

To the Doom? Cryptos at a trial by fire.

Cryptocurrencies

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To the Doom? Cryptos at a trial by fire

Cryptos as a safe haven is more and more an old story, at least since large players of the financial markets, such as institutional investors, started looking at them and offering products that ended up being treated in the same way of equity. It's thus even harder to see any kind of certain rosy future at the horizon for these assets, with the global market likely to be impacted by a conflict that will add up to uncertainty around the pandemic and concerns of overvaluation. This section aims to provide an overview of the current state-of-play of this world and to identify possible drivers of future (relative) good performance, focusing also on the recent start of a war whose consequences are likely to embrace every aspect of our world, crypto markets included.

The starting point

It was already a cold winter for blockchain-based assets. Vitalik Buterin, the main mind behind the development of Ethereum, used this term to refer to the current conditions of the crypto-ecosystem. It's generally used to describe a period in which the interest in

these assets fades away and, consequently, the value of the market plummets, as also happened between 2017 and 2018 when Bitcoin crashed 80% from all-time highs.

Despite new investor-friendly products, such as ETNs and ETFs covering blockchain-related businesses, have been launched, the overall interest seems somehow faded away.

In line with this, DappRadar reported that Decentralized Finance (DeFi) dapps¹ are the most severely impacted so far, and claimed that without changes, 20% of those which control 80% of the sector will disappear in one year. Consistently, Figure 1 shows the decline in the overall value deposited into these applications.

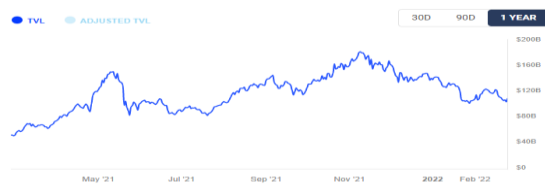
Short term speculators seem fewer than some months ago, funds are more limited, and in this context the value of each project will be assessed by its endurance to cooler market conditions.

The reasons behind such a situation are probably multiple. First, ever increasing correlation with equity indexes, especially S&P500 and NASDAQ, wipes away the initial

¹ A decentralized app (dapp) is an app run whose operations are run making use of a blockchain at least partially. Dapps strongly

developed with Ethereum, the first blockchain network compatible with Turing complete programming language.

Figure 1: Total Value Locked into Defi dapps over time



Source: DappRadar.com (2022)

peculiarity of these coins of being part of a niche market, independent from real economy movements. More and more trading by professional investors may have reduced profit margins for retail investors from trading, too.

Secondly, many platforms and products of these blockchain network still have to prove they can be applied to concrete needs and functions and show their fundamental value.

Third, the coins with the largest user bases are not really environmentally friendly. In fact, regardless of the platform, to be approved and accepted as valid by the network every transaction must be included in a block, a capped-size list proposed by a miner. The two most common and alternative ways each block must be validated by are proof-of-work (PoW) or proof-of-stake (PoS). The former is the first invented and it's the one used by the most important coins, such as Bitcoin. Under a PoW consensus mechanism, to be eligible,

the block must be delivered containing such a string of code that causes the output of the hash function² used in the protocol to begin with a predetermined number of zeros. The more zeros required, the harder the search puzzle to solve through the computational power of the mining units. Difficulty is periodically adjusted to keep the average time between block approvals fixed, to limit the consequences of eventual breaches and attacks to the system and to enhance miners' commitment and the value of the coins minted. Profits for miners come from a fixed reward and from transaction fees, both collected by whoever has proposed the block become part of the blockchain. The current difficulty in BTC puzzles is the highest all-time: if it gets to threshold perceived as excessive to keep profiting from their activity, miners may quit the network and thus reduce the overall interest in it both directly and indirectly, if concerns about the reduced trustability of a system with fewer validators arises. Moreover, computational power comes at a cost: according to the University of Cambridge, no more energy than now has been consumed to mine Bitcoin. In a world that is becoming more and more environment-friendly, this comes at odds, and the rise of

² A cryptographic hash function is a cryptographic mathematics that ensures private information entered into a blockchain cannot be used by entities

and for purposes different from the ones it was originally destined to. These functions convert data into an alphanumeric string starting from which is almost impossible to go back to the data.

pools to save on costs, risk undertaken and environmental impact may even have worsened the situation instead, since more people can partake in the business at lower risk and fixed costs. Interestingly and maybe counterintuitively, then, the Chinese ban on cryptocurrencies has made things even worse: mining seems now to rely on dirtier energy, with the shares of activity stemming from renewables, such as Chinese hydropower, dropped from 42% to just 25% (de Vries, Gellersdörfer, Klaaßen, Stoll, 2022)

Added up to pandemic, higher-than-usual inflation, unemployment and low economic growth may gradually push investors in risk-on mode. A preference for more defensive assets may discourage investors to bid up for cryptos.

War in Ukraine: a turning point?

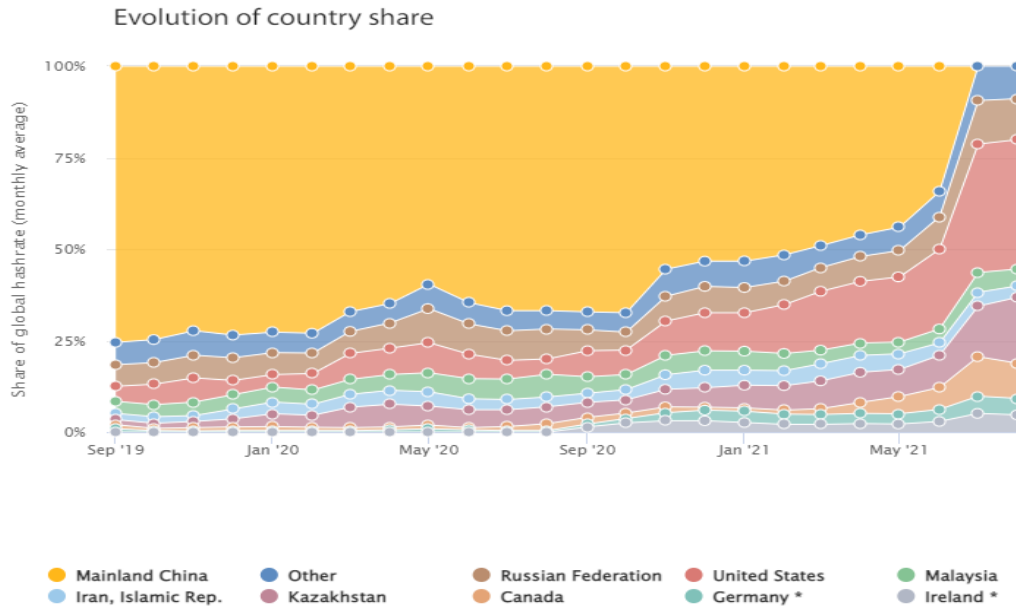
On February 24th, the price of all coins saw a double digit decrease after the start of Russian operations in Ukraine. Once again, these trends closely followed the equity markets and, like them, rebounded quickly despite the conflict, more in a wait-and-see fashion. But what can the conflict imply for the future of these assets?

According to Cambridge University, Russia accounts for around 11% of the

global BTC hash rate³, the third largest player after the US and Kazakhstan, since they can offer cheap internet connection, electricity and climate conditions that are favorable to mining. Despite many pools charge fees in the same cryptocurrency they mine, so that they do not usually rely on the banking system, some firms still prefer to have their income denominated in fiat-currency terms since origination: for example, BitCluster is a Moscow-based company which provides hosting services and mining hardwares to other individuals and corporations willing to scale-up their hash power, and they receive payments only through a bank account managed by Sberbank, the biggest Russian institution of this type. As a response to Russia starting the conflict, Sberbank has been targeted by many countries all around the world, together with other Russian peers, as a possible subject of sanctions. The hypothesis on the table may consider excluding most of the Russian banking system from the Society for Worldwide Interbank Financial Telecommunication (SWIFT) system, which enables more than 11,000 banks of the world to conclude transactions in a faster, standardized and more effective way. Exclusion may mean isolating any firm whose operations are

³ The hash rate is a measure of difficulty of hash function-based search puzzles

Figure 2: Distribution of Bitcoin Total Hash Rate by country



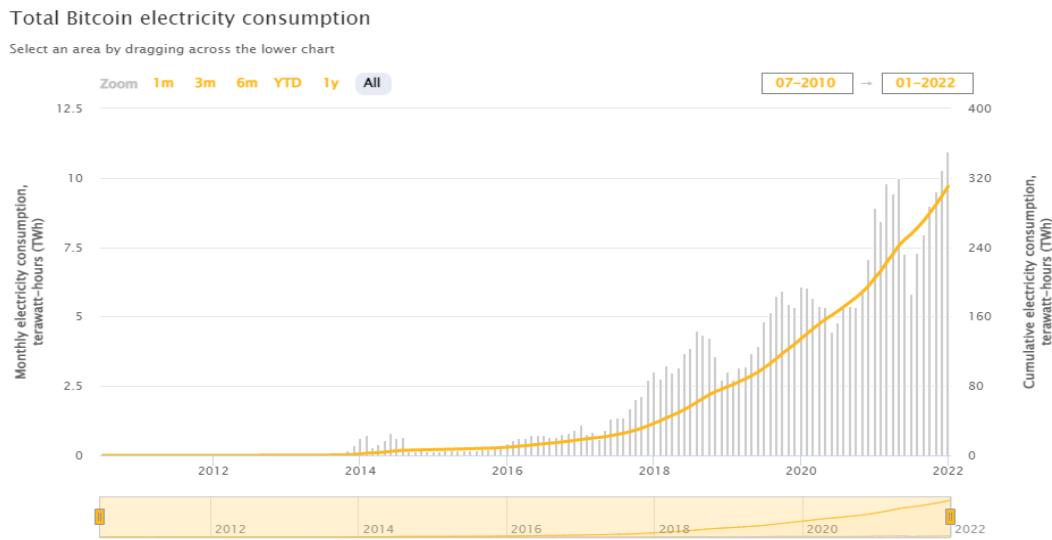
Source: University of Cambridge (2021)

linked to a Russian bank account from the rest of the world. To be determined whether this will lead to some players leaving the business or fully moving it to blockchain platforms, undertaking further currency and operational risk, as also Russia itself is considering to dribble sanctions (source: The New York Times). On the other hand, some pools already decided to take position against the war, in more or less impactful ways: Flexpool, the fifth largest Ether mining pool, has excluded all the addresses directly linkable to Russian people from their services, but probably the use of a simple virtual private network (VPN) can nullify the effectiveness of this measure (source: Coindesk.com). Overall, as of today, mining activity in Russia has not seemed affected by the conflict yet (source: Decrypt.com). Also hard to think about

sanctions directly regarding access to cryptocurrencies, as The Wall Tree Journal recently suggested Washington is considering, given the nature and ideological pillars most of them are grounded on.

The provision of energetic material may be the real determinant of a drastic change: while the US may be less directly impacted by changes in the supply from the former Soviet Union, since around 93% of their demand for oil is satisfied by other partners (source: AS) and they almost can get all the natural gas needed from internal production and storage (source: U.S. Energy Information Administration), the European countries strongly depend on Russia for both oil and gas, for respectively 40% and 20-80% (depending on country: the most eastern are the most dependent) of their

Figure 3: Bitcoin Electricity consumption over the years



Source: University of Cambridge (2022)

total demand (source: BBC and Bloomberg). Price hikes and similar expectations are likely to firstly hit these countries and then, through commodity markets and knock-on effects, be transmitted also to the most immune ones. On February 24th, indeed, wholesale natural gas, oil and for example palladium futures prices rose sharply globally. Futures on the former reached +70% peaks before settling around +40% in Europe (source: Financial Times)

Given that both Europe and the US heavily rely on fossil fuels to produce electricity, any fluctuation in the value of these commodities is likely to be reflected in energy prices, and consequently on the cost of highly energy-consuming mining. An inflation rate above acceptable level, that is likely to persist in war-like periods (source: The Guardian), could contribute to

making this activity too costly for miners to profit from it by selling their coins at a sufficient price.

Finally, few cryptocurrencies like Bitcoin and Ethereum are often used as a collateral to buy crypto-backed stablecoins used to then buy other cryptocurrencies: margin requirements and risk of sell-off of the collateral in adverse markets further increase the correlation among BTC, ETH and all the altcoins, turning specific risk into systematic and, at the end, hampering the independent development of any of these assets.

To sum up, this leads us to a really cold winter which only the most promising projects may survive to.

Figure 4: Example of coin prices moving closely together



Sources: Coinbase, Google (2022)

When the winter ends. Where to look to invest

Said that the general outlook for this asset class is not rosy now, there is still room to devise some criteria to identify which coin may steadily rebound more when the bottom has come. In the meantime, roller coasters in coin prices may become even more frequent given the less stable global context: for example, on January 28th the prices of many coins was pushed up to around 14% higher, after sanctions towards the Russian financial system have been confirmed, Moscow banned export of national currency from March 1st and its central bank doubled policy rates to 20%, inducing citizens to exchange as much rubles as possible for cryptocurrencies to keep the value of their holdings safer (source: Reuters). Some academic research has pointed to two or three characteristics a blockchain ecosystem needs to have to better perform and develop: heterogeneity

of users' needs, use of tokens to allow early users to capitalize on platform growth, reduce user-base volatility and enhance network effects (Cong, Li, Wang, 2021) and an adequate coin supply/minting scheme to favor platform volume growth while limiting inflation, so allowing appreciation. Extensive, detailed white papers, adequate vesting period for the first issued coins and proved skin-in-the-game by developers further support trustability (Gryglewicz, Mayer, Morellec, 2021).

Next, now more than ever, well-working consensus mechanisms based on proof of stake rather than PoW can become a full-fledged competitive advantage. Through PoS, transactions are not approved by solving highly complex computational problems, but any node of the network which is willing to can start validating blocks and contributing building the blockchain, on the "only" condition that a minimum amount of coins owned is deposited as a guarantee of compliance with good behavior network rules. These nodes, "validators", profit when randomly selected to validate a block, and are subject to penalties and possible losses whenever they are responsible for misbehavior.

Since not relying on incredibly complex computation, PoS mechanism is way better than a PoW one from an environmental point of view: commitment is not shown by paying high bills and hoping to be lucky,

but just by staking some coins, being a good guy and hoping to be lucky while just keeping your ordinary laptop turned on. A huge difference⁴. A difference that can be even more crucial under inflation and altered supply of energy fuels, due to old suppliers marking-up or new sources still being under development or, simply, more expensive than the previous ones. Less energy-intensive mechanisms also allow for more physical decentralization of validating pools by leveraging on lower needs for electricity, so making the diversification of exposure to regulatory, political, event risk such as e.g. a war⁵, more convenient.

Furthermore, stakers are further disincentivized to misbehave, compared to PoW, since they can lose all the amount if spotted. This also enhances security.

Thus, as the most developed platform after Bitcoin, Ethereum is one of the main candidates to benefit from PoS in the long run⁶. Nevertheless, Ethereum *de facto* is still PoW-based: the transition to PoS has been in progress for years, but the final step must be done: putting an end to PoW on

Ethereum by merging the “traditional” layer with the new, recent one, already run through PoS and that will work as a coordinator for the new platform. This finalization is being continually delayed, and possible reported explanations are about the amount required to become a staker: 32 ETH, more than 7,000 euros at the time of writing. Finding enough network participants willing to allocate that sum is probably harder since several of them quitted the platform, when congestion drove transaction fees and waiting time for transaction approval at well high levels. As happened for mining, staking pools may soften this barrier, and could also be a cautious way to invest in cryptocurrencies in this period, together with ETPs whose shares have a small price. For European investors, the VanEck series on cryptocurrencies allows investment starting from around twenty euros at the moment, so that if someone believes in PoS-based coins or whatever, these beliefs can be put into action without losing good nights of sleep, at least for personal finance reasons.

⁴ According to Digiconomist.com, the amount of energy consumed per transaction by Bitcoin and Ethereum under PoW mechanism is currently equal to 1278.36 and 146.81 kgCO², that is, 213,059 and 24,468 hours watching YouTube. Ethereum is expected to consume one 225th of this amount under PoS.

⁵ A recent study by the University College London showed that Ethereum ranks among the worst PoS-based platforms in terms of energy consumption

per transaction, trailing behind, among others, Hedera, Algorand and Cardano.

⁶ Developers of other platforms have come up with other consensus mechanisms, too. Solana, for example, makes use of Proof of History. As PoS, that system is far more sustainable than PoW, but is more demanding in financial terms as it requires the use of hardwares with at least 128 GB of RAM (source: Solana.com).

An aerial photograph of a city at dusk, with a blue overlay. The city lights are visible, and the sky is a mix of blue and purple. The word "Conclusion" is written in white serif font on the left side of the image.

Conclusion

Neither it seems possible to identify another coin that will lead the future of this industry, as of today. Further complications may derive from possible plans of public entities such as countries or Unions to develop their own Central Bank Digital Currency (CBDC), capable of displacing any other project. At the moment, anyway, current affairs and various kinds of contingencies suggest that, were there a future for cryptocurrencies, this is likely to be based on flexible and “light” mechanism such as Proof of Stake, but there is still a long way to go.

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