

**Demetri Kofinas:** What's up everybody? Welcome to another episode of Hidden Forces with me, Demetri Kofinas. Today I speak with Ari Paul. Ari is co-founder and CIO of BlockTower Capital, one of a number of newly minted hedge funds, focused exclusively on the cryptocurrency space.

He was previously a portfolio manager for the University [00:00:30] of Chicago's \$8 billion endowment and a derivatives market maker, and proprietary trader for Susquehanna International Group. In our most recent episode with crypto fund manager Chris Burniske, we learned about the models that some of the most forward looking investors are using to value crypto assets.

In this episode, we learn how to trade them. How does a crypto fund manager manage risk? And what are the existential risk factors for such a new and fledgling market? What are the benchmarks for measuring performance? Is it Bitcoin, cryptocurrencies, or the broader equity markets? How do you seek alpha in an already uncorrelated asset? And how might the flood of institutional capital alter these correlations?

What does a consolidation in cryptocurrencies look like? Are we verging near a collapse in valuations? And if so, what sorts of tools are available for shorting an overheated market? We look at cash settled futures, the use of put and call options, and consider how to protect [00:01:30] ourselves from counterparty and exchange risk.

Finally, we examine some of the most interesting and creative investment opportunities for making money in this emerging market and what you can do to take advantage of them. As always you can join our email list by visiting the show's website at HiddenForces.io. If you listen to Hidden Forces on your iPhone or Android, make sure to subscribe. If you like the show, write us a review. And if you want a sneak peek into how each episode is made, [00:02:00] or for special storylines told through pictures and questions, then like us on Facebook and follow us on Twitter and Instagram at @HiddenForcesPod.

And now let's get right to this week's conversation.

Ari, welcome to Hidden Forces.

**Ari Paul:** Thanks for having me Demetri.

**Demetri Kofinas:** It's great having you here. So why don't we start with your background. How did you get into this space?

**Ari Paul:** So my background was first as a trader at Susquehanna International Group as a market maker, commodity FX, trading [00:02:30] kind of anything and everything. And then as an asset allocator at University of Chicago endowment. So I think of it as kind of the two far ends of the extremes of investing. One is the very short-term trading, and the other is long term asset allocation.

**Demetri Kofinas:** So how would you describe what you're doing now?

**Ari Paul:** I run a crypto investment firm that has one product, which is a hedge fund. And it's definitely more active trading focused than most crypto investment funds in the space. And what that means is we do a lot of event driven trading. For example, we'll make trades based on hard forks or conference events. So I think of it as really the intersection of an understanding [00:03:00] of cryptocurrency, fundamentally, with the trader mindset of always looking for edge. What is our alpha? What edge do you have over our competition, over the market?

**Demetri Kofinas:** How many partners do you guys have?

**Ari Paul:** So I have one co-founder as partner, and then we currently have a team of eight people in total.

**Demetri Kofinas:** There are a lot of funds now kinda opening up in the space and you guys ... Am I correct you raised \$140 million in one particular round with Union Square Ventures and Andreessen Horwitz?

**Ari Paul:** We actual raised much less. So we launched with less than 10 million dollars back in August. We've raise another [00:03:30] roughly forty after that, and we grew that 140 number very quickly just 'cause frankly, the whole market was up.

**Demetri Kofinas:** Yeah there's a tremendous amount of interest in the space. So that kind of gets to the question I wanted to ask you right of the bat, which is, what type of returns are you looking for? Like what are you looking to gain in this market?

**Ari Paul:** So very broadly, what I'm trying to accomplish is really to capture the upside of cryptocurrency with far, far less risk. And what that means in practice is when, we have a period like in the last quarter, the cryptocurrency market as a whole was up roughly [00:04:00] 2X. It depends on which kinds of things you look at, but if you look at Bitcoin and kind of the large caps, it was up 2x, 3x. So our focus is really during a raging bull market, we want to capture that for investors. But we're really focused on the fact there are bear markets too. And this is a market that a bear market does not mean down ten or twenty percent, it could be mean down 80%. So we're really focused on mitigated risk, mitigating that downside.

So when people talk about your target return, to me as an investor, that is actually a really bad question. I don't believe in targeting return. I don't think you can target return. I think what you can do is target risk. And so we really try to really minimize the risk [00:04:30] of ruin, to bring the probability of say, a 60% drawdown as close to zero as we can. And then within that constraint, we try to maximize.

And what that means in practice is, when there's tremendous opportunities, we try to make every penny we can. But if you tell me that there's going to be a bear market that's going to last a year and everything's going to be down 70% and maybe the arbitrage opportunities go away and maybe it's hard to generate alpha. My goal in that scenario is to lose as little as possible. My target return might be zero.

**Demetri Kofinas:** See, there are a number of really interesting points you bring up there. One is, you're touching on this thing of benchmarks, which is that, traditionally a hedge fund gets graded [00:05:00] on how you perform, if you outperform market. In this case you don't just have to outperform the market, you also have to outperform the cryptocurrency space in general. Right?

**Ari Paul:** Yeah no one's impressed ... I mean so cryptocurrency as a whole --

**Demetri Kofinas:** And probably Bitcoin too.

**Ari Paul:** Yes, so and I mean in a period where crypt is up 100%, no one's impressed you outperformed treasury bonds or even equities. So it's a really challenging question of what is the benchmark? Because the simple answer might be Bitcoin. But a year ago, Bitcoin was 75% of the market, now Bitcoin is about 30%. Well, what if Bitcoin falls to five percent, what if Ethereum conquers the world? What if [00:05:30] something as yet uninvented conquers the world? None of our investors are going to be happy that Bitcoin went to zero, let's say, and we were down 90%. No one's going to be happy about that.

So I like to joke that benchmarked against whatever wins, with hindsight bias.

**Demetri Kofinas:** Well that's interesting too right, because if it's something that hasn't been invented yet how do you guys get exposure to that? And we'll get into that, because there's tons of interesting questions I had for you.

So getting back to return and risk. There is a lot of volatility in this market, that's one of the things that makes it really attractive. And we'll get into sort of how you [00:06:00] can play that volatility and capture a lot of spreads there, because there are many. But that's obviously something where your investors have to be aware of that level of volatility. And what are your ... Can you talk about lock up provisions and how do you manage your capital? Is it the same as any other hedge fund or?

**Ari Paul:** Sure, so the regulatory rules in the space you're really not supposed to talk about an investment vehicle but what I can talk about is our investment approach, which is almost the same thing. And the idea there is you're not supposed to market, really.

So the way I like to approach this the space, the way I want to invest my own money frankly, and that's how we do everything, it's very much ... Most [00:06:30] of my own money is invested with us and I want to invest our investor's money the same way that my own money is invested. And the thinking there is, I'm very confident in both the beta tailwind, I'm confident that cryptocurrency as a whole will succeed, I'm very confident in our ability to find high alpha opportunities.

**Demetri Kofinas:** But just to clarify for our audience, by the beta tailwind you're talking about the exposure to the cryptocurrency market in general. Basically catching that entire wave and also having the rewards on top of that, beta, with alpha, which is what you're referring to there.

**Ari Paul:** Exactly, so total cryptocurrency [00:07:00] network value, I'm confident is going to be higher. Now when I say confident, doesn't mean it's a sure thing. But that's the bet we're making, that's the bet anyone who invests with us is making. If you think cryptocurrency is going to zero, you don't allocate to cryptocurrency. And we are confident that it is an inefficient market and there's opportunity.

So I say that, so what's our focus? Our focus is ... That's why we're inordinately focused on avoiding those big drawdowns, because it's this idea that as long as we're in the game, we're going to end up happy in three years. So we want to make sure that we stay in the game. And that means avoiding blowups of any sort and that means extreme drawdowns [00:07:30] due to market risk. It also means security, right? So avoiding having our assets stolen. It means counterparty risk. So if I had all my assets sitting on one exchange and that exchange gets taken down, or hacked, or bankrupt ... So we're very focused on making sure we don't have any extreme losses.

**Demetri Kofinas:** So you're like touching on these questions that I already had for you, Ari, and you're throwing me off a little bit. But I definitely want to get into exchange risk and counterparty risk in general. Also, I'm curious to what extent you can use leverage given the liquidity in this market.

But before that why don't we take a step back here. Why don't you walk [00:08:00] me through your investment framework. Sort of what you feel differentiates both crypto funds in general, and this industry. Because one of the things I was thinking about, and this brings us back to beta and alpha, is that if traditional fund managers, some fund managers might be trying to get exposure to cryptocurrency. And in fact, I heard you mention this yourself about when you were at the endowment, that it would have been potentially a good move, certainly in hindsight it would have been a good move, for the Chicago school endowment to have some exposure to [00:08:30] cryptocurrencies and in fact that provides a certain ... To quote my friend Christopher Cole, it's like adding Dennis Rodman to your portfolio. It gives you exposure to convexity.

Now you're already in the cryptocurrency market ... And that brings us back to beta, like which is your beta. So, I don't know, walk me through your framework here. Feel free to geek out with me.

**Ari Paul:** Sure, sure. So there's no right answer to the product that investors want to invest in. So within the asset allocator seat, the question we often ask the endowment was, do we want the hedge fund manager or investor to be responsible for timing the market [00:09:00] or for deciding ... So for example what if you write a check to a real manager, is it their responsibility to foresee the 2007 and 2008 downturn in real estate?

**Demetri Kofinas:** Of course Ari, didn't you know that?

**Ari Paul:** Well the challenge though-

**Demetri Kofinas:** I'm kidding.

**Ari Paul:** Look at it from the other side. Let's say I'm an endowment and I want 10% of my portfolio in real estate and I write the check for the real estate manager and the real estate says "You know what, we think things are frothy, we going to hold 80% cash." They've kind of destroyed my allocation decision. So it was my decision to decide how much I want to allocate to real estate.

**Demetri Kofinas:** I see what you're saying.

**Ari Paul:** So there's an argument to say that the job of a fund manager is to do the best they can, relative to the bench mark, [00:09:30] relative to the person who invested in them is deciding how much risk they want to take. Do they want to invest two percent of net worth or 10% in that asset class? That is fine. We don't do that.

So what we say is ... There's a lot of people who unlike tradition asset classes. Most people feel like they have some sense of equities. Right, we all know what a p-ratio is. Most people who invest in a real estate fund have some sense of real estate and valuation.

Most of the people invest in cryptocurrency including a fund like ours kind of know that they don't know. And they're looking for us to make, not only the kind of alpha decisions, but also the beta. They also want to us to time the market. [00:10:00] And, again I'm not saying it's the right answer for every fund and every firm, but that is what we do.

So we typically hold a lot of cash. We target something like 40% cash on average. We trade in and out of that aggressively, so you asked about leverage. So no, I want to de-leverage because cryptocurrency is so, so volatile and so risky-

**Demetri Kofinas:** Kind of is leveraged already?

**Ari Paul:** It's almost like a call. It's like a call. And so I'm far more comfortable managing a portfolio that's a little bit de-leveraged. And I'm very confident there's enough alpha opportunity that we're still going to end up producing really, really attractive returns for investors despite [00:10:30] having that cash drag.

**Demetri Kofinas:** So you said it's like a call. Are you able to use puts and calls in this market?

**Ari Paul:** You can, so I believe that I have actually personally traded the majority involved of the calls that have been traded in the space. And that sounds like a silly statement but in reality, there's almost no options that have traded. So we did a million dollar options trade that in our mind was not a big trade or meaningful trade it was a very small percentage of the portfolio, ended up getting a-

**Demetri Kofinas:** Cornering the market.

**Ari Paul:** Well it was funny cause it got written up by the Wall Street Journal as "Anonymous trader makes massive million dollar bet that they point will go to 50 thousand dollars".

**Demetri Kofinas:** I saw that.

**Ari Paul:** And I read that and was like, disbelief. [00:11:00] It was like, oh, that was just a tiny bet for us.

**Demetri Kofinas:** And also didn't properly capture ... Also can you explain to our audience how put works and how call works. What the difference is and how you would use and why that doesn't necessarily reflect that you're going long, that you need to pay out of 50 thousand price of Bitcoin in order your fund to be successful or to have a successful quarter or whatever.

**Ari Paul:** Sure, so a call is the right, but not the obligation to buy something. A put is the right, but not the obligation to sell something. So to use a concrete example, so if Microsoft is trading at \$20, I can buy a \$ [00:11:30] 25 Microsoft call, maybe for, let's say two dollars. So if Microsoft goes to \$30, I then have the right to buy Microsoft stock for \$25, I paid \$2 for that right, I then get to sell Microsoft stock at \$30. So I make five dollars minus two dollars, I get three dollars in profit.

So a call is potentially a less risk way to have access to upside.

**Demetri Kofinas:** You're kind of borrowing money from the person that you're getting the stock from. Not the stock from-

**Ari Paul:** Kind of. So it can be a way to get leverage. It can be capital efficient. It can be a way to limit your downside risk, so in that scenario, the most I'm risking is two dollars. If Microsoft goes to zero, [00:12:00] I still lose two dollars. But I think something people often miss is there's this term called put-call parity. So the way you actually price a put and a call, I'm going to oversimplify. A put is a call, because you can trade the underlining and convert one into the other.

So what that means, I can buy a call, I can then short stock and it is identical to if I bought a put. To an options trader, a call is not a bet on something going up. A call is a bet on volatility. And the reason for that is, I can buy a call, short the stock, and hedge out the delta. Hedge out the upside exposure. So what am I really betting on if I [00:12:30] buy a call? I'm betting that the stock is going to move a lot. And I don't care if it goes up or down. I'm betting that it's just going to move a lot.

Then there's kind of the second derivative. Not only am I betting that it's going to move a lot around where it is now. If I buy it deep out on the money call, instead of buying that \$30 Microsoft call, let's say I buy an \$80 Microsoft call. The way that's priced relative to the \$30 call is a bet on the shape of the distributions. There's a term called fat tails kurtosis. So that 50,000 strike calls ... So what I did is I bought basically a million dollars of calls that settled

the end of 2018 that are 50, [00:13:00] 000 striking Bitcoin. I did that when Bitcoin was trading around \$18,000. And so, one way to think about it is I'm betting Bitcoin will go higher. But I could just buy Bitcoin, if I want to make that bet. I can hedge that part of the calls.

Another way to frame it is, I'm betting that Bitcoin is going to be very, very volatile. If it goes down a lot, that call actually makes me money, because I own less Bitcoin because I have the call. So I lose less on the way down by owning the call.

Then there's another way to look at it, which was definitely part of my thinking, which is an idea of the shape of the distribution.

**Demetri Kofinas:** Just to clarify also, I think this is an important point for anyone that is listening. This is why [00:13:30] these are tools that ... And this gets us to one of my sub-headings in this rundown is boy plunger. I told you I have a few quotes from Jesse Livermore because I think there's a great advantage right now in this market for people who understand how to use these tools. And my question really is also ... Again sorry to have to interrupt you with ink all over the map, but you're saying so many things that I don't want to miss out on.

I'm curious how you're able to apply this tool box, because this is a very sophisticated level of risk management that you're talking about here. And how you apply [00:14:00] these tools and also how that tool box might expand because I'm thinking right now you're talking about using options, and I'm wondering about how to deal with margin calls in this environment and given just the liquidity and illiquidity and all that sort of stuff. So that gets me to sort of wondering, you've got a tremendous amount of knowledge and you're a very creative thinker. You know I've listened to a few of your interviews and that has come across to me. So I think that someone like you, I feel you're in this market you're probably able to stretch the boundaries of what ... You're probably pushing right [00:14:30] up against what you can do, in terms of all the different tools that are available. And I wonder how you see that toolbox might be growing, expanding and how that's factoring in.

Sorry to kind of jump in there, but I wanted to get that out there before I forgot.

**Ari Paul:** Yeah, no problem. So what we've been seeing for the last year, and I think is only going to accelerate, is professionalization of the space and many more tools coming online. So six months ago if you wanted to short, really the only way to do it was within an exchange. So there were exchanges that gave you the ability to short. That was very unattractive.

**Demetri Kofinas:** Like LedgerX?

**Ari Paul:** Well LedgerX didn't even [00:15:00] exist, but like Poloniex, Bitfinex offer the ability to short on their exchange. The problem with that though was you have to post full collateral, you're borrowing from that exchange. Those exchanges tend to be risky. So they're not CFDC regulated. The nature of facilitating margin means there's a risk of

blowup of the exchange. So some of the other things like socializing losses. They tend to have flash crashes very frequently, because there's people who can get margin called on those exchanges. And because they're generally relatively unregulated and relatively opaque, they'd be really, really tough for an investor to say "I trust somebody with [00:15:30] 50 million dollars." Right? So it might be fine for a retail investor to say "Okay I'll put 10 ten grand on there" but how do you trust somebody with a huge sum of money? So six months ago, for the professional investor of the space, I'd say shorting was almost impossible. It was very hard to do it prudently.

Now we have things like Bitcoin futures, which makes shorting much, much easier.

**Demetri Kofinas:** Which is cash settled, and that's very different than what we're talking about here.

**Ari Paul:** Correct.

**Demetri Kofinas:** And I'm curious, so if you can tell as we move forward, how you might be able to use those. What are the correlations between those markets and are they at risk of breaking down in a way that we wouldn't be able to foresee [00:16:00] given how new the market is?

**Ari Paul:** Sure, a ton of great questions there. First on the toolkit, so LedgerX I think of as somewhere between. They're CFDC regulated, very professionally run. But they don't have a huge balance, they're entirely a Bitcoin business. They're one of the biggest hacking targets in the world because they're sitting on bitcoin. So there is a concern in my head that ... Let say I buy those calls, and at the moment I only have a million dollars of risk, right so I buy million dollars in premium. I can't get margin called cause I own calls, right? Someone who's short an option can get margin called. For the most I can lose is that million dollars.

But let's say that million dollar bet becomes a five million, [00:16:30] ten million, twenty million dollar in the money bet. Then I have that exposure to LedgerX. LedgerX owes me that money. That's a lot of counterparty exposure. So what happens if LedgerX gets hacked? So their regulated, but-

**Demetri Kofinas:** So fascinating.

**Ari Paul:** they're not insured to my knowledge. So that is a concern, that is a reason that would prevent me from wanting to buy it, you know put huge amount of collateral there and this is not a criticism if LedgerX, I think they are very professionally run. You have other things arising like cash lending.

So now if I want to go short something for example, there's an OTC desk Genesis, they're a big trading desk in the crypto world. They have a large balance sheet. And they now will actually "lend me", [00:17:00] air quotes, physical crypto currency. So what that means is, if I want to short Bitcoin, I can go to the Genesis desk. I can say I want to borrow 20 million dollars in Bitcoin. They will transfer me the actual Bitcoin. I can then short that Bitcoin. By

short, I can just sell it, I then get cash. The cash goes in my bank account, and I can't get margin called on that. So Genesis can margin call me but they don't have my cash or my Bitcoin. So nothing kind of malicious or unsurprising ... There can't be any surprises. I can't get margin called due to some weird market activity.

So that's a [00:17:30] much more attractive way for me to short now. And that only arose basically two months ago.

**Demetri Kofinas:** I knew you were a creative guy, Ari. I listened to a few of your interviews before. I am very satisfied so far. So let's continue with that question I had about the futures market and-

**Ari Paul:** Correlations.

**Demetri Kofinas:** Correlations. What do you think about that? Again, I'm very interested in your ... It's so awesome listen to you talk it makes me ... It stresses me out a little bit thinking about your position. You know, being in your position. I'm curious, every fund manager has experienced the stress. Stress is a requirement [00:18:00] for success. I'm curious how this experience right now is for you, being a pioneer in this space and talking to your friends who are trading in traditional markets right or who are managers of other funds, how does that differ and what does this feel like for you?

**Ari Paul:** Interesting question. So-

**Demetri Kofinas:** Not a CNBC question.

**Ari Paul:** So I say this. Launching BlockTower, which I did with my co-founder Matthew Goetz. We left our jobs in July. It was an extremely fast hedge fund launch, we were working 18 hour days in parallel to launch August 15th. So six weeks, we launched [00:18:30] the fund. We've now grown eight people, we're hiring eight more in the next two months. We're at the weird intersection of a growth company and a traditional financial firm. So we want to be best in practice in every regard in terms of being ... Attention to detail matters. So regulatory compliant, legal compliance, having operations that are tight, security is paramount. We obsess over security. And yet, we're also a growth company. So we're trying to hire extremely quickly, we're trying to grow. We're trying to be industry leaders in the space.

And I say that intersection ... Well what's been interesting to me is, I wasn't naive about the [00:19:00] challenges of running a hedge fund. Coming from U Chicago, U Chicago invests in hundreds of investment firms and I've underwritten some of them myself. So I was pretty familiar with the space. Still, I was amazed at how much operational work there is. So we were in a point in our growth about six weeks ago, where we had a team of seven and five of those people were on the operation side and only two on the investment side. Which is kind of incredible, using a seven-person team as a hedge fund, only two are investors. But that's how much operational work there is. So dealing with investor relations, regulatory compliance, all of that. [00:19:30] So now we're beefing up both sides of the organizations-

**Demetri Kofinas:** How does that compare if you were a traditional fund?

**Ari Paul:** So it's more balanced. It really, really depends on the type. I'll give you an example. So my former employer Susquehanna International Group, there was a point where they had 200 traders and 900 other staff members. So the other staff was everything from HR, there was a lot of algorithmic programmers, electrical engineers who would do things like produce the trading infrastructures that the traders would use. But the people actually making the trading decisions were only about 15, 20 percent of the firm. That's how much support staff you needed. And calling them support staff [00:20:00] is kind of unfair because they're a critical part of the organization.

One reason we're so heavy on the operational staff is just the speed. So there are some things you only have to do once. You only have to create a PPM, a private placement memorandum once, you only have to deal with the lawyers with that once. We were fundraising from a great number of partners and onboarding each one. Again, that's not something ... We're not going to be continuing at that pace. We were kind of racing to get up and running.

With that said, it's a operationally intensive business. So when you ask about kind of how has it been for me, and stress and things. I stress [00:20:30] out for sure about the portfolio. About risks in both directions. It's kind of funny. So there's obviously the risk of capital loss, but there's also the risk of underperforming on the upside. So we hold a lot of cash, we obsess over risk. And so what about when the entire market is going parabolic, well that's also stressful right? I'm mean capturing the opportunity-

**Demetri Kofinas:** Right, that brings us to the benchmark. The fact that you have all these different benchmarks that you're really up against. Which is really interesting, you put yourself in a career pickle.

**Ari Paul:** But it's also stressful dealing with being an entrepreneur. Growing a firm. Dealing with hiring new people and all the aspects that come with just growing a [00:21:00] business.

**Demetri Kofinas:** It's super impressive, man. What you're doing is super impressive and exciting. You're really sort of at the vanguard of something brand new and you get to learn a tremendous amount by putting yourself at the deep end of the pool like this.

Counterparty risk, exchange risk. A very unusual set of risk factors for you guys that other funds don't have to deal with. I mean the fact that you do have to worry about having the exchange being hacked on which you currently have open positions or whatever else. Do you put a lot of your ... Is a lot of the crypto that you own [00:21:30] personally, is that in cold storage? How do you guys manage that? How do you mitigate the unusual risk characteristics of this market?

**Ari Paul:** Yes so anyone who's not actively trading, none of your crypto currency should be on exchange. What I highly recommend to everyone is buy a hardware wallet, so

for example the Ledger Nano or the TREZOR. They look like USB sticks, and they're industries best practice to store cryptocurrency and are quite secure.

Because we're active traders, we need to have some cryptocurrency on exchanges so that we can react quickly. We very consciously underwrite the individual [00:22:00] and counterparties. We're very conscious about the risk we're taking. So at any given time, we typically have about 20% of our fund, more like 15% actually, on exchanges and that's spread out over six exchanges. And there's some exchanges we won't trade on because we don't think ... Ultimately it never makes sense to look at risk in isolation. It's always a risk averse return. So for example, if you tell me that there's an exchange that's 50/50 to go under in the next year, I might still put some money on it if I'm confident that the return are worth putting two percent of my capital at risk.

So it's not that things [00:22:30] are too risky or not risky, it's always we're underwriting the risk as traders. So I say, okay this is in exchange for we were going to earn a ton of money for our LP's, we're willing to risk 3% of AUM and have that sitting on the exchange. And we think by having it sitting there, if there's a flash crash, if the market is moving really quickly, there's an opportunity we can exploit.

**Demetri Kofinas:** So that's interesting, so you said how many exchanges do you trade on?

**Ari Paul:** About six actively right now.

**Demetri Kofinas:** So how important is arbitrage for you, because there are significant discrepancies between exchanges, particularly in some of these Asian markets, where people are having a hard time getting [00:23:00] their money out. How are you capitalizing on those? Are you? Are you able to, sort of ...

**Ari Paul:** So we're not focused on arbitrage. My view on that was, I don't want us to build a business where someone like a Citadel or Rentech, these giant financial firms are optimized for that. If and when they get into the crypto game, they can be better than us at that the next day. So I don't want to build a business where we're competing against the world's best in their game.

Now with said, we have been doing some arbitrage because, hey if it's low hanging fruit, and it's there, and I can exploit it, and I have money sitting on exchanges already, [00:23:30] why not? So in December, there were great opportunities, we did take advantage of them. That is not a core business for us, it's a very small percentage of what we do. And specifically, because I can't tell you that I'm better than everyone else in the world.

**Demetri Kofinas:** So where do you have a competitive advantage?

**Ari Paul:** I think at the intersection between crypto fundamental understanding, trading expertise, and relationships. It's like a triangle.

**Demetri Kofinas:** Can you define the crypto fundamental understandings? Do you just mean generally your broad understanding, and depth in understanding cryptocurrency, the technology, and the sort of ecosystem?

**Ari Paul:** This is probably easiest was an example. So I am non-technical. I am not an engineer, I am not a cryptographer, I don't claim ... If someone was in the room and they said they were a cryptocurrency expert, they probably know more than I do. What I try to do is-

**Demetri Kofinas:** I don't think you've been to enough crypto meet-ups in New York City, Ari.

**Ari Paul:** Maybe not, maybe not. But then I claim really no cryptocurrency expertise. What we do is we talk to the world's best. We talk to the best blockchain engineers, the best developers. And what I mean by that is, we're talking to creators of the [00:24:30] cryptocurrencies, the lead developers of the projects. And when they disagree with one another, I'm not making a bet. So if two of the world's best blockchain engineers disagree on a database architecture, who am I to decide between them?

But often what happens is all of the developers, all the engineers, will tell you one thing and the markets says something else. And that's because this is 90% retail market where people have no idea what their buying. So all the engineers tell me, for example, that Ethereum, Ether, which is one of the leading cryptocurrencies is nearing capacity, that it's about to be clogged as a network. They all tell me that, there's no special insight [00:25:00] there but the market has no idea. I can see the average retail trader, the average investor is totally unaware of this, that might present an opportunity for us to make a bet because then we have enough of a fundamental understanding of what's going on and we know how to think like traders. So I can structure a trade ... Let me give this very specific example of one of our best trades.

Around November 17th, there was supposed to be a Bitcoin hard fork. It was called SegWit2x. It was very contentious. It was very complex. Basically, it meant that Bitcoin was going to fork into two and there were going to be two chains that were competing for the Bitcoin-

**Demetri Kofinas:** This would have been the second Bitcoin fork.

**Ari Paul:** Yes, [00:25:30] so the earlier one was on August 1st called Bitcoin Cash. Bitcoin Cash was kind of like a spinoff, it was friendly. It was called Bitcoin Cash and not Bitcoin, that's important. Exchanges gave it a different ticker symbol. It had technological protection in it called replay protection that meant that users who didn't know anything weren't going to lose money between the two chains. And so for all those reasons, it acted like a dividend. So if you owned Bitcoin before the fork, after the fork you actually made money, 'cause you had bitcoin cash and bitcoin-

**Demetri Kofinas:** A very nice dividend.

**Ari Paul:** It acts as a dividend and it wasn't value destroying 'cause the two chains didn't really [00:26:00] attack each other.

The SegWit2x chain would've been a contentious hard fork where the two chains would have basically been at war. If it happened, it would have been the single biggest event in cryptocurrency history. It would've been the biggest event for Bitcoin. I think it would've been incredibly destructive for Bitcoin. Not everyone agreed with me on that but that was a firm-

**Demetri Kofinas:** Can you explain your thinking?

**Ari Paul:** Sure, so there's maybe three points of competition here. One is you take an existing network and you split it into two. Generally, the value of network effects is more than linear, so if you double the size of the network, it's more than twice as valuable. If you cut a network in half, it's less than half as valuable. [00:26:30] With Bitcoin Cash, that wasn't the case because Bitcoin Cash and Bitcoin were truly differentiated in their value proposition. It was a little bit like, sometimes a company will split in two but they're different business lines. So there aren't really ... It was a conglomerate of a mishmash of businesses.

**Demetri Kofinas:** 'Cause Bitcoin Cash ... Sorry to interrupt, just for the audience that may not know ... Is the reason because Bitcoin Cash was attempting to solve the problem of the scalability in transactions and so it was more of a transactional currency, whereas Bitcoin ... The original actually was if you wanted to store value, it was more for that?

**Ari Paul:** Exactly. [00:27:00] So Bitcoin Cash was trying to optimize for transaction throughput for low cost, high throughput transactions. And Bitcoin was trying to optimize for decentralization and security to support the store value use case.

The communities were also at each other's throats. Within the Bitcoin community, before that hard fork, you had two camps that were fighting. So by separating those two, you can argue that it became more valuable networks, more consistent in their vision.

With SegWit2x, the 2x hard fork was a very, very minor change in a literal sense. It only doubled the block size, whereas Bitcoin [00:27:30] Cash basically increased it more than 8x. So the 2x would have been a relatively minor change. It wasn't really a differentiated value proposition. It would have been competing for the brand. And that's huge because ...

Imagine if there's an exchange in the U.S. and another exchange in the U.S. and what is called Bitcoin what gets the ticker symbol you see on one, is a different product than what gets that symbol on the other. The confusion that would have created would've been tremendous. It would have led to, probably a very large loss of funds, and loss of confidence. If you have a retail investor, someone goes home to Thanksgiving and they tell their uncle "hey you should buy Bitcoin," and [00:28:00] that individual just bought Bitcoin. Well maybe I bought Bitcoin for \$5000 and you bought Bitcoin for \$2000 'cause it's literally a different thing.

And most people don't ... Everything we just discussed, very few people, even the people who own Bitcoin, they don't understand. They don't know this. Many people would've gotten confused. And then there's also this technical issue of a replay attack, where people could actually lose money due to malicious attacks that would've been possible between these two chains.

So I think it would've been a very destructive. So something that we did as an investment firm is we spent a lot of time heading into that, talking to all the key players. So I was a poker player [00:28:30] at a professional level in college and I like ... I was kind of trained to think of trading as a poker game. So who are the key players? What cards do they hold? What do they think is ... In practice what this meant was talking to Coinbase, and Xapo, and BitPay and Bitco and Chinese Mining pools. The key players in the Bitcoin ecosystem, to understand what is their positioning? Do they have a lot of Bitcoin? Bitcoin Cash? How were they positioned as a business? What do they think will happen? What do they want to happen? And how will they react to different scenarios?

So we gathered all that information and, frankly we didn't have a clear view on what was likely [00:29:00] to happen. When SegWit2x was called off about a week before it was intended to go live, suddenly everything clicked for me and we put on a trade where we bought Bitcoin Cash. And Bitcoin Cash is a tangent. So this was Bitcoin Cash hard forked and was born August 1st. This hard fork was Bitcoin separating into Bitcoin and Bitcoin2x.

So why would I buy Bitcoin Cash? And the reason is, a lot of the Bitcoin community who favored larger block, who favored high throughput, low fee transactions, were betting [00:29:30] on SegWit2x. They were saying, okay Bitcoin Cash, we really don't know or care. We're waiting for SegWit2x so the moment SegWit2x was called off, I thought that entire camp is now going to shift to favoring Bitcoin Cash. And sure enough that's what happened and Bitcoin Cash went up 5x over the next two weeks.

So that trade, what was our edge? How do I even describe it? Well I think we needed a decent fundamental understanding of the hard forks themselves, but it's not like I had a better understanding of that than ... I'm sure you can find hundreds of engineers who knew it as well as I did or better. But it was also this understanding of the game theory, putting [00:30:00] the time in to develop the relationships and meet the players and talk to them. And then how do you construct a trade, understanding the market psychology, understanding how markets work.

**Demetri Kofinas:** When you look out into the world, where other people see binary outcomes, it seems to me that you see a probabilistic function.

**Ari Paul:** Yeah, I certainly try to.

**Demetri Kofinas:** Will it certainly sounds ... I mean more like it ... Obviously, go ahead

...

**Ari Paul:** I credit my first employer after college, Susquehanna International Group. It was a firm that was founded by poker players. I played a lot of poker in college, [00:30:30] and obviously as a poker player you need to think probabilistically. People often think that odds play a bigger role in poker than they do. They're just an entry point. Any reasonably smart person can learn all the odds you need to know to play a decent game of poker in about an hour. It's very simple. But you learn to think probabilistically because you're always waiting on that next card. You always trying to think what are my pot odds? What are the odds I get that flush on the river? So you think probabilistically, you know the future is uncertain. You know that, no matter how good you are, you're very likely to lose a hand against a bad player. The best player [00:31:00] doesn't even necessarily win any more hands against a bad player. They maximize their wins, they minimize their losses.

So I thought probabilistically from poker. As a trader, I was trained very, very made much to think probabilistically and I think it's especially important in cryptocurrency because the assets are so hyper volatile. We're talking about assets that can easily rally 4x in a month. Bitcoin was \$800 last November. It's now just crashed down to \$10,000. What a ridiculous statement, it was \$800, it crashed down to \$10,000. So you have to think probabilistically in this market. If you just say " [00:31:30] oh I think Bitcoin is eventually going to conquer the world," certainly as someone who is managing other people's money, that's not a great way to view things. Because on the path, on the path from ten cents to \$10,000 Bitcoin's crashed 80% five separate times.

**Demetri Kofinas:** Which also brings us to something that I do want to touch on at some point, which is how do you think about ... Because a retracement or a consolidation in this market looks very different than it does a traditional equity market. And in changing market conditions, how you incorporate that? [00:32:00] And I'm interrupting you and ... There's one more thing I want to ask you though, before we move to anything else or before you answer that question, because I just remembered it. I'm curious, your process when you're sitting around thinking through a dilemma or a problem. This is a perfect example right, SegWit2x. And you're trying to find the play here, the position. How do you want to position yourself? What's the opportunity?

I'm curious, besides the modeling, what you did when you said it all just came [00:32:30] together and you said the play is Bitcoin Cash. I'm curious, how you experience that all coming together and what that process was, because that's what is so exciting about what you're doing in the business that you're in is that you get to have those moments. And you get to play on the edge there.

**Ari Paul:** Yeah, I'll extrapolate this to a life philosophy of mine. So I think a good approach to life is, most of the time you want to be relatively conservative. You grind. You put in the work. You learn. You study. You gain the skills and then every [00:33:00] once in a while, a fast pitch lines up. And by "once in a while," I mean once a decade. Maybe it's once a lifetime, it depends on the scale we're talking, and then you swing for the fences. And then you have to be willing to take risks. In poker, you have to be willing to shove your chips in. You have to be willing to go all in. In life, that means maybe leaving your job and joining a startup. As a trader, means maybe that's the time you make the big bet.

And so that was true for me career wise, as far as building skills. Following are relatively conservative path when I wasn't super clear on what the right choice was. And then it was leaving to launch a crypto fund as quickly as we can. Throwing [00:33:30] all of my own money in it. Throwing all the career risk in it. And similarly, that's how I think about the portfolio. So because we're positioned in more of a risk adverse way, all in for us is not all in the in terms of 100% of the money in a trade. So in this example, I really liked the trade, I thought it was a home run. We put 15% of the portfolio in it. So all in does not necessarily mean crazy bet but-

**Demetri Kofinas:** That's a good chunk.

**Ari Paul:** But it's a good chunk. And it was a very risky trade with a somewhat binary outcome. So Bitcoin Cash, basically a very small number of people owned it and were promoting it and if they abandoned it, I thought it could basically had zero [00:34:00] very quickly. So it was somewhat of a binary outcome. Very few things are really binary outcomes but-

**Demetri Kofinas:** And you have less data to go off of too. I mean there is less ... Your gut is playing a bigger role in this market. That's my instinct and that's why I keep going back to these qualitative questions. I didn't even plan to ask you these. There just coming up as I'm sitting here across another human being, who's in a position to make millions of dollars off trades in a very short period of time, given the volatility of this market. And you have [00:34:30] to make these very adult decisions and you have to put on your big boy pants and do it. And I just think it's an interesting thing that keeps popping back into my head. How do you do that, especially given the fact that you don't have this giant roadmap to go off of?

**Ari Paul:** You know, it's funny. I get asked a lot, basically how do you invest in cryptocurrency without historical data? To me, it's a really weird question, because when I was at the endowment at U Chicago I got shown a lot of back tests. In finance, everyone obsesses over analyzing historical data. Partly because it's there, and because you can.

So if you're a grad student trying to get PhD in Econ, the easiest thing [00:35:00] to do is you do some slightly marginal analysis looking, or the same analysis someone else did on a new data set. And it's 'cause you can. You can spend three years doing that, you can calculate something out to three decimal points. The reality is that may or may not have any value in predicting the future.

So does that fact ... The biggest mistake investors make tends to be extrapolating the past. So in the sixties, everyone said IBM is growing at 25% a year, we can come up with a fundamental argument about why it's the best company in the world and will keep doing that. And towards the end, if you extrapolated that, another 15 years IBM would have been worth more than every other company on the planet. You get these very clear absurd outcomes [00:35:30] that seem somewhat rational but are just extrapolations of the past. We can calculate what the U.S. equity risk premium is. We can say over a hundred years; the U.S. has averaged six and a half percent excess returns. And let's say you calculate it and

your modeling says 6.6 and mine says 6.4. My argument is, that doesn't matter at all. That margin of error, that 0.2%, is so tiny relative to the forward looking error, relative to the ...

The real question we need ask is, okay we have a rough idea of what the past looked like. What is going to be different about the future? And does that difference make us want to double our estimate? Cut it in half? [00:36:00] So in cryptocurrency, it's that but much more extreme. Which is to say, the biggest question I'm constantly asking is, what will the next regime look like? What fundamentally is changing about cryptocurrency that will make the future not resemble the past at all?

**Demetri Kofinas:** So you're talking about market regime. I want to get into that. It's interesting also what you're bringing up ... You're touching on portfolio theory and it's actually something that came up in my last conversation with Chris Burniske. And you know Chris, and you know Joel Monegro-

**Ari Paul:** They're fantastic, they're friends.

**Demetri Kofinas:** They're super smart guys. But one of the things I did question Chris [00:36:30] on was, how much does he depend on ... 'Cause he uses a lot of portfolio theory and that's in his book a lot. And that is of course, looking at the past and building on future and thinking statistically in that sense and Bell distribution, Gaussian way. So that's interesting that you say that. You make a really good point on that. So you're talking about changing market regimes. Talk to me a little bit more about why you brought that up.

**Ari Paul:** Sure, it's at the center of how I think about cryptocurrency, and frankly [00:37:00] how I think about investing in general. Even in the non-cryptocurrency assets. The difference is, a regime change in U.S. equities may happen once every decade or 20 years. Depends on ... Regimes is a very wishy-washy word, it can refer to a lot of things. For example, we had a 30-year bond bull market. So if you're waiting for the next bond regime it's literally ... Your entire career might have gone in one regime.

So we have a generation of investors and traders have never seen a bond bear market. What does real estate do? What do correlations look like? How do commodities do in a bond bear market? We can look at what they did 40 years ago but obviously it's a [00:37:30] different world economy now. Like trying to draw a lesson from how copper and real estate interacted 40 years ago, we might learn the wrong lessons. Even the construction of real estate might use way more or less copper than it did 40 years ago.

So cryptocurrency is the same idea, it's just instead of a 40-year timeframe, you have a three month timeframe so it's incredible how fast ... So you mention the toolkit, right? So now you've CME and CBOE futures. How's that going to change market micro structure? How that going to change the volatility? Is it gonna make things more or less volatile? These are questions I think are more important than analyzing what a standard deviation of Bitcoin was [00:38:00] three years ago.

And that one by the way ... I guess since I raise the question, I should try to answer it. I don't think it's really clear-cut. My guess is the way the futures and derivatives on Bitcoin, I think the effect they are going to have is they're going to mute very short-term volatility. You're going to have more market makers, deeper order books, people who soak up some of that very short-term extreme ... So without market makers, what happens is one person wants to buy \$30,000,000 of Bitcoin and they sweep it up 5% or 10%. With market makers, that \$50,000,000 order doesn't move things, so you have less very short-term volatility. But [00:38:30] the month to month volatility, I don't think falls at all, because that's fundamentally driven.

**Demetri Kofinas:** Now also, with guys like you entering the space in general, there's more money coming in. The ecology is changing. And up until now, this market has been closed off. It's been very siloed, right? But you're beginning to get leakage into it from the broader market. And that's going to lead to some level of correlation. So then that's kind of another way of getting into asking you what your broader perspective is on markets more broadly. Let's kind of zoom out here. And then [00:39:00] also does that impact market movements in Bitcoin? What would be the impact of a breakout in inflation, or a deflationary spiral in the economy, or a recession? How would all of those things impact through cryptocurrency space and how you think about all that?

**Ari Paul:** So at the end of the day, the price of an asset is driven by supply and demand. Stupidly simple statement, right? But order flow, which broadly just means who's buying, who's selling, is so critical to understand asset prices so ... And this is true in every level. So if you ask me [00:39:30] where will U.S. equities be in a decade, I think I would care less about macro things. Like, how much did the U.S. GDP grow? What are profit margin companies. If I could only ask one question, my question would probably be "what is the savings rate" or "what percentage of people's income are they putting into retirement accounts?" Because that tells you how much money is flowing in passively. How much money is going into 401ks. So you have all these people who, they're not looking at p-ratios. Their saying, okay I'm going to put five percent of my monthly income into my 401K and I'm going to passively buy the S&P 500. And that so dramatically impacts [00:40:00] the price to earnings ratio of stocks.

In crypto currencies, it's even more extreme, because there is no quantifiable straightforward intrinsic value. So Chris Burniske has done a phenomenal work pushing us towards some kind of quantification but he's very practical and reasonable about this. What he's providing us with is a model, a mental framework. He puts precise numbers to it, but he's saying smart enough. His other statement, he fully understands that it's garbage in garbage out. That he's just providing a mental framework, and the numbers are somewhat arbitrary.

**Demetri Kofinas:** We're just throwing a dart on the map and we're starting somewhere.

**Ari Paul:** So I spent [00:40:30] a lot of time thinking about questions like ... Here's a really a simple example. So six months ago, no twelve months ago, South Korea and Japan

were a relatively small part of the cryptocurrency market. If you looked at both real buying and exchange volume, it was basically U.S. and China.

China now is something like 5% of the market in terms of exchange volume. It's more than that, I think, in terms of buying power. It's a large percentage of Bitcoin hash power but China's become a much smaller piece. South Korea and Japan are huge. South Korea's about a third of the global cryptocurrency market now, in all regards. How's that changed us?

**Demetri Kofinas:** And that's interesting. And there's a huge opportunity there [00:41:00] for ... When I was talking about arbitrage, that's a huge arbitrage opportunity there, but go ahead...

**Ari Paul:** I neglected to answer your arbitrage question. So the Korean arbitrage, basically no one can do it scale. So individual Koreans can pull \$50,000 a year out in won. The way it often works is someone with the family member who is a business there, which maybe has some kind of export license, they can pull little more out. So there was a point where you could have traded \$1,000,000,000 of Bitcoin at 40% premium. You could have made \$400,000,000, if you have the ability to get Korean won out of Korea. No one was able to do it, [00:41:30] to my knowledge.

**Demetri Kofinas:** So what are the sorts of arbitrages you can do in Korea right now?

**Ari Paul:** So the arbitrage you can do in Korea, so you can do for example, what's called triangle arbitrage. For example, I can transfer Bitcoin to a Korean exchange, convert it into Ether, bring the Ether back to the U.S. and converted that back into Bitcoin. So if the Bitcoin-Ether pair spread is different in Korea versus the U.S. I can arbitrage it. What I can't do is arbitrage fiat. I can't arbitrage Korean won versus U.S. dollar prices.

**Demetri Kofinas:** So back to the macro perspective and the broader economy. [00:42:00] That gets to this question of when are we gonna see a change in market regime. The market has, up until ... We had 2008 to 2012 the Mario Draghi speech, you pretty much had this inflation deflation. After that, the market for a much said okay, the Fed is the only game in town. Central banks are the game in town. Lever up as long as rates are low. Rates have been rising and now the question is what's gonna happen? There are those that think that we're going to tip back into deflation. That the economy [00:42:30] won't be able to get out of this liquidity trap that we've been stuck in. That we're in the rut of Japan. I've heard you take the opposite view. That you think there's actually an unrecognized level of risk that there will be inflation. And I think in that sense you kind of share much in common with Christopher Cole, who we've had on the show before. How would you respond to that and how does it affect your trading right now?

**Ari Paul:** So first let me say almost no one is good a global macro in traditional markets. There's almost no one in the world with a decent hit rate. In fact there's no one [00:43:00] in the world whose more than 70% on calling in straight direction. So the world's best bond traders, the world's best interest rate traders, they will readily admit that they are maybe a little better than a coin flip at calling in which way interest rates are

going to go, which way inflation is going to go. It's incredibly hard. So anything I say in that regard I offer humbly. But that is one of the reasons I got into cryptocurrency.

So, 2008 crisis hit. The U.S. Federal reserve started printing insane amounts of money. So the base money supply increased 4x. The amount of U.S. dollars circulating increased fourfold. And the reason that didn't produce big inflation was because the velocity of money fell [00:43:30] and lending rates by banks fell and borrowing demand by companies fell. But my thinking in 2009 was I'm a student of economic history and I know this is not going to immediately produce inflation. The deflationary impact of 2008 is gigantic. We also have things like automation that are deflationary in nature. They put downward pressure on wages.

**Demetri Kofinas:** Demographics too.

**Ari Paul:** Demographics. So I knew there wasn't going to be inflation any time soon. But at some point, this massive money printing, that isn't just the U.S., it's the world, is going to make me not want to own fiat. I'm not gonna want U.S. dollars or euros, or yen. And what do I want to own that can't be depreciated. That can't be printed [00:44:00] into oblivion. So that set me searching for something like Bitcoin that is supply constrained.

**Demetri Kofinas:** This is 2008. you were concerned about inflation at the time?

**Ari Paul:** Yeah, it was really 2009 I started thinking about it, but I knew that I had time. And I didn't call for inflation in 2009. In fact the opposite, I said there were people at the time saying the Fed just quadrupled the money supply-

**Demetri Kofinas:** Most definitely.

**Ari Paul:** So, I was smart enough to know that we had at least a couple years.

**Demetri Kofinas:** Can I ask you something about that, Ari. Because I remember that time very well and there were many people who were convinced we were gonna have inflation. What in your [00:44:30] personal education gave you the conviction that we were gonna have deflation?

**Ari Paul:** So to think that we're gonna have inflation, you really need a really simplistic economic model of basically money gets printed and that causes prices to go up. If you look at any kind of historical money printing episode in history, there were so many historical examples where a central bank printed tons of money, Japan is a classic, and failed to get inflation. So if you dive a little bit into why, you then see the importance of bank lending, demand for ... In fact, a huge part inflation is demand [00:45:00] driven. So the fact that banks are showering money on people is almost never enough. The fact that central banks are printing money is almost never enough to cause inflation. You need-

**Demetri Kofinas:** The multiplier.

**Ari Paul:** Laborers to waivers to demand higher wages reaches to be able to demand it and you need businesses to be borrowing. Yeah, you need to add multiplier.

**Demetri Kofinas:** You need the banking system to be able to create multiple above that base money. But go ahead, I just wanted to ask you about that.

**Ari Paul:** So I knew we had time, but I was starting to really look forward and think forward. There's a really important distinction here to be made here that there's no good academic way of distinguishing. People say "inflation" [00:45:30] or they say "currency depreciation". And if I say "currency depreciation" that implies versus something. So if I say the U.S. dollar is going to depreciate, the next question you should ask me is, against what? Do you mean the euro's going to go up? Do you mean the yen's gonna go up? And I actually say is my call, starting in 2010, which this will not happened yet but at some point, probably in a year or two or three, there's going to be massive, massive currency depreciation. Not against anything, any other currency.

So what does that mean? That means I thought the U.S. dollar, and the euro, and the yen were all going to depreciate relative to real assets. So [00:46:00] relative to real estate and commodities. And I think we've seen that. So, the kind of "bubble," air quotes, and basically everything is rallying. Stocks, real estate, commodities. And you look at treasury bonds, right? So in the U.S. we have somewhat reasonable interest rates but much of Europe as zero or negative interest rates.

You think of the absurdity of someone is paying the government of Germany to borrow their money for five or ten years.

**Demetri Kofinas:** I'm paying you to take my money.

**Ari Paul:** It's absurd to me that you have financial experts and heads of banks calling Bitcoin a bubble and not [00:46:30] calling paying someone to take your money a bubble. Like, that is such a clear bubble.

**Demetri Kofinas:** What you're saying a bubble here is the fiat system is a bubble, based on what you're saying.

**Ari Paul:** Yes. So what we've seen is ... and I think that is this mass currency depreciation that I think is going to accelerate. So what does that mean? So we're now at this weird point where people don't want to own fiat but stocks look pretty rich, real estate looks pretty rich. So what can rally without looking absurdly overpriced relative to currency? So I can tell you right now, I still like cryptocurrency, I still like gold. That's [00:47:00] kind of another bid on that.

**Demetri Kofinas:** Do you have a target for 2000. Do you think that we might see that in the next year? In gold?

**Ari Paul:** In the price of gold? I don't have exact price. Timing these things ... So slightly broader, the U.S. is under attack as global reserve currency. I think it's very likely to lose that status. Currency's getting knocked off their pedestal tends to take far longer than people expect. So you have really, really clearly unsustainable paradigms. Whether it's like the Bank of England when Soros broke the bank. People were calling for that five, ten years. What tends to happen in currencies is there's a really clear [00:47:30] dynamic. Everyone knows a peg's going to get broken. Traders give up on it. They try to make that bet one year after another and eventually they give up and it ends up happening ten years down the line.

So I'm wary of trying pick a time. There are a lot of people ... One of the reasons I'm bullish on gold right now is that ... For five years people have been bullish on gold for the same reasons I'm bullish on gold right now and they've almost given up. So the sentiment is people have just given up.

**Demetri Kofinas:** You've called ... Getting back to this sort of notion of ecology. A lot of alpha driven investors have also gotten really ... They've sort of died out of this ecosystem [00:48:00] because the beta has done so well. The market has done so well and if you've chased alpha, you've had a really hard time. So that makes sense, what you're saying.

Also, by the way, we had Robert Johnson on this show. You mention Soros and the trade. We talked about that trade. We talked about breaking the Bank of England.

So let's say we have recession. You're saying that in the midst of a recession, you don't expect to see a knock-on effect on asset prices?

**Ari Paul:** I think it will depend entirely on whether it's it inflationary or deflationary recession. So most recessions are deflationary. [00:48:30] Off the top of my head, I'll say 80%. I'm making up the number but certainly the vast majority, for good reason. It's not that easy to have an inflationary recession and I could see either happening.

In a deflationary recession, where the recession is basically global slowdown of growth, general wealth destruction, which could be caused by a lot of things. Could be caused by war, political turmoil, a general cyclical type recession, I expect all asset prices to be hurt. So I would expect cryptocurrency to be hurt at the margin.

Now a thing to understand with cryptocurrency is the idiosyncratic volatility is so gigantic. [00:49:00] For example, ceteris paribus, all things being equal, let's say we think that due to money flows cryptocurrency will 2x 2018. If you then tell me there's going to be a recession, then maybe I say it only goes up 20%. So I'm not saying it goes down because that correlation is pretty low. But all things being equal, if equities are down, probably cryptocurrency goes down. That relationship is very likely to strengthen over time.

So two years ago, the people who owned cryptocurrency, it was a Facebook engineer who look at the price once a day. Who had, maybe a couple hundred grand in Bitcoin and had a day job [00:49:30] and that wasn't a huge part of their portfolio, most likely. And so they

weren't rebalancing. They weren't saying "oh my Bitcoin's up, I'm going to sell some and buy equities." It was just kind of a hobby. It was a thing on the side.

As more institutional money flows in cryptocurrency you are going to see what you started see ... So before the call of 2004, commodities were not really part portfolios, for the most part. If they were, it was more in the equity sense. So people would own a stake in a gold mining company. They would own a stake in a natural gas driller. What happened in 2004 through 2006 was [00:50:00] suddenly commodities passive exposure to the actual physical commodity became kind of okay to have in a portfolio. So you had ETFs like USO and UNG that became gigantic. Pensions started passively owning crude oil.

And that changed the market dynamic, it changed the correlations. Because suddenly if a pension has 5% of their portfolio and crude oil and 95% in things that are highly correlated equities then what happens is when the 95% falls, they then rebalanced. So that causes them to sell crude oil. And they're price insensitive sellers. They're not [00:50:30] selling for normal reasons, they just push the price down because other stuff went down. Call it a wealth effect or rebalancing effect. So we don't see that that much yet in cryptocurrency. I think we will increasingly as crypto becomes part of institutional portfolios.

**Demetri Kofinas:** You know I could geek out with you on the macro stuff all day, but in the interest of time I wanna ask you more specifically, what sort of plays you think are most interesting in the space right? Are there things that you can share, that you're looking at? And are there any things that someone who's obviously not invested in a fund, doesn't [00:51:00] have a professional money manager managing their money, that they would look to do? And not just generally, but also specifically the crypto space?

**Ari Paul:** So my advice on this is pretty similar to when I used to have relatives ask me about trading equity options, which was my first role at Susquehanna. You don't want to compete against professionals at their own game. So I am my own portfolio, I don't buy individual equities because it's full time job. There are people that are world class at it who spend 80 hours a week doing nothing but stock picking. Why do I think I can beat them as a hobbyist. And [00:51:30] that's something I do have some expertise in. So why would someone want to play against me, picking individual crypt or actively trading cryptocurrencies, right?

It's not to say they can't make money, but it's just not an attractive game to be. It's not that I'm smarter than them but if you're a surgeon, you're a brilliant surgeon but you're doing surgery 60 hours a week. Well maybe you could be better than me at this but you're not doing it full time. There's a lot of pitfalls. There's lot of easy ways to lose a lot of money, whether it's exchange counterparty risk. Security failures where you have your coin stolen because you stored them improperly-

**Demetri Kofinas:** Those are huge.

**Ari Paul:** Outright scams. So a huge number of people right now are [00:52:00] losing money. A lot of them don't know they've lost it yet but it's lost. Buying into worthless ICO's,

initial point offerings. And I say they don't know it's loss because either that ICO has not become exchange listed so there is no market price, or there's a market price but no liquidity.

**Demetri Kofinas:** That's totally crazy. Do you think it's ... I mean to me this is a mania unlike anything I've seen. This isn't comparable to the late nineties where you actually had companies that had products and actually had revenue. Here in many cases, you don't even have a product demo. You have a piece of paper with some ideas [00:52:30] on it, and maybe some math if you're lucky. And you have people being able to raise billions of dollars from the market.

What accounts for that? How much of that do you think is also a reflection of the forces we were describing before, the low interest rates? And the high levels of wealth inequality and the fact that this offers the first opportunity for a whole generation of people to get exposure to that lottery ticket.

**Ari Paul:** Yeah, I think that last part is really critical. So part of this is a result of regulation [00:53:00] that precludes individuals who are not accredited investors from participating in venture capital. And so if you're that individual, the U.S. government is not allowing you access to something that could give you a 10x return. You are literally not allowed to participate in attractive investments.

**Demetri Kofinas:** Such a good point.

**Ari Paul:** So this may look attractive to you. Another thing I think a lot of this comes down to a really basic human psychology. So the ICO market is going to have nine lives. I expect it to collapse and be reborn and collapse and be reborn again. The reason is that it's incredibly attractive as a get rich quick scheme for [00:53:30] developers. And it's incredibly attractive as a get rich quick scheme for investors. Because it is a lottery ticket. And it's a lottery ticket that provides liquidity very, very quickly.

So what I think that's likely to happen is the regulators are starting to crack down increasingly. The current wave of ICO's, sooner or later you'll have a crash and you'll have a freeze. And it will be reborn in a slightly different form. So you're going to have actually correctly registered security offerings. It may be offered on decentralized exchanges based on locales that support. So for example, you may have development teams moving to where ever it is, Cayman Islands, Zug Switzerland or [00:54:00] wherever they feel safe doing it. And then they'll be able to sell those token on decentralized or they'll become listed on decentralized exchanges.

It's not to be easy to stamp this out and a lot of people are gonna lose money over the next three to five years

**Demetri Kofinas:** Before I read Chris Burniske's paper on the equation of exchange and then his book and then having him on the program and also ... I was looking really to understand where I felt. Where did I really put Bitcoin as a value proposition [00:54:30]

that it had an upside opportunity. That there was really something there and where did I rank Ethereum and these utility layer or the utility protocol and then the layer of DApps.

I actually, not to come out and say this, I'm sure they'll make a definitive statement here, but the one thing that I think actually think people don't see as risky enough is Ethereum. I actually think the really great opportunities is identifying teams that are building decentralized applications [00:55:00] that might be able to scale with a utility protocol that has not been invented yet or has not come out yet. So I think you can get exposure to some of those if you know what are doing. I think Bitcoin actually has a use case, but I don't know how to price it, as much as I've looked at it.

But I think Ethereum for me people are under appreciating the risk that it will be replaced as a foundational utility protocol. I wonder what you think of all that.

**Ari Paul:** Yes. [00:55:30] Okay so first let me say that no one knows anything. An amazing thing of cryptocurrency right now is, when you're valuing companies whether the VC or traditional perspective, there's at least a business there or a perspective business. And it's not winner take all. We're not gonna end up with a world with one company. Even within an area like social networking, you can both a LinkedIn and a Facebook, and you can even have more niches and you could have second place and third place winners.

With cryptocurrency a big question is, to what degree is this gonna look like a winner take all world? Are there going to be a 1000 valuable cryptocurrencies or 10? Is it gonna follow power law? Is it going to ... These are questions that are [00:56:00] fundamentally unknowable because there's a lot of individual pieces that you have to solve for. And some of those pieces ... Here's an example of something no one knows. We don't know there's a viable consensus system alternative to proof of work.

So Ethereum's looking to transition to prove of stake. You have things like Ripple that have distributed proof of stake. You have proof of space time, which is a project by Bram Cohen, creator of BitTorrent. They're all experiments, we honestly don't know. And there are some really phenomenal debates between the world's best cryptographers and blockchain engineers. New code is buggy. There's no way to know prior that [00:56:30] new code will not be buggy. And similarly, there's no way to know the new consensus system will be sound from a game theory perspective until there's billions of dollars on a line.

**Demetri Kofinas:** Now does that mean you're on the lookout? Do you have people in the fund who are actively looking for that?

**Ari Paul:** Yes. So a question that I ask pretty consistently is ... I like taking the Bayes' theorem approach. If you ask what could kill Bitcoin, and you ask a lot of the smartest Bitcoin developers, for example their answer's nothing. But these are some of the smartest people and they are great critical thinkers and so I need to get that information from them. So the way I frame it to [00:57:00] them as well as to myself is, let's play a game. Bayes' theorem, let say Bitcoin died, what killed it?

So my current answer I think is, it's either a consensus mechanism that provides greater security and decentralization at less cost, which we don't know if that exists but we can't say it doesn't. It won't be invented or maybe it's been invented and just not proven yet. And the other is governance mechanism. So Bitcoin has something that, I didn't invent the term but there's no formal term for it but a lot of people call it "governance by exit." And the idea is that, basically if you want to try and change Bitcoin, you have to hard fork and leave the existing chain.

[00:57:30] If you use proof of stake or use hybrid systems like Decred that uses proof of stake, proof of work hybrid that allow for voting. And the idea is that community can be a supermajority vote, majority vote. You can set the rules however you want. There is some way to change the existing code without requiring hard fork. We don't know if that's superior or not. It's kind of an open experiment, but is fundamentally different. It is truly differentiated.

So big picture and let me take a slight step back. Most cryptocurrencies are like seed stage VC investments. They're experiments, most will fail, like any new company. Most new companies fail. [00:58:00] The more ambitious they are, the more likely they are to fail. Doesn't mean it's not a good investment, doesn't mean it's not a good experiment. If I had a VC portfolio and I buy 20, I don't like the term "lottery ticket" because it implies that you just guessing but ... I make 20 bets on things that might kill Facebook. If one of those is a winner, I was a great investor.

Most cryptocurrencies, I think Ether included are VC style investments. Ethereum is competing on features. I think is an important point. Ethereum will not survive without sharding. Ethereum will not survive without ... So sharding is a way to scale a blockchain. Block sharding moves [00:58:30] computations off chain. Ethereum ultimately will need to support decentralize applications and to do that, it needs to work very differently than it works now.

So Ethereum in its current form will die. Everyone knows and accepts that, and the question is can Ethereum basically pivot ... I'm not using the language the team would use. A lot of people in crypto would object to the language I'm using. But my view is Ethereum is a great team, a great brand, a great development community. It's a little bit like Uber. Eventually we are gonna have self-driving cars. Whether Uber exists in 10 years or not depends on can they pivot to that new industry. And you can argue that they're in great position [00:59:00] to pivot and to remain a market leader. And I would probably agree. But if Uber survives, in 10 years it's gonna look nothing like what it looks today. And I think Ethereum is in the same boat.

So that mean Ethereum is ripe for disruption. It's very, very easy for someone to produce a better Ethereum that's better on all sorts of features that kills Ethereum. Bitcoin I think is the one exception, in the cryptocurrency world. I think it's not competing on features. Bitcoin is competing on longevity, stability, and security.

**Demetri Kofinas:** Network effect too.

**Ari Paul:** Network effect too. But it's important to note that less than 1% of the world uses cryptocurrency. So if Facebook launched Facebook coin, in [00:59:30] one day it would have greater network effects than Bitcoin has accumulated over a decade. So let me finish that thought because I think it's important. So the analogy I would use here is, Uber has to move fast and break things. Uber has to constantly innovate or it will die.

Lloyd's of London doesn't. So an ancient insurance company, it can be priced over its peers. It can have fewer features. It can be less accessible. It can have a worse UI. It will win because it is competing mostly on the fact that it's 100 years or whatever.

The same with a JP Morgan type. JP Morgan is not really competing on features. Basically, they can be behind all their competitors, as [01:00:00] long as it's not so, so much. Same with Coca-Cola. If someone come out with an exact replica of Coca-Cola under a different and it's five cents cheaper, it's not gonna kill Coke. Because Coke's not competing on price. If someone comes out Coca-Cola that's 90% cheaper, well maybe that will do it.

So when I look a Bitcoin it's ... There's a line from Naval Ravikant who's the CEO of AngelList, a of great thought leader in the space. And he said "All Bitcoin needs to do to win is survive." I don't know if that's true but I feel that's kind of the right mindset. And so I ask what could kill Bitcoin? Something with slightly lower fees isn't gonna do it. Something with 10x lower fees [01:00:30] isn't gonna do it. Something with 10x the transactional capacity isn't gonna do it. I think it's something ... If you can get the same security and decentralization with all 100x throughput or 1/100th the cost, that might do it.

**Demetri Kofinas:** Well it's also not clear if the throughput's really the issue here and that brings us back to what Chris has done and his work on velocity. Last question, this feeds back to into what could kill the Ethereum. Are you familiar with the Hashgraph protocol?

**Ari Paul:** Yeah, I actually just did a bit of a dive into it a week ago.

**Demetri Kofinas:** What do you think of it?

**Ari Paul:** So slightly more broadly, it's an implementation of a directed acyclic [01:01:00] graph. That's a technology that's been around for a while. Blockchains are terrible at many, many things. They are incredibly inefficient. They make no sense for anything like Internet of Things. They make no sense for your coffee to talk to your microwave. Directed acyclic graphs are incredibly useful and efficient for some things.

It's funny, blockchain has become almost a religious or political term. It has all these connotations. It's a database structure. At the end of the day, it's a database structure. And you can have a cryptocurrency that's based on many other database structures. Is the blockchain the best structure for a decentralized cryptocurrency? I think there's some evidence it's currently [01:01:30] the best we've ever seen. To say that nothing better will ever come along is a weirdly religious statement to me. The same with direct acyclic graph.

It seems like it's far better than blockchains for certain use cases that have nothing to do with what we probably care most about.

**Demetri Kofinas:** What do you think about the actual consensus protocol? Forget the fact that it's a DAG. It's actual consensus protocol. I've interviewed Leemon Baird twice, I bring this up because we've actually cover this on the program. I put on a panel in New York in October and I had Leemon on in September and so I've covered this. And I've had [01:02:00] the team I had Mance, the CEO on the panel as well. And it's a protocol that I found extremely impressive and extremely promising. Of course, they need to scale it as a public ledger. But I think it there are very interesting ways to do that.

**Ari Paul:** So I think it's really important to distinguish technologies from investments, especially when we're dealing with the open source world. So the engineers behind Hashgraph brilliant, there's no question. That's not something I can even comment on. So when I say they're brilliant, it's not even me saying they're brilliant. What I'm saying is [01:02:30] other engineers in the space that I respect have told me that their brilliant. I can't talk to them and say whether they're more or less brilliant than Vitalik. I'm not that level. It would be like me judging that of the two best neurosurgeons in the world are actually best, right? I can't, right?

So I can tell you there's consensus among engineers that it's a great team, a brilliant team. They've been very innovative. They've invented new engineering, new cryptography. So here are the downsides to investment. So there is a private company behind it that holds patents and so there's a real question over, really over the applications and use case. So if we think ... How valuable can a database structure [01:03:00] be? And where does the value really come from? So let me take the extreme example. So what they have with Hashgraph is an extremely efficient database structure potentially for communicating information. Ultimately, it's all information. Transferring money is transferring information.

I can do that on one server. So I can beat Hashgraph on throughput on myself. I can literally go home and beat Hashgraph on throughput by running on a centralized server. Same with any other product, I can beat Ripple on throughput, I can beat Neo on throughput by running on one server. So what is the value proposition here? So basically, there's a spectrum of decentralization. [01:03:30] Any time you move away from one single server, you're going to lose some efficiency in some form, right?

So at one end of the extreme you have Bitcoin, which is on about 12,000 public nodes. There's a bunch more listening nodes. Incredibly inefficient architecture but what we get from that is, of what we've seen of the database architecture is the most secure, the most transparent that exists right. And then there's projects like Ripple or Neo that are somewhere on the spectrum so they're not fully centralized, they're not fully decentralized and that might be a really happy medium for a lot of use cases.

So the analogy I really like using is insurance. [01:04:00] I don't need \$1,000,000,000 of insurance on my quarter of a million dollar house. It makes no sense. There's no extra value for me paying that insurance premium. Similarly, why do we pay 2% or more per credit

card transaction. It's not because it's hard to transmit the information. You're paying for mostly insurance. You're paying fraud protection is one of the biggest pieces. Well I don't need fraud protection for buying Coca-Cola.

So what I'm saying is, on that spectrum there are a lot of use cases for which a semi-centralized cryptocurrency makes tons and tons of sense. However, as you can really towards the centralized, you're then competed against Amazon cloud services. And I'm skeptical [01:04:30] that a technology is going to be very, very valuable competing against Amazon cloud services. So you need a, to beat Amazon cloud services you need ... It's a giant business. So they have patents, they have some IP, which a lot of ... There are a lot of cryptocurrencies with zero IP. They're open source, they're forkable. So when all there is a code and there's no network effects and people are like this thing's worth a billion dollars, my answer is well I can literally just copy it. And you have no network effect and I have no network effects. So how is your thing worth a billion? That makes no sense to me. So Hashgraph to me is ... The challenge they're going to face is, okay it's a great [01:05:00] technology, but if someone can implement anything similar. If they can get around the patents, they can violate the patents, if they can find a way to do something similar...

**Demetri Kofinas:** That's a great point.

**Ari Paul:** And the problem is because its centralized. Because it's owned by company they're going to have to be really smart about incentivizing developers to work on them and adopt them.

**Demetri Kofinas:** Great point also. The second point is one that I've thought of before. The first one I haven't thought of. I've thought about it a bit in terms of China, where there could be Chinese developers who just don't have any reason to adhere to the patent. I think that's a really interesting thing about violate. But just [01:05:30] from a technology standpoint, and we'll leave it there just because we're running so much at a time Ari, is I am very excited to see how they try and scale it. I think that it could offer a more amenable consensus protocol for things like proof of stake or alternative ways of scaling a public ledger.

So just the sort of curious person in me is very interested and I think it's really just something I've been watching and will continue to watch.

Ari this was freaking great. I wish we had more time. I really could have just talk [01:06:00] to you for another hour. You're super smart, you're a super creative guy and I wish you the best success with your fund and I appreciate you very much for coming onto the program.

**Ari Paul:** Thanks so much for having me.

**Demetri Kofinas:** And that was my episode with Ari Paul. I want to thank Ari for being on my program. Today's episode was produced by me and edited by Stylianos Nicolaou. For more episodes, you can check out our website at [HiddenForces.io](https://HiddenForces.io). Join the conversation

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