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Bitcoin and Ethereum – What’s the difference?

Key takeaways

- In this report, we compare the two largest digital assets, Bitcoin and Ethereum. By understanding their fundamentals, risks, and benefits, you can be better informed about challenges and opportunities in this fast-changing landscape.
- For an introduction to digital assets in general, please see our four-part series “Intro to digital assets.”

As digital assets gain popularity, it is important to understand that while many appear similar, they are not all created equally. Among the plethora of digital assets, Bitcoin¹ and Ethereum have emerged as the largest, accounting for roughly 70% of the total digital asset market capitalization.² Despite often being viewed in a similar light, they differ fundamentally, both in their purposes and the mechanisms that allow the networks to function. This report compares these two digital assets, noting their similarities, differences, and risks.

What is Bitcoin?

Bitcoin is the first and largest digital asset platform, accounting for 57% of the total digital asset market capitalization (see Chart 1). It was created in 2009 to address the lack of ability to transfer value electronically without the use of an intermediary. Bitcoin is simply an alternative method to independently transfer value to anybody who has access to the internet. Conceptually it is similar to a person exchanging physical cash with a peer — bitcoin is done virtually.

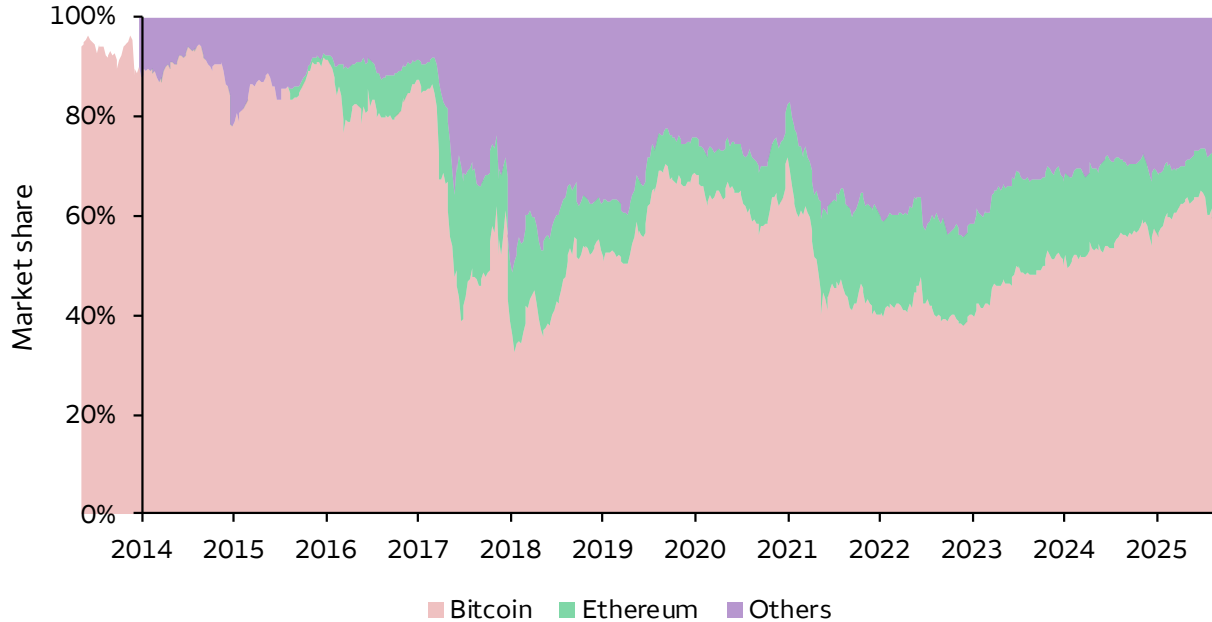
Investment and Insurance Products: ➤ NOT FDIC Insured ➤ NO Bank Guarantee ➤ MAY Lose Value

1. Bitcoin can be referred to as “Bitcoin”, which represents the network itself, and “bitcoin” which is the token used to interact with the network. For this report, we will be referring to the network itself unless stated otherwise.

2. Coinmarketcap.com, as of September 5, 2025.

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Chart 1. Bitcoin and Ethereum market share



Sources: Coinmarketcap and Wells Fargo Investment Institute. Weekly data is from January 4, 2014 – August 31, 2025. Bitcoin and Ethereum’s market share is calculated as a percentage of the total digital asset market capitalization compiled by Coinmarketcap.

Unlike traditional payment services, Bitcoin is decentralized, meaning there is no owner or intermediary. Instead, it runs on a network of computers around the globe, abiding by set protocols and rules. In theory, these rules can change. However, in practice, this is highly unlikely due to requirements for updates to be approved by a majority consensus among users.

Decentralization helps promote privacy by preventing any single entity from controlling user data. Playing into the theme of decentralization, Bitcoin supports the implementation of basic smart contract functions. Smart contracts are a program on a blockchain, that automatically runs rules when certain conditions are met, without the use of an intermediary. One example of how a Bitcoin smart contract could be used is in the case that funds need to be locked until a set period, for example parents could utilize a script to release funds to their child once they reach a certain age.

What is Ethereum?

Ethereum was proposed in 2013 and launched by Vitalik Buterin and his team in 2015. The platform is built on many of the same principles initially laid out by Bitcoin such as decentralization. Unlike Bitcoin, however, Ethereum’s founders attempted to broaden the programmability capabilities of blockchain³ technology beyond maintaining a secure ledger for payments. The Ethereum network can handle more complex smart contracts than the Bitcoin network. For example, Ethereum can process a smart contract for a decentralized autonomous organization (DAO), where members lock tokens in a special wallet to vote on proposals, automatically executing decisions like fund allocations based on majority votes and conditional logic. This expanded programmability helps support more complex applications with Ethereum tokens.

3. Blockchain is a decentralized digital ledger that records transactions across a network of computers in a secure and transparent manner. For a complete introduction, please see Wells Fargo Investment Institute’s (WFII’s) four-part series of reports, “Introduction to digital assets and the next digital era.” March 2025.
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How are they different?

Now that there is a basic understanding of the two assets, what are the key differences?

Security

Bitcoin and Ethereum are both highly secure due to their decentralized nature and scale, making it extremely difficult for any single party to successfully alter their networks.⁴ They utilize systems, known as consensus mechanisms, to ensure that transactions are accurate and the network is secure. Bitcoin's consensus mechanism is considered more complex as it relies on users, known as validators, to compete to solve complex equations in order to process transactions. (These validators are also often referred to as “miners”, but for our purposes we will refer to these users as validators.) Validators are essential as they verify transactions and maintain the blockchains integrity. Validators have an incentive to verify transactions, because they receive a reward for each transaction they confirm. Ethereum, on the other hand, utilizes economic incentives by requiring validators to stake or lock up Ether⁵ as collateral. This deters validators from processing fraudulent transactions, as they run the risk of losing collateral.

In effect, it requires much more energy to keep Bitcoin's blockchain secure compared to Ethereum's. In theory, this may also make Bitcoin more secure than Ethereum, as altering the blockchain in a malicious manner would require vast amounts of time and energy. Bitcoin's protocols also do not change as frequently as Ethereum's, which have been updated numerous times over the years.

Supply

The same mechanisms used to validate transactions and secure the blockchain can also influence supply. In Bitcoin's case, there is a limited supply of 21 million bitcoins that will ever be issued. Rewards in the form of transaction fees, paid by users, and newly minted bitcoins are distributed to validators once a set of transactions are processed. These same validators disseminate the supply of newly issued coins by selling to the open market to pay for mining expenses, effectively growing the available supply. Over time, supply growth slows as the reward of newly issued bitcoins are cut in half about every four years through a built-in event coded into the software. This prevents too much inflation in the bitcoin supply, making it scarcer over time. For example, validators initially received 50 bitcoins for processing transactions, but today they earn 3.125 bitcoins and validators — following the next halving — will only receive 1.56 bitcoins.

Roughly 95% of all bitcoins have been issued; however, due to the halving process materially slowing supply growth, the 21-million supply limit is not expected to be reached until 2140. Once the final bitcoin has been issued, validators will be rewarded with transaction fees in the form of bitcoin, paid by users, ensuring there is still an incentive to keep the blockchain running. This limited supply creates scarcity and can help support Bitcoin as a store of value.

Like Bitcoin, Ethereum validators earn rewards in the form of coins, growing the available supply. However, Ethereum does not have a set supply cap and there is no halving process. In Ethereum's system, all active validators earn rewards if they are online and perform their duties, such as attesting (voting) to validate blocks, even if they don't propose a block themselves – rewards come from base fees, tips, and maximal extractable value (MEV), distributed proportionally based on stake. The “base fees” are like a fixed toll everyone pays to make a transaction. “Tips” are optional bonuses users add to their transactions to get processed faster, going directly to the validator who includes them. “Maximal Extractable Value” (MEV) is extra money that validators can make by

4. For more details on blockchain security please see Wells Fargo Investment Institute's (WFII's) four-part series of reports “Introduction to digital assets and the next digital era.” March 2025.

5. Ether is the native coin on the Ethereum blockchain, similar to bitcoin on the Bitcoin blockchain.

arranging transactions in a block to capture opportunities, like arbitraging prices. All these earnings are divided up proportionally, meaning if you stake more tokens (like putting up more money as collateral), you get a bigger slice of the rewards pie. This encourages people to stake more and helps keep the network secure.

To help manage supply growth, a base fee from every transaction on the Ethereum network is permanently destroyed (burned), reducing the total amount of outstanding Ether tokens. This makes the supply of Ether more dynamic and when the usage of the Ethereum network is high it can lead to Ether becoming deflationary as more tokens are burned through transaction fees than created through staking rewards, balancing growth with scarcity to potentially support value over time.

For both platforms, validators play a critical role in the security and supply issuance of their respective digital assets. Put simply, they are the key players that keep the blockchains running and secure.

Risk considerations for investors

Historically, Bitcoin and Ethereum exhibit high volatility, amplifying drawdowns up to 93% during past market corrections. Digital assets exhibit high volatility primarily due to factors like speculative trading, immature market structures, rapid shifts in investor sentiment, regulatory uncertainty, and low liquidity compared to traditional assets. Despite this, some digital assets are often viewed as stores of value because of their fixed supply, decentralization that may protect against inflation or government interference, and growing institutional adoption, where long-term holders focus on potential appreciation over short-term fluctuations.

Additionally, although digital assets like Bitcoin and Ethereum are commonly referred to as “currencies,” we caution that this may be misleading. They are classified as commodities by the Commodity Futures Trading Commission because they are decentralized digital assets created through mining (validating) or staking, with value being driven by supply, demand, and market forces, rather than being issued or backed by a government or central bank. Bitcoin and Ethereum do not offer profits from a company’s efforts (unlike stocks) and are not designated as official money with legal tender status.

In terms of security risks, Bitcoin and Ethereum networks have remained secure and have resisted security breaches on their networks. Bitcoin’s hash rate, a measure of the computational power used to secure the network, provides stronger deterrence against future hacks. The size and computational power of this network makes it feasibly impractical for a bad actor to maliciously alter the network. While theoretically not impossible, in practice we believe a successful hack is highly unlikely. Additionally, Bitcoin’s security though computational power comes at the expense of higher energy costs, which can present challenges to miners.

Custody options can also present risks for investors. Direct exposure through a digital asset wallet can become a challenge for the average investor, as wallet addresses and passwords are not intuitive and cannot be restored if lost. Indirect exposure through spot exchange-traded funds attempts to remedy these issues, as the assets themselves are typically stored in a digital vault and managed by a trusted custodian. However, indirect exposure through a trusted intermediary creates third-party risk and the potential for fraud. Lastly, digital assets are an evolving asset class subject to regulatory changes. We view the evolving regulatory environment as an ongoing risk for digital assets.

Conclusion

Overall, while Bitcoin and Ethereum may appear similar on the surface, there are many fundamental differences and purposes between the two. Bitcoin pioneered many principles common among digital assets today, such as a focus on decentralization and blockchain technology. Ethereum expanded on these concepts to broaden the use cases beyond payment and a store of value. We believe it’s important to understand their unique differences and how they are being applied to serve different needs within digital assets.

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Digital assets are not a physical currency, nor legal tender. Investors must have the financial ability, sophistication/experience and willingness to bear the risks of an investment, and a potential total loss of their investment. An investor could lose all or a substantial portion of his/her investment. Digital assets have limited operating history or performance. Digital Assets are sometimes exchanged for U.S. dollars or other currencies around the world, but they are not backed or supported by any government or central bank. Their value is completely derived by market forces of supply and demand, and they are more volatile than traditional fiat currencies.

Bitcoin and other cryptocurrencies are a very speculative investment and involves a high degree of risk. Investors must have the financial ability, sophistication/experience and willingness to bear the risks of an investment, and a potential total loss of their investment. An investor could lose all or a substantial portion of his/her investment. Cryptocurrency has limited operating history or performance. Fees and expenses associated with a cryptocurrency investment may be substantial. Cryptocurrencies are sometimes exchanged for U.S. dollars or other currencies around the world, but they are not backed or supported by any government or central bank. Their value is completely derived by market forces of supply and demand, and they are more volatile than traditional fiat currencies

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