Briefing

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Virtual currencies

Challenges following their introduction

SUMMARY

Virtual currencies began creating controversy soon after their launch. The nature of virtual currencies is difficult to apprehend, the underlying technology is complicated, their operations are conducted in a decentralised way, and they are almost unregulated. No-one can predict if a particular virtual currency may become a direct competitor for existing currencies in the distant future, or if it might just collapse overnight. What is certain, however, is the high level of volatility demonstrated by today's market leader, Bitcoin.

This raises questions concerning the possible impact of virtual currencies on a number of sensitive fields. It appears that there is little, if any, influence expected on monetary policy, or on the stability of the financial system. However, some danger might arise for payment systems, including reputational damage for systems which are not directly exposed to virtual currencies. The most problematic field is consumer protection, as there are no safety nets, such as deposit guarantee funds, available to alleviate losses. Extending prudential supervision to virtual currencies might be difficult, if not impossible, so most regulators are now pondering how to regulate the points of contact between virtual currencies and fiat money, i.e. where one is exchanged for the other.

The Paris terrorist attacks in late 2015 have revived interest in virtual currencies, as there is a growing fear that they could be used with criminal intent. The European legal framework will be adapted to take the terrorist threat into account.

In this briefing:

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Author: Christian Scheinert

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Glossary

AML/CFT: anti-money laundering/countering the financing of terrorism.

Bitcoin: the name of a cryptocurrency based on blockchain technology specially developed for Bitcoin, and which is still the market leader amongst virtual currencies.

Blockchain: consists of many blocks of encrypted electronic records of Bitcoin transactions linked together.

Cryptocurrency: virtual currency where all relevant information is carried in encrypted form, e.g. in a blockchain.

E-money: money held in electronic form. Not to be confused with virtual currency.

Fiat money: a currency that is legal tender, but not backed by a commodity such as gold.

Miner: individual or entity involved in Bitcoin mining. Miners are central to the smooth functioning of Bitcoin. Their activity consists of participating, with the help of powerful computers, in the complex decentralised process of discovering and maintaining blocks of transaction records.

Virtual currency: 'a digital representation of value, not issued by a central bank, credit institution or e-money institution, which in some circumstances can be used as an alternative to money' (ad-hoc definition, as used by the European Central Bank).

The emergence of virtual currencies

Bitcoin and the underlying technology

Bitcoin, which started its operations in 2009, is at the origin of the present phenomenon of virtual currencies, and has remained market leader in that field.[1] Technologically, it is based on a piece of open-source software that was specially developed for that purpose. A ledger, which is a digital financial record referred to as 'blockchain', is laden with encrypted information about the transfer of virtual currencies and disseminated through a dense IT network. In principle the scheme allows for the anonymised and secure hoarding of virtual currencies and their cheap, fast and secure transfer between individuals or firms, with no national boundaries interfering. Although a huge and therefore costly IT network is necessary to run the scheme, a set of incentives was built into the system in order to make it financially self-supporting. The activity of discovering blocks and updating them with actual transaction information is called mining, and can be carried out, unlicensed, by anyone with the necessary skills and access to powerful computers and servers.

New entrants and consolidation

Based on open-source software, the Bitcoin scheme can easily be copied, improved upon, or tailored to other needs. It has spawned an estimated 500 to 600 similar virtual currencies. Schemes constantly appear and disappear. Most of these are irrelevant to the wider financial system or dedicated niche products whose purpose is solely known to insiders, as information about the smaller schemes is scarce. Bitcoin remains the undisputed leader, with more than 80% of total market capitalisation, although Ripple has recently grown to about 10%. As a consequence, attention is still focused almost exclusively on Bitcoin. The Bitcoin mining market is swiftly consolidating in an oligopoly. China is the biggest player, both in the use of Bitcoins, and in providing the necessary IT infrastructure.[2]

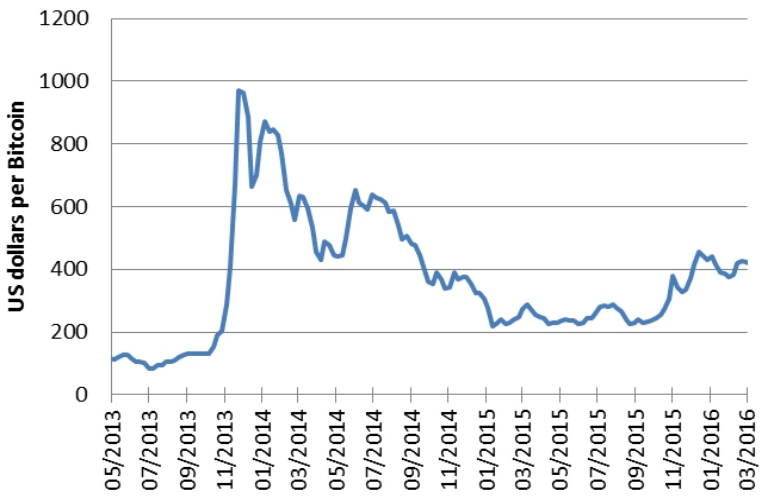
Increased use of virtual currencies

The issuance of new Bitcoins is intentionally limited to avoid inflationary effects. In addition, the design of the system comprises a cap on the amount of currency that can be created, effectively limiting it to 21 million Bitcoins. The market is under the general assumption that this limit will be reached in the year 2140. However, 15 million have been created since 2009, which is a tribute to the success of the money transfer scheme and seems to show that there is a market for such a product. It has however often been suggested that speculation is the main driving force behind the success of Bitcoin.[3] This might be confirmed by the fact that a large proportion of Bitcoins is not used for money transfers but for hoarding. The high level of volatility in the exchange rate with the United States (US) dollar seems to encourage speculative behaviour.

Bitcoin volatility versus the US dollar

The value of a virtual currency can be measured once it is converted into a legal means of payment. For Bitcoins, the relevant currency is the US dollar. The fluctuation level of that exchange rate is immense (see figure 1).[4] Bitcoin value increased by more than 700% in just two months, between the beginning of October 2013 and the end of November 2013. December 2013 saw a reversal, which is believed to have been triggered by a statement from the Chinese regulators which limited the legal use of Bitcoins to private individuals as well as to trade and exchange platforms. The decline lasted just over a year, with a loss of three quarters of market capitalisation. For most of 2015, Bitcoin stayed very stable, inducing a false impression of stability for market participants, however at the end of the year its value suddenly doubled. The Bitcoin exchange rate has been a 'roller-coaster' ever since.[5]

Figure 1 – Exchange rates between Bitcoin and the US dollar



Data source: coinmarketcap.com, 2016.

The reasons for the level of fluctuation are manifold. To some extent, fluctuation is inherent to the system, as Bitcoin creation is linked to supply and demand. The former being technically limited by built-in ceilings as well as the will and capacity to engage in mining activities, and the latter being fully exposed to market forces. Fluctuation is also self-accelerating, as speculators are attracted as soon as they see a dramatic increase in the exchange rate, thus gambling on an even higher future value. The value is also influenced by expectations concerning the virtual currencies' ability to become more widely used in larger parts of the economy, be it in the financial sector, or as a means of payment for internet shopping, or by more traditional 'bricks-and-mortar' firms.

A crucial factor is the markets' perception concerning the viability of the whole concept. Should confidence fall dramatically, then the whole scheme might collapse, resulting in a total loss of their Bitcoin portfolio for every person or firm engaged in the process.

Differences and interaction between virtual currencies and fiat money

Virtual currencies are not fiat money

Fiat money is defined as a currency that is legal tender, but is not backed by a commodity such as gold or silver. Most of today's currencies are fiat money, i.e. their value is solely based on trust. Central banks do not consider virtual currencies as equivalent to money, as they are not legal tender, are not issued by a central bank, by credit institutions, or by e-money institutions.

In a legal sense, anything widely used to exchange value in transactions is money. Virtual currencies do not fulfil this criterion, as the degree of acceptance is very low. For example, in the euro area the only legal tender is euro banknotes and coins.[6] From an economic point of view, the three traditional functions of money are: as a medium of exchange; to store value; and as a unit of account. At present no virtual currency fulfils these economic criteria.

The ad-hoc definition for virtual currencies of the European Central Bank (ECB) stipulates that a virtual currency is 'a digital representation of value, not issued by a central bank, credit institution or e-money institution, which in some circumstances can be used as an alternative to money'.

Bitcoin is neither a traditional currency nor is it linked to legal tender, which may create problems for its users. In cases of loss or fraud, no compensation mechanism, such as deposit guarantee funds, exists. There is no redemption mechanism. This problem might not hit only a limited number of users, e.g. in the case of a scam, but could affect all users, should the virtual currency scheme collapse.

Virtual currencies and fiat money interact

Some virtual currencies are solely used inside a relatively closed circuit, such as inside a company, or within a computer-gaming community. But the interest in virtual currencies would remain extremely limited if there was no gateway between them and fiat money. This is where convertible virtual currencies such as Bitcoin come into play. The most obvious example is exchanging money into Bitcoins, then having these Bitcoins transferred to a geographically different place, which may be located in another country, where the recipient would exchange the Bitcoins into money. The main advantage afforded would be to bypass generally expensive money-transfer systems. Another use would be for hoarding Bitcoins in the hope their value will rise due to exchange rate fluctuations. For instance, anyone who acquired Bitcoins at the beginning of October 2013 and sold them two months later could have made a considerable profit.

Consequences of the emergence of virtual currencies for selected policy fields

The rise of virtual currencies, especially of Bitcoin, has attracted attention, prompting many observers and decision-makers to express concern. This new phenomenon, enabled by the widespread availability of powerful computers as well as the globalisation of the economy, is barely, if at all, regulated, and threatens to expand rapidly into sensitive and highly regulated fields.

Implications for monetary policy

The emergence of any form of unregulated currency in parallel to fiat money will raise questions in central banks as far as the implications for monetary policy are concerned.

However, there seems to be a consensus amongst central banks that the impact of virtual currencies on monetary policy and price stability remains negligible. The ECB sees no imminent risk, as long as the volume of virtual currencies is stable and their usage is not widespread. However, the ECB is closely monitoring the phenomenon.

Influence on financial stability

Theoretically, virtual currencies could endanger financial stability, i.e. destabilise the financial system, due to the high exchange rate volatility and uncertainty about the survivability of the schemes. However, as in the case of monetary policy, the low volume of virtual currencies makes this a negligible threat at present. According to the ECB, this assessment could change, especially if the following conditions are met: (1) virtual currencies' usage increases in regular payments; (2) they make greater inroads into the real economy; and (3) nothing is done to increase stability. Central banks are therefore pushing for increased transparency, and continue to monitor the situation.

Impact on payment systems

The possible negative implications for payment systems are more acute than for the two categories mentioned above, due to the fact that virtual currencies are first and foremost designed as a means of transferring money. However, these risks are not expected to materialise in the near term. The ECB warns that this assessment might change if at least one of the following conditions were met: (1) large financial institutions embrace virtual currencies; and/or (2) if their use becomes widespread when paying for commercial transactions. Should this be the case, a major event in the sphere of virtual currencies might spread to other virtual currencies and eventually transmit shocks to traditional payment systems. In addition, such an event might trigger a general loss in confidence in established payment instruments, such as electronic payment systems or e-money.

This draws attention to the likelihood of the use of virtual currencies spreading. Although the many proponents of such schemes hope use will rise, a number of industry experts have voiced scepticism. They argue that the costs generated at both ends of the transfer process are high, especially when compared to initial expectations. Expensive operations occur when money is converted into a virtual currency prior to transfer, as well as after transfer, when exchange into money takes place. As a consequence, the remaining advantage of virtual currencies would be faster currency transfer than with traditional transfer systems. Some contest that even the speed argument fails, as Bitcoin transmission time is not always impressive and may slow further as the blockchain becomes saturated. Countries with highly developed payment systems will also benefit less from virtual currencies than some other parts of the world.

Prudential supervision and consumer protection

Providers of virtual currencies are eager to stress the manifold advantages they can offer to consumers. These include speed of transfer; low costs; technical security; relative anonymity; ease of transferring funds across borders; and a lack of bureaucratic procedures. Providers point to what seems to be the emergence of a solid trend towards the increased use of virtual currencies. However, consumers face a barrage of warnings concerning the use of virtual currencies, especially from central banks and financial supervisors, who point to a lack of regulatory protection in case losses are incurred. The European Banking Authority (EBA) first issued a warning in December 2013 (see box).

EBA warning

– Consumers may lose their money using exchange platforms. As these platforms are generally unregulated, the failure of a scheme can lead to the loss of currency. There is evidence that consumers incur large losses on a regular basis.

– Money may be stolen from a digital wallet. Virtual currencies are stored on digital platforms protected solely by passwords. Hackers have repeatedly obtained access to these passwords, thus allowing them to plunder the accounts. The probability of getting any of the money back is negligible. Additionally, losing a password often means there is no means to access one's virtual currency.

– There is no protection for those using virtual currencies as a means of payment. There are no refund rights. Payments from digital wallets can generally not be reversed.

– The value of a virtual currency is unstable. Apart from high exchange rate volatility, there is also the chance that the currency loses all of its value.

– There is a danger that virtual currencies are used for unlawful activities, such as money laundering. This may prompt authorities to close down the exchange platforms, depriving consumers of access to their funds.

– Tax liabilities may derive from holding virtual currencies. This requires consumers to be well aware of tax regulations.

Building on this warning, the EBA published a detailed opinion, analysing possible risks. Similar concerns were voiced by a series of national central banks. In all cases, attention is drawn to the lack of prudential supervision. Nevertheless, proponents of virtual currencies insist on the self-regulating properties of their schemes.

Money laundering and the fight against terrorism

Opinions diverge fundamentally on the level of anonymity offered to participants, as well as on the traceability of transactions. Nowhere are these more important than in the field referred to as AML/CFT (Anti-money laundering/countering the financing of terrorism). Bitcoin providers point to the technology itself as a guarantee of fully fledged traceability, as transfer information is permanently written into the blockchain. In addition, the users linked to each transaction are not only registered, but these registers are publicly available. However, many, again from the central bank sphere, as well as financial regulators, strongly disagree with this view and do consider the process to be opaque at best, and impenetrable at worst. An analysis published by the Financial Action Task Force (FATF) in June 2014 came to the conclusion that convertible virtual currencies may become a vehicle for AML/CFT activities. Potential anonymity is deemed much higher than with traditional card systems, or online payment systems such as PayPal. Bitcoin is identified as vulnerable to these risks. The weaknesses listed by the FATF include the following: (1) no customer identification is attached to Bitcoin addresses; (2) neither the identification, nor the verification of participants are required; (3) records of transactions are not always linked to 'real world' identities; (4) no central oversight body exists; (5) during an investigation, law enforcement agencies cannot pinpoint a central location or an administrator, particularly given that the infrastructure is complex and generally spans different jurisdictions; (6) a virtual currency scheme constantly evolves in many of its characteristics; (7) some of the operations may be carried out in jurisdictions with a low level of AML/CFT enforcement, or with none at all. A number of tools destined to increase anonymity and avoid tracing of transactions have emerged (see box).

Examples of electronic tools designed to enhance anonymity and avoid traceability

– Anonymiser: helps to hide the source of a Bitcoin transaction, thus creating anonymity.

– Mixer: obscures individual transactions by linking them to the same Bitcoin address, and adding semi-random 'dummy' transactions, making it difficult to identify the intended recipient of the fund.

– Tor: hidden network of computers designed to conceal IP addresses, thus hiding the identities of the network's users.

– Dark Wallet: extension wallet increasing the anonymity of Bitcoin transactions by using a combination of electronic techniques, such as anonymisers and information black markets.

– Cold Storage: a Bitcoin wallet which is not online, thus preventing virtual currencies from being detected.

Source: information drawn from Virtual Currencies: Key Definitions and Potential AML/CFT risks, FATF.

Similarly, tools have been developed by software producers which help to trace transactions and those behind them. These include Chainalysis and Elliptic, which inspect the blockchain in search of illegal activities.

A well-publicised case of illegal activities dependent on Bitcoin was Silk Road, an illegal organisation which was shut down by US law enforcement agencies in 2013. The organisation provided a network for sellers and buyers of illegal goods and services, including weapons, drugs and stolen electronic data. Bitcoin was the only currency accepted, and a high level of anonymity was reached. It was estimated that total sales in excess of US$1 billion were made.

Proponents of virtual currencies draw attention to the low overall value going through cryptocurrencies, as opposed to the high amounts of money laundered, thus demonstrating that the amounts laundered using virtual currencies cannot be significant, and will probably not grow in the short-term. Using the same logic, one might conclude that virtual currencies offer ample room for transferring terrorist funding, as the amounts involved should be small in comparison to the more widespread phenomenon of money laundering. However, according to Europol, no proof of the use of Bitcoin or similar cryptocurrency has emerged to date in connection with ISIL/Da'esh financing networks.

Adapting the EU's regulatory framework

Little, and patchy, regulation

There is currently no EU legislation on virtual currencies, which does not mean they are completely unregulated in Member States. Rather, patchworks of national legislation, compatible to a varying degree, exist in some Member States, while others have no legislation at all. In many Member States, nothing more than a series of opinions and warnings has been issued by central banks or regulators. Germany has the most elaborate rules, and considers virtual currencies as units of account, thus not conferring them legal tender status. For certain operations authorisation requirements exist, which may include the acquisition of a banking licence. In France, which follows an approach similar to Germany, actors may be required to hold a licence as payment service providers. In the United Kingdom, the Financial Conduct Authority (FCA) has yet to issue any guidance, meaning that virtual currency businesses are not obliged to register or obtain authorisation, although a number of them do so on a voluntary basis. It is to be noted that the European approach to regulating virtual currencies is fundamentally

different from that prevailing in the USA. Whilst in the former, virtual currencies are considered as units of account, in the latter they are treated as commodities and are therefore strictly regulated.

Is there a need for additional regulation?

Proponents of virtual currencies do not generally favour additional regulation. Some warn that their use can be undermined by legislation. Commercial operators may be dissuaded from using virtual currencies if legislation limits their advantages. An additional problem is that legislation might go beyond the scope of virtual currencies and spill over into the nascent blockchain technological field. It might therefore be dangerous to begin legislating in a field as yet not fully understood.[7]

The ECB considers that virtual currencies are not yet important enough to require regulation in its fields of competence, but, in view of the divergent approaches at national level, points to the desirability of establishing a level of clarity. Concerning financial stability, however, the ECB considers that a more robust regulatory framework may be required in time, and this may need internationally coordinated action.

Amongst others, the Banque de France has clearly identified the difficulties of regulating virtual currencies, but has emphasised regulating and monitoring the point where virtual currencies and fiat money are exchanged. Banque de France reached the conclusion that virtual currencies may be out of control, but as long as full oversight on real money remains possible, including the moment of an exchange with virtual currencies, then crucial functions such as AML/CFT enforcement can be ensured. Without anonymous currency conversion, money launderers or terrorists would find no advantage in virtual currencies. This, however, implies that all entities performing currency exchange tasks need to be subjected to financial supervision, including every single internet-based money exchange. Proponents of virtual currencies support this approach, as does the EBA, at least as a first step, warning that going further, i.e. by putting into place a comprehensive regulatory system for virtual currencies, would require a large amount of resources and take significant time before being effective. As long as no comprehensive system exists, the EBA advises national supervisory authorities to discourage the use of virtual currencies.

European lawmakers' next moves

These concerns were heightened considerably by the Paris terrorist attacks of late 2015, and AML/CFT jumped to the top of the EU policy-making agenda. In December 2015, the European Commission proposed a directive destined to criminalise the financing of terrorists. On 2 February 2016 it adopted an Action Plan to strengthen the fight against terror financing. The aim is to track the terrorists' financial movements and to hinder the movement of funds and assets, as well as to disrupt their sources of revenue. Procedurally it is intended to build on existing EU legislation and, if necessary, to add new legal instruments. In particular, the fourth Anti-Money Laundering Directive, which was adopted in May 2015, will be amended in order, amongst other things, to bring virtual currencies into its scope. Virtual currency exchange platforms will have to apply customer due diligence controls each time virtual and real currencies are exchanged, which effectively puts an end to the anonymity of virtual currency users. Additionally, part of the plan is a possible amendment of the Payment Services Directive, in order to extend its licensing and supervision framework to virtual currencies.[8]

Outlook: virtual currencies vs blockchain technology

It is too early to assess the possible impact of the forthcoming EU legislation on virtual currencies, but there is little doubt that it will be profound. Whether it will affect the growth of the emerging virtual currency industry, or provide it with a more stable regulatory framework, thus increasing its acceptance as money and eventually allowing it to become mainstream, is an open question.

What is often overlooked is that Bitcoin may have triggered something which goes well beyond virtual currencies. Although the blockchain technology was initially meant to implement Bitcoin's currency business model, it now seems to be emerging as a promising means to achieve a number of other goals. Blockchain technology could find its way into the mainstream financial markets.[9] The technology may be used in a variety of applications where data have to be transmitted without risk of corruption. The handicap for Blockchain technology might be that it first appeared in the particularly sensitive and highly regulated field of currencies, having attracted the regulators' attention while still at an immature stage, and with its potential not fully understood.

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Endnotes

[1] Although Bitcoin attracts much attention, it is not the first virtual currency ever created, and many previous currencies have failed.

[2] The present Chinese interest in Bitcoin derives not so much from use inside the country, which is not encouraged by supervisors, but rather from the problems created by China's strict separation between onshore and offshore money markets. Bitcoin can help overcome that divide, as it offers an easy way to transfer money across the Chinese borders. In Taiwan, however, Bitcoin has been used in thousands of retail outlets since 2015. (See: Why bitcoin can flourish in China, Aiga Gosh, coindesk.com, 28 September 2015.)

[3] As, for example, reported by Kyle Torpey in an article published in Bitcoin Magazine, 28 January 2016, citing Taavet Hinrikus, CEO of TransferWise.

[4] The data points were collected at seven-day intervals, and therefore do not necessarily indicate peaks. The ECB reports an all-time high of US$1 240 for a bitcoin on 4 December 2013, which is not reflected in this graph.

[5] Bitcoin fluctuation was at its highest in its early days. The first exchange rate, registered in April 2010, was US$0.3 for a bitcoin and it essentially stayed under US$10 until the end of 2012. At that time a single article in the financial press attracting attention to Bitcoin could increase the value noticeably. The first substantial fluctuations occurred during the Cypriot sovereign debt crisis, when investors desperately sought any safe harbour, only to be caught by a dramatic fall in value, caused by an attack on Bitcoin denying access shortly after. (See Banque de France.)

[6] In addition to euro notes and coins, scriptural money and electronic money labelled in euro are accepted not by law but by choice, thus these categories taken together define the euro as a currency. The fact that virtual currencies are not directly linked to a legal tender disqualifies them as a currency.

[7] In a presentation made on 25 January 2016 to the European Parliament's Economic and Monetary Affairs Committee (ECON), Primavera de Filippi of the National Centre for Scientific Research (CNRS) in Paris, explicitly warned about possible collateral damage for blockchain technology. More details are expected in a forthcoming publication: Blockchain and the Law, De Filippi, P., Wright, A., Harward Academic Press.

[8] At the time of writing, the EP Committee on Economic and Monetary Affairs (ECON) is preparing an own-initiative report on virtual currencies (rapporteur Jakob von Weizsäcker, S&D, Germany).

[9] A Bank of America executive recently revealed that the bank has already filed 15 blockchain-related patents, with another 20 expected. Despite an unclear future, the bank is eager to profit from the technology. (Cited in PYMNTS.com, 21 January 2016.)

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