CAMBRIDGE
Cambridge University Press & Assessment
978-1-009-36231-3 — Digital Assets
Edited by Reena Aggarwal , Paolo Tasca
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PART I

Institutionalisation of Digital Assets

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1 *Institutionalisation of Digital Assets*

REENA AGGARWAL AND CHRIS MATTURRI

1.1 Introduction

Are digital assets a great bubble or will their underlying technology, blockchain, transform the world of finance? People have debated this question since Bitcoin and other digital assets took off in late 2017. Bitcoin was the first digital asset, developed in response to the financial crisis of 2007–2008, and a growing distrust towards banks and other financial institutions that contributed to the crisis. In the original 2008 Bitcoin Whitepaper, Bitcoin's anonymous, pseudonymously known as Satoshi Nakamoto, claimed, 'what is needed is an electronic payment system based on cryptographic proof instead of trust, allowing any two willing parties to transact directly with each other without the need for a trusted third party' (Nakamoto, 2020).

A decade later, this thesis laid the groundwork for the future of digital assets and blockchain technology that some argue has the potential to revolutionise the world.

Although Bitcoin is the most popular cryptocurrency today and represents 75% of the total market cap of digital assets, it is still just one small piece of this ecosystem. To clarify, Bitcoin is a cryptocurrency, which is a subsegment of the entire digital asset class. A cryptocurrency is essentially a digital instrument that uses encryption to conduct monetary transactions without the need for a bank or third party. Cryptocurrencies have use cases ranging from payments to stores of value to enabling of smart contracts. Another example of a digital asset can be a stablecoin, which uses the same blockchain technology as other cryptocurrencies but is backed by a traditional fiat currency or even a tangible asset.

Blockchain is the underlying technology that makes all these cryptocurrencies and digital assets usable. A blockchain is a distributed ledger that can be used to record anything. In other words, a blockchain is the digital bookkeeping of any transaction. The 'blocks'

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that are part of the blockchain are linked together and create what is known as a 'chain'. This seamlessly allows all cryptocurrency or digital asset transactions to be recorded on one massive ledger, for everyone to see. While cryptocurrencies made blockchain popular, there are countless use cases for blockchain technology outside the digital asset world.

1.2 Current State of Institutionalisation of Digital Assets

The digital asset space has matured some over the past few years, although there is still a long way to go. They have become more institutionalised than many may realise and are already being embraced by some of the largest banks, exchanges, and investment firms in the world. At the same time, cryptocurrencies have also been marred with problems with Bitcoin being associated with purchases of illegal drugs from the Silk Road or the Mt. Gox Bitcoin exchange hack in 2014. Cryptocurrencies have also been criticised because of their usage in ransomware attacks. Next, we discuss products and services that are helping in the institutionalisation of digital assets.

Bitcoin Futures Contracts on Chicago Mercantile Exchange

One of the earliest and most prominent financial institutions to introduce a regulated digital asset product was the Chicago Mercantile Exchange (CME), the world's largest exchange. CME announced in October 2017 their intention to launch a Bitcoin Futures contract by the end of the year shortly after the Chicago Board Options Exchange (CBOE) had also announced plans to create the first regulated Bitcoin Futures contract. The CME and CBOE products existed together for some time, but the CBOE delisted its contract a year later (Rooney, 2019). The successful introduction of a cryptocurrency futures product was seen as one barometer for the institutional growth of digital assets.

New futures products often follow a 'hockey-stick trajectory', of very slow growth at first, followed by a strong uptick in volume as the contract matures and more entrants to the market create a 'network' effect enabling more participants to trade among each other. However, CME's Bitcoin Futures launch saw immediate adoption, indicating demand in a regulated venue to trade digital assets. The Average Daily

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Volume and Open Interest across CME's Bitcoin Futures market have consistently grown since inception.

In 2019, CME's Bitcoin Futures contract had average daily volume of 6,365 contracts, which is equivalent to 31,825 Bitcoin and represents a notional transactional value of nearly $250 million per day. As a result, Bitcoin Futures finished as CME's 55th largest futures contract by volume in 2019 (Daily Exchange Volume and Open Interest, 2020).

There was a steady growth in Open Interest of CME's Bitcoin Futures contract during the period 2018–2020. Unlike volume, which measures the number of contracts transacted, Open Interest indicates how many open positions exist, or in other words, how much risk traders are taking or hedging against. There are two ways to observe the growth in Open Interest at CME, through the total number of contracts or by looking at the number of large open interest holders (LOIH). To classify as an LOIH, a market participant must hold over 25 contracts in a specified futures market. For example, to appear as an LOIH, someone must own over 25 contracts of Bitcoin Futures at the time of disclosure. As seen, not only has CME set an Open Interest record of 13,600 contracts, but they have also grown to 93 LOIH, which is up from nearly 45 at the start of 2020 (Bitcoin Futures and Options on Futures, 2020). CME's Bitcoin Futures market has provided a quick way for investors to gain exposure to cryptocurrencies, sometimes as a hedge to their traditional portfolio.

CME has become one of the most important venues to transact Bitcoin. With an average daily turnover of 31,825 Bitcoin at CME in 2019, CME now ranks as the largest venue in the world to transact USD Bitcoin (Bitcoin Trading Volume, 2020). Unlike many of these 'spot' cryptocurrency exchanges that are more retail oriented and not regulated, it is much more difficult to open a futures account to trade on CME. All futures trading is regulated by the Commodity Futures Trading Commission (CFTC). Thus, looking at CME's volume is much more indicative of institutional adoption than just observing the volume of cryptocurrencies in totality at non-regulated crypto spot exchanges.

Based on interest from investors, CME started calculating an Ethereum Reference Rate in May 2018 (CME Group, 2018) and launched a Bitcoin Options contract in January 2020 (CME Group, 2018). Micro Bitcoin and Micro Ether futures and options contracts

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have also been introduced. These additions are a sign that there is interest in additional digital asset products.

Bitcoin Exchange Traded Funds and Trusts

Aside from directly purchasing or trading cryptocurrencies themselves, there are a growing number of ways to access the digital asset market. One investable digital asset product is the Grayscale Bitcoin Trust (GBTC). A division of Digital Currency Group, Grayscale, introduced GBTC in September 2013. In early 2020, Grayscale registered with the SEC as a reporting company.

Grayscale has seen assets under management (AUM) in GBTC product increase, reaching as high as $6 billion (Grayscale, 2020). GBTC traded at a premium compared to the price of its underlying Bitcoin for a while but has recently been trading at a significant discount (Grayscale Investments, 2020). Grayscale credits the interest in the product to its institutional customer base of hedge funds, family offices, and endowments.

There have been two main types of digital asset exchange traded fund (ETF) filings: physical-based filings and futures-based filings. Physical-based filings would hold 'physical' cryptocurrencies for their underlying exposure in the ETF. Whereas a futures-based filing would hold futures contracts traded on an exchange for their exposure. A physical-based filing would replicate what is traditionally seen in the equity space, where an ETF holds the underlying shares of stocks or other instruments that make up the basket in the ETF. On the other hand, a futures-based filing would be similar to most commodity-based ETFs that get their exposure through holding futures contracts based on the underlying asset.

A Bitcoin or digital asset-pegged ETF would give institutional and retail investors another way to access this market. However, regulators have expressed several concerns about spot ETFs.

Hedge Funds and Venture Capital

Some of the largest hedge funds have begun allocating funds to digital assets. In 2020, Renaissance Technologies, which manages $75 billion in total assets, disclosed they had begun trading digital assets (Chaparro, 2020). Similarly, the hedge fund manager Paul Tudor Jones

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announced that the firm has put 2% of its assets in Bitcoin, arguing that 'bitcoin reminds me of gold when I first got into the business in 1976 and the most compelling argument for owning Bitcoin is the coming digitisation of currency everywhere, accelerated by COVID-19' (Schatzker, 2020).

Another key indicator of institutionalisation in digital assets is the growing number of hedge funds focused exclusively on strategies related to cryptocurrencies. As reported by PWC & Elwood Asset Management in their annual Crypto Hedge Fund Report, the total AUM of cryptocurrency hedge funds increased from $1 billion in 2019 to $2 billion in 2020 (PWC, 2020). In addition, they found that the average AUM of a crypto hedge fund increased from $21.9 million in 2019 to $44 million in 2020. The growth in total assets in funds with digital asset strategies is another indicator that institutional investors are gaining exposure to digital assets through allocations to cryptocurrency hedge funds.

Many actively managed cryptocurrency funds today employ either a basic cross-exchange arbitrage or levered beta strategy (Koutoulas, 2020). The cross-exchange arbitrage strategy effectively exploits arbitrage opportunities across various cryptocurrency exchanges but is subject to operational risks. Many of these exchanges are at risk of hacks or poor infrastructure that could crash and lead to catastrophic losses for funds trading on them. The other common strategy actively managed crypto funds follow is a levered-beta product, which is essentially highly levered exposure to digital assets. However, many of these levered-beta funds charge extremely high fees (as high as 3% management and 30% performance), and it is not clear whether they deliver any true 'alpha' other than leveraged, long exposure to digital assets. In addition, they are not providing any downside protection and can have huge drawdowns.

There is also a growing number of venture capital (VC)-style investment firms that provide exposure to the digital asset space through investments in new blockchain start-ups. Unlike actively managed crypto hedge funds, crypto VC firms have a much longer-term holding period. According to research from Hutt Capital, a blockchain VC fund of funds, as of April 2020, there were over 65 venture funds managing over $4 billion in assets – an increase from 49 funds with an aggregate of $3.8 billion in assets a year prior. (Hutt Capital, 2020).

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In addition, Hutt Capital estimates that of the $4 billion AUM in blockchain VC funds, nearly $1–1.5 billion is available as dry powder and ready to invest. This represents roughly 0.5% of dry powder for all VC funds, which is a slightly undersized amount since blockchain start-ups raised 1.1% of all VC capital and accounted for 2.8% of all deals in 2019 (Hutt Capital, 2020). This suggests that VC blockchain funds are putting their capital to work more quickly than traditional VC funds, as they are finding more attractive deals in the blockchain start-up space.

Some of the largest and most successful blockchain VC investment firms include Pantera Capital ($750 million AUM), Polychain Capital ($1 billion AUM), and A16z Crypto ($860 million AUM fund part of VC firm Andreessen Horowitz) as of the end of 2020.

Other Indicators of Institutionalisation

Goldman Sachs established a trading desk looking to offer non-deliverable forwards, an over-the-counter derivative-based swap, to their clients (Rooney, 2018).

Similarly, Fidelity Digital Assets, a division of Fidelity focused on building out custody and execution services surrounding cryptocurrencies. They published a report on the state of institutionalisation in cryptocurrencies (Baker, 2020). Fidelity surveyed 774 institutional investment firms from both the United States and Europe and found that 36% of respondents already had some sort of exposure to digital assets, with hedge funds and VC firms as their primary source of exposure. Somewhat surprisingly, European institutions had more exposure than US- based firms (45% vs 27%). Fidelity also found that 80% of investors they surveyed found 'something appealing about the asset class,' perhaps indicating this is just the beginning of a trend.

1.3 The Future of Institutionalisation of Digital Assets

There has been growth in the institutionalisation of digital assets in recent years. However, with a total market cap of only $360 billion, as of 2020, the size of digital assets markets is still small compared to the entire investable universe today. There are many inefficiencies related to volatility, regulatory clarity, and the introduction of custodians and prime brokers, among others, that need to be addressed

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before they can be truly institutionalised. We next examine the opportunities and challenges in institutionalisation to reach the next stage of development.

Valuation, Volatility, and Correlation

Cryptocurrencies such as Bitcoin have a trading price, but investors don't know how to value them in a traditional sense. There is no cash flow analysis approach that can be applied as is the case with equity. Even with gold and silver, some valuation approaches have been applied. Even though individual cryptocurrencies are scarce and have a finite supply, however, there is no limit on creating new cryptocurrencies, and thousands of them exist even today.

Another major problem is their high volatility that limits their wide adoption. According to research from Nasdaq, Bitcoin's one-year realised volatility is almost 10 times that of more traditional assets such as equities, bonds, gold, real estate, or foreign exchange.

Digital assets, such as Bitcoin, have a low correlation with most investable asset classes. According to research from Van Eck Associates, from February 2012 to June 2020, Bitcoin's highest correlation came from the S&P 500 at just 15bps. However, during periods of market stress, the correlations become much higher, and it is too early to tell whether there are benefits from diversification.

Regulatory Uncertainty

Digital assets are still very new and carry considerable risk. It is prudent of regulators to cautiously approach regulation. At the same time, the markets are looking for clarity from financial regulators.

One roadblock to Securities and Exchange Commission (SEC) approval of spot ETF approval has been the concern with the underlying, unregulated spot crypto exchanges. Since most cryptocurrency trading gets done on unregulated exchanges, price manipulation conducted on these offshore exchanges can influence the prices across the entire market. Thus, subjecting even regulated, US-based exchanges to potential price manipulation.

It has been reported that much of the 'reported' cryptocurrency volume across exchanges is fake. Bitwise Asset Management published

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a report in March 2019 illustrating this phenomenon and found that over 90% of the reported cryptocurrency volume is fake.

In May 2014, following the hack of the largest digital asset exchange at the time, Mt. Gox, the SEC published a warning on the risks associated with investing in 'Bitcoin and Other Virtual-Currency Related Investments' arguing that:

> The rise of Bitcoin and other virtual and digital currencies creates new concerns for investors. *A new product, technology, or innovation – such as Bitcoin – has the potential to give rise both to frauds and high-risk investment opportunities*. Potential investors can be easily enticed with the promise of high returns in a new investment space and also may be less sceptical when assessing something novel, new and cutting-edge (Securities and Exchange Commission, 2014).

A few years later, in July 2017, the SEC made a ruling on Initial Coin Offerings (ICOs) in the decentralised autonomous organisation (DAO) Token report. In their investigation, the SEC concluded that:

> tokens offered and sold by a 'virtual' organisation known as 'The DAO' were securities and therefore subject to the federal securities laws. The Report confirms that issuers of distributed ledger or blockchain technology-based securities must register offers and sales of such securities unless a valid exemption applies. Those participating in unregistered offerings also may be liable for violations of the securities laws. Additionally, securities exchanges providing for trading in these securities must register unless they are exempt (Securities and Exchange Commission, 2017).

This meant that many ICOs exhibit the same characteristics as basic securities and must be treated as such under regulation.

In September 2015, the CFTC officially declared Bitcoin as a commodity. A few years later in October 2019, CFTC Chairman Heath Tarbert followed with a similar ruling on Ethereum, the second-largest digital asset in the world:

> We've been very clear on bitcoin: bitcoin is a commodity under the Commodity Exchange Act. We haven't said anything about ether – until now. It is my view as Chairman of the CFTC that ether is a commodity, and therefore it will be regulated under the CEA. And my guess is that you will see, in the near future, ether-related futures contracts and other derivatives potentially traded … It's my conclusion as Chairman of the CFTC that ether is a commodity and therefore would fall under our jurisdiction (CFTC, 2019).

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The New York State Department of Financial Services (NYSDFS) has set up a designation called a 'BitLicense'. A BitLicense is a permit that allows a firm to participate in any digital currency-related businesses in the state of New York. According to the NYSDFS, without a BitLicense, a firm is not allowed to take part in the following (Department of Financial Services, 2020):

- receiving Virtual Currency for transmission or transmitting Virtual Currency;
- storing, holding, or maintaining custody or control of Virtual Currency on behalf of others;
- buying and selling Virtual Currency as a customer business;
- performing exchange services as a customer business; or
- controlling, administering, or issuing a Virtual Currency.

There are nearly 200 cryptocurrency exchanges across the world that mostly go unregulated. Unlike a stock exchange that must receive approval before listing new securities, cryptocurrency exchanges often list thousands of highly illiquid cryptocurrencies. Dozens of different spot exchanges claim significant portions of market share, with the largest being Coinbase, Kraken, and Bitstamp (Bitcoin Trading Volume, 2020).

Originally, much of the appeal to cryptocurrencies was their decentralised nature and the fact that they were outside the control of the banks or regulators. This allowed digital assets, like Bitcoin, to act like a safe-haven asset and offered protection against inflation or changing monetary policies from central banks. However, this '*laissez-faire*' attitude must change if digital assets are to be truly adopted by institutions. Proper regulation must exist and there can no longer be unanswered questions as to what and who truly regulates digital assets else institutional investors will continue to wait on the sidelines.

Custody and Prime Brokerage of Digital Assets

Another important requirement for the institutionalisation of digital assets is the ability to custody them. In traditional markets, custodian banks act as third-party agent that holds assets and securities on behalf of their customers. Two of the largest custodian banks in the world, BNY Mellon and State Street, have nearly $70 trillion in assets

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