

Research Proposal

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My research interest is in digital currencies, especially Bitcoin. There are several reasons that Bitcoin ignites my attention. Bitcoin represents the largest market capitalization in digital currencies. It is the first decentralized payment system and is operated by open-source software. As a result, no individual including a single country can affect the supply of Bitcoin. The innovation of a decentralized payment system provides pros and cons to the world's monetary system. If Bitcoin becomes the dominant currency in the world, we do not have to worry about any mismanaged monetary policy done by the governments. However, since the total supply of Bitcoins is limited to 21 million, we have a high chance to experience deflation.

On the other hand, the transaction fee of using Bitcoin is relatively low right now. People can transfer their money from developed countries to developing countries without paying wire transfer fees to banks. However, researchers challenge that the low transaction fee of Bitcoin is not sustainable. When Bitcoin become widely accepted, it will require a huge computational power to maintain the system. This is because every transaction in Bitcoin is recorded in a public distributed ledger called the block chain.

There are other issues that may appear if Bitcoin becomes a dominant currency in the world. The most obvious one is the cyber security. Bitcoin is just like the money on your wallet but now it is stored in the computer or other electronic device. If one's computer is hacked, it is possible that the owner would lose all the Bitcoins on it. Last but not least, banks play an important role in the financial market; they allocate money between savers and investors. In the world of Bitcoin, banks do not exist, but there are some big Bitcoin exchange companies that hold significant amount of Bitcoins. It is reasonable to believe that they might or will engage in lending and borrowing activities. However, those Bitcoin exchange companies are not regulated by any policies such as deposit insurance and required reserve ratio. Therefore, as a researcher, I can see a lot of areas that have to explore on digital currency.

My research is empirical and theoretical. For example, in my dissertation, I focus on the empirical analysis on Bitcoin. The first chapter of my dissertation investigates whether Bitcoin is a good investment vehicle. The Capital Asset Pricing Model and the Fama-French Three Factors model suggest that Bitcoin does not carry much systematic risk. Thus, Bitcoin is able to add some diversification to the risk in an investment portfolio. Furthermore, I use mean-variance portfolio analysis to examine the optimal proportion of Bitcoin in an investment portfolio. My result suggest that an optimal portfolio should include no more than 21% of Bitcoin.

The second and third chapters of my dissertation examine the determinants of the Bitcoin price movement and the liquidity of Bitcoin. A wide range of time series analysis methods and four liquidity measures are applied in these chapters. In my opinion, Bitcoin would be widely accepted if people see more studies have been done on it. I believe Bitcoin will ultimately create a new monetary system in the world, and the role of the governments and banks will change. Thus, in my theoretical paper, I investigate the role of these two parties in a world when both Bitcoin and fiat money exist.

I develop a theoretical model for Bitcoin. My model follows the framework of an overlapping generation stochastic relocation model. Based on the setup, households face an uncertainty about relocating to other islands, and they deposit their endowments to bank(s) when they are young and withdraw them in either fiat money or Bitcoin when they are old, depending on the destinations where they have to relocate. My results show that the government policy, which maintains a fixed ratio of fiat money and bond, plays no role on the demand of Bitcoin, but the banking structure can affect the demand of Bitcoin.

In my future research, I want to explore the cost and benefit for a country to adopt Bitcoin and moreover how a country can adopt Bitcoin. Based on my knowledge, the amount of research on Bitcoin is still limited. I would like to conduct both empirical and theoretical research on digital currency. I believe that even if Bitcoin fails in the next couple years, other better versions of digital currencies will appear in the market. Theoretically, I am interested to explore the possibility of applying the combination of the search model of money and the overlapping generation model to Bitcoin analysis.