BTC in China: a New Value Chain in China
November 14th, 2013

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Bitcoin and Hedging Strategy against Volatility Risk

Since the publication of "Bitcoin: A peer-to-peer electronic cash system" by Satoshi Nakamoto in 2009, the bitcoin economy has flourished with a few key advantages against the modern world currencies. Some of the advantages includes, but not limited to:

1. Completely open transaction history;
2. No transaction fees;
3. Relative anonymity

Those advantages are well-known and built into the bitcoin system as the author Nakamoto pointed out that, "To accomplish this [prevention of double-spending] without a trusted party, transactions must be publicly announced, and we need a system for participants to agree on a single history of the order in which they were received. The payee needs proof that at the time of each transaction, the majority of nodes agreed it was the first received."

Then came the bitcoin. The amazing payment system that reduces the transaction cost to zero and keeping the transaction in the open is certainly sounding the death troll for the financial industry, who even at this time impose huge fees for overseas money orders and there lies the intrinsic problem of them all: the sovereignty issue of independent nations. China, in particular, does not welcome foreign direct investment due to nationally-owned financial systems and interestingly enough, it is also where most bitcoin transaction activities are observed.

So the question is whether or not bitcoin is the trend we are going to be seeing looking forward?

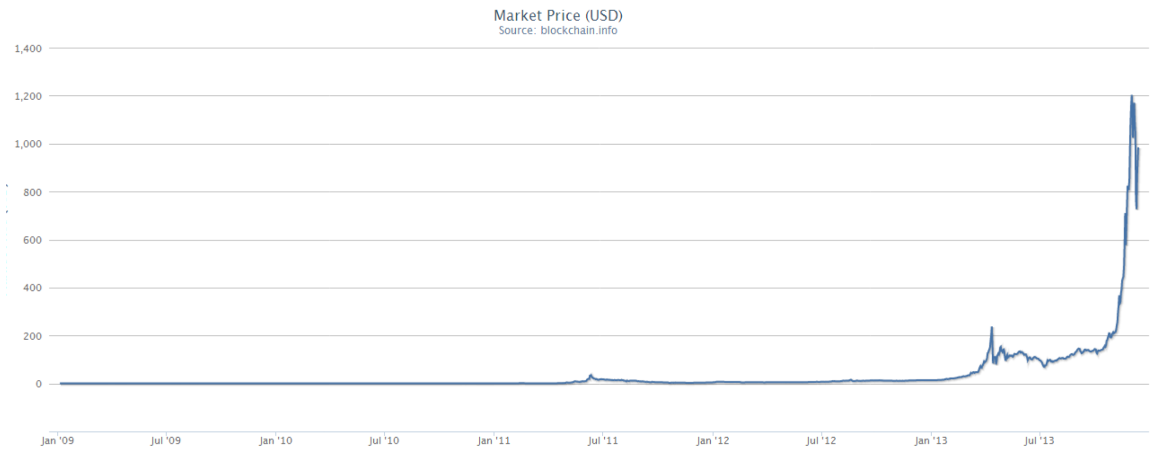


Table 1: Bitcoin Exchange rate with USD since Jan 09 till now

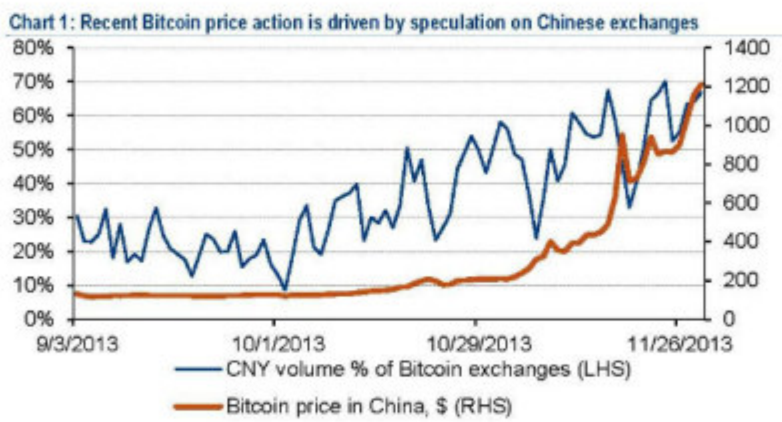
Although launched in January 2009, the momentum for Bitcoins only picked much since earlier this year. As Bobby Lee, Co-Founder & CEO of BTC China, the final speaker for the EE402A fall seminar series pointed out, there have been times of big boom and bust related to bitcoins, and every single time, virtual currency is able to come back and go even further. The highlight comes around October when there has was a surge of bitcoin's value from 190 USD to 1200 USD and everything is indicative of a big bubble.

With such a clever algorithm, bitcoins now only supplies 12 million coins and there will be another 9 million to be mined before it saturates in 2140. There mechanism that is built into the coin will halve the mining rate by half every 4 years and due to the large amount of public transaction created that naturally increase the hash key, it becomes increasingly difficult to mine bitcoins without machines with high computing power. Unlike the tulip bulb bubble in the 17^{th} century or the hyperinflation scenario plaguing Zimbabwe, bitcoin mania is unlike any of these because of the intrinsic value of the coin itself, that is, to eliminate transaction cost, to make all transactions transparent and relative anonymity of the user.

So does that warrant the validity of bitcoins traded as a storage of value?
The big question that is surrounding the currency market for bitcoins is how to valuate this currency and whether investors should come in with a long or short position and for how long. Value investors in bitcoin probably look at the upside as the storage of value while many short-term investors normally come in at the trough and sell the coin when it climbs up again. This is exactly what we have observed after the bitcoin climb up to 1200 USDs in November this year; many investors switch out of bitcoin markets to the gold market to seek a safe haven and causing the market to drop back down to 1000 USD.

Although these signals for choosing investment strategy might be vague at first, the discussion of the intrinsic value of the coin is necessary to understand where the investment signals come from and how to invest when the next one comes. The intrinsic disadvantage of the coin lies in its very volatility. As a currency vehicle, large fluctuation of its price indicates a lack of confidence in the currency and therefore, the demand is largely driven by news and by people's expectation of the future value of the coin or the market. Therefore, as we see, many news items surrounding the coin would cause it to increase or decrease value tremendously just like on December 5th, when the Chinese government announced that they are not going to support the validity of the currency, it turned out that the price of the bitcoin dropped to 600 USD.

In this paper, we would like to explore some ways to invest in bitcoin and given the large volatility, we would like to explore a way to hedge against such a risk. We are also going to valuate the bitcoin to reflect the true price and if that could be observed in the future, any price above the intrinsic value would be a call to go short on the currency,



The above graph sets the bottom line for our discussion: there is intrinsic value to the bitcoin. As the transaction volume of bitcoin fluctuates in China wildly, the price of the bitcoin is steadily increasing. It can be argued that the price increase of the bitcoin is not solely due to the expectation of the bitcoin economy alone, there are definitely other factors with it.

Then we try to valuate this value pegged against that of ecommerce. The reason thus far is that one area of bitcoin uses is in the ecommerce business, and it has been supported by many brick and mortar stores as well; one of the examples is our very own Stanford Coupa Café at the GSB.

So, assuming that the level of ecommerce is going to grow at the rate where the US economy is going to grow: 3% consistently for the years to come;

- taking bitcoin as a risky foreign currency, like Spain, therefore the risk premium is 5.8% and the country default spread is 8.8%;
- US 12 month bond rate is 0.13% with a market beta of 1.2;
- The Bitcoin discount rate is 0.13%+1.2(5.8%)+8.8%=15.9%;
- the current ecommerce market size is 220 billion as of 2012;
- 5% of the future e-commerce transactions will be carried out by bitcoins;
- US accounts for ¼ of the world's economy;
- By the time of 2140, the bitcoin will reach satuation of 21million coins in total
  A very back-of-the-envelope calculation will show that the total market size for bitcoins at 2140 will be:
  220billion*5%*(1+3%)/(15.9%-3%)/21million*4 = 16,730 USD

  In a way, if the assumptions are right, bitcoins will shoot up to 16,730 USD in the future.

  So this is a clear signal to hoard bitcoins to maturity to 100 years later. The model above prices a very high risk factor into the currency but the value of bitcoin is only going to increase further if less risk is built in.

  So to hedge away the risk, I propose the following mechanism:

1. Divide 1 billion of RMB into 2 parts equally;
2. Invest half into the Chinese BTC Exchange into Bitcoins;
3. Invest the other half into the US BTC Exchange and buy short on it
4. Wait till a significant event happens that is about to bring in a loss of confidence in investment
5. The price of the Bitcoin is going to increase with the downside covered

It is important to invest in this order as the Chinese market does not allow short-selling on the exchange market. In this order, people could hedge the risk for bitcoin as an investment; however, in order to seek greater investment opportunities, step 4 is important and it could be best if a directly correlated investment event happens.

For example using the establishment of the Chinese Free-Trade zone established in September 29th, 2013, the following graph for bitcoin prices in BTC China is observed as bitcoins are significantly affected by new items:

We could see that the price of bitcoins plummeted after the freetrade zone itself and comes back up about 1 week later to its original levels. At the same time, the graph below showed a stock in Chinese market that is representative of the development of the Free Trade Zone as it has a high stake being the first group of companies moving into the Free Trade Zone. It could be seen that the price starts to increase after the announcement of the Free Trade Zone on 29th September, and then slowly dropping as people start to lose confidence of the Free Trade Zone, exactly 1 week later.

The news item: Free Trade Zone posed an interesting opportunity to invest in bitcoin due to its large volatility and again, due to the short position in the US market, our down side is covered. This situation is one particular point where bitcoin and the Free Trade Zone are closely correlated as they both reduce transaction cost and as the confidence of one goes up, that of the other one will go down. And this is exactly what we have observed in this investment opportunity. And we could earn even more if we use leverage but the point of such an exercise is the Free Trade Zone is probably not very bullish.

In summary, bitcoin poses a great innovation of the current financial industry and many countries are looking at it with great caution. It is still up to the government to promote such a currency if the government sees the need and be careful that any regulation on the currency will most likely destroy its very intrinsic value: no transaction cost. And clearly, this is an international effort to work with each other to determine the future of such a new and interesting system originated by geeks.

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