StableUnit: A low-volatile p2p Electronic Cash System

www.stableunit.org

Abstract. Bitcoin introduced a purely peer-to-peer version of electronic cash which allows online payments to be sent from one party to another without going through a financial institution. Despite all of its advantages, predefined finite monetary supply inevitably leads to price volatility which makes Bitcoin suboptimal as a medium of exchange, store of value or unit of account. We propose a solution to the price stabilization problem using a decentralized currency unit which evolves from being collateral-backed to being regulated by an autonomous monetary policy as the network receives wider adoption. The system defines a soft peg to any measurable value, such as the US dollar, which it maintains using a collateralized stabilization fund and if necessary expands and contracts available money supply via the issuing of bonds, share dilution and temporary parking of funds. Ownership of the network is distributed to shareholders who form a decentralized autonomous organization capable of changing some parameters of the system through a voting consensus mechanism. This creates a new type of crypto-asset which combines the advantages of Bitcoin with the stable price of a US dollar.

Introduction

Bitcoin was a phenomenal innovation: for the first time, people could hold and transfer assets to anyone on the network quickly and privately. Furthermore, by its nature, this new asset could be stored and transmitted with software that is open-source, in a cryptographically secure manner while completely eliminating the requirement of relying on a trusted third party[1]. All these features plus improved durability, portability and divisibility created a new class of digital currency, a decentralized digital currency.
Despite its advantages bitcoin has failed to achieve mass adoption for a number of reasons.

[1] https://bitcoin.org/bitcoin.pdf

Mass Adoption of Cryptocurrency

Why has bitcoin not achieved mass adoption in finance and commerce?
Slow and expensive to use. With the introduction of Lightning Network, this is not a problem anymore. Many altcoins have also resolved this issue.
Time for adoption. Bitcoin has existed since 2009, and even if we start counting from 2013 (the first Bitcoin bubble and arguably the first introduction of Bitcoin into collective consciousness), it is longer than PayPal got to conquer e-commerce and online transaction market. Moreover, PayPal marketing campaigns were much smaller than Bitcoin's news coverage[2-3].
Security. There are some risks of permanently losing funds due to key mismanagement, but overall cryptocurrency for consumers is in parity with other online payment systems or credit cards. This is not true for business; however, things are getting better (more in p. Risks and Mitigations).
Transaction immutability: Introduction of decentralized escrow services effectively solved this problem. There are many companies such as Microsoft, Spotify, and others, which accept Bitcoin and other cryptocurrencies via BitPay, or similar services but these companies do not keep their money in crypto and immediately convert back to fiat. Why do companies prefer dollars to technologically superior crypto? Because these companies are not in the business of speculating on bitcoin. They have expenses needed to cover without additional risks.

[2] https://www.statista.com/statistics/664604/paypal-marketing-spending/
[3] https://trends.google.com/trends/explore?cat=16&date=today%205-y&q=paypal,bitcoin

Price Stability

"Stable Coins, The Holy Grail Of Cryptocurrency" - Forbes[3]

The main functions of money fundamentally distinguished as: a medium of exchange, a unit of account and a store of value[4]. The value of bitcoin often experienced large fluctuations, rising over 178% a month, or losing 35% a week[5]. These value fluctuations make bitcoin a suboptimal medium of exchange, unit of account or short-term store of value in comparison with fiat money. Indeed, since the value of bitcoin is highly unpredictable, while business expenses are not, businesses are motivated to convert payments back to fiat money as soon as it is received. Also, it is unclear whether 1 bitcoin per month is a enough income for a household because a fall of the bitcoin value may create difficulties to pay bills.
Taking the arguments above we consider **price volatility is the biggest barrier to widespread adoption** of bitcoin and other volatile cryptocurrencies.

[3] https://www.forbes.com/sites/shermanlee/2018/03/12/explaining-stable-coins-the-holy-grail-of-crytpocurrency
[4] "money : The New Palgrave Dictionary of Economics". The New Palgrave Dictionary of Economics. Retrieved 18 December 2010
[5] https://coinmarketcap.com/currencies/bitcoin/ (12 Nov - Dec 2017 and 17-22 Dec 2017)

Eventual Stabilization

Will bitcoin eventually grow less volatile?
While volatility will decrease with greater adoption, it is unlikely that price fluctuations will ever be less than occur in large-cap stock such as Google[6] or in gold[7]. In case the price eventually did stabilize – it would likely imply that it was performing poorly as an investestment, therefore creating a new sell-off cycle thereby introducing new volatility.
Some crypto enthusiasts might have very valuable arguments as to why bitcoin or another system with predefined supply might eventually stabilize itself. Because we can not provide all the possible counterarguments in this whitepaper let us settle on the fact that there is a non-zero probability that there will be demand for a completely decentralized non-volatile cryptocurrency.
Tether's 2B+ market cup[8] proves the need even without decentralization.

[6] https://finance.yahoo.com/quote/GOOG/
[7] https://goldprice.org/
[8] https://coinmarketcap.com/currencies/tether/

Non-volatile Cryptocurrency

What is a stable currency? It is a currency which successfully performs its functions as a means of exchange, unit of account and a store of value because its purchasing power is stable[9]. Purchasing power is the value of a currency expressed in terms of the amount of goods or services that one unit of money can buy[10] This ability to buy might be direct or indirect. Direct via greater market adoption and indirect via ensured exchangeability to other assets with non-zero value. In the same manner as gold has purchasing power despite there being very few services that will accept it as a direct payment method.
Therefore, decentralized cryptocurrency is stable if it accepted as a payment method for same amount of good or services or it provides exchangeability for other asserts at the market price in a decentralized way. Right now cryptocurrency is the only assert which provides exchangeability in a totally decentralized cryptographically secure way. So for cryptocurrency to be stable it is sufficient, if at any given moment of time each user is able to exchange it for another cryptocurrency at the current market price.

[9]http://www.nbbmuseum.be/doc/chap5e.pdf
[10]https://www.investopedia.com/terms/p/purchasingpower.asp

Example of Usage

There are many use cases for a non-volatile cryptocurrency because it offers advantages over both bitcoin and strong fiat currency like the US dollar:

- The same manner as any cryptocurrency it can be freely sent to others, used as payment for goods and services
- A low-volatility crypto-asset for traders
- Gateway between fiat money and crypto
- Prevents creation of taxable events for holders/traders (in certain jurisdictions)
- Credit and debt markets
- Savings for people in nations with weak institutions or unstable local currencies (Ukraine, Argentina, South Africa).
- Main temporary currency for countries with extremely weak local currencies (Ecuador, Panama, Venezuela, Zimbabwe)
- International trading for countries which might prefer cryptocurrency for political reasons (Russia, Turkey, Jordan)

Because this fusion of fiat money and cryptocurrency has a unique set properties which never existed before, there might be some usage which we cannot foresee.

[TODO: proof links]

Stable Unit System

The solution we propose inherits all technological features and cryptographic security of its parent protocol such as Bitcoin, Ethereum or EOS and ensures price-stability in a completely decentralized way by utilizing several additional components.

1. **A Peg value -** is some measurable value, which defines the target price for a **StableUnit(SU).** In the simplest case, SU is softly pegged to a single US dollar. It also might be a function of the time Peg(t), for instance, US dollar of 2008 to appreciate the inflation. Or more complicated values such as Consumer price index (CPI) or even combination of both.
2. **Oracle -** is a system on a blockchain which is designed to provide information from outside of the blockchain to the smart contract. More specifically an oracle is able to provide the current market price of SU and other cryptocurrencies in a decentralized and transparent way.
3. **Stabilisation Fund -** a special reserve which stores popular cryptocurrencies with great market adaptation such as Ethereum or Bitcoin, and ensures exchangeability of SU.
4. If the market conditions are such that cryptocurrency market is experiencing big fluctuations and the market and the Stabilization Fund is unable to provide the necessary exchangeability of SU, the System dynamically expands and contracts supply of available SU in the circulation to regulate the price of SU. This is known as the Quantity Theory of Money and is used by all central banks around the world. We call decentralized onchain implementation of this monetary policy a **Multilayer Stabilization.**
5. Financial beneficiary and owners of the System are **shareholders** who together make up a **Decentralized Autonomous Organization (DAO).** Using smart contracts shareholders are able to vote for receiving dividends and share ownership of Stabilisation Fund and the System as a whole.

This solution, despite simplicity, provides resistance against black swan events, liquidity crunches and offers scalability on a much wider range of market conditions than currently proposed systems.
How can we ensure that at any given moment of time each user is able to exchange SU back to volatile cryptocurrency by current market price but without providing strict overcollateralization like MakerDao does? Such an approach of relying solely on decentralized crypto-collateral has proved to be stable but

unfortunately also fundamentally unscalable because it always has to have more crypto assets on the reserves than Dai in the circulation[1].

Our assumption that, as a payment system gains adoption, many users just keep their assets in the system and not all users want to exchange it back at the same time[2]. Therefore when number of users exceeds some critical mass, the condition "always fully backed by any equal amount of collateral" is unnecessary. Similar to the present day banking system, where the majority of people right now keep their money: if too many clients decide to withdraw their funds - the bank will not have enough cash to cover their liabilities and this can lead to a collapse[3]. This users' behavior is also evident in MakerDao's Dai, Tether and other asset backed systems.

Another consequence from our assumption, that exact same principle of staying on the system creates an actual value, similar to non-zero value of bitcoin, and other cryptocurrencies without collateral. From this perspective, our proposal is an evolutionary system. It starts from using already popular cryptocurrencies as decentralized collateral to bootstrap network when it is small. And it uses decentralized on-chain monetary policy to regulate the price, when network receives greater adoption. This in some sense recapitulate evolution of US dollar.