StableUnit: A low-volatile p2p Electronic Cash System

This is a draft of the white paper. The rest of the will be released soon. Add your email to the list at https://email.stableunit.org to get notified of upcoming reference implementation, market simulations and protocol specification updates.

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 the 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.

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 the 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 have 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.

Price stability

"Stable Coins, The Holy Grail Of Cryptocurrency" - Forbes[4*]

The main functions of money include: 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.

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 that which occur in large-cap stocks 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 introducing renewed 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 market demand for a completely decentralized non-volatile cryptocurrency.

Tether's 2B+ market cup[8] proves that market demand exists even without decentralization.

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 is accepted as a payment method for same amount of goods or services or if it provides exchangeability for other assets at the market price in a decentralized way. At present cryptocurrency is arguably the only asset which provides exchangeability in a 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.

Example of usage

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

- In 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[11])

- Credit and debt markets
- Savings for people in nations with weak institutions or unstable local currencies[12] (Ukraine, Argentina, South Africa).
- Main temporary currency for countries with extremely weak local currencies[13] (Ecuador, Panama, Venezuela, Zimbabwe)
- International trading for countries which might prefer cryptocurrency for political reasons[14] (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.

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, the US dollar in 2018 adjusted for inflation. Or a more complicated value 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 significant market adoption such as Bitcoin, Ether or tokens such as Dai 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 shared 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 the 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 circulation[15].

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[15]. Therefore when the 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 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[17]. This users behavior is also evident in MakerDao's Dai, Tether and other asset-backed systems (as the system grows, more and more users continue to stay in the system).

Another consequence from our assumption, that exact same principle of staying on the system creates a network effect 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 the US dollar.

Problem formalisation

Does fluctuation of the price of assets held in reserves impacts the volatility of SU? How does the dynamic of the demand for SU on the market or global market trend affect the price of SU? To answer these questions we have to formalize the definitions and the problem we solve.

StableUnit is a system which utilizes multiple unpredictable inputs and complex configuration. We can define the price of SU as a random variable, which depends on time and multiple random-process inputs such as price of assets in the reserve or market demand for the SU.

We define the price as stochastic process **price(SU(init_conf, inputs))[t] → $\mathbb{R}$,**

where:

- **init_conf = {stabilisation_conf, oracle_conf, Peg(t)}** - initial configuration which specifies all parameters of the System,
- **stabilisation_conf = {Δs, Δb, Δd, Δp, f_reserve_sell[], f_reserve_buy[]}** - configuration of the multilayer stabilisation mechanism,
- **oracle_conf = {oracle1, oracle2, Δt, w[t, C], max_delta_price}** - configuration of the oracle,
- **oracle(crypto)[t_i]→** $\mathbb{R}$ - function which determines current market price of the crypto asset,
- **inputs = {reserve, demand}** - dynamic inputs to the System,
- **reserve = crypto_1 … crypto_n, crypto_i** - asset held in reserve,
- **demand(SU)[t]** - function which represents the accumulated market demand for SU at the moment of time t,
- **Peg(t)** - target for the sort peg.

Using this definition, decentralized cryptocurrency is stable if and only if the mathematical expectation (mean value) is equal to peg: **E(Price(SU)[t])** == Peg(t).

Our goal is to design such a system that SU price fluctuation i.e. variance (expectation of the squared deviation of a random variable from its mean) of the prices will be minimum:

Var_max→min: **Var(Price(SU(init_conf, inputs))[t]) < Var_max**, for ∀ **inputs ∈ {acceptable_inputs}** and ∃ **init_conf.** Such *init_conf* is called the **optimal configuration** and *Var_max* **- expected price fluctuation** for the particular design of the System.

We propose the design of the System with multi-layer stabilisation mechanism which is able to provide price stabilisation on a greater range of possible market conditions than all current solutions on the market.

The design we describe in this article is **protocol agnostic**. SU can be pegged to any measurable value and Stabilization Fund is able to store collateral in a set of different cryptocurrencies, such ETH, BTC or EOS.

Without loss of generality, assume pegged value is equal to 1 USD. Also, for simplicity, let Stabilization Fund store only ETH and measure all exchange prices directly in USD($), however real exchanges happen in SU/ETH and USD/ETH.

Let us see the components of this system in detail.

Oracle system

Oracle - is an on-chain smart contract which is able to determine the current market price of SU. StableUnit is a decentralized cryptocurrency therefore is freely exchangeable on different markets so the market price is not just one numerical value but a set of values in 4 dimensional space of exchange history {price, volume, time, place}.

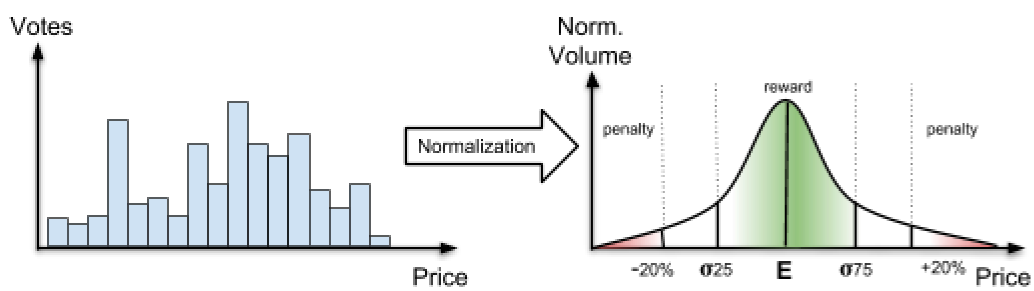
We define the price as "some average" value in the specific timeframe Δt: **price(SU)[t_i] → ℝ** where [t_i] defines the range [$t_0+\Delta t*i$, $t_0+\Delta t*(i+1)$] and an average value can be the median, arithmetic mean, weighted average or other approximation function depending on the method of measurement.
Let us define two such price measurement methods (oracles) which are implementable using mechanism of the smart-contracts.

Median value from the set of trusted providers

The oracle takes the median price from the set of predefined trusted providers (forex exchanges).
This semi-decentralized approach is used by MakerDAO's DAI[18]. As of May 2018, they use[19] the following set of trusted providers: [bitbay, bitfinex, bittrex, cex, coinbase, cryptocompare, etherscan, gdaxgemini, hitbtc, kraken, livecoin, poloniex, yobit].
This approach is an easy way to securely bootstrap the protocol but with cost of sacrificing decentralization.
The problem with this approach is that the trusted providers might be compromised. If we have N providers, then to fake median value the attacker should compromise at least round_up[N/2]. To prevent this, the System uses a parameter **max_delta_price** $\geq$ max(Δprice(SU))$_{\Delta t}$ = max (|price(SU[t_1]) – price(SU[t_2])|) for $\forall$ t_1,t_2: $|t_1 - t_2| < \Delta t$, which restricts the movement of the price. If the trusted provider returns the price value beyond max_delata_price range, this provider is excluded from further participation. If more than 10% of providers are excluded – the **global settlement event** is triggered to investigate the reasons and mitigate the potential attack. This price movement restriction also ensures that there is enough time to trigger the settlement event.

Decentralized betting mechanism

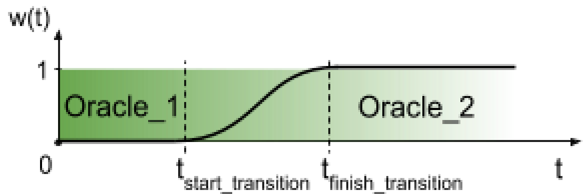
Every turn of Δt time any person is allowed to bet some SU on what was the average price in the last Δt time. At the end of the turn the System takes all beted values (an array of pairs {p,v}: V SU in total was bet that the price was P USD), after that normalize the distribution of the values and calculates the weighted average and dispersion. The weighted average is taken as the true price. People who voted between 25th and 75th percentiles received reward proportional the reward function **reward(betted_price)** = (1–|betted_price–actual_price|^2). People who made an error more than 2*max_delta_price (for example 20%) loose their bets:



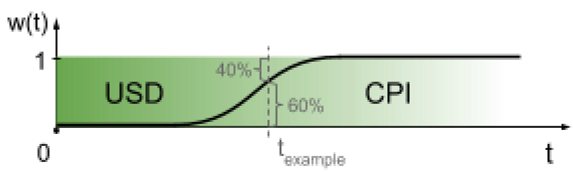
The threshold of the rewards and penalties for a reason are made independently (reward depends on the distributing of bets and penalties on absolute value) in order to motivate users to vote for correct price (the more accurately a speculator guesses what was the average price – the more reward he/she will receive) but without a fear of being penalized if the distribution is very small (if the System uses only distribution – there would always be people who lose bets even if everyone tried to guess correctly).
It is easy to show that this decentralized approach of finding consensus about the price - provides the same level of security against a potential attacker as Proof of Stake (PoS).
People who get reward - receive it that from new issued SU. Total reward if relatively small to the SU in circulation and comparable to the miners' reward - so it will not be able to destabilize the System.

Smooth transition

Both the oracle mechanisms described above have advantages and disadvantages. Despite the median value from the list of trusted providers, (Oracle_1) was proved to be reliable.[20] For MakerDao, it can be used only as a temporary solution because it is not truly decentralized and it is possible to take control over a majority of trusted provides. Decentralized betting mechanism (Oracle_2) does not have that issue but works only when there are enough users ready to participate. To provide an easy bootstrap solution while the system is small and without compromising the decentralisation in the long-term we are going to use **a smooth transition** of these two mechanisms.
The System use **Oracle** = (1-w[t,C])*Oracle_1 + w[t,C]*Oracle_2, where **w[t,C]** is a weight function from the time and SU in circulation which grows from 0 to 1 as the network grows.



Despite its simplicity, the smooth transition is a very powerful mechanism which allow us to use the optimal algorithms and approaches for the **growing network** (due to very different properties of the small and large network) and does this without compromising security or decentralization.
During the growth of the network the System also performs an implicit transition from being purely overcollateralized to being regulated by monetary policy.
Another example of the smooth transition is the movement of the soft peg from US dollar to CPI. If the System were adopted for international trading then US dollar might became suboptimal as unit of value with stable purchase power. Instead of calculating the price of USD2018 with appreciation of inflation, the direct measurement of CPI **might be** considered as an alternative solution for the peg. CPI might be calculated as CPU-U/W, an average price of popular commodities, indexes, market buckets, etc. however there are a lot of challenges with this approach [21] and further investigation is needed.



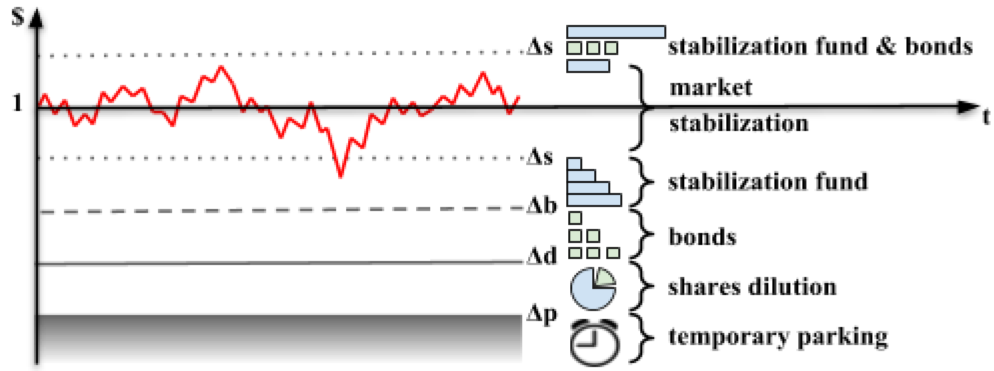
In this example, at the moment $t_{example}$ the peg value is equal to 0.4*Price(USD) + 0.6*Price(CPI).

DAO

The StableUnit blockchain is controlled not by a centralized organisation such as corporation or government but by a **Decentralized Autonomous Organization** via special token **SU_DAO_Share** or just ‘share’ for short. Ownership of the System is distributed among shareholders, who can vote for resolutions during a Global Settlement Event (if such an event is triggered, for example by attack on the Oracle). Voters can also reach consensus about receiving dividends. Voting for dividends happens once a year for the 50% of the minimum amount of the reserves during the last 12 months (for example, if during the year the reserve never held less than X USD worth of crypto assets, then people can vote for distribution of X/2 SU to the shareholders proportionally to the amount of shares they control). Such distributing should not compromise the stability of the System since that collateral was not used for a significant period of time. However, this will still reduce the theoretical resilience against potential loss of demand and future black swan events.

Multi-layer stabilisation mechanism

The stack has x layers and best understood via this diagram



SU is a decentralized cryptocurrency therefore is freely tradable and inevitably has a volatile market price. We might expect three possible scenarios:

- Price of SU fluctuates near the pegged value – no action is required.
- Price of SU goes above pegged value – to stabilize the price the System has to undertake actions to reduce the price.
- Price of SU goes below pegged value – to stabilize the price the System has to undertake actions to increase the price.

Let us fix some constant parameters, such 0 < **Δs < Δb < Δd < Δp.**

1. Market Stabilization

If SU ∈ (1-Δs ... 1): What does it mean that the price of SU is below the nominal value $1? It means that there are not enough buyers so sellers have to offer lower bid to find buyers. But offers of $1 worth SU for lower price create an opportunity to make a profit, more accurately the **return on investment (ROI)** = $\frac{1-Price(SU)}{Price(SU)}$. For example, if you see $0.97=SU sell offer, by buying it now you might expect to sell it back for $1 and make 3/97 = ~3.09% ROI. This profitability creates a competition among traders, which increases price back to ~$1.
If SU ∈ (1 ... 1+Δs): If price of SU is above $1 that means there are not enough traders who want to sell their SU for nominal i.e. $1 price. So buyers have to offer higher bid in order to buy some SU. But existence of buyers who are ready to pay more than $1 creates an opportunity for traders to make almost instant profit by selling $1 worth SU for higher, i.e. 1+(ROI) price. Therefore competition among these sellers reduces the price back to ~$1.
In other words, under normal circumstances the traders have a financial initiative to perform operations, which stabilize the price of SU. This implicit mechanism is not unique for our System and we constantly see this trading behavior on markets with Tether, Dai and others.
Let's define an **Elasticity of Layer** - as a maximum change of demand, while current stabilisation layer is still able to keep the price on the desirable [a..b] range level. In other words, it is a cumulative demand shock the System can sustain. A very rough approximation:

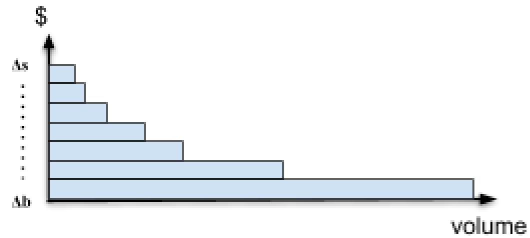
El(L1) = $\frac{Vol(L1)}{Cir(SU)}$, where **stabilization volume Vol(L1)** = $\sum_{traders}(risk * portfolio)$ and **Cir(SU)** - amount of SU in the circulation.

2. Stabilization Fund

The market stabilization has limited elasticity, and when supply exceeds total demand provided by traders - the price will go down. To prevent further price fall the System uses special crypto reserves to provided necessary liquidity by offering a guaranteed supply.
The Stabilization Fund (SF) is a smart contract which stores crypto asset as a collateral (for this example we will show only ETH but actual collateral could store diverse portfolio of

cryptocurrencies which is possible to keep in a cryptographically secure way on the **parent blockchain** via **bridging mechanism**) and has an interface, which allows the caller to exchange their SU to ETH and back with predefined prices and limits.

If SU ∈ (1-Δb ... 1-Δs]: The System has a limited SU buy order at the prices [**$1-Δs … $1-Δb]** and gradually increased volumes, that total buy order volume per day is $SF_{daylimit}$ * Size(SF). The bids are distributed according to the the hyperbolic function f_reserve_buy to provide a balance between a guaranteed liquidity for SU on the wide range of possible prices and maximizing the profit for the reserve from these exchange operations. This increases the maximum amount of SU users can sell to the reserve therefore increasing the set of possible market conditions when the System can guarantee stability.



If 1+Δs ≤ SU: Stabilization Fund has an unlimited sell offer at $1+Δs level enforcing the upper limit for the SU price. All ETH which the System receives – it stores in the Stabilization Fund.

Since the algorithm of the Stabilization Fund is open source and executed on a blockchain – traders have full transparency of the predictability of the System's behavior.

Why the Stabilization Fund cannot be manipulated?

If we let ETH price be constant, then the Stabilization Fund obviously cannot be out-traded because it buys low (1-Δb … Δs) and sells high (1+Δs). However, the ETH price (or other crypto asset held in reserve) is not constant. It is possible to exchange ETH for SU when the price of ETH is high and back when ETH has a low price, therefore, gain profit at Stabilisation Fund's expense. However, it implies such a trader is able to predict movements of the price of ETH but with such insight this trader is able to gain bigger ROI on centralized exchanges due to the spread of buy/sell offers than from the Stabilisation Fund.

Stabilization volume **Vol(L2)** = $\sum_{to\ 1-\Delta b}^{price = from\ 1-\Delta s} f\_reserve\_buy(price)$ therefore the total cumulative demand shock the System can sustain is: El(L1) + El(L2). Keep in mind that we use Vol(L2) only for analysis, the actually smart contract uses a computationally simpler **reserve_ratio[t] =** $\frac{Price(reserve)}{Cir(SU)}$ which is **lower** than Vol(L2).

Hyperbolic function f_reserve_buy provides optimal solution for stabilisation in the acceptable rage of market conditions (see Appendix A).

This Stabilisation Fund is sufficient to keep the price of SU stable for the most of expected market conditions. However during significant market volatility, when the portfolio of the crypto assets in the reserve has low price and at the same time the market demand on SU is low (which should not be a likely event because during the price fall of volatile cprytocurrecny we naturally expect higher demand for the stable cryptocurrency to hedge the risks) this might be insufficient to prevent the further price fall.

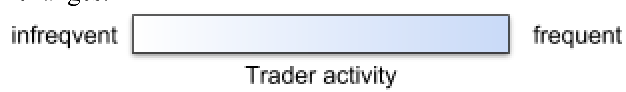
3. Bonds/Repos

Treasury bonds and other types of repurchase agreements (repos) have proved to be a very reliable and efficient method of monetary policy for central banks. If a Stabilization Fund is unable to stop the fall of SU price, the System sells some repos in form of bonds which later can be redeemed at the higher price.

If (1-Δd < SU <= 1-Δb): The System unlocks bonds which are enough to buy out some percentage (i.e. 5%) of the SU in circulation. Users are able to exchange SU for the bonds in form of token and later to redeem it back when the Stabilisation Fund regains its loses. More formally when **reserve_ratio > srr(t,C) safe reserve ratio.**

If (1 < SU and SF had regained loses): the bond holders are able to exchange bonds back to SU for the price 1+Δs i.e. receiving (1+Δs - bond_price)/(bond_price) ROI.

Why does the System not automatically exchange bonds for SU using FIFO queue during the bond sell to motivate potential buyers to buy bonds as soon as possible and get profit earlier? The reason is that we want to give bond holders an opportunity to freely exchange their bonds on a secondary market because this market will emerge anyway (some bond holders might want to sell their unredeemed bonds) and FIFO complication will only create the frustration for holders (bond[i] can't be redeemed before bond[i-1]) which inevitably reduces the price for the bonds. Instead we use special property of a bond **unlock_time** which is proportional to the time the bond was bought since bonds were unlocked and restrict redeemability of this bond by the System's smart contact on corresponded time.
Why does the System sells bonds instead of offering some sort of savings account that people can use to park their funds for a bonus? Despite both these methods offering a mechanism to reduce SU in the circulation, in reality we can put all traders on a scale of how frequently they perform SU exchanges.



Saving accounts might be implemented into wallets therefore engage players who rarely trade to park their funds. While this does indeed reduce the money supply it does not influence market movement as much as selling bonds to the traders who influence price faster.

4. Shares dilution

The stabilize mechanism is unlikely to initiate, since it is implied that very severe market changes have happened or that the system has been compromised. According to our principles (please see p. Foundation), the System exists solely for users, therefore profit-driven shareholders should take this risk. While all current proposals of uncollateralized cryptocurrencies expected to collapse at this point, we propose to preserve the System with share dilution.
If (1-Δp < SU <= 1-Δd): automatically dilute the "SU_DAO_shares" to recapitalize the System by selling it in an automatic auction until Price(SU) goes up or new minted shares exceeds the maximum limit which is equal to some percentage of the available supply and depends of the time the System had been exist.
This limit is equal to $\sum_{t=0}^{current\_year} (\frac{1}{4})^{(t/4+1)}$ which is harmonic Dirichlet series and converges because (t/4+1) > 1. It leads to possible additional supply of 25% of shares in the first year, ~17% in the second, 12.5% in the third and so on defining the theoretical additional supply of shares by $\frac{1}{4}(1 + \sqrt{2}) \approx 60\%$.

5. Temporary fund parking

In the event of extreme or severe market instability, the Funds Parking Mechanism can be engaged. This process can be used as a last resort to cryptographically guarantee stability of the system.
Parking is in many ways comparable to lending at interest, where holder enters into an agreement to lock some portion of their funds at ($t_{starttime}$) for some period of time and unlocks their funds at an end time ($t_{endtime}$) and in the process receives the promise of some rate of return. Design of the Stabilization Fund guarantees that reserves are never empty unless the cumulative price of all crypto assets in the reserve are zero. Therefore **∃ parking_ratio: Cir(SU)*parking_ratio*srr(t,C) ≤ Vol(L2) ⇒** it always possible to temporary park some percentage of available funds that rest of funds will be under conditions of guaranteed liquidity that drives SU price back to the peg value.

Fees

Fees will be sufficiently small so that they provide little to no friction for the user
Is it possible to make a transaction free? Technically yes, the System could not reward miners with Shares therefore it removes fee from the sender, however fees are necessary to prevent network from Denial of Service attack (DoS), where bad actors can send massive amounts of transactions at no or

little cost. Furthermore,it is necessary that transaction fees cover the System's expenses to support that network (miners).

The rest of the white paper will be released soon. Add your email to the list at https://email.stableunit.org to get notified of upcoming reference implementation, market simulations and protocol specification updates.

Why stabilisation mechanism layers are in exactly this order?

Incentives

Implementation

Risks and mitigations

Oracle

Competition

Single point of failure

Keys mismanagement

Challenges

Network grow

Token governance

Example of products

Fundation

Legal and compliance

Conclusion

References

[1]https://bitcoin.org/bitcoin.pdf
[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
[4*]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)
[6]https://finance.yahoo.com/quote/GOOG/
[7]https://goldprice.org/
[8]https://coinmarketcap.com/currencies/tether/
[9]http://www.nbbmuseum.be/doc/chap5e.pdf
[10]https://www.investopedia.com/terms/p/purchasingpower.asp
[11]https://www.coindesk.com/top-uk-tax-agency-eliminate-20-levy-bitcoin-trading/
[12]https://www.forbes.com/sites/nathanielparishflannery/2016/12/19/5534
[13]https://www.washingtonpost.com/news/worldviews/wp/2018/03/23/venezuela-hopes-to-tackle-the-worlds-worst-inflation-by-deleting-zeros-from-its-currency/
[14]https://www.forbes.com/sites/kenrapoza/2015/01/27/russia-to-retaliate-if-banks-given-swift-kick
[15]https://makerdao.com/whitepaper/
[16]https://www.researchgate.net/publication/322951893_Stabilising_fractional_reserve_banking
[17]http://positivemoney.org/2012/06/spanish-crisis-illustrates-the-inherent-instability-of-fractional-reserve-banking/
[18]https://www.reddit.com/r/MakerDAO/comments/7zitlv/why_should_we_trust_the_makerdao_oracle_system/
[19] https://developer.makerdao.com/feeds/
[20]https://www.reddit.com/r/MakerDAO/comments/7zitlv/why_should_we_trust_the_makerdao_oracle_system/
[21]https://www.bls.gov/opub/mlr/2008/08/art1full.pdf

Appendix A

Appendix B