

BLOCKCHAIN  
& THE FUTURE  
OF DIGITAL  
SETTLEMENTS

**CMIC** MARKETS  
CONNECT

# Introduction



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Talk of the blockchain and its potential to truly disrupt the way we work continues to proliferate. However, all too often, it's cryptocurrencies that end up dominating the agenda and whilst the two are inexorably linked, it's vital that we find the time to analyse and discuss these two aspects individually.

This resource has been developed to discuss the potential role of blockchain in transforming digital settlements. We will look at whether the blockchain can truly be a force for good where all participants benefit, what the issues may be in its implementation, and how trust in the pseudo anonymous building blocks can be assured. Critical issues of governance and regulation still need to be established, whilst legal and operational frameworks have to be addressed, too. However, it is vital that these conversations can take place without being overshadowed by the cryptocurrency narrative.

The blockchain also has the scope to see the FX industry benefit from decentralised record keeping whilst increasing the availability of information being stored. But until the relevant technologies are adopted on a market wide basis, just how much upside can we expect to see delivered? And in terms of day-to-day transactions for the population as a whole, can the blockchain really be adopted in connection with an inclusive framework to foster a truly inclusive economy? The opportunities here are wide-ranging, from the use of smart contracts to enforce better business practices, through to delivering a scalable solution for banking the unbanked, but there are still so many conversations that need to take place.

I hope that this overview informs, raises questions and helps further the debate as to whether our collaborative efforts can see blockchain transform digital settlements in the years that lie ahead.

# What is Blockchain Technology?

Blockchain technology is a type of a **distributed ledger** that records and tracks transactions in an efficient way. You can think of it as a shared database where the information is stored in a chain of blocks. The information can be anything from simple rental contracts to real estate stocks to virtual currencies.

“The internet is great, but blockchain technology makes it better.”

Each block in a blockchain network holds multiple **transactions** and is secured with a digital signature and a timestamp. The blocks are cryptographically linked to each other - so, the data stored on the blockchain is immutable.

Since the blockchain technology uses **peer-to-peer** (P2P) protocol, the authenticity of a transaction is verified by the network. This consensus mechanism eliminates the need for a centralized authority to ensure trust between parties.

## KEY ELEMENTS OF BLOCKCHAIN

Although blockchain technology is redefining the **security architecture of the internet**, it is not a new technology. Rather, it is an amalgamation of three proven technologies: private key cryptography, P2P network and a protocol governing incentivization.

The core architecture of blockchain can be condensed to five components:

- ◆ Decentralization
- ◆ Immutability
- ◆ Security
- ◆ Consensus
- ◆ Tokenization

## TYPES OF BLOCKCHAIN

Blockchains can be implemented in many ways—but they are broadly classified into three categories:

- 1. Public blockchain:** These blockchains are fully decentralized. So anyone in the network can participate and examine the transaction details. The bitcoin blockchain is an example of the public blockchain.
- 2. Private blockchain:** Unlike the public blockchain, private blockchains are more centralized as they are shared only with trusted participants. They are also referred to as permissioned blockchains, as transactions are available only to a select group of authorized participants. Hyperledger is an example of a private blockchain.
- 3. Hybrid blockchain:** As the name suggests, a hybrid blockchain is a combination of the public and private blockchain. They are designed to combine the privacy benefits of a private blockchain and the transparency benefits of the public blockchain.

## Where Do Cryptocurrencies Come In?

Many know blockchain as the **technology that underpins the Bitcoin network**. Though the use of blockchain was popularized by Satoshi's whitepaper, the technology was originally conceptualized by Stuart Haber and W. Scott Stornetta in 1991.

Bitcoin leverages the features of blockchain infrastructure - **immutability, transparency** and **verifiability** - to secure and authenticate transactions. Bitcoin can be used as **digital money** to purchase goods and services.



## A NATIVE MEDIUM OF VALUE

For many who are new to cryptocurrency, the terms coin and token might seem confusing as they are used interchangeably in many online references.

## COIN: BLOCKCHAIN AS A CURRENCY

A coin is a crypto asset that serves as a **form of digital money**. These cryptocurrencies can be used as digital cash to purchase goods and services.

In today's market, there are well over 5000 cryptocurrencies - with Bitcoin, Tether and Dogecoin being some of the prominent ones.

## TOKEN: BLOCKCHAIN AS AN INFRASTRUCTURE

On the other hand, a token is a crypto asset that serves as a **digital representation of an asset** such as stocks, contracts and votes. Unlike coins, tokens can take many functions depending on the use case.

The Ethereum blockchain is the most common platform to create tokens. With the use of **'smart contracts'** (a piece of code on the blockchain), users can create a wide range of decentralized applications (commonly known as **DApps**) such as games, digital collectibles and online-voting systems.

## Does Cryptocurrency Hype Overshadow the Benefits of Blockchain?

In simple terms, a cryptocurrency is a form of digital money that's powered by the blockchain.

As the most well-known adopter of blockchain technology, cryptocurrency (and the crypto community) has done a great job of bringing awareness about the issues within the financial systems.

With all the hype around cryptocurrencies, it can be tricky for many people to grasp the extent of blockchain's potential. The principal reason behind this **difference in perception** is the nature of how they operate.

“Blockchain is to Bitcoin, what the internet is to email.”

On the first look, both cryptocurrency and blockchain technology might seem to be operating on the same horizon; and that's a common misconception. Blockchain technology operates in a business-to-business (B2B) sector, while cryptocurrency flourishes in a business-to-consumer (B2C) market.

## BLOCKCHAIN AS A DECENTRALIZED SOURCE OF TRUST

Ever since the **demonstration of digital decentralization** by Bitcoin, blockchain technology has been adopted in a wide range of sectors, including banking, finance, law, energy and supply chain management.

The paradigm shift of blockchain technology goes beyond cryptocurrencies and digital payments.

- ◆ Blockchain technology can be used to record transactional activities and validate the ownership of the data at any given point in time.
- ◆ Its resistance to manipulation (incorruptibility) has significant applications in governance and politics.
- ◆ The immutability nature of blockchain offers a transparent end-to-end tracking in the supply chain management.
- ◆ Blockchain technology has also become the undisputed choice in protecting data from cyber-attacks and to combat data breaches.

# Blockchain and its Environmental Impact

Climate change has been one of the most pressing concerns in today's world. The **Paris Agreement** sure has instigated shifts in policy regulation across the world, but that will still not be sufficient to fight the climate crisis. Individuals and local organizations will need to play their role in mitigating carbon emissions while working on long-term consumption habits.

So how can blockchain technology help solve the environmental challenges?



## USE CASE 1: FOOD SUPPLY CHAIN

Food production isn't just about the quality of the commodity. It is also about how food is distributed, how it's packaged, and how it's consumed. Although consumers are making conscious decisions to buy eco-friendly products, there's little to **no transparency** of the product's supply chain.

The adoption of blockchain in the food system can help track information of the product **from origin to the retailer**. This increases the **ethical accountability** of food production and reduces unsustainable practices.

In 2016, IBM collaborated with the multinational food retailer Walmart on a blockchain-based tracking system, **Food Trust**, to identify and flag recalled foods.

“The environmental concern is not a plastic problem or a global warming problem. It is a human-centered problem.”



## USE CASE 2: RENEWABLE ENERGY

Governments around the world issue a **renewable energy certificate** (REC) to keep track of the clean energy being produced. The use of blockchain technology to issue and track these certificates can streamline the traditional process and ensure the authenticity of each transaction.

Tracking the source of renewable energy doesn't just solve **environmental management challenges**. It also helps consumers to identify the companies that derive energy from clean and sustainable resources.

As climate movements gain traction across the world, many companies and entrepreneurs are showing a growing desire to **invest ethically**. Environmental experts are convinced that blockchain technology has the potential to institute a **fundamental transformation of environmental governance**.

That's not to say blockchain technology hasn't had a negative impact on the environment. The energy consumption of the Bitcoin blockchain is problematic. However, the technology keeps evolving and finding efficient ways to minimize their carbon footprint.

Blockchain technology offers the opportunity to **bring trust to the forefront for social good**.

## Digital Settlements and Blockchain's Use: The Story so Far

The decentralized nature of blockchain technology makes it exceedingly relevant in so many fields, including healthcare, supply chain management, cybersecurity, voting and politics. However, the most significant impact of blockchain technology has been in the **finance** and **banking** sector.

Today, transactions are facilitated by **'trust systems'** and intermediaries such as banks and financial institutions. And depending on the nature of the transaction, it might take anywhere between 1-3 business days for it to be settled.

So, how can blockchain change the way the world does digital settlements?

### BLOCKCHAIN-BASED SETTLEMENT LAYER

Blockchain technology's ability to **circumvent the need for "middlemen"** (such as clearing houses, brokers and payment networks) has received mixed emotions in the financial services industry. Nevertheless, the advancements that blockchain can bring to financial services are indisputable.

The **immutability** and **decentralized** aspect of blockchain infrastructure can streamline the data-rich, transaction-heavy financial services industry. Specifically, it can address two of the major concerns in digital settlements: slow settlement period and database redundancies.

**1. Reduced settlement latency:** The current settlement process requires multiple systems to process a transaction, as the information and accounts are maintained by different financial institutions. A settlement system with blockchain technology can **shorten the end-to-end processing** and settle transactions directly and more efficiently.

**2. Reduced intermediation of recordkeeping:** All intermediaries maintain their version of the book-entry system. And this makes the reconciliation process prone to inefficiencies and security risks. Since blockchain maintains a **single distributed ledger**, it eliminates the need for reconciliation across multiple infrastructures. By virtue, trading, clearing, and settlement will happen in a single ledger.

The adoption of blockchain technology in digital settlements will not only offset existing inefficiencies but also yield substantial benefits in remittance and securities trading. Other key advantages include increased data security and increased transparency to consumers, investors and regulators.

## Blockchain Anonymity: Good or Bad?

Blockchain's strength as a **bookkeeping method** to verify, link, and store records across a network of computers is simply exceptional. While the technology is poised to solve global economic problems, the inherent infrastructure of blockchain may come with some colluding complexities.

“No technology by itself can be a boon or a bane.”

Most societies rely on a government or other third-party arbitrators to provide consensus. With blockchain, this **consensus** is brought about in a decentralized manner. Such underlying intricacies are why many jurisdictions and businesses have been slow to adopt and invest in blockchain.

## ANONYMITY IN BLOCKCHAIN

To really understand what is special about blockchain, we need to understand the “anonymity” aspect of the technology.

The term anonymous simply means “without a name”. In the technology realm, anonymity is a combination of two concepts: unidentifiability and unlinkability.

When you send or receive cryptocurrency on blockchain, you don’t use your real identity or name. Instead, you use a **public key hash** - a complicated string of values that masks your identity. So, observers cannot link you to the transactions.

While one can mask their real identity in blockchain, it is still possible to link the transactions to their public key. By that definition, the transactions on the blockchain are not anonymous, but **pseudo-anonymous**.

## BENEFITS

One major characteristic of blockchain technology is the ability to perform anonymous transactions. This aspect brings other benefits within the distributed ledger environment, including **confidentiality of information** and **security of transactions**.

Blockchain’s potential to eliminate centralized authorities like governments and financial institutions is not a matter of if, but when. Beyond privacy and **financial freedom**, blockchain also provides users with a sense of **personal liberty** and **trust**.

## DOWNSIDE

As with any technology, the inclusion of anonymity comes with some trade-offs. Though blockchain has profound economic implications, unscrupulous activities like money laundering is a legitimate worry. This is a common dilemma in any digital security and privacy.

By coupling blockchain technology with **anonymous communication networks** like VPN and Tor, the bad agents can achieve **complete anonymity**.

While there’s an existence of possible criminal application, this can be tackled. People operating in the blockchain industry are aware of the benefits and downsides of the technology and are convinced that the pros outweigh the cons.

On one hand, anonymity and decentralization **safeguard users’ privacy information**. On the other hand, bad actors may exploit these features to trade illegal drugs and other contraband items. That’s why it is important not only to understand the technology but also its intended use.



## What the Blockchain Can Do, and What It Can't

We live at an exciting point in time in the history of technology, where we fully understand the capability of the Web. However, we can't say the same about the blockchain.

Although blockchain is still in its early years, we can discern its path by comparing it with the Web's trajectory.

While the Web replaced some of the brick and mortar businesses and introduced social networking, blockchain technology pits us against the old beliefs about value and trust—how it is earned, and what it enables.

“Blockchain can do some amazing things, but it is not the be-all and end-all of the innovation.”



### THINGS BLOCKCHAIN CAN ADDRESS

As a secure, distributed, decentralized, permission-less, open-source ledger, blockchain technology can solve (almost) any **data integrity problem**.



### BLOCKCHAIN CAN ELIMINATE INTERMEDIARIES.

Blockchain is brilliant at recordkeeping and verifying the integrity of the data. This can help individuals and businesses agree about the true state of affairs without relying on intermediaries. It also enables people to transfer money across the world at **lower transaction costs**.



### BLOCKCHAIN CAN PROVIDE BETTER BANKING SYSTEMS.

Blockchain technology has a lot of benefits in the finance and banking sectors. The decentralization nature of blockchain can provide **banking privileges** to over 1.5 billion people who are currently unbanked. Blockchain can build smarter supply chains. Adopting blockchain technology in supply chain management can provide a single database of truth that is accurate, fast, and has a global tracking system.



### BLOCKCHAIN CAN BUILD SMARTER SUPPLY CHAINS.

Adopting blockchain technology in supply chain management can provide a **single database of truth** that is accurate, fast, and has a global tracking system.



## Things Blockchain Can't Solve

Blockchain technology can revolutionize the way we transact and collaborate. It's a game-changer in many industries, and there's no doubt about that. But it's not the be-all and end-all of innovation.

Hence, when assessing blockchain-based use cases it is important to understand what blockchain can't do.

### BLOCKCHAIN CAN'T PREVENT ALL CYBERATTACKS.

Blockchain and decentralization offer improved security by making it harder for hackers to access data and alter records. However, it is not immune to cyberattacks that involve data breaches and human errors.

With every improvement made in blockchain technology, hackers will find a way to override things—such is the nature of cybersecurity.

### BLOCKCHAIN'S SMART CONTRACTS AREN'T ERROR-FREE.

With the use of smart contracts (a piece of code on the blockchain), users can create a wide range of decentralized applications including games, digital collectibles, and voting systems.

Smart contracts hold the logic that safeguards and guarantees the transaction terms. But there have been incidents where this safeguard has failed due to smart contract bugs.

### BLOCKCHAIN CAN'T OVERCOME HUMAN ERRORS.

There are plenty of things that blockchain can enhance or eliminate, but it can't address the human aspect of things. This includes human error, emotional decision-making, manipulating parties, and more.



### THE “SUNRISE” PROBLEM

*Experts have described the current phase of regulations around blockchain technology as the “sunrise period”. The sunrise phase has been coined to describe on the one side the push in Blockchain regulatory advancements in certain jurisdictions – considered to be seeing the “sunrise”, and on the other hand jurisdictions that are taking a more cautious wait-and-see approach.*

*As countries globally balance their regulatory frameworks against domestic legislation, infrastructure and market considerations the “sunrise” issue will deepen and we may witness countries implementing the use of blockchain technology years apart.*

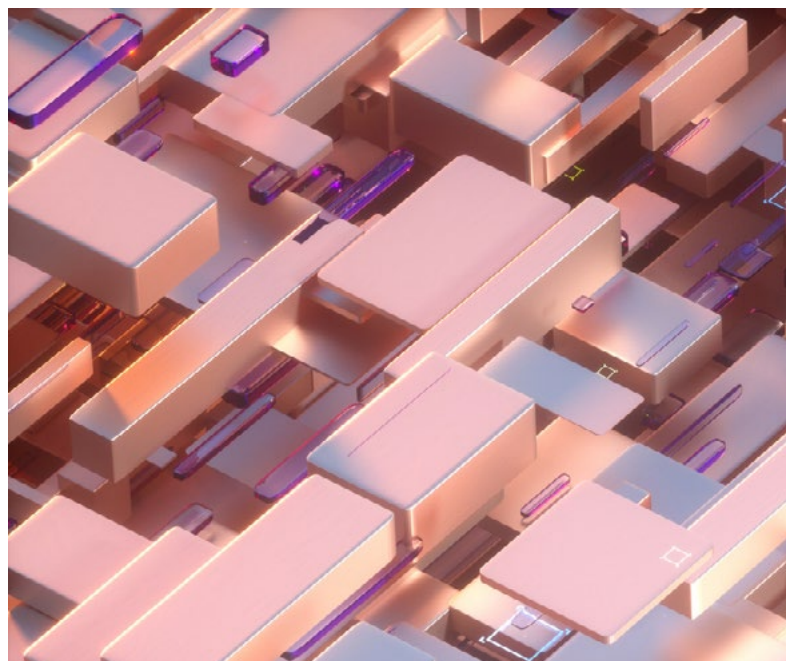
*The overarching idea behind the “sunrise period” is that until all jurisdictions adopt a seemingly similar regulatory approach to the technology, Blockchain will not be able to be utilised in an efficient manner.*

## The blockchain's role in the CFD/FX world

Blockchain offers many clear benefits where a product or record has to be passed along a chain between multiple participants. With that in mind, so-called over-the-counter - or 'OTC' - traded products including foreign exchange and contracts for difference, may not appear to be the most obvious candidates to benefit from this technology. Where a relationship is simply between a broker and a client, it is simple enough for both sides to monitor a single ledger. However, blockchain's ability to decentralise record keeping and provide greater transparency could prove exceptionally valuable in cases ranging from distributing liquidity to tracking toxic flow.

As an example, with prime-of-prime brokers generating their own liquidity pools simply by recycling from others, a better understanding of where flow originates from would likely prove beneficial in fast-moving markets. It could prevent the same liquidity being offered by multiple providers, something which would reduce order rejection rates and in turn improve the quality of the market.

Similarly, better management of so-called toxic flow would also be possible if transactions were conducted across the blockchain. The indelible ledger would allow aggressive scalping or front running to be identified easier, reducing latency and nullifying the need for last-look. In the longer term, blockchain may have the potential to completely reshape how OTC markets work, but in the short term, the technology still has the scope to deliver genuine trading efficiencies.



## Introducing CMC Connect

CMC Markets Connect provides sculpted liquidity to a global institutional client base of banks, brokerages, funds and dealing desks. Our continuous innovation and investment in trading technology means that we are able to respond consistently to changing markets. Through a single connection, our clients have access to multiple asset classes worldwide allowing them to seamlessly execute their chosen strategy and increase revenue potential.

CMC Markets is regulated in multiple jurisdictions, under the Financial Conduct Authority (FCA) in the UK, the Australian Securities and Investment Commission (ASIC) in Australia and Monetary Authority of Singapore (MAS) in Singapore.



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