

**CRYPTOCURRENCY: RESOLVING SPLITS AND FORKS ON THE BLOCKCHAIN**

**CAN WE MAKE CRYPTOCURRENCY SAFER WITHOUT HURTING IT?**

An Undergraduate Thesis Portfolio  
Presented to the Faculty of the  
School of Engineering and Applied Science  
In Partial Fulfillment of the Requirements for the Degree  
Bachelor of Science in Computer Science

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May 9, 2022

## **A SOCIOTECHNICAL SYNTHESIS**

Cryptocurrency has had a significant impact on how we think about money in the world, and how it can be done with no central authority. Looking first at how the technology functions, the technical research paper aims to analyze the techniques applied to resolve splits and forks in various cryptocurrencies. Through the study, it is found that the more transactions that are flowing through a particular currency, the better it does on the technology side of things. However, any service which allows for transactions in an anonymous manner, like the kinds that cryptocurrency offers, it begs the question of how to make sure transactions are well regulated. The science, technology, and society (STS) topic provides a framework through which to analyze the effect of cryptocurrency regulations in various social groups and onto the currency itself. The tightly coupled technical and STS topics describe the process of using a cryptocurrency, as well as the considerations of how regulations may affect the usage of any cryptocurrency.

The technical report analyzes four cryptocurrencies to determine what the best algorithms are for resolving splits and forks on the blockchain. Resolving splits and forks on the blockchain are vital to the usage of any cryptocurrency, so therefore this was a technical area that needed to be researched. This was conducted via a meta study of Bitcoin, Ethereum, Bitcoin Classic, and Bitcoin Cash. The research first looked at the white papers of each of these cryptocurrencies, which are high level overviews of the algorithms put in place, then at various research papers on how these design choices have improved or hurt the currency.

The results of the study of splits this concluded that Ethereum's usage of what are known as uncle blocks make their blockchain more secure than Bitcoin's blockchain. In the study of forks, the cryptocurrencies studied showed that the optimal solution to truly fork off the original

blockchain was to give users a dividend of their new cryptocurrency in proportion to their ownership of the original cryptocurrency. The report concludes discussing future areas of research that can be conducted of cryptocurrencies using the same research method.

The initial inspiration for researching cryptocurrency regulations came from the desire to understand how a technology resistant to regulations has been regulated. The research led to answering the question of how regulations have affected various groups involved in the usage of cryptocurrency. Law and Callon's Actor Network Theory was used to create a network of related groups that are involved in the creation of cryptocurrency regulations. The network was created by examining various groups who are involved in the usage of cryptocurrency and the government.

Using this Actor Network model, it was determined that a good metric to use to determine the effectiveness of certain regulations was to see what proportion of the population of countries used cryptocurrency. Using this metric, the research paper looks at three countries over time after applying various regulations to determine how those regulations affected the usage. Through this analysis, it was determined the three countries, Canada, Switzerland, and Germany, all saw increases in the usage of cryptocurrency, with the highest overall usage being in Switzerland. Overall, the research was not definitive in stating certain regulations were the best or worst, but provided general guidelines stating certain countries saw increases in the usage, so those regulations were beneficial for the network.

Cryptocurrency fills a need in society to have a money system that is independent of any government or banking structure. This technology however needs to be optimized in order to facilitate the usage of it by as many people as possible. By optimizing both the technical and regulatory sides of cryptocurrency, then the technology can become more widely used.

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