodities in the index and how they get included and you know, the answer to the why is a liquidity question you know, if the total open interest of a commodities futures contract is 30 contracts, that's probably a fairly good reason not to include it, but we've also done a lot of work in the index design of kind of thinking about this concept of a waiting room for commodities that we know will ultimately must ultimately become large enough.

Matt Schwab (26m 03s):
And I said earlier, you know, that cobalt's been becoming much more liquid and we take that as a really positive sign for some of these other commodities. Another one is about, you know, how are you going to handle technological change, as some technologies win and others lose. It's kind of like the plugin hybrid versus electricity electric vehicle comment I made earlier and you know, our answer to that is that one, you know, we need to constantly stay on top and review the commodities that are there, but also, you know, we firmly believe that just as liquidity will move into the contracts and the commodities that are more important, if certain things become less important, liquidity will leave. Liquidity will leave, there's less producer hedging, speculators will earn less and speculators are not in the business of losing money and they'll leave.

Matt Schwab (26m 47s):
And so I guess the final one is why take a broad approach, as opposed to maybe just saying, okay, just do you know batteries or just do carbon and our answer really there is no one really knows how this is going to play out. What we know is that the economy as a whole for everything from you know, electricity we're consuming right now to the cars that we drive to, ultimately the ships that move things around in the planes that take us are all going to move to a greener electrified source and so when we talk to people, we say, well look, you know, I don't want to make a bet on whether Tesla or the Chevy Volt wins. I want to make a bet that the whole economy is moving this way and that's exposure to different technologies and I think just going back to something Don said earlier, getting there, and so, you know, it's great if we're gonna be a certain place in 2050, but you know, as we get to 2050, ethanol may have a larger role than it would in 2050, for example.

David Greely (27m 51s):
So with that, I want to turn to you, Don, and ask you the unfair question because Matt's already told us that we, no one knows how this is gonna play out, and the right play is to have a diversified approach to what you do. But, you know, I'll ask you the unfair question as you look out over the coming years, how do you see commodity futures markets and commodity futures indices developing in the energy transition space and what role do you see them playing in financing the energy transition?

Don Casturo (28m 17s):
Well, just like I started with today, Dave, and talking about the GSCI and how important that was to financing old world energy supply sources, that similar sort of evolution needs to happen with the energy transition commodities and as I think back how it actually happened then I think it's a good model for answering your tough question about how it's gonna happen this time around. Realistically, I think indices need to be flexible in evolve. I mean, I Matt saying, if you don't know how it's gonna play out, you're not gonna put a prescriptive index in place and think that's gonna work for the next 20 years when we're still trying to figure out what exactly is gonna be the most, uh, relevant thing in terms of how the technology plays out. So one of the things that needs to happen, not only do we need to transition away from the existing benchmarks, what we transition to probably has to be a little bit more flexible than, than become or GSCI has historically been, because you know that those were the right commodities for 30 years.

Don Casturo (29m 12s):
We're not really sure what the next ones are. So the committee infrastructure that goes behind those indices probably needs to be a little bit more flexible. Even before we get to something index related, though, I would say you're gonna need to see futures volume and open interest developed before they can be reliably be put in those indices because you have this concern about, you know, the index with a prescriptive weight getting too large distorting markets until it's ready and then, you know, obviously there's a lot of those considerations that go into the benchmark construction in terms of, of investment support levels based on volume and NOI. So some of these markets, they're gonna need to develop as a future's market before they can be put into indices and I think the way that naturally happens is that, you know, funds can do active management before there's indices to sort of, to express the same thing.

Don Casturo (30m 00s):
Our banks will make products that they can do on a bespoke one off basis for clients. They wanted to deploy capital into the space before there's a formal index to allow it to happen and I mean, index indexes will work, but they're gonna need to evolve and as I say, I think the actual transition is gonna be more bespoke active products, which will blend generation, OI and volume creation, which then will allow them to be put in indices. And as we get more clarity on what the commodities that are most relevant to the transition, you know, the indices will start to take shape.

David Greely (30m 32s):
Thanks again to Don Casturo and Matt Schwab of Quantix Commodities. We hope you enjoyed the episode. Join us next week with our guest, John Goldstein, Head of Sustainable Finance Group at Goldman Sachs. We hope you'll join us.

Announcer (30m 46s):
This episode has been brought to you in parts by Base Carbon. The trading of carbon credits can help companies and the world meet ambitious goals for reducing greenhouse gas emissions, but how do we judge the quality of these projects and how can we ensure that our investments are creating real value. At Base Carbon, we are focused on financing and facilitating the transition to net zero through trusted and transparent partners. It's time to focus on what's important. It's time to get serious on carbon. Learn more at Basecarbon.com. That concludes this week's episode of SmarterMarkets by Abaxx. For episode transcripts and additional episode information, including research, editorial and video content, please visit smartermarkets.media. Please help more people discover the podcast by leaving a review on Apple Podcast, Spotify, YouTube, or your favorite podcast platform. SmarterMarkets is presented for informational and entertainment purposes only. The information presented on SmarterMarkets should not be construed as investment advice, always consultant licensed investment professionals before making investment decisions. The views and opinions expressed on SmarterMarkets are those of the participants and do not necessarily reflect those of the show's hosts or producer. SmarterMarkets, its hosts, guests, employees, and producer Abaxx Technologies shall not be held liable for losses resulting from investment decisions based on informational viewpoints presented on SmarterMarkets. Thank you for listening and please join us again next week.