

## **Bitcoin:**

In 2009, Satoshi Nakamoto published the bitcoin whitepaper, which solved the double-spending problem of digital currencies with a distributed ledger system, called a blockchain. This allowed for the development of the first secure, decentralised digital currency, called Bitcoin (BTC). The Bitcoin blockchain, which began the first-generation of blockchains, is simply a record of every bitcoin transaction ever made, and is stored on every node, or miner, in the bitcoin network. These miners validate transactions by competing to solve a highly complex computational problem, with the first miner to solve the problem receiving bitcoin as a reward. They also receive a portion of the fees from bitcoin transactions. They then tell the answer to the other miners and record the transaction in a block, and when a majority of miners validate their answer, the block is added to the blockchain. This means an attacker would need to control 51% of the network to alter the blockchain, which is practically impossible, as there are over 12,000 miners across the world. This consensus mechanism is called Proof of Work (PoW), and is one way to achieve trust and security in peer-to-peer transactions without a centralised third party, as miners are incentivised to maintain the credibility of the network.

Bitcoin is a digital token that is stored in an address on the blockchain that can be accessed using public and private keys, which are long strings of letters and numbers created with encryption algorithms, and are similar to a bank account number and private PIN.

The current supply is around 18.7 million BTC, with a max supply of 21 million, leaving 2.3 million still to be mined. The amount of BTC earned by miners is halved every 4 years, meaning the last bitcoin won't be mined until the year 2140, although the bitcoin protocol could change before then. With a current price of around \$58,000, BTC has a market cap of almost 1.1 trillion dollars. Bitcoin benefited massively from first movers advantage, and is now seen more as a store of value than a currency, with people calling it 'digital gold' and a 'hedge against inflation'.

## **Ethereum:**

The Ethereum network is a PoW blockchain like Bitcoin, but with a key difference, the implementation of smart contracts. This began the second-generation of blockchains. Smart contracts are essentially just pieces of code which are stored on the blockchain and execute automatically when the conditions in the contract are met. This means the Ethereum blockchain is programmable, like a virtual computer, which allows for decentralised application (dapps) to run on the blockchain. This has enormous potential for innovation, which is already happening. Two examples are decentralised finance (DeFi), an alternative to the current financial system, and Non-fungible tokens (NFTs), which are unique digital tokens that have a variety of use cases, such as proof of ownership and trading.

The ETH token can be used just like Bitcoin for financial transactions, but is also used to pay the 'gas fees' to run dapps, you can think of ETH as the 'fuel' of the Ethereum network. By investing in ETH, you are investing in the overall success of projects developed on the Ethereum network, which is by far the biggest network in crypto at the moment. However, Ethereum has not scaled well and is currently suffering from very high gas fees. The Ethereum developers hope to solve this problem with the roll out of the Ethereum 2.0 upgrade, where they will switch from the PoW consensus mechanism to Proof of Stake (PoS). Miners will be replaced with validators. To ensure a validator acts with the best interest of the network in mind, they must 'stake' their own ETH on the network. If they act in bad faith, their stake is slashed. PoS is already successfully being used by many other projects, including some of Ethereum's main competitors, such as Cardano and Polkadot.

### Cardano:

As mentioned above, Cardano is one of Ethereum's main competitors. They developed their own PoS consensus mechanism, and Cardano is the first blockchain founded on peer-reviewed research and technology, led by one of Ethereum's co-founders, Charles Hoskinson. However, this means it takes some time to get things done, and it hasn't implemented smart contracts just yet, but it has seen massive growth and they will be implemented in the coming months. It is considered a third-generation blockchain, which improves upon the shortcomings of first and second-gen blockchains in terms of scalability and sustainability. Cardano has secured a number of high-level partnerships across industries, particularly in Africa, where they will develop a student and teacher database system in collaboration with the Ethiopian Ministry of Education. Cardano's native token, ADA, can be used like a currency just like any other crypto, and also to stake on the Cardano network, where token-holders earn staking rewards and have a say in the development of the system.

### Conclusion:

Bitcoin's status as a 'hedge against inflation' and a competitor for gold as a store of value leave it with no real competitors in the crypto space. I think Bitcoin is clearly the safest investment, as it has seen the most institutional adoption by far and doesn't really have any competitors. However, I think ETH and ADA have much more potential to grow, but also carry more risk, as the technology and use cases are simply much better than Bitcoin, but they have a lot of competitors, such as Polkadot and the Binance Smart Chain. I would recommend a portfolio of 60% BTC, 30% ETH and 10% ADA. I think ADA is the best hedge against Ethereum, as I believe it is the most promising of Ethereum's competitors. I would also recommend looking into Chainlink, as they are the leading provider of the oracle service that is required for smart contracts to work with off chain data.

	Price	Supply (Max)	Market Cap	Uses	Consensus
BTC	\$58,000	18.3M (21M)	\$1100B	Currency, Store of value	PoW
ETH	\$3,900	115.8M(115.8M)	\$445B	Currency, Ethereum network fuel	PoW (PoS on Ethereum 2.0)
ADA	\$1.77	31B (45B)	\$51B	Currency, Cardano network governance	PoS

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