

An Introduction to the Ethereum Ecosystem, Blockchain & Cryptocurrency



Harlem Capital

Key Takeaways

Industry Overview

- The Ethereum Ecosystem, as the world's programmable blockchain, is a community-run, decentralized network that is unlocking a new, advanced approach to transaction and information management
- The Global Blockchain Technology market represents a \$3bn revenue opportunity (as of 2020) and is expected to grow to a ~\$40bn revenue opportunity by 2025 (representing a ~67% CAGR)
- Cryptocurrency and digital payments, powered by blockchain technology, also represent a significant market opportunity, expected to grow from a ~\$541mm revenue market in 2017 to ~\$2.9bn revenue market in 2023 (~32.3% CAGR)
 - Currently, the revenue opportunity represents a \$1.6bn market (2021), and is supported by >\$2 trn cryptocurrency market cap,¹ with over 10,000 different types of publicly traded cryptocurrencies

Recent Trends

- Blockchain-focused organizations are helping improve transparency across the supply chain, contributing to the transformation of the financial industry and introducing secure methods to protect consumer data and credentials
- Cryptocurrency startups are continuing to generate interest from both investors and entrepreneurs, as individuals are becoming more educated on the space, coupled with the growth of stablecoins, official currency adoption and the journey to the public markets

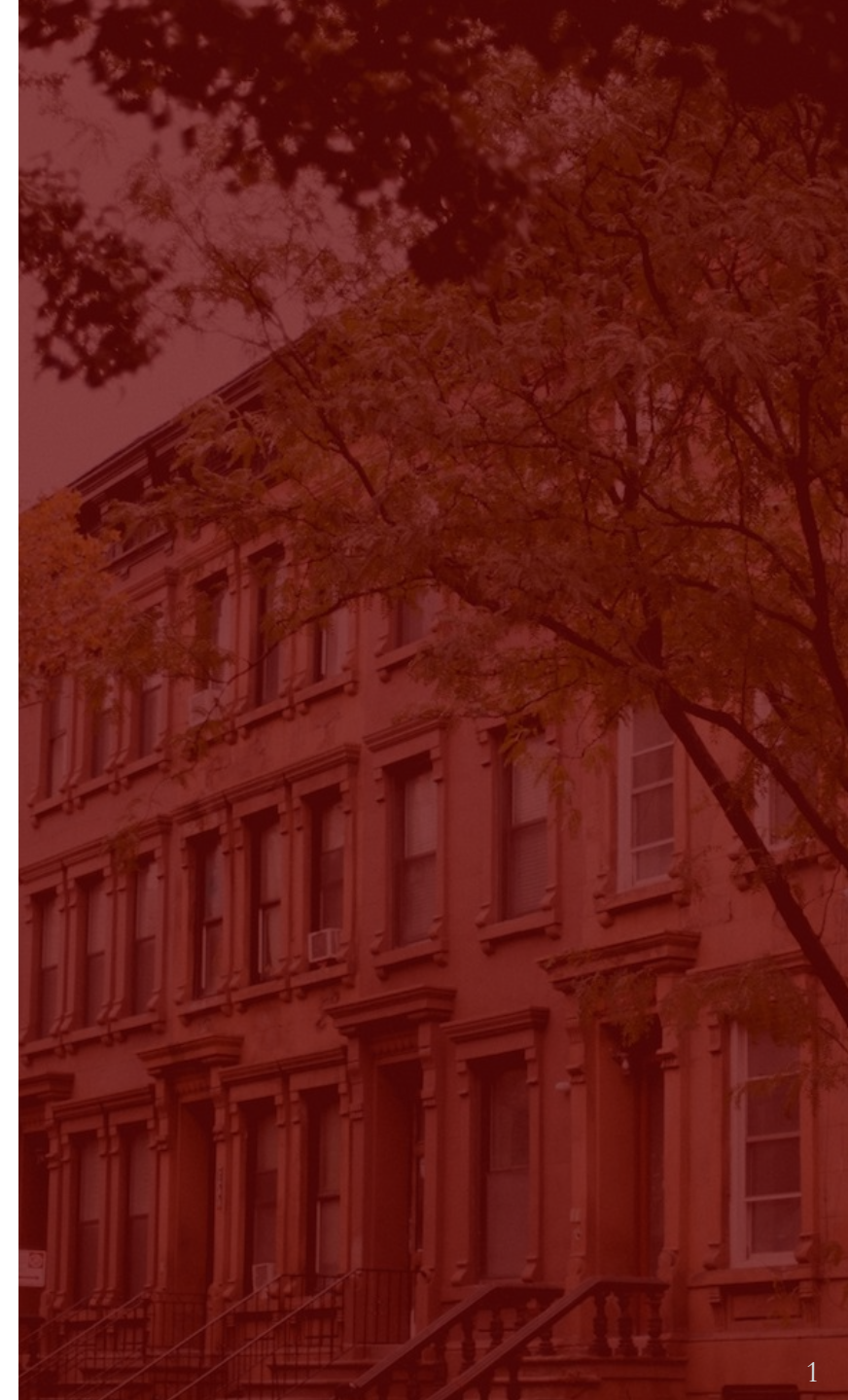
Investment Thesis

- Companies that are focused on blockchain development will deliver significant value due to their focus on securing personal information, increasing transaction transparency and discovering new, scalable uses cases for the technology
- Cryptocurrency startups are increasing access and efficiency around payments, while providing an opportunity for users to transact in a decentralized environment
- Both blockchain and cryptocurrency-focused organizations offer LPs / investors the ability to gain exposure to a nascent industry that is typically not correlated with the general market, with the potential to deliver outsized returns

Investor Activity

- Investors in the space have pivoted from solely allocating capital from larger funds to creating specific vehicles to invest in blockchain and cryptocurrency
- Some of the most notable investors are Andreessen Horowitz, Blockchain Capital, Dragonfly Capital and Polychain Capital, investing in anywhere from blockchain infrastructure, to digital wallets, to cryptocurrency exchanges and NFTs

Source: MarketsandMarkets, MarketWatch, TechCrunch, Crunchbase. ¹ As of April 2021.



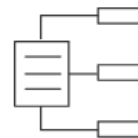
Industry Overview

The Ethereum Ecosystem (Blockchain)

Overview

- Ethereum is the world's programmable blockchain
 - A “blockchain,” by definition, is a shared, immutable ledger that facilitates the process of recording transactions and tracking assets (tangible or intangible) in a business network, reducing risk and cutting costs for all parties involved
 - Blockchains are ideal for delivering the critical information that businesses rely on because they provide immediate, shared and completely transparent information stored on a ledger that can be accessed only by permissioned network members
 - A blockchain network has an endless number of functionalities including tracking orders, payments, accounts, production and much more
 - Since members share a single view of the truth, one can see all details of a transaction end-to-end, giving greater confidence as well as creating new efficiencies and opportunities
- The decentralized network is a community-run technology powering the cryptocurrency, Ether (ETH) and can be used to create and run specialized digital applications
- The concept of Ethereum as a platform was first proposed in a 2013 white paper by Vitalik Buterin, a 17-year-old computer programmer. Following a period of online crowdfunding in 2014, the platform was developed and launched in July 2015
 - The platform kicked off with 72mm pre-mined ether coins, sold at a fixed price during the first two weeks
- Ethereum is open-access to digital money and data-friendly services for all, providing a variety of use cases and benefits, including a more censorship resistant, private internet, a peer-to-peer network, commerce guarantees, combability and banking services for everyone

Key Elements of a Blockchain



Distributed ledger technology

All network participants have access to the distributed ledger and its immutable record of transactions. With this shared ledger, transactions are recorded only once, eliminating the duplication of effort that's typical of traditional business networks.



Immutable records

No participant can change or tamper with a transaction after it's been recorded to the shared ledger. If a transaction record includes an error, a new transaction must be added to reverse the error, and both transactions are then visible.



Smart contracts

To speed transactions, a set of rules — called a **smart contract** — is stored on the blockchain and executed automatically. A smart contract can define conditions for corporate bond transfers, include terms for travel insurance to be paid and much more.

The Properties of Distributed Ledger Technology

Programmable

A blockchain is programmable (i.e. Smart Contracts)

Secure

All records are individually encrypted

Anonymous

The identity of participants is either anonymous or pseudonymous

Distributed

All network participants have a copy of the ledger for complete transparency

Immutable

Any validated records are irreversible and cannot be changed

Time-stamped

A transaction timestamp is recorded on a block

Unanimous

All network participants agree to the validity of each of the records

Industry Overview (cont'd)

Ethereum is the community-run blockchain technology powering ETH (Ether) and thousands of decentralized applications

ETH (Ether)

- **ETH (Ether)** is the core currency of Ethereum that individuals can use to make purchases
- Users have the option to buy Ether from a centralized exchange, a decentralized exchange or from crypto wallets (with debit / credit card, bank transfer, etc.)



Centralized Exchanges

Exchanges are businesses that let users buy crypto using traditional currencies. They have custody over any ETH that is bought until transferred to a wallet



Decentralized Exchanges (DEXs)

With a DEX users can trade without giving control of funds to a centralized company through buying ETH peer-to-peer



Wallets

Some wallets let users buy crypto with a debit/credit card, bank transfer or even Apple Pay (Geographical restrictions apply)

Ethereum Dapps (Decentralized Applications)

- **Ethereum Dapps** are applications (products and services) that run on the Ethereum network, and users need a digital “wallet” to access them. Key examples of the types of applications include:

- **Finance Options**

- Applications that focus on building out financial services using cryptocurrencies. Typical offerings include lending, borrowing, earning interest, and private payments (with no personal data required)



- Examples: *Aave, Uniswap, Polymarket, Token Sets*

- **Arts and Collectibles**

- Applications that focus on digital ownership, increasing earning potential for creators, and inventing new ways to invest in creators and their work



- Examples: *Foundation, SuperRare, Audius, OpenSea*

- **Gaming**

- Applications that focus on the creation of virtual worlds and battling other players using collectibles that hold real-world value



- Examples: *Cryptovoxels, Dark Forest*

- **Technology**

- Applications that focus on decentralizing developer tools, incorporating cryptoeconomic systems into existing technology, and creating marketplaces for open-source development work.



- Examples: *Gitcoin, Golem, Brave*

DeFi (Decentralized Finance)

- **DeFi (Decentralized Finance)** is a global, open alternative to the current financial system
- DeFi is based on open-source technology that anyone can program with that uses cryptocurrencies and “smart contracts” to provide services that don't need intermediaries
 - Provides products that let individuals borrow, save, invest, trade, and more
- In DeFi, a “smart contract” replaces the financial institution in the transaction. It is a self executing contract with terms of contract between the buyer and seller directly written into lines of code. They cannot be altered once created and will run as programmed
- Most financial services have a decentralized alternative, but Ethereum also creates opportunities for creating financial products that are completely new. Some examples include:
 - Sending money around the globe
 - Accessing stable currencies
 - Borrowing funds with / without collateral
 - Starting crypto savings and trade tokens
 - Managing portfolios

Industry Overview (cont'd)

Ethereum is the community-run blockchain technology powering ETH (Ether) and thousands of decentralized applications

NFTs (Non-Fungible Tokens)

- **NFTs (Non-Fungible Tokens)** are blockchain tokens representing a unique, digital item, that allow individuals to buy and sell ownership. Examples include:
 - A unique digital artwork
 - A unique sneaker in a limited-run fashion line
 - An in-game item
 - An essay
 - A digital collectible
 - A domain name
 - A ticket that gives you access to an event or a coupon
- NFTs provide a way to represent anything digitally unique as an Ethereum-based asset, and are giving more power to content creators than ever before



DAOs (Decentralized Autonomous Organizations)

- **DAOs (Decentralized Autonomous Organizations)** are internet-native businesses that are collectively owned and managed by its members, providing an effective and safe way to work with like-minded individuals around the globe
 - DAOs have built-in treasuries that no one has the authority to access without the approval of the group
- Examples:
 - Charites: Individuals can accept membership and donations from anyone in the world and the group can decide how they to spend donations
 - Freelancer Network: Teams can create a network of contractors who pool their funds for office spaces and software subscriptions
 - Ventures and Grants: Individuals can create a venture fund that pools investment capital and votes on ventures to back. Repaid money could later be redistributed amongst DAO-members
- Types of Membership:
 - Token-based membership
 - Share-based membership
- The backbone of a DAO is its smart contract, which defines the rules of the organization and holds the group's treasury
 - Once the contract is live on Ethereum, no one can change the rules except by a vote

The Ethereum Ecosystem (Blockchain) and Cryptocurrency

Overview

- The Ethereum Ecosystem and the world of cryptocurrency are inevitably intertwined as the popular cryptocurrency, ETH (Ether), is powered by the Ethereum blockchain
- “Cryptocurrency,” by definition, is digital money (or a form of payment) that is bought and sold online that does not go through a traditional financial institution
- Cryptocurrencies can be exchanged online for goods and services, and many companies have issued their own currencies, often called “tokens” or “coins,” that can be traded specifically for the good or service that the company provides
- Purchasers of cryptocurrencies can “hold” tokens / coins within a cryptocurrency “wallet” (an online application to hold currency) and can buy cryptocurrencies with US dollars, or other forms of cryptocurrencies, from a variety of cryptocurrency exchanges
- The market cap of global cryptocurrency market was worth >\$2 trn as of April 2021 and there are over 10,000 different types of cryptocurrencies that are traded publicly
- The market is relatively appealing for a variety of reasons:
 - Cryptocurrency removes central banks from managing the money supply, helping remove the risk of banks reducing value via inflation
 - The technology behind cryptocurrencies, blockchain technology, is a decentralized processing and recording system that can be more secure than traditional payment systems
 - Transaction fees for cryptocurrency are comparatively lower than what is charged in the traditional financial system
 - The cryptographic nature of cryptocurrencies, makes it difficult for a government body to tax or confiscate tokens without the cooperation of the owner (though this may change with increased regulation)
 - Ability to efficiently transfer payment across borders with little to no cost, delay or foreign currency fluctuations
- Though the cryptocurrency market has run into legal challenges as its popularity has risen, the option to transact in digital currency provides a new, flexible opportunity to power and reconstruct the financial payments system globally

Overview of Top Currencies / Coins

Top 10 Currencies / Coins

Name	Function	Date	Background / Objectives	Current / Maximum Supply	Consensus Mechanism
Bitcoin (BTC)	Currency	2009	The first cryptocurrency, established to allow peer-to-peer transactions without the need for a trusted third party. Transactions are verified by network nodes and recorded on the blockchain.	18.7mn / 21mn	Proof of work (one party proves to the other that a certain amount of computational effort has been expended)
Ethereum (ETH)	Smart contract app platform / Currency	2015	The most actively used blockchain, established to enable the creation and use of smart contracts and decentralized applications. Ether is Ethereum's native cryptocurrency.	115.9mn / Unlimited	Currently proof of work, but moving to proof of stake
Tether (USDT)	Stablecoin	2014	Originally designed as a stablecoin—aiming to be fully backed by a fiat currency—it was later found that each tether was not fully backed by US Dollars at all times.	58bn / Unlimited	N/A; USDT tokens run on Algorand, BCH, EOS, Ethereum, Liquid Network, Omni, Solana, Tron
Binance Coin (BNB)	Currency / app / utility	2017	Issued by the Binance exchange, Binance Coin is used to pay for fees on the exchange. While it originally operated on the Ethereum blockchain, BNB had its own launch in 2019.	153.4mn / 170.5mn	Proof of stake (randomly assigns the node that will mine/validate, partially according to the number of coins a node stakes)
Cardano (ADA)	Smart contract app platform / Currency	2017	Cardano is a public blockchain established to enable the creation and use of smart contracts while focusing on scalability and interoperability. Ada is Cardano's internal cryptocurrency.	31.9bn / 45bn	Proof of stake
Dogecoin (DOGE)	Currency	2013	Named after the Shiba Inu meme and created as a "fun" alternative to bitcoin, dogecoin is a peer-to-peer, open-source cryptocurrency. Dogecoin is a fork of the luckycoin blockchain.	130bn / Unlimited	Proof of work
XRP	Currency	2012	XRP is a real-time settlement system, exchange, and remittance network that facilitates cross-border payments for financial institutions.	46bn / 100bn	A network of servers validates transactions through a custom consensus algorithm
USD Coin (USDC)	Stablecoin	2018	USDC is a stablecoin running on the Ethereum, Stellar, Algorand and Solana blockchains. USDC is fully backed by the US Dollar, with Centre—the consortium that mints USDC—holding \$1 for every coin in reserves.	14.4bn/ unlimited	N/A; USDC tokens run on the Ethereum, Stellar, Algorand, and Solana blockchains
Bitcoin Cash (BCH)	Currency	2017	Another fork of Bitcoin, bitcoin cash was created to facilitate the use of BTC as a medium of exchange rather than the original store of value purpose. BCH does this by increasing the speed at which transactions are processed via larger blocks.	18.7mn/ 21mn	Proof of work
Litecoin (LTC)	Currency	2011	A fork of Bitcoin, Litecoin was created with the goal of speeding up transaction times, which it achieves by utilizing a different cryptographic algorithm than BTC.	67mn/ 84mn	Proof of work

Overview of Additional Key Platforms / Tokens

Relevant Smart Contract Platforms and Blockchains

Name	Function	Date	Background / Objectives	Current / Maximum Supply	Consensus Mechanism
Polkadot (DOT)	Smart contract application platform	2017	Polkadot is designed to provide interoperability between other blockchains. Polkadot features “shared security”—developers can create their own blockchains on the system while still having access to Polkadot’s security.	939mn/ Unlimited	Proof of stake
Internet Computer (ICP)	Smart contract/data platform	2021	Internet Computer is a public blockchain that extends the functionality of the public internet to allow it to host back-end software. This enables developers to create websites, enterprise IT systems and internet services by installing code directly onto the public internet, bypassing server computers and commercial cloud services. ICP is Internet Computer’s utility and governance token.	124mn/ unlimited	Independent data centers operate standardized computer nodes, and are rewarded for the time that they correctly operate these nodes
Uniswap (UNI)	Governance token	2018	Uniswap is a decentralized finance (DeFi) platform running on the Ethereum blockchain on which users trade cryptocurrencies and tokens. UNI is the platform’s governance token, giving users the right to vote on new developments and platform changes.	565mn/ 1bn	N/A; UNI tokens run on the Ethereum blockchain
Aave (AAVE)	Governance token	2017	Aave is a decentralized non-custodial money market platform that allows users to lend and borrow crypto assets. AAVE is the Ethereum-based, native governance token of the platform.	12.8mn/ 16mn	N/A; AAVE tokens run on the Ethereum blockchain
Monero (XMR)	Privacy currency	2014	A privacy-focused cryptocurrency, Monero aims to make transactions untraceable and unlinkable through the use of ring signatures and stealth addresses.	17.9mn/ 18.4mn	Proof of work
Algorand (ALGO)	Smart contract application platform	2017	Algorand is a blockchain built by MIT professor Silvio Micali that supports DeFi applications and smart contracts, built on scalability as its most important principle, but also on open participation, security, and transaction finality.	3br/ 10bn	Proof of stake

Cryptocurrency Mining: Proof of Work vs. Proof of Stake

Consensus Mechanisms in Cryptocurrency Mining

Cryptocurrency Mining

- Cryptocurrency “mining,” by definition, refers to gaining cryptocurrencies through a transactional process that involves the use of computers and cryptographic processes to solve complex functions and record data to a blockchain
- This process involves validating data blocks and adding transaction records to a public record / ledger (which is known as a blockchain)
- More simply put, cryptocurrency “miners” work verify the legitimacy of transactions in order to reap the rewards of their work in the form of cryptocurrencies
- Though the process is financially lucrative and leads to greater privacy around individual finances, the process is highly resource intensive, expensive and can be harmful to the environment process
- There are two main “consensus mechanisms” that are used to validate the legitimacy of transactions on the blockchain:
 - Proof of Work: Method that requires all of its miners to attempt to solve a complex sum, with the winner determined by the person who has the most powerful/quantity of hardware devices
 - Proof of Stake: Model that attributes mining power to the proportion of coins held by the miner (called “validators”) that are chosen at random to create blocks and responsible for confirming blocks they do not create

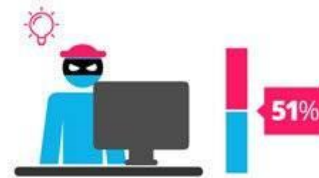
Proof of Work vs Proof of Stake



proof of work is a requirement to define an expensive computer calculation, also called mining



Proof of stake, the creator of a new block is chosen in a deterministic way, depending on its wealth, also defined as stake.



A reward is given to the first miner who solves each blocks problem.



The PoS system there is no block reward, so, the miners take the transaction fees.



Network miners compete to be the first to find a solution for the mathematical problem















Proof of Stake currencies can be several thousand times more cost effective.

Core Exchanges and Cryptocurrency Mining

Top Cryptocurrency Exchanges in the USA

Top Cryptocurrency Exchanges

Name	Features:
 BINANCE.US	Automated recurring buys, over-the-counter trading, staking rewards, crypto pairs, institutional trading services
 coinbase	Coinbase Earn rewards, Coinbase Pro advanced account, user-controlled storage, Stablecoin, staking, and institutional trading tools
 kraken	~60 cryptocurrencies, margin / futures and OTC trading; account management for HNW / institutional clients; multiple trading platforms, educational resources, and rewards
 CEX.IO	More than 80 cryptocurrencies, margin trading, staking rewards, crypto-backed loans, institutional services
 GEMINI	Trading options for beginners, experts, and institutions; Gemini Earn, Gemini Wallet, and \$200 million insurance in Gemini Custody
 BITTREX	Instant buy/sell, highly secure cold storage, mobile access

Name	Features:
 Bitstamp	Offering ~20 cryptocurrencies, with options for advanced traders and institutional traders, US clients can trade crypto assets through its subsidiary, Bitstamp USA
 ABRA	Mobile crypto exchange offering more than 100 cryptocurrencies, including bitcoin, ethereum and dogecoin
 SoFi	Offers three crypto assets: Bitcoin, Ethereum, and Litecoin
 eToro	Offers a highly secure and easily navigable interface that gives access to roughly 16 crypto assets
 Webull	Online brokerage that only requires \$1 to start trading crypto, but its investment selection is limited
 Robinhood	Commission-free structure has quite the appeal for those who prefer low-cost investments, but cryptocurrency selection is on the shorter side

Top VC Funds

Top 15 VC Funds with dedicated efforts towards the Blockchain / Cryptocurrency space

Top Blockchain / Crypto VC Funds			
Name	Fund Size (\$M)	Industry Segment	Selected Relevant Investments
Andreessen Horowitz	\$2,200.0	Cryptocurrency	Solana, Nansen, Phantom, Compound, Celo
Blockchain Capital	\$300.0	Blockchain, Cryptocurrency	Securitize, Blocknative
Dragonfly Capital	\$225.0	Blockchain, DeFi, NFTs	Ledger, Chainalysis, Amber Group, Compound, Matter Labs
Polychain Capital	\$200.0	Cryptocurrency, Blockchain	Solana, Amber Group, Compound, Celo
Pantera	\$175.0	Blockchain	Amber Group, Terraform Labs, Acala Network
#Hashed	\$120.0	Blockchain	Dune Analytics, TokenSets, Matter Labs
Framework Ventures	\$100.0	Blockchain, Cryptocurrency	Chainlink, Slingshot, Aave
Multicoin Capital	\$100.0	Blockchain, Cryptocurrency	Saber, Solana, Dune Analytics
CoinFund	\$83.0	Blockchain, Cryptocurrency	Solana, Rarible, Serum
Draper Goren Holm	\$25.0	Blockchain	Ledger, Totle, Degens, AlphaFin
NGC Ventures	\$20.0	Blockchain, Cryptocurrency	Antler Interactive, PlotX, Marlin
Coinbase Ventures	\$15.0	Blockchain, Cryptocurrency	Amber Group, Nansen, FTX, Rarible, Compound
Divergence Ventures	\$10.0	Cryptocurrency	Compound, Dune Analytics, DeFiDollar
Binance Labs	CVC	Blockchain, Cryptocurrency	Matter Labs, Marlin
Delphi Digital Ventures	CVC	Cryptocurrency	Synthetix

Source: Company websites, CrunchBase, TechCrunch, Cointelegraph Research
 Note: Fund sizes based on latest publicly available data as of July 2021.

Trends in the Industry

There are a variety of emerging / current trends in the industry that are important for potential investors to monitor

Top of Mind Trends

Blockchain

- Supply Chain Transparency: Improved interoperability and data integrity is giving suppliers and consumers visibility into a product's entire lifecycle
- Tokenization: The ability to digitally represent anything from unique artwork (NFTs) to cryptocurrency is boosting liquidity and will expand to new realms
- Financial Transformation: Banks and other institutions are able move assets more efficiently and offer new investment products to clients
- Decentralized Identify Management: For enterprises, blockchain is offering a way to securely establish a "decentralized identity," giving users more control over when, where and with whom they share their credentials
 - "Tokenizing" a person's identity can give them more convenience and control over how they share credentials and who has access
- Blockchain-Fueled AI: Introducing machine learning algorithms on a set of new, far-reaching data will drive more effective pattern matching and predictive analytics for individuals and enterprises
- Multi-Organizational ERP (Enterprise Resource Planning): Linking ERP systems could create an overarching "super ERP" for resource planning across organizations
 - ERPs enables a complex and dispersed organization to communicate internally between the various parts of its business, ensuring that one part knows what another is doing, and blockchain will allow different ERPs across an organization to be linked together to form comprehensive "network resource planners" (NRPs)

Cryptocurrency

- Cryptocurrency to Mainstream: Companies are adding Bitcoin and other cryptocurrencies to treasury holdings and government central banks are backing digital currencies (or introduction their own CBDCs (Central Bank Digital Currencies))
- Growth of Stablecoins: Dollar pegged stablecoins, with Tether and USDC being the market leaders, will see more light due the advantages that they offer, primarily protecting investors from usual crypto market volatility
- Compensation Optionality: Sports players and key social media influencers have started to accept cryptocurrency as a form of payment (including salary)
- Currency Adoption: Countries and states have started accepting Bitcoin and other cryptocurrencies as official, legal currencies
- Government Regulation / Taxation: Governments of different countries are creating tools to monitor and regulate cryptocurrency transactions
- Continued IPOs: With crypto exchanges growing in popularity, growing cryptocurrencies may look at the opportunity to IPO
- Focus on ESG: Increased efforts around finding sustainable and eco-friendly approaches to cryptocurrency mining due to governments crackdowns worldwide
- Fintech Integration: Continued introduction of credit card with cryptocurrency rewards, such as Upgrade, BlockFi and Gemini, along with larger fintech companies launching cryptocurrency wallets

Investment Thesis

The Ethereum Ecosystem (Blockchain) & Cryptocurrency

Key Areas of Interest

- **Diversification:**
 - Startups in the space offer LPs the ability to gain exposure to a new industry that is often uncorrelated with how investments perform in other industries
 - Opportunity to take advantage of industries that are still relatively nascent, with significant, proven runway for growth, coupled with high return potential
- **Evolving Use Cases:**
 - As blockchain technology continues to evolve and users understand how to manipulate and leverage the technology, programmers and developers will continue to discover additional use cases that can be built upon
- **Increased Access, Efficiency and Transparency in Payments**
 - Cryptocurrency transaction costs are relatively low, and allow users to transact at any time of the day or night with no limits on purchases and withdrawals
 - Any user is free to use cryptocurrency, unlike setting up a bank account, which requires documentation and other paperwork
 - International cryptocurrency transactions are faster than wire transfers
- **Demand for Information and Transaction Security:**
 - Companies that leverage the Ethereum network and blockchain technologies will contribute to an ecosystem that is more secure, reliable and transparent
- **Consumer Preference of a Decentralized Ecosystem**
 - With a decentralized ecosystem, users avoid having to put trust in a central authority, enjoying less censorship and reduces the risk of transaction with a system that has a single point of failure
 - More likely to be open development platforms that any user can leverage to build tools, products and services (removing limits on development opportunities)
 - Potential for network ownership alignment (people who contribute value to the decentralized network receive ownership or economic stake in the network that becomes more valuable over time)

Source: Cointelegraph Research, Petkanics, Bloomberg

VC Investor Activity

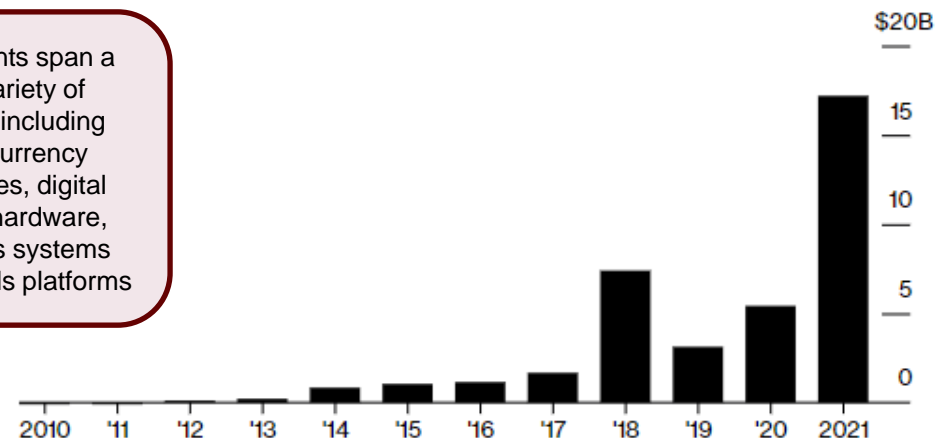
VC Ecosystem

Overview

- While historically, most of the investments in the crypto space happened with little to no VC involvement (82% of all investments to date), 2020 saw a significant shift in those numbers
- Last year, only 22% of investments had no VC involvement at all, and the remaining 78% were equally split between crypto VC firms, regular VC firms and joint ventures between the two
 - The majority of those investments happened at the seed round (which also offers the highest potential returns) and were focused toward blockchain infrastructure
- With blockchain touted as having similar global business process disruption capabilities, several notable participants in the mainstream arena appear keen to interact with the emerging technology
 - This appetite for backing players in the novel arena appears even more apparent among VC firms
- The token economy associated with blockchain startups also offers early backers the opportunity to acquire cryptocurrencies that could appreciate in value within a short period.
 - Even with vesting schedules that mandate a significant lock-up of these tokens for VC funds, the gains often outsize their initial equity investment
- Notable investments lately include FTX's \$900mm Series B, Ledger's \$380mm Series C and BlockFi's \$350mm Series D
- There has been keen interest across a variety of sub-verticals in the space including blockchain infrastructure, digital wallets, crypto exchanges, payments, rewards and NFTs

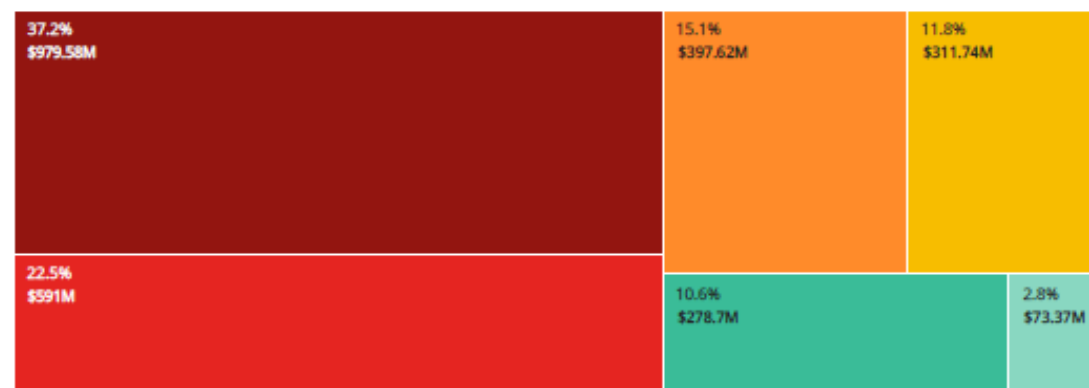
VC Investments in the Cryptocurrency

Investments span a wide variety of verticals including cryptocurrency exchanges, digital wallets, hardware, payments systems and rewards platforms



VC Sub-Vertical Investments in Blockchain

Capital Raised by Category in 2020



Source: Cointelegraph Research

Blockchain infrastructure Trading infrastructure Wallet
 Crypto exchange Payments Compliance and regulation

VC Investor Activity

Recent Funding Rounds

Date	Name	Funding Round	Raise (\$M)	Post-Money Valuation (\$M)	Selected Investors	Industry Segment
Jul-21	FTX	Series B	\$900.0	\$18,000.0	Paradigm, Sequoia Capital, NEA, Coinbase Ventures, Lightspeed Venture Partners, Insight Partners, Softbank, Coinbase Ventures, Altimeter Capital	Cryptocurrency Exchange
Jun-21	Ledger	Series C	\$380.0	\$1,500.0	10T Holdings, Cathay Innovation, Draper Associates, Draper Dragon, Draper Esprit, DCG, Korelya Capital, Wicklow Capital, Uphold Ventures, Felix Capital	Cryptocurrency Wallet
Mar-21	BlockFi	Series D	\$350.0	\$3,000.0	Bain Capital Ventures, DST Global, Pomp Investments, Tiger Global	Cryptocurrency
Jun-21	Solana	ICO	\$314.0	-	Andreessen Horowitz.500 Startups, Foundation Capital, Polychain, Slow Ventures, CoinFund, BlockTower Capital	Blockchain
Jul-21	Fireblocks	Series D	\$310.0	\$2,200.0	Sequoia Capital, Stripes, Spark Capital, Coatue, DRW VC, SCB 10X, Siam Commercial Bank, BNY, SVB Capital	Cryptocurrency Infrastructure
Mar-21	Blockchain.com	Series C	\$300.0	\$5,200.0	DST Global, Lightspeed Venture Partners, VY Capital	Cryptocurrency Wallet
Jun-21	Chainalysis	Series E	\$100.0	\$4,200.0	Benchmark, Accel, Addition, Dragoneer, Durable Capital Partners, 9Yards Capital, Altimeter, Blackstone, GIC, Pictet, Sequoia Heritage, SVB Capital	Blockchain
Jun-21	Amber Group	Series B	\$100.0	\$1,000.0	Paradigm, Pantera Capital, Polychain Capital, Dragonfly Capital, Blockchain.com, Fenbushi Capital, Coinbase Ventures	Cryptocurrency
Jul-21	MobileCoin	Series B	\$75.0	\$1,000.0	General Catalyst, Future Ventures, AU21 Ventures	Cryptocurrency, Blockchain
Jul-21	Core Scientific	Pre-IPO Raise	\$54.0	-	Celsius	Cryptocurrency Mining
Jun-21	Securitize	Series B	\$48.0	-	Blockchain Capital, Morgan Stanley, Ava Labs, IDC Ventures, Migration Capital, Borderless Capital	Cryptocurrency
Jul-21	Vauld	Series A	\$25.0	-	Valar Ventures, Pantera Capital, Coinbase Ventures, CoinShares, CMT Digital, Gumi Cryptos, Robot Ventures	Cryptocurrency Exchange
Jul-21	Messari	Series A	\$21.0	-	Point72 Ventures, Coinbase Ventures, Uncork Capital, Underscore VC, Blockchain Ventures, Winklevoss Capital, Kraken Ventures	Crypto Market Intelligence
Total Median (25 Raises)			\$21.0	\$2,600.0		
Total Average (25 Raises)			\$124.1	\$4,512.5		

Source: CrunchBase, TechCrunch, GlobalNewsWire, PRNewsWire, WSJ, Reuters, Coindesk, Axios

VC Investor Activity (cont'd)

Recent Funding Rounds

Date	Name	Funding Round	Raise (\$M)	Post-Money Valuation (\$M)	Selected Investors	Industry Segment
Jul-21	Virtually Human Studio	Series A	\$20.0	-	TCG Capital Management, Andreessen Horowitz.	NFTs
Jul-21	Tenderly	Series A	\$15.3	-	Accel, Point Nine Capital, Version One Ventures	Blockchain, Ethereum
Jun-21	Rarible	Series A	\$14.2	-	Coinfund, Venrock	NFT Marketplace
Jun-21	Nansen	Series A	\$12.0	-	Andreessen Horowitz, Skyfall Ventures, Coinbase Ventures, imToken Ventures, Mechanism Capital, QCP Capital.	Cryptocurrency, Blockchain
Jul-21	Blocknative	Series A	\$12.0	-	Foundry Group, Blockchain Capital, Robot Ventures, Rho Capital	Cryptocurrency, Payments
Apr-21	Ramp	Seed	\$10.0	-	Seedcamp, Galaxy Digital, Firstminute Capital	Cryptocurrency, Blockchain
Jul-21	Lolli	Series A	\$10.0	-	Acrew Capital, Banana Capital, Formula VC, UpNorth Media, Animal Capital, Seven Seven Six Ventures	Cryptocurrency Rewards
Jul-21	Phantom	Series A	\$9.0	-	Andreessen Horowitz, Variant Fund, Jump Capital, DeFi Alliance, Solana Foundation	Cryptocurrency Wallet
Jul-21	Saber	Seed	\$7.7	-	Race Capital, Social Capital, Jump Capital, Multicoi Capital, Solana Foundation	Cryptocurrency Exchange
Jun-21	Mercuryo	Series A	\$7.5	-	Target Global	Cryptocurrency, Payments
Jul-21	Horizon Blockchain Gam	Seed	\$4.5	-	BITKRAFT Ventures, CMT Digital Ventures	Blockchain, Gaming
Jun-21	Cent	Seed	\$3.0	-	Galaxy Interactive	NFTs, Ethereum
Total Median (25 Raises)			\$21.0	\$2,600.0		
Total Average (25 Raises)			\$124.1	\$4,512.5		

Notable Exits / Public Players

As startups in the space continue to mature, the industry will continue to see more initial public offerings and horizontal M&A

Overview

- Many companies in this nascent industry are pursuing IPOs due increased investor comprehension around blockchain / cryptocurrency and discovery of new and additional use cases
 - Companies in the space are becoming increasingly more comfortable with SPACs as an exit option as well
- As the infrastructure around cryptocurrencies begins to mature, while the overall complexity remains high and talent is scarce, it often makes more sense for companies to acquire rather than to build from the ground-up
- Acquisitions happen both within the space (crypto companies acquiring crypto companies) and outside of it (crypto companies acquiring non-crypto companies and vice versa)
- Strategic buyers continue to try to scale their platforms more quickly through acquisitions for specific technology or unique platform capabilities
- Not much traditional private equity interest in the space yet due to the ever-changing nature of the industry, along with evolving sentiment around rules and regulation
- Some of most notable recent transactions are Coinbase and Circle's SPAC IPOs, along with FTX's \$150mm acquisition of CoinMarketCap

Selected Notable Exits


Name	Valuation (\$M)	Acquiror	Date	Last Funding Round/Raise/	
				Post-Money Valuation	Industry Segment
Coinbase ¹	\$86,000	IPO	Jun-21	Series E / \$300mm / \$8bn	Cryptocurrency
Bullish Global	\$9,000	IPO (SPAC)	Jul-21	Strategic / \$300mm	Cryptocurrency Exchange
Circle	\$4,500	IPO (SPAC)	Jul-21	Growth / \$440mm	Cryptocurrency
Core Scientific	\$4,300	IPO (SPAC)	Jul-21	Corporate / \$54mm	Blockchain
LMAX Group ²	\$1,000	J.C. Flowers	Jul-21	-	Cryptocurrency Exchange
CoinMarketCap	\$400	Binance	Mar-20	-	Cryptocurrency
Blockfolio	\$150	FTX Exchange	Aug-20	Series A / \$14mm	Cryptocurrency
BitTorrent	\$140	Tron	Jun-18	ICO / \$7mm	Blockchain
B2C2 ³	<\$100	SBI Holdings	Dec-20	Series B / \$30mm	Cryptocurrency
Tagomi ⁴	\$75-\$100	Coinbase	May-20	Series A / \$13mm	Cryptocurrency
Gamma Point	\$35	Blocktower	Jun-21	-	Cryptocurrency, Blockchain
Harbor	< \$10	BitGo	Feb-20	Corporate / \$28mm	Cryptocurrency, Blockchain
Lumina	< \$10	BitGo	Apr-20	Seed / \$4mm	Cryptocurrency
Vo1t	< \$10	Genesis Global	May-20	Seed / \$2mm / \$17mm	Cryptocurrency, Blockchain
Chainspace	-	Facebook	Feb-19	-	Blockchain

Source: Crunchbase, TechCrunch, GlobalNewsWire, PRNewsWire, WSJ, Reuters, Coindesk, Axios

¹ Market Cap value at close as of 14-Apr-2021. ² Valuation represents total acquisition value based on J.C.'s 30% minority interest in LMAX. ³ Valuation represents total acquisition value based on SBI Holdings' 30% minority interest in B2C2. ⁴ \$75-\$100mm estimated value range based on public sources.

Selected Notable Startups


Notable startups include a combination of blockchain and cryptocurrency companies that have generated a significant amount of interest from a slate of reputable investors

Name	Latest Stage	Latest Valuation (\$M)	Total Funding (\$M)	Notable Investors	Description
 FTX	Series B	\$18,000.0	\$908.0	Paradigm, Sequoia Capital, NEA, Coinbase Ventures, Lightspeed Venture Partners, Inisght Partners, Softbank, Coinbase Ventures, Altimeter Capital	FTX Exchange is a cryptocurrency derivatives exchange company built by traders, for traders.
 Ledger	Series C	\$1,500.0	\$468.0	10T Holdings, Cathay Innovation, Draper Associates, Draper Dragon, Draper Esprit, DCG, Korelya Capital, Wicklow Capital, Uphold Ventures, Felix Capital	Ledger provides security and infrastructure solutions to critical digital assets for consumers and institutional investors.
 BlockFi	Series D	\$3,000.0	\$508.7	Bain Capital Ventures, DST Global, Pomp Investments, Tiger Global	BlockFi is a secured non-bank lender that offers cryptoasset-backed USD loans to cryptoasset owners.
 SOLANA	ICO	-	\$335.8	Andreessen Horowitz.500 Startups, Foundation Capital, Polychain, Slow Ventures, CoinFund, BlockTower Capital	Solana is a crypto startup that builds and develops crypto apps for decentralized apps and marketplaces.
 Fireblocks	Series D	\$2,200.0	\$489.0	Sequoia Capital, Stripes, Spark Capital, Coatue, DRW VC, SCB 10X, Siam Commercial Bank, BNY, SVB Capital	Fireblocks is a blockchain security service provider for moving, storing, and issuing digital assets.
 Blockchain.com	Series C	\$5,200.0	\$490.0	DST Global, Lightspeed Venture Partners, VY Capital	Blockchain.com is a platform that offers ways to buy, hold, and use cryptocurrency.
Median		\$3,000	\$490		
Average		\$5,980	\$533		

Areas of Interest

There are a variety of sub-verticals in the space that may be of interest to Harlem Capital

Sub-Vertical	Description
Infrastructure	Platform-as-a-service (PaaS) providers that coordinate and maintain access to the infrastructure that powers blockchains, such as dev tools and nodes, bundled with the underlying infrastructure needed to operate their systems, such as cloud storage and security.
Capital Markets & Financial Services	Refers to companies that primarily develop solutions for financial institutions and intermediaries to address issues of clearance, settlement, and data management, among others, as well as to companies that build new blockchain-based investment vehicles.
Enterprise Services & Currencies	Blockchain services companies primarily develop blockchain operating systems, APIs, and protocols intended for multiple and varied use cases, or companies that act as general-purpose blockchain consultants, typically for enterprises. Blockchain currencies refers to companies that build unique and custom cryptocurrencies and tokens.
Data & Analytics	Companies building powerful tools for blockchain research that provide tools to query, extract, and visualize vast amounts of data from the blockchain.
Content Management & NFTs (Non-Fungible Tokens)	Content companies primarily operate blockchain-based content platforms, whereby publishers and creators establish immutable rights and ownership of content and engage in microtransactions for the usage of content. NFTs are blockchain tokens representing a unique, digital item, that allow individuals to buy and sell ownership.
P2P Marketplaces & P2P Lending	Primarily operate blockchain-based, peer-to-peer marketplace platforms, where users can exchange goods directly and without the use of an intermediary. P2P lending refers to companies that develop blockchain-based, peer-to-peer lending platforms which allow users to engage in lending transactions with peers, as opposed to traditional financial institutions.
Storage, Security & Regulatory	Storage companies that primarily store data with blockchain-secured technology. Security & regulatory companies assess risk from and to blockchains, build secondary security systems, blockchain security applications, or monitor cryptocurrencies for criminal activity by assembling an audit-trail of cryptocurrency addresses.
Cryptocurrency Mining	Companies that primarily build or operate hardware, software, cloud-based pools, and other services for the mining of cryptocurrencies.
Merchant Services	Refers to companies that primarily develop cryptocurrency and blockchain solutions for merchants and sellers. This category includes blockchain-based rewards programs, cryptocurrency point-of-sale kiosks, and merchant-directed blockchain consulting services.
Social & Browsers	Social companies primarily develop blockchain-based social networks. Browser companies primarily build blockchain-secured web browsers, often including microtransaction capabilities.
IoT & Identity	IoT companies primarily assign physical assets blockchain-secured digital signatures and establish trusted networks by which these physical assets can communicate. Identity companies primarily build identity management applications for consumers to record and secure identification data.

 Key Area of Interest for HCP