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## Cryptocurrencies

### Oxford Analytica Conference Call summary

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G20 finance ministers and central bankers are meeting in Argentina this week. Cryptocurrencies are high on their agenda and the question of whether and how they should be regulated. Some governments see only peril, fraud, scams, money laundering and financing terrorism. Others see tremendous potential in the underlying blockchain technology and the promise it holds for financial products and services. Where does the balance lie between regulating this new financial Wild West and not stifling innovation? The question is becoming urgent. Institutional and retail participation is expanding. Russia and Venezuela are adopting cryptocurrencies to avoid sanctions. The United States yesterday banned dealing in Venezuela's Petro cryptocurrency. Billions of dollars are being raised by initial coin offerings (ICOs) and many are failing. Many sectors are exploring opportunities to use the decentralised blockchain technology.

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### Cryptocurrencies are attracting huge attention

2017 was a key year for cryptocurrencies as an asset class with the market capitalisation peaking at 500 billion dollars (currently at around 300 billion dollars). The volatility reflects the lack of long-term views among retail investors. The fast growth is leading to interest from banks and institutional investors. The first ICO was in 2013 and between 2014 and 2016 the amount raised from ICOs was less than 100 million dollars. In 2017, 3.8 billion dollars was raised although some of these have already failed.

In 1995, the market was lukewarm to technology stocks and had reservations about valuation. People struggled to value Amazon. Over time people will gain a better understanding of how to value these assets. From the perspective of the retail investor the main concern is the vulnerability to the risk of an ICO scam or from thefts from an exchange as there is no central custodian. There have been several hacks of exchanges in Asia, the United States and the United Kingdom over the last five years.

Banks, institutional investors and the major technology firms are waiting to hear what regulators will do before investing.

We have been through three phases. The first phase was the 'believers' between 2008 and 2013 when people interested in the technology built a system to share data. In 2013 the public first heard about bitcoin and blockchain. Between 2013 and 2016 investors including high net worth individuals and family offices took bets on the new technology. In 2017 retail investors led the price gains.

This differs from other bubbles as the major banks and fund managers are not yet invested. We are far from the 3 trillion dollars invested in the technology bubble of 2001. Regulators, banks and fund managers understand the risks of this asset class. The next phase will be new regulation, investment from banks and fund managers and then mass adoption on the retail side.

### Main risks and opportunities

Governments will increasingly regulate but not over-regulate cryptocurrencies. Governments understand the competitive advantages that exist in the development of cryptocurrency services and they want to capture some of them in their jurisdictions. We have seen examples of a cautious approach towards regulation. For example, the UK Financial Conduct Authority has announced that it is launching a global financial technologies (fintech) regulatory pilot programme after the successful outcome of their UK pilot programme that will allow fintech innovation without strict testing regulation. Japan designated bitcoin as a legal currency last year, contrasting with the sentiment among the broader G20.

A crisis in the fiat currency in some nations will drive government and the public to adopt cryptocurrencies. Zimbabwe is already an example -- even with a fall of 65% in the price of bitcoin in the last few months -- it still offers relative stability in that country given the inflation rate of over 1,000%.

Governments will use cryptocurrencies to transact with each other secretly. This is an important purpose of Venezuela's Petro cryptocurrency because it helps the heavily sanctioned government circumvent some of these sanctions.

The Chinese authorities are laying the ground for a national coin or blockchain environment that the authorities can control. The authorities have cracked down on cryptocurrency exchanges and miners. Nonetheless, around 80% of the bitcoin computing power is concentrated in Chinese mining farms and we will not see China's presence in the market decrease significantly.

Within 12-18 months, possibly sooner, about nine out of ten types of coin will disappear. They may still be traded but they will have near zero value. Most of these types, and there are about 1,500 of them, should not have been created as they lack a credible case for use. New types of coin will emerge but only a small number will have credible cases for use.

Satoshi Nakamoto, the author or group of authors who published the paper in 2008 laying out the basic principles for the blockchain technology on which the bitcoin protocol is based, will be awarded the Nobel prize in economics, the first time that the prize will be awarded to an anonymous person.

### **The approach of the authorities to cryptocurrencies**

A currency is an asset, but an asset is not a currency. Mark Carney of the Bank of England talks about crypto assets. Currencies have three characteristics: firstly they are mediums of exchange, secondly they are stores of value and thirdly they are units of account. For example a flat in central London is a store of value but it is not a unit of account or a medium of exchange. Gold before 1914 was similar to cryptocurrencies in that it was mined in limited quantities, but it did meet all three characteristics. Cryptocurrencies are currently mainly a store of value, the exchange is illiquid and priced as a unit of account they are highly volatile.

There are fundamental differences in how central bankers and regulators are approaching crypto assets, revolving around three questions.

- Should cryptocurrencies be allowed to operate only within the regulated banking system? Here there are two approaches: many central bankers in emerging markets and also Andrea Enria, the chair of the European banking authority, do not want to let cryptocurrencies into the regulated banking system but believe that they should be lightly regulated outside the conventional financial system. The position of Japan, the United States and the United Kingdom is to let them in but regulate them tightly. The chairman of the Commodity Futures Trading Commission (CFTC) in the United States has told the Senate that he is in favour of federal regulation of cryptocurrencies and is against self-regulation.
- How seriously should we take the historic association of crime with cryptocurrencies? About half of bitcoin holdings and about 20% of transactions are linked to crime but 80% are not. Anti-money-laundering legislation will be expanded and enhanced to include cryptocurrencies in many jurisdictions. Wallets will need to be regulated as there is no third-party custodian in these currencies which users can revert to.
- Central bankers worry what could happen to the financial system if regulated banks are weakened by the new technologies. This is not comparable to replacing black cab drivers in London by an application. It is completely different to transform the financial system because this sector -- if something goes wrong -- has the capacity to wreak havoc on the global economy, which we saw in the global financial crisis ten years ago.

### **Emerging markets and advanced markets**

Cryptocurrencies are more likely to flourish in emerging markets than in developed markets.

Regulations prevent interest rates moving freely in many emerging markets. In Kenya there are central bank regulations on how much interest can be earned and how much interest can be paid on bank deposits, making ICO offerings in Kenya attractive.

In many countries, trust in the local currency is weak. There are many semi-dollarised economies where the dollar circulates alongside the local currency. Angola is one, Azerbaijan another. Commodity exporters are particularly prone to this.

Central bankers might argue that the banks provide credit to the economy, but banks do not provide venture capital to businesses in emerging markets. They buy government debt, handle currency transactions and make personal loans.

In emerging markets, the arguments for protecting the banks are weaker while in the developed markets the arguments are stronger.

### **Cybercrime and the pace of technological advance**

Exchanges which trade bitcoin into fiat currencies and other cryptocurrencies have been hacked and hundreds of millions of dollars lost. This will get worse as some exchanges are in an early stage of development and vulnerable to cyber threats. This will have a significant negative impact on the price of the coins affected.

The security of the exchanges is very different from the security of the blockchain ledger itself. Although many cryptocurrency exchanges have been hacked, the bitcoin ledger has never been hacked and is proving to be very resilient. To take possession of bitcoin's blockchain ledger an entity would have to gain control of more than 50% of the computing power, which would be extremely difficult to do. Additionally, the cryptographic protocols securing decentralised ledgers such as the bitcoin ledger are highly sophisticated compared to current hacking tools.

### **Quantum computing**

One thing to watch out for is the advent of quantum computing. It is impossible to predict when this will be -- it could be five years, it could be 30 years -- but it will significantly increase the processing power of the hackers who possess this technology and therefore will threaten current cryptographic protocols. It is something governments and other interested parties should start to plan for.

### **Energy usage concerns**

There is concern about the energy consumption of bitcoin and other proof-of-work cryptocurrencies, but you could equally ask how much energy is used by the traditional paper-based fiat currency when printing and distribution costs are considered.

### **How much is blockchain technology over-hyped?**

There is a misunderstanding that blockchain is a technology that can do anything and will save the world. There are two key features:

- Everything on the ledger is traceable, which is not possible with an Excel spreadsheet or any classic database. One of the most transformative aspects is that it allows users who do not trust each other to transact with each other and it can be independently validated. Even if you assume that each user in the network distrusts all others, it still allows you to achieve trust and validation of transactions in a completely decentralised and distributed environment.
- You do need to have a central party to share information. With blockchain the consensus ensures security and data is not shared through a central technology. When bitcoin appeared in 2013 many people looked but it was not adopted broadly in the West. Today there is a lot of interest in crypto assets and decentralisation but further research needs to be done.

It is important to distinguish bitcoin from the concept of blockchain more generally. In much of the public perception bitcoin and blockchain are often considered to mean the same thing and the terms are sometimes used in incorrectly.

Bitcoin, in some respects, has been over-hyped although it may prove to have a long-term purpose as a store of value. We have yet to see some of the most important and transformative applications of blockchain technology. These applications will emerge in coming years. The vast majority of companies that use blockchain today could be described as 'Napsters' using an analogy from the early phase of the social internet. There may be an Amazon or a Google already lurking.

**What are the blockchain applications that we have yet to see?**

Blockchain technology has huge potential for data security if a cryptographically secure protocol system can be developed to validate information such as health records, land registries and even voting outcomes. This would solve a major problem of data integrity which governments across the world face. Interestingly these are blockchain applications that do not require the use of coins.

**Other cryptocurrencies**

Bitcoin is the first blockchain proof of concept and it is not clear if it will be a winner. The ripple payment protocol is quicker and faster, but it is 97% owned by San Francisco-based Ripple, raising trust concerns as the firm could go bankrupt. Monero and Z-cash offer more privacy. Anyone can see transactions on the bitcoin blockchain as it is an open ledger.

**Payment system potential**

People have tried to find a way to avoid cross-border fees and to make quicker transactions. Many transactions done by current payment providers are quicker than the payment systems on blockchain which is not yet fully developed:

- The number of transactions one can do on a blockchain ledger is very small at 15 transactions per minute; Visa or Mastercard can handle millions of transactions per minute.
- Bitcoin fees are about 2 pounds per transaction, for a retailer the cost of using cash is 1.5 pence, card payments are 8 pence and online payments 19 pence.
- The Visa system processes about 65,000 transactions per second while Bitcoin processes about seven. The Visa system is also more energy-efficient.

Some central banks are exploring cryptocurrencies as a replacement for cash so that everyone would have access to the same real time gross settlement system, allowing simultaneous settlements of debits and credits. There would not be a private bitcoin but a public bitcoin that would be issued by a central bank nationally, for example the Swedish Riksbank. This is attracting central banks as their real-time gross settlements systems need maintenance and upgrading, particularly for settlements across exchanges.

We are likely to hear a lot more about central bank cryptocurrencies but there is no prospect of anyone making any money out of it because it would simply be an expansion of fiat currencies inside a single economy.

There are limitations in this application. National cryptocurrencies could speed up the global payments and settlement process. Government-backed and possibly central-bank-supported cryptocurrencies will emerge and they will have positive effects, but they will not be able to solve or alleviate the liquidity problem. Even in a future scenario in which every nation in the world has a national cryptocurrency -- if a bank wants to transact internationally it will still have to lock up trillions of dollars in so-called 'escrow' or transaction accounts, which are estimated to hold about 27 trillion dollars. National cryptocurrencies would still leave the global monetary system highly fragmented although there are some companies trying to solve this.

**Competing currencies?**

There is no problem having competing currencies inside an economy. When former UK finance minister Gordon Brown was discussing whether the United Kingdom should join the euro one of the ideas was that the euro should circulate freely with sterling in the economy. In Angola the dollar and the Angolan currency are used interchangeably. Central banks are not considering a global cryptocurrency. Policy makers will draw the line at the dollar effectively being replaced as a global currency by a privately produced currency.

**Is the crypto 'bubble' similar to the 2008 housing market bubble?**

There is no comparison because a house is a physical asset. Nothing is underpinning bitcoin except its acceptance by other people. There is an analogy with the failure of the US movement to use free silver as an alternative to gold in the late nineteenth century. Bitcoin has no underlying value.

The comparison with the global financial crisis is more of a disanalogy than an analogy.

There is a huge difference in scale. The 2008 crash was possible because the derivatives market represented a large portion of the global financial market and this impacted national economies. One of the most recent and credible reports indicated that a severe crash in the current cryptocurrency market could affect at most 1.0% of global GDP. The comparison is not very relevant as cryptocurrency market capitalisation remains below 1 trillion dollars. As this increases to several trillions of dollars over time then the analogy with the 2008 crisis will become more relevant.

How governments and authorities will deal with a major crash will also be different. In the case of conventional market crashes governments have instruments to use including quantitative easing. If there is a major crash in the cryptocurrency market, some of the centralised instruments will not be available precisely because these cryptocurrencies are decentralised, so the authorities would not be able to mitigate the damage even if they wished to. Central banks could purchase cryptocurrencies to stop a crash but there are no signs yet that governments would be willing to do that.

**Comparison with gold**

Gold was abandoned as a form of currency in the Great Depression nearly 100 years ago. Gold's limited supply meant regular periods of declining prices -- driving producer prices lower and interest payments on debt higher -- devastating holders of debt. Under the Bretton Woods Agreement inflation could be controlled by the dollar. The maximum bitcoin supply is set at 21 million and the ceiling is expected to be reached by 2140. At that point it will become a disinflationary asset. The limited supply is central to bitcoin and if there is going to be a limited supply of cryptocurrencies that will mean declining prices -- with profound implications for the global economy.

**Crypto assets -- adjusting to meet demand?**

Bitcoin is not related to sterling, so it serves as a hedge if the Bank of England was to fail or if there is a 'black swan' event. Other crypto assets give users a voucher with which they can access services. Filecoin, which offers decentralised storage, is paid for by tokens. Each token is valued by the amount of storage provided.

Four purposes of cryptocurrencies can be invoked in the face of scepticism:

- They eliminate intermediaries in the value chain.
- They eliminate central authorities in asset creation as it is governed by the blockchain protocol.
- Cryptocurrencies enable real time and inexpensive transactions -- their original purpose. It is ironic that it is no longer the main purpose.
- They are a store of value; currently this function is replacing the transaction mechanism as the main purpose.

**End state for regulation of crypto assets**

Banking regulation is done from the bottom up on a national basis. There is a division between countries that do not want their banking sectors to be involved in cryptocurrencies, mostly emerging markets but also Europe. The United Kingdom, the United States and Japan are prepared to regulate cryptocurrencies.

There is nothing intrinsically difficult about regulation cryptocurrencies provided regulators have access to the digital wallet. This is similar to the 'know your client' rules in traditional banking. The anonymity will have to be overcome so that the banks can look at the final owner of the asset and this may put people off using them.

The most flexibility is likely to come from the United States, which is where the thrust is coming from, with the United Kingdom tagging along. Japan has already made it clear that this is what it will do.

Europe will struggle for coherence. Switzerland aims to be a leading cryptocurrency nation and friendly regulation is emerging there.

The various approaches will be difficult for international banks to navigate.