

Cryptocurrency

Has its time come?

March, 2015



As we increasingly operate via electronic and mobile banking, money has moved from being 'a thing' we hold, to numbers we move around. In such an environment, it is inevitable that new forms of currency will emerge to challenge the historic norms. Cryptocurrencies, such as Bitcoin, take this a step further by using a model which reflects the underlying structure of the Internet and World Wide Web, namely a distributed model where the software and operating model becomes self-sustaining. So in such an environment, we believe it is more a matter of 'when' rather than 'whether' such models will impact our existing currency models.

The move from paper money and metal coins to electronic wallets is underway

When travelling in many countries, it is now possible to not have to carry money, and instead do everything electronically. In the Nordics, it has now been the case for many years that anything can be bought with a card, no matter what the value. Our observation is that the other 'advanced' countries, such as the UK, are behind the curve, as cash still plays a large part in small transactions.

However, the limitation of the cashless model is that the digital exchange can occasionally be vulnerable to lack of Internet access. This need for access illustrates the limitation of centralized, electronic money models. In principle, it should be possible to overcome this through the use of cards that guarantee a minimum value. But there appears to be a trend that all transactions try to make a remote call irrespective of the value.

If we replace bank cards with electronic wallets on phones then this need for access can in principle be overcome as only a local connection is required. The wallet can then maintain a running balance against the value lodged the last time a connection was made to the account. If electronic wallets become the focus, then this creates the need for encrypted, electronic currency managed on mobile phones so that we have the same portability as cash¹.

Thus, independent of the emergence of cryptocurrencies, we can see the trend towards electronic or digital money and the creation of electronic wallets for holding that digital money.

What is money anyway?

If we recognize that money is already becoming electronic then we can focus on who controls the currency and defines its value for exchange of goods and services. At a regional or country level, currencies are issued and controlled by Governments and their central banks. The value of the currency is then determined by wider economic issues and parameters (such as interest rates) and the money supply.

Money supply has moved from a model of 'printing money' to one of quantitative easing. Money supply, and its impact on the value of the currency, is again determined by electronic transfer of funds rather than a physical manifestation of the currency.

¹ News - Ciphrex Raises \$500k to Advance Multisig Wallet Offering
<http://t.co/ude0f3xuDS>

So currency in this circumstance is merely a representation of a value, the currency having no intrinsic value itself. In fact, the value is guaranteed by the central bank, which then holds reserves of precious metal, although the relationship between the currency and the reserve is no longer fixed.

We can compare this with the historic concept of coinage, when coins were minted from metals which had their own intrinsic value. This led to the historic picture we have of people 'biting' coins to test the metal type. So in the historic physical world, coinage was more than a currency; it was an asset in its own right. The value of the coinage was related both to the value of goods it could buy, as well as to the inherent value of the metal it was made of.

Are cryptocurrencies old money or new money?

To create a Bitcoin, the electronic coin has to be mined by processing a hashing algorithm. The complexity and energy required for the calculation is increasing over time, with the result that serious compute power and energy is required to mine the algorithms.

Discussing this with a number of Bitcoin miners, it would seem that even in its early years, the processing needed moved quickly from a PC to requiring the processing power and energy management of a data center rack to create the coins. Now faster chips and lower energy boards make this easier but at the same time the processing algorithm is becoming more challenging. As such, current miners consider it a struggle to match the cost of the processing to do the mining with the value of the Bitcoin created.

So we see that the mining is itself a high cost activity and as such there is an inherent cost and potentially value in the item created. So, digital assets are being created as a result of Bitcoin mining. This view was confirmed recently in a tax judgment² where Bitcoins were seen as property for tax purposes and are now subject to Capital Gains Tax in some regions.

The original design of the algorithm ensures the scarcity of the Bitcoin commodity increases over time and that there is ultimately a limited supply, as with physical mining of precious metals. The difference is that the Bitcoin limit is well defined at 25M³, which means that the total value of the currency is likely to be in the billions of USD. However, building on the Bitcoin model many other cryptocurrencies are emerging, which could have the potential to create much larger pools of currency and challenge existing, centralized money supply models.

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Given this analogy we can then see that the Bitcoin is more like the old forms of coinage made from precious metals than current Government secured currencies. Similar to precious metals, however, there is little relationship between the functional value of a Bitcoin and its trading value.

The distributed operating model for cryptocurrencies and the Bitcoin

Unlike other currencies, there is no central governance for the creation and management of coinage; rather it is determined by the algorithm and the maintenance of the single view of the transactions and available money supply via the blockchain in the Bitcoin case. The blockchain is community managed and determines, via an algorithm, the mechanisms for mining the coins, which in itself changes over time to set the requirements for the mining process.

This means that the supply of available coins (aka the money supply) cannot easily be manipulated by a single individual (or government). This creates a decentralized, community based control mechanism, which operates at the boundary between the physical and virtual world. It does however rely on an element of self-regulation and monitoring and any digital system can be subject to fraud given sufficient concerted effort.

This decentralized, virtual model is reflective of and enabled by the inherently decentralized nature of the Internet. However, we can also see a parallel in that the Internet started out as a purely community based tool, but which now, as its importance has become critical, is subject to the attention of governments and large corporations.

² <http://www.bloomberg.com/news/articles/2014-03-25/bitcoin-is-property-not-currency-in-tax-system-irs-says>

³ <http://bitcoin.stackexchange.com/questions/161/how-many-bitcoins-will-there-eventually-be>

So whilst cryptocurrencies have started as purely community based services, as they become a significant and mainstream they will come into the same focus from governments and large corporations, particularly financial institutions.

In fact this is already happening as from day one there has been value ascribed to cryptocurrencies and as such they draw immediate attention from tax authorities, who need to understand their relationship to each country's trading and tax regime.^{4, 5}

Cryptocurrencies as an alternative neutral currency for globalization of services

Even in countries in the developing world, where currencies can be unstable, access to the Internet via mobile phones and other devices is still growing rapidly, creating the opportunity for electronic money transfer.

We can see this from the growth of M Pesa, a mobile-phone based money transfer system operating in parts of Africa⁶. In such circumstances, if someone is to be paid for work, or money needs to be exchanged between individuals, it may be best for the agreed value to be held in a neutral form. In recent years the USD has often been used as that form, but offering an independent, neutral cryptocurrency, such as Bitcoin, is an alternative.

This global, 'neutral currency' for use in developing nations is identified as a significant opportunity and use case for some observers of cryptocurrency. It will, however, rely on the 'neutral currency' having a stable value for people to want to use or accept it so it will probably only evolve as the currency stabilizes and matures.

Cryptocurrencies as a focus for speculative investments

Precious metals and commodities in general (such as oil) fluctuate in value subject to supply and demand, but also in response to investors who speculate on their growth or demise. This can create large swings in value, as a result of mismatches occurring in supply and demand, (as we have seen recently in oil pricing) as a result of attempts to capture the market (as was evidenced in silver some time ago) or just as a result of volatile trading in an immature or uncertain

market. History tells us that all these aspects will at some point apply to the cryptocurrency market.

We saw it with the Internet where the .com boom of 2000 created a huge range of speculative investments in new properties and assets, some likening it to the Wild West period in US history. This passed with a period of consolidation and we have now moved into a period of continuous rapid evolution as new ideas and models test the consolidated giants.

The evolution of cryptocurrencies appears to be in a similar stage now as the .com boom was in 2000, with a rapid growth of options and new currencies appearing all the time. This is accompanied by wild swings in value, as a consequence of the factors outlined above, that one can find in emerging commodity markets⁷.

One feels though that the rate of evolution is potentially faster than that of the Internet, post the .com boom. The internet consolidation happened up to the mid-2000s and we then entered the next phases of growth as new waves of ideas arrived, such as social media and now the Internet of Things.

Cryptocurrencies as a vehicle for currency conversion and trading

If one can convert a cryptocurrency into a traditional currency and back again, it then creates the opportunity for using it as the intermediate form for currency trading. Its potential benefit is that, because it has no legacy in physical currency, transaction charges can be very low, creating the opportunity for disrupting the existing exchange markets.

Given the huge volumes of currency trading that happens on a daily basis electronically, any disruptive model that is successful, even in a small way, will create a significant volume of transactions.

This opportunity is illustrated by the rapid growth in trading platforms and mechanisms, such as the recently announced trading options from Tether⁸, which allows cross border trading between currencies using Bitcoin as the intermediary.

Cryptocurrencies as an alternative for retail transactions

Given the rapid arrival of electronic wallets as a means of purchase, it would be quite feasible to see these currencies become a vehicle for defining the value held in the wallet.

4 Information - Cryptocurrency stats
<http://coinmarketcap.com/currencies/bitcoin/#charts>

5 News - BoE worries about stability of decentralised Bitcoin
<http://t.co/hTv7XRASwD>

6 News - BoE worries about stability of decentralised Bitcoin
<http://t.co/hTv7XRASwD>

7 News - Integration between traditional and new mobile money services such as M Pesa continues <http://t.co/j7CRaQIWIIn>

8 News - BoE worries about stability of decentralised Bitcoin
<http://t.co/hTv7XRASwD>

The rapid evolution of capabilities and use cases for cryptocurrencies creates a number of opportunities and threats for existing financial institutions and governments. Now is the time to consider potential scenarios in which these use cases can be embraced as once change happens it could be extremely rapid.

However, for it to be used in retail purchases on a daily basis on a large scale, the value ascribed to it would need to stabilize.

The benefits of using such a currency over an electronic record of a traditional currency would also need to become clearer for adoption to grow. Nonetheless we are seeing many experiments by early adopters, for example the Circle ATM⁹.

However, if one of the big retail financial services providers were to adopt a cryptocurrency within its portfolio it could easily trigger a rapid acceleration of adoption. We can see a potential analogy to the buying of small start-up concepts by the web giants which can trigger step change growth in new types of digital services. We are seeing the first forays into this area as established players such as PayPal start to accept Bitcoins¹⁰.

So, as with any new digital service, adoption is likely to move via step changes, either up when critical mass is reached or down when a better alternative (in the consumer's eyes) appears.

What about the challenges?

Whilst cryptocurrencies have many positive aspects, they also create some challenges in terms of their potential for fraud and money laundering. Transfers are not traceable and do not respect borders, which means they are potential vehicles for money laundering. The collapse in 2014 of the Mt. Gox Bitcoin exchange based in Tokyo, Japan, left many unanswered questions including where large volumes of Bitcoins had gone and also sparked fears of fraud¹¹.

Gambling is also a large potential driver for the use of such currencies, enabling people to get around local laws¹². There is also the simple challenge of the availability of suitable electronic wallets to keep the virtual currency safe, both from external access as well as loss of data. These challenges, however, are not unusual and will inevitably generate their own solutions from the growing industry of start-ups focused on the opportunity.

So what do we do about this new world of virtual currencies?

Cryptocurrencies have many of the characteristics of a precious metal based coinage with a form of inherent value, rather than a government-backed currency used for trading of value. The decentralized model for the creation and control of the cryptocurrencies means that they are a disruptive influence on traditional currencies as they are not easily subject to central control.

Their alignment to the rapid growth of the consumer use of electronic purchase and electronic wallets, as well as their basis in the core principles of the Internet, means that they are likely to have a significant impact on our existing currency and exchange models.

The rapid evolution of capabilities and use cases for cryptocurrencies creates a number of opportunities and threats for existing financial institutions and governments. Now is the time to consider potential scenarios in which these use cases can be embraced as once change happens it could be extremely rapid.

9 News - Treasury is looking for inputs on what to do with Bitcoins
<http://t.co/LTMAhOzQEB>

10 News - PayPal to accept Bitcoin - <http://www.theguardian.com/technology/2014/sep/11/paypal-bitcoin-brintree-overstock-reddit>

11 The Inside Story of Mt. Gox, Bitcoin's \$460 Million Disaster | WIRED
<http://www.wired.com/2014/03/bitcoin-exchange/>

12 News - Gambling drives Bitcoin transactions (<http://arstechnica.com/business/2013/08/firm-says-online-gambling-accounts-for-almost-half-of-all-bitcoin-transactions/>)

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