Sz-Je Wang
Hank Korth
CSB-242-010
May 2, 2023

# CSE 242 Final Paper

The cryptocurrency market has experienced significant growth in recent years, attracting the attention of investors, businesses, and regulators. Amidst the volatility of cryptocurrencies such as Bitcoin and Ether, stablecoins have emerged as a promising solution for maintaining market stability.

Since the introduction of stablecoins in 2014, these digital assets have become a critical financial instrument within the cryptocurrency sphere. Consequently, nations have adopted a relatively hands-off stance when managing stable currencies, and a definitive regulatory structure is still in development. This absence of regulation poses risks to financial stability and consumer safeguarding. The primary emphasis of this study will be on the hazards associated with stablecoins and the mechanisms employed to ensure their stability.

Throughout the course, we investigated the diverse types of stablecoins and explored the fundamental mechanisms that control each one. Stablecoins are created to be stable cryptocurrencies resembling conventional fiat currencies in terms of value stability. In the cryptocurrency realm, there are three main types of stablecoins: fiat-backed, crypto-backed, and algorithmic stablecoins. Each type utilizes a distinct approach to maintain price stability, offering various advantages and challenges to users and investors. As we analyzed these different categories, we better understood the complexities involved in their creation, execution and possible influence on the broader financial landscape.

Here are some of the benefits of using stablecoin in the blockchain.

- Reduced transaction time and cost: Stablecoins enable faster and more cost-efficient transactions than traditional banking systems and other cryptocurrencies. This is particularly beneficial for cross-border transactions, where stablecoins can reduce both the time and fees associated with currency conversions.
- More excellent stability: Compared to traditional cryptocurrency, Stablecoins offer more excellent price stability. Therefore, stablecoins are always one of the most attractive options for investors looking to avoid the volatility associated with the market.
- Increased security: Stablecoins leverage the security features of blockchain technology, providing users with a secure and transparent means of transacting. This can help reduce fraud and other financial risks associated with traditional payment methods (Everything you need to know, 2023).

Despite the advantage of stablecoins, several open questions are related to stablecoins.

- What are the pros, cons, and principal risks of each type of stablecoin?
- What is the leading cause of the collapse of the UST and Anchor Protocol, and will algorithm stablecoin still be safe to use?
- Which type of stablecoin is best suited for individuals looking to invest in cryptocurrency?
- How will Central Bank Digital Currencies (CBDCs) affect the stability of stablecoins?

The fiat-backed stablecoin is one of the most well know and uses stablecoins in the world. It means one stablecoin equals one currency unit (1 US dollar). To maintain the stability of fiat-backed stablecoin, the company that manages the stablecoin will have real fiat currency deposited in a bank account when the stablecoin is minted (Iredale, 2022). And when the investor wants to exchange their stablecoin for cash, The entity that manages the stablecoin will withdraw a certain amount of legal currency from the reserve, transfer the fiat cash back to the investor, and then the equivalent stablecoin will burn and be destroyed. One of the most representative stablecoins for fiat-backed stablecoin is Tether (USDT). USDT is the world's largest stablecoin, pegged to the U.S. dollar and backed "100% by Tether's reserves." To gain investors' confidence, USDT published their transport of reserves by mentioning that their total value in reserves will be published daily and updated at least once daily (What are teahter, 2023).

A crypto-backed stablecoin is similar to a fiat stablecoin, except its underlying collateral is another cryptocurrency rather than a real-world tangible commodity or fiat currency. Users of crypto-backed stablecoin will

lock the cryptocurrency in a smart contract that issues tokens, the contract will issue tokens, and then if they get back their collateral (cryptocurrency), they must pay the stablecoin back to the same contract (and pay interest) (Iredale, 2022). Dai is one of the biggest crypto-backed stablecoins in the world. Dai is created when users borrow against locked collateral and offset when the loan is repaid. Investors would create a new Dai if an investor deposits Ether or another cryptocurrency accepted as collateral. The locked collateral will be reclaimed when investors pay back the Dai they borrowed.

Last, algorithmic stablecoins use algorithms to control the currency volume of stablecoins (control currency issuance) and manage the supply of issued tokens through algorithms and smart contracts (Iredale, 2022). From a functional point of view, this monetary policy closely reflects the central bank's. The policy used to manage the national currency, the algorithmic stablecoin system, will reduce the token supply if the price is lower than the price of the fiat currency it tracks; If the price exceeds the value of the fiat currency, new tokens enter the circulation to reduce the value of the stablecoin. UST and Anchor Protocol are one of the biggest crypto crises in the blockchain world. In addition, UST is an algorithmic stablecoin to the primary dollar. When a UST is minted, it must burn a dollar's worth of LUNA, which helps maintain the UST's 1:1 peg to the dollar through this arbitrage mechanism (Liam, 2022).

All stablecoins have pros and cons, and people need to understand them before they use the stablecoin. The fiat-backed stablecoin is the simplest structure among stablecoins, and it is easy to understand for anyone new to cryptocurrency. As long as the economy of the country associated with a stablecoin remains stable, the value of the currency will not experience fluctuations. This implies that even if the entire cryptocurrency market collapses and Bitcoin drops to $0, fiat stablecoins will remain unaffected. One advantage of utilizing fiat-backed stablecoins is that their stability concept is easily understandable, making them particularly accessible for novice crypto market investors. However, the most significant drawback and risk of using fiat-backed stablecoins is their centralized control by companies or third parties. For example, USDC, the third largest stablecoin, is owned by Circle. Continuing with the cons of fiat-backed stablecoins, this centralized control can lead to several issues. Furthermore, the centralized nature of these stablecoins makes them more susceptible to censorship, regulatory scrutiny, and potential shutdowns by governments. In some cases, users' assets could be frozen or confiscated, undermining cryptocurrencies' trustless and permissionless ethos.

For the crypto-backed stablecoin, the main difference between it and a fiat-backed stable is that the margin behind it uses another cryptocurrency as collateral. Therefore, the risk and cons are the collateral's value because most cryptocurrency has dramatically fluctuated, such as Eth. Take DAI as an example; if the value of Ethereum (ETH) were to drop by 50%, the value of DAI (a crypto-backed stablecoin that ETH collateralizes) would also drop by 50% (What is Dai, 2023). Another con for crypto-back stablecoin may be that the issuer of the stablecoin may need more collateral to back the stablecoin. This could lead to a situation where the issuer cannot redeem the stablecoin for the underlying asset. For example, if the issuer of DAI ran out of ETH, they would not be able to exchange DAI for $1 worth of ETH.

In summary, the advantage of algorithmic stablecoin is that it is not subject to government or any financial institution control, so it has a more attractive option for the user who values privacy and decentralization. Moreover, the algorithmic does not require collateral like fiat-backed or crypto-backed stablecoins. Therefore, it will give the investor more efficiency than the traditional stablecoin. In addition, stablecoins provide arbitrage opportunities for investors such as UST and Luna. In detail, UST and Luna are two tokens used together to maintain the price of UST at $1. Luna is a cryptocurrency that can be burned to mint UST and vis-versa, and UST can be burned to mint Luna (Liam, 2022). This mechanism is designed to keep the price of UST stable, but it also creates an arbitrage opportunity.

Conversely, because most of the algorithmic stablecoins are in the experiment, this leads to this type of stablecoin as the most unstable and with the highest risk. Furthermore, algorithmic stablecoins are more volatile than traditional ones because they are not backed by any assets, which will not protect the value of stablecoin when the crypto market fluctuations. Also, it has a more complex concept than two other stablecoins, making it more difficult to understand and not user-friendly. Another significant risk is that after the collapse of the UST and Anchor

Protocol, confidence in algorithmic stablecoin could be improved. Even worse, the US government is cornering to ban an algorithmic type of stablecoin to prevent the same thing from happening.

After the collapse of UST and the Anchor protocol, many people have concerns about using algorithmic stablecoins. Anchor protocol is the decentralized finance protocol built on the Terra blockchain. It offers a high stablecoin yield saving with 20% APY on UST deposits. With this high yield saving, it attracts massive of people to deposit in their protocol. However, the primary cause behind its failure was the arbitrage mechanism between UST and Luna and the desirable Anchor protocol's APY. For instance, the high-interest rate attracted many investors looking for a quick profit in the protocol but also made the Anchor unsustainable in long-term growth. For example, when UST's price started to drop, these investors started withdrawing their UST from Anchor, which put a lot of selling pressure on the token. Another reason for the collapse of the Anchor protocol was the lack of transparent and decentralized management. A reserve of Bitcoin and other cryptocurrencies funded the protocol. Still, before the collapse, Terraform Labs had enough time to make reasonable response measures to restore investor confidence, but they lacked transparent policies and over-centralized management. This made it difficult for investors to trust the Anchor protocol and Terra blockchain.

The collapse of UST and Anchor taught every investor essential lessons for seeing the algorithmic stablecoin now.

- Algorithmic stablecoins are less stable than they seem: UST was designed to maintain its peg to the US dollar through a complex system of minting and burning tokens. However, this system proved vulnerable to attack, and UST quickly lost its peg. This event showed that algorithmic stablecoins are less reliable than traditional, collateralized stablecoins.
- The crypto market is still volatile and unpredictable: The collapse of UST and Anchor was just one of many significant events that rocked the crypto market in 2022. This event showed that the crypto market is still very volatile and unpredictable, and investors should be prepared for significant losses.
- Confidence in the project: One of the primary factors contributing to the collapse of UST was the rapid loss of investor confidence when they observed the price drop. A significant reason for this was that many people who invested in Anchor were primarily interested in making quick profits, often needing to understand the underlying principles of the protocol entirely. Consequently, this lack of understanding led to an immediate loss of confidence when the price began to fall. Therefore, investors must familiarize themselves with the concepts and mechanisms behind each stablecoin or protocol before investing.

After considering the advantages, disadvantages, and risks of each type of stablecoin, different stablecoins have unique features that cater to the needs of various individuals. First, fiat-collateralized stablecoins are the most common and widely used type of stablecoins (Wang, 2023). Therefore it is suitable for the cryptocurrency investment transactions, such as for traders who want to make quick and easy trades. And the businesses that want to accept digital currency payments. In addition, with the advent of Web 3.0 and beyond, fiat-collateralized stablecoins may become even more versatile and valuable. Second, the crypto-collateralized stablecoins are majorly backed by cryptocurrencies, such as Ethereum or Bitcoin. Therefore, crypto-collateralized stablecoins are well-suited for those who trust cryptocurrencies' long-term potential and growth and plan to employ them for payments. Last but not least is the algorithmic stablecoin. Instead of using the assets to back the stablecoin value, the algorithmic stablecoin anchoring value with smart contracts can be considered a decentralized bank. Algorithmic stablecoins are ideal for experimenters who want to try out a new type of stablecoin and individuals who prefer to use a stablecoin that is not backed by any assets.

As the adoption of CBDCs grows and becomes more widespread, concerns regarding the interplay between CBDCs and stablecoins have emerged. CBDCs represent digital currencies issued by central banks and possess the capacity to offer a secure, convenient, and regulated alternative to both cryptocurrencies and stablecoins. By being linked to their corresponding fiat currencies, CBDCs can provide the same level of stability as traditional money while also enjoying the benefits of digital currencies (Glazer, 2022).

Even though CBDCs share similarities with conventional stablecoins, they have the potential to reduce the demand for stablecoins without negatively impacting the current structure of blockchain technology. For instance, CBDCs might promote the growth of stablecoins by supporting the increased adoption of digital currencies. For example, CBDCs can contribute to financial inclusion by simplifying access to and usage of financial services, as they enable payments without requiring a bank account. Furthermore, CBDCs could stimulate advancements in the cryptocurrency realm, particularly for stablecoins. As a result, stablecoin projects might aim to stand out by offering unique features or solutions to remain competitive.

The top three stablecoins (USDT, USDC, and BUSD) have led to a rush to define the competitive landscape in the coming years. For example, USDC and BUSD have been calling for more stablecoin regulation, seeing it as a way to assuage the fears of institutional investors and trying not to follow in the footsteps of Terra and UST. Alongside the escalating competition and evolving regulatory landscape, the stablecoin market has experienced considerable transformations during these turbulent times. For instance, the current high-interest-rate environment has created substantial revenue possibilities for centrally issued stablecoins, as traditional finance presents more attractive returns. Nevertheless, regarding infiltrating traditional finance and worldwide payment systems, stablecoins will likely maintain their leadership position in the crypto world. Moreover, even though regulatory constraints will intensify, it remains particularly intriguing to us that stablecoins can still unleash on-chain innovations in the lending market and provide emerging opportunities in programming and tokenization.

Overall, stablecoins offer a range of benefits and are likely to become increasingly important in digital finance. By understanding the characteristics of different stablecoin types, individuals can choose the one that best meets their needs and goals.

Citation

*Everything you need to know about Stablecoins and how they work*. Flexiple. (n.d.). Retrieved May 2, 2023, from https://flexiple.com/blockchain/what-are-stablecoins-and-how-do-they-work/

Glazer, B. L., Manager, P., & Management, W. (2021, November 22). *What are CBDCs?: John Hancock Investment Mgmt*. John Hancock Investment Management. Retrieved May 2, 2023, from https://www.jhinvestments.com/viewpoints/investing-basics/what-are-cbdcs-central-bank-digital-currencies?cid=US-EN_JHIM_RT_PS_AdWords_ThoughtLeadership_blog___whatareCBDCs_&utm_source=PS&utm_medium=AdWords&utm_campaign=ThoughtLeadership_blog&utm_term=whatareCBDCs_&gclid=Cj0KCQjw6cKiBhD5ARIsAKXUdyYtSyaqp-NIAQKSSsHKNZK76wLCJ6VWslrVGqe3M8NOmUtarnsqKzsaAkQYEALw_wcB&gclsrc=aw.ds

Iredale, G. (2022, August 15). *What are the different types of stablecoins?* 101 Blockchains. Retrieved May 2, 2023, from https://101blockchains.com/types-of-stablecoins/

Liam J. Kelly, R. S. (2022, May 11). *What is Terra? the algorithmic stablecoin protocol explained*. Decrypt. Retrieved May 2, 2023, from https://decrypt.co/resources/what-is-terra-algorithmic-stablecoin-protocol-explained

Wang, A. (2022, June 16). *The Pros and cons of stablecoins: Why you need to know how they work*. Boxmining. Retrieved May 2, 2023, from https://boxmining.com/the-pros-and-cons-of-stablecoins-why-you-need-to-know-how-they-work/

What are tether tokens and how do they work? (n.d.). Retrieved May 2, 2023, from https://tether.to/en/how-it-works

*What is Dai cryptocurrency?* SoFi. (n.d.). Retrieved May 2, 2023, from https://www.sofi.com/what-is-dai-crypto/