

# STABLE



**Stabilizing the digital tokens universe**

**Whitepaper**

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## Introduction

Between December 2013 and January 2015 the price of Bitcoin in US dollars lost nearly 87% of its value, which followed an even more severe decline of 93% between June and November of 2011. A 87% drop requires a subsequent 670% increase just to break even, while a 93% drop requires a 13-fold increase to fully recover the loss. Measuring price changes over shorter timeframes does not paint a better picture of the digital tokens (**DTs**) landscape. Bitcoin's price drops over a 24 hour period exceeded 15% on 5 occasions in 2017 alone. Flash-crashes abound in local markets (individual exchanges), even for tokens with highest market capitalization (Bitcoin and Ethereum).

Digital tokens (**DTs**) price volatility stands in a stark contrast to the risk of holding developed countries currencies and traditional financial instruments such as stocks or bonds. Instability of prices is making life harder for the current users of cryptocurrencies and is one of the main reasons of slower acceptance of this vital innovation by outsiders. To make things even less appealing, prices across different exchanges differ, which further increases uncertainty as to where and when an exchange between digital tokens or between digital tokens and fiat currencies (**FCs**) should take place.

One of the things the digital tokens universe lacks the most is stability.

## Project overview

**STABLE** is a project aiming to reduce the volatility and inefficiencies existing in digital tokens markets and stabilize them, thus driving their wider acceptance.

In global financial markets inefficiencies are usually minor and finding them requires extensive back-testing, costly software and detailed statistical analysis. In digital tokens markets the reality is quite different. In fact, the inefficiencies are so pervasive, that for a veteran investor noticing atypical behavior of these markets may require just a glance at "the tape". They manifest in a multitude of ways, including persistence of price disparities, speed of price adjustments, behavior of bid/ask spreads following shocks, as well as presence (or lack thereof) and behavior of automated trading systems (API bots), some of which have visibly unsophisticated trading rules. More efficient digital token markets are possible, but in order to achieve this goal-state new entrants into the space are required with an appropriate experience both in cut-throat traditional financial markets, as well as the fledgling digital tokens markets. Additionally, more liquidity is needed to accommodate varied strategies to be executed on those highly fragmented markets.

## Inefficiencies in digital token markets

There are five main types of inefficiencies manifesting themselves in digital tokens markets:

- 1) inter-exchange inefficiencies,
- 2) temporal inefficiencies,
- 3) liquidity based inefficiencies,
- 4) excess volatility based inefficiencies,
- 5) intra-exchange inefficiencies.

## **1) Inter-exchange inefficiencies**

One of the main inefficiencies is persistence of different prices (exchange rates, exchange ratios) for the same DT pairs, or for the same DT/FC pairs at different exchanges. These differences stem from multiple sources:

- a) separate markets display different demand/supply characteristics, as different venues may serve in different proportions to investors, speculators, and market participants using digital tokens primarily for transactional purposes,
- b) existence of leveraged instruments on some exchanges may induce wild price swings due to forced liquidations (so called “crowded exits”),
- c) certain price differences arise due to change in exchange rates between fiat currencies. Thus, a change in EUR/USD exchange rate on global FX markets will necessitate a change in BTC/USD or BTC/EUR exchange rate in all DT markets. Analogous adjustments are necessary for all other DT/FC pairs that have exchange listings in more than one currency.

## **2) Temporal inefficiencies**

This type of price disparities manifests itself in instruments and cryptocurrency exchange functionalities that facilitate exchange of tokens through time. In plain English, one would be tempted to simply describe this as token lending and borrowing, but this does disservice to the multitude of instruments such as margined positions (with different mechanisms charging positive or negative time-value-of-money adjustments), forwards, swaps, inverse swaps, futures and inverse futures contracts available in digital tokens marketplace.

In theory, there are three components of expected return for instruments that deliver certain value in the future, rather than right now: inflation premium, term premium and liquidity premium. The inflation premium compensates for the increase in the number of token (or currency) units over time. The term premium is subdivided into a ‘risk-free’ time-value-of-money premium and default premium. Risk-free rate is usually associated with the rate of lending to national or federal governments of developed countries. The default rate in case of DT markets must consider a multitude of risks: cryptocurrency exchange business failure, fraud risk, theft risk, etc. Liquidity premium applies primarily to instruments with low turnover, wide bid/ask spreads and non-transferability. FCs and DTs are easily transferable, so even if liquidity and bid/ask spreads are unfavorable on a given exchange, the holder of such assets may opt to transfer them to another venue with better characteristics. To the contrary, a DT swap or futures contract listed on a certain exchange may have to be closed at unfavorable price or bid/ask spread now, or held to maturity (settlement), as it is not transferable to another marketplace. This lack of flexibility to negative market conditions requires additional expected return, which should translate to lower price in the present vs. the future.

### **3) Liquidity-based inefficiencies**

Some inefficiencies can best be resolved through increased liquidity. Our best estimate is that a number of exchanges lack sufficient liquidity to absorb arising inefficiencies. Specifically, when price of a certain DT/FC pair is too high, it requires a sale of DT for FC to bring the exchange ratio to an equilibrium. As an example, if an exchange rate of BTC/USD is too high on a certain exchange vs. all other exchanges, it requires a sale of BTC for USD on that exchange in order to close that inefficiency. Transferring new BTC to that exchange will usually take several blockchain confirmations (say, 30-60 minutes), thus an entity with ample liquidity available on that exchange will have a head start and can benefit to a much larger degree than another market participant that would only transfer tokens once the disparity arose and has been spotted.

In the opposite situation (when DT/FC price is too low) bringing an exchange rate to balance requires transferring fiat currencies from one market to another, which takes much more time. EUR SEPA transfers may take 1-2 days and USD SWIFT transfer time can be as long as 5 to 7 days. An entity with a big enough asset base can arrange with banks for express international transfers, an option which is unavailable for participants with smaller amount of capital but achievable for bank's institutional client. In any case, feeding new fiat currency liquidity to an exchange is impossible over weekends and extended holidays, such as Christmas, New Year or Lunar New Year. Additionally, as demonstrated recently by banking issues in Taiwan affecting Bitfinex and OKcoin, there can be regulatory hurdles coming from tightened AML/KYC procedures. Therefore, a price disparity on an exchange may persist for the duration of the wire transfer, bank holidays or heightened government scrutiny.

### **4) Excess volatility based inefficiencies**

High level of price volatility of digital tokens is a well-known phenomenon. Rational investors seek investments that have high level of expected profits coupled with relatively little risk. What is much less known is the fact, that an instrument with too high risk (too high volatility) is not efficient from theoretical point of view as well. In such a case economic profits can be obtained from the so-called "volatility selling" strategies. In financial markets this is usually done via variance swaps, volatility futures, but can also be achieved by writing (issuing) options, which have implied volatility embedded as part of their price. As such instruments are not yet common in digital tokens marketplace, volatility selling strategies have to be implemented via custom-made algorithms and proprietary-written software.

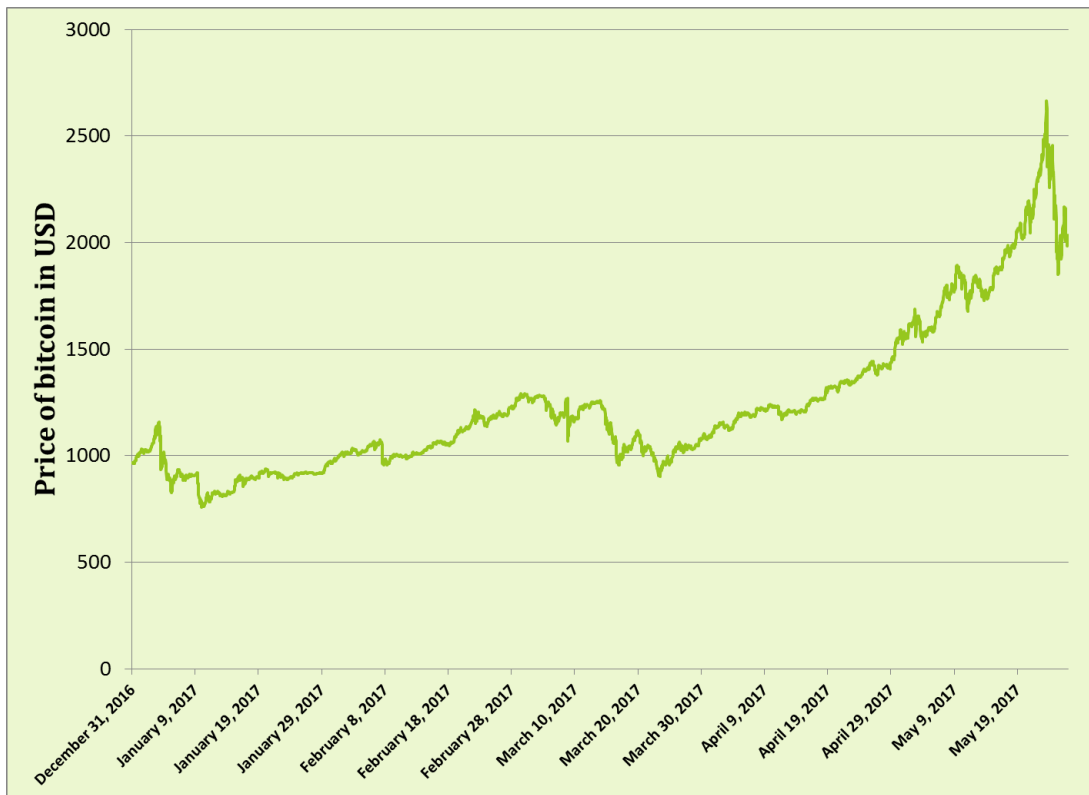
### **5) Intra-exchange inefficiencies**

Price disparities between two instruments listed on one exchange are largely of the same nature as those that can be observed between two separate exchanges. However, intra-exchange inefficiencies tend to be smaller and disappear faster, therefore they are of lower priority for an entity aiming at stabilizing markets. Nevertheless, this type of inefficiencies will be monitored for and taken advantage of, should they offer better opportunities than any of the inefficiencies described above.

### Case study 1 – an example of Type 1b and Type 3 inefficiency

In order to illustrate the size and pervasiveness of market inefficiencies we present price discrepancy between two Bitcoin contracts, traded in different currencies at different exchanges. Please note, that price differences exceeding 10% do not happen very often, and may be indicative of additional risks present at one of the exchanges. Additionally, please note, that the capacity of such strategy is limited by liquidity available on smaller of the exchanges at any given time. In this case it is estimated at about 1-2 million USD, as measured by transacted volume. For a project with a number of strategies allocating no more than 10-20% of its asset base to any single idea, the optimal capacity of this strategy at the described time would be consistent with an asset base of about 10 million USD.

**Chart 1. Bitcoin price in USD between Jan 1 and May 28, 2017**



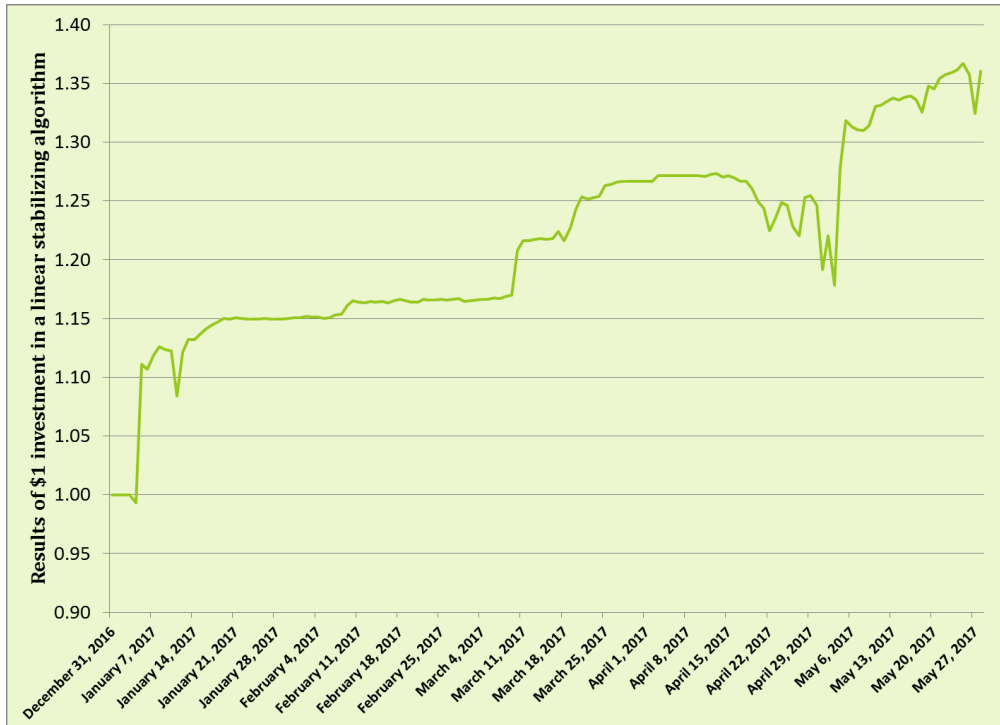
Source: bitcoincharts.com

**Chart 2. Ratio of Bitcoin prices on two separate exchanges between Jan 1 and May 28, 2017**



Source: bitcoincharts.com, cryptocurrency exchanges APIs

**Chart 3. Results of \$1 investment using a linear stabilizing algorithm**



Source: simulation based on data from cryptocurrency exchanges and our proprietary software (Cryptoscanner)

Note: The results presented above represent a potential and are not indicative of future results, even under similar circumstances. The simulation includes estimated commission costs, but did not include financing costs. The calculations were based on realized transaction prices, but actual prices could differ depending on actual transaction size and type of orders used. Past results are not indicative of future results.

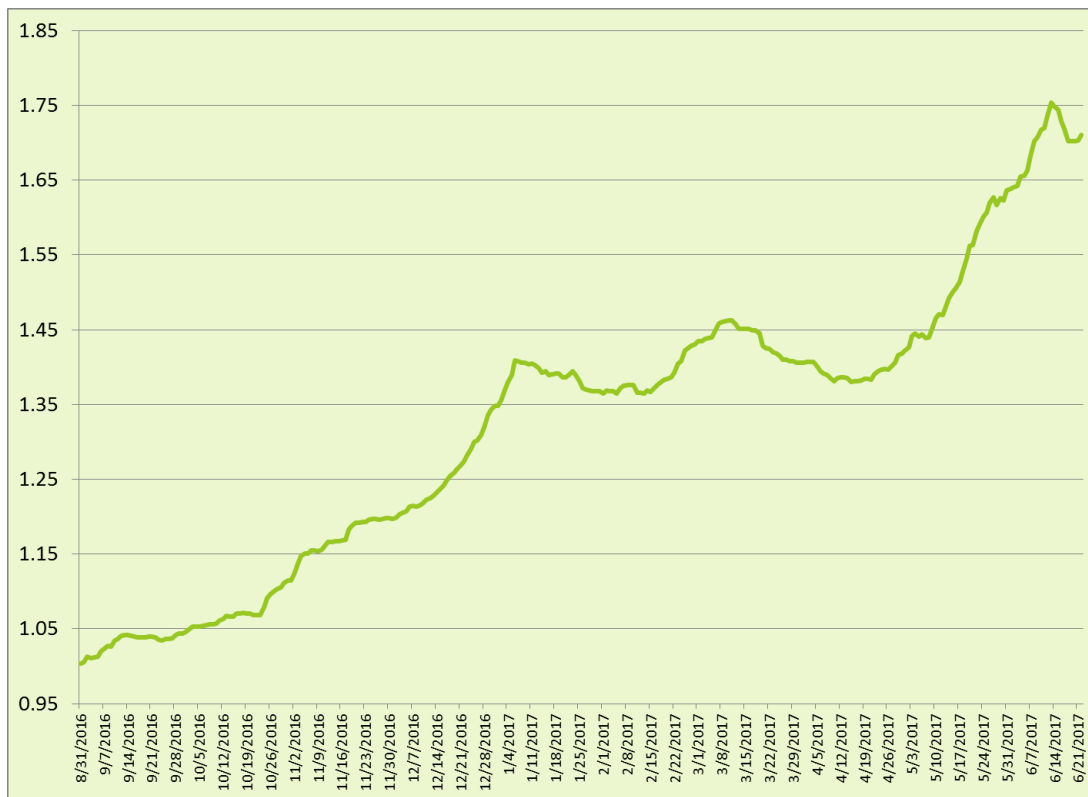
Chart 3 presents potential results of a strategy using a linear stabilizing algorithm. An investment of \$1 would have grown to as much as \$1.36 during the first 6 months of 2017. The time frames of Charts 1, 2 and 3 are identical.

### **Case study 2 – an example of temporal (Type 2) inefficiencies**

The second example of inefficiencies deals with DT lending/borrowing and instruments that have time-value-of-money embedded as part of their price – such as forwards or futures contracts. In DT universe users of tokens can be both lenders and borrowers. Lending/borrowing rates on two exchanges can differ to a much larger degree (ratio-wise) than prices (exchange ratios), but when compared on a daily basis they may seem insignificant. However, a small 0.1% difference in future prices or lending rates on a daily basis translates to as much as 44% annually. Such minor differences in values of instruments and lending rates tend to be overlooked by market participants, which is understandable, given how volatile DT markets can be. However, if discovered by proprietary market scanning software, properly managed and hedged, even such small daily differences in lending rates can be harvested and will then compound to very attractive annual growth rates. Chart 4 presents simulated results achieved by following an algorithm that consistently exploits differences in funding rates available on two cryptocurrency exchanges.



**Chart 4. Results of \$1 investment using a lending/borrowing strategy (Sep '16 - Jun '17)**



Source: simulation based on data from DT exchanges

Note: The results presented above are hypothetical and are not indicative of future results, even under similar circumstances. The calculations were based on realized lending/borrowing rates, but actual rates could differ depending on actual transaction size. Past results are not indicative of future results.

## Asset base necessary to stabilize the markets

On June 22, 2017 the market capitalization or, in other words, the market value of all digital tokens stood at about 110 billion US dollars, while daily turnover exceeded 3.7 billion dollars. Those numbers has grown substantially over the past year and may grow further, as new tokens enter the marketplace and existing ones enjoy wider acceptance. In order to fully close the existing inefficiencies the asset base and volume of transactions must constitute a substantial portion of DT markets capitalization and volume. It is difficult to quantify this with accuracy, but it reasonable to assume, that the asset base necessary to make digital tokens markets efficient should be expressed not in millions, but rather in hundreds of millions or even billions of US dollars. Achieving such an asset base from the get-go is neither realistic nor necessary. **STABLE** will act as a proof-of-concept and, as an early entrant in using stabilizing techniques and algorithms, will pluck the low-hanging fruits, eliminate the biggest inefficiencies and reap economic benefits that may allow its assets to grow at a high rate. While the inefficiencies should progressively diminish over time, it is unlikely

that they will disappear completely. Our ultimate goal is to bring digital token markets to a level of efficiency that characterizes markets for goods, services or financial products.

## Project timeline

The STABLE project has 4 phases: the design phase, the crowdfunding phase, the setup phase and execution phase. The design phase will largely have been concluded with the release of this white paper and other documents, as published on project's website ([www.stable.foundation](http://www.stable.foundation)). There are still certain project details left to be decided concerning legal structure and team size, which is partially dependent on the scale of crowdfunding support.

## The crowdfunding phase

The crowdfunding phase of the project will take place over 28 days between **3<sup>rd</sup> of September and 1<sup>st</sup> of October**, 2017. It will take a form of Initial Coin Offering (ICO), wherein Ethereum (ETH) tokens will be exchanged for the newly created STB tokens. The base exchange ratio is set at **10** STB tokens for each ETH token. Early participants in the crowdfunding exchange will enjoy a premium of 6% during the first 5 days of the ICO, 4% in the second 5-day period and 2% in the third. Crowdfunders exchanging ETH for STB in the final quarter of the ICO phase will be subjected to the base exchange ratio of **10 STB/ETH**.

Additionally, the ICO smartcontract will generate **100** Stable Awareness tokens (STA), which will be distributed to the Ethereum miners. The STA distribution phase will start 5 days before the ICO phase and will last for 25 days, with an average of 4 STA tokens distributed every day. Ethereum miners will be able to exchange the STA tokens for the STB tokens during the ICO phase and **10** days after the closing of the ICO. The amount of STB tokens reserved to be exchanged for the STA tokens mined by Ethereum miners is 0.5% of the STB tokens exchanged for the Ethereum tokens transferred by crowdfunders.

The ETH tokens transferred during ICO will be held at a multisig address for the duration of the 20 day ICO phase. The minimum level of crowdfunding is set at **3000** ETH, which corresponds to a minimum asset base level at which the cost of maintaining the infrastructure and funding the project team effort is estimated to be economically viable. If achieved, the crowdfunding will be deemed successful, Ethereum tokens gathered during the ICO phase will be released to legal entities handling the operations of the project and crowdfunders will receive the STB tokens. If the minimum level of funding is not achieved, the ETH tokens will be returned to the addresses from which the ICO smartcontract has received them.

During the ICO phase the value of Ethereum tokens transferred will likely be subjected to high volatility vs. base currency of crowdfunders (US dollars, euros, yen, British pounds, etc.). The sliding-scale premium embedded in the smartcontract code (6% for the first 5 days, 4% for the second 5-day period and 2% of the third 5-day period) is designed to partly compensate for this expected volatility. The only way to fully protect oneself from the price swings likely to be experienced during the ICO phase is to hedge the Ethereum amount transferred to your base currency on one of the DT exchanges. The project team will announce on the project's website the

moment when the crowdfunded Ethereum tokens will be fully hedged from the price swings, which will also be the baseline date for project's performance measurement.

The Stable tokens (STB) created during the ICO will be distributed as follows:

- a) at least 99.5% of STB tokens will be distributed to the Ethereum crowdfunders,
- b) no more than 0.5% of STB tokens supply will be distributed to the Ethereum miners, who will have mined randomly selected 100 blocks over 5 days prior to the ICO start and during the 20-day ICO phase,
- c) the project management team will neither receive nor reserve any funds gathered from the ICO. All funds will be used for the project's purposes – stabilizing the digital tokens markets, with the sole exception of legal entities setup costs, which will be covered from the asset base. All other operational costs will be covered from the management and success fees.

### **The setup phase**

Immediately following the successful crowdfunding phase, the project team will proceed with the setup of legal entities necessary to carry out operational activities. Jurisdictions of stable democracies with strong rule of law will be preferred. Digital token exchanges will be approached to list the STB token in order to allow token exchangeability and provide a reliable day-to-day market price. Algorithmic APIs will be deployed. An accounting company that has sufficient experience with digital token accounting will be chosen and employed. Finally, an auditing company will be hired in order to ensure reliability of project's financial reports.

### **The execution phase**

**STABLE** project team infrastructure (both hardware and software) will be prepared to be deployed immediately following the successful conclusion of the ICO. Some modules have previously been used to connect our algorithms to the world's biggest stock exchanges (NYSE/Tokyo Stock Exchange) as well as world's biggest commodity/stock index futures exchanges (COMEX/NYMEX/GLOBEX). The software will scan cryptocurrency markets for such data as: token, token futures and token swaps prices, swap/borrow rates, bid/ask spreads, commissions/rebate rates, then rank the opportunities and stabilize the markets 24 hours a day, 7 days a week, 365 days a year. While the relatively simpler and repeatable decisions will be algorithmized and transacted by the APIs, decisions concerning more complex situations will be analyzed and transacted "manually" on case-by-case basis.

The funds will be spread across a number of DT exchanges, with no more than 20% of project's asset base concentrated on any one venue. Exchanges domiciled in the developed countries (OECD members) will be preferred, although a venue in any country with satisfactory stability and rule of law can be considered. Exchanges that release DTs for transfer manually or keep vast majority of clients' tokens in cold storage will be preferred. Access to project's tokens at the exchanges will be subject to at least two-factor-authentication (2FA) processes.

As a general rule, the more inefficient and more unstable markets will be addressed as a first priority, subject to exposure limits. The project will be involved in both the DT-DT type of transactions and positions, as well as the DT-FC type of transactions and positions. The project may, on occasions, enter leveraged positions. This is expected to be beneficial for two reasons: first, leveraged products are at times some of the more inefficient, as they suffer from forced liquidations by exchanges (so called “crowded exits”), and second, a safe, hedged position requires one leg to be on the long side and one on the short side. Such a spread by its very nature creates a gross leveraged position, even if the net exposure is zero or very low.

Importantly, one of the tokens to be stabilized by the **STABLE** project will be the STB token itself. As the intrinsic value of the token will be known (equal to the asset base divided by number of tokens), audited and periodically published, the project will be prepared to buy tokens at a discount to its value and sell above its value should such a situation arise. The actual discount/premium at which the project will purchase/sell STB tokens will be dependent on market conditions.

### **The need for flexible STB token supply**

One of the common features of digital tokens is a hard-coded maximum token supply or fixed rules for new token inflation. Unfortunately, with a fixed STB token supply, the project team could only deliver low volatility of changes in the project’s asset base (Net Asset Value), but not in market value of the token, which would be dictated by the forces of supply and demand. In times of high demand, the value of the token could be traded in the market at a significant premium to its intrinsic value. Project team would not be able to satisfy the demand with increased supply of tokens, as it cannot sell tokens that it does not own. In times of low demand project team could stop the market value from going significantly below intrinsic value, by purchasing the STB token in the market – as, obviously, it can purchase the STB tokens that it does not own. Such asymmetric situation is potentially dangerous, as the premium may reach arbitrarily high level and then collapse abruptly, which could significantly increase the volatility of the STB token and create economic losses for token holders.

Chart 5 presents historical values of price premium of Bitcoin Investment Trust (GBTC). Even though the intrinsic value of trust’s assets is well known, as it is derived from underlying value of Bitcoins it holds, market participants have nevertheless been willing to pay significant premium in order to purchase its units, at times reaching 100% (which means that the price of Bitcoins purchased through GBTC is twice as high as in the international markets).. As the direction of premium usually mirrors the direction of the price changes of the underlying asset, on average it expands, when underlying instrument’s prices go up, and it shrinks, when prices go down. In case of GBTC, volatility of the market price over the past year was nearly twice as high as volatility of Bitcoins it holds. In times of prices corrections or prolonged price declines, the shrinking premium will likely add to the downside volatility.

**Chart 5. Premium of Bitcoin Investment Trust (GBTC) over its Net Assets Value.**



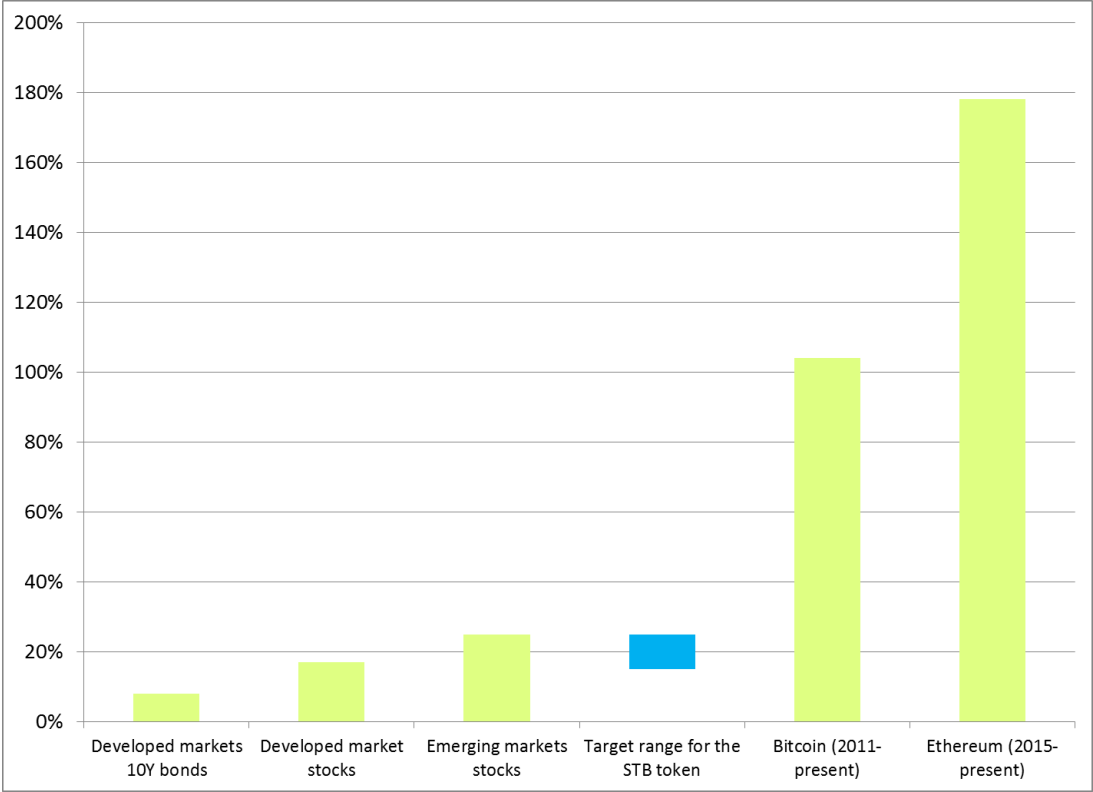
Source: Bloomberg

In order to prevent such a situation and keep STB token volatility at lowest possible level, project's team reserves the right to mint additional STB tokens at times when market price of the STB token exceeds the net asset value by at least 10%. Such events will be announced with sufficient lead time (at least 48 hours) on the project's website.

### **Expected results**

It is the goal of the project's team to stabilize the DT tokens markets and, at the same time, ensure a relative stability of the STB token value over time. The team expects to deliver the annual volatility (variability) of project's net assets and therefore STB token price that is much lower (about 5-10 times lower) than that of other major digital tokens. It is presumed that a wider acceptance of the token is only possible if the realized volatility is comparable to that of traditional financial assets (such as stock market indexes). It is important to note, that in traditional financial markets it is possible to model and target a certain level of volatility with very good accuracy. In digital tokens markets the situation is much different – they have a short history, which makes them more difficult to model. They also suffer from the 'unknown unknowns' type of risks, that may result in higher volatility of prices than expected or experienced in the past.

**Chart 6. Expected (targeted) volatility of the STB token as compared to other digital tokens and financial asset classes**



The project team does not target or expect any specific growth rate of the asset base, and consequently change in fundamental value of the STB token. This results from multiple uncertainties concerning DT markets as well as the project itself. The growth rate also, to some degree, depends on the scale of the project, as some fixed costs that may have significant impact on the asset base at minimum level of funding will have a proportionally much lower impact in case of more successful crowdfunding.

**Project’s benefits**

**Benefits to the community of DT users**

The primary benefit to the current and future users of digital tokens will be more efficient and more stable DT markets. With the implementation of the project prices differences between the same currency pairs on different exchanges should be reduced and the volatility of digital tokens markets stabilized by the project should be lower. Additionally, individual markets will become more liquid, which should ensure more streamlined execution of orders on DT exchanges.

**Benefits to the holders of the STB token**

One of the primary goals of the STB project is creation of a digital token, which is expected to be much more stable in value than other popular tokens. If the goal is achieved by the project team, holders of the STB token will enjoy all the benefits of digital tokens such as speed of transacting, global transferability and anonymity, coupled with much lower volatility of prices across time. Additionally, if the economic benefits of executing stabilizing transactions exceed the costs of running the **STABLE** project, value of the STB token should rise over time, thus benefiting holders of the token.

### **Benefits to the project team**

The project team will be compensated for their efforts by a fixed percentage fee of no more than 2.5% of the net asset value annually plus a variable performance fee of no more than 20% of the increase in STB token value.

## **Risks**

The risks to the project can be subdivided into several areas:

### **Blockchain technology related risks**

First group of risks comprises of negative events that revolve around the blockchain technology itself. A Bitcoin 51% attack, in which an entity gains effective control over 50% or more of the network's computing power is one example. Errors in smartcontracts code on the Ethereum blockchain may impact performance of the network (such as transaction processing time), which, in turn, may result in unpredictable smartcontract code execution and unforeseen consequences for the markets.

### **Cryptocurrency exchanges related risks**

Second type of risks concentrate on the operation of cryptocurrency exchanges. They are exposed to theft through hacking or exploitation of security flaws, as evidenced by the demise of Mt. Gox in 2013/14 and security breach at Bitfinex in August 2016. Additionally, the exchanges carry the usual bankruptcy risk coming from competition and business risk relating to erroneous or suboptimal decisions taken by the management. A regulatory risk, which may result in temporary or permanent closure of an exchange operations should also be given weight. Cryptocurrency exchanges, especially those allowing leveraged position have suffered from flash-crashes (sudden, unexpected and substantial price drops). In thinly-traded markets, a large order may clear the order book on the opposite side, which may result in transactions matched at prices substantially different than in other exchanges. Some positions may be force-closed by exchanges due to margin calls or loss-sharing procedures.

### **Project-specific risks**

Another area of risks is concerning the operation of the project. While the management team will assume fiduciary duties and do its best to ensure best business practices concerning safety of project's asset base, there's still a non-zero risk that through human error or malice of outside

agents a portion of asset base might be lost, misappropriated or stolen. Similarly to cryptocurrency exchange hacking events, recovering lost, misappropriated or stolen funds may be difficult or impossible due to high level of anonymity of digital token owners.

### **The 'unknown unknowns' type of risk**

The 'unknown unknowns' type of risks is much more difficult to address. These risks are by definition unexpected as to their nature and as to their timing. As the digital tokens universe is still relatively young, there are plenty of potential risks in the area of government regulation, digital tokens coding, cryptocurrency exchange security solutions that can negatively impact the project, but which, as of yet, has not been experienced, therefore cannot be expected or properly quantified.