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The Growth & Regulatory Challenges of Decentralized Finance

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to hold more events like this one featuring our chapter authors and others who are interested in speaking about blockchain in the law, so please let us know if you're interested in participating in that adventure.

PRESENTATION 1: AARON WRIGHT—THE GROWTH & REGULATORY CHALLENGES OF DECENTRALIZED FINANCE

SETH ORANBURG: With that, I'd love to turn this presentation over to Professor Aaron Wright for his perspectives on decentralized finance.

AARON WRIGHT: Thanks so much, Seth, and thanks for the great introduction. My name's Aaron Wright. I'm a clinical professor at Cardozo Law School and director of Cardozo's Blockchain Project. Just give me a second to share my screen and then we'll get moving. So, Seth started with, I think, a great introduction about blockchain technology. Many folks may have heard about Bitcoin and roughly understand how it works. One way to think about Bitcoin is it's a decentralized payment system, kind of like a decentralized central bank, and that's an analogy that folks have used.

Over the past year, we've really seen a whole new category of blockchain technology emerge and what it's really and squarely focused on is decentralizing other forms of financial services. So I'm going to run through this quickly. I may go pretty fast. The whole presentation is here. But decentralized finance, affectionately known by many in the blockchain ecosystem as "DeFi," is a fast growing sector. It used to be the fastest—probably NFTs, which Seth also mentioned in the introduction, are growing faster at this point. And what they're doing is that they're using smart contracts, or small little bits of code that operate on a blockchain, most often on the Ethereum blockchain, to create financial services and other products that are non–custodial in nature.

So instead of having some centralized intermediary that's facilitating a financial service or product, they're just relying on these automated smart contract–based systems to do that. And ideally, they don't rely on one central party, but in practice, some do. But I think over the longer arc and increasingly, you're going to see core aspects of what we see down in Wall Street, or other parts of the globe when it relates to financial

services, managed increasingly by these automated software–based systems. As Angela knows, who is going to speak, the lexicon and the use of phrases in blockchain technology, are often mystifying and often inaccurate, but there's some words that you may increasingly see, especially if you begin to dig in.

DeFi applications are often administered via online portals, often referred to as "dApps," they're supported by individuals that pool together their assets into a liquidity pool, and those that deposit assets into a liquidity pool are referred to as "locking their assets" and often earn fees and/or automatically receive other digital assets also known as "governance tokens." The practice of submitting these assets to DeFi protocol is increasingly referred to as "liquidity mining" and the process of earning fees under governance tokens is referred to as "yield farming." So I just wanted to lay down that foundation because I'm going to use some of those terms throughout the rest of the presentation.

This is a big deal and this number should be updated, it's actually $55 billion. There's about $55 billion of total locked assets in DeFi up from about $1 billion at the beginning of this year. What's really interesting between it is that there's a dynamic emerging between Bitcoin, the grandfather of all digital assets, whereby Bitcoin is being locked into decentralized finance and earning a yield. So for the first time, we have a closed loop system where digital assets can create a return in other digital assets, and I think that's particularly notable. So it's growing super fast and it's also creating this closed loop system which has the potential to grow rapidly.

There are lots of different areas of decentralized finance, just like the financial services industry. I'm going to highlight some, but there are many more that are coming down the pipeline. The kind of the core engine of decentralized finance are DEXes, or decentralized exchanges, which operate a little bit like the New York Stock Exchange or NASDAQ or some other exchange, but without a centralized custodian. There are borrowing and lending protocols that are emerging. Oftentimes, they generate a stable asset known as a "stablecoin." There are more advanced derivatives and synthetic asset protocols, insurance protocols, and other market protocols like prediction markets. On top of all of these different smart contract–based systems, we're starting to see aggregation tools, so

DEX aggregators and yield and asset management protocols. So going back to the way Seth, when he was referring to JP Morgan at the beginning of the program, you can start to see that a lot of these other core functions of the financial services industry are beginning to get filled in.

One way to conceptualize this if you're a little bit more visual is to think about what's emerging in this schema. You have a core blockchain, which is being used as a settlement layer. You're seeing smart contract–based protocols that are emerging on top dealing with these core functions: borrowing, lending, DEXes, etc. Many of these core protocols spit out or rely on other tokens or other assets, including governance tokens, stablecoins, or depend on wrapped assets. And then there's an aggregation layer that's emerging on top. Plugging into this are crypto–to–fiat gateways (those could be centralized exchanges or other services), Oracle services (which are data services—you can think of them as a little bit like Bloomberg, KYC, and identity solutions, which are fast coming, although not here yet), and then token factories (which generate various different things).

Lots of potential benefits that are cited by the developers here: lower cost, greater accessibility, permissionless access, financial inclusion. One notable one, which is really coming into focus, is all of these systems talk to one another. So today, we've got lots of legacy financial infrastructure that the banks or other financial services participants have created. They don't talk well to one another. They were built in an earlier era of computing. Lots of challenges with getting them to be able to work with one another and transmit information to one another. Because this is all being rebuilt with the ground up and 50 plus years of computer science behind it, all these systems have the ability to interact and talk to one another. Great opportunities with that, great risks, as I'm sure some of the other speakers may highlight.

Also, some interesting ideas about having community–run financial infrastructure, which I think goes to Seth's point also at the beginning. Lots of blockchain technology has a veneer of trying to improve the financial services industry and some of the dangers that we saw in 2008. One idea here is to actually have greater and broader stakeholders support them and potentially higher degrees of security. At the same time, lots of problems, right? Really hard to use this stuff—it feels very

much like the early Internet if you remember that. There's a lot of leverage that's getting introduced to the system which creates risks. As many regulators know, runs on liquidity, entropy, and complexity that can be created by this composability. And obviously, what's most relevant to us lawyers are regulatory questions.

So I just wanted to kind of run through and unpack a couple of these and then highlight at least how I think some of the regulatory approaches to DeFi may shift a bit. So DEXes are really, really interesting. They rely on a formula and underlying smart contracts to be able to enable folks to trade digital assets without using an order book. I think that that's pretty notable for most markets. I imagine from the time we set up underneath the buttonwood tree to today, there was some order book or order book-like system that was created.

DEXes operate a little bit differently. They pull together assets through a liquidity pool and that lessens the need for an order book. We may see order books kind of appended onto this, but it lessens the need for it. There was no central administrator of that pool. It's maintained by the smart contract. It's open and permissionless, which means that anyone can list a digital asset for exchange to anybody around the globe. And these smart contracts are "alegal." So not illegal, but alegal— they don't necessarily incorporate regulatory compliance.

Pricing on DEXes is accomplished entirely algorithmically. The way it works is that you're making a trade with a pool of assets. So it's not a peer–to–peer trade, it's a pool–to–peer trade. So people pool assets and you're able to get another asset back nearly instantaneously with a pricing that's automatically generated without the need to be matched to a counterparty, which is interesting. At least as of today, the larger an order or a trade relative to the size of the liquidity pool underneath it, the worse rate people receive. Thus, the goal is for many of these AMMs to build very, very large pools of liquidity. And at least looking at more mature markets, they're not even close to that yet.

Pricing is maintained in an interesting way. It assumes kind of where the market is today, that there's going to be algorithmic arbitragers that are going to profit on any price disparities between centralized exchanges and decentralized exchanges, and there's a number of decentralized exchanges. We've seen some large financial services companies emerge

that basically engage in this arbitrage. And also, to incentivize people to provide liquidity, the smart contracts award the providers with fees and governance tokens with the right to kind of manage the smart contract set up. Unlike other financial services companies, because all the activity is occurring on an underlying smart contract, people can access and interact with the smart contracts from a whole bunch of different front ends.

Uniswap, which is a notable decentralized exchange, has about 50,000 different, separately, independently run portals that enable you to interact with it. So imagine if JP Morgan, to use an example, had 50,000 different sites to interact with it. Some of these systems are hosted by the original smart contract developers, others are hosted and increasingly will be hosted on decentralized file storage solutions that are not maintained by one central party.

Super low barriers to entry, especially with DEXes. Most of this technology is completely open source, so there's very, very little proprietary rights that are imprinted over the code itself, although there's a little bit of a shift to that recently, and the liquidity providers appear to demonstrate low loyalty to a particular DEX which suggests that over time they may become commoditized.

There are lending protocols. Some notable ones here are Compound, AAVE, and Maker. The way that these work is that people deposit digital assets into a vault, i.e., into a smart contract, and they borrow another token, oftentimes the stablecoin. Some of these protocols create or aim to create a stable digital token through this borrowing and lending function. One example here is that you can deposit some amount, let's say like 1,000 Ether, and get back 200 DAI or stablecoin. And through this kind of overcollateralization, you're able to get a stable loan and a stable asset that comes out of it.

I'm just going to flip forward. One thing to note about this is that often times these rely on outside data feeds—oracles— which determine the value of the collateral deposited by a user and its liquidations are done in an interesting way, pretty much any party is able to liquidate a lending position if it drops below a certain liquidation ratio.

We're also seeing a whole host of more advanced DeFi projects emerge, including decentralized derivative and synthetic asset protocols, and these are probably the most risky

parts of DeFi, just like they're the most risky parts of traditional finance. What happens here is that people deposit some amount of an asset of some sort, which they can overcollateralize and pull back a synthetic asset based on that.

So that's just a little bit of an overview of the kind of the base protocols. What's notable here also is that we're starting to see some aggregation layers emerge on top. There are three major types of aggregators: DEX aggregators, yield aggregators, and assets managers. So what DEX aggregators do is they operate a little bit like Google. They search through all the DEXes and all the tokens that are being traded on these DEXes and find you the best price for it, just like Google finds you the link that you want. You can get better pricing if you're a trader, they're entirely non–custodial in nature, but important from a regulator's perspective, they may serve as points of centralization. And just like how we see more regulations heaped on top of Google or other aggregation layers when it comes to information, I wouldn't be surprised that these DEX aggregators are turned to apply an increasing range of financial regulations.

We're also seeing similar aggregation occurring at the yield level. So folks that are looking to maximize the return are using yield aggregators, a notable one here is "Yearn," where they're able to just deposit their assets into Yearn and have the return maximized.

And the last set, which is interesting, is asset managers. We're starting to see new tools that help people either track, manage, or hedge their exposure to different tokens. So you can deposit into a smart contract a basket of tokens and get back another token. It looks like a very basic or rudimentary index fund, also looks like the beginning of securitization.

So just to kind of take a step up, core aspects of the financial services industry are increasingly managed by various different smart contract based systems. This is moving really fast. A lot of this stuff has been built in the last year. So if you fast forward five years, you can start to see really an entirely digital Wall Street that's built.

So let's just touch on, for last couple of minutes, and I know I'm running out of time, Seth, some regulatory considerations. One thing, just to note here, the laws don't go away as I think we all know. The big question is: how decentralized are these systems? Are there any centralized actors? If there's not,

who's going to be the party that's responsible if there's an issue? These are questions that the government has begun to look at, most notably starting with the DAO, which was an earlier decentralized autonomous organization and the SEC issued a 21(a) Report related to it.

There are a host of issues here, right? And I'm sure as I was talking, many of the more experienced lawyers in the room were just starting to tear up and cry at the number of regulatory issues, or maybe not crying, maybe they were thinking about different things, but thinking about all the issues that are emerging here. And these fall into well–recognized buckets from AML, KYC, or other laws that are aiming to stamp out fraud or other concerns related to terrorist financing, to commodities exchange act issues (to the extent that some of these assets are considered commodities), to the host of securities–related issues that we saw during the token boom from 2016 to 2018. This is going to raise some big questions related to liability for developers. In general, software development is protected and often protected under the First Amendment. That's not a complete bar. We've had courts in the past impute liability against software developers—wouldn't be surprised if we start to see some activity there.

There's a big question though here about the degree to which and the effectiveness of bringing certain actions against developers as even acknowledged by the CFTC. If you bring an action against a developer of a smart contract, it doesn't do that much. These smart contracts, these systems can't be stopped. They're running on a blockchain and until the blockchain itself either has a fork or in some way is rendered moot, which seems difficult to perceive, these systems will still be available. So it doesn't really have a strong deterrent effect. We may see liability also imputed for maintaining interface relating to the underlying smart contract, some centralized control over some core mechanic, or potentially deploying the smart contract itself.

We've seen approaches like this taken by the SEC in a case called *In the Matter of Zachary Coburn*, which related to an earlier decentralized exchange which was fairly centrally run. These are the factors in part, although not dispositive, that the SEC focused in on. My sense is, over the longer arc though, we'll see expanded theories of secondary liability emerge. There are already hooks for that in the existing regulations

where parties that aid and abet or control certain aspects of these systems will be found liable. We've already seen the CFTC kind of edge into this in a case *CFTC v. Edge Financial Technologies* where they relied on the aiding and abetting standard to hold the software developer responsible for some bad activity.

SETH ORANBURG: Aaron, we're just about out of time. So just if you don't mind, just we'll need to close it up.

AARON WRIGHT: Okay. So I think this is where it's going— expanded theories of secondary liability. And just last point to lead here, I do think there are a lot of lessons from the copyright wars that we saw before related to how to impose liability on more decentralized systems. I wouldn't be surprised if we see more conversation around creating kind of a safe harbor to balance the need for innovation with the need to obviously build markets that do not hurt consumers. So thanks and sorry I went a minute over.

SETH ORANBURG: No, it's fine. Thank you, Aaron. That was a really interesting point too about the movement from peer–to–peer lending to pool–to–peer lending. I know LendingClub just stopped their peer–to–peer lending services, and so really a neat preview into what's next for finance. So thank you so much for that introduction, more than introduction, really very, very interesting. And by the way, if you have questions for Aaron, we do have that breakout session afterwards, so please feel free to join his room to talk further.

PRESENTATION 2: CARLY HOWARD—BLOCKCHAIN & ESTATE PLANNING

SETH ORANBURG: Up next, I'd love to introduce Carly Howard who's going to talk to us a bit about estate planning. Carly, feel free to take it away with your slide show at this point.

CARLY HOWARD: Thanks, Seth. Hello, everyone. I have the challenge today of talking about a very vintage area of the law, estate planning, along with very cutting–edge technology, blockchain. So I'll be attempting to merge these two areas of the law in a mere fifteen minutes. Let me share my presentation for you here. Let's see. Play slideshow. Does that look good, Seth?

SETH ORANBURG: Yep. You're all set. Looks great.