Bitcoin - the financial system's benign tumour:

An evaluation of the systemic risk posed by cryptocurrencies

[2238 words, excl. references]

INTRODUCTION

On the 1st of November 2008, Satoshi Nakamoto (2008) published a white paper detailing what they described as "a new electronic cash system...". In 2009, with the support of a significant number of people, Nakomoto's idea was implemented. Today Bitcoin is now a worldwide phenomenon and the subject of rigorous debate. Bitcoin's meteoric rise in 2013 made the world take note and led to 2013 being declared 'Year of the Bitcoin' (Christensen, 2013). Since then, many alternative electronic money platforms such as Ethereum and Ripple have emerged and are collectively known as cryptocurrencies.

Given the wide spread enthusiasm towards cryptocurrencies, as well as the contrasting initial and still prevailing scepticism expressed by prominent figures such as Allan Greenspan and Warren Buffet, the potential impact of cryptocurrencies on the global financial system is worth exploring. This essay will argue that, based on the current understanding of the causes of financial crises, cryptocurrencies do not pose a systemic risk. It will first discuss the nature of systematic risk. It will then move to applying what is known about systematic risk to Bitcoin's functions as both a currency and a speculative asset and show that it falls short of posing systemic risk. The aspects of cryptocurrencies examined here are common to all block chain based cryptocurrencies. Bitcoin is the most prominent of such cryptocurrencies and will thus be used as proxy for all the other cryptocurrencies. This essay assumes readers have a basic knowledge of what Bitcoin is and how it works. Little focus will be placed on how decentralized ledger technology (blockchain) works. Focus will be placed on the economic impact of this technology.

SECTION 2: SYSTEMIC RISK

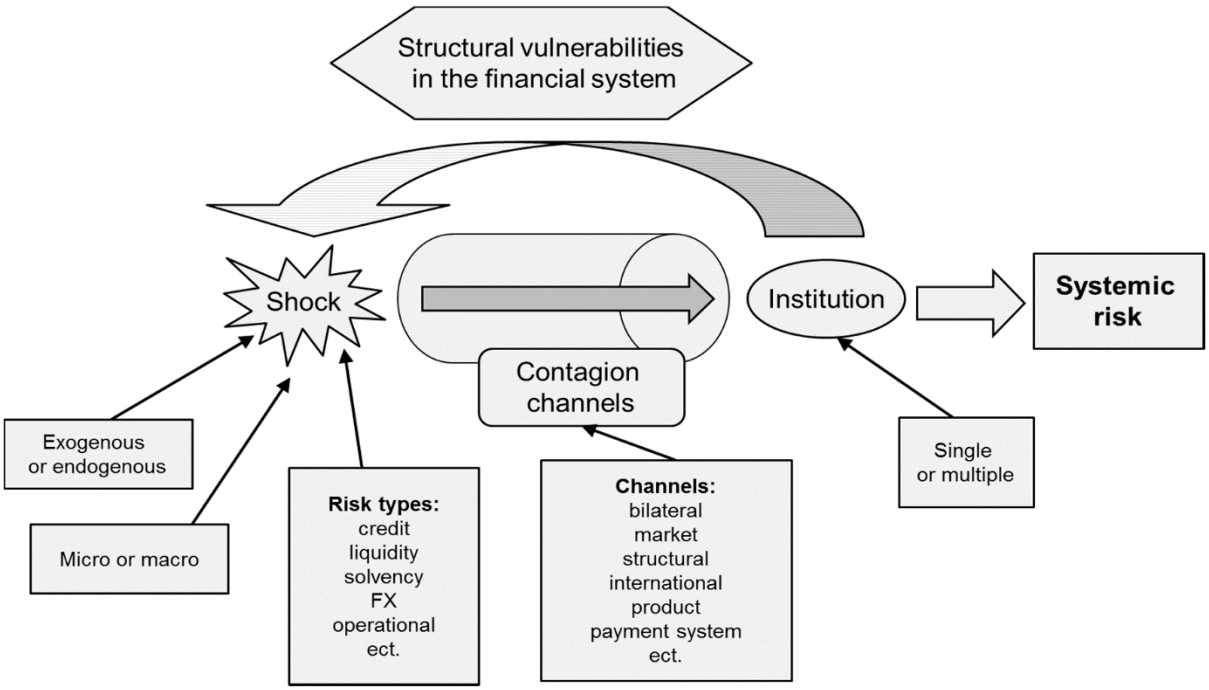
2.1 Defining Systemic Risk

The exact nature of systemic risk is broad and there is no consensus on what constitutes financial stability and systemic risk (Smaga, 2014, p. 2). However, for the purposes of this essay the definition proposed by Pawel Smaga (2014) will be used. It states that systemic risk is the risk that a shock will result in such a significant materialization of macro-financial imbalances that it will spread on a scale impairing the functioning of financial system to the extent that it adversely affects the real economy.

2.2 The mechanics of Systemic Risk

Most of the current literature on systemic risk analyses and draws conclusions from the causes of the 2008 Financial Crisis and the 2001 Dotcom bubble. The study of these previous financial crises has led to different aspect of systemic risk such as imbalances in the economy, information asymmetry, asset bubbles, negative externalities, correlated exposures of financial institutions and the collapse of confidence being identified (Smaga, 2014, p. 3). It is widely emphasized that systemic risk involves many financial institutions or one big part of the financial system disrupting the performance of the financial system and its functions such as intermediation (Smaga, 2014, p. 4). Figure 1 below is a proposed model illustrating how systemic risk works and the various factors involved.

Figure 1: Mechanics of Systemic Risk



Source: (Smaga, 2014, p. 16)

From the above model we can see that systemic risk has four core factors:

1. An initial shock to the system
2. Contagion channels
3. Institutions
4. Structural weaknesses

2.2.1 Initial Shocks

A shock is a single significant event that has a negative effect on the financial system such as a sovereign default or the collapse a systemically important financial institution ('SIFI') e.g. collapse of Lehman Brothers in 2008. Shocks can be idiosyncratic, start off only affecting the health of one institution or financial asset, or systemic, affecting all or many financial institutions simultaneously (De Bandt & Hartmann, 1999, p. 42).

2.2.2 Contagion channels

A contagion is the mechanism/pathway through which systemic risk materializes and spreads throughout the financial system (Smaga, 2014, p. 19). These can range from market based channels to structural channels. An example of a market based channel is the change in behaviour caused by the loss of confidence in the banking system during the 2008 Crisis. This made banks refuse to lend to each other and consumers rushed to withdraw their money from banks.

2.2.3 Institutions

Shocks can originate from within institutions and/or be propagated (act as contagion channels) through networks of institutions. As such, institutions are the mediums by which a shock may originate, the effects of said shock spread to the rest of the economy and the end results of that shock manifest.

2.2.4 Structural weaknesses

Structural weaknesses make detection of risk difficult and amplify the effects of a shock by reinforcing it (act as a kind of positive feedback loop). Examples of such weakness can be laxed regulation and failure of institutions to adequately play their roles.

2.3 Limits to applying this model to Bitcoin

This model is most effective as a descriptive tool and not a predictive one. With it we can easily anticipate and prevent a repeat of the past crises. However, when faced with shocks totally different from ones we have had before its predictive power is weakened. For example, the decentralized nature of Bitcoin and its current limited use means the effect of the "institutions" and "structural weakness" factors will depend on if and which institutions adopt Bitcoin in the future. Similar to how many economic models failed to predict the 2008 crisis and were updated afterwards (The Economist, 2014), this model may have to be

updated post a cryptocurrency caused financial crises in a future. In short, financial crises are by nature 'black swans' and it would be unrealistic to claim we can truly model what is inherently an exception to the norm (Mandelbrot & Taleb, 2005). However, this essay will propose why such a financial crisis is improbably.

SECTION 3: EVALUATING BITCOIN

Now, with the framework of what systemic risk is and how it works established, it is time to evaluate Bitcoin potential to cause a systemic risk. In their paper, Nakamoto (2008) described Bitcoin as electronic cash that can be used to make payments while bypassing the need for a financial institution. This initial intended function will be examined first.

3.1 Bitcoin as a currency

3.1.1 Nature of a good currency

Money has three core functions, namely to act as a store of value, a unit of exchange and a unit of account (Mohr & Associates, 2015). Bitcoin fulfils the last 2 but currently does not do well as a store of value. It exhibits high volatility in its value in comparison to fiat currencies. This can be seen in Figure 2 below contrasting the volatility of Bitcoin prices relative to the U.S Dollar.

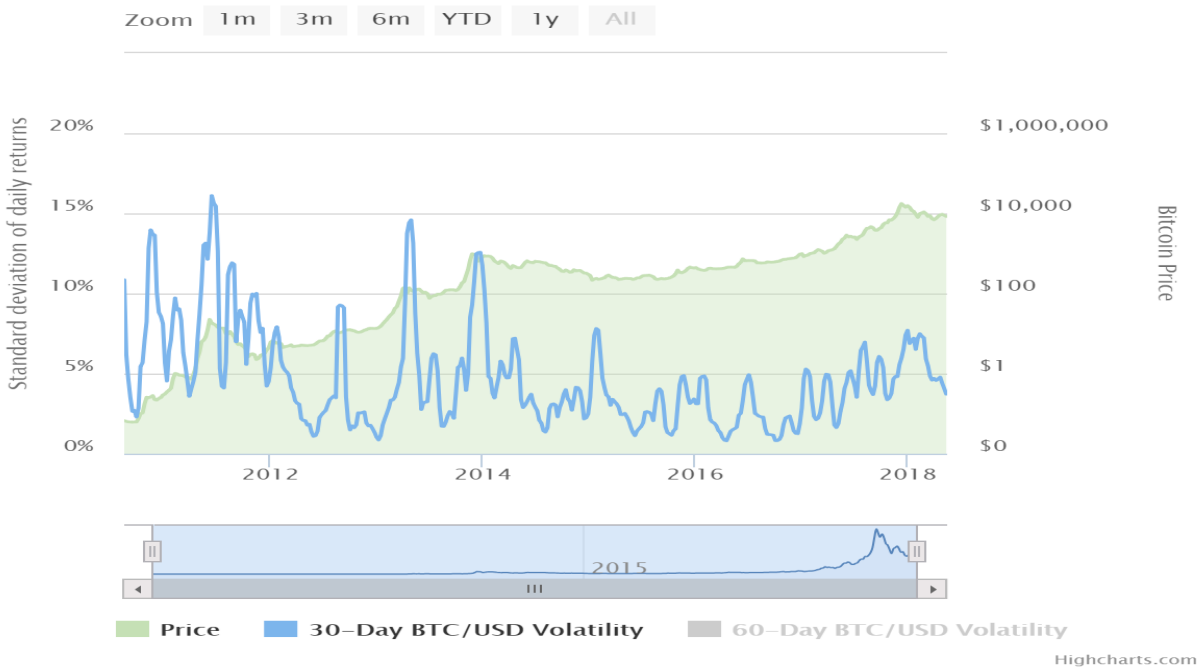


Figure 2: Volatility of Bitcoin relative to U.S Dollar (Buy Bitcoin Worldwide, 2018)

This volatility is due to Bitcoin having no intrinsic value apart from its utility as a medium of exchange, which is purely based on the subjective valuation of its users (Bloomberg, 2017). This is the core of the argument that states that the value of Bitcoin is the product of a speculative bubble and why some appeal to 'the greater fool theory' (The Economist, 2017). Ever since the movement away from the gold standard to the current system of fiat money there has been no tangible resource backing world currencies. Despite this, fiat currencies exhibit more stability than Bitcoin. This is because fiat currencies are based on trust in governments, central banks and the broad financial system. The need to maintain the underlying integrity of this system is what disciplines central banks, preventing them from behaving recklessly (Beer & Weber, 2014, p. 59). This system backing fiat currencies is more objective because a currency's value is determined using a broad array of facts that can be openly observed and quantified such the political stability, government debt, inflation rates etc. This means fiat currencies can be valued more reliably.

3.1.2 Why Bitcoin as currency does not pose systemic risk

The volatility in Bitcoins value makes valuing things in BTC complicated. This is because that would also mean the intrinsic value of whatever is valued using BTC fluctuates with the value of Bitcoin rather than factors endogenous to itself. This puts any business that values things using bitcoin at risk of making substantial exchange and conversion losses (Beer & Weber, 2014, p. 61). Unless this is addressed, wide spread adoption as a currency is unlikely. The Bitcoin bubble does not pose a systemic risk because price volatility must be combined with wide spread integration into the financial system (must have contagion channels) and this is not the case currently (The Economist, 2017). This is unlikely to change because studies suggest that the regulatory hurdle that Bitcoin is facing now will restrict further increase in its use in the future (Seetharaman, et al., 2017).

This suggests that the future success of Bitcoin and other cryptocurrencies is dependent on how well they can be integrated into the existing system. They may be used to enhance current system's efficiency rather than the unlikely scenario that they completely replace it, doing away with central and commercial banks altogether (Blundell-Wignall, 2014, p. 16). This is evident in how some central banks have expressed interest in distributed ledger technology (DLT) (Bech & Garret, 2017).

3.1.3 Legality & Regulation

Figure 3 below shows the attitudes of different governments towards Bitcoin as of April 2018.

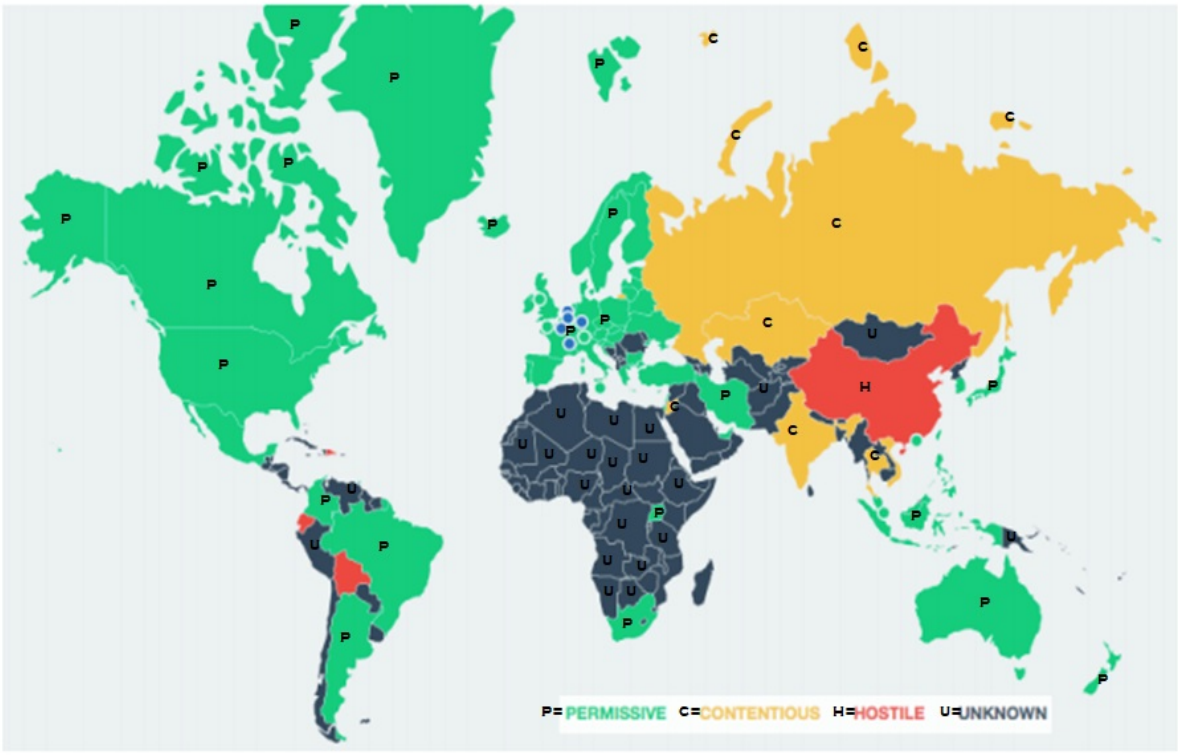


Figure 3: World map showing legality of Bitcoin in different regions (Bitlegal, 2018). (*alphabet key system author's own)*

Despite many countries being 'permissive', Bitcoin's use as a currency remains small. This is partly because some countries, though open to Bitcoin, do not recognise it as a form of a legal tender and consumers are cautioned to transact at their own risk. In South Africa Bitcoin can be traded as an asset but not used as currency because the Reserve Bank reserves the right to issue legal tender (South African Reserve Bank, 2014, p. 4). However, this position seems to be under review now as regulators consider appropriate policy frameworks for cryptocurrencies (Peyton, 2018). Policy on regulating Bitcoin is still in early stages of formulation in most countries and regulators are currently looking to address problems of potential fraud and tax evasion that Bitcoin's anonymity raises (Omri, 2013, p. 43). The policies adopted will determine the future of Bitcoin.

3.2 Bitcoin as a speculative asset

Even though Bitcoin was intended to be a currency it appears to be treated more as a speculative asset. Only 50% of all Bitcoin holdings are actively being circulated in trades every 6 months and 38% does not exchange hands within a year (Seetharaman, et al., 2017, p. 238). Due to the speculative nature of its value and the fixed number of Bitcoins that can ever be mined, many owners of Bitcoins seem to be interested in buying the coins only to sell them whenever their value appreciates.

3.2.1 Why the Bitcoin bubble bursting is unlikely to constitute an initial shock

As of the 13th of April, Bitcoin's market capitalization was roughly $134 billion, comparable to that of some of the largest companies like Apple with a market cap of $174,96 billion (Bloomberg, 2018). Despite its large market cap, the instability of Bitcoin's value does not pose a real systemic risk because of its lack of integration with the real economy (Seetharaman, et al., 2017). Asset bubble bursts that pose a serious risk are those that have some relationship (contagion path) with the real economy. Sufi & Mian (2014) illustrate this in their comparison showing why the Housing Bubble was more severe than the Dotcom Bubble. This is because the middle and lower-class consumers have a larger portion of their wealth tied to their house than the rich, whose wealth is less concentrated. This meant they were severely impacted and the bubble destroyed value for a greater part of the economy (Sufi & Mian, 2014). In comparison, the distribution of losses for the Dotcom bubble where more concentrated amongst the rich who bought most of the stocks of internet based enterprises. It is reasonable to assume that majority of Bitcoin traders do not have most of their wealth tied to Bitcoin. This assumption cannot be proven nor disproven at this moment due to Bitcoin's anonymity. It is worth noting that the trading of Bitcoin futures, if not monitored, may create contagion channels. There is still much debate on how serious a risk they may pose, with rating agencies like Moody's saying there is no need to be concerned (Golovtchenko, 2018)

3.2.2 Legitimate Causes for concern

Bitcoin may not be a systemic risk but serious concerns about its use for fraud, tax evasion and losses made by investors are all valid. 'The Bitcoin Question: Currency versus Trust-less Transfer Technology' by Blundell-Wignall (2014) is recommended for a detailed discussion on these issues and why cryptocurrencies cannot undermine the central bank's ability to

conduct monetary policy. These issues however, fall beyond the scope of this essay since a relationship between them and systemic risk does not seem to appear strong in literature.

CONCLUSION

This essay explored the nature of systemic risk and argued Bitcoin fails to pose a systemic risk. It has shown that systemic risk is characterised by the presence of (i) a shock, (ii) contagion channels, (iii) institutions and (iv) structural weaknesses. It argued that Bitcoin, because of its decentralized nature, cannot act as a shock, lacks contagion channels and is separate from any institution. It therefore fails to pose systemic risk when analysed using our current understanding of the causes of systemic risk.

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