Geeq

Algorithmic Monetary Policy for Geeq's Stabilized-Token

Algorithmic Monetary Policy for the Geeq Stabilized-Token[1]

Introduction

Geeq is a new approach to distributed ledger technology (DLT). Geeq's proprietary protocol, Proof of Honesty (PoH), provides a multilayered security guarantee based on economic mechanism design, that extends to the entirety of the Geeq Platform. Each instance of a geeqchain has a validation layer with its own blockchain and ledger, its own independent network of validating nodes, and a separate application layer which may be customized to meet the requirements of a wide variety of use cases.

The "**$GEEQ**" (the platform's native token) is primarily intended to pay the networks of nodes for their validation and virtual machine services. **$GEEQs** can also be used for micropayments in IoT, content management, smart city, and other applications, or as a general purpose cryptocurrency. This paper describes a transparent, predictable, algorithmic monetary policy designed to let platform use and token demand – rather than speculation – be the primary drivers of token value.

The Volatility of Cryptocurrencies Limits Blockchain Adoption

Blockchain has enormous potential to create new markets, make existing markets more efficient, to protect and empower, and for social good.[2] Unfortunately, the price volatility displayed by existing cryptocurrencies has had the effect of making the public wary of blockchain technology and platforms in general. Token prices seem to be, and often are, driven by speculation and market manipulation. This may be true even for good projects with dedicated teams building important applications.

Allowing any currency, fiat or crypto, to become detached from its underlying utility to the economy puts speculators squarely in charge of determining its value. Rational users naturally insist on a premium to buy and hold such risky assets, which further depresses their values. To make matters worse, both positive and negative price swings can be driven by relatively small trading volumes which can take on a life of their own once they start.

Speculation and volatility are familiar problems in finance and economics. Theory and historical experience have many lessons to teach about what a well-designed monetary policy can achieve. Allowing any currency, fiat or crypto, to become detached from its underlying utility to the economy puts speculators squarely in charge of determining its value. The result is volatility and

1 This paper contains a description Geeq's stabilized-token and the monetary policy that supports it. Geeq, geeqchain, Geeqosystem, Proof of Honesty, PoH, Strategically Provable Security, SPS, Catastrophic Dissent Mechanism, CDM, Stabilized-coin, and Stabilized-token are all registered trademarks of The Geeq Corporation.

2 See for example, a portion of a report written for the World Bank posted here: https://medium.com/geeq-official/world-bank-using-blockchain-to-further-its-mission-9a4f12fde51a

possibly monetary collapse, none of which benefits investors in platforms, application developers, or users in the DLT space.

Stable-Coins and Exchange Rate Pegs

If it were possible to create a "stable-coin" that had a fixed value with respect to fiat currencies, it would probably relieve a great deal of the public's concern and anxiety about using cryptocurrencies. The idea of maintaining fixed exchange rates between currencies has a long history in economics and policy. Central banks of many nations have often attempted to peg the value of their own currencies to another, to a basket of other currencies, or to a commodity such as silver or gold. Banks support these pegs by standing ready to buy back any domestic currency offered at the promised exchange rate. Unfortunately, policies that have attempted to fix the relative value of a currency either through foreign exchange pegs or stable-coin approaches have been difficult, expensive, ill-advised, and almost always unsuccessful.

For example, in the early 1990s, England attempted to maintain a 2.7 mark/pound exchange rate as part of its effort to support the European Exchange Rate Mechanism. George Soros and other currency speculators shorted the pound forcing the Bank of England to raise interest rates and commit large parts of its foreign exchange reserves to buying back the pound on the open market. This became increasingly difficult as the Bank of England's reserves dwindled. Ultimately, England was forced to give up and let the exchange rate float. Currencies backed by commodities such as gold or silver have also proven to be unsustainable. The underlying economics here is that the one and only way to support a fixed exchange rate is to maintain a 100% reserve of the other currency or commodity in question.[3]

True stable-coins also have an obvious downside from the standpoint of platform builders. Namely, if 100% of token sale revenue is kept in reserve to guarantee the value of the stable-coin, nothing is left over for platform development. In addition, the lack of any upside removes all incentives for investors to purchase the token of a stable-coin project.

Lessons for Tokenomics

The bottom line is that a bad monetary policy can destroy a platform's utility just as easily as it can destroy a nation's economy. The extremes of uncontrolled volatility and costly or infeasible stable-coin policies are both undesirable. Bad tokenomics are bad for projects and bad for the cryptospace at large.

What is needed is a monetary policy that is predictable and creates expectations that reduce price volatility without attempting the impossible task of controlling the market. Geeq's tokenomics were developed with these objectives in mind.

3 The problems with stable-coins are discused in more detail in "ETFs Rule, Stablecoins Drool: How to Make Cryptocurrencies go Mainstream".

Geeq introduces an Algorithmic Monetary Policy that provides users certainty about Geeq's token supply and ties it directly to platform usage. By expanding or contracting the tokenbase in response to market conditions, this policy creates a "stabilized-token" that can increase in value in an orderly way, but is supported to protect it from rapid price decreases driven by thin speculative trading.

Geeq's Monetary Policy

Geeq's novel Algorithmic Monetary Policy (AMP) is designed to let platform use and token demand rather than speculation be the primary drivers of token value. We provide a high level description of the AMP in this section.

Overview

A total of 100M **$GEEQs** with a notional base price of $.25 will be pre-mined, and then sold or otherwise distributed to investors, contributors, founders, the community, or reserved for platform development. The AMP becomes active when the mainnet is launched and $GEEQ's then current market price will be taken as the original price level used as a foundation for the Geeq's stabilization policy.

The fundamental idea of Geeq's monetary policy is to slowly expand the tokenbase as **$GEEQ's** price goes above the original price, P^0, to generate a cash reserve that will be used to support **$GEEQ**'s price if it should ever start to decrease. The AMP itself uses this to create a non-trivial and predictable base of supply and demand for **$GEEQ** at every price level that should insulate **$GEEQ** from fluctuations that result from thin trading volumes.

Operationally, the AMP generates new tokens at a rate of 10% for every multiple of the base price of $.25 that $GEEQ's price goes up. Part of the revenues generated from the sale of these new tokens is placed in escrow in a Fiat Stabilization Reserve (FSR) account. As long as **$GEEQ**'s value goes up, both the tokenbase and the FSR go up as well. If $GEEQ's price ever begins to fall, the FSR account automatically starts buying back a predetermined, publicly known, number of tokens and places them in a Token Stabilization Reserve (TSR) account which removes them from the circulating coinbase.

Overall, 45% of any new $GEEQs issued will be set aside for token value stabilization, 30% for development, sales, and other platform expenses, 15% for founders advisors and contributors, and the remaining 10% for developer support and community outreach. The AMP uses the funds in the FSR for stabilization in three separate price defense zones.

High Water Zone (HWZ): 25% of the FSR is used to stabilize the $GEEQ's value from the highest price it has ever obtained (called the high water price) to 90% of that value. This is because the greatest volatility exists close to the current equilibrium price. To put this another way, 1% variations in price are more common than 5% variations, which are more common

than 10% variations, and so on. Day over day price increases and decreases of 15% or 20% are not unheard of for cryptocurrencies, but they are far less frequent than smaller variations. As a result, a disproportionate share of resources is devoted to stabilization at the top 10% of the token valuation range. Heading off price drops while they are small is also a much more efficient way to use reserves than letting such fluctuations build and start generating negative expectational feedback.

Middle Price Zone (MPZ): 50% of the FSR is used to stabilize the $GEEQ's value if prices should ever leave the HWZ. In the MPZ, the monetary policy is designed to provide certainty that demand for the $GEEQ exists at all price levels and thereby serve as a speed bump to slow or stop price drops. Often, such price drops are built on very thin trading volumes rather than a wholesale loss of confidence in a currency. In such cases, the offer to buy back non-trivial quantities of tokens (although not a large fraction of the total coinbase) can have a disproportionate impact on price levels.

Price Floor Zone (PFZ): 25% of the FSR is used to guarantee a minimum value or price floor for $GEEQ. The price floor also represents the lower bound of the MPZ. Where this is set depends upon the size of the FSR and TSR. The details of how the price floor is calculated are discussed below.

To summarize, Geeq's AMP[4] creates a predetermined, publicly known, additional supply of tokens in bull markets, and additional demand in bear markets by using the FSR to repurchase tokens and remove them from circulation. The size of the circulating tokenbase is therefore automatically adjusted to reflect the actual needs of the users of the platform. This does not prevent the $GEEQ's value from increasing, nor does it guarantee that its value will never fall. What it does is fund a kind of insurance policy in good times that can be deployed to reduce the impact of bad times. The fact that there is a prefunded commitment to defend $GEEQ's value can dampen or stop low-information expectations driven price changes as well as make it much more difficult for speculators to manipulate $GEEQ's value.

An Example of the AMP at Work

To get a sense of how Geeq's stabilization policy works in practice, the following tables show how the AMP operates starting from from two possible original prices, $P^0 = \$.50$ and $P^0 = \$1.00$.[5] For simplicity, the tables assumes that price of $GEEQ at mainnet launch increases monotonically to $\$5.00$. If prices were to follow a more complicated path of upward and downward volatility, the

4 The Project's objective is to implement Geeq's monetary policy through a smart contract. However, the policy requires interactions between real world banks, token exchanges, and Geeq users. While Geeq can and will make implementation of this policy transparent, regulatory and technical issues may place limits on fully automating the policy through a smart contract. Geeq's founding principle is that code is law, and so to the extent that it is practical and compliant, an automatic process will be used. Banking and exchange fees, transactions costs, and similar expenses will be deducted from the FSR as they are realized.

5 Of course, $GEEQ's original price could be higher or lower when then mainnet is launched. See the appendix for a formal mathematical description that accounts for these details.

only thing that would change is that the FSR would be somewhat higher (the reason is discussed below). See the mathematical appendix at the end of this document for more details on how these numbers were calculated.

Token Generation by the AMP with $P^0 = \$.50$							
Token price	Base price multiple	Token quantity	Token cap	Token creation revenue	Dollars in the FSR	Platform dev.	Community fund
$,25	1X	100	$25	$0	$0	$0	$0
$P^0 = \$.50$	2X	100	$50	$0	$0	$0	$0
$1.00	4X	122	$122	$17	$12	$7.7	$1.7
$1.50	6X	149	$224	$51	$23	$15.3	$5.1
$2.00	8X	181	$362	$109	$49	$33	$11
$2.50	10X	222	$555	$200	$90	$70	$20
$3,00	12X	271	$813	$366	$244	$78.3	$37
$4.00	16X	404	$1616	$807	$485	$261	$81
$5.00	20X	603	$3015	$1707	$905	$415.2	$170

Token Generation by the AMP with $P^0 = \$1$							
Token price	Base price multiple	Token quantity	Token cap	Token creation value	Dollars in the FSR	Platform dev.	Community fund
$,25	1X	100	$25	$0	$0	$0	$0
$P^0 = \$1$	4X	100	$100	$0	$0	$0	$0
$1.50	6X	122	$183	$27	$12	$8.1	$2.7
$2.00	8X	149	$298	$75	$34	$22.5	$7.5
$2.50	10X	181	$453	$150	$68	$45	$15
$3,00	12X	222	$667	$261	$117	$78.3	$26.1
$4.00	16X	331	$1,324	$646	$291	$193.8	$64.6
$5.00	20X	494	$2.469	$1384	$623	$415.2	$138.4

(All numbers are in millions except token price)[6]

6 This is the revenue that would be generated if all tokens were sold at the moment they were created. In fact, 85% will be sold immediately. Founders and advisors' tokens are subject to lockups and may be held instead of forced onto the market directly as they are created.

These tables illustrate the token creation aspect of the AMP. The central purpose of Geeq's monetary policy, however, is price stabilization which this token creation makes possible. The following is an example to illustrate how the policy accomplishes this goal assuming that the original price used for the AMP is $P^0 = \$1.00$.

First, suppose that \$GEEQ's price starts to rise from $P^0 = \$1.00$ For every multiple of \$GEEQ's base price of $\$.25$ above P^0, new tokens are created at a rate of 10%. This means that new tokens are generated at a rate of 0.4% for each penny that \$GEEQ's fiat value rises above P^0. Thus, if the price of \$GEEQ goes to $\$1.01$, a total of $(.004)100M = 400k$ new \$GEEQs are created, if it goes up by another penny to $\$1.02$, an additional $(.004)100.4M = 401.6k$ new \$GEEQs are created, and so on. Suppose that price continues to increase until it reaches \$5.00. Then a total of \$623M would have been added to the FSR to defend \$GEEQ's price.

Second, suppose that \$GEEQ's price starts to decrease from this high water price of $\$5.00$. One quarter of the FSR or $\$156M$ is deployed in equal amounts over the 50 one cent intervals from $\$4.99$ (one cent below high water price) to $\$4.50$ (90% of the high water price) in the HWZ. If \$GEEQ's price falls all the way to $\$4.50$, a total of approximately $33M$ \$GEEQs would have been repurchased and placed in the TSR leaving $494 - 33 = 461M$ in circulation.

Third, suppose that \$GEEQ's price continues to fall into the MPZ. The AMP deploys 50% of the FSR to defend \$GEEQ's price over the range of $\$4.49$ to one cent above the price floor. It will turn out that we can set the price floor at $52¢$ in this case. This means that the MPZ has 396 one cent price intervals between $\$4.49$ and $\$.53$ and so deploys $311.5/396 = \$787k$ to repurchase tokens in each. Suppose that \$GEEQ's price drops all the way to the price floor. In total, the AMP would have repurchased $167M$ tokens. This implies that approximately $461 - 167 = 294M$ tokens remain in circulation and so the TSR holds $33 + 167 = 200M$ \$GEEQs.

Finally, the AMP deploys 25% of the FSR in the PFZ as an offer to buy any number of \$GEEQs from users at the price floor. To see that a price floor of $52¢$ is feasible in this case, note that the AMP has $\$156M$ to use in the PFZ which allows it to buy up to $156/.52 = 300M$ \$GEEQs, that is, slightly more than the $294M$ \$GEEQs remaining in circulation. Interestingly, this means that the AMP ends up offering price floor for \$GEEQ that it is higher than \$GEEQ's $25¢$ issue price in this case.

So far, we have explored what would happen if \$GEEQ's price rose monotonically from $P^0 = \$1.00$ to a high water price of $\$5.00$ and then fell monotonically to the AMP's price floor of $52¢$. Let's continue the example with \$GEEQ's price rising again to $\$5.00$ and then beyond.

Starting from the price floor, the AMP stands ready to both to buy any tokens still in circulation, and sell any tokens in TSR, at $52¢$. Suppose that \$GEEQ's price started to rise again into the MPZ until it reached $\$4.50$, the top of the MPZ. The AMP sells an equal share of the $167M$ the tokens it purchased in the MPZ at each of the 397 one cent intervals between $\$.53$ and $\$4.50$. Thus, it sells $167/397 = 422k$ tokens at each price level. This generates a revenue of $\$419M$. Note that

this is more than the $622/2 = \$311.5M$ that the AMP spent purchasing these tokens and so a profit of $\$108.5M$ is made in the MPZ.

If $GEEQ's price continues to rise to the original high water price of $\$5.00$, an equal share of the 33M tokens purchased in the HWZ are sold at each of the 50 one cent intervals between $\$4.51$ and $\$5.00$, or $660k$ tokens in each. In total, this generates approximately $\$157M$ in revenues which is $\$1M$ more than the $\$156M$ that was spent acquiring them. The profits are much smaller than in the MPZ, but the principle is the same.

If $GEEQ's price goes above its old high water price, three things happen. First, all of the profits made by the AMP are added to the FSR. Thus, at $5.01, the FSR is reset and contains $623 +$106.5 + $1 = $730.5M. Second new $GEEQs are issued at a rate of .4% per cent as long as price continues to go up. Finally, the high water mark price is reset at the point that $GEEQ's price price starts to decrease again. The AMP would then start to buy back tokens as outlined above only from a new high water price and with a larger FSR.

A key element of the AMP is that it produces a fiat surplus. This is because an equal *share* of the dollars in the FSR are spent buying $GEEQs on the way down, but an equal *number* of $GEEQs are sold on the way back up. Thus, many more $GEEQs are purchased at lower prices than at higher prices on the way down, while an equal number of $GEEQs are sold at all prices on the way up.

This implies that the more volatility $GEEQ experiences, the more effective Geeq's monetary policy becomes in the future. As we see above, the AMP generates a surplus as prices move up and down. The result is the FSR grows in proportion to the tokencap, greater resources are deployed to support prices in each of the price defense zones, and the price floor that the AMP generates for $GEEQ increases.

Geeq's monetary policy is pre-funded, transparent, and is designed to smooth the volatility and reduce uncertainty. The policy does not, in and of itself, determine the $GEEQ's market price. Instead, the AMP stands ready with a set of known bids and asks that all platform users can take into account when planning and conducting their business.

Conclusion

Geeq's tokenomics is centered on the idea of creating a middle path between the impracticallity of a fixed exchange rate stable-coin, and the uncertainty and volatility of an unsupported, free-floating token. The main purpose of the $GEEQ is to pay the network of nodes that support multiple, interoperable instances of geeqchains for their validation and virtual machine services. The intention of Geeq's monetary policy is to tie token value more closely to its use on the platform and the value of the services built by developers within the ecosystem of the Geeq Platform. Limiting the impact of speculators and dampening the impact of fear, uncertainty, and doubt creates a more predictable and stable environment to support and sustain adoption and usage for all of Geeq's platform participants.

Appendix: Implementing the AMP

This appendix outlines the implementation of Geeq's monetary policy in detail. We begin by defining some notation:

B : The tokenbase (total number of $GEEQs in existence) at any given time

F : The dollar value of the FSR at any given time

$\overline{F}$: The dollar value of the FSR at the most recent high water price.

T : The number of $GEEQs in the TSR at any given time $\left(T=T^H+T^M+T^F\right)$

T^H : The number of TSR $GEEQs purchased in the high water price defense zone

T^M : The number of TSR $GEEQs purchased in the middle price defense zone

T^F : The number of TSR $GEEQs purchased in the price Floor defense zone

P^H : The highest price $GEEQ has reached to date on exchanges in cents (high water price)

P^M : The boundary of the middle price zone ($P^M \approx .9P^H$) in cents

P^F : The price floor for the $GEEQ that can be guaranteed by the FSR in cents

P^0 : The original price at which $GEEQ's AMT starts

Price Defense Zones

The dollars in the FSR account are committed to supporting the $GEEQ's value if the price ever happens to decrease. More, specifically, $\overline{F}$, the amount in the FSR at the most recent high water prices is deployed in three separate price defense zones.[7]

Price Defense Zones:

- High Water Price Zone (HWZ): P^H to P^M
- Middle Price Zone (MPZ): P^M to P^F
- Price Floor Zone (PFZ): P^F

7 As we mention above, the AMP runs a profit that increases with price volatility. All profits are added to the FSR but are not deployed for stabilization until $GEEQ's price rises above its previous high water mark. This is remove incentives for currency traders to manipulate $GEEQ's price in order to profit from the AMP directly.

The boundaries of the price defense zones are rounded down to the next whole cent and any fractional cents are ignored. Thus, if the highest price \$GEEQ has every obtained is \$5.4878, then $P^H = 548¢$, and since $.9(5.4878) = \$4.93902$, $P^M = 493¢$. Note that all prices in this appendix are expressed in cents rather than dollars.

Initializing the Algorithmic Monetary Policy

Geeq's AMP begins when the mainnet is launched. The current market price for \$GEEQs on existing exchanges is determined and is set as the original or base price, P^0, for the AMP. If the \$GEEQ's price happens to drop below this immediately after the mainnet is launched for some reason, the AMP does nothing and no new tokens are issued. The AMP become active only when \$GEEQ's price rises above P^0. In this event, the AMP creates new \$GEEQs at the rate of .4% of the current tokenbase, B, for each one cent rise in price. A total of 45% of all revenues received from the sale of these newly created \$GEEQs is placed in the FSR account to stabilize the fiat value of \$GEEQ.

Operationally, the AMP creates an order book of open asks of the following form:

AMP Initial Token Issue Order Book		
Bid or Ask	Price	Quantity
Ask	P^0+1	$.004B$ \$GEEQs
Ask	P^0+2	$.004B$ \$GEEQs
⋮	⋮	⋮
⋮	⋮	⋮

As long as \$GEEQ's price rises monotonically from P^0, new \$GEEQs are created and sold which adds to the FSR.[8] Of course, \$GEEQ's price my rise and fall over time. The AMP buys and sells \$GEEQ counter-cyclically to offset this. In this event, new \$GEEQs are only created if and when its price exceeds its previous high using the same formula outlined above.

Defending \$GEEQ's Price

As long as \$GEEQ's price goes up, the AMP accumulates dollars for FSR to defend \$GEEQ's value should it ever starts to decrease. In the HWZ, 25% of the FSR is deployed in equal amounts to repurchase tokens at one cent internals. Since there are $P^H - P^M$ such intervals in the HWZ,

8 Note that B, the tokenbase, does not remain constant. If there are $100M$ \$GEEQs initially, then the first ask is to sell $400k$ \$GEEQs at P^0+1 which increases the token base to $100.4M$. Thus, the second Ask is to sell $400.4k$ \$GEEQs at P^0+2.

$\overline{F}/4(P^H-P^M)$ is used to buy back \$GEEQs to be placed in the TSR. In effect, a smart contract generates a book of bids of the following form:

High Water Zone Bid Order Book		
Bid or Ask	Price	Quantity
Bid	P^H-1	$\frac{\overline{F}}{4(P^H-P^M)(P^H-1)}$ \$GEEQs
Bid	P^H-2	$\frac{100\,\overline{F}}{4(P^H-P^M)(P^H-2)}$ \$GEEQs
⋮	⋮	⋮
Bid	P^M	$\frac{100\,\overline{F}}{4(P^H-P^M)(P^M)}$ \$GEEQ

In words, the AMP offers to buy back $100\overline{F}/4(P^H-P^M)(P)$ \$GEEQs at every price in the HWZ.

The MPZ order book of bids is essentially the same. The differences is only that 50% of the FSR is deployed and there are at total of P^M-P^F-1 price intervals between P^M-1 and P^F+1.

Middle Price Zone Bid Order Book		
Bid or Ask	Price	Quantity
Bid	P^M-1	$\frac{100\,\overline{F}}{2(P^M-P^F-1)(P^M-1)}$ \$GEEQs
Bid	P^M-2	$\frac{100\,\overline{F}}{2(P^M-P^F-1)(P^M-2)}$ \$GEEQs
⋮	⋮	⋮
Bid	P^F+1	$\frac{100\,\overline{F}}{2(P^M-P^F+1)(P^F-1)}$ \$GEEQs

The last 25% of the FSR is deployed to provide a price floor for \$GEEQ. If the price continues to drop into the MPZ, the AMP buys back \$GEEQs and places them in the TSR which removes them from circulation. Thus, the circulating tokenbase drops with the price under the AMP. At some point, the remaining 25% of the FSR is large enough to repurchase all the \$GEEQs remaining in circulation. This happens when:

$$B - T^H - T^M = \frac{100\,\overline{F}}{4\,P^F}.$$

The value of P^F is calculated at the moment that \$GEEQ's price falls below its high water mark and remains unchanged until \$GEEQ price reaches a new high.

Price Floor Zone Bid Order Book		
Bid or Ask	Price	Quantity
Bid	P^F	all \$GEEQs

Replenishing the FSR as Price Increases

Now we consider what happens if price drops to some $P \in \{P^M, \ldots, P^H\}$ in the HWZ,[9] but then starts to rise again. In this case, the AMP generates a book of asks that offer to sell the \$GEEQs in the TSR in equal amounts over at one cent price intervals between the current price and P^H. For example, suppose that $P^H = 200¢$ (which implies that $P^M = 180¢$) and that \$GEEQ's price has dropped to $P = 190¢$ but then starts to rise. In this event, the ATM would have expended 12.5% of the FSR buying and adding \$GEEQs to the TSR. If \$GEEQ's price starts to rise again, therefore, the AMP generates a set of 10 asks:[10]

High Water Zone Ask Order Book		
Bid or Ask	Price	Quantity
Ask	$191¢$	$\frac{T^H}{10}$ \$GEEQs
Ask	$192¢$	$\frac{T^H}{10}$ \$GEEQs
⋮	⋮	⋮
Ask	$200¢$	$\frac{T^H}{10}$ \$GEEQs

9 Note that expressions like $P \in \{P^M, \ldots, P^H\}$ mean that P is some integer between P^M and P^H.

10 Note that since the price is in the high water zone, $T^H = T$.

Note that no new $GEEQs are created and that if $GEEQ's price reaches $200¢$ again, the TSR will be empty.

Continuing the example above, suppose instead that $GEEQ's price drops to $150¢$ and therefore goes into the MPZ. First, a full set of HWZ asks would be added to the order book:

Full High Water Zone Ask Order Book		
Bid or Ask	Price	Quantity
Ask	P^M+1	$\frac{T^H}{P^H-P^M}$ $GEEQs
Ask	P^M+2	$\frac{T^H}{P^H-P^M}$ $GEEQs
⋮	⋮	⋮
Ask	P^H	$\frac{T^H}{P^H-P^M}$ $GEEQs

Second, since $GEEQ's price has fallen $30¢$ into the MPZ, the AMP offers to sell an equal share of T^M (the tokens in the TSR purchased by the AMP in the MPZ) at each one cent price interval between $151¢$ and $179¢$, a total of 29 asks:

Middle Price Zone Ask Order Book		
Bid or Ask	Price	Quantity
Ask	$151¢$	$\frac{T^M}{29}$ $GEEQs
Ask	$152¢$	$\frac{T^M}{29}$ $GEEQs
⋮	⋮	⋮
Ask	$189¢$	$\frac{T^M}{29}$ $GEEQs

Thus, if $GEEQ's price fell from $200¢$ to $150¢$, and then started to rise again, the AMP offers to sell tokens out of the TSR at 29 different price points outlined above. If the price rose to $180¢$, the AMP would start to sell tokens out of the TSR under the full order book for the HWZ. If at any point, the price started to go down, the relevant bid order book would also be open and available to

users. For example, at a price of $152¢$ a bid and and ask would exist for \$GEEQs through the AMP. Before the price to rise to $153¢$, $\overline{F}/2(P^M-P^F-1)(P^M-2)$ \$GEEQs would have to be purchased by users from the TSR, and before the price could fall to $151¢$, users would have to sell $T^M/29$ \$GEEQs to be added to the TSR.[11] Thus, the AMP's bids and asks create the certainly of both supply and demand for \$GEEQs at every price level.

Ask	$151¢$	$\frac{T^M}{29}$ \$GEEQs
Ask	$152¢$	$\frac{T^M}{29}$ \$GEEQs
Bid	$152¢$	$\frac{\overline{F}}{2(P^M-P^F-1)(152)}$ \$GEEQs
Bid	$153¢$	$\frac{\overline{F}}{2(P^M-P^F-1)(153)}$ \$GEEQs

Continuing the example, suppose the despite all of these efforts \$GEEQ's, price drops to the price floor, P^F. The full MPZ order book would be created as follows:

Full Middle Price Zone Ask Order Book		
Bid or Ask	Price	Quantity
Ask	P^F+1	$\frac{T^M}{P^H-P^M-1}$ \$GEEQs
Ask	P^F+2	$\frac{T^M}{P^H-P^M-1}$ \$GEEQs
$\vdots$	$\vdots$	$\vdots$
Ask	P^M-1	$\frac{T^M}{P^H-P^M-1}$ \$GEEQs

In addition, one final ask is made to sell all the remaining tokens that were purchased at the price floor, P^F.

11 The fact that the bids and asks would be be filled by users before the price moves to another level is guaranteed by an arbitrage condition. Of course, users would also buy and sell to one another on their own accounts. The supply and demand curves that determine the equilibrium price of \$GEEQ are the sum of the AMP bids and asks and the combined user supply and demand curves.

Price Floor Zone Ask Order Book		
Bid or Ask	Price	Quantity
Ask	P^F	T^F $GEEQs

Mathematical Appendix

Geeq's AMT is initiated when the mainnet is launched, and the fiat price of $GEEQ on existing trading platforms is taken as the original base price, P^0, for the policy. New tokens are created at a rate of 0.4% for each penny that $GEEQ's fiat value rises above P^0. Thus, if the price of $GEEQ goes to P^0+1, a total of $(.004)100M=400k$ new $GEEQs are created, it it goes up by another penny, $(.004)100.4M=401.6k$ new $GEEQs are created, and so on. Readers familiar with finance and banking will recognize this a future value calculation. Given this, suppose $GEEQ's price increases monotonically from P^0 to some $P>P^0$. Since there are $P-P^0$ one cent intervals between P and P^0, a total of:

$$\left((1.004)^{P-P^0}-1\right)100$$

Millions of new tokens issued as $GEEQ's price rises from P^0 to P.

would be created by the AMP. For example, if $P^0=100¢$ and the $GEEQ's price goes to $125¢$, then approximately $11M$ new $GEEQs are issued which brings the tokenbase up to $111M$.

This implies that for any $P'\in\{P^0,\ldots,P-1\}$, if $GEEQ's price increases one penny from P' to $P'+1$, the number of tokens increases from $[100M(1.004)^{(P'-P^0)}]$ to $[100M(1.004)^{(P'+1-P^0)}]$. Thus: $[100M(1.004)^{(P'+1-P^0)}]-[100M(1.004)^{(P'-P^0)}]$ new tokens are issued as a result of this one cent price increase. For example, if the prices goes from $120¢$ to $121¢$, $433k$ new tokens are created. Assuming that all of the newly created $GEEQs are sold as they are issued. The revenue from these sales would be the following:[12]

$$\sum_{p=1}^{P-P^0}\frac{(P^0+p)}{100}\left([(1.004)^{(p)}]-[(1.004)^{(p-1)}]\right).$$

Millions in revenue from new tokens issued as $GEEQ's price rises from P^0 to P.

12 Note equations in this section are often divided or multiplied by 100 in this section. This is because prices are stated in cents while revenue is given in dollars.

For example, if the \$GEEQ's price goes from $P^0 = 100¢$ to $125¢$, then total revenue would be approximately $\$11.9M$.

Now suppose that \$GEEQ's price starts to fall from the high water price. We calculate the number of tokens repurchased as the price falls from P^H to some $P \in \{P^M, \ldots, P^H - 1\}$ as follows:

$$T^H(P) = \sum_{p=1}^{P^H - P} \frac{100\overline{F}}{4(P^H - P^M)(P^H - p)}.$$

Millions of tokens purchased in the HWZ as price falls from P^H to P.

This reduces the amount in the FSR by:

$$\frac{(P^H - P)\overline{F}}{4(P^H - P^M)}.$$

Millions spent purchasing tokens in the HWZ as price falls from P^H to P.

Similarly, we calculate the number of tokens repurchased the price, $P \in \{P^F + 1, \ldots, P^M - 1\}$, drops into the MPZ as follows:

$$T^M(P) = \sum_{p=1}^{P^M - P} \frac{100\overline{F}}{2(P^M - P^F - 1)(P^M - p)}$$

Millions of tokens purchased in the MPZ as price falls from P^H to P.

This reduces the amount in the FSR by:

$$\frac{(P^M - P)\overline{F}}{2(P^M - P^F - 1)}.$$

Cost of purchasing tokens in millions in the HWZ as price falls from P^H to P.

Finally, recall that B represents the total number of tokens in existence (the tokenbase) at any given time. Then following equation determines the price floor at which the AMT offers to repurchase any outstanding \$GEEQs.[13]

13 Note if the FSR happens to be very large, it might be that P^F is determined by the following equation: $(B - T^H(P))100P^F = F/4$, but this is unlikely.

$$\left(B-T^H\left(P^M\right)-T^M\left(P\right)\right)100\,P^F=\frac{\overline{F}}{4}.$$

Equation for the price floor, P^F

Working from the other direction, suppose that the price of $GEEQ has fallen to P^F from a high water price of P^H. Recall that the tokenbase is B and that T^H+T^M tokens would have been purchased and placed in the TSR in the HWZ and MPZ by the AMP. This means that users could have sold as many as $B-T^H-T^M$ $GEEQs back to the TSR (the entire remaining tokenbase) or as few as T^H+T^M (only what was sold in the HWZ and MPZ). Therefore, $T^F\in[0,B-T^H-T^M]$. Note that all purchases and sales of tokens in the PFZ occur at the same price and so these are wash transactions from a standpoint of net revenue for the FSR. If the price goes above P^F again, however, the FSR will first have sold all tokens purchased at the price floor and so will have recovered $\overline{F}/4$.

Now suppose that $GEEQ's price rises to some $P\in\{P^F+1,\ldots,P^M\}$ in the MPZ. Then the number of tokens sold out of TSR is:

$$\frac{\left(P-P^F\right)T^M}{P^M-P^F},$$

Millions of tokens sold in the MPZ as price rises from P^F+1 $P\in\{P^F+1,\ldots,P^M-1\}$

and the revenue from these sales would be:

$$\sum_{p=1}^{P-P^F}\frac{\left(P^F+p\right)T^M}{100\left(P^M-P^F\right)}.$$

Millions in revenue from tokens sold in the MPZ as price rises from P^F+1 $P\in\{P^F+1,\ldots,P^M-1\}$

If $GEEQ's price continues to rise to $P\in\{P^M+1,\ldots,P^H\}$ in the HWZ, then the number of tokens sold out of TSR is:

$$\frac{\left(P-P^M\right)T^H}{P^H-P^M},$$

Millions of tokens sold in the HWZ as price rises from P^M+1 to $P\in\{P^M+1,\ldots,P^H\}$.

and the revenue from these sales would be:

$$\sum_{p=1}^{P-P^M} \frac{\left(P^M+p\right)T^H}{100\left(P^H-P^M\right)}.$$

Millions in revenue from tokens sold in the HWZ as price rises from P^M+1 *to* $P\in\{P^M+1,\ldots,P^H\}$.

Finally, if $GEEQ's price started to rise above the old high water price of P^H, the TSR would be empty and the FSR would be be reset to include any profits made by the AMP over the course of its stabilization efforts. In addition, new tokens would begin to be issued at the standard rate.

Disclaimer

This document does not constitute a solicitation or offer to buy or sell any security or any token in Geeq Corporation and cannot be relied upon for making an investment decision. This document has been prepared and circulated for informational purposes only and is not intended to provide investment, legal, accounting or tax advice or recommendations to any recipient and should not be considered a recommendation to purchase or sell any particular security or token. You should consult your tax or legal advisor about the information contained in this document. This document does not constitute an offering memorandum of Geeq Corporation under applicable Canadian securities laws and does not attempt to describe all material facts or material information regarding Geeq Corporation, its business and operations or its tokens. Any private offering of tokens will only be made to qualified accredited investor. Geeq Corporation has not filed a prospectus or offering memorandum with any securities commission or similar authority in Canada or elsewhere in respect of the tokens and, accordingly, the tokens will not be qualified for sale in Canada or elsewhere and may not be offered or sold directly or indirectly in Canada or elsewhere, except pursuant to an exemption from the prospectus and registration requirements of applicable securities laws. No securities commission or similar authority in Canada or elsewhere has reviewed or in any way passed upon the merits of an investment in Geeq Corporation or its tokens, and any representation to the contrary is an offense. All of the information contained in this document is for preliminary discussion purposes only. Final terms and conditions may change without notice and are subject to further discussion and negotiation.