

A stylized illustration of a person with long, flowing blue hair wearing a blue VR headset. The person's face is rendered in a light yellow color, and they are wearing an orange top. The background is a dark blue gradient.

THE METAVERSE: A Virtual Reality

Take a dive into the metaverse from an investor's perspective and see how the story of digital art, games and cryptocurrency are all interconnected in *actual* reality.

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“
Investors ask about practical use cases for blockchain technology. We believe the answer lies in the latest iteration of the internet — the metaverse.
”



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When the artist known as Beeple sold a digital artwork for nearly \$70 million a little over a year ago, the public awakened to the possibility of digital ownership through non-fungible tokens (NFTs) and a frenzy took hold. In 2019, fans flocked to Arthur Ashe Stadium, not for tennis, but for the annual Fortnite video game tournament where a 16-year-old won a \$3 million grand prize. In 2016, the augmented reality (AR) game Pokémon Go was a worldwide phenomenon, with downloads topping more than 500 million. We believe these seemingly one-off events collectively point to a paradigm shift taking place among businesses and consumers that is driving burgeoning opportunities in the digital world known as the metaverse.

The rise of the metaverse and growing popularity of NFTs is not coincidental to the increasing adoption of another digital phenomenon, cryptocurrency (crypto). A key underpinning of this entire digital universe is blockchain technology, which was conceptualized decades ago but finally found a practical application with bitcoin in 2009. Blockchain has unlocked a mechanism to confer digital ownership and verify authenticity, essential elements for a functioning metaverse and NFT marketplace.

THE TECHNOLOGICAL FORCES ALIGNING TO MAKE THE METAVERSE POSSIBLE HAVE THE POTENTIAL TO RESHAPE OUR DAILY LIVES

Say you are not a (digital) art collector, crypto speculator or gamer, does any of this matter, particularly for investors? In our view, yes, but for reasons that may not be readily apparent. While the artistic merit — and more importantly long-term viability — of popular NFTs like CryptoPunks or Bored Ape Yacht Club is debatable, and not everyone will warm to the idea of having a digital mortgage on digital real estate, the technological forces that are aligning to make these ideas possible have the potential to reshape many aspects of our daily lives, much like the evolution and impact of the internet over the past 30 years. Furthermore, the metaverse is gaining momentum among mainstream businesses as many seek to dip their toes in the water of this experimental digital playground. Perhaps this is not the most apt description as current investments in the metaverse are in the millions and even billions of dollars, with significant growth expected.

Undoubtedly there is much yet to be determined in the metaverse, but we are confident the innovation story has just begun. In this *Strategy Insights*, we focus on why the metaverse matters for investors and how its story is inter-connected to crypto markets.

First, a Primer

A primer on the metaverse is really a history of the internet and telecommunications over the past 30 years. The World Wide Web was opened to the public in the early 1990s, ushering in a technological revolution that has touched nearly every area of daily life. As with most innovation, early adopters saw potential for what the internet could do for telecommunications, but few probably imagined the impact the internet would have on the rise and fall of entire industries. The path from a world before e-mail to multimillion dollar digital real estate in the metaverse is far from a straight line.

No matter how its applications have changed and improved over time, at its core the internet is an innovative way to communicate. The early days of the internet, known as Web1, gave us the means to communicate with anyone across the globe instantly. The technology was clunky and the primary users were those who created their own web pages, which were mostly limited to text; pictures and videos would come much later. For perspective, consider how remarkable it is that in 1991 the Information Technology sector totaled just 6% of the S&P 500® compared to nearly 28% in March 2022. Interest from those initial tech enthusiasts eventually spread to entrepreneurs and investors seeking to monetize this new technology. As we learned, it took many years and even the dot-com bubble and market crash to find a sustainable balance. That period fomented the era of the internet we are still in today, Web2.

In Web2, there has been a greater focus on harnessing the power of the internet to create more efficient business models driven by first-mover advantages, scalability and powerful network effects. Lessons of the dot-com experience also led to greater emphasis on profitability and/or cash flows. A seismic shift in the internet's history came in 2001 with the advent of high-speed mobile broadband. Now anyone with a modern cell phone can access the internet from nearly anywhere, untethered by desktop PCs and wired connections.

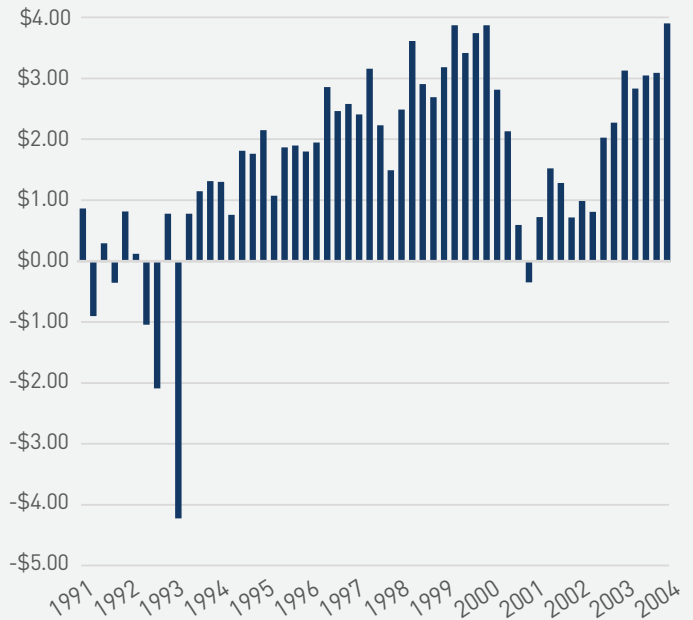
**THE S&P 500
INFORMATION
TECHNOLOGY
SECTOR
WEIGHT
HAS GROWN
SIGNIFICANTLY
IN THE LAST
30 YEARS**

**6%
1991**



**28%
2022**

Figure 1. S&P 500 Information Technology Sector Earnings per Share, Trailing 12 Months
Technology earnings recovered from the dot-com crash by 2004



3/31/1991 - 1991 12/31/2004. Source: FactSet®. FactSet® is a registered trademark of FactSet Systems Inc., and its affiliates.

By the end of 2004, the Technology sector had grown earnings per share to the highest amount since 1999 and had climbed to 16% of the S&P 500, becoming the second-largest sector in the index (Figure 1).

As the monetization of internet activity grew exponentially, innovation shifted away from computer hardware and toward software, primarily software-as-a-service delivered via —you guessed it — the internet. The scalability and network effects of internet-centric businesses created a flywheel, enabling a handful of companies to go from big to behemoth in a relatively short period of time. The best example of this is the so-called FANG stocks — Facebook, Amazon, Netflix and Google — which came to dominate their sectors, at times driving a disproportionate share of market returns. As the centralized control exercised by these companies has grown, privacy and antitrust concerns have risen as well. We believe this notion is at the center of the push toward the next era of the internet, Web3, envisioned as a decentralized, user-controlled experience.

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Web3 largely remains conceptual, but the primary building blocks — blockchain, crypto, NFTs and decentralized autonomous organizations (DAOs) — are already in use today and are proliferating rapidly. Furthermore, the applications for these building blocks stretch beyond just Web3.

Blockchain

Blockchain is an innovative technology consisting of complex cryptography and software that creates an immutable, decentralized database for whatever its application may be. In other words, the data cannot be changed, and there is no central authority over the records. The concept of blockchain technology dates to the early 1990s (i.e., the early days of Web1), but it was not until the invention of bitcoin as a peer-to-peer payment network that it found a real-world use case. Blockchain is the underpinning technology that allows digital assets like crypto and NFTs to exist because it creates a permanent record that can be used to verify uniqueness, authenticity and ownership, which are essential elements when you are dealing with things composed of bits and bytes.

Cryptocurrency

Crypto is a type of digital asset that is transacted using blockchain technology. The original crypto, bitcoin, was developed as a peer-to-peer payment system. To date, thousands of types of cryptos have been issued; however, the entire ecosystem can be condensed into three broad categories: store of value assets (e.g., bitcoin), decentralized finance tokens (e.g., ether), and stablecoins (e.g., USD Coin). Since bitcoin's creation, use cases for



Cash, credit or bitcoin?

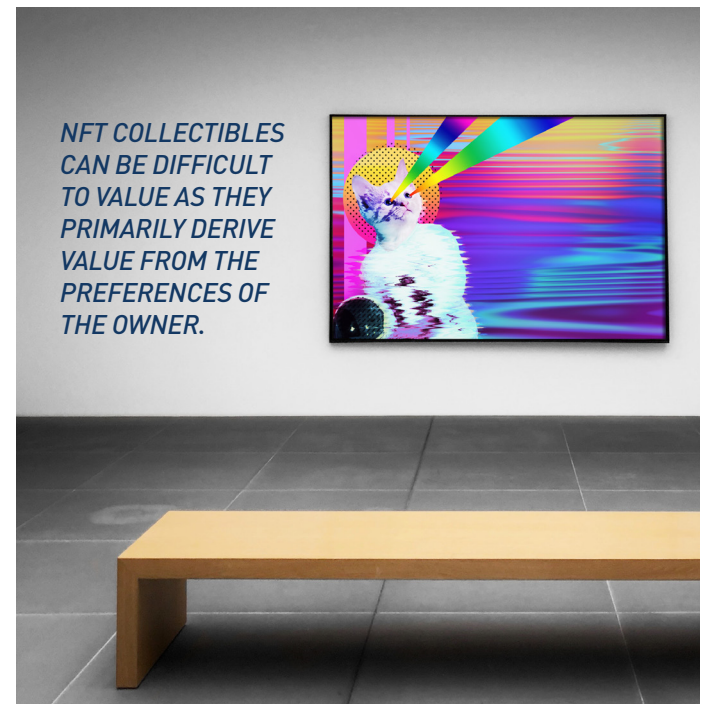
CRYPTO ISN'T JUST FOR THE METAVERSE—BUSINESSES AND EVEN SOME COUNTRIES TAKE CRYPTO IRL.

crypto have expanded as adoption has increased. Key cryptos have become acceptable forms of tender not only for transactions in virtual settings like the metaverse, but also among many mainstream businesses. Some countries even allow crypto as payment as well. Crypto is still nascent in its development and highly volatile, therefore we view it as speculative and not suitable for all investors.

NFTs

In its simplest form, an NFT is a unique digital file. While that might sound reminiscent of crypto, the key difference is that crypto tokens are interchangeable (one bitcoin equals one bitcoin), and NFTs are not. For this reason, NFTs are often associated with digital artwork, videos, audios or other collectible items where there is a desire to limit the number of authentic copies and prove ownership. Unique identifying information and any transaction history is stored in a blockchain. NFT technology is also used in interactive video games so players can, for example, customize their avatars with various clothing, accessories and other items. Makers of physical goods have been experimenting with NFTs as well to certify authenticity.

Digital creators have taken interest in NFTs because an artist can sell their works directly to collectors without involving an intermediary like a gallery or auction house. Additionally, when an NFT is created (also called "minted"), its blockchain signature prevents the risk of copies from diluting the value of the original. Another benefit to digital creators is the possibility to embed code in the NFT whereby the author or artist receives a royalty from future sales of a piece.



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The innovation around and use cases for NFTs is growing rapidly. For now, we can classify NFTs into three broad groups:

- **Collectibles** – The collectible NFT market is largely composed of digital artwork. Prices range from nominal amounts to millions of dollars. There are several online NFT marketplaces, and purchases are stored in a user’s digital wallet. Pricey, high-profile pieces have even been sold at premiere auction houses such as Christie’s. Some collectible NFTs confer membership in a club or community of other owners.
- **Redeemable Tokens** – Like some collectibles, redeemable tokens grant access to activities or events. For example, a European DJ sold an NFT for \$1.2 million for exclusive access to his concert.
- **Social Tokens** – These NFTs are primarily for video game platforms and can include clothing and accessories for digital avatars, real estate, or other sorts of in-game purchases to enhance characters or experiences.



From an investment perspective, the unique characteristics of NFTs make them challenging to value using a traditional framework. As a result, most NFTs primarily derive value from the preference of the owner, akin to traditional artwork, or utility in the case of video game examples.

Smart Contract

Smart contracts describe a computer program that is coded to operate without the need for human intervention, and they depend on blockchain technology to ensure the integrity and security of the program. Applications for smart contracts are wide ranging and go hand-in-hand with the decentralized nature of Web3, as well as the growth and development of artificial intelligence and machine learning technology.

DAOs

In keeping with the ethos of blockchain’s decentralized nature, a DAO is a democratic entity formed through smart contracts with no centralized leadership. One could think of it as crowdsourcing through crypto. DAO members vote to establish rules and participate in decision-making, all of which are visible and encoded by the blockchains on which the organizations are formed.

While some cryptos like bitcoin are a store of value, and other decentralized finance cryptos are governance tokens to operate an application, DAOs bring together a network of users and pool their capital together to accomplish a specific goal. Like other cryptos, DAO members can remain pseudonymous. Governance decisions are made from a bottom-up approach where everyone that owns the DAO token can cast a vote, have a say on proposals and publicly express views about the DAO’s objective.

A common use case for DAOs is to acquire high-priced NFTs. The users share in the governance of where to digitally store the NFT and also share in the profits upon selling it, on a proportional basis. Since a DAO is created on a blockchain, just like an NFT, its transaction history and ownership data are all recorded and publicly available.

DAO objectives are not limited to the digital world. One well known recent example is ConstitutionDAO. Formed in November 2021 through a grassroots effort on Twitter, its purpose was to raise funds to buy one of the 13 remaining original copies of the U.S. Constitution that



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was coming up for auction at Sotheby's. Within three weeks, the community grew to approximately 17,000 members and raised \$47 million. While ConstitutionDAO was outbid, the experience showed how quickly a DAO can form and raise significant capital.

Although DAOs can offer a novel fundraising method, they have a turbulent history within the crypto ecosystem. A prime example is The DAO started in 2016. Intended to be a crowd-funded smart contract for venture capital investments, the security of The DAO was compromised shortly after it went live, and hackers extracted approximately \$50 million. As such, DAOs took a back seat in the evolution of crypto. However, with the rising popularity of NFTs, we believe DAOs could see a resurgence as a way to acquire NFTs and build out the decentralized version of the metaverse.

The Metaverse

The confluence of all these digital concepts — blockchain, crypto, NFTs, smart contracts and DAOs — form the backbone of the next digital wave, the metaverse. At a high level, the metaverse is an immersive, 3-D virtual experience that combines elements of virtual reality (VR), augmented reality (AR) and video game technology where users can interact, shop and consume experiences. It is not a specific place or owned by a particular company, nor is it completely decentralized

like the concept of Web3. Though the hype has been growing steadily as companies such as Meta Platforms (formerly Facebook) and Microsoft have put multibillion dollar stakes in

the metaverse ground, consumers' current experience is largely confined to VR video game-like applications. The promise of the metaverse is bound by two things — technology and the imagination.

As with any transformative change, it will be an iterative process rather than a proverbial flip of a switch. It was true for the internet as we know it today, and we expect

Welcome to the METAVERSE

AN IMMERSIVE, 3-D VIRTUAL EXPERIENCE COMBINING ELEMENTS OF VR, AR AND VIDEO GAME TECHNOLOGY, WHERE USERS CAN INTERACT, SHOP AND HAVE DIGITAL EXPERIENCES.



METAVERSE PLATFORMS OFFER SHARED VIRTUAL WORLDS WHERE USERS INTERACT THROUGH AVATARS. THEY SHOP IN VIRTUAL STORES, BUY VIRTUAL PLOTS OF LAND AND PARTICIPATE IN GAMES AND EVEN LIVE EXPERIENCES.

the same to hold for the future of the metaverse. There is a chicken and egg relationship between technological development, consumer adoption/adaptation and societal goals or needs to drive this ecosystem forward. To understand where the metaverse might be heading, let's consider the version that exists today.

There are a large handful of metaverse platforms operating today; two of the largest are Decentraland and The Sandbox. Decentraland is a browser-based shared virtual world where users interact through digital avatars. Users can shop in virtual stores, buy virtual plots of land and participate in video games and even live events like concerts, among other things. Decentraland runs through its own governance token, MANA, that users can purchase on crypto exchanges and spend within the platform. Unlike first generation "virtual world" video games such as Sim City and Second Life, Decentraland is overseen by a DAO and maintained by the community of users. Also unique to this next generation virtual world, prominent corporations — Samsung, Coca Cola and Nike, among many others — are investing in virtual storefronts, experiences and digital goods within Decentraland.

The Sandbox offers a similar experience. Users buy virtual pieces of land and create experiences on top of them to share with other users. For example, you could buy a parcel of land, build a house, design your own furnishings (minted as NFTs), or purchase them from the Sandbox marketplace, and then invite other users over for an avatar party. The Sandbox is also run by a DAO and has its own governance token, SAND, which like Decentraland runs on the Ethereum network. Both platforms held initial coin offerings (or “ICOs,” akin to initial public offerings of corporate equity) in 2017, launching in 2020, and already have a combined market capitalization of nearly \$8 billion.

How can a video game have a market capitalization value, and in the billions of dollars no less? In both above examples, their governance tokens, MANA and SAND, trade much like widely traded cryptos such as bitcoin and ether. Users can purchase the tokens with fiat currency or with other crypto. Unlike store-of-value cryptos, each governance token can only be used within their respective platforms. The value of these tokens is derived from the same supply and demand forces that shape real-world economics because each metaverse platform is essentially a virtual economy unto itself, as users buy and sell goods and services from each other just as they would in the analog world.

**BY 2024, BLOOMBERG
EXPECTS THE METAVERSE
MARKET SIZE TO REACH**

**\$800
BILLION**

While these examples represent the metaverse of today, they are unlikely to capture the scope of the metaverse of the future. The potential applications are wide-ranging, and if some visions come to fruition, it could upend current business models

and create new ones, much like ecommerce did for brick-and-mortar retail. Interactions that were formerly face to face (or face to screen) could move into 3-D virtual realms. This could reshape all manner of daily lives, from education and business travel, to events (e.g., conferences, concerts, etc.), healthcare, retail and more.

According to Bloomberg data, venture capital funds raised more than \$10 billion in 2021 for more than 600 deals specifically focused on the metaverse. For perspective, global venture capital raised more than \$600 billion in total in 2021. The metaverse market size is expected to reach \$800 billion by the end of 2024 compared to \$450 billion at the end of 2020, according to Bloomberg. These numbers, while significant, may still underestimate the metaverse’s potential.

We will continue to monitor these trends as they play out, but like the early days of the internet, we expect it will take years before consumer and business preferences solidify. From an investment lens, we fortunately have 30 years of history to learn from. There are two broad trends we expect to see play out during the adoption of the metaverse.

1. Ongoing market share growth for Technology and internet-native companies

The Tech sector grew from 6% to nearly 28% in 30 years, and that excludes several mega-cap companies such as Alphabet Inc and Meta Platforms as they were reclassified to the Communication Services sector in 2018. Additionally, Consumer Discretionary industries such as internet retail are also excluded from the tech total. On a pro forma basis, the combined weight of these internet-centric businesses totals 38% of the S&P 500 as of March 10. This is not just a U.S. story. The largest sector in the MSCI All Country World Index is also Tech, and the sum of that sector and internet-native industries totals 29%. While the combined market capitalization of these industries will not quadruple over the next 30 years as they did over the past 30, we believe it is likely to remain the dominant area within the market.

2. Structural shift in capital

Internet-based businesses have limited physical capital needs. In our view, it is no coincidence the tangible book value per share of the S&P 500 has never recovered back to the peak reached in fourth quarter 2014, the height of the U.S. shale oil and gas boom (Figure 2, page 7).

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Capital-lite business models also command an ability to leverage profit margins. Over the past 40 years, during business cycle contractions, operating margins typically declined and bottomed at 8.0% on average. However, looking at the period since the arrival of 3G telecommunications when the iPhone debuted in 2007, operating margins have bottomed around 10.3% on average during business cycle contractions. The trend toward settling at higher lows appears firm as margins during the pandemic-induced 2020 global recession remained above those of the last great recession in 2009 (Figure 3). As investors contemplate the potential market impact of growth in metaverse businesses, we believe trends toward capital-lite business models and operating margin leverage to continue for the foreseeable future.

Doubts about the longevity and potential impact of the metaverse are reminiscent of the early skepticism about the internet. After all, many investors may recall the late 1990s saw many businesses overpromise and under deliver. We believe it is far too soon to define the specifics of what parts of the metaverse will succeed and which sectors or industries will be winners or losers. With that in mind, we attempt to focus on what we do know so investors can interpret the ever-changing metaverse landscape.

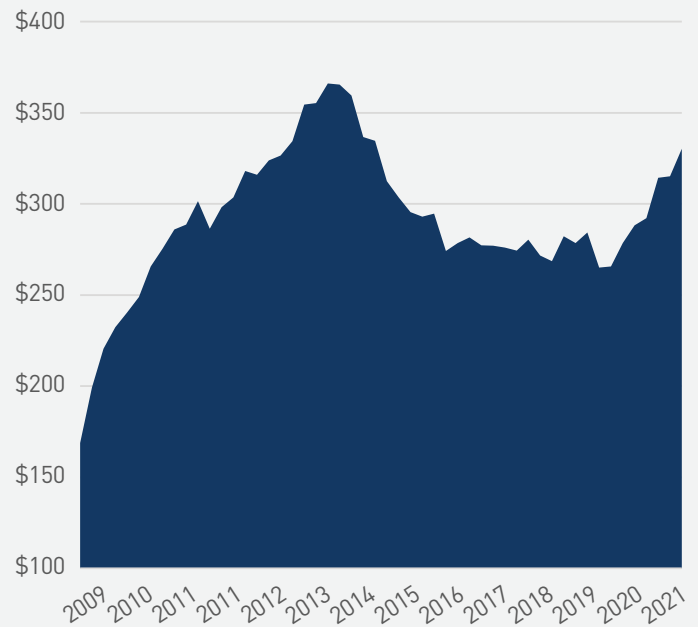
The Metaverse Investor Toolkit

Given the nascent stage of metaverse development, the most direct route to investing in the metaverse is by owning governance tokens of a metaverse platform such as MANA or SAND. Below we examine these tokens through our three-pronged investment process.



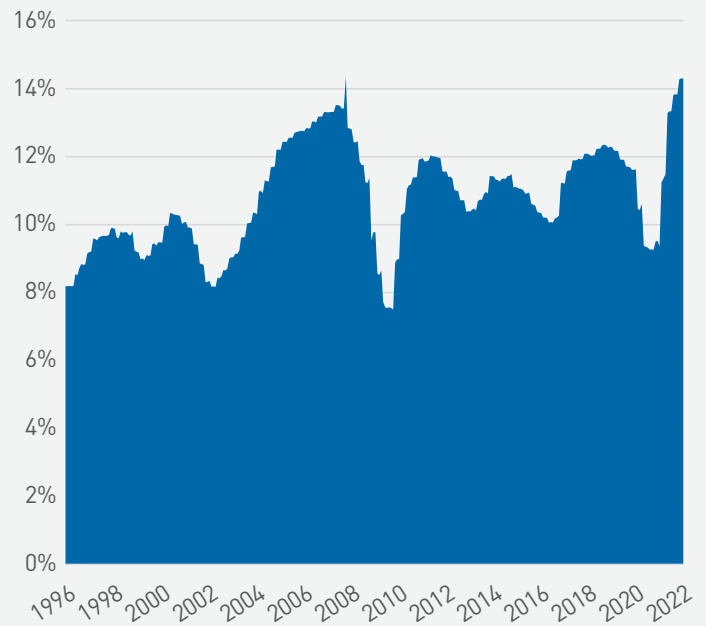
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Figure 2. S&P 500 Tangible Book Value per Share
Capital-lite business models keeping a lid on book values



As of 12/31/2021. Source: FactSet®

Figure 3. MSCI All Country World Index Operating Margin
Margins keep expanding as technology improves



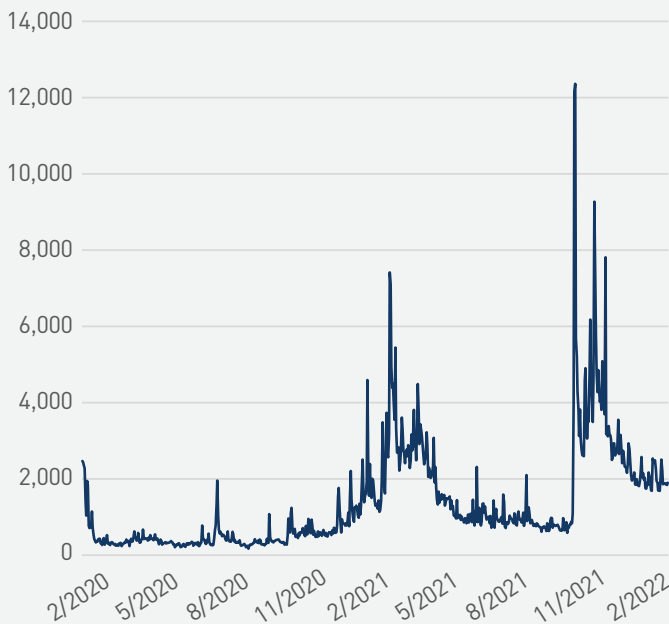
As of 2/28/2022. Source: Bloomberg, L.P.

Business Cycle

In our traditional approach to investment analysis, we view the business cycle as having four phases: recovery, accelerating expansion, slowing expansion and contraction. While there is no GDP or purchasing managers index for the metaverse, investors can apply a similar method we use for cryptocurrency analysis by examining the all-important network effect. For crypto, we strongly believe growth in the number of long-term users leads to a stronger network; it highlights which cryptos have enough perceived value for participants to maintain a presence on the network. The same can be applied to metaverse platforms. It is not just a popularity contest, growth in the community of users should also support development in key areas such as network security and innovation of the platform itself.

Using Decentraland and MANA as an example, an investor can look at the number of active addresses (think of these like bank account numbers) as a guide for network growth (Figure 4). Because MANA and Decentraland have just a two-year history, participants should still be active in its development, thus we would

Figure 4. MANA Active Addresses, 7-Day Moving Average
Higher lows show strengthening adoption



As of 2/24/2022. Source: glassnode.com

not expect to see non-active “HODLers” (crypto slang for “Hold On for Dear Life!”) like there are in more mature crypto markets. As such, with each spike in interest, the number of active users has leveled off higher than before the jump in activity. In other words, the network is making higher lows, which in our view is a positive signal for acceleration of its business cycle.

Valuations

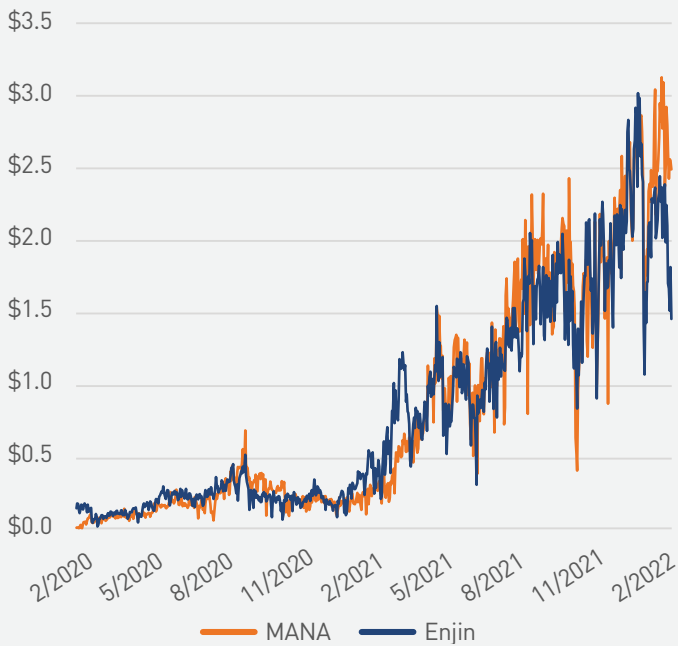
In our view, one cannot calculate the intrinsic value of a metaverse governance token because they do not have fundamentals like earnings or cash flows to rely on like in traditional analysis. Additionally, the goal of some token owners, such as developers of the software, may be to support the network, and thus they have less regard for valuation in the short to medium term. However, metaverse investors do have ready access to trading data, the number of users and market capitalization, which can be used to determine relative valuation.

For example, a competing metaverse platform to Decentraland, Enjin, has a token called EnjinCoin. While EnjinCoin has a much longer history than MANA, it has a similar market capitalization, indicating network growth has been slower. Looking at a ratio of market capitalization-to-active addresses, Decentraland network growth has pulled significantly ahead and is now larger by a differential of more than \$1 million in market cap per user (Figure 5, page 9). Does this mean Decentraland is more expensive relative to Enjin? If one ignores the context of the business cycle, the answer would be a resounding yes. However, as we pointed out, the active user base for Decentraland is growing faster than Enjin, indicating the former’s growth is supporting the higher valuation premium.

ONE CANNOT CALCULATE THE INTRINSIC VALUE OF A METAVERSE GOVERNANCE TOKEN BECAUSE THEY DO NOT HAVE FUNDAMENTALS LIKE EARNINGS OR CASH FLOWS TO RELY ON LIKE IN TRADITIONAL ANALYSIS.



Figure 5. Market Cap per Active Address
MANA growth has outpaced Enjin



As of 2/24/2022. Source: glassnode.com

Figure 6. MANA Price History
Technical analysis still works in the metaverse



As of 2/28/2022. Source: glassnode.com

Technicals

Technical analysis is the practice of using past price data to identify trends and momentum. It is a key component of our investment process that governs the short-term timing of allocation decisions and works in tandem with the qualitative nature of fundamental analysis. Investors use rules-based technical analysis with traditional asset classes such as equities, fixed income, currencies and commodities. Therefore, it should come as no surprise that technical analysis can apply to crypto markets as well.

TECHNICAL ANALYSIS CAN APPLY TO CRYPTO MARKETS

Traditional technical analysis techniques can be applied to metaverse governance tokens because they have daily pricing and historical data. Therefore, analysis such as studying moving averages and other momentum signals can offer insight for investors (Figure 6). However, in the case of some DAOs and most NFTs, liquidity is typically low or has a very limited history, in which case technical analysis would not be useful.

METaverse OPPORTUNITIES

KEY MERITS

Growth Potential

As the internet evolves into the metaverse, new technology and experiences for consumers and businesses offer potential breakthrough growth for a number of industries well beyond technology or finance.

Rapid Adoption

In barely a year's time, the size of some NFT communities in the metaverse are surpassing those of prominent cryptocurrencies, indicating shifting network effects are already underway.

Usability

The concept of investing in metaverse governance tokens or DAOs should be familiar to a sub-set of crypto investors, and metaverse marketplaces offer a wide variety of use cases for NFTs.

Diversification

Metaverse-based cryptocurrencies have low to no correlation with public equities as a unique diversifying opportunity for investors, and metaverse adoption could take hold in a number of sectors globally, thus allowing a number of public and private asset classes to offer exposure.

AND RISKS

Regulation

If the Securities Exchange Commission or other regulatory body classifies digital assets such as metaverse governance tokens, NFTs, DAOs and cryptos as securities, there will be numerous challenges to growth and adoption.

Security/Portability

Metaverse governance tokens require the same steps of security and custody as any other crypto. For NFTs, most marketplaces are not custodians, so if a user's crypto wallet is lost or compromised, access to the NFT is potentially lost forever.

Liquidity/Volatility

Trading metaverse governance tokens, while volatile like other cryptos, have daily liquidity similar to most public equities. NFTs usually have a limited supply, thus trading is much thinner than crypto markets, which also adds to the volatility of token prices.

Going Concern

Given the early stage of metaverse adoption, platforms could lose significant market share as new projects are developed, and NFTs could lose both liquidity and market value as demand for collectibles changes over time.



Asset Classes in the Metaverse

Since the metaverse is such a new concept, as are innovative investment opportunities such as NFTs, DAOs and governance tokens, we want to highlight where we see potential metaverse beneficiaries among traditional asset classes. These views will likely change over time, but based on where the technology is today, we see opportunity in global equities as well as private equity and venture capital.

Public Equities

The innovative leaders of the metaverse build-out reside in Information Technology (hardware, software and IT services) and Communication Services (entertainment and internet services). Unexpected metaverse innovators could also enter the arena, such as financial services technology. For example, the Korean financial services firm KB Financial Group, which has a market cap of nearly \$20 billion, launched a metaverse branch with a fully immersive customer experience.

THE ENTERTAINMENT INDUSTRY HAS ALREADY BEEN A DRIVING FORCE OF METAVERSE ADOPTION, AS GAME PUBLISHERS SUCH AS ROBLOX GENERATE BILLIONS IN SALES, ALL WHILE BEING FREE TO PLAY.

The entertainment industry has already been a driving force of metaverse adoption, as game publishers such as Roblox generate billions in sales, all while being free to play. Even the sports industry is undergoing a dramatic shift to e-sports in the metaverse. For example, there were nine million attendees to the 2019

Fortnite World Cup Finals held in Arthur Ashe Stadium in Queens, New York, which hosts the annual U.S. Open tennis tournament. Was it really that different than watching a physical tennis match? Apparently nine million attendees do not think so. We expect e-sports to continue to grow.

Alternative Asset Classes

In our view, private alternatives are positioned to benefit from the growth of the metaverse. The challenge is forecasting the key areas of innovation over the next 10 years, which could lead to highly differentiated outcomes for venture capital investors. However, real estate is one private (and public) asset class that seems

poised to benefit. Further growth in the metaverse is going to require more investment in data centers and other industries that support telecommunication infrastructure and other specialized real estate. As we mentioned in our 2022 outlook, crypto was the number one category that hedge funds collectively were looking to grow in the coming year. With the rise of new crypto tokens focused on the metaverse, it could create new opportunities for investors that want actively managed exposure through crypto hedge funds.

Meet Me in the Metaverse

Investing in the metaverse is more than putting on a VR headset and escaping to a 3-D digital realm. In fact, such a limited view might risk missing the bigger trend. For starters, one does not invest “in the metaverse” but in the ecosystem, through decentralized as well as



THE FUTURE IS NOW
AND WE ARE FULLY IMMERSSED IN ITS FORMATION.

more traditional means that support its growth and development. We believe the metaverse has the potential to catalyze a paradigm shift in how users

interface with the internet. And yet, it is still so early in its development that many of these trends remain highly speculative. The metaverse could morph into something different altogether as new technology develops, or the current trajectory could stay largely the same.

What we do know is the pricing and valuation of metaverse investments are highly volatile and as such may not be suitable for all investors. While the long-term potential could be significant, it is still too early to perform any concrete analysis. Therefore, for the time being, we remain focused on tangible mega-trends investors can use to make informed decisions: continued growth in technology-focused industries and a structural shift in capital allocation among firms. We believe these two trends will have a far greater impact for investors than if the metaverse takes the world by storm with digital farmland. The future is now, and we are fully immersed in its formation.

For more information, please contact your PNC advisor.

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Investors should conduct extensive research into the legitimacy of each individual digital asset before investing. The features, functions, characteristics, operation, use and other properties of the specific digital asset may be complex, technical, or difficult to understand or evaluate. The digital asset may be vulnerable to attacks on the security, integrity or operation, including attacks using computing power sufficient to overwhelm the normal operation of the digital asset's blockchain or other underlying technology.

Blockchain is a nascent and rapidly changing technology and there remains relatively small use of blockchain networks and blockchain assets. The development of blockchain networks is a new and rapidly evolving industry that is subject to a high degree of uncertainty.

Factors affecting the further development of the blockchain industry include: continued worldwide growth in the adoption and use of blockchain networks and assets; the maintenance and development of the open-source software protocol of blockchain networks; changes in consumer demographics and public tastes and preferences; the popularity or acceptance of the Bitcoin or Ethereum networks; the availability and popularity of other forms or methods of buying and selling goods and services, including new means of using fiat currencies; government and quasi-government regulation of blockchain networks and assets, including any restrictions on access, operation and use of blockchain networks and assets.

The application of distributed ledger technology is novel and untested and may contain inherent flaws or limitations. Blockchain is an emerging technology that offers new capabilities which are not fully proven in use. There are limited examples of the application of distributed ledger technology.

The creation and operation of digital platforms for the public trading of blockchain assets will be subject to potential technical, legal and regulatory constraints.

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