

A special report by



The Unstoppable Rise of Digital Assets

How New Exchanges, New Custodians, New Regulations
and New Assets are Levelling the Investment Playing Field

Table of Contents

03

Foreword

04

Executive summary

04

Introduction



06

Digital exchanges

11

Custody and Insurance:
How does it work in crypto?

14

Trends and opportunities in the
digital asset market

22

Building liquidity in the digital
asset markets

24

Market sizing

28

Evangelizing to investors

30

How value is created: A portfolio
balanced by digital assets

34

Appendix: Profiles of digital
asset companies

Foreword

Thank you for your interest in digital assets and the role of digital asset exchanges, custodians and the value digital assets offer to investors looking to diversify.

For any currency, digital or otherwise, confidence in the integrity of it is essential. History offers numerous examples of what happens when that confidence is lost. This report is about the development of digital assets, cryptocurrencies and tokenization and how that all-important confidence is established.

It's clearly evident that as an asset class, digital assets are coming of age. After a shaky start just over ten years ago, it has grown into a multi-billion-dollar asset class offering both performance and opportunity for portfolio diversification. It is a compelling proposition.

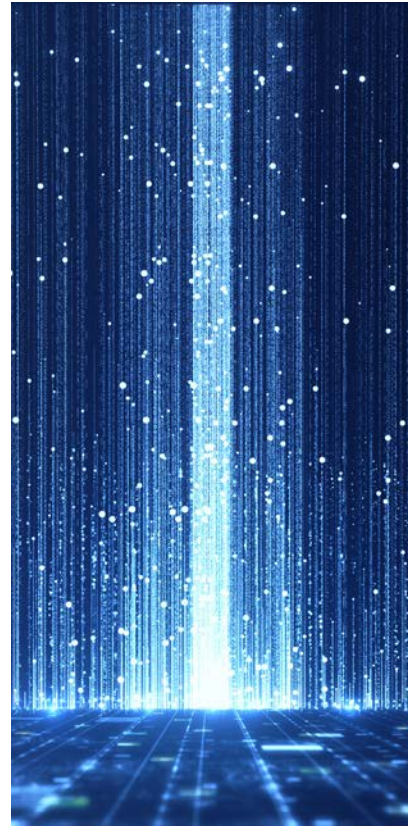
But to understand the future potential, one should hear how the roots of the industry took shape. We start this report by taking a quick look at the background and then move on to examine the role of digital asset exchanges and custodians, including the challenges they face and the solutions. This section draws on interviews with London Stock Exchange Group (LSEG) Technology, AAX, and Koine Money Limited (Koine).

The report then looks at the role played and issues faced by digital asset managers — after all, they're helping guide smart money into the space. Of course, we couldn't leave you without insights into current trends and how the industry is creating value through the main digital assets available, along with a look at the investors, and their appetite in this space.

We want to thank AAX for sponsoring this report. It is the first cryptocurrency exchange in the world to use the same matching engine as the London Stock Exchange and other traditional financial markets. Its exchange infrastructure is provided by LSEG Technology, which is also used by the Oslo Stock Exchange and the Johannesburg Stock Exchange.

As the industry continues to grow, and not without its growing pains, we hope that our report will help you understand the dynamics better. After all, it is reshaping global finance as we know it.

Angie Lau
Forkast Editor-in-Chief



This report is about the development of digital assets, cryptocurrencies and tokenization and how that all-important confidence is established.

Executive summary

The crypto market of 2020 is not the crypto market of 2013. What was once a *cryptocurrency* market is now a *digital asset* market. Blockchain's strengths in efficiently and transparently tracking assets have given birth to an industry of assets represented by tokens, allowing both a new class of investors to have exposure to these commodities and a those that have access to assets to tokenize them to generate a new category of liquidity.

This report finds that the digital asset market has a value of nearly

US\$20 billion, the majority of which are tokenized currency (stablecoins). While other assets exist such as energy, gold, and commodities, the market size and liquidity is nowhere comparable to that of stablecoins. In addition, regulatory alignment around security token issuance isn't quite consistent yet: a patchwork of rules and regulations about whom can issue tokens and who can invest in tokens (accredited vs. non-accredited investors) has chilled market potential. Lastly, some commodity types, such as real

estate, have a myriad of rules and regulations that would prevent the issuance of fractionalized ownership. Thus, many projects in the space are illiquid.

Despite this challenge, the industry is building out infrastructure to make itself institutional-grade. Some exchanges use the same software engines used by those in the world's financial capitals. Favorable regulatory changes, such as the creation of a regulated custodian industry, have buoyed investor interest.

Introduction

A decade or so back, digital assets didn't exist, at least not by that name. Bitcoin was invented back in 2008 amid the global financial crisis and shortly after a nascent cryptocurrencies market emerged. It experienced the type of teething problems typical for markets in their infancy – little or no regulation,

little risk management, unreliable custodians, high volatility and no shortage of scams.

The market evolved with hiccups and missteps along the way. Quite often, initial coin offerings (ICOs) – unregulated fundraising for a new cryptocurrency ventures – proved to be fraudulent, doing little for the

image of the market. Trust was low, confidence was low; it wasn't just risky for investors, it was perilous. During the period, billions of dollars were lost to various forms of cyber-crime. The market was there, but proper oversight was needed.

Luckily, the financial services sector transformed. Since the financial crisis of 2008, the digitalization of all aspects of the sector, notably through the use of cloud, big data analytics, blockchain and artificial intelligence, has impacted the lives of everyone – often without them being aware of it. Both the benefits and the level of digital usage have become very apparent this year during the pandemic.



Tokenized Assets vs. digital assets vs DeFi

While the terms *digital assets*, *tokenized assets* and *cryptocurrencies* are often used interchangeably, it's important to outline the exact meanings of these terms.



Tokenized asset:

A blockchain token that represents a physical, tradeable asset/commodity.

Digital asset:

An asset recorded on the blockchain or a digital ledger via a token that is secured by a cryptographic key. A digital asset can be a cryptocurrency or a token that represents another asset.

DeFi:

Decentralized finance refers to dApps that, through smart contracts, build liquidity in the cryptocurrency market via credit and leverage. While there are tokens from DeFi projects, they do not (yet) represent a digital asset due to their extreme volatility.

After several years seemingly kicking the crypto-can down the road, regulators started to pay more serious attention to cryptocurrencies and digital assets. If there was one single trigger that made the regulators sit up, it was Facebook's launch of Libra, its own digital currency, in June 2019. Its scale and reach obliged the regulators to act in order to protect investors, a move welcomed by serious players in the digital assets market.

The past two to three years have seen some consolidation in the market. Moves by regulators across different jurisdictions to bring the sector under their authority is smoothing out some of the rough

edges, imposing processes and compliance, and making the sector a safer one for retail investors. It has helped grow confidence and build trust. It also means that institutional investors can now more readily get access to digital assets.

Worldwide digital assets under management (AUM) now total close to US\$20 billion, a tiny fraction of global AUM for all asset classes which topped US\$100 trillion¹ by the end of 2019, but a rapidly growing one in terms of size and returns. In the current low-yield environment, for those with more risk appetite and seeking a more varied portfolio, digital assets tick many of the boxes.

Alongside the growth of digital assets have been the growth of digital asset exchanges and digital asset custodian services. For the market to grow, the marketplace needs to provide absolute reliability, security, liquidity and transparency, along with a great user experience, in order to earn the trust and confidence of its various stakeholders.

This is where digital asset exchanges come in. This report will illustrate what exchanges across the digital asset landscape are doing to ensure the trust and confidence of their users is fully justified. It also explores the vital role of digital asset custodians.

¹ Forkast.News (see page 24)

WillisTowersWatson, Global asset manager AUM tops US\$100 trillion for the first time (19 Oct 2020)

Digital asset exchange infrastructure geared for high-volume trading

Managing trading volume and geography

The importance of having the right infrastructure to drive an exchange – any exchange, not just ones for digital assets – cannot be overstated. It provides the engine that lies behind every software platform.

Investors need to know they can execute trades without outages or other interruption. As well, they want transparency with open standards and code disclosure – closed-source, proprietary engines will no longer meet the demands of traders and can deter investment if something goes wrong.

It's clear that the efficacy and security of the engine is critical to ensure investor confidence in the exchange. Alongside, there's a need for speed and volume, pre-requisites for active institutional investors. If digital assets are to meet the needs of these investors, exchanges need the capacity to process very large volumes of orders in real-time to keep up with the demands of the market.

Use of top-tier infrastructure, tried and tested in a recognized high-volume marketplace, is an effective way to gain investor trust and meet market demand.

LSEG Technology's engine technology has been rolled out both on conventional stock exchanges and digital asset exchanges around the world. Besides London, these

UNDER THE AAX HOOD

AAX uses exchange infrastructure provided by LSEG Technology. It is the first cryptocurrency exchange in the world to use the same matching engine as the LSE and several other leading financial markets. AAX deployed its LSEG matching engine to the cloud to mitigate the risks of outage that come with having a centralized data center. Using cloud technology also saves on the capital cost of building a storage facility. Cloud providers have deep experience and very wide geographic spread for their data centers, enabling them to provide an ultra-low latency trading experience for anyone anywhere in the world.

exchanges include ones in Italy, South Africa, Norway, Hong Kong and in Switzerland, where the SIX Digital Exchange (SDX) is the blockchain-based venue for digital asset trading.

SDX is noteworthy because it is at the forefront in Europe from a technological and regulatory perspective. Its goal is to provide the same institutional-level experience traders expect from the traditional stock market, but for digital assets. SDX is currently in the process of applying for a license from the regulators, while its parent, the Swiss Stock Exchange (SIX), has already experimented with offering tokenized equity through its traditional market.

The LSEG engine ticks the speed box. It can close a trade within 90 microseconds, with the average order being process in under 800

microseconds. This compares with 650-950 microseconds¹ for the New York Stock Exchange's ARCA engine.

The value of robust exchange infrastructure and accountability is clear given the outages that plague the industry. Binance and BitMEX both experienced significant outages during the past year, according to Cointelegraph and Coindesk respectively. Outages mean that trades are not executed and the longer the outage the greater the potential slippage. BitMEX's insurer paid out US\$400,000 in refunds following the outage. Binance's outage cost the company US\$40 million.

The goal for any exchange is to *never* fail, but realistically that is currently impossible to guarantee. However, it is possible to mitigate risks through best practices, such as use of cloud computing.²

¹ <https://www.businesswire.com/news/home/20100105006381/en/NYSE-Arca-Achieves-Sub-Millisecond-Speed-Order-Execution>

² <https://blog.aax.com/en/2019/08/16/crypto-exchange-hosted-data-center-cloud/>

INTERVIEW

Implementing global standards in digital exchange infrastructure

Lorne Chambers, Global Head of Sales and Marketing, LSEG

Forkast.News: How does LSEG Technology's matching engine ensure orders are closed with as little latency as possible? How does this prevent the phenomenon of negative convexity, where the market moves away from the position staked out by the trader?

Lorne Chambers: The architecture of LSEG Technology's matching engine is highly modular and multi-threaded, which allows for the best possible performance from the hardware it is deployed on.

Based on our multiple deployments across markets, we have not seen much of an impact related to convexity, given that our interface APIs are architected so that all investors have a "first in, first out" (FIFO) allocation based on when their order is submitted.

Some markets may also use speed bump methods to ensure fairness across different types of investors and to even the playing field.

FN: Can you describe some of the redundancies LSEG Technology's matching engine has in place?

LC: All critical software and hardware components are deployed with redundancies to eliminate single points of hardware/software failures, thus ensuring the availability and recoverability of the system. Recovery is seamless in most cases, with no impact on system functionality.

All application processes in LSEG Technology's solutions have at least two instances running at any given

time: a primary instance and a mirror instance. An instance is a copy of the binary running in the memory. These multiple instances allow the system to "failover" and achieve continuous availability.

The recovery mechanism is implemented at the application level without any dependency on underlying hardware-level redundancy. Therefore, the system can provide an extremely high level of reliability, even when deployed on commodity hardware.

In addition, the system also employs multiple methods of maintaining secondary backup sites based on an individual client's needs.

FN: At a high level, what sort of customization did LSEG Technology need in order to deploy the engine to AAX? At its core, AAX is a market similar to many of LSEG Technology's other clients, but digital assets/crypto are also quite unique. What sort of adjustments to your software stack did this require?

LC: As the matching engine was built to cater to a multi-asset, multi-market structure, there were hardly any functional customizations required. The existing asset class build, features and configurations were deployed off-the-shelf. Our focus was primarily ensuring that the matching engine, which normally operates in daily trading cycles at traditional exchanges, could run 24/7 without the need for daily or even regular monthly maintenance windows.

As this was our first crypto deployment, we implemented an ultra-low latency API, which allowed us to integrate with AAX's position management system to check each and every order on a cash and position basis prior to trade execution.

It was also our first cloud deployment, which only required configuration changes in the system to fine-tune the application from a technology operations point of view.

FN: How does LSEG Technology's matching engine ensure trade transparency in the digital asset market while allowing for regulatory compliance in as far as the regulations exist?

LC: LSEG Technology's matching engine can be configured with various market structures, such as allowing for a fully transparent central limit order book (CLOB), continuous trading and auctions, dark pools, request for quote (RFQ) functionality, bulletin boards, and many other execution methods. The matching engine provides pre-trade checks and is also MiFID II compliant, allowing customers to adhere to the necessary regulatory requirements.

Furthermore, the Millennium Exchange provides a variety of industry-standard APIs and messaging protocols for market supervision or regulatory authorities to actively and efficiently monitor the market, which was one of the key considerations for AAX when selecting LSEG Technology.

INTERVIEW

Growth of digital assets markets and exchanges

Thor Chan, CEO of AAX

To watch the full video interview with Thor Chan, scan the QR code here:



Forkast.News: The value of digital assets has exploded during the last year, and we are now at levels well above previous forecasts. What are you seeing in the market right now?

Thor Chan: We think that the global crypto market is growing. More money is flowing in, and that's not just because of the Covid-19 pandemic. We are also seeing more innovation, such as the growth of the stablecoin market and an increase in the quantity of stablecoin that is being issued. The market cap is growing.

Stablecoins are tokens pegged to a fiat currency

This is a very good sign because when people use stablecoins, they typically use it as an entry point for buying and selling different types of digital assets. So, the growth of stablecoin is a good indicator that the market is growing.

We have also recently seen that there are a lot of decentralized finance assets. These tokens are currently booming—growing at a rate of ten times or twenty times.

FN: What trends are you monitoring right now at AAX? What are people really excited about that you're seeing in terms of liquidity and volumes on your exchange?

TC: We continue to look at the major digital assets: Bitcoin and Ethereum. What we see is that those who were primarily focused on traditional finance and who may have had a little interested in crypto previously only invested in the stock market or in gold or forex.

Now they are getting more and more interested in crypto. As a result, we're monitoring the "on-ramp" and "off-ramp", as well as how many people are willing to buy their first Bitcoin using their local currency. In Hong Kong, for example, an increasing number of people are asking us questions like: "I want to buy my first Bitcoin. Where should I go? What is Tether? Can you tell me a more about it?"

Tether (or USDT) is a popular stablecoin tied to the USD

AAX focuses on how to capture the retail market or retail users, and how those people get their first Bitcoin. This is still a major indicator for us in terms of how we grow the platform.

Right now, even decentralized finance and those kinds of assets are very hot, but for the majority in the finance industry or the average investor, this is still an extremely complex process. They are still asking basic questions like "how can I get my first Bitcoin?"

Our aim is to educate them about DeFi, but at the same time, we don't want to scare them off. Although it is very complex, they just want to try Bitcoin. Once they get their first Bitcoin, get their USDT, they can start trading it. [And once introduced to the ecosystem] we could begin to tell them more about DeFi assets.

Some of my friends who trade stocks, when they trade DeFi assets, say: "Oh, the liquidity is too thin. I just want to buy maybe 500,000 Hong Kong dollars. But the slippage if I buy this very famous DeFi asset is too high." They don't feel comfortable with it, so they often choose to just trade Ethereum instead.

FN: You say that slippage is something that traditional markets and traditional exchanges are really disciplined about, but this is not necessarily something that we see with crypto or digital asset exchanges. Can you talk about the slippage you see in trading?

TC: So, first, this is an institutional-grade technology. Therefore, when we built this matching engine and



trading infrastructure with off-the-shelf technology (AAX uses LSEG's engine, but also as its own code in the stack as well), we wanted to make it institutional-grade.

It's all about market infrastructure. We have created a very capable matching engine. We offer pre- and post-trade transparency, market surveillance, and proper AML (anti-money laundering). So really, all of this institutional-grade technology is about our attitude and commitment to market integrity, and these are the conditions required to make our trading value more suitable for institutional investors.

When there are increasing numbers of institutional investors or similar professional traders coming into the space, they create more liquidity on our platform. And that's why we tried to develop more of a market-maker program. We can give them excellent technology and infrastructure, and they can place orders here as we provide very good liquidity.

FN: What are you seeing within the Hong Kong microcosm of investors in terms of what interests them? First, they buy Bitcoin, and then stablecoin, and then what?

TC: Hong Kong is a fairly mature financial market. Like me, a lot of people in my age group started trading stocks while in university, so investing is something that we are very familiar and comfortable with.

A lot of people here already know how it works, but when they return to it, they have to be very careful because the market has changed over the years. At the same time, they're very curious about Bitcoin, because more people are exploring cryptocurrencies and there is a lot of media coverage about Bitcoin here in Hong Kong. Additionally, we have recently had an influx of Bitcoin-related advertisements on our trams, in the tram stations, and on the front pages of our newspapers. So, over the past two years, attitudes toward Bitcoin in Hong Kong has improved quite a lot.¹

FN: As one of the many digital asset exchanges active in cryptocurrency and DeFi, what do you and other exchanges need to do in terms of best practice to attract more of these new crypto digital assets enthusiasts into the market? What are the key best practices that should be applied?

TC: Education is a really important part of crypto culture today. Universities teach their students about it in terms of exposure. Mainstream media and articles are quite good and they are covering Bitcoin, but they're not yet delving into altcoins. So, education is crucial for the crypto market. Crypto operators must educate their users and keep all communication very transparent. This is very important.

Financial platforms have become very used to a lot of their payments, a lot of online banking, and also stock trading. The platforms are very simple and easy to use. When it comes to crypto, sometimes users want to try it out. But when they see confusing terms or very

¹ In early November, Hong Kong Securities and Futures Commission executive Ashley Alder announced that the SFC has planned extensive regulations targeting cryptocurrency exchanges that operate in the city or target its residents. These regulations seek to apply securities laws to more token products, seemingly the opposite of the regulatory direction taken by US authorities.



technical words that they don't fully understand, their view is: "Oh, I don't have the confidence to do this. I don't want to try anymore." So, this is something that we need to need to improve.

FN: How do you assess the current state of regulation in the digital asset market space? Is it harder for exchanges like yours to navigate?

TC: For us, as a global platform, we have users from different jurisdictions and different countries, so it's actually very costly for us to look into different regulations.

But at the same time, we can see that the market is expanding. It's reached a scale that the regulators can no longer ignore. They have to implement strict regulations to protect investors' interests. And as this is a very hot topic, people will continue to talk about it. Retail users will want to buy more digital assets and some people will just take advantage of that. Those people will issue some (so-called) "shitcoins" or undertake projects similar to Ponzi schemes, that kind of thing. So, the regulators, they have to pay attention and keep investors safe.

For us, we actually look at the regulations and try to work very closely with the regulators, especially in our target markets. In many jurisdictions, we have noticed they are now taking a more hands-off approach because they want to keep the door open for innovation.

FN: The regulators are starting to pay attention, but different jurisdictions have different rules. How are you dealing with that? And how are you trying to reach crypto investors in different jurisdictions?

TC: It's actually a very challenging task for exchanges to enforce these regulation and compliance practices across various jurisdictions. Because we have users from all around the world, from different jurisdictions, they all have different compliance processes. So, we simply try to be very self-organized and self-regulated.

We also look very closely at the regulations and the compliance guidelines in our target markets. Right now, for example, it's clear that the regulators are very eager to implement strict regulations because they want to protect retail investors. At the same time, there are some jurisdictions that take a more hands-off approach, like Hong Kong, as they don't want to limit innovation or progress.

FN: Where do you project this industry going in a year, in two years, in five years?

TC: We are predicting that more and more institutions and retail customers will introduce Bitcoin as part of their portfolio diversification.

And because of the regulations that are in place, these institutions will have a green light to invest more

money and allocate more capital to digital assets. But from what I have seen, institutions will probably only invest in more established assets, like Bitcoin or Ethereum in the next few years, not in altcoins.

In Hong Kong recently, an exchange got a license to operate exclusively for institutional clients or professional investors. That's a very good sign for the industry because some licensed entities in Hong Kong will be able to invest in Bitcoin through this channel. More and more institutions are adopting and embracing Bitcoin, but they are not really moving to altcoins just yet.

I predict that they will focus primarily on Bitcoin and Ethereum, and we will likely hear more and more news about institutions buying Bitcoin and publicly announcing it. This is what I predict for institutions in the near future.

For the retail market, there will be a lot of gamification happening in this space because the crypto generation, who are mostly millennials, are gamers. There will be a lot of innovation and a lot of new and innovative ways of buying, owning or staking crypto. And these are the retail users that the industry loves to chase. Newbies will probably start with Bitcoin and Ethereum before they jump into different methods of staking more, saving or acquiring more digital assets.



Custodians: looking after your assets

The need for custody

Who holds the keys? Who looks after the digital assets? The person with control has custody. For an exchange, that custodian should be a third party for better risk management, more robust security and improved accountability. There is no shortage of examples of the inherent problems that can arise when exchange and custodian are bundled together.

The early days of the cryptocurrency industry were defined by staggering attacks on crypto exchanges and service providers. An example can be found in Mt. Gox. The exchange, which in 2013 handled around 70% of all of Bitcoin's transaction volume,¹ collapsed in 2014² after hackers breached the link between

the exchange's hot (online) and cold (offline) wallets,³ siphoning off bitcoin as they moved between the two. In analog terms, this would be the equivalent of a bank losing track of funds as they moved it from a teller's desk to its vaults. A later investigation found that the 2014 hack was the work of the same team that conducted an earlier hack in 2011.⁴ In total, over 700,000 BTC were stolen, equivalent to over US\$7 billion in 2020 figures.

While Mt. Gox holds the record for the sheer scale of an attack, another notable contender can be found in the demise of the Canadian exchange Quadriga CX. The exchange, which ultimately went offline in January 2019, experienced

liquidity problems for most of the year prior that culminated in the death of its founder, Gerald Cotten, in December 2018.⁵ Insolvency proceedings that followed found that Cotten had sole control over the exchange's keys, meaning he was, in effect, the principal custodian of the assets. According to a report from Ernst & Young, appointed by the court to facilitate bankruptcy proceedings, the exchange's users were missing US\$190 million in cryptocurrency⁶ at the time, which has grown to more than US\$470 million as of Q4 2020 as the value of bitcoin continued to rise. Court documents note that the exchange had no basic financial controls or accounting records, and both funds and cryptocurrency were regularly

¹ <https://thenextweb.com/hardfork/2019/03/14/a-brief-history-of-mt-gox-the-3b-bitcoin-tragedy-that-just-wont-end/>

² <https://www.wsj.com/articles/BL-263B-352>

³ <https://www.wired.com/2014/03/bitcoin-exchange/>

⁴ <https://blockonomi.com/mt-gox-hack/>

⁵ <https://cointelegraph.com/news/most-crypto-users-think-quadrigacx-ceo-faked-own-death>

⁶ <https://documentcentre.ey.com/#/detail-engmt?eid=342>

transferred off-platform to accounts controlled by Cotten.⁷

In the legacy financial world, there are assets worth trillions of dollars being traded every day. Although cybersecurity is a major concern for every stakeholder in the financial sector, and there are occasional “Lehman Moments” of institutional failure, retail investors being burned in the same way that those who had assets at Mt. Gox or Quadriga CX is extraordinarily rare.

Why? The presence of custodians.

Whomever has the keys has custody

Within the legacy financial industry, custodians are financial institutions that hold customers’ securities for safekeeping. The custodian may hold stocks or other assets in electronic or physical form. These institutions are third parties that are hired by exchanges, and they come complete with stringent insurance policies. Should the exchange fail, the investors are protected. Should the custodian service fail, insurance will cover the losses.

As digital assets become institutional-grade commodities, the need for custodian services has emerged. Crypto custodians act as an intermediary between the investor and the exchange by holding assets in storage for settlement and payment clearance or even storage.

Crypto custodians store the keys in air-gapped cold storage at an undisclosed location, which hypothetically is as secure as one can get. Custodians also use a multi-signature approach, meaning that to transfer the assets, multiple parties holding different parts of the private

key need to sign the transaction together (similar to how a company might require multiple signatures on a check or wire transfer as a control method). Furthermore, the custodian will take out an insurance policy on the holdings. Thus, it must satisfy an insurer about the quality of its security protocols.

The evolving crypto custody industry

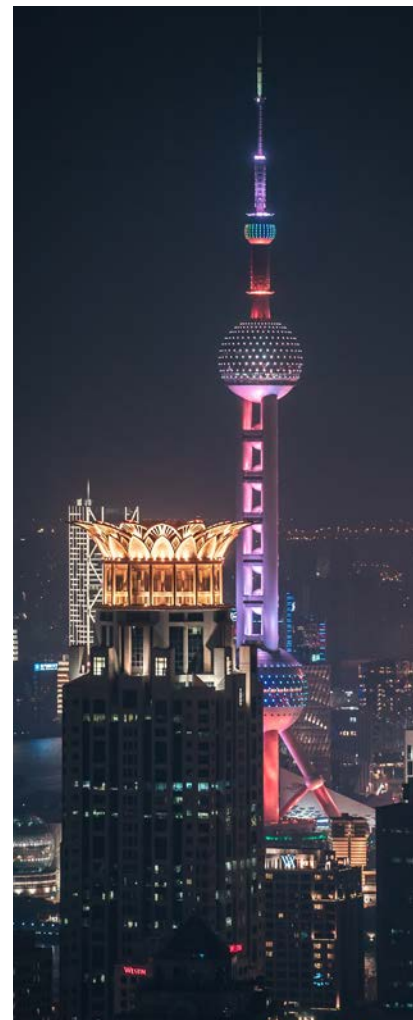
In 2019, Hong Kong’s Securities and Futures Commission created a legal framework⁸ for digital asset portfolio managers and custodians. Since then, multiple custodian firms have opened their doors, such as Aegis Custody, OSL and Hex Trust. In early 2020, Hong Kong saw its first entries into the market with virtual asset manager Arrano Capital setting up shop.

Arrano Capital was one of the first firms in Hong Kong to take advantage of this arrangement. In an interview with *Forkast.News*, CIO Avaneesh Acquilla cited a sizable institutional interest in custody solutions and crypto portfolio management.

“As a designated, approved virtual asset manager, we’re able to have portfolios that invest up to 100% in virtual assets,” Acquilla told *Forkast.News*.⁹ “I think we’re seeing the market very quickly shift from being a retail sort of early adopter market to being one that’s driven by large flows from institutions.”

In July this year, in an unexpected move, the US Office of the Comptroller of the Currency granted US banks and credit unions¹⁰ the right to act as digital asset custodians. US banks, such as BNY Mellon, have signaled interest in opening up crypto custodian desks.¹¹

“Well, what I have heard ... a number of big crypto custodians – Anchorage, Coinbase and a number of others – have been contacted by banks about whether they’d be willing to be like the third-party custody providers for national banks whose customers want to invest in bitcoin,” Acting Comptroller Brian Brooks said on Laura Shin’s “Unchained” podcast in October 2020. “What they’ll want to do is either buy crypto custodians, or partner with crypto custodians to provide those services on their behalf and now they can legally do that.”¹²



⁷ <https://amyhcastor.files.wordpress.com/2019/06/fifth-report-of-the-monitor.pdf>

⁸ [https://www.sfc.hk/web/EN/files/IS/publications/VA_Portfolio_Managers_Terms_and_Conditions_\(EN\).pdf](https://www.sfc.hk/web/EN/files/IS/publications/VA_Portfolio_Managers_Terms_and_Conditions_(EN).pdf)

⁹ <https://forkast.news/arrano-capital-crypto-bitcoin-tracking-fund-hong-kong-regulator-sfc-approved/>

¹⁰ <https://www.occ.gov/news-issuances/news-releases/2020/nr-occ-2020-98.html>

¹¹ <https://www.bnymellon.com/us/en/our-thinking/crypto-custody.jsp>, <https://www.coindesk.com/bakkt-acquires-crypto-custodian-partners-with-bny-mellon-on-key-storage>

¹² <https://www.youtube.com/watch?v=3DW7Q-4e5n0&feature=youtu.be>

INTERVIEW

The importance of a third-party custodian

Phil Mochan, founder of UK-based custody provider Koine

Forkast.News: What is a custody solution? What's the difference between simple cold storage and custody?

Phil Mochan: Custody is about a lot more than simply managing safes (or cold stores). The trade settlement process is an integral part of the function of the custodian. At Koine, we view the participation of humans in the handling of private keys, where there is even a remote possibility that they may have access to them, as inherently unsafe and unacceptable to institutional investors.

We therefore do not use a cold store model (which requires humans to gain access), but a new engineering solution called Digital Airlocks, which is fully automated. With this approach, we are able to guarantee that humans never touch the private keys, which is a regulatory requirement in some jurisdictions. Furthermore, this solution delivers huge scalability and a lower unit cost without impairing the security model.

FN: How do custodians work with regulators?

PM: Each jurisdiction has its own methods of incorporating custodians into the framework of trading financial assets. Regulators create rules, defining when a custodian is essential or optional for a given asset

class. They either specify what a custodian is or provide guidelines as to how a custodian should perform its functions.

There is the regulatory requirement for funds ensure that the fund manager and the depositary are distinct. The depositary and the custodian can be [and often are] the same. With unregulated assets (physical oil, Bitcoin and gold), the depositary may well appoint an investment manager for the safekeeping of the assets – as long as he or she can discharge their duties.

The most important role of a custodian is the administration of assets, which is the only activity that generates income. In the world of UK regulated financial services, safeguarding and custody are “reserved words” that each have a special meaning. In short, they mean looking after someone else’s investments. The contract in common law that underpins this relationship is called “bailment”, where the bailee (the custodian, in this case) temporarily gains possession, but not ownership, of the assets.

FN: How does insurance work with custody services?

PM: In digital assets custody, there are broadly two types of insurance cover. These are, respectively,

assets at rest and assets in flow. In digital assets, this most often covers the flow into and out of custody, which only needs to cover the peak momentary transaction flow. An insurance policy is only as good as the policy and the creditworthiness of the underlying insurance company. Some policies are taken out purely for marketing or box-ticking purposes and must be seen as such, e.g., a \$100 million policy for assets at rest is relatively meaningless, whereas a \$10 million for assets in flow is much more significant.

FN: During the last year, what are the most interesting developments you've seen in the digital asset sector?

PM: The three most interesting developments have been: (1) COVID-19, which is likely to see asset allocations by family offices shift more into alternative investments, including cryptocurrencies. We expect the volume to start arriving in Q1 2021. (2) The issue of stablecoin regulation being given attention by central banks. (3) The beginning of the shift to digital amongst the incumbent financial infrastructure sector.

Phil Mochan is the founder and head of strategy and corporate development at Koine.¹

¹ Founded in 2017, Koine offers segregated, institutional custody and settlement of digital assets, providing a transformative security model, eliminating settlement and counterparty risks. Koine is authorized as an electronic money institution (“EMI”) by the UK Financial Conduct Authority (FCA) for the issuance of electronic money with the firm reference number (FRN) 900934.



Trends and opportunities

Top three digital asset market trends shaping the future

Three key trends in the digital asset market are:

1. Tokenization of widely traded traditional assets, such as stocks and bonds;
2. Tokenization of previously untraded or under-traded assets, such as real estate and fine art;
3. Institutional adoption and trading of digital tokens.

During the past year the number of projects attempting to tokenize assets has grown, but as discussed later in this report, some of these have liquidity challenges.

The buildout of digital asset trading infrastructure, paired with, regulatory clarity is creating ideal conditions for these three trends and heralds explosive growth in the overall trading of digital assets in the coming years, with opportunities for digital asset trading infrastructure providers growing alongside.

Tokenization

The tokenization of assets refers to “the process of issuing a blockchain token that digitally represents a real tradable asset—in many ways similar to the traditional process of securitization, with a modern twist... These security tokens can then be traded on a secondary market.”

Any asset, physical or virtual, can be tokenized. In the world of traditional assets, tokenization is inevitable. Major institutions—including the People’s Bank of China, the Austrian Government, the World Bank, and Daimler—have all directly issued tokenized assets, like securities, bonds, loans, and commodities. As pilots evolve into commercially available products, and as regulation is clarified, this trend is set to explode.

While digitizing traditional assets is itself a huge opportunity, the emergence of novel digital assets represents, perhaps, an even greater opportunity for capital markets growth. Previously untraded or under-traded assets that have already been tokenized (at relatively small scales thus far) include real estate, fine art, warehouse receipts, digital items in virtual spaces, sports teams, and even people.

“100% of the stocks and bonds trading on Wall Street today could be tokenized, and in five years, 100% of the stocks and bonds on Wall Street WILL be tokenized.”

- Robert Greifeld, former chairman and CEO of NASDAQ
(Jan 30th, 2019, via Twitter)

Drivers

The three key advantages of tokenization driving the trend are:



1 Fractionalization

Tokenization and fractionalization enable assets to be broken down into manageable pieces, thereby lowering the barrier to entry for investments. In the real estate sector, for example, the 1.675 million ASPEN tokens, which were minted in 2018 in what is widely considered the first real estate security token offering, represent US\$18 million worth of indirect ownership in the St. Regis Aspen Resort—a five-star, 179-room hotel situated in Colorado. This made each stake in the hotel, at the time of purchase, worth just US\$20. ASPEN tokens are tradeable 24/7 on a third-party exchange.

Fractionalization along such lines will also facilitate the creation of new trading markets into assets that were previously difficult to trade. Take the example of fine art. As expensive art pieces are fractionalized into tradeable tokens, it brings in new traders and new money by lowering the barrier to entry.

2 Automated compliance

Digital security tokens can be designed so that compliance is baked in. For example, assets that are only available to accredited investors can be coded such that exchanges of the tokens can only be made between whitelisted traders. Security offerings that are only available to a limited number of traders can also have their tokens coded to ensure such compliance. This programmability of trading reduces the cost of compliance and eliminates the risk of violations.

Digitalization of securities can significantly lower the barrier to entry for entities looking to raise capital. The concept of a security token offering (STO), which emerged in 2017 as a regulatory-compliant alternative to the initial token offering used by start-ups to raise capital, is already gaining momentum. The amount collectively raised through STOs grew from US\$22 million in 2017 to US\$452 million in 2019, but STOs are just getting started.

It is likely that digitally issuing securities will completely replace legacy methods for both private and public offerings due to the lower costs, baked-in compliance, and ease with which secondary trading is made possible. In Europe, where regulatory clarity around STOs is already largely clarified, it is projected that the trading volume for security tokens will reach €500 billion by 2022.

3 Liquidity

With assets broken down into smaller pieces, and with earlier access to buy and sell thanks to the increased speed with which tokens can be brought to secondary markets, the tokenization process increases liquidity. This enables more direct access to capital and more efficient price discovery, ultimately providing more direct capital markets. For example, investors in a private equity offering for an early-stage start-up can be issued security tokens rather than having to wait five to ten years for liquidity as they do now.

Provided the rules baked into the token allow for it (defined vesting periods, for example, may be built in), investors can begin trading the asset almost immediately. The decreased risk taken on by investors thanks to this improved liquidity should in turn facilitate access to capital for enterprises.

Tokenization also brings with it the possibility of providing liquidity to a wide range of novel assets. Going back to the example of tokenizing fine art, owners of fine art can turn a previously illiquid asset into an extremely liquid asset, thereby freeing up capital. By issuing tokens to represent a portion of the artwork, owners can liquidate a portion of their asset while retaining possession of it. The same can be said for practically any asset that was previously illiquid, from antiques to homes.

Digital asset funds

Another key trend in the digital asset market is the emergence of digital asset funds. These are investment vehicles that enable investors to gain exposure to the emerging global digital asset ecosystem without the burden of taking custody of the assets themselves. This is attractive for institutional investors, who typically lack the legal framework to be a custodian of their own digital assets.

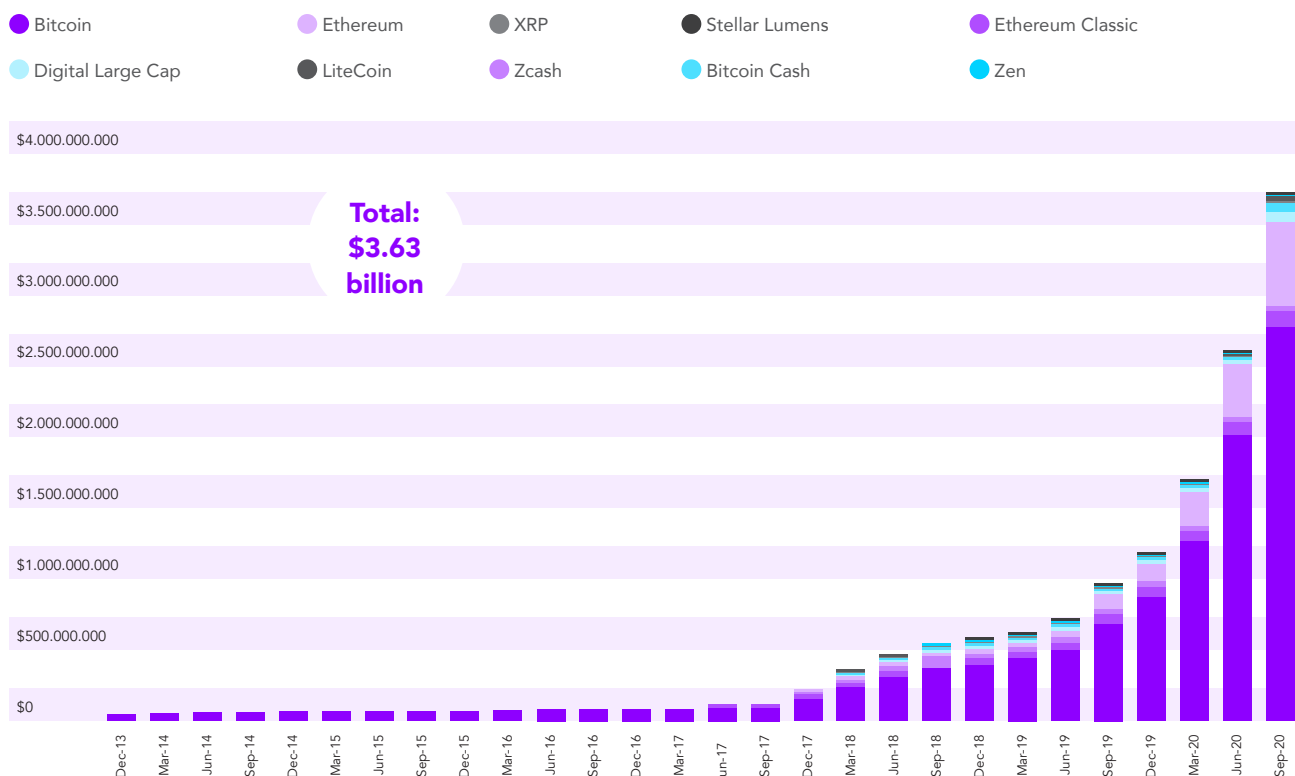
An additional consideration is around so-called “tainted coins”, or coins that may have been involved in criminal activity in the past. Purchasing digital assets directly exposes the buyer to the possibility of being connected with such coins, which is an unacceptable risk for institutional investors. Gaining exposure to digital assets through a fund, however, eliminates that risk.

Digital asset funds have been steadily gaining traction since 2017, but in the last year, uptake has been explosive. New York-based Grayscale Investments, the world’s premier digital asset fund manager, recorded US\$1.4 billion in inflows in the first half of 2020, moving its total assets under management to over US\$2.5 billion. According to Grayscale’s Q2-2020 report, institutional investors continued to be the primary source of investment capital in 2020, accounting for 84% of inflows.

Some digital investment funds offer exposure to more than just a basket of the top cryptocurrencies. Digital asset hedge funds, such as the Canada-based Digital Asset Fund from Exponential Ventures, may include a broad range of assets, such as real estate, venture, precious

metals, digital currencies, bonds, digital utilities, public equities and commodities, as well as other digital assets.

In Asia, the appetite for exposure to digital assets through the fund structure is likely to accelerate thanks to the addition of a slew of high-quality fund managers in recent months. Singapore-based Stack, for instance, launched Asia’s first Bitcoin index fund in January 2020, with inflows of US\$200 million in the first month and projections to capture US\$750 million in assets under management by the end of 2020. In April 2020, in Hong Kong, the Securities and Futures Commission approved the jurisdiction’s first-ever digital asset manager to launch a crypto fund.



Source: Grayscale.co

A new asset class

Digital assets have become a “new institutional investment class.”

- Morgan Stanley

Investors are attracted to digital assets due to their historical performance, as well as the perception that digital assets offer a unique portfolio diversification opportunity moving forward, particularly given the instability in traditional markets. Critically, digital assets have now reached institutional-grade status. This means that more and more family offices, hedge funds, and even endowments will allocate a portion of their capital to the growing array of digital assets becoming available.

“We’ve seen a dramatic increase in the number of investors seeking to diversify their portfolios using Bitcoin. Fears of a global recession, combined with deteriorating trade relations globally, are accelerating this process considerably. Bitcoin is one of the best-performing assets in history—with 19 times returns since 2014—and is uncorrelated with traditional markets, making it an attractive prospective investment for both individuals and institutions.”

Stack co-founder Matthew Dibb

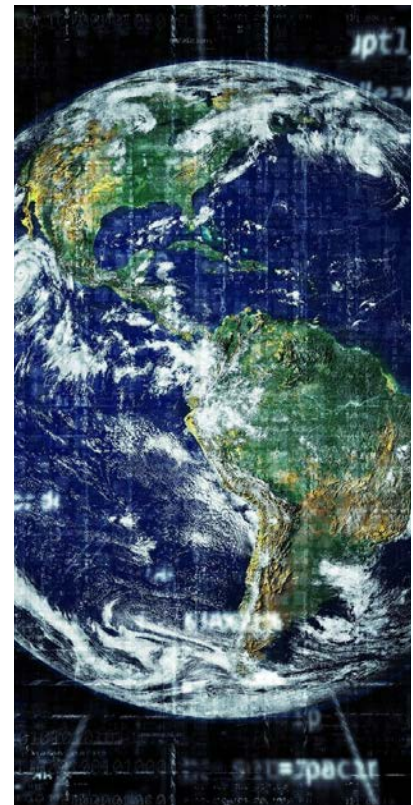
Opportunities

Ultimately, declaring ownership rights of assets in digital form has the potential to create new streams of capital for businesses and markets globally. The growth of tradable digital assets necessitates concurrent growth in the infrastructure for trading them. This bodes well for digital asset exchanges, which will take their place as foundational infrastructure in the digital asset ecosystem.

Early digital asset exchanges are just now starting to take off. For example, tZERO, a platform for the trading of security tokens, saw trading volume increase 15 times from US\$125,000 to US\$2.02 million between June and July 2020, following the listing of a security token generated by the online retailer Overstock.

Forward-thinking traditional exchanges, recognizing the opportunity, are also making efforts to facilitate the issuing and trading of digital assets. For example, since 2017, the Swiss Stock Exchange has been developing a digital exchange that enables the issuance of digital security tokens, live trading, and instant settlement. The SIX Digital Exchange platform went live with a pilot in late 2019 and is expected to launch its full version in Q4 2020.

With increasing regulatory clarity in key markets on issues such as digital asset custody and security token offerings, the stage is set for rapid uptake.



Hong Kong's Securities and Futures Commission's new crypto rules will hinder opportunity

Hong Kong's Securities and Futures Commission chief, Ashley Alder, kicked off a firestorm during Hong Kong FinTech Week 2020 by announcing a plan to regulate all cryptocurrency exchanges that operate in the city or target its citizens.¹

These new proposed rules would replace a voluntary framework introduced in 2019 that allowed exchanges to opt in and commit to a set of best practices.

According to the proposal, if any cryptocurrency exchange offers one virtual asset that is currently classified as a "security," then all assets being traded on the platform would be considered securities.

Citing membership in the *Financial Action Task Force* as reason for Hong Kong regulators to push through with a strengthened anti-money laundering scheme, Alder said that cryptocurrency exchanges operating in the city — "centralized virtual asset platforms," in their parlance — would fall under the same rules as securities brokerages.

Despite the murmurs over Alder's remarks, these new regulations likely won't be the end of retail cryptocurrency trading in Hong Kong.

These regulations would likely help provide a rules-based environment that would be conducive to institutional money entering Hong Kong's market. One result could be institutional-grade

cryptocurrency exchanges popping up in the territory, potentially run by its incumbent traditional banks. As reported on *Forkast News*, Singapore's DBS, one of the largest banks in Southeast Asia is already believed to be setting up a cryptocurrency exchange. Similar plays could take place in Hong Kong.

Hong Kong is breaking away from the direction of the US

For the SFC, this is quite a different direction than the direction their regulatory peers at the Securities and Exchange Commission are taking. Hester Peirce, one of the SEC's commissioners, told *Forkast News* in an interview that the commission needs to do some "soul searching" on the Howey Test — which defines what and what's not a security.

Pierce has also proposed an expanded three-year safe harbor that would allow projects some time to determine if they were or were not a security.

This method gives some breathing room, and would allow some leeway for a project to perfect its decentralization.

In contrast, the SFC appears to be casting a wide net and is looking to classify *more* things as securities

despite them only having some of the characteristics of a security. This isn't going to be the best approach, as it will only push projects into markets with more permissive jurisdictions. When Warren Davidson, a US congressman from Ohio, was drafting the *Token Taxonomy Act*, he specifically cited



¹ <https://forkast.news/hong-kongs-new-crypto-exchange-laws-will-be-embraced-with-vpns/>

the need to move jurisdiction for token products away from the SEC to other regulatory jurisdictions like the Commodity Futures Trading Commission — better reflecting the reality of the product. Further, in parallel, the *Securities Clarity Act* is also creating a new definition of securities laws to specifically exclude cryptocurrency tokens from what is defined as a security.

In the eyes of US lawmakers, without these bills the industry would just leave the US and hunt for flags of convenience. If investors in these projects were burnt, they'd need to litigate the case in Seychelles or some other far flung jurisdiction. With these bills, lawmakers have provided a pathway back to the US for these projects.

Will retail crypto investors vanish from Hong Kong?

Although many of the biggest cryptocurrency exchanges have offices in Hong Kong, they fly their corporate flags elsewhere. Binance, the biggest by volume, is notoriously elusive of where that might be. Coinbase and Kraken are American. Huobi is Singaporean. BitFinex is in the British Virgin Islands.

On the derivatives side, BitMEX is headquartered in Seychelles, while FTX is one of the few that calls Hong Kong home but bans residents from using its service.

Even if these companies were Hong Kong-registered, they could simply ban residents from its platform but look the other way when VPNs are used to bridge the gap. AAX,

with an office in Hong Kong but a parent company in Seychelles (and subsidiaries in Malta), unlike BitMEX and FTX, allows Hong Kongers on the system but has yet to receive a sanction from regulators.

What the SFC may be doing is laying the groundwork for Hong Kong to become a hub for institutional cryptocurrency cash. What Adler proposes creates solutions for most of the obvious pain points in the industry.

This shouldn't be thought of as a play to rein in the retail investment space. Despite a nexus to Hong Kong with offices here, they don't actually operate *in the territory*. Any attempt to ban Hong Kong's retail investors from their favorite cryptocurrency exchange platforms would likely be met with VPNs.



INTERVIEW

Family offices are turning to digital assets

Trent Barnes, Principal at Zerocap

“Tokenization brings new models for raising capital, as well as institutional-grade opportunities,” says Zerocap’s principal.

Forkast.News: How does a digital asset become “institutional-grade”? What sort of criteria are institutional-level traders looking for?

TB: The criteria would include clear guidelines and regulatory frameworks as to how digital assets are treated, deepening pools of liquidity for trade executions, counterparty protections with insurance, wallet, storage and custody security, regulated derivatives and new access vehicles to digital asset credit markets.

Regardless, the strength and robustness of a digital asset is determined by the reach and depth of its network. Bitcoin’s growth of users, not only by quantity but also by the breadth of its participants, has created deeper intrinsic value to the network. A part of this has been driven by institutional infrastructure and, recently, increasing institutional adoption due to macro-economic factors that have shone a light on the investment case for digital assets—

primarily, Bitcoin being regarded as a safe haven asset and inflation hedge, much like gold.

FN: Why do we want to tokenize assets? What’s the advantage of digital assets?

TB: Blockchain technology has modernized the financial system for the digital age. Just like if we were to invent money today, we wouldn’t necessarily invent paper money, coins and credit cards, we’d probably invent Bitcoin. In financial markets, I’d like to think we’d be smart enough to create a digital ecosystem of assets that allows us to tokenize anything of value in the real world—which is happening now. A digital age requires digital assets.

The reasons for the move toward the tokenization of assets are around liquidity, opportunities in fractional ownership, which also allows for a new model raising capital, transferability, accessibility, programmable trust via the blockchain, and authenticating the asset.



FN: What’s your take on the explosive growth of stablecoins during 2020? Are you seeing demand for non-USD denominated stablecoins?

TB: The growth of USD-backed stablecoins is evidence that people are looking for a safe, non-volatile store of value. Whether it’s to provide protection from the volatility in the crypto market, being used as a gateway currency into trading, or solving remittance challenges in cross-border payments. They’re faster, they remove the need for an intermediary, and they come with



all the benefits of a decentralized blockchain: speed, transparency and security.

The demand for non-USD stablecoins is still in its early stages. The primary assets across our client base are Bitcoin, Ethereum and USDC, as well as Tether (USDT). For non-USD stablecoins, gold-backed ones are the most interesting for us—the benefits of gold without the drawbacks of holding the physical asset. There are obvious advantages to having gold tokenized on the blockchain, such as instant transaction speeds, liquidity, accessibility, transferability, portability and smaller minimum purchases.

We aren't seeing a huge demand for these at the moment, and we put it down to a chicken-or-egg-type basket in regards to the liquidity available—is there low liquidity because of demand or because of the supply available?

FN: What are some of the barriers right now in the digital asset market? Is it regulation? Education? Infrastructure?

TB: Definitely all three of these. Brokerages in the traditional finance sector could lose key parts of their business and margins. It's a money-making machine and no one wants their cash cow taken away from them. However, you would also still need a centralized entity to hold these securities and tokenize them on the blockchain. Trust is important when persuading people to use new products, particularly where there is counterparty risk. Crypto and digital assets don't have a long history and have been plagued by scams and plenty of adverse media.

In order to develop the infrastructure surrounding digital assets and their use cases, we need more thoughtful participation and investment, as well as an increase in regulatory support. From what we can see, some regulators are actively participating in the conversation around digital asset adoption and are providing clear guidelines where they can.

FN: How has the custody market for digital assets evolved in the last year?

TB: From a traditional adoption perspective, one of the notable events in the US from earlier this year was the US Treasury/OCC (Office of the Comptroller of the Currency) giving the greenlight to banks to provide digital asset custody services for their customers. Though banks were never restricted in providing these services, having clarity from the OCC provides an official green light.

It will be interesting to see which US banking institutions take it up, as European and even Asian banks (particularly in South Korea) have

and are already moving forward with it from a global perspective. One of the key drivers behind this, particularly for innovative banks, is preparing for a robust digital asset management and tokenized assets ecosystem, which is now on the horizon. A digital age requires native digital assets, and the banks that don't keep up will be left behind.

FN: How has the explosion of DeFi shifted your strategy? DeFi isn't really a tokenized commodity, but it can build liquidity in the tokenized asset market. What's your take on this relationship? Is DeFi the missing link to build liquidity?

TB: Whilst DeFi is not a tokenized commodity – yet – it is already making huge waves in the liquidity space. DeFi essentially aligns incentives for all participants in the chain of a transaction.

The securitization of tokens has been challenged by shallow liquidity. DeFi structures in this space would incentivize deeper levels of “maker” liquidity and engagement, while lowering fee structures for those “taking” liquidity. DeFi offers huge benefits in 24/7 liquidity, yield and speed. DeFi is in its infancy. The natural next step would be to offer a vast array of tokenized commodities and assets.

ZeroCap is a digital asset firm that provides bespoke financial solutions to family offices, HNWI's and emergent wealth globally, including bitcoin and digital asset trading, insured custody, and yield products.

Building liquidity

Although institutional interest in Bitcoin is rising, there is still the volatility conundrum to consider. Bitcoin's market fluctuations, however, make it a poor store of value. But, at the same time, there is an advantage to keeping capital stored in crypto: cashing out crypto into fiat is almost always a taxable event and not ideal unless the investor intends to withdraw from the market.

In the search for functionality and the need for a stable, liquid digital asset, investors have traded their fiat currency "on-ramp" for stablecoins. Dubbed as the "holy grail" of cryptocurrency, these digital tokens, like USDC and Tether (USDT), have emerged as the alternative to gold and Bitcoin in response to the looming crisis. These are digital assets that offer the same benefits of cryptocurrency, but are backed by a reserved asset (either fiat money or a collateralized asset like gold or crypto) that allows convenient transactions without the extreme volatility of cryptocurrencies.

The advantage of stablecoins is found in its infrastructure, which leverages a non-inflationary value to balance volatility, combining it with a "two-token model" for price regulation. This provides better stability in comparison with traditional cryptocurrencies, making it an ideal "safe haven" during an economic crisis. While speculative investing in cryptocurrency may be far from over, those who are looking for functionality and use cases for cryptocurrency may find what they are looking for in stablecoins.

Stability without USD

While the majority of stablecoins in the market are denominated in USD, according to AHKD (a subsidiary of AAX's parent company, Atom Group), there is demand for a HKD-denominated stablecoin, which it plans to launch later this year.

AHKD has partnered with Hong Kong-registered First Digital Trust, a regulated entity under the HK SAR Trustee Ordinance. The firm acts as a custodian of the cash reserves that back the stablecoin in a segregated client account. Having a regulated trustee that is subject to audit requirements controlling custody of the assets that back the stablecoin helps build a level of confidence in the product. Tether, for instance, has been dogged by allegations that it's undercollateralized.¹ The use of regulated custodians would be an easy way for a firm to refute these allegations.

The Hong Kong dollar itself is a compelling choice given the currency's role in the region. The HKD is pegged to the USD and allowed to trade in controlled band as part of a plan called the "currency board". Although it is pegged, the HKD has served as an on-ramp and off-ramp for Mainland China's renminbi. Hong Kong is home to the largest off-shore liquidity pool of RMB, and with the HKD's international liquidity, the city can act as a pipeline for EUR/USD-HKD-RMB settlement.² Thus, a HKD-denominated stablecoin is more likely to capture interest from Mainland China than a stablecoin denominated in an alternative currency.

State-backed liquidity: the central bank digital currency race

"Liquidity is the new boss in town" could be the theme for the last year in fintech development. The explosive growth of stablecoins led the charge in blockchain-based liquidity as investors sought efficiency in on-ramps and off-ramps.

Almost in parallel to all of this, a number of the world's central banks are developing central bank digital currencies—digital money (not *digitized* from the existing supply) that exists on a digital ledger. A digital ledger is a decentralized ledger that requires multiple verifications to authenticate transactions. Blockchain is a type of digital ledger technology, but not all digital ledgers are blockchain.

China's CBDC ambitions

It's of great annoyance to Beijing that despite China's rise to the status of the world's second-largest economy, most of the world's transactions are settled in USD. A businessman in Chengdu trying to settle a transaction with a vendor in Lahore, Pakistan, would likely do so in USD as it's the most liquid currency for both parties. That's not Beijing's only problem: with the near-ubiquitous nature of WeChat Pay and AliPay, China has a money supply problem on its hands. Can China's national digital currency DCEP (Digital Currency Electronic Payment) be a solution for this?

¹ <https://breakermag.com/tether-now-admits-its-not-fully-backed-by-dollars/>

² https://www.hkma.gov.hk/media/eng/doc/key-functions/monetary-stability/rmb-business-in-hong-kong/hkma-rmb-booklet_accessible.pdf



From Forkast's China Blockchain Report¹:

The central bank's digital currency efforts, ironically, would give it more control over the economy. According to reports and the PBOC's statements, the digital currency would replace M0, or the money in circulation, of which central banks generally have the most control. For China, this is important considering how private companies are digitizing currency through popular mobile payment platforms WeChat Pay and Alipay. A substantial portion of the payments that drive the consumer economy has shifted to these platforms, which means they have moved from M0 to M2, of which central banks have less control. While M2 includes M0 (in addition to M1, the amount of cash held in checking accounts), it largely refers to the funds and credit in commercial bank accounts—where WeChat Pay and Alipay currency is held.

¹ <https://forkast.news/china-blockchain-report-global-rmb-usd/>

Central bankers back digital currency

Central bankers around the world, from London to Brazil and Jakarta, have expressed interest in exploring the potential of CBDCs. Indonesia's economy is heavily dependent on remittances, and the majority of this occurs through privately owned payment rails with high friction costs. In order to boost adoption of the real and break down barriers in regional remittances, Brazil is said to be exploring a CBDC.

"We are in the middle of a revolution in payments," writes former Bank of England Governor Mark Carney in an early 2020 discussion paper³ on the topic. "The use of banknotes—the Bank's most accessible form of money—is declining, and use of privately issued money continues to increase, with technological changes driving innovation."

Stablecoins would be part of the category that Carney defines as "privately issued money." The

inherent problem with such privately issued money is that it expands the supply of M2 – as the PBOC has recognized – giving the central bank less control over the economy through monetary policy. And the issue of risk always remains. For example, Tether currently has just over US\$15 billion in circulation,⁴ while USDC has just over US\$2.4 billion in circulation.⁵ Regulators have taken an interest in both.⁶ Should Tether or UDSC fail and wipe out investors, it would have a detrimental impact on the crypto-economy and likely cascade into the broader economy, as Tether will soon have sufficient capital under its control sufficient to it in the list of top-100 US banks by assets.⁷

The rise of digital money, particularly stablecoins, has forced central bankers to act. It's unlikely that the rise of CBDCs would have a broad impact on the demand for stablecoins since these are primarily used for on-ramps and off-ramps for crypto.

³ <https://www.bankofengland.co.uk/-/media/boe/files/paper/2020/central-bank-digital-currency-opportunities-challenges-and-design.pdf>

⁴ https://wallet.tether.to/transparency?_cf_chl_jschl_tk__=d38fe28be51b92b4e2d1c4395f52d0789dcc6e1b-1599437355-0-ARsLQZHlYdNRzLXPXw6FEsJ5iKV49ZozfMG_5L1F6Yx-89HtY4V-V5zqT3Gdxby7ilo6T3j7QRNs92eqnT6OOX3

⁵ <https://nomics.com/assets/usdc-usd-coin#chart>

⁶ The report covers this in more detail on page XX

⁷ https://en.wikipedia.org/wiki/List_of_largest_banks_in_the_United_States

Asset Type	Project Count	Market Size	Daily Volume
Tokenized Commodity	4	831,887.85	151.08
Tokenized Currency	46	17,724,673,331.00	33,085,605,998.00
Tokenized Energy	12	133,059,827.20	2,251,235.37
Tokenized Fiat Money	1	50,150,013.00	0.00
Tokenized Gold	8	159,267,392.30	3,026,945.63
Tokenized Real Estate	9	128,056,794.90	187,697.19
Grand Total	80	18,196,039,246.00	33,091,072,027.00

Notes:

Currencies are by far the highest traded

Gold - sometimes considered a currency - is the next followed closely by energy commodities

Total market size of US\$18.1 billion

Based on our findings, the current market size as of Q4 2020 of the tokenized asset market is US\$18.1 billion.

In comparison, the total digital asset market size is approximately US\$350 billion

(source: CoinMarketCap)

HOW VALUE IS CREATED

Tokenized asset market sizing and analysis

Our methodology for calculating the value of this market includes tokenized commodity, energy, currency (i.e., stablecoins), gold and real estate projects. Calculations include publicly listed projects found via Blockexplorers. It excludes cryptocurrency, as it's a native digital asset, as well as DeFi projects because of their extreme volatility.

Our research shows that the total share of tokenized assets compared to the total assets of select commodities worldwide is currently immaterially small and represents an insignificant percentage of the world's total assets. However, that's simply because the market itself is far from mature and is only in its first stages of development. Should the regulatory, institutional and educational barriers be lifted, we believe that this market has the potential for significant growth.



Asset	Total Global Value	Total Tokenized Value
Gold	\$9.6 trillion	159,267,392.30
Real Estate	\$10 trillion	128,056,794.90
Commodities	\$20 trillion	831,887.85
Currency	\$6.6 trillion	17,724,673,331.00
Total	\$46.2 trillion	\$18.1 billion
Total Digital Asset Market		\$350 billion

Sources: Perth Mint Bullion, MSCI, Comdex, Bloomberg, ETHEplorer

Given the popularity of stablecoins, we find that the majority of digital assets exist as stablecoins, which is expected considering the demand and practicality of the asset.

Gold is next, for reasons similar to currency, followed by real estate and commodities. The latter two have regulatory concerns that prevent their respective expansion, which will be addressed in the deep dive below.

According to publicly available data from CoinMarketCap, the majority of AAX's current trade volume is dominated by traditional cryptocurrencies and DeFi tokens. *Should AAX invest more in prominently listing these tokens, it would present a new growth story for the exchange.*

Tokenized commodities

Market size:
less than
US\$1 million

The big opportunity of a tokenized commodity market - There are many reasons for tokenizing commodities, and these benefit existing players in the industry and democratize access for retail investors, drastically increasing the total addressable market. In fact, as cited earlier in the report, Robert Greifeld, former chairman and CEO of NASDAQ, has a bullish view that non-tokenized commodities only have a five-year lifespan.

By tokenizing commodities, more people have access to the global trade in a way that serves a broader range of wealth. Because of this, there will be more activity in the markets, which creates greater liquidity and market depth

with better price discovery. The commodities market would not only become more efficient, but for the first time in its long history, it would be open every single hour of each day.

Both traders and the overall industry stand to benefit greatly from tokenized commodities being available on crypto exchanges. Alex Mashinsky, the chief executive of the decentralized finance (or DeFi) platform Celsius and the inventor of the voice-over-internet protocol (or VOIP) discussed the platform's recent introduction of support for Tether Gold (or XAUT).

Mashinsky described the platform's support for tokenized gold as offering a bridge for users from fiat currency to non-correlated and decentralized assets. "Every time you have bought gold, you've had expenses, storage fees and insurance fees. Or perhaps there was a funds fee—fees upon fees upon fees. We have a positive yield of three or four percent per year," he said.

With the addition of gold, Mashinsky stated that Celsius now provides support for a non-correlated asset that is stable, allowing users who may not yet be interested in crypto assets to explore the possibility of moving out of fiat currency and non-correlated assets.

Growth potential

Aside from the general regulatory uncertainty that prevents the market from thriving, tokenized commodities have not taken off – and are the laggard in the sector – because of the perceived usefulness of fiat and gold-backed tokens. For this to take off, the market would need to see the adoption of a stablecoin backed by a basket of commodities and currencies.

Tokenized currency (Stablecoins)

Market size:
US\$17 billion

By far the most liquid tokenized asset class, fiat-backed stablecoins' explosive growth is due to its role as an on-ramp and off-ramp for crypto, and a hedge against the crypto market's fluctuations, as discussed earlier in the report. According to data sourced from Bitstamp,¹ the market capitalization of stablecoins grew 40% between March and August in 2020.

The inherent problem with fiat-collateralized stablecoins, such as Tether, is that they require a certain level of trust in the issuer. This level of trust has been called into question with Tether, which has attracted interest from industry stakeholders and regulators² for understating the collateralization of Tether and how the tokens are structured. Although each Tether is pegged 1:1 to the USD, news that the stablecoin was undercollateralized has occasionally driven the value of 1 Tether to below US\$1. Conversely, heightened demand for stablecoins as a crypto on-ramp and off-ramp has driven the value of Tether to above US\$1.

Tokenized currency should not be confused with central bank digital currency. Tokenized currencies are simply tokens representing currencies stored in a vault, whereas CBDCs are currencies issued by a central bank natively on a digital ledger. The market size of tokenized currency continues to increase dramatically as more tokenized currency is minted. Thus, while the market was valued at US\$17 billion at time of measurement, it continues to expand thus we are pegging it at "over US\$17 billion".

¹ <https://decrypt.co/38763/tethers-market-cap-breaks-12-billion-for-the-first-time>, <https://f.hubspotusercontent00.net/hubfs/5264302/The%20Rise%20of%20Stablecoins.pdf>

² <https://decrypt.co/7795/investigators-tether-loaned-usdt-to-investors-illegally-traded-in-new-york-ran-an-unregistered-securities-offering>

Growth potential

In theory, the stablecoins market should have the least regulatory concerns as each issued token is simply representative of cash, not a regulated commodity. All of this ensures that every stablecoin is collateralized 1:1 with a dollar.

However, regulators in New York have taken some interest in whether stablecoins should be categorized as a "deposit", thus triggering banking regulations. Section 131 of the New York banking law prohibits "unauthorized persons from issuing notes or other evidences of debts to be loaned or put in circulation as money or receiving deposits."³ Aside from a broad investigation into Tether and BitFinex, regulators have not taken any significant action against stablecoins. Their efforts seem to be focused on products that may be considered securities (although Tether's fluctuation in price is due to under-collateralization), which has made some regulators question whether or not it is a security⁴.

Forkast's view is that the most interesting growth story will be from non-USD denominated stablecoins. As cryptocurrency becomes a tool for worldwide remittances, stablecoins denominated in localized currencies are likely to become more common. For instance, Binance's Project Venus seeks to create stablecoins denominated in regionalized currencies on the Binance chain to compete with USD-denominated stablecoins like Tether.⁵ Since the 2019 blog post that made the announcement, it does not appear that further progress has been made. The Indonesian Rupiah-pegged RupiahToken⁶ (not affiliated with Binance's Project Venus) is an attempt at this. However, the token appears to trade in low volume.

Tokenized energy

Market size: US\$133 million

Because of the popularity of roof-mounted solar cells, more homes are becoming less dependent on the grid. At the same time, "feed-in tariffs", where the local utility company pays for excess energy generated by solar panels, is declining in value⁷, creating a demand for alternative energy markets.

Projects like Cenfura, PowerLedger and WePower allow users on the same grid to trade power so that some users can offset their use of grid power (which might be from carbon-intensive sources) with green power derived from solar panels or small wind turbines. In many ways, this is similar to a carbon offset.

The majority of the tokenized energy projects out there have had their tokens classified by the SEC as utility tokens, and as a utility token, the token itself is not sold as an investment contract. It is therefore not considered a regulated security, which in practice means that renewable energy transactions are done in the form of pre-payment.

Growth potential

Although the idea of trading tokenized energy on alternative markets sounds enticing, these projects are wholly dependent on the grid being brought on as a stakeholder. This means that such projects could only be developed in regions that have invested in smart grid technology, which excludes much of the United States or residential complexes that have their own power grid.

Power Ledger has had some success with onboarding residential developments and regional power grids in Australia, Southeast Asia, and Europe.⁸

But tokenized energy projects tend to trade in low volume. This is because in order for such projects to truly take off, they would need much more scale and buy-in from a regional government. In addition, the market might be confused as to exactly why tokenized energy trading is advantageous, so a broader educational campaign is needed. Ideal customers might not be retail users but rather residential or commercial developments.



³ <https://www.nysenate.gov/legislation/laws/BNK/131>

⁴ <https://www.sec.gov/corpin/pocketful-quarters-inc-072519-2a1>

⁵ <https://www.binance.com/en/support/articles/360032604131>

⁶ <https://rupiahtoken.com/>

⁷ <https://www.choice.com.au/home-improvement/energy-saving/solar/articles/are-solar-feed-in-tariffs-worth-it>

⁸ <https://www.powerledger.io/clients/>

Tokenized gold

Market size: US\$159 million

Like stablecoins that are collateralized 1:1 with currency, tokenized gold projects issue tokens that are backed by gold. Brisbane-based Meld partnered with Algorand and the Australian gold industry to integrate the supply chain of gold on the blockchain. Paxos has created stablecoins that are pegged to gold bars (each token is pegged to "one fine troy ounce of a 400 oz" gold bar), allowing for both a form of collateral-backed crypto and also a method for P2P gold trading. Using the Algorand blockchain, gold brokers can meet sellers with the transaction secured by the blockchain.

Growth potential

Given the renewed interest in gold as a commodity to hedge against current economic conditions, tokens that allow for fractionalized ownership of gold show considerable growth potential due to both the lower cost of ownership, thanks to the efficiency of blockchain technology, and the lower threshold for ownership. While there are ETFs and other securities available that allow for the purchase of gold, market-listed products would have much higher buy-in thresholds than tokens.

AurusGold⁹ is an interesting case study in this: the platform offers the ability to purchase tokenized fractions of gold bars, with revenue sharing for those that offer to tokenize their own holdings, distributed at vaults around the world. AurusGold plans to issue debit cards so you can access cash equivalents to your holdings. Unfortunately, the AurusGold token

trades in low volume¹⁰ compared to other gold-backed tokens, so it is unclear if the market is receptive to this project's proposition.

Furthermore, many market-listed products do not actually physically own the gold. Instead, they track the value of the market, whereas gold tokens are tied to physical bullion. This, along with the lower buy-in costs, are a very attractive proposition to investors.

Tokenized real estate

Market size: US\$128 million

Real estate tokenization refers to recording and transacting the underlying title as well as the relevant conveyance (transfer) notices. Digital tokens can be used for signifying proof of ownership, transferring fractional rights of the land, receiving interest or paying debt on the structure or to holding equity or shares of a physical property, all to build liquidity for the title owner. Any interaction or transaction made on the token is then permanently stored on the blockchain ledger.

Given that any individual can own a fraction of the property through tokens, this eliminates the access barrier present in the expensive real estate industry, which is normally a great class divider. The presence of real estate tokens on exchanges ensures that liquidity is available to title owners, and with much more competitive rates than a home equity line of credit or other similar mechanisms. Theoretically, an investor could hold a portfolio of different real estate classes from a broad geographic spectrum at costs lower than a REIT.

Growth potential

Although tokenization of real estate shows a lot of potential, there are significant legal challenges to overcome if this segment is going to take off.

Real estate securitization has been traditionally done through special purpose vehicles (SPV), and the chances are that tokenization will go in the same direction. SPVs are legal entities designed for a single purpose, like managing or holding a real estate title. An SPV can represent limited partnerships, trusts, corporations, and other entities, all of which have their own pros and cons. If used in the right way, SPVs can be separate from the developer for liabilities and assets, which allows tokens to exist as independent investments without considering the developer's creditworthiness. Still, this is a very complex process of structuring SPVs, and it will require the knowledge of experienced professionals.

This legal barrier is an important one. If the property title or fractionalized ownership structure falls into dispute, the courts may not recognize the rights of token holders. Furthermore, without an SPV in place, title insurance policies may no longer be valid.

All this considered, there are a lot of legal barriers that need to be addressed before tokenized real estate takes off. Groups like the American Land Title Association, the national trade association in the United States, and other equivalent bodies worldwide will need to write best practices guides to address these issues before the market can really grow.

⁹ <https://aurus.io/aurusgold-card/>

¹⁰ <https://etherscan.io/token/0x696acc2de564b48682d71d0847b3632f87c9a402>

Evangelizing to different investor profiles

Millennials and Gen Z

Millennials have earned the reputation of disrupting or killing traditional industries, and the financial sector is no exception.

The disconnect between millennials and traditional investments is the result of various factors, such as their firsthand experience with the long-term effects of the 2008 global recession on assets and investments, as well as the complexities and inefficiencies in the procedures for and the maintenance of traditional investments like stocks.¹

Crypto and digital assets, however, appear to have more appeal for millennials. The lack of a middleman and offices, both of which add to overhead costs, and ease of access makes it convenient for the millennial to open and maintain an account.

Furthermore, the system that processes and maintains these digital assets is perceived by millennials to be more trustworthy, unbiased and transparent. The possibility of fractional ownership of these digital assets also coincides

with millennials' values and beliefs around the shared economy.²

To further growth in the market, tools are continuously being developed to attract more millennials and younger investors, making it easier for them to understand the dynamic digital exchange market.³

Traditional investors

While crypto and digital exchanges appear to be aimed more at millennials and younger investors, sophisticated and experienced investors in traditional markets have already joined or have shown great potential for conversion. Traditional investors who are continuously looking for new opportunities cannot help but notice, despite the volatility, the resiliency of cryptocurrencies like Bitcoin, which was able to bounce back and surge to US\$12,000 in June 2020 faster than any other financial investments, despite the ongoing pandemic.⁴ Some have speculated that the Bitcoin surge can be attributed to a large transfer of



the stablecoin Tether (USDT) to the Bitcoin and cryptocurrency exchange Binance.⁵ Nonetheless, while these traditional investors may not resort to putting their investment directly in Bitcoin, some of them have already invested or have demonstrated an interest in investing in stablecoins' low volatility.

Marketing a crypto exchange to traditional investors isn't always a surefire thing. Bakkt, which raised nearly US\$500 million,⁶ promised a physical settlement of Bitcoin futures contracts. In theory, this would be a godsend to institutional investors, as a cash settlement is the norm at

¹ "Survey Finds 27% Of Those Aged 18-34 Prefer Bitcoin Over Stocks". Forbes.com. <https://www.forbes.com/sites/ktorpey/2019/04/30/survey-finds-27-of-those-aged-18-34-prefer-bitcoin-over-stocks/>

² "Why Millennials and Crypto are made for each other". AAX Academy. <https://academy.aax.com/en/why-millennials-and-crypto-are-made-for-each-other/>

³ "Cryptocurrency Tools Aimed At Millennial Investors Are Gaining Traction". Forbes.com. <https://www.forbes.com/sites/rachelwolfson/2019/01/29/cryptocurrency-tools-aimed-at-millennial-investors-are-gaining-traction/#36203408cfc1>

⁴ "Bitcoin Just Suddenly Surged Toward \$12,000 But Now Might Not Be The Time To Buy—Here's Why" Forbes.com. <https://www.forbes.com/sites/billybambrough/2020/07/27/bitcoin-just-suddenly-surged-toward-12000-but-now-might-not-be-the-time-to-buy-heres-why/#5b450e7bec6>

⁵ "Forget The Halving—Is This The Real Reason Bitcoin Suddenly Soared Toward \$10,000?" Forbes.com. <https://www.forbes.com/sites/billybambrough/2020/05/02/forget-the-halving-is-this-the-real-reason-bitcoin-suddenly-soared-toward-10000/#1c06cb2477a8>

⁶ <https://www.crunchbase.com/organization/bakkt>



Capturing new investors

Digital exchanges use different tools to attract new investors, ranging from apps that emulate traditional investment tools and terms used in stocks to simple tools that cater to younger investors. Still, barriers to entry in the market remain due to the overwhelming number of options, the number of tokens in the market and the rapidly changing technology, which can be both intimidating and confusing for new entrants. Furthermore, the digital exchange market is still new and there is no widely accepted or consensual agreement in the industry on the correct way to start investing.

These barriers to entry can be simplified into:

- finding and applying the correct information to start investing; and
- the type of digital assets in which to start investing.

While digital exchanges evolve their processes and tools to make signing up to a crypto exchange and the process of trading easier and less tedious, accessible and transparent educational tools, including white papers, blogs, explainers, market updates and so forth, that relate to cryptocurrencies can be used to support lead management in order to attract investors.¹¹

institutional-grade exchanges like CME. So, why didn't they take the physical settlement?

Data from the first few weeks shows that demand simply wasn't there. On the first day of trading, 72 bitcoins were traded on the platform.⁷ As Federman Capital's Tom Federman points out, institutional investors simply weren't interested in the product.⁸ They already had institutional-grade exposure. Millennials, the growth story for the industry, weren't targeted.

According to a study released by the Frankfurt School Blockchain Center and BlockState AG in 2019, 71% of investors in digital securities

are traditional and not blockchain-specific investors.⁹ In a more recent study in June 2020 by Fidelity Digital Assets, it was also found that institutional investors—like financial advisors, high net-worth individuals and pension and hedge fund managers—have also been actively investing in digital assets and tokenization.¹⁰

These findings may mean that a simulated and targeted approach to attracting traditional investors may no longer be necessary. But there are still traditional investors who may not be too keen on entering the digital exchange market due to lack of accurate information.

⁷ <https://medium.com/federman-capital/bakts-unsuccessful-launch-is-no-surprise-666ad3d1010>

⁸ <https://medium.com/federman-capital/bakts-unsuccessful-launch-is-no-surprise-666ad3d1010>

⁹ "A surprising number of traditional investors are already in crypto". Decrypt. <https://decrypt.co/10944/a-surprising-number-of-traditional-investors-are-already-in-crypto>

¹⁰ "A quarter of institutional investors hold Bitcoin, says Fidelity." Decrypt. <https://decrypt.co/31753/institutional-investors-hold-bitcoin-says-fidelity>

¹¹ The AAX Academy website is a good example of the type of resources that's helpful to investors.

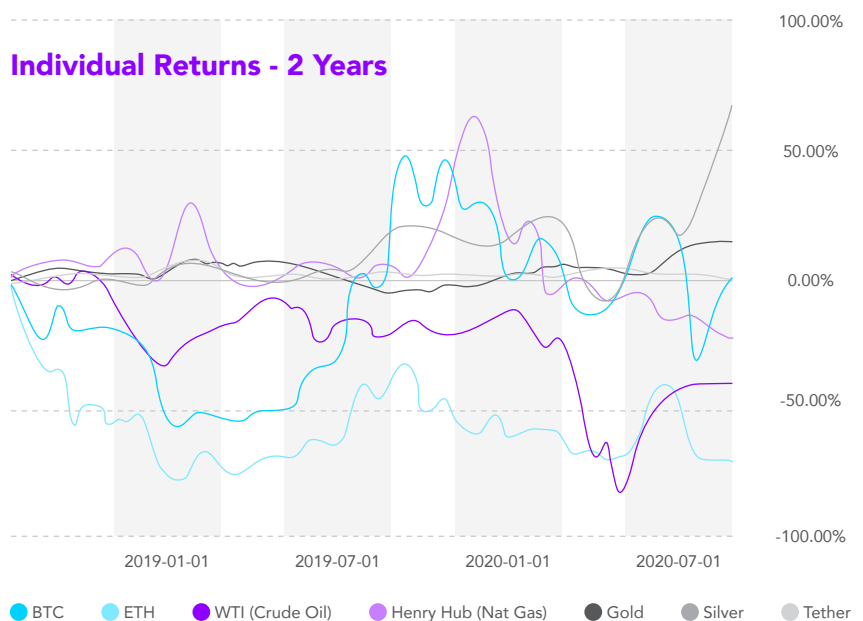
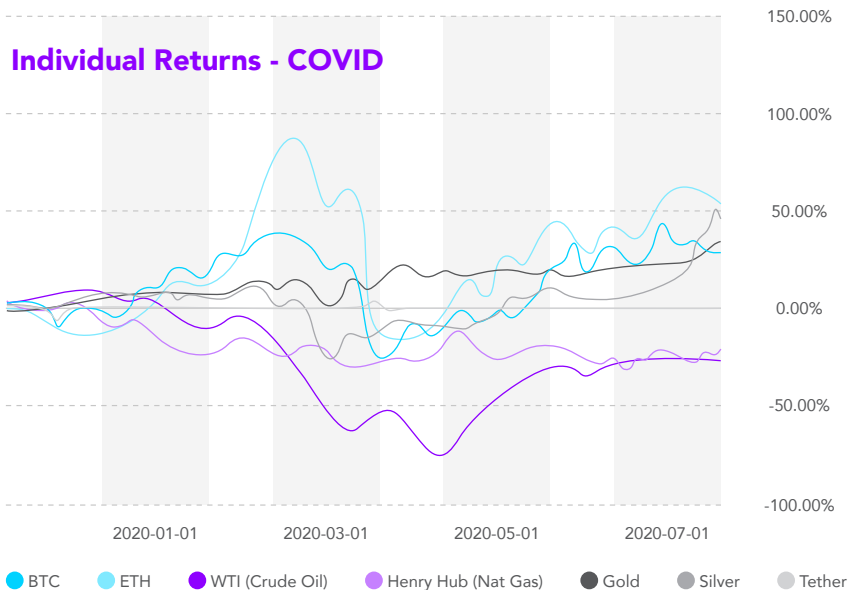
A portfolio balanced by digital assets

Do cryptocurrencies follow broader market trends?

Cryptocurrency has long been perceived as a hedge against the fluctuations of the broader equities market. The idea of cryptocurrency as an alternative investment has taken off during the Covid-19 pandemic as equity prices rose to stratospheric highs despite the fundamentals of the economy significantly weakening.

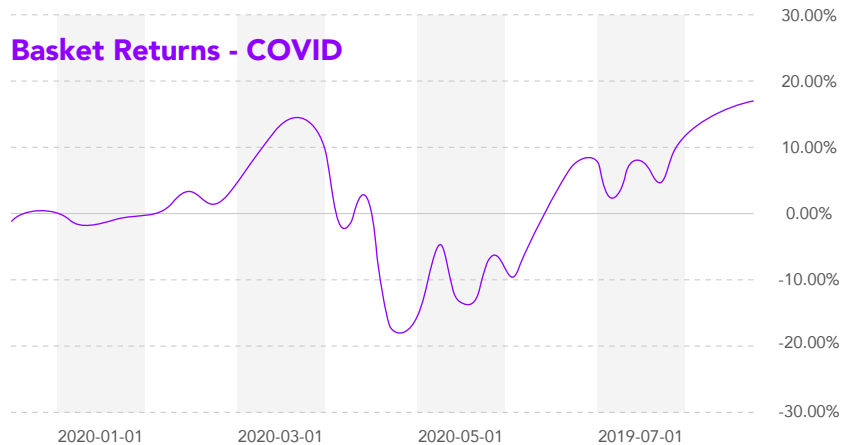
An example that underscores the thesis of digital assets, namely crypto, as a hedge against the equities market can be found in an analysis of crypto's performance during the "Covid period", which for the purpose of data collection is defined as the 2020 calendar year through to August 1.

Aside from a dramatic dip in March, our analysis shows that two of the most prominent cryptocurrencies outperformed some of most commonly held traditional assets: gold, silver, natural gas and oil. That said, when the data-gathering period is extended to a two-year period, the conventional assets outperformed the two listed cryptocurrencies.

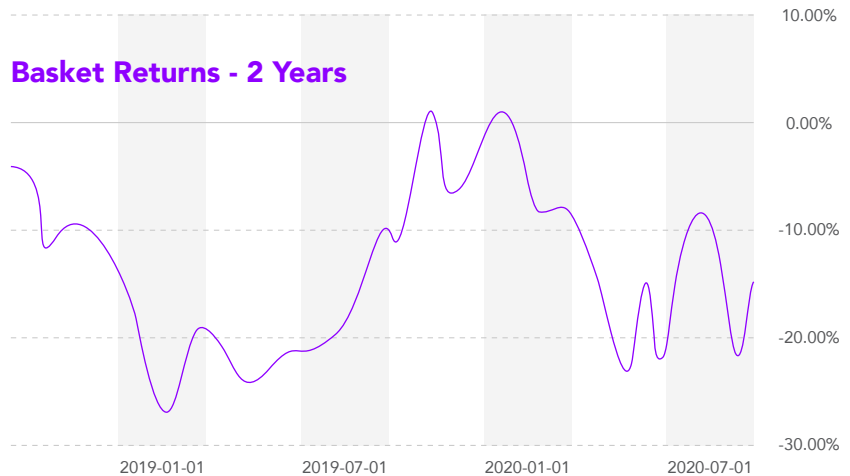


So, what is the best strategy to hedge against fluctuations in the commodity and cryptocurrency market? A basket that balances both crypto and traditional commodities.

During the Covid period, this simulated basket finished the period up 13% as cryptocurrencies buoyed losses in the traditional commodities market.



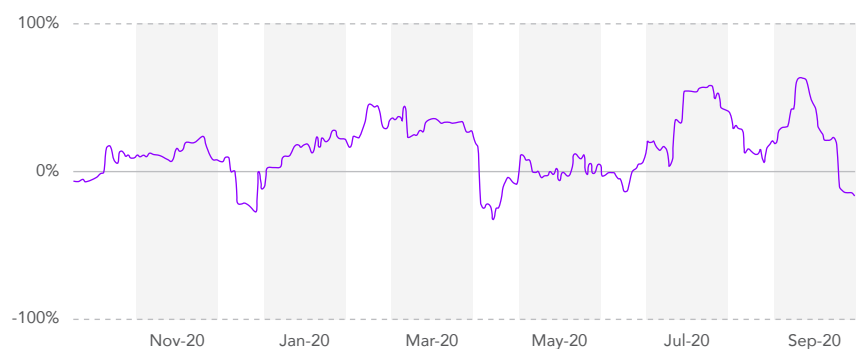
However, when this data-collection period was expanded to the last two years, it proved to be a loss given the extreme volatility of the cryptocurrency market.



This shows that a long-time holder of crypto (a HODLer in industry parlance) will be exposed to significant risk if they are not actively trading. However, macroeconomic factors affect crypto and commodities in different ways. Thanks to digitized assets, a portfolio that is balanced between the two will tend to lessen overall losses, so a certain degree of active trading is needed to mitigate risk.

Bitcoin and gold have enjoyed a strong correlation throughout the year as investors treat both as stores of value, typically for amounts less than US\$1 million.

Bitcoin-Gold Realized Correlation



● XAU 1 Month Corr. Min: -42.8%, Max: 76.3%, Avg: 15.6%, Last: -23.7%

● XAU 1 Year Corr. Min: 3.6%, Max: 22.2%, Avg: 11.5%, Last: 15.1%

Cryptocurrencies and the equities market

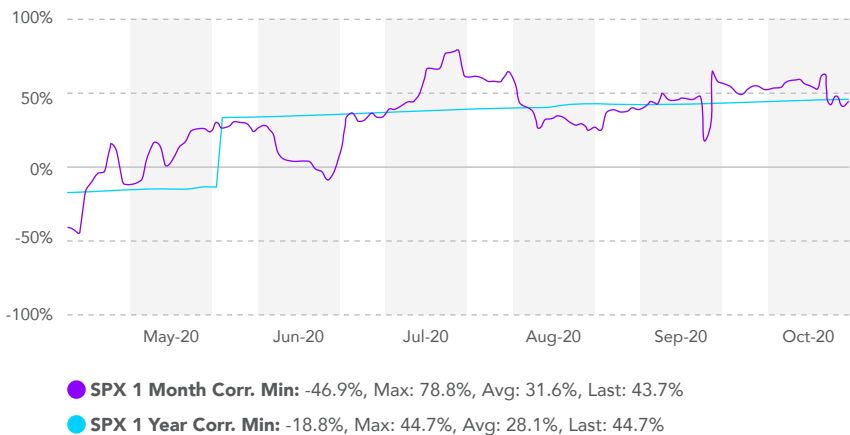
But is crypto an effective hedge against fluctuations in the equities market? It is often said that crypto is a safe-haven against the equities market. To test this thesis, crypto prices were compared to a variety of different ETFs. The results show a moderate correlation between the price of Bitcoin and broader equities. However, Covid wreaked havoc on the economy, and it did so unevenly – the technology sector, for instance, showed gains, while sectors like commercial real estate have been heavily impacted given the trend toward working from home.

The height of the summer's stock market rally saw the strongest correlation between equities prices via the S&P 500 and crypto, which peaked at almost 78% before dropping back to around 40% in October. The near-tandem movement could be seen in the summer, as investors hunted for opportunities and assets that were moved from the initial market crash to safe, low-interest rate assets were placed back in the market.

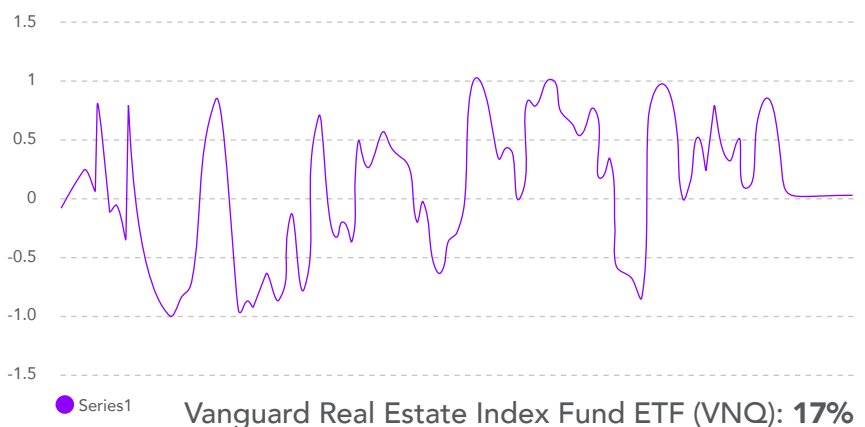
By analyzing a basket of different ETFs, a variety of different correlations between prices could be seen for a data-collection period that spanned from May to September 22.

The relationship between Bitcoin and the equities market comes and goes, and the correlation is arguably the product of an unprecedented year. The weakening of the correlation between BTC and the S&P 500 in the fall of 2020 shows that it still is a unique asset class for investors looking to diversify. While there may be some correlation between crypto prices and tech stocks, the S&P 500 is more than just technology. Removing tech stocks from the basket – for example, looking at real estate – tells a different story, but correlation remains between crypto and bank ETFs, showing that Bitcoin might be viewed as part of the broader financial sector.

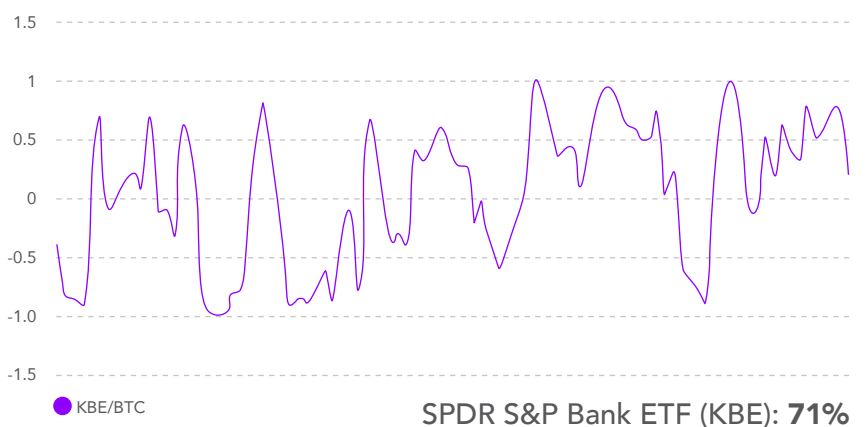
Bitcoin-S&P500 Realized Correlation



VNQ/BTC



KBE/BTC





APPENDIX

Profiles of digital asset companies

Project Name	URL	Asset Type	Asset Type (Specified)
Ba00Coin	http://www.ba00coin.io/	Tokenized Commodity	Tokenized Commodity (Ba00)
PRG	https://paragoncoin.com/	Tokenized Commodity	Tokenized Commodity (Can0bis)
FoodCoin	https://fcegroupp.ch/en/about	Tokenized Commodity	Tokenized Commodity (Food)
Ifoods Token	https://www.ifoodchain.io/	Tokenized Commodity	Tokenized Commodity (Food)
Tether USD	https://tether.to/	Tokenized Currency	Tokenized Currency (USD)
USD Coin	https://www.centre.io/	Tokenized Currency	Tokenized Currency (USD)
Paxos Standard	https://www.paxos.com/pax/	Tokenized Currency	Tokenized Currency (USD)
Bi0nce USD	https://www.bi0nce.com/en/busd	Tokenized Currency	Tokenized Currency (USD)
TrueUSD	https://www.trusttoken.com/trueusd/	Tokenized Currency	Tokenized Currency (USD)
HUSD	https://www.stcoins.com/	Tokenized Currency	Tokenized Currency (USD)
Dai Stablecoin	https://makerdao.com/	Tokenized Currency	Tokenized Currency (USD)
Gemini dollar	https://gemini.com/dollar	Tokenized Currency	Tokenized Currency (USD)
mStable USD	https://mstable.org/	Tokenized Currency	Tokenized Currency (USD)
STASIS EURS Token	https://stasis.net/	Tokenized Currency	Tokenized Currency (EUR)
Rupiah Token	https://rupiahtoken.com/	Tokenized Currency	Tokenized Currency (Rp)
Synth sUSD	https://www.synthetix.io/	Tokenized Currency	Tokenized Currency (USD)
USDQ Stablecoin by Q DAO v1.0		Tokenized Currency	Tokenized Currency (USD)
BGBP	https://www.bi0nce.je/en	Tokenized Currency	Tokenized Currency (GBP)
EURO TOKEN		Tokenized Currency	Tokenized Currency (EUR)
mAED	https://www.me0pay.io/	Tokenized Currency	Tokenized Currency (AED)
TrueAUD	https://www.trusttoken.com/trueaud	Tokenized Currency	Tokenized Currency (AUD)
Synth sAUD	https://www.synthetix.io/	Tokenized Currency	Tokenized Currency (AUD)
TrueCAD	https://www.trusttoken.com/truecad	Tokenized Currency	Tokenized Currency (CAD)
DC EUR		Tokenized Currency	Tokenized Currency (EUR)
TrueGBP	https://www.trusttoken.com/truegbp	Tokenized Currency	Tokenized Currency (GBP)
GMO JPY	https://stablecoin.z.com/	Tokenized Currency	Tokenized Currency (JPY)
KRW Gluwacoin	https://gluwacoin.com/	Tokenized Currency	Tokenized Currency (KRW)
RUB Coin	https://poa.gitbook.io/rubc/	Tokenized Currency	Tokenized Currency (RUB)
United States Dollar Equal Coin		Tokenized Currency	Tokenized Currency (USD)
VND Token	https://www.vndtoken.io/	Tokenized Currency	Tokenized Currency (VND)
South African Tether	http://www.xzar.co.za/	Tokenized Currency	Tokenized Currency (ZAR)
PowerLedger	https://www.powerledger.io/	Tokenized Energy	Tokenized Energy
WePower	https://wepower.network/	Tokenized Energy	Tokenized Energy
WPPTOKEN	https://wppenergy.io/about-us/what-we-do/	Tokenized Energy	Tokenized Energy
RED MWAT	https://restartenergy.io/	Tokenized Energy	Tokenized Energy
ElectrifyAsia	https://electrify.asia/	Tokenized Energy	Tokenized Energy

Etherscan/BlockExplorer URL	Price \$	Total Supply	Average Volume (Aug 2020) (\$)	Market Cap (\$)	Other Sources link
https://etherscan.io/token/0x865d176351f287fe1b0010805b110d08699c200a#tokenInfo	0.0143	6100409.9	150	87196.09	
https://etherscan.io/token/0x7728dFEF5aBd468669EB7f9b48A7f70a501eD29D#tokenInfo	0.0028	164936509.6	1	469812.28	
https://etherscan.io/token/0x2a093BcF0C98Ef744Bb6F69D74f2F85605324290#tokenInfo	0.0002	400903136.4	0.08	74397.48	
https://etherscan.io/token/0x81e74a3ea4bab2277aa3b941e9d9f37b08ac5374#tokenInfo	1.6	10000000000	0	200482	
https://etherscan.io/token/0xdac17f958d2ee523a2206206994597c13d831ec7	1.0008	14500000000	31033374218	6522665078	
https://etherscan.io/token/0xa0b86991c6218b36c1d19d4a2e9eb0ce3606eb48	1.0007	1084713839	386683075.7	1085822163	
https://etherscan.io/token/0x8e870d67f660d95d5be530380d0ec0bd388289e1	1.0024	251684841.4	234730685.4	252276958.5	
https://etherscan.io/token/0x4fabb145d64652a948d72533023f6e7a623c7c53#tokenInfo	1.0011	158768641.4	224375522.7	158950231.6	
https://etherscan.io/token/0x0000000000085d4780B73119b644AE5ecd22b376#tokenInfo	1.001	204471910.4	104816515.6	204683428.1	
https://etherscan.io/token/0xdf574c24545e5ffecb9a659c229253d4111d87e1#tokenInfo	1.0003	127659408.9	29398366.68	127704039.9	
https://etherscan.io/token/0x6b175474e89094c44da98b954eadeac495271d0f	1.0114	155282349.8	17872689.31	156714947	
https://etherscan.io/token/0x056fd409e1d7a124bd7017459dfeaf2f387b6d5cd#tokenInfo	0.9952	10871505.65	6966113.74	10819035.27	
https://etherscan.io/token/0xe2f2a5c287993345a840db3b0845fbc70f5935a5	0.997	61799489.62	1952525	61616254.13	https://www.coingecko.com/en/coins/mstable-usd
https://etherscan.io/token/0xdb25f211ab05b1c97d595516f45794528a807ad8#tokenInfo	1.0995	31979207	1053015.13	35161293.85	
https://etherscan.io/token/0x998FFE1E43fAcfb941dc337dD0468d52bA5b48A	0.0001	5421200000	346738.9	3688812.17	
https://etherscan.io/token/0x57ab1ec28d129707052df4df418d58a2d46d5f51#tokenInfo	1.0068	37470089.65	38498.52	37724025.63	
https://etherscan.io/token/0x4954db6391f4feb5468b6b943d4935353596a9c9#tokenInfo	0.9099	5531632.504	0	5033380.5	
https://etherscan.io/token/0xc9a2c4868f0f9faaa739b59934dc9cb304112ec#tokenInfo	1.3156	700001	0	920930.05	
https://etherscan.io/token/0x7a0e91c4204355e0a6bbf746dc0b7e32dfefdecf	0.0008	300000000	0	237870	
https://etherscan.io/token/0x794332f2de333436a31552cdeefea746f5a76b5#tokenInfo	0	100000	0	0	
https://etherscan.io/token/0x0006100F7090010005F1bd7aE6122c3C2CF0090#tokenInfo	0	1229130.77	0	0	
https://etherscan.io/token/0xf48e200eaf9906362bb1442fca31e0835773b8b4#tokenInfo	0	178749.0824	0	0	
https://etherscan.io/token/0x00000100F2A2bd000715001920eB70D229700085#tokenInfo	0	356932.79	0	0	
https://etherscan.io/token/0xdd239298e512427ba98b6602e4c8050c3e21f58b#tokenInfo	0	19	0	0	
https://etherscan.io/token/0x0000000441378008ea67f4284a57932b1c000a5#tokenInfo	0	1532985.5	0	0	
https://etherscan.io/token/0xC08512927D12348F6620a698105e1BAac6EcD911#tokenInfo	0	20001	0	0	
https://etherscan.io/token/0x4cc8486f2f3dce2d3b5e27057cf565e16906d12d#tokenInfo	0	20989274.13	0	0	
https://etherscan.io/token/0x53D5D15edBdC9a80384a22d4e7B9E734d39798e2#tokenInfo	0	10000	0	0	
https://etherscan.io/token/0x81fbb4977e0870895222357d0549b89f26205d71#tokenInfo	0	1E+13	0	0	
https://etherscan.io/token/0x164cd8bc19402c7bd49c2a97d5248310d7e1ec02	0	100000000	0	0	
https://etherscan.io/token/0x48f07301e9e29c3c38a80ae8d9ae771f224f1054#tokenInfo	0.00057687	10000000000	0	0	https://www.coingecko.com/en/coins/0xzar
https://etherscan.io/token/0x595832f8fc6bf59c85c527fec3740a1b7a361269#tokenInfo	0.0911	1000000000	1780358.48	91092339	
https://etherscan.io/token/0x4CF488387F035FF08c371515562CBA712f9015d4	0.0082	745248183.1	403286.54	6088503.34	
https://etherscan.io/token/0x056dd20b01799e9c1952c7c9a5ff4409a6110085#tokenInfo	0.006	5000000000	52361.37	30222521.5	
https://etherscan.io/token/0x6425c6be902d692ae2db752b3c268afadb099d3b#tokenInfo	0.0026	500000000	12184.37	1278574.5	
https://etherscan.io/token/0xd49ff13661451313ca1553fd6954bd1d9b6e02b9#tokenInfo	0.0008	749999945.3	1320.43	629813.35	

4NEW	https://www.4new.io/	Tokenized Energy	Tokenized Energy
TESLA	https://energitoken.com/	Tokenized Energy	Tokenized Energy
EnergiToken	https://energitoken.com/	Tokenized Energy	Tokenized Energy
Pylon	https://pylon-network.org/	Tokenized Energy	Tokenized Energy
KWHCoin	https://www.kwhcoin.com/#/	Tokenized Energy	Tokenized Energy
Simmitri	http://token.simmitri.com/	Tokenized Energy	Tokenized Energy
Cryptosolartech	https://cryptosolartech.org/	Tokenized Energy	Tokenized Energy
XPlay	https://xpa.io/	Tokenized Fiat Money	Tokenized Fiat Money
Paxos Gold	https://www.paxos.com/paxgold/	Tokenized Gold	Tokenized Gold
KaratBank Coin	https://karatgold-kbc.com/	Tokenized Gold	Tokenized Gold
Digix Gold Token	https://dew.one/	Tokenized Gold	Tokenized Gold
Perth Mint Gold Token	https://pmgt.io/	Tokenized Gold	Tokenized Gold
Goldmint MNT Prelaunch Token	https://goldmint.io/	Tokenized Gold	Tokenized Gold
Ethereum Gold	https://www.etgproject.org/	Tokenized Gold	Tokenized Gold
Almeela	https://www.almeela.com/	Tokenized Gold	Tokenized Gold
HelloGold	https://www.hellogold.org/	Tokenized Gold	Tokenized Gold
Propy	https://propy.com/browse/	Tokenized Real Estate	Tokenized Real Estate
HOUSE TOKEN	https://ihtcoin.com/	Tokenized Real Estate	Tokenized Real Estate
RNTB Token	https://bitrent.io/	Tokenized Real Estate	Tokenized Real Estate
EcoRealEstate	https://ecorealestate.com/	Tokenized Real Estate	Tokenized Real Estate
Real Estate Asset Ledger	https://www.real.markets/	Tokenized Real Estate	Tokenized Real Estate
Relx	https://www.relex.io/	Tokenized Real Estate	Tokenized Real Estate
ATLANT	https://atlant.io/	Tokenized Real Estate	Tokenized Real Estate
AltEstate token	https://alt.estate/	Tokenized Real Estate	Tokenized Real Estate
ETHEERA		Tokenized Real Estate	Tokenized Real Estate
Binance USD	https://www.binance.com	Tokenized Currency	Tokenized Currency (USD)
JUST		Tokenized Currency	Tokenized Currency (USD)
xDai	https://www.xdai.com	Tokenized Currency	Tokenized Currency
QCash		Tokenized Currency	Tokenized Currency (CNY)
Terra KRW	https://finder.terra.money/	Tokenized Currency	Tokenized Currency (KRW)
USDK	https://www.oklink.com/	Tokenized Currency	Tokenized Currency (USD)
Neutrino Dollar	https://beta.neutrino.at/	Tokenized Currency	Tokenized Currency (USD)
1SG	https://1.sg	Tokenized Currency	Tokenized Currency (SGD)
Anchor	https://theanchor.io/	Tokenized Currency	Tokenized Currency (Global)
CryptoFranc	https://www.swisscryptotokens.ch/	Tokenized Currency	Tokenized Currency (CHF)
USDx	https://dforce.network/	Tokenized Currency	Tokenized Currency (USD)
JUST Stablecoin	https://just.network/#/	Tokenized Currency	Tokenized Currency (USD)
VNDC	https://vndc.io/	Tokenized Currency	Tokenized Currency (VND)
bitCNY		Tokenized Currency	Tokenized Currency (CNY)
EURBASE	https://eurbase.com/	Tokenized Currency	Tokenized Currency (EUR)
EOSDT	https://eosdt.com/	Tokenized Currency	Tokenized Currency (USD)
Constant	https://www.myconstant.com/	Tokenized Currency	Tokenized Currency (USD)
NuBits	https://nubits.com/	Tokenized Currency	Tokenized Currency
bitUSD	https://bitshares.openledger.info/create-account	Tokenized Currency	Tokenized Currency (USD)

https://etherscan.io/token/0x241ba672574a78a3a604cdd0a94429a73a84a324#tokenInfo	0.0003	150000000	1256.49	43378.01
https://etherscan.io/token/0x03806ce5e69bd9780edfb04c29da1f23db96294	0.0003	1000000000	403	282300
https://etherscan.io/token/0x3c4a3ffd813a107febd57b2f01bc344264d90fde#tokenInfo	0.0002	2500000000	36.1	474292.5
https://etherscan.io/token/0x7703c35cfd5cda8d27aa3df2f9ba6964544b6e#tokenInfo	0.7969	633858.3113	28.01	505136.19
https://etherscan.io/token/0xb8ddc930c2bab6c71610a2be639036e829f9c10b#tokenInfo	0	2193100000	0.31	8456.15
https://etherscan.io/token/0x7528e3040376edd5db8263db2f5bd1bed91467fb#tokenInfo	0.0001	350000000	0.27	19429.59
https://etherscan.io/token/0xbb49a51ee5a66ca3a8cbe529379ba44ba67e6771	0.0021	1124463121	0	2415083.1
https://etherscan.io/token/0x90528aeb3a2b736b780fd1b6c478bb7e1d643170#tokenInfo	0.005	10000000000	0	50150013
https://etherscan.io/token/0x45804880De22913dAF09f4980848ECE6EcbAf78#tokenInfo	1979.0732	26291.412	1872305.67	52032628.32
https://etherscan.io/token/0xd67b1Db49801b6F4c96a01a4F7964233150dc58b#tokenInfo	0.0049	12000000000	1099020.14	58264231.2
https://etherscan.io/token/0x43afec4e5a3f2a6a1a411def7d7dfe50ee057bf#tokenInfo	64.5555	120400	32487.64	7772487.63
https://etherscan.io/token/0xaffcdd96531bcd66faed95fc61e443d08f7efef	1986.4972	366.09365	11824.96	726923.69
https://etherscan.io/token/0x83cee9e086a77e492ee0bb93c2b0437ad6fdeccc#tokenInfo	0.1905	10000000	5890.74	1904538.38
https://etherscan.io/token/0x28cd01ff633ea9cd8fc6a451d7457889e698de6	0.0135	24000000	5416.48	324254.4
https://etherscan.io/token/0x8de67d55c58540807601dbf1259537bc2dff84d#tokenInfo	0.0929	400000000	0	37170852.12
https://etherscan.io/token/0xba2184520a1cc49a6159c57e61e1844e085615b6#tokenInfo	0.0011	1000000000	0	1071476.6
https://etherscan.io/token/0x226bb599a12c82647e3a771454697ea52e9e220#tokenInfo	0.1484	100000000	174659.1	14839632.22
https://etherscan.io/token/0xeda8b016efa8b1161208cf041cd86972eee0f31e#tokenInfo	0.0011	996491162	6178.16	1137012.26
https://etherscan.io/token/0x1fe70be734e473e5721ea57c8b5b01e6caa52686#tokenInfo	0	1000000000	3260.85	31695.64
https://etherscan.io/token/0xb052f8a33d8bb068414eade06af6955199f9f010#tokenInfo	0.1066	1000000000	2306.42	106620807.4
https://etherscan.io/token/0x9214ec02cb71cba0ada6896b8da260736a67ab10#tokenInfo	0.1603	19717289.23	509.59	3159795.49
https://etherscan.io/token/0x4a42d2c580f83dce404acad18dab26db11a1750e#tokenInfo	0.0001	2000000000	405.74	164625.4
https://etherscan.io/token/0x78b7fada55a64dd895d8c8c35779dd8b67fa8a05#tokenInfo	0.0353	54175040.68	376.45	1912997.14
https://etherscan.io/token/0x419b8ed155180a8c9c64145e76dad49c0a4efb97#tokenInfo	0.0001	1069639374	0.88	138316.67
https://etherscan.io/token/0x9195e00402abe385f2d00a32af40b271f2e87925#tokenInfo	0	9919303956	0	51912.68
https://etherscan.io/token/0x4Fabb145d64652a948d72533023f6E7A623C7C53	1.0002	197139083	185885199	196562602
https://tronscan.org/#/token20/TCFLL5dXZJdKnWuesXxi1VPwjLVmWZZy9	0.059224	9900000000	445473765	586319420
https://etherscan.io/token/0x0Ae055097C6d159879521C384F1D2123D1f195e6	18.1598	2537841	12343746	46204225
https://etherscan.io/token/0xe74b35425fe7e33ea190b149805baf31139a8290	0.14446	10000000000	293035827	66453207
https://finder.terra.money/	0.00084	76557110972	158541	63966926
https://www.oklink.com/	1.00459	28600072	12762994	28731286
https://dev.pywaves.org/assets/DG2xKfPdDwKUoBkzGAhQtLpSGzfXLiCYEzeKH2Ad24p	1.00416	26560567	1072136	26650282
https://etherscan.io/token/0x0f72714b35a366285df85886a2ee174601292a17	4.59262	22227000	9	10223485
https://etherscan.io/token/0x5456bc77dd275c45c3c15f0cf936b763cf57c3b5	0.79096	759493671	13803	10135421
https://etherscan.io/token/0xb4272071ecadd69d933adcd19ca99fe80664fc08	1.0865	4726000	1600	5134805
https://etherscan.io/token/0xeb269732ab75a6fd61ea60b06fe994cd32a83549	1.00208	5780477	3484	5792513
https://tronscan.org/#/token20/TmWfHYXLJaRUpeW6421aqXL4ZEzPRFGkGT	1.01019	10834593	3385240	11082173
https://etherscan.io/token/0x1f3f677ecc58f6a1f9e2cf410df4776a8546b5de	0.00004	1.18691E+11	465110	4357383
http://cryptofresh.com/a/CNY	0.14433	28245600	78540419	4076730
https://etherscan.io/token/0x86fadb80d8d2cff3c3680819e4da99c10232ba0f	1.13042	5000000	56239	3260523
https://eospark.com/token/eosdt/eosdtsttoken	1.00073	2642505	10797694	2644422
https://etherscan.io/token/0x4983f767b1bc44328e434729ddabea0a064ca1ac	49.8368	56036	190	2527029
https://nubits.com/explorer	0.21824	70510851	1834	2396625
http://cryptofresh.com/a/USD	0.82331	1961580	203	1614998



Insights. Context. Expertise.

Forkast.Insights, the research arm of Forkast, helps the world realize the potential of emerging technologies. We start with blockchain.

Our journalists, contributors, producers, editors and experts aim to help global audiences connect at a deeper level with the stories and companies that are reshaping the future — in language we can all understand.

Based in Asia, Forkast aggregates and centralizes quality content, curated from experts and industry contributors. At Forkast, we believe that those who build today will guide our tomorrows. Technology shouldn't be intimidating, nor confusing. It should be inspiring. We bring that quality, credibility, and trust to a new frontier.



[@forkast.news](#)



[@forkast_news](#)



[@forkast.news](#)



[youtube.com/forkastnews](#)