The JPMCC Panel on Cryptocurrencies

Yosef Bonaparte, Ph.D.
Program Director, J.P. Morgan Center for Commodities (JPMCC), and Associate Professor of Finance, University of Colorado Denver Business School

Bill Sinclair
Former Chief Technology Officer, Interim President and CEO, SALT

Andrei Kirilenko, Ph.D.
Director, Centre for Global Finance and Technology, Imperial College Business School (U.K.)[1]

Colin Fenton
Managing Partner and Head of Research, Blacklight Research LLC and Co-Chair, JPMCC Advisory Council[1]

Introduction

On March 6, 2019, the JPMCC was honored to host three experts on cryptocurrencies during a panel presentation organized by the JPMCC Program Director, Dr. Yosef Bonaparte. This article recounts the insights of Mr. Bill Sinclair, formerly of SALT; Dr. Andrei Kirilenko of Imperial College (U.K.); and Mr. Colin Fenton of Blacklight Research during their respective presentations.

Dr. Yosef Bonaparte, Ph.D., the JPMCC Program Director and Associate Professor of Finance at the University of Colorado Denver Business School, organized and moderated the JPMCC's industry panel on cryptocurrencies.

Some of the panelists' insights rely on prior knowledge of cryptoassets, blockchain, and tokenized securities. For a primer on cryptocurrencies, please see the *GCARD* article, "Cryptocurrencies, Bitcoin and Blockchain: An Educational Piece on How They Work" (in the Winter 2018 issue.) In addition, for a primer on blockchain technology, please see the *GCARD* article, "Blockchain and Financial Innovation" (in the Summer 2019 issue.) Also, for a primer on tokenized securities, please see the *GCARD* article, "Digital Assets: The Era of Tokenized Securities" (in the Summer 2019 issue.)

We will now cover the panelists' views on cryptocurrencies in the order of their presentations.

Bill Sinclair

"Usually the knowledge and ownership of cryptocurrencies is directly proportionate to the lack of gray hair. I happen to be one of the older gray hairs of my organization; that is changing as the adoption of cryptocurrencies is increasing.

I'm going to give you a brief overview of crypto in general. While most of you have heard of it, blockchain and cryptocurrencies are used rather interchangeably. In some cases they are and in many cases they are not. I think it's important to have a baseline for our conversation today. Essentially, blockchains are distributed ledgers.

On top of blockchains, you have cryptocurrencies, which are essentially mediums of exchange or stores of asset value. The most famous one of course is Bitcoin, but since then we have had a number of other ones. The important thing about cryptocurrencies is that they are highly divisible, transparent and available to anyone and everyone. They can be energy intensive at times depending on their consensus mechanism, and are usually decentralized. Some of the newer ones are more centralized, but Bitcoin specifically is not.

Some benefits of blockchain include increased divisibility and reduced transaction costs; obviously these fluctuate with demand. In some cases, they operate for free. They are irrevocable, and they allow us to minimize fraud and enhance our audit capabilities. People talk about cryptocurrencies being used for all sorts of nefarious reasons. The fact of the matter is that for most blockchains out there and cryptocurrencies, transaction history tracing is very simple. Much easier than, say, suitcases full of cash, for instance. Far more fraud is conducted on a percentage basis and obviously on an actual basis in the traditional fiat world than cryptocurrencies and blockchain.

Regarding the different types of digital assets, we have transactional assets such as Bitcoin, and we have utility tokens. SALT specifically operates in that world. There are also security tokens. And then we have platforms where you can actually build the blockchain technology or build use cases on top of this technology.

We are seeing more interest from traditional financial institutions. The most recent one and probably the most famous one in recent years is J.P. Morgan launching their own stable coin designed to reduce the amount of wiring in the wholesale markets. They transact on $5 trillion per day in wholesale markets, and all of that is being handled with wire transfers, which is very inefficient. So they decided they

wanted to launch their own stable coin to essentially handle transaction settlements between wholesalers. This is pretty exciting.

I think we will talk a little bit today about government and regulatory issues. These are challenging times if you are in the cryptocurrency space. There is some regulatory guidance. For example, Ethereum and Bitcoin have squarely fallen into the commodities definition. There are other tokens that are being deemed or treated as securities, then others as utilities.

Colorado is actually becoming a blockchain hub. Our previous governor and our current governor have both invested heavily into making the state a standout in the blockchain space. We've had a number of companies start-up here. Some of the more famous ones include SALT. On the top of that list is ShapeShift, which is a famous digital asset exchange. One of SALT's founders is actually on the governor's blockchain council, which led to some recent legislation that was passed about how to create utility tokens that are exempt from Colorado securities laws. This was groundbreaking legislation.

I will conclude with a brief description of SALT. The company has over 60,000 registered users, and is an asset-based lending platform. So essentially people deposit their cryptographic assets with SALT, which takes custody of them, and then SALT lends them fiat currencies. The firm serves crypto-revenue dominated companies like miners and exchanges; the company also serves high net-worth individuals, hedge funds, and other types of institutions. All to provide them liquidity for their blockchain assets. SALT has never lost a dollar of principal in over 14 months of operation. The nice thing about cryptographic assets is that there is a 24-hour market for them all over the world. SALT is growing very rapidly and is very much a software company."

Andrei Kirilenko, Ph.D.

"My career lies at the intersection of finance, technology and regulation. I am a classically trained financial economist; I was trained at Wharton. I have worked as a professor at MIT in finance, [and] I am [now] a professor of finance at Imperial College, … both [of which] … are technology schools. I am [also] a former regulator. During the aftermath of the Global Financial Crisis, I was the chief economist at the U.S. Commodity Futures Trading Commission. ... Technology-wise, a lot of the work that I've done … is primarily in academic finance, … [including] how digital technology changes finance. …

[In the past,] I overlooked a very important aspect of this digital technology – blockchain. As I started looking more and more into the blockchain, and again as you were told, cryptocurrenices and cryptoassets exist on a blockchain, but the blockchain *per se* can be applied … [in other ways.] Cryptoassets and crypto tokens are just one way [that] … blockchain can be used. And blockchain again is a type of database with a consensus mechanism, meaning that it could be distributed. …

In … [a] database, there are three primary functions: … who can read, who can write, and who can edit. The consensus mechanism decides in a way what determines who can read, who can write, and who can edit. What you read, write, and edit is then the subject of whatever this technology does. It could be transactions; it could be records; it could be other things.

Dr. Andrei Kirilenko, Ph.D., Director of the Centre for Global Finance and Technology at Imperial College Business School (U.K.), participated in the JPMCC's expert panel on cryptocurrencies.

A very important part of it, that took me a few years to understand, is that blockchain is a technology that enables the creation of scarcity in the digital domain. It is very difficult to create scarcity in the digital domain because digital objects could be copied infinitely many times. And exact copies of these digital objects can be created. This means that scarcity is very elusive. You can transmit a lot of things; you can make a lot of copies; you can try to protect it; [and] you can create databases. … But blockchain for the first time creates scarcity. Once you create scarcity [for] a digital object, … this digital object can no longer just be replicated and presented as a replica. It exists in the database, [and] only that is the true verifiable object. [The object is] digital in nature, meaning that it never existed in a physical space in the first place. That's where economics kicks in. Once something becomes scarce, it can have value. But that value can be risky. That value can fluctuate. You can have value and risk associated with the digital object, which are the characteristics of an asset – an intangible digitally-native asset. Digitally native objects are very interesting. They can be transmitted with very low frictions. … There is a lot of development, as it turns out, [of] about 30 to 40 years of applied math and cryptography that went into the creation of this digital object.

So once I started looking into that, naturally I started thinking of what does this resemble to me. And what this resembles to me, for the most part, is commodities. In fact, under the existing definition of commodities, cryptocurrencies could be described and fully fit under the existing definition of commodities under the Commodity Exchange Act. You don't need to create any specific regulatory environment for it. It's scarce; it is used for some economic or financial gain; it could be transmitted;

[and] ownership could be changed and so forth. Then the next questions that emerged [were as follows]: 'Is there something more than a digital commodity? Is there something that we can learn from commodities to think about cryptoassets?'

I think one of the important things that I learned from being a regulator is that I've seen firsthand, if you will, when the commodities market started … becoming 'financialized.' Financial investors [who were] only interested in financial gains started moving into commodities and in particular, commodity futures. Things started really changing. … All of a sudden you see booms and busts. You've seen volatility and … a presence of investors who … are different. … They go in and out; they are interested in using it as an asset class [as opposed to analyzing each commodity's fundamentals.] We are seeing cryptoassets experiencing that. … To me it is a natural process. A lot of people may … [see the volatility as] difficult and traumatic, but I've seen it happen before. It is a natural part of something maturing, potentially, as an asset class.

But I would also like to say is that I've heard a lot of things said in the past, and I have repeated them myself, without fully understanding … [the technology's implications.] … [It was] only … about … six months ago [when] I started coding on a blockchain … [that] I start[ed] really understanding what it is and how it really makes you rethink everything.

I judged at a hackathon in London, and the winner of the hackathon [was] … one of the … four providers of enterprise blockchain solutions, [which, in turn, are] Ethereum, Hyperledger, Corda for financial services, and a company called Digital Asset. Digital Asset is the company that won. It is a large start-up. I really like their solutions, and I asked them if they could train myself and my staff the next time they were in London about how to code, using their modeling methods, on the blockchain. And really things changed once you start doing that; you start understanding. The first thing we did [was] we coded money on a blockchain. [One has to figure out] who issues money, how it is transferred, who was potentially double-spending, how you introduce agents, where it was held, and all of that. And it really changes the way you think about things. We started creating … financial accounts. We started coding financial instruments. And all of a sudden, we started realizing that it really is the future, and that is how things should be done because the costs and frictions really become minimal, and we can create on top of the blockchain, lots and lots of different solutions; [that is,] … once the regulatory and other problems are solved. …"

Colin Fenton

"I am going to draw from some illustrative research done by J.P. Morgan and make some comments. But first: 'How many of you were over the age of 12 in 1999?' I ask that because that was the last time we had what we all agree was a bubble, a tech bubble. And a lot of people look at a chart of the market cap for cryptocurrencies or the price itself. They see a big parabolic move up and a big parabolic move down and their mind goes to the financial history. We are at a stage in time when most people who are commenting did not actually live through the tech bubble, let alone what happened in the 1620's in the tulip market. It's really important to recognize that this is much more like what happened with Nasdaq, rising and falling and then coming back and we still have the internet today. I am sure all of you have

smartphones and you all have apps and you are still using the internet. It is a totally non-existent parallel to compare the tulip mania with cryptocurrencies.

Mr. Colin Fenton, Managing Partner and Head of Research, Blacklight Research LLC, also participated in the JPMCC's expert panel on cryptocurrencies.

When you see people trying to superimpose a chart of cryptocurrency values on tulip prices, just be aware of that. I also want you to look at this data sourced from J.P. Morgan, which I think is interesting: 97% of all Bitcoin wallets have one coin or less. We can see all the data. You can go to the internet right now and get a whole mapping of all of the wallets. There are people out there with a lot of coins in their wallets, but most of us have few. I should disclose that I actually invested in Bitcoin in 2015, and I still have most of my Bitcoin. I did get out of part of my Bitcoin investment to make sure I had a profit. We now also have futures exchanges with contracts that can be used to bet against the price of Bitcoin. That's really interesting because now you have a two-way market, and you have a really liquid way to use the commodity mechanism we are all familiar with to get price transparency. You have a derivative that provides additional liquidity that we didn't have until recently. We also are able to see how much it costs to produce Bitcoin. We can start to create cash cost curves as we do with gold, and copper and oil and other commodities.

We can see how much it costs to produce 50% of the Bitcoin. It's a little above $2,000, according to J.P. Morgan research from the 4th quarter of 2018. We can see on the high-cost side, it cost about $10,000 per coin. So there is a way to link a physical commodity, electricity, to the value of this product. In 1620, they were planting tulip bulbs in the ground, and there was no such mechanism. It truly was: 'I really

hope it comes out pink because that's what I promised the buyer. I really hope it doesn't get too cold.' You were tied to an individual tulip. That's not a commodity, really, right? That's a specific product. It's like owning a specific Stradivarius violin or a specific Monet. Bitcoins are commodities; gold is a commodity, and so on. In the first quarter of 2017, the average low-cost Chinese mining cost, according to J.P. Morgan, was $183. By the fourth quarter it was $850. So you were told to pay attention to the price, this parabolic movement. I want you to pay attention to that average price rising because there is a fixed supply of Bitcoin and now until the middle part of the 22nd century, it is going to cost something to produce this stuff. So there is a sustainability here that has often gone unrecognized. And finally, in terms of the Bitcoin price charts, I want to point out that a lot of people have said: 'it's a bubble;' 'it makes no sense;' 'it's going to go away;' 'Bitcoin is dead.'

I thought this was interesting. J.P. Morgan took the price of Bitcoin and superimposed it on the NASDAQ in the 1990s, on the Nikkei in the 1980s, and on gold, which is the longest chart of the three. I will make two observations. The first is that the first impulse buyer of Bitcoin looks a lot like the first movement of gold in the 1970s. But there was a second bull market for gold in the 1970s that a lot of people tend to forget about, and that's when you got that much higher price. And so it would not surprise me at all to see, after a period of consolidation here, that there is another even more frenzied manic bull market in Bitcoin.

We have all the financial authorities in the world such as the IMF and the BIS writing papers and unwittingly giving us data that shows that putting 1% or 2% of your portfolio into a cryptoasset actually improves the characteristics of an investment portfolio. You are going to find that more and more people are going to say wait a minute, 'Maybe I should do that. Why do I have gold when I could have this cryptoasset? Why do I have the GSCI total return swap when it's so much easier for me to not go to a broker or an exchange? I can just pull out my phone, go to Coinbase and trade the product.'

So that is the backdrop just to orient you, and I will conclude with an argument that Bitcoin is a viable investment strategy as long as you don't put a fork in it. If you're familiar with this market, it has a big supply, but repeatedly Bitcoin has been warped into other products. The problem with that is that you lose the scarcity. There is no longer, at least in the universe of Bitcoin-like things, scarcity; Bitcoin itself though still has the same fixed amount. So I would argue that the proponents see the libertarian aspects of this asset. They see disintermediation of governments and central banks. It is an anti-elitist worldview. Proponents want you to have the power to set money supply and value, and not a committee of central bankers in Washington, Brussels or elsewhere. But on the other side, critics see a financial mania, a Ponzi scheme, and a funding mechanism for criminal activity. Now how many rap songs have you heard about the 'Benjamins'? Cash has a lot of criminal activity attached to it as well.

So here are the three benefits. First, as far as I see it, think of it as a cryptoasset not a cryptocurrency. It is a bet against perpetual debt. What's the flavor of the day? Modern monetary theory [MMT]: this idea that deficits don't matter. Well, if deficits don't matter, why do we tax anyone? Let's get rid of all taxes if deficits don't matter. You can see the problem with this argument. At some point somebody actually owns the debt. And they are staring at you, and they have got to decide whether to trust you to have the capacity to pay them back. So MMT is being spoon-fed into the marketplace and is going to die because it is clear that the people who are making this argument don't understand how bond markets

work. Bond traders do actually understand the bond market and especially the people in China who own 3 trillion dollars in U.S. Treasuries. They are fully aware of the risk of MMT. Cryptoassets are a hedge against inflation.

I would argue that when we saw that parabolic movement in Bitcoin, don't think of it as an inflated asset. View that price move as a curtain that got pulled. And you saw very wealthy people's opinion about negative interest rate policy. They were telling you that the true value of the dollar, the euro, and other fiat currencies was much less than you were led to believe because there is a consequence for punishing the savers to reward the risk-takers. They were basically saying, 'I would rather put half a billion dollars into this digital asset than to leave it in a sovereign debt instrument where I am guaranteed a loss. In the latter case, they are going to literally punish me for putting on the trade.' And if you have billions of dollars you can start investing in a cryptocurrency with hundreds of millions of dollars.

The second benefit is that Bitcoin is a haven against despots and tyrannical confiscation of wealth. Think about what is happening in Venezuela right now. It's very easy for investment bank analysts in New York and London to pooh-pooh these digital currencies when they have the rule of law and the sanctity of contracts. They have the security of knowing you can walk down the street in most circumstances and go about your life. You can't do that in Venezuela. There is clear confiscation of wealth. So you have an incentive here to find disintermediation whether it's tyrannical or despotical that either overtakes your wealth or indirectly takes your wealth through mismanagement of the resources in society.

There is a third benefit and that is Bitcoin is insurance against catastrophe. I am always amused when I hear a gold bug say, 'Well, I own physical gold. I am here in London, and my gold is in Switzerland.' That is going to be problematic going into a post-apocalyptic world, and you have to travel across a lot of water and land to go get your coins to trade them in these post-apocalyptic trades. You have to really have a sense that you can port the digital asset, and you really can hoard these cryptoassets in a way you could never do with gold coins or silver. It's true: there are problems using Bitcoin to buy $2 coffee; as such, transaction costs make some of the peer-to-peer payments not practical. But if you did have a problem with the payment system worldwide, you can really move a lot of capital around the world.

Finally, let me just say that we hear a lot of stories and complaints that Bitcoin and cryptoassets are going to break the internet, or going to break electricity limits. I mentioned the story of the Dutch tulips, and the idea they are not backed by any kind of intrinsic value. But on the electricity point, when I ask the question: 'Do any of you know the temperature at which gold melts?' 1,948 degrees. Copper is even higher at 1,984. So when you think about digital assets versus physical gold and physical copper, these metallic monies that literally have to go through processing where we melt rocks and form them into these bars: that uses a lot of electricity, too.

It's true that maybe as much as 1% of global electricity consumption has been directed towards these crypto use applications. And what will happen is that society will demand a growing share of electrical power in order to give us the utility of the distributed ledger, not just for a store of value in cryptoassets, but for all of these useful applications in tracking commodity goods through supply chains and having a very accessible and verifiable system.

So, for me, it makes sense for many institutional investors to look at a central bank policy that promises you that there could be a 1-2% deterioration in the real value of your portfolio through targeted inflation. Ask yourself, 'Well if I put 1% into a cryptoasset, there's a pretty good chance that it doubles at some point, particularly in a hostile market, as defined in the financial markets, so that's a pretty good hedge.' You will find that institutional investors will eventually come around to that argument in the same way that there was financialization of the commodity markets through total return swaps such as the Goldman Sachs Commodity Index. That would be one of the benefits to your own retirement account. You won't trade it; you'll just let it sit there as a form of portfolio diversification."

Conclusion

The JPMCC is grateful to the cryptocurrency experts for their insights on this innovative asset and for their permission to quote from their presentations. As for the *GCARD*, we look forward to providing additional insights on this topic in future issues.

Endnotes

1 These were the respective positions of the panelists as of March 2019.

This article was transcribed and lightly edited by Hilary Till, Katherine Farren, and Meghan Nemechek. For further coverage of cryptoassets and blockchain, the reader is invited to read past *GCARD* articles on these markets and technology.

Of note is that this article does not necessarily represent the views of the JPMCC, its sponsors, or donors. The article is for educational purposes only and should not be construed as investment advice or an offer or solicitation to buy or sell securities or other financial instruments.

Participant Biographies

YOSEF BONAPARTE, Ph.D.
Program Director, J.P. Morgan Center for Commodities, and Associate Professor of Finance, University of Colorado Denver Business School

Dr. Yosef Bonaparte is the Program Director at the J.P. Morgan Center for Commodities at the University of Colorado Denver Business School, and Associate Professor of Finance, University of Colorado Denver Business School. Dr. Bonaparte graduated from the University of Texas at Austin in 2008 with his dissertation, "Essays in Dynamic Household Finance with Heterogeneous Agents." His main research interest is in portfolio choice and asset pricing. In particular, he examines how the political climate and political affiliation influence portfolio choice and the stock market in general. One of his asset pricing papers is forthcoming in the *Journal of Monetary Economics*, and one behavioral finance article is forthcoming in the *Journal of Financial Economics*. His work has also been cited in top media outlets, including the *Wall Street Journal*, the *New York Times*, ABC, CNBC, *MarketWatch*, and at a top Israeli cable program.

BILL SINCLAIR
Former Chief Technology Officer, Interim President and CEO, SALT

Bill Sinclair has over 20 years of experience in technology and software. He has managed software development teams, IT departments and executed global strategies across industries including finance, energy, Internet of Things (IoT) and blockchain. Mr. Sinclair's domain expertise in the energy industry guided Agelio Networks and the development of MineralFile, a patented SaaS platform for revenue tracking and land management in the oil and gas industry. He sold MineralFile to NeoFirma in 2014. Mr. Sinclair later joined Cartasite as Chief Technology Officer where he aided the company

in securing multiple funding rounds, established product management organization, and managed both the product management and engineering teams. Cartasite was later purchased by GeoForce.

In 2018, Mr. Sinclair joined SALT as Chief Technology Officer to manage development of a blockchain lending and custody platform. After the platform launched successfully, he occupied the role of Interim President and CEO before leaving in 2019 to pursue a new opportunity. An early adopter of blockchain technology and cryptocurrency, Mr. Sinclair has significant experience in mining, programming, and developing technology solutions in the space.

ANDREI KIRILENKO, Ph.D.
Director, Centre for Global Finance and Technology, Imperial College Business School (U.K.)

Dr. Andrei Kirilenko is the Director of the Centre for Global Finance and Technology and a visiting Professor of Finance at the Imperial College Business School. He is also a Research Fellow in the Financial Economics Programme of the Centre for Economic Policy Research (CEPR). Prior to joining Imperial in August 2015, he was a Professor of the Practice of Finance at MIT Sloan and Co-Director of the MIT Center for Finance and Policy. Prior to MIT, Professor Kirilenko served as chief economist of the U.S. Commodity Futures Trading Commission (CFTC) between December 2010 and December 2012.

In addition, Dr. Kirilenko was the winner of the Best Paper Award at the JPMCC's 2nd International Commodity Symposium.

COLIN FENTON
Managing Partner and Head of Research, Blacklight Research LLC

Colin Fenton is the managing partner and head of research at Blacklight Research LLC, a strategic adviser to senior leaders of corporations, institutional investment firms, and sovereign governments. Previously, Colin was managing director at J.P. Morgan Chase & Co., where he served as global head of commodities research and chief commodities strategist.