

# Will cryptographically enhanced commerce lead to a better world or make it more unequal?

*Web 3.0 is meant to describe a new set of technology developments for the internet that are moving the pendulum back to a more decentralised environment, away from walled gardens such as Apple, Facebook, and Google. But the jury is still out on whether cryptographically enhanced commerce will be positive or negative for improving equity, diversity, and inclusion in societies and organisations. **Thomas Kalafatis** and **Richard Nesbitt** explain how having a better world or a more unequal one depends on how cryptographically enabled techniques are rolled out across software and finance.*

Will cryptographically enhanced commerce (CEC) improve inclusivity within organisations and societies, or will they instead compromise it? When most of us read articles about crypto currencies we find them mysterious. What are these ideas all about, why do they exist, and what is the end game? No one really knows their future, but there is no question that something is happening that could be very big. The big question we wonder about is, will these new activities make for a better world or one that becomes increasingly concentrated and unfair?

Crypto currencies are often a subject of debate about how to define them exactly. Some argue that they are a replacement for money. But how can they be a replacement for money if they're not accepted for purchases in the normal form that we use money? An important definition of money is an instrument by which you can pay the central government its taxes. Government-issued money was created for the purpose of paying taxes, otherwise revenue authorities would end up with storehouses full of grain, chickens, and a variety of other consumable commodities. Money issued by the government is called fiat currency. In order for governments to provide public services, tax authorities prefer to be paid their taxes in an instrument such as fiat currency. Today there is no cryptocurrency that can be used for this purpose. Therefore, while it may be a store of value and other things, it is not money (not yet anyway).

Another critical aspect of money is the need to transport it safely and securely, verifying its purpose. From serial numbers to anti-tampering papers, special inks and technologies, cryptographic techniques are critical in securing our paper "fiat" money. Furthermore, our digital representation of fiat money has benefited from advanced cryptographic techniques applied via the computing revolution. From automated teller machines, to trading on the stock exchange and mobile phones payments; encryption keys and technology are critical to providing the portability coupled with the security modern commerce demands. Crypto-currencies can to a degree be considered an extension of these cryptographic techniques down to the unit — singular transaction level — or message layer within software (the money of machines), but in a decentralised way (no singular central authority validates a digital coin). So, a better world or a more unequal one depends on how cryptographically enabled techniques are rolled out across software and finance.

## Software

The advent of cryptocurrencies is, in part, a natural evolution of the development of the Internet. Web 1.0 was the internet's first wave. It was an open architecture created by public institutions for public use. This resulted in products that are used universally today, such as email and the HTML protocol for the purposes of displaying documents on the Internet.

Web 2.0 is a term that can be applied to the development of commercial applications for the Internet as many commercial needs were not contemplated by the early Internet's open architecture. Over time internet usage over a public domiciled activity shifted to a more private, commercialised, and centralised set of activities as they become more secure, safe, and convenient for commerce. Think of the networks created by companies such as Apple, Facebook, and Google, which have become their proprietary "walled gardens". They have generated massive wealth for those involved.

Web 3.0 is meant to describe a new set of technology developments for the internet that are moving the pendulum back to a more decentralised environment. It promises a more open and more available architecture using CEC technology such as blockchain. The automated management of various rights required for distributed software to function for a user are enabled by distributed programming languages such as Solidity (Ethereum).

Crypto currencies are now seeing an explosion in the number of transactions. There are tens of thousands of developers applying their skills in this new space. The next successful social media or cloud services company may well be centred around cryptographically enabled commerce distributing and decentralising power. For example, organisations attempting to decentralise cloud services include Filecoin and Helium. These are non-corporate cloud infrastructures in which excess hard drive space or bandwidth around the globe can be deposited into their respective universe. It can then be utilised by others within the same universe. However, no one corporate entity controls this universe and therefore it is different from the cloud applications provided by companies like Amazon or Apple.

This development reminds us of the time 20 years ago when an initiative to look for extraterrestrial life leveraged the unused capacity of disparate computers, adding processing power to examine signals from the outer universe. The difference today in a decentralised world is that these systems can be run autonomously in every location in which they operate.

Cryptographically enhanced commerce can thus be thought of as the evolutionary decentralised creation of technology for financial (store of value) or nonfinancial instruments of exchange (non-fungible tokens, “NFT”). Blockchain, a form of CEC, promises decentralised holding of these instruments – the value created by the network would be owned by users of the network itself. This outcome is highly dependent upon the access to these decentralised networks remaining open. Observers wonder about what happens if this access is also captured by centralised, self- interested parties in new, novel, and unforeseen ways?

## Finance

Bitcoin, Ethereum and other forms of cryptocurrencies have seen substantial expansion of use over the past five years. This growth has been controversial and not without potential negative consequences in finance.

The holding of cryptocurrencies is today highly concentrated and many worry about some of the indirect effects such as the impact on climate change of electricity use in creating these currencies. Central banks are very concerned about potentially losing control over the money supply. They are following developments closely and are prepared to launch central bank digital currencies if the need becomes relevant.

This has been met with a public policy approach ranging from banning many of these activities in countries like China, Turkey, and Iran, to attempting to determine a regulatory environment that meets the needs of investor protection, while at the same time providing room for innovation, in Europe and the United States. Some countries such as El Salvador are embracing cryptocurrency directly into their money supply. At the same time, the products continue to grow, and more and more people are becoming involved in their development. Will more favourable jurisdictions leapfrog their peers in the rate of technological progression and consequently economic growth? Or will the cost of cryptocurrencies outweigh benefits? Will the growth and/or consequences be equitably distributed?

If we, as societies, thoughtfully plan for cryptocurrencies and roll these out in a way that is designed to meet needs not fulfilled by current markets, will they improve on the inequality that is all around us? Many argue that the existing system of money, finance and markets is inherently unfair. They point to the fact that in many countries of the world there are millions of people who do not even have a bank account, the “unbanked”. How can they possibly participate in what the internet and other advances have to offer? Furthermore, only a small group of people is able to take full advantage of current capital markets generating a return on savings, such as investing in the stock market, which leads to further inequality.

The jury is still out on whether cryptographically enhanced commerce will be positive or negative for improving equity, diversity and inclusion within our societies and organisations.

On one hand the new sets of technology offer the possibility of improved inclusion:

- Distributed data bases are not under central control of commercial or government entities and can be

constructed to spread their benefits to the largest number of people. New products such as non-fungible tokens will create new businesses and may create value for large groups of people who are currently shut out of the existing mechanisms for getting products to market.

- In societies that have unsophisticated banking systems, poor monetary policy or confiscatory governments, new stores of value may bring millions into a world where they can share the benefits of technological change.

On the other hand, there are forces in our society that will seek to control the future of CEC for their own benefit:

- It is likely that some parties will seek to control these cryptographically enhanced commerce processes. That is the usual way of human development. This is often done for commercial reasons but can also be a way for state sponsors to maintain controls on illicit activities such as money laundering. How society maintain their open and distributed access to new processes will be a major challenge going forward.
- It may be that CEC is as prone to concentration and lack of inclusiveness as our current systems, in a self-reinforcing loop. Today only a small number of people actually participate in the CEC world. An even smaller number control the vast wealth that has been created from crypto activities merely by getting there first. Once again do we rely upon whether these are good actors or bad actors (much like the current market paradigm) in how they share the benefits with society at large?
- Tax authorities are often unable to collect revenues from the new industry, which means that the burden of public spending falls on a smaller base of those in traditional activities, who end up subsidising their very own displacement from new untaxed industries who benefit from the public commons.
- There may be just as many unpriced negative externalities in the CEC world as there are in the existing world of finance and business. For example, it was recently reported that 8% of the entire electricity consumption of Kazakhstan (Wired, Jan 22, 2022) was being used for mining cryptocurrencies. Not only is this having a negative effect on carbon dioxide emissions at a time when we are trying to reduce these globally, but it would also imply a type of electricity use in which the benefits are narrowly shared in that country.
- Regulators are not yet able to protect the public as they do not have the legal, technologic, or geographic footprint to cope with a new borderless industry. A recent article in the Financial Times advocated a cautious approach and reported significant concern by the International Monetary Fund of recent developments by one country. "The IMF last week urged El Salvador to stop recognising bitcoin as legal tender." (Financial Times, January 2022)

## Policy and business implications

So, what public policy actions should governments take? Should corporate leaders participate in CEC or is it premature and risky? What are the implications of pursuing CEC versus the possibility that competing countries or corporations pursue CEC and achieve relative competitive advantage? These questions and others have yet to be answered. How does any of this help us create a more inclusive society?

Based on developments to date, governments and regulators need to pay close attention to what is happening with CEC. Just as with every aspect of commerce and activities within our economies, the answer will be in a strong regulatory framework and willingness to enforce the rules in order to protect the vulnerable members of our society. However, the need for regulation is not a reason to stop pursuing these new technologies. Without pursuing new approaches, we will never change the existing issues that contribute to inequality and lack of inclusion that we have in current market practises.



### Notes:

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