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CryptoFinance Insights: Is Bitcoin money?

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We aim to educate investors on the emerging world of Bitcoin and cryptofinance. We partner with a Cryptocurrency expert and investor – Ari Paul. Ari is Managing partner and CIO of BlockTower Capital.

Bitcoin and its underlying blockchain technology has implications on business models across industries, particularly around financial services and payments. However, what we find more interesting is the relative value dynamics this industry is bringing about between (deflationary) virtual currency and (inflationary) fiat currency. Bitcoin now trades at ~US$4,800 per Bitcoin with total market value of ~$80bn. It is worth delving into the very nature and essence of Bitcoin to understand what drives its value. Is it legal tender currency or an asset class comparable to digital gold? Or is it like the 17th Century Tulip Bulbs mania as claimed by those who call it a fraud? As market cap of the crypto tokens increases, does it have monetary policy, regulatory and geo-political implications? Would Wall street allocate money to Crypto assets?

As we spent time understanding Bitcoin, we always came back to this tweet by one of the Bitcoin core developers:

"First step to understanding Bitcoin: Admitting you don't understand Bitcoin.
Final step: Realizing that "understanding" is a moving target."

— Jameson Lopp (@lopp) February 8, 2017

In this note, we start with the most basic question – Is Bitcoin money?

Do we understand money?

To answer the question whether Bitcoin is money, we need to first understand money. Our attempt to explain Bitcoin is necessarily constrained by our own conditioning and understanding of the world we grew up in. The broad narrative we have been taught is 'first there was barter and then came currency to make it more efficient'. We have always seen governments or monarchies issue currency with faces of Monarchs embossed on them. Understanding money backwards from today is a failed exercise to start with because our understanding of money is overly obsessed with its current physical form and its authority from the sovereign state. As we go through the idea behind money, we will highlight a few characteristics so that they can be compared with the big ideas behind Bitcoin.

Economic exchange did not wait for currency

The genesis of money lies in the concept of credit. Money before coinage was simply 'I owe you dues' (IOU) which would be tracked using simple accounting records. The accounting method could be simple records, tally sticks, stone markings.

Economic exchange did not wait for coinage. People went about trade – they just recorded the value in rudimentary but effective forms of record keeping. Coinage and standardized currency came in much later.

For example, if A, a producer of wheat sold 1 kg of wheat to B. Suppose, B was a producer of oranges. The accounting records would just keep track that B owes A, but not necessarily A would have to accept oranges in return. A is just assured that when he needs something, B would return the favour (in oranges or not).

Literacy, numeracy and accounting was invented before money. Money was always imaginary (using a ledger) before we made it physical with coins and notes. This single big idea about money, carries the maximum freight to explain the current phenomenon of virtual currencies which are simply decentralized ledgers secured using cryptography.

EXHIBIT 1: **Is the conventional history of money just convenient logic?**

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History of money as taught by textbooks	
Specialisation of labour ↓	….but needs are wider than what you produce
Barter ↓	….inefficent as needs don't coincide
Currency/coinage ↓	….as medium of exchange, standardised
Bank money	….multiplied money in the system
History of money discovered by anthropologists	
Clearing & accounting systems ↓	….as societies still traded by keeping accounts of dues
Convenient money (salt, sugar, dried cod) ↓	…. Using acceptable items of common use
Metals as money ↓	…..as metals durable, portable, divisible for long distance trade
Coinage ↓	…attempt to standardize, universal value
Bank money	….with original function as account clearing between merchants

Source: Money: The Unauthorized Biography (Felix Martin); Debt: The First 5,000 Years (David Graeber), Bernstein analysis

Credit and clearing systems existed before cash currency

People engaged in trade without barter and even before coinage. All they needed was a simple method of maintaining accounts between parties - a simple system of IOUs. History is replete with unique methods being used to keep tally accounts in form of what we call a modern-day ledger. The ledger could be maintained as markings on stones, wooden sticks, or even markings on a wall or even large immovable stones which have value attributed in form of credit (see Exhibit 2)

The system of IOUs have also been prevalent during recent periods. When the Irish banks shut down for 6 months in 1970, the economy survived on a system of private cheques /IOU shouldered by neighborhood pubs. For 6 months, what worked was a personalized credit system without any definite time horizon for eventual clearance of debits and credits. In fact, even during recent demonetization in India in 2016, we heard anecdotes of goodwill ledgers beings used by businessmen to settle accounts and continue trading.

In many cases, the stone could be immovable but everyone would still attribute credit to its rightful owner. (Stone used in Yap Island in Exhibit 2). The coins and currency are mere tokens to record the underlying system of credit and clearing. **Currency is only cosmetic; it is the underlying system of credit and clearing that is fundamental foundation of money.** Money in the museums has always been shown in form of ancient coins in copper, gold and silver. This vivid image of money has over emphasized the token/the currency and not the underlying mechanism around it. **If money was displayed in the museums as an old ledger, it probably would not be as interesting to look at.**

EXHIBIT 2: **Stone used in Yap Island for recording dues**

Source: Wikimedia Commons

The myth of barter

The notion of barter evolving to money was a convenient assumption for thinkers and economists. People did not really try to exchange chickens for wheat because there were no matching engines back then to solve the double coincidence of needs. Instead, people starting storing goods of common use (e.g. salt) which everyone else finds useful and hence, commodities such as salt, sugar became convenient alternates to currency. History is filled with cases of salt, dried cod, sugar, hides, even nails being used as currency. **Thus, currency in simple terms is something the society believes in to be acceptable universally.**

Currency evolved to metals for long distance trading as metals are **durable, portable and divisible**. Coinage was merely the process of standardizing and stamping the metals to be of designated weight and size.

Monetization, universal value and creation of markets

For markets to function, there has to be a shared unit of economic value so that participants know the language of negotiation. Then came the process of tokenizing the coins with standard attributed value (initial coins were just standard weight silver, but issued coins were for example 100 drachmas). Universal economic value is just a universal language to discuss the value of anything. Through this process of monetization, emerged the concept of 'market' as the organized principle of prices and the language to express ambition, greed, and entrepreneurship.

Transferability and negotiability

Money is credit due (IOU) but it needs to be transferrable credit. Money has value, when you expect others to accept it. It needs to be transferable in an open market. Thus, for any party to accept an IOU, there should be trust that any third party will be willing to accept the IOU i.e. there is a liquid market for it to be transferable. Thus, appeared bank money. Banks in their early forms became clearing house of debt between merchants.

Onset of bank money with trust being reposed in centralized banks

Banks first started as merchant clearing houses. Once a bank had endorsed the credit/IOU, it would become transferable in the market based on the faith in the large clearing houses. In simple terms, Banks could issue IOU to depositors and receive IOU in form of receivables. We look at banks as lending organisations today, but banks' original function was this clearing function.

Role of the sovereign state

As we have seen by now, money is a system of credit, that is liquid, transferable and trustless. Sovereign states became more important, maintaining large armies, protecting societies and thereafter provision of public goods and services against which they would collect taxes. Sovereign governments (regardless of form) became a significant part of the national output and thus largest source of payments in the economy.

This economic prominence of the sovereign state only meant that money issued by the sovereign facilitated the trustless, liquid market where the citizens would trust the money issued by sovereign. Today, we assume that currency needs to be issued by the sovereign state; however, it is not the sovereign stamp, but the trust and universal acceptability feature that gives currency its value.

Money, as we understand now has the following core functionalities:

+ Credit clearing mechanism or a simple ledger (often maintained by banks and intermediaries in modern times)
+ Portable, durable, divisible
+ Transferable, trust and faith (often comes from the sovereign endorsement)

Standard universal value (though politics/economics/monetary policy has often impacted value of money by inflating (printing) /deflating money)

Bitcoin: Can you create value from thin air?

Cryptocurrency (e.g. Bitcoin) is best understood in form of 3 layers:

+ **Blockchain (ledger and clearing systems)**
+ **Protocol (crypto based monetary policy and incentives establishing trustless network)**
+ **Tokens (Portable, durable, divisible, transferable)**

Blockchain – the ledger and clearing systems

The blockchain is a shared ledger, which keeps a permanent, immutable record of digital transactions. The ledger is decentralized i.e. a copy of the ledger is maintained across multiple computers across the globe. The Computer nodes are called miners; it would be easy to think of them as book-keepers who verify the transactions and agree on the state of the ledger that needs to be carried forward. For performing the ledger verification service or the bookkeeping services, they are rewarded in Bitcoins (also called mining Bitcoins).

The protocol – the new crypto based monetary policy

Protocol is a set of rules that nodes in a network use to transmit information. Transmission control protocol (TCP) is the set of rules to exchange information packets on the internet. The Internet protocol (IP) is the set of rules to exchange messages at the internet address level.

In the context of blockchains and particularly Bitcoin, because the information is a form of digital financial transaction, the protocol becomes a set of rules to govern the identity, security, economic incentives of the digital transactions on the Bitcoin network. The identity and security of the transactions and the ledger is established through cryptography both at the account holder level (through public/private key crypto rules) and at the level of Miners/book-keepers to maintain security and authenticity of the ledger – simple to build consensus on the state of the ledger. These set of crypto-economic rules could be seen as the new monetary policy. Further, the Bitcoin blockchain is so designed that the supply is capped at 21 million bitcoins (with the maximum supply reached in the year 2140). There are currently ~16.6 million bitcoins with an exponentially decreasing inflation rate – thus the bitcoin protocol is considered to be deflationary in nature.

The trust, security and transferability of the Bitcoin come from the set of crypto-economic rules that are part of the Bitcoin protocol. It clearly obviates the need of a central authority to validate transactions centrally.

Tokens are like bearer cash

The token native to the Bitcoin blockchain network is called Bitcoin. Other blockchains can have their own tokens e.g. Ether is the intrinsic token to the Ethereum blockchain network. Tokens are used as economic incentives/disincentives to reward the miners / users as part of the network.

The Bitcoin token is divisible to the 8th decimal. It functions as bearer cash. You just need to know the public address of the receiver to send it – it is permission-less just like how cash currency is in the physical world. If you want to buy anything off the shelf, you just need to hand over the cash. Similarly, to transfer Bitcoin, you just need to know the public address of the receiver. The white paper on Bitcoin by Satoshi Nakamoto (unidentified individual or a group) refers to Bitcoin as electronic peer to peer cash. It intends to build a mechanism to make payments over a communication channel (just like we send information on the internet) without a centralized trusted third party.

Governance issues in absence of central authority

To change or upgrade the Bitcoin network software sometimes requires a "hard fork." A hard fork is a change in the network protocol that renders it incompatible with older versions of the software. A hard fork may be uncontentious and viewed as a welcome software upgrade by the entire community, or it may be contentious. In a contentious hard fork, some people running Bitcoin software may install new incompatible software, while others remain on the old network; this can result in two competing blockchains that are "forks" of the previous chain. On August 1st, Bitcoin forked into Bitcoin and "Bitcoin Cash." In November, there may be another fork in which there may be two blockchains each claiming to be "Bitcoin." Some investors fear this could produce confusion and hurt investor confidence, while others see it as the cost of decentralized governance.

While, it emerges that Bitcoin does share some of the core functionalities of money – secure clearing mechanism, divisible, portable, transferable, secure and trustworthy (crypto-economic rules), the most intriguing part is its value? How do we know it is worth ~$4,800 as it stands today?

What gives bitcoin value?

It's tempting to value Bitcoin relative to companies or commodities with related value propositions. The value of top 4 global payment networks aggregates to ~$550 bn; the world's gold supply is worth roughly $7 trillion vs. Bitcoin's market cap of ~$76 bn. While these comparisons are useful starting points, they fall short.

Monetary transmission or a new economy?

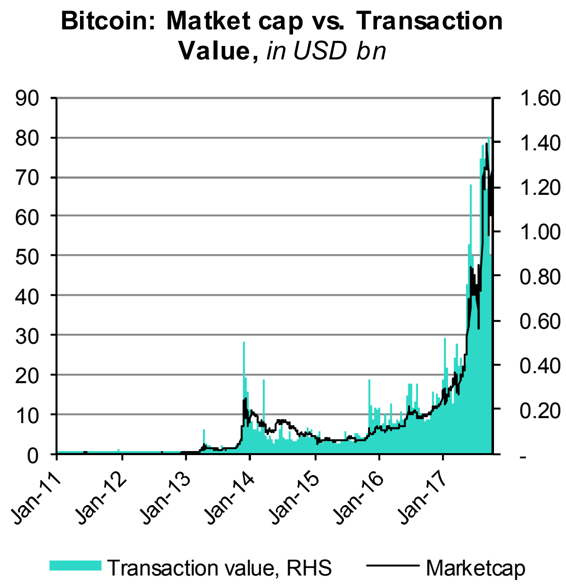
Some of Bitcoin's value does indeed come from its usefulness for payments or monetary transfer. Early advocates of Bitcoin suggested it would be adopted by merchants to avoid chargebacks, or that it would displace traditional money transfer services by providing cheaper and faster remittances. Bitcoin currently allows the user to transfer large amounts of money in about 10 minutes for about $2, an attractive alternative to wire transfers or international remittance services. However, nothing prevents existing financial institutions from offering even faster and cheaper transmission services. Bitcoin is valuable in this regard only for "censorship resistance." Payment networks can block payments to a particular company for example and bank regulators can ban wire transfers to a particular country or company. In contrast, it is near impossible to prevent an owner of bitcoins from transferring them to a third party of their choice.

In fact, Bitcoin could be seen as virtual 'bearer cash' economy supported by a decentralized 'trustless' network – a new crypto economy with its own protocol or policy. The faith of its citizens– software developers, miners, investors, early individual and sovereign state adopters would drive the value of that network.

The value of the new economic network can be related to the transactions in the network as reflected in Exhibits 3 to 4

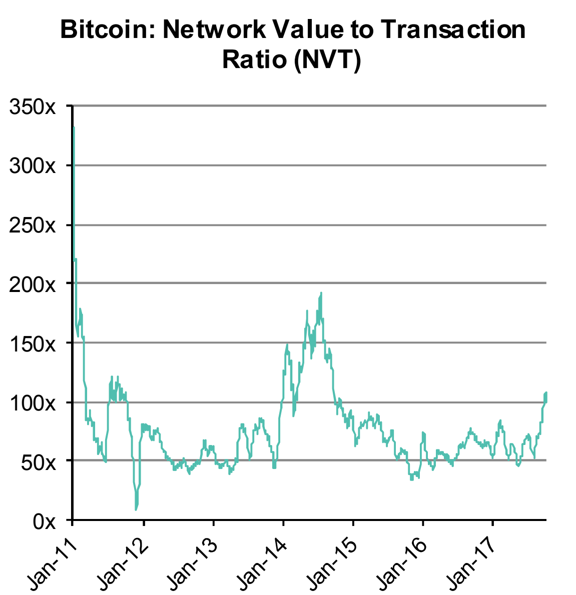
Bitcoin could fluctuate daily (as high as 5-10% per day) for it to be stable money, although it is in its early days. Fiat money is still the final form of settlement – governments still collect taxes in fiat money and salaries are still paid in fiat money. Thus, for now Bitcoin has only emerged as a 'censorship resistant' asset class. We will delve deeper into Bitcoin and its cryptographic cousins in the coming editions.

EXHIBIT 3: **Evolution of Bitcoin in terms of its market value and processed transaction value**



Note: Estimated USD transaction value taken from Blockchain.info
Source: Willy Woo, Chris Burniske, Blockchain.info, Bernstein analysis

EXHIBIT 4: **Bitcoin Network Value to Transaction ratio**



Note: The above ratio has been smoothed
Source: Willy Woo, Chris Burniske, Blockchain.info, Bernstein analysis

DISCLOSURE APPENDIX

TICKER TABLE

Ticker	Rating		9 Oct 2017 Closing Price	Target Price	TTM Rel. Perf.		EPS Reported 2017A	EPS Reported 2018E	EPS Reported 2019E	P/E Reported 2017A	P/E Reported 2018E	P/E Reported 2019E
HDFCB.IN	O	INR	1,795.50	2,430.00	21.3%	INR	59.16	71.98	89.11	30.35	24.94	20.15
MXAPJ			538.87				30.59	37.14	40.86	17.61	14.51	13.19

O - Outperform, M - Market-Perform, U - Underperform, N – Not Rated

MXAPJ base year is 2016;.

VALUATION METHODOLOGY

India Financials

India is a growth market and investors generally seek growth-based returns in India. We believe all banks in India trade on what market believes as the sustainable earnings growth momentum. Banks that have sustained cross-cycle earnings growth despite sector asset quality concerns trade at a premium. On the other hand, banks that have been inconsistent in earnings growth get penalized by the market until they build investor confidence again. We value our coverage on a target P/E multiple based on one year forward earnings calibrated by trading history and our expectation of three-year sustainable earnings growth. We use a one-year forward multiple based on FY'19 earnings to arrive at FY'18 end target price. We corroborate our target price earnings multiples with a P/BV based multiple as a secondary check. We also believe the market can be brutal with growth stocks if the growth story shows any structural weakness and thus we constantly stress-test for structural growth weakness across our industry and company investment thesis. This methodology works for banks under NPL stress too as we expect earnings to largely normalize by FY'19

RISKS

HDFC Bank Ltd

+ HDFCB faces significant margin pressure beyond our expectations in line with industry trends
+ HDFCB is unable to drive operating leverage and scale across its retail lending business to enable significant costs savings in operating expenditure
+ HDFCB has to meaningfully slow down credit cards and personal loan book growth due to unexpected risk concerns

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12-Month Rating History as of 10/10/2017

Ticker	Rating Changes
HDFCB.IN	O (IC) 11/16/16

Rating Guide: O - Outperform, M - Market-Perform, U - Underperform, N - Not Rated
Rating Actions: IC - Initiated Coverage, DC - Dropped Coverage, RC - Rating Change

HDFCB.IN / HDFC Bank Ltd

Date	Rating	Target(INR)
11/16/16	O(IC)	1510.00
08/24/17	O	2430.00

IC - Initiated Coverage

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