Market Updates

The increasing global importance of Central Bank digital currencies (CBDCs)

The market for Central Bank digital currencies (CBDCs) continues to develop with further growth forecasted in the coming years. The majority of central banks are researching the concept and design of digital currencies, and the COVID-19 pandemic has served as a further impetus towards their study .

In general, central banks are shifting from 'probabilistic reasoning' to 'realistic innovation' as regards their interaction with CBDCs. Government interest in CBDCs is highly contextual and influenced by local socio-economic conditions. Financial inclusion and payments productivity goals guide general purpose CBDC work in both emerging markets and developed economies where central banks show comparatively stronger motivation.

In January 2021, the Bank for International Settlements (BIS) released a report presenting the results of a survey carried out among more than 60 central banks in late 2020 about their participation in CBDC work, their motivations and preparations for CBDC issuance. It's worth noting that the respondents make up almost a quarter of the world's population.

According to the BIS survey, 86 % of central banks are looking into CBDCs, exploring the benefits and drawbacks. While most respondents agree a digital currency will not be issued in the immediate future, a large number of banks believe otherwise.

The findings also show that about 60 % of central banks are experimenting with digital currencies or conducting proofs-of-concept (POW), while 14 % are moving forward to development and pilot projects.

In addition to the survey, the BIS Innovation Hub (BISIH) has released a programme aimed to conduct a number of CBDC trials around the world. One of the priorities for 2021-2022 is directly linked with the further development of current projects and the creation of new ones, such as:

- **Project Helvetia:** A partnership between the Swiss National Bank (SNB) and SIX, Helvetia highlights the technical viability and legal robustness of settling tokenised assets with a wholesale CBDC (proof of concept 1) and connecting a distributed ledger infrastructure network to current payment networks (proof of concept 2) in a near-live environment. This experiment should not be considered a guarantee the SNB will issue a CBDC in bulk.
- **Multiple CBDC (mCBDC) Bridge:** Building on the Inthanon-LionRock project, this joint initiative of the Hong Kong Monetary Authority and the Bank of Thailand was completed in December 2019. The mCBDC will investigate the use of distributed ledger technology

(DLT) to enable real-time cross-border fund transfers and atomic settlement versus payment for foreign exchange transactions. The project will also develop a cross-border corridor network prototype to support other central banks CBDCs.

What's more, there is a project connected with the tokenisation of Green Bonds. The project, titled **Green Bond Tokenisation**, is a testbed for the applicability and scalability of tokenised retail bonds.

Benoît Cœuré, head of the BIS Innovation Hub for CBDCs and research, noted: "This work programme shows our commitment to exploring in the most practical ways how best to harness technological change for the benefit of central banks and create public goods to support the global financial system."

Digital yuan development

The world's most populous country (equivalent to 18 % of total world population) is accelerating the testing of its digital national currency. China is charging ahead with its **digital yuan**. To date, China's Bank of Communications and the China Construction Bank have conducted digital yuan trials at two major department stores in Shanghai.

According to a recent report published by the [Shanghai Daily online](), the Bank of Communications gave 6 500 local shoppers 100 yuan worth of virtual vouchers to use when paying with the Digital Currency/Electronic Payment (DCEP), China's official digital currency.

Some 2 000 people spent more than 380 yuan and received a 150 yuan worth of coupons from the China Construction Bank. Participants travelled to one of the bank's pre-selected local branches to register for the e-wallet trial. They also uploaded a DCEP app to their smartphones. Also, the digital vouchers will be attached to their virtual wallets for offline payments.

For this initiative, the [Postal Savings Bank of China]() developed a biometric 'hard wallet' card. With this card, consumers can quickly verify their identity with their fingerprint and authenticate online and offline payments using digital yuan. Consumers who are taking part in the CBDC trials will also use the card to receive healthcare services. According to the bank, the 'hard wallet' is designed to provide the elderly easier access to the CBDC and healthcare facilities without the use of smartphones.

Cooperation of banks for CBDC creation

In a [joint statement]() issued on 23 February 2021, several major Asian banks announced their decision to create a cross-border central bank digital currency. The initiative, dubbed the Multiple Central Bank Digital Currency Bridge (m-CBDC), brings together the Hong Kong Monetary Authority (HKMA), the Bank of Thailand (BOT), the Central Bank of the United Arab Emirates (CBUAE), and the People's Bank of China's Digital Currency Institute (PBC

DCI). Its aim is to propose new ideas and strategies to mitigate the existing pressure points associated with cross-border fund transfers, such as inefficiencies, high costs and dynamic regulatory enforcement.

The findings of the proof-of-concept work will be used by participating central banks to assess the viability of the m-CBDC Bridge project in their own jurisdictions in terms of cross-border money flows, foreign exchange settlement and stock market transactions.

Other market news:

- Alexey Zabotkin, the deputy chairman of Russia's Central Bank, said the bank is aiming to present the prototype of a digital ruble platform before the end of this year. In 2022, once the platform has been finalised, the bank will begin testing the currency.
- The Riksbank, Sweden's central bank, is collaborating with Accenture (an experienced consultancy in terms of CBDC) on a pilot project to create a technological solution for an e-krona which can be used in addition to currency. The main objective of the pilot is for the Riksbank to gain a deeper understanding of a digital krona provided by the central bank. Extended until 20 February 2022, the project's goal for this year is to continue improving the technological solution, with an emphasis on consistency, scalability, off-line functionality testing and bringing external partners into the testing area.
- Having announced its decision to start testing distribution of its digital currency in 2021, South Korea's Central Bank also published a book exploring the legal matters that need to be solved to ensure the future central bank digital currency runs as smoothly as possible.

Technological Trends & Developments

German Digital Health Passport to use Blockchain

Blockchain is expected to make a big impact in the healthcare sector, now more than ever with the COVID-19 pandemic. A representative use case is encountered in Germany with a tender for the German Digital Health Passport. The tender was awarded to IBM, Ubirch, Bechtle and Govdigital for completing numerous tasks as applications for vaccination certificate and tests. Blockchain, which offers immutability to data, seems like the trustworthy solutions to facilitate the needs of the multiple stakeholders for the vaccination certification.

Various initiatives are undertaken for the formulation of a platform on the vaccination certification. There is the possibility of developing fragmented solutions. However, actions are being taken towards interoperable solutions by Mastercard and the International Chamber of Commerce. The initiative will assist in the recovery from the pandemic. The solution will leave behind the paper version of these certificates with the implementation of trusted technology. It will aim to tackle fraud and enhance trust between the stakeholders.

IOTA announcing Smart Contracts Protocol Alpha Release

Over the past couple of weeks, the IoTA Foundation has been rolling out numerous announcements. The IoTA foundation designs an open-source distributed ledger for Internet of Things (IoT) devices. Since the protocol does not use miners, it requires participants to approve two transactions and execute a small proof of work (PoW) to issue a new transaction.

In February 2021, the tokenization of assets by smart contracts was introduced with a framework that implements coloured coins to carry information via the colour tag. The Chrysallis upgrade will enable coloured coins to be transferred with gas fees, or other transaction costs just like IOTA coins. Use cases include (though not limited to) utility tokens, security tokens and Non-Fungible tokens. Also, the smart contract protocol has shifted to the alpha release that integrates a multi-chain environment. The Multi-chain environment is secured by the IOTA Tangle. Sub-networks comprised of Wasp nodes called "committees". These can run many blockchains in parallel without losing perspective of the environments that secures IOTA digital assets, the Tangle.

Ethereum Confirms Berlin Hard Fork Date

Ethereum's Berlin hard fork is scheduled for mid-April 2021, introducing several improvements to the underlying protocol. The Berlin upgrade is scheduled to be activated

[on the mainnet block 12,244,000.](#) The upgrade introduces the following EIPs to the Ethereum network:

EIP-2565: ModExp Gas Cost
[The improvement](#) is lowering the gas costs of the proposal to bring in line with the cost of executing other operations. The EIP reprices EIP-198 "ModExp" precompile. This precompile is one of a handful of functions executed natively on the system as they are inefficient to execute in the EVM. The Mod-Exp precompile is currently over-priced, making operations inefficient and expensive. By reducing the cost of this precompile, the relevant cryptographic functions become more practical, enabling improved security, stronger randomness and more.

EIP-2718: Typed Transaction Envelope
The proposal is introducing a new transaction type. When the Ethereum network was launched, there was only one transaction with fields "to" and "Data". [EIP-2718](#) introduces a new transaction type that is an envelope for future transaction types.

EIP-2929: Gas Cost increases for state access opcodes
The rationale of raising gas cost for SLOAD, CALL, BALNACE, EXT and SELFDESTRUCT when used for the first time in a transaction is mitigating the largest remaining DoS attack vector in Ethereum. It is also an initiative towards bounding witness sizes in the context of stateless Ethereum.

EIP-2930: Optional Access Lists
[EIP-2930](#) aims to fix the breaking changes to existing contracts and mitigate some of the gas cost increases that will occur due to the introduction of EIP-2929. The proposal will add a transaction type that contains an access list (a list of addresses and storage keys) that the transaction plans to access.

Vitalik Buterin proposes increasing Ethereum's address size from 20 to 32 bytes

Vitalik [submitted a proposal](#) which suggests the increase of Ethereum's address size from 20 to 32 bytes. Key reasons are the security, the addition of Shard ID if Ethereum has multiple EVM-capable execution shards, and adding an address space ID is a state expiry scheme requires it. Current 20 byte (160 bit) addresses provide 80 bits of collision resistance. This means that someone can spend $2^{**}80$ computing work to generate two pieces of contract init code (sender, ID) pairs, or one piece of contract code and one EOA private key that have the same address. $2^{**}80$ will be within the reach of sophisticated attackers; the bitcoin blockchain has already made more than $2^{**}90$ hashes. The challenge for this update is that existing contracts are designed to accept 20 byte addresses.

ParaState is launching Web Assembly-based Ethereum Virtual Machine (EWASM) as Polkadot Parachain

A parachain is an application-specific data structure that is validated by the validators of the Polkadot Relay Chain. A parachain will take the form of a blockchain, but there is no specific need for them to be actual blockchains. Parachains are able to parallelise transaction processing and achieve scalability of the Polkadot blockchain, while they share in the security of the entire Polkadot network.

Ethereum remains the most used public blockchains with the greatest number of applications and users. New public chains which are highly optimised such as Solana, NEAR and Harmony are using Web Assembly as an upgrade of the Ethereu Virtual Machine (EVM). Web Assembly is a well-established industry standard. However, most of the Web Assembly-based blockchain virtual machines are NOT compatible with existing EVM applications. ParaState through its extension framework, fully supports the Ethereum Web Assembly (EWASM) specification. In addition to EWASM, the pallet fully supports EVM smart contracts – both at the source code level and bytecode level.

MetaMask Custom Network APIs are now supporting Layer 2 Protocols

MetaMask has extended the capacity of developers to recommend a variety of chains to their users, including Layer 2 networks.

Moving computation to Layer 2 Networks is the immediate solution for developers to tackle with Ethereum's high gas fees. The user interface from switching from Ethereum Mainnet to various Layer 2 Networks has been complex. It allows developers to recommend a variety of chains to their users, including Layer 2 networks like Polygon, Arbitrum and Optimism; sidechains like SKALE and xDAI, as well as any EVM-compatible chain, including enterprise networks and test nets.

NVIDIA launching CMP for Professional Mining

In an official announcement, NVIDIA is limiting the hash rate of GeForce RTX 3060 GPU's to render them less desirable to miners. The RTX 3060 model is designed to detect specific attributes of the Ethereum mining algorithm, in order to limit the hash rate, and by extension the mining efficiency will be slowed down by around 50 %. The company will launch the NVIDIA Cryptocurrency Mining Processor. The new dedicated GPU for Professional Mining allows a fully open, airflow optimised bracket and is configured to allow a greater number of GPUs to be controlled by one CPU.

Policy and Legal Developments

European Central Bank advises on the European Commission's proposed regulation on Markets in Crypto-Assets

The European Central Bank (ECB) published an Opinion on the European Commission's Markets in Crypto Assets Regulation (MiCA). Generally in favour of the MiCA's overall aim, the ECB said certain areas should be amended. It made suggestions for amendments related to the e-money and stablecoins provisions.

One major amendment proposal relates to stablecoins. It reads: "where an asset-reference arrangement [i.e., stablecoins] is tantamount to a payment system or scheme, the assessment on the potential threat to the conduct of monetary policy, and to the smooth operation of payment systems, should fall within the exclusive competence of the ECB". This means the ECB would have veto power on the launch of stablecoins in the euro zone.

European Parliament's Economic and Monetary Affairs Committee report on proposed regulation on pilot regime for market infrastructures based on Distributed Ledger Technology

As part of its Digital Finance package, the European Commission published a proposal for a Regulation on a pilot regime for market infrastructures based on distributed ledger technology (DLT). The proposed regulation aims at providing mechanisms for allowing market infrastructures to experiment with certain restricted use cases of DLT.
The European Parliament's Economic and Monetary Affairs Committee published a report on the European Commission's pilot regime. The main amendments proposed are listed below:

- The overall scope of the proposed Regulation in terms of addressing requirements for entities allowed to participate in the regime, and the limitations on DLT transferable securities that can be admitted to trading on or recorded by DLT market infrastructures, as well as (tentative) market capitalisation of issuers of DLT transferable securities.
- The need to ensure a level playing field between entities allowed to participate in the DLT Pilot Regime and the regulatory supervision across the Member States.
- The requirement to ensure proportionality by allowing adequate flexibility to supervisors, and by providing for appropriate provisions regarding transitioning out of or winding down DLT market infrastructures.

ESMA warns about risks of 'non-regulated' cryptocurrencies

The European Securities and Markets Authority (ESMA) has warned consumers about the risks of cryptocurrency investment. In its [Trends, Risks and Vulnerabilities Report](#), published 17 March 2021, the EU securities markets regulator highlighted the increased risks linked with investment in non-regulated crypto-assets. ESMA, together with the European Banking authority (EBA) and the European Insurance and Occupational Pensions Authority (EIOPA) – a trio known collectively as the ESAs, explain that some crypto-assets are highly risky and speculative. As noted by the ESAs in February 2018, consumers must be alerted to the high risks of buying and holding so-called virtual currencies (VCs).

According to ESMA's latest Trends report, the majority of crypto-assets are unregulated in the EU. This is an issue the European Commission has set out to address. In September 2020, the Commission presented a legislative proposal for a regulation on markets in crypto assets.

INATBA Task Force Work on MiCA Regulation Proposal

The International Association for Trusted Blockchain Applications (INATBA) has concerns over the European Commission's Markets in Crypto-assets Regulation Proposal (MiCA). In a February 2021 [report](#) on the Survey & Stakeholders' Engagement Sessions, INATBA noted that the proposal does not favour emerging cryptocurrency and blockchain firms. Instead, MiCA offers regulatory clarity for the European territory and its current investors.

As cited in the report, the respondents recognised that MiCA has the potential to (i) significantly increase the competitive advantage of DLT businesses that are subject to it, (ii) mitigate fraud and market abuse particularly on trading platforms, and (iii) enable seamless cross-border operation of the businesses that it regulates, whilst (iv) ensuring that the crypto industry does not
threaten the financial stability of the existing financial system.

The report also highlights concerns about MiCA's possible outcomes with decentralised finance applications. Also, due to the fast evolving nature of the industry, INATBA suggested regulators work closely with the industry actors to achieve effective regulation.

Eurasian Economic Union fails to reach consensus on harmonisation of laws on cryptocurrencies in EU

The Eurasian Economic Union (EAEU) is an international organisation for regional economic integration. Its Member States include Armenia, Belarus, Kazakhstan, Kyrgyzstan and Russia. The group told a press conference on 17 March 2021 that EAEU Member States have not formed consensus on the harmonisation of laws on cryptocurrencies. According to Iya Malkina, assistant chairman of the Eurasian Economic

Commission Board, the EAEU Member States do not support a recent request for a uniform cryptocurrency regulatory framework within the union.

BaFin issues fresh warning against cryptocurrencies

Germany's Federal Financial Supervisory Authority (Bundesanstalt für Finanzdienstleistungsaufsicht – BaFin) issued a warning to retail cryptocurrency investors. The financial regulator called on investors to be aware of the risks related to crypto investments.

"Despite recent price records, virtual currencies such as Bitcoin and other crypto values are highly risky and speculative investments," BaFin warned. "Currently, crypto values are largely unregulated in the European Union," BaFin added. "In Germany, companies that want to operate the crypto custody business require a permit from BaFin. In addition, companies need permission from BaFin for activities that involve banking or financial services and that relate to crypto values due to the expansion of the term financial instruments to include crypto values."

BaFin also stressed that this does not provide any protection against losses.

Regulation around the world

Ghana prioritises blockchain projects in new Regulatory Sandbox

The Central Bank of Ghana launched a fintech regulatory sandbox pilot indicating preferences to projects using blockchain technology. In a press statement, the Central Bank of Ghana noted innovations in remittances, crowdfunding, e-KYC (electronic know your customer) platforms, and new merchant payment solutions for small and medium-sized enterprises.

Nigeria won't discourage people from trading crypto

Godwin Emefiele, the governor of the central bank of Nigeria, clarified the bank had not banned Nigerian residents from trading cryptocurrencies. Instead, it reiterated an already imposed ban on institutions facilitating cryptocurrency transactions. The ban requires all commercial banks to close accounts belonging to cryptocurrency exchanges and businesses transacting in cryptocurrencies in Nigeria.

Russia's President issues additional measures to fight illegal cross-border transfers of digital assets

Russian President Vladimir Putin requested closer attention to address the illicit use of cryptocurrencies, especially in a bid to prevent illegal cross-border transfers of digital assets.