

The emergence of bitcoin and other crypto-assets: challenges, risks and outlook

The blockchain technology on which the circulation of certain crypto-assets is based should offer numerous potential uses to both financial and non-financial corporations. This technology, among others, contributes to the welcome dissemination of innovation in the financial sphere.

Crypto-assets, such as bitcoin or ether, were born at the start of the 2010s, following the global rise of “virtual” communities, where internet users interact through digital media, such as chat rooms, forums, etc. Often mistakenly termed “virtual currencies” or “cryptocurrencies”, these assets are defined by the French Monetary and Financial Code as “any instrument containing non-monetary units of value in digital form that can be held or transferred for the purpose of acquiring a good or service, but do not represent a claim on the issuer”.

Initially designed to be instruments of exchange in the digital world, crypto-assets have gradually gained a foothold in the real economy through services whereby they can be bought or sold against fiat currencies, held, or used as a means of exchange, or even more recently as investment or financing instruments with the creation of Initial Coin Offerings (ICOs).

These recent developments, alongside the sudden emergence of a speculative bubble, have led financial supervisors and regulators to reflect on ways to change the regulatory framework in order to address the development of these assets, via a concerted approach at the European and international level.

This Focus explains why crypto-assets are not currencies, shows the risks to which crypto-assets expose their users and outlines the existing regulatory solutions identified to prevent such risks.

1

Crypto-assets are not currencies

Crypto-assets: the example of bitcoin

The crypto-asset bitcoin is a virtual asset stored electronically which allows a community of users that accept it as payment to carry out transactions without using fiat currency.

Bitcoin is created within an online community, also known as miners, which have an open source software installed on their internet-connected devices that generates, using an algorithm, bitcoins which are then allocated to miners as a reward for their participation in the operation of the system.

Once created, bitcoins are stored in a digital wallet on the user's computer, tablet or mobile phone, or even remotely (for example in a cloud). It is then possible to transfer them anonymously via internet between members of the community.

While bitcoin is the crypto-asset that receives the most media attention and has the greatest valuation, there were over 1,300 assets of this type worldwide at the start of 2018. In addition to bitcoin, other crypto-assets, such as ether or ripple, are also developing considerably. They function in similar ways to bitcoin.

Crypto-assets do not meet, or only partially satisfy, the three functions of money

- First, their value fluctuates very significantly, meaning it cannot be used as a **unit of account**. Consequently, very few prices are expressed in these crypto-assets.
- Second, as a **means of payment**, crypto-assets are far less effective than fiat currencies, in that (i) their price volatility makes it difficult to use them as a means of payment; (ii) they generate transaction costs that are too high for simple retail payments; and (iii) there is no guarantee of reimbursement in the event of fraud.
- Lastly, their lack of intrinsic value means that they cannot be used as a trusted **store of value**. Crypto-assets are not based on any underlying fundamentals. They are often a product of hashing power, with no relation to trade or economic needs, which prevents them from having an intrinsic value.

Legally, crypto-assets are not recognised as a fiat currency, or as a means of payment

According to Article L.111-1 of the French Monetary and Financial Code (CMF), “The currency of France is the euro”. This is therefore the only currency with legal tender status in France. Thus, crypto-assets cannot be qualified as fiat currencies in France. Consequently, they can be refused as payment without violating the provisions of Article R.642-3 of the French Penal Code, under which it is an offence to refuse payment in banknotes and coins denominated in euro with legal tender status.

Crypto-assets also fail to meet the CMF’s definition of a means of payment, and more specifically its definition of electronic money,¹ in that they are not issued on receipt of funds. Therefore, and contrary to electronic money, crypto-assets do not benefit from an EU legal guarantee to be reimbursed at face value at any time in the event of an unauthorised payment.

Consequently, **contrary to fiat currency, they offer no guarantee of security, convertibility or value.**

2

Distributed ledger and blockchain technologies

The major technological innovation on which the circulation of crypto-assets is based is a distributed ledger that records all the crypto-assets issued or transferred between users. This ledger aims to provide full traceability of all crypto-asset transactions. The transactions are assembled into blocks and then added to a chain, which is why the register is known as blockchain. This chain, whose blocks are cryptographically linked, aims to protect against attempts to falsify the ledger.

More specifically, updating the ledger requires network participant consensus on the validity of transactions, in particular of those validating them (known as miners). This consensus is sought via a decentralised system of cryptographic calculations whose probability of resolution depends on the hashing power that each miner is able to deploy. As all network participants have cryptographic keys enabling them to use and exchange crypto-assets, miners, having resolved the calculation associated with the validation of a block, lock it to the previous one using their own keys.

Distributed ledger and blockchain constitute two interesting technological advances with very promising potential uses in the broad area of financial services. Many experiments with these innovations are currently underway, and are resulting in concrete applications in the areas of both payments and post-market activities for example.

¹ Article L.315-1 of the CMF, which transposes Article 2.2 of Directive 2009/110/EC, defines electronic money as a monetary value stored in electronic form, including magnetic form, representing a claim on the issuer, which is issued on receipt of funds for payment transactions as defined in Article 4, point 5, of the Directive 2007/64/EC and which is accepted by a natural person or legal entity other than the electronic money issuer.

■ Crypto-assets are experiencing a price bubble

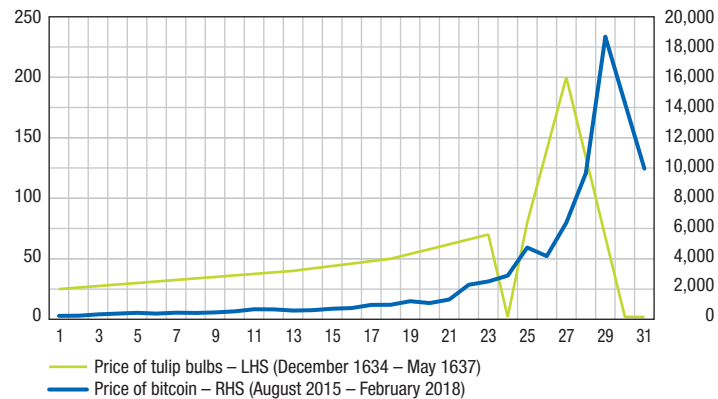
Crypto-assets are highly speculative and their price can collapse at any time

The convertibility of crypto-assets into different fiat currencies is not guaranteed by any centralised authority. Therefore, investors can only recover their funds in other currencies if other users wish to acquire the same crypto-assets. Consequently, the price of a crypto-asset may at any time collapse if investors wishing to unwind their positions cannot find purchasers and become holders of illiquid assets.

In the particular case of bitcoin, the process of issuing units, which is solely dependent on hashing power, is capped over time. This limitation maintains their scarcity which, given the high demand, mainly for speculative purposes, results in very large price fluctuations. Current fluctuations in the price of bitcoin recall those of tulip bulbs² between 1634 and 1637.

The price of bitcoin: comparison with the price of tulip bulbs

(Price of tulip bulbs – left-hand scale; price of bitcoin in USD – right-hand scale; months)



Sources: Earl Thompson and Bloomberg.

The market capitalisation of crypto-assets is still small compared to the stock of fiat money in circulation

The crypto-asset market capitalisation reached around EUR 0.33 trillion at end-2018, mainly made up of bitcoin (35%), ether (20%) and ripple (10%). But this sum has to be set against the stock of fiat money in circulation. The M1 aggregate, which corresponds to the amount of coins and banknotes in circulation, as well as non-financial agents' overnight deposits, stood at end-2017 at over EUR 7.5 trillion in the euro area and at almost USD 3.5 trillion in the United States.

■ The use of crypto-assets is becoming more diversified and is exposing investors to increasing risk of losses

There is a growing interest in crypto-assets from outside their initial communities, i.e. from users and merchants not playing an operational role in the issuance and management of these assets (e.g. those not mining crypto-assets). This is leading to the development of numerous services whose structure is based on that of existing services in the traditional financial sphere.

For instance, in the area of market infrastructures, exchange platforms on which crypto-assets can be bought and sold for fiat currencies (EUR, USD, etc.) have been created. These platforms enable users that have not participated in the creation process to acquire such assets, or convert into fiat currency crypto-assets received as payment. They have also spurred numerous services related to the storage of crypto-assets, which are similar to depositary activities.

In addition, they have fostered the development of services in the areas of financial disclosure and data provision, as well as investment advice and trading. These activities promote the creation of investment instruments backed

² The high demand for tulips in the 17th century, for decorative and artistic reasons, led to a sharp rise in the price of tulip bulbs in the north of the Dutch Republic (now the Netherlands), exacerbated by growing speculation. At the height of the speculative bubble, in February 1637, the demand from Europe as a whole pushed the price of a tulip bulb up to 15 times the annual wage of a specialised artisan, or the equivalent of 5 hectares of land. The sudden price crash of spring 1637 ruined a vast number of investors and shook the Dutch economy. This is now considered to be one of history's first speculative bubbles.

by crypto-assets, such as funds or derivative instruments, similar to the initiatives of the Chicago Board Options Exchange or the Chicago Mercantile Exchange.

Financing activities have also benefited from the development of crypto-assets, through Initial Coin Offerings (ICOs). ICOs replicate the concept of crowdfunding but use crypto-assets instead: in this type of scheme, internet users funding projects (in crypto-assets or fiat money) receive in return digital assets (or tokens). In practice, these tokens represent an economic stake in the project. They offer their holders certain rights, such as priority access to the platform or financed application (like traditional crowdfunding), or receiving a share in the firm's profits or voting rights (like shares). Since the management of tokens issued in ICOs is itself performed by the blockchain used for the ICO, it is based on almost identical exchange mechanisms to those used by the crypto-assets. They therefore constitute an additional form of crypto-asset, carrying specific rights (privileged access to the financed project, voting rights, etc.). The limitations and the risks of the crypto-assets discussed in this Focus therefore also apply to these tokens.

■ **Crypto-assets also represent risks in terms of cyberattacks, money laundering and terrorist financing, while carrying an environmental cost**

Due to their anonymous nature, crypto-assets promote the financing of terrorism and criminal activities as well as the circumvention of anti-money laundering regulations

The anonymity surrounding the issuance and transfer of most crypto-assets makes it more likely for these assets to be used for criminal purposes (internet sales of illegal goods or services) or for money laundering or terrorist financing.

In France, the organisation TRACFIN (responsible for Processing of Information and Action against Clandestine Financial Activities) has identified the use of crypto-assets, especially bitcoin, as posing a specific risk in the area of money laundering and terrorist financing.

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The storage of crypto-assets is prone to major cyber-risks, and offers no protection in terms of the security of these assets

The digital wallets that store these crypto-assets are known to be at risk of hacking. Against this backdrop, holders have no recourse in the event of their assets being stolen by hackers. Repeated incidents of major fraud (hacking of Coincheck in January 2018 where USD 534 million were stolen, or the momentous collapse in 2015 of MtGox, the first global bitcoin exchange)³ illustrate the vulnerability of the crypto-asset ecosystem and the attendant high level of risk, in the absence of guarantee mechanisms.

The use of crypto-assets also carries an environmental cost

It was estimated in December 2017 that processing a single bitcoin transaction requires 215 kilowatt-hours of electricity, or the equivalent of six months of work on a computer running 24 hours per day. This energy consumption is constantly being revised upwards, due to the heightened competition stemming from the growing validation network.

■ **Regulating crypto-assets to manage identified risks**

It is advisable to regulate activities associated with crypto-assets for four main reasons: the fight against money laundering and the terrorist financing – which is a key priority – investor protection, preserving market integrity, including in the face of cyber-risks, and lastly, in the event of further growth in these activities, financial stability concerns.

3 Following an insider fraud leading to the disappearance of 650,000 bitcoins worth around USD 360 million.

The Banque de France and the *Autorité de contrôle prudentiel et de résolution* (ACPR) are advocating extending the regulation of the provision of services associated with crypto-assets in order to cover two areas

1. Regulating the services offered at the interface between the real economy and crypto-assets

The conversion of crypto-assets into fiat currency by internet platforms that play the role of intermediary between buyers and sellers is considered to be a payment service and requires an authorisation to provide such services. However, this requirement arises from the third-party management of accounts held and denominated in a fiat currency, and not from the provision of services associated with crypto-assets.

In addition to this approach, the Banque de France and the ACPR are advocating broadening the regulation of the provision of such services, by creating a crypto-asset services provider status.

These regulatory changes could stem from the revision of the Fourth Anti-Money Laundering Directive currently being adopted by the EU (known as 5th AMLD). This Directive provides for the regulation of players offering (i) the exchange of crypto-assets for fiat currencies and (ii) the storage, on behalf of private clients, of cryptographic keys that can be used to hold, store or transfer crypto-assets.

The crypto-asset services provider status would make it possible, beyond the fight against money laundering and terrorist financing which is a priority, to subject market actors to rules governing operational security and customer protection. This status could also cover services concerning transactions between crypto-assets.

2. Regulating investments in crypto-assets

The regulation of crypto-asset service providers could be supplemented by a limitation of the possibility for certain regulated companies (banks, insurers, asset management firms, etc.) to develop activities in crypto-assets. The first objective would be to ban deposits and loans in crypto-assets. As regards savings products, banning the marketing of any such investment vehicles to the general public should be considered, thus reserving these products for the most sophisticated investors. Furthermore, these products should be subject to stringent customer protection rules. Lastly, for the proprietary investments of regulated entities, in the absence of a complete ban on crypto-asset investments, the stringent regulation of these products, for example by deducting their total value from capital, should be considered. In order to implement these regulatory changes, national and European legislation would need to evolve.

For its part, the French Financial Markets Authority (AMF) considers that the marketing of crypto-asset derivatives requires an authorisation and that these products cannot be advertised electronically. In addition, following on from its public consultation on ICOs, the AMF has decided to continue its work on defining a regulatory framework specific to ICOs offering appropriate guarantees, notably regarding information disclosure, which would be necessary for this new type of offering. This work will be carried out in coordination with the other public authorities concerned.

Regulation should be coordinated at the European and international levels in order to ensure that it is more effective.

Since crypto-assets are dematerialised and use internet-based technologies, which promotes the provision of cross-border services, the patchwork nature of domestic regulations might make it impossible to fully mitigate the relevant risks.

It therefore appears necessary to discuss the regulation of crypto-assets at the international level. On 7 February 2018, the French and German Ministers of the Economy and Finance and central bankers requested the involvement of the G20 in this respect.