base·protocol[12]

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Introduction

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The Base Protocol

Synthetic Assets

Elastic Supply

Rebasing



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1.1 The Base Protocol

The Base Protocol (BASE) is a synthetic crypto asset that derives its price from the total market cap of all cryptocurrencies (*cmc*) at a ratio of 1 : 1 trillion. BASE exists to maintain a market rate that is stably pegged to its underlying asset – the crypto industry. BASE's peg to *cmc* is held stable through an elastic supply protocol.

Crypto Index

The Base Protocol acts as a one-stop trading instrument which allows holders to speculate on all cryptocurrencies simultaneously, rather than just one or a select portfolio of multiple. It allows traders to agnostically invest in the entire crypto ecosystem. This is its primary function.

The Base Protocol can also be used as a tool for more nuanced trading situations:

Save Haven

BASE can be used as a transitory, "save haven" position between crypto transactions. Typically, one might trade into a "blue chip" crypto to reduce risk exposure, or trade into a stablecoin to remove risk exposure. Trading into BASE presents an alternative that maintains exposure to all cryptocurrencies rather than just one. This could be riskier than trading into a blue chip, but in some instances, may act as a hedge against some isolated / unforeseen events. For example, a rapid downfall in the blue chip, or the rapid emergence of a new project. Trading into BASE mitigates the inherent risk of holding one coin, while absorbing the potential gains of several others. So far, the most popular safe haven crypto asset is Bitcoin, as it generally leads industry direction and is historically the least volatile. The ability to "hold" the entire crypto market should present a useful trading alternative.

Price Reference

Another use case is for BASE to function as a price reference for all cryptocurrencies. If a trader is speculating on an altcoin (x), he will often track price in terms of x/BTC rather than x/USD. This price reference illustrates how x performs relative to BTC rather than USD, which is the more important data for many crypto traders. If the trader instead uses x/BASE as their price reference, it would illustrate how x performs relative to the overall crypto market, rather than just BTC. The x/BASE price reference should present a valuable alternative to the popular x/BTC price reference.

Lending Instrument

BASE can also be used as a lending instrument to hedge on leveraged crypto trading. Traditionally, lending has been a challenge in crypto; if an individual borrows 1 BTC to buy a car, they could be on the hook for much more than they originally borrowed when it's time to pay that 1 BTC back. This volatility presents a problem in borrowing crypto for general purposes, but can be useful if borrowing for crypto investing. Say a trader borrows 100 BASE to buy an altcoin, and that the altcoin plummets alongside a bearish trend in the crypto markets. When the trader goes to pay their 100 BASE back to the lender, he notices the value of that BASE also dropped – perfectly correspondent to the crypto market. This means that when he pays the loan back, he only absorbs the loss he took that was in excess of the overall loss in the market. And vice versa, if his altcoin went bullish, he would only absorb the gain in excess of overall market performance. In this way, BASE can be used as a strategic hedging instrument for crypto-focused portfolios trading on leverage.

The ability to speculate on the entire crypto market with one synthetic instrument lends itself to use cases like these and many others. Those interested in exploring these use cases can build on the Base Protocol to create relevant, second layer products.

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1.2 Synthetic Assets

syn·thet·ic

/sin'THedik/

devised, arranged, or fabricated for special
situations to imitate or replace usual realities.

"Synthetic is the term given to financial instruments that are engineered to simulate other instruments while altering key characteristics. There are many different reasons behind the creation of synthetic positions. A synthetic position, for example, may be undertaken to create the same payoff as a financial instrument using other financial instruments. Synthetic positions can allow traders to take a position without laying out the capital to actually buy or sell the asset. A synthetic is an investment that is meant to imitate another investment." (Chen, 2019)

Derivatives (such as futures or options) are the most common form of a synthetic asset. However, not all synthetics are derivatives – it is important to understand the difference.

What distinguishes derivatives is that they have defined value. For example, a futures contract for gold has a defined value equal to the dollar cost of that contract. It derives changes in value from gold, but maintains some independent value because it was either purchased with cash or a legally binding guarantee for future purchase was made.

However, something can function as a synthetic without having defined value. For example, consider "fantasy football," a free-to-play activity where users create virtual football teams that relate to the performance of real players. A virtual team acts as a synthetic to its underlying players, but the virtual team doesn't have defined value because it was never purchased – it was only created. In this way, the virtual team is a synthetic representation of its underlying players, but it is not a derivative.

The virtual team has no defined value. That is, until a user decides to pit their virtual team against another for a wager. If a user places a bet on their team in a virtual game, that team now holds speculative value, because the value of their wager is derived from the performance of their virtual team's real life players.

The difference between this virtual team and the more traditional derivative is that it could be created out of thin air. And unlike a derivative, it acts a synthetic asset before monetary value is attached to it. So far, this nontraditional class of synthetic hasn't presented any valuable use-case in financial markets. However, it inspires unique possibilities in an emerging decentralized finance space.

1.3 Elastic Supply

BASE is a synthetic asset that functions to reflect the "price" of all cryptocurrencies. BASE derives its **target price** (*tp*) directly from the **total market cap of all cryptocurrencies** (*cmc*) at a rate of 1 : 1 trillion, or cmc x 0.1^{12} :

$$tp = cmc \times 0.1^{12}$$

For example, assume $cmc = \$500{,}000{,}000{,}000$

$$tp = (500{,}000{,}000{,}000 \times 0.1^{12})$$

Target price is $0.50.

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The Base Protocol functions to ensure that BASE **market price** (*mp*) is equal to target price (*tp*).

When	When
market price (*mp*) = target price (*tp*)	market price (*mp*) ≠ target price (*tp*)
BASE is in a state of **equilibrium**.	BASE is in a state of **disruption**.
Its price perfectly reflects *cmc*.	Its price does not perfectly reflect *cmc*.

When BASE is in a state of disruption, where its market price does not perfectly reflect total market cap of all cryptocurrencies, it must reconcile to reach a state of equilibrium. This is achieved through programmatic expansion / contraction of the total BASE supply, made possible through an elastic supply protocol. These supply expansions or contractions are called **rebases**.

1.4 Rebasing

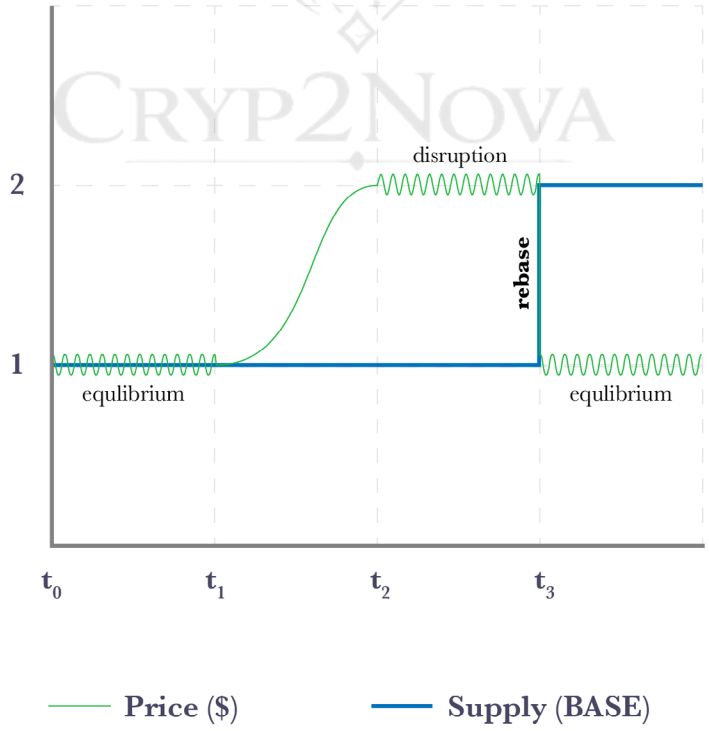
At the highest level, a rebasing protocol exists to do one thing: correlate a synthetic asset's price perfectly with the price of its underlying asset. This is achieved by adjusting the synthetic asset's supply until its market price (*mp*) reaches its target price (*tp*), the price at which the synthetic asset is at equilibrium with its underlying asset.

Consider this example, where *tp* = $1:

***t*₁ :** Starting Equilibrium
John has 1 BASE worth $1.

***t*₂ :** Price Increases
John has 1 BASE worth $2.

***t*₃ :** Ending Equilibrium
John has 2 BASE each worth $1.



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At t_1, John starts with a balance (supply) of 1 BASE with a market price of $1.

At t_2, the market price of BASE goes up to $2 – but remember, its target price is $1. At t_2, price equilibrium is disrupted and must be resolved through a rebase event.

At t_3, the rebase event occurs. The total supply of BASE is adjusted in proportion to the difference between market price and target price. By adjusting supply, the rebase drives market price down, pegging it back to its $1 target.

The rebase makes no difference in John's net balance. Whether he holds 1 BASE worth $2 or 2 BASE each worth $1, his net $ balance and percent ownership of total supply remains constant.

This illustrates the long-term intention, which is to correct price by adjusting supply. However, rebasing cannot instantly correct price as modeled in this example. Rebasing can only influence price corrections.

Market actors must respond to rebases for price to correct.

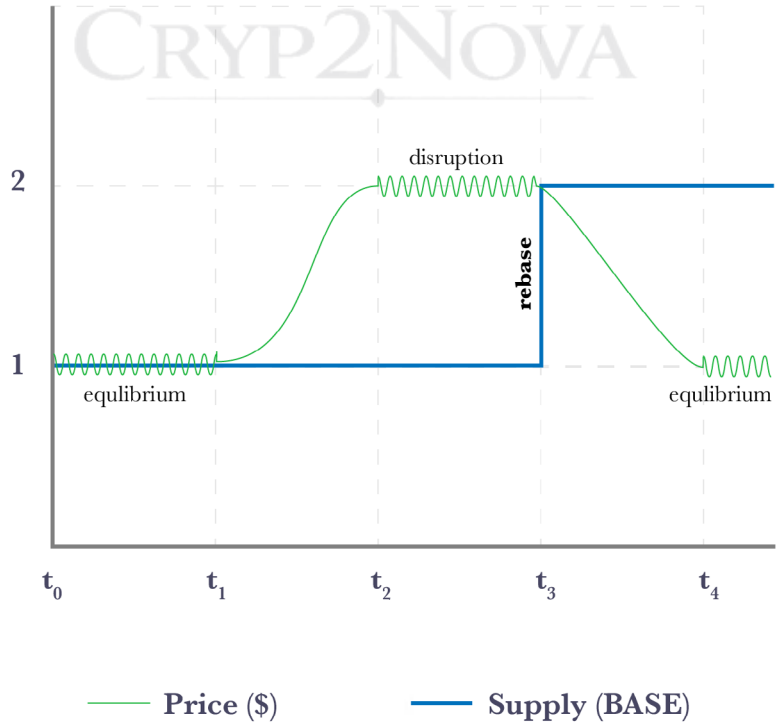
Consider the example below (expansion):

t_1 : Starting Equilibrium
John has 1 BASE worth $1/BASE.
net balance: $1

t_2 : Price Increases
John has 1 BASE worth $2/BASE.
net balance: $2

t_3 : Expansion Occurs
John has 2 BASE worth $2/BASE.
net balance: $4

t_4 : Ending Equilibrium
John has 2 BASE worth $1/BASE.
net balance: $2



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In this example, there is a lag between the rebase at t_3 and the downward price correction at t_4. If John acts quickly during this lag period, he could sell 2 BASE at $2 each for a total of $4. In other words, he has a chance to sell more BASE at t_3 than he could have at t_2 for the same higher price. This arbitrage opportunity incentives John and other holders to sell as soon as possible. As sellers sell in this window, price corrects back down to its target while supply retains its increase.

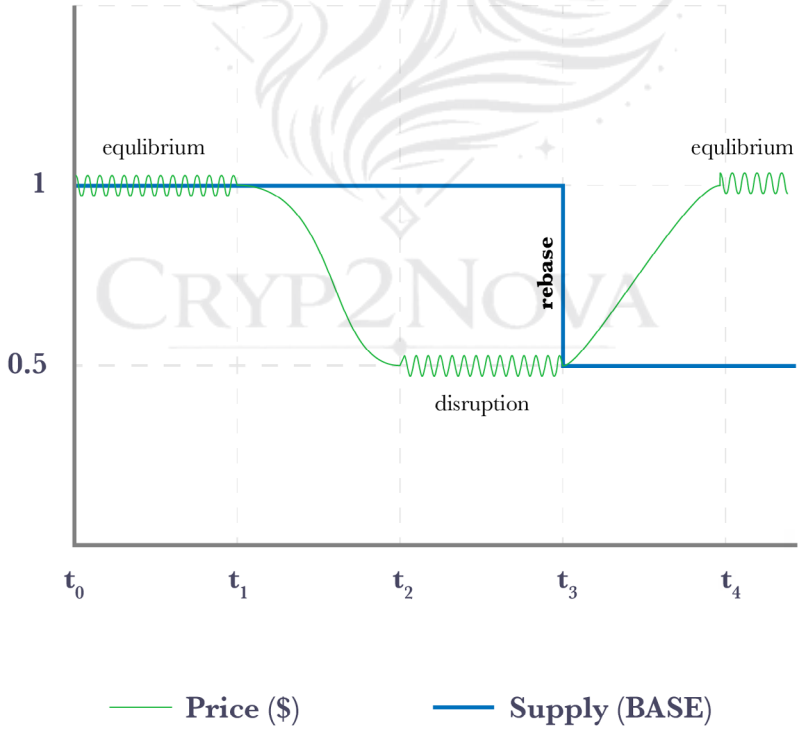
Consider the example below (contraction):

t_1 : Starting Equilibrium
John has 1 BASE worth $1/BASE.
net balance: $1

t_2 : Price Increases
John has 1 BASE worth $0.50/BASE.
net balance: $0.50

t_3 : Contraction Occurs
John has 0.5 BASE worth 0.50/BASE.
net balance: $0.25

t_4 : Ending Equilibrium
John has 0.5 BASE worth $1/BASE.
net balance: $0.50



In this example, there is a lag between the rebase at t_3 and the upward price correction at t_4. If buyers act quickly during this lag period, they could purchase a greater share of the network. Before this rebase, 1 token may have

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represented 1% of the network; after this rebase, 1 token would represent 2% of the network. In other words, buyers have a chance to purchase a greater network percentage at t_3 than they could have a t_2 for the same lower price. As buyers buy in this window, price corrects back up to its target while supply maintains its decrease.

This contraction scenario begs the question – why would John sell right after the rebase? If the token price should eventually correct back up to $1, wouldn't he and everyone in his position just hold until then? This leads us to our next section, which goes over the challenges faced by synthetic rebase assets.

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Challenges

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Acceptability, Lag & Freeze

Formative Period & Final State

The Base Protocol Hypothesis

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2.1 Acceptability, Lag & Freeze

A core problem faced by synthetic rebase tokens is that their value depends on their "general acceptability." This isn't entirely unique to these tokens – it is one of the 7 necessary characteristics of any currency.

For example, a given country's currency is valuable because it is generally accepted. But if trust for that country was lost, its currency would likely be less accepted and lose value as a result.

Let's apply this principle to a simple example of a synthetic rebase token – one whose price is pegged to $1. We will refer to this token as DOL. In this example, DOL is a new project and has not yet reached a reasonable point of general acceptability. For good measure, we'll say it starts with a circulating supply of 100,000 DOL.

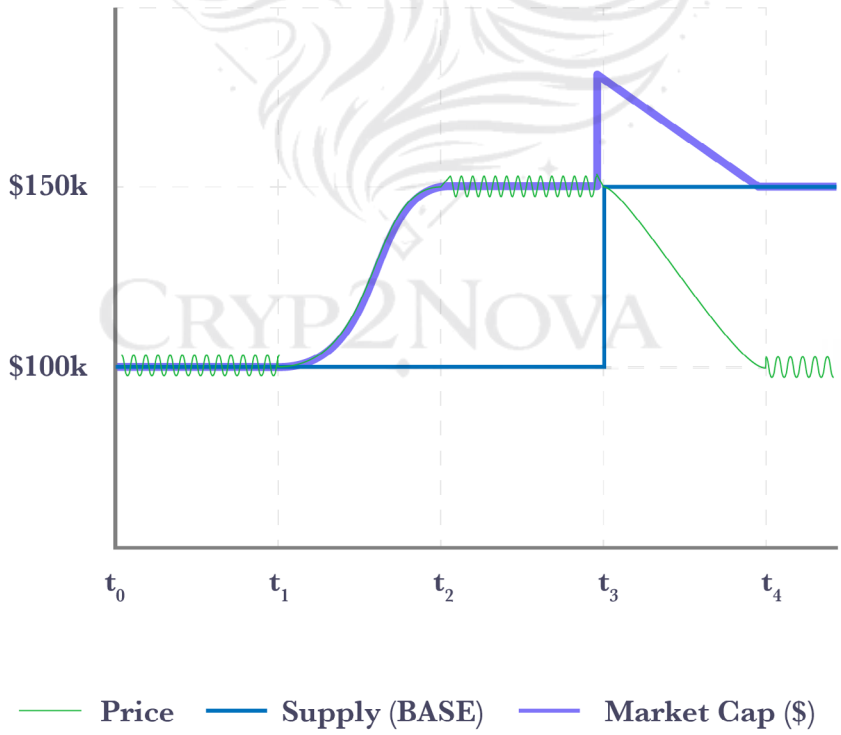
Let's consider a bullish scenario, where DOL price rises above $1.

At t_0, DOL price is $1 (equilibrium) and its market cap is $100,000.

Then, let's say market actors buy DOL because they want to use it as a synthetic pegged to the dollar. At t_0, DOL is serving that function. The market likes this, so at t_1, it buys.

At t_2, DOL price is $1.50 (bull disruption) and its market cap is $150,000.

This is cause for a supply expansion rebase at t_3. Ideally, after rebase occurs, the market would sell DOL, driving its price back down to $1. If this happens, the net result is that DOL price stays pegged, supply grows, and the market cap for DOL locks in its growth to $150,000.



This market cap growth represents DOL adoption and/or positive speculation on further DOL adoption. In other words, it indicates an increase in general acceptability.

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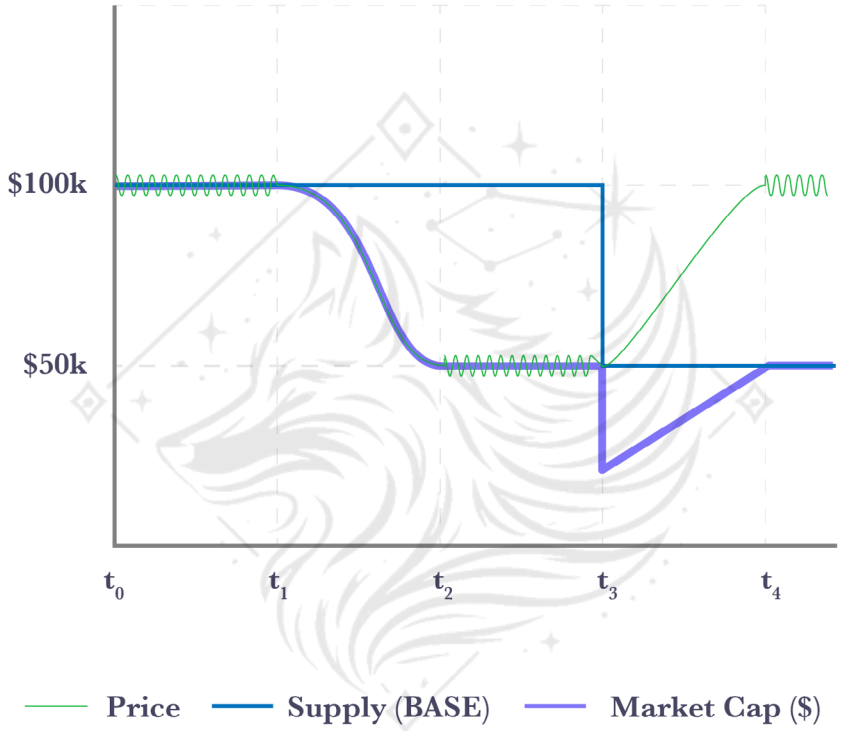
Now, let's consider the bearish scenario, where DOL price drops below $1.

At t_1, DOL price is $1 and its market cap is $100,000.

Now, let's say market actors sell DOL – perhaps the result of a bearish crypto market.

At t_2, its price is $0.50 (bear disruption) and its market cap is $50,000.

This is cause for a supply contraction rebase at t_3. Ideally, after rebase occurs, the market would sell DOL, driving its price back up to $1. If this happens, the net result is that DOL price stays pegged, and the market cap for DOL locks in its drop to $50,000.



However, as pointed out in the last section, there is a lag between the rebase at t_3 and the price correction at t_4. This lag creates unique trading opportunities, but also creates problems if the market doesn't act on them.

This applies for both bull and bear disruptions, but let's focus on the bear scenario. The easiest way to illustrate these problems is through a series of critical questions:

What incentive is there to buy DOL at $0.50 during a lag period?
Following the supply contraction and prior to the price correction, there is one core reason why market actors would buy DOL, which is that there is an opportunity to purchase a greater percentage ownership in the network than they could have before the rebase.

Why is a greater percentage ownership in the network attractive?
Fundamentally, this depends on one factor: the speculative value of the network. And the speculative value of the network is determined by its potential for general acceptability. Assuming a buyer is bullish on that potential acceptability, they would be motivated to buy during the lag period.

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What incentive is there to sell DOL at $0.50 during a lag period?
If a DOL holder sells immediately after a supply contraction and prior to the price correction, they realize a net loss compared to if they sold prior to the contraction. After the rebase, the holder is hoping that price corrects back to $1 so that their net balance remains unaffected. Remember, that is the point of rebasing. So, it's fair to assume that while there may be demand from buyers at $0.50 after contraction, holders won't be as motivated to place sell orders at that price. Some may have been willing to do so before contraction, but are less willing to do so after contraction. This creates a stalemate or "freeze" where buyers want to buy at ~$0.50 but holders want to sell closer to ~$1.

If this freeze persists, it presents a major threat to the peg.

Why would anyone buy a token to use as a stable $1 peg while it's priced at $0.50?
Remember, the token's core function is to peg to its target price. If the price peg is undermined by a freeze, the token is worthless for those interested in its function, which makes it less attractive for bullish speculators, which further disrupts the price peg. This can become a problematic feedback loop.

Conclusion
In its early stages, a synthetic rebase token – whose goal is to peg to the price of an underlying asset – is mostly speculative. That speculation is derived from sentiment that the asset will eventually serve its function. That functionality directly depends on general acceptability – in other words, adoption. And until a popular adoption threshold is met, the asset is susceptible to refractory lag, freeze, and volatility.

2.2 Formative Period & Final State

Initially, the synthetic starts with a high risk / reward profile, as traders speculate on its potential for adoption.

But over time, the risk / reward profile diminishes alongside adoption for its pegging function.

The rollout for a synthetic rebase asset is much like the rollout for Bitcoin; risky / rewarding in the beginning, less risky / rewarding through adoption, and stable in its final state.

However, the problem of severe lag and freeze periods is uniquely threatening to synthetic rebase assets, because it undermines their core function; price pegging.

In the crypto space, this problem has been addressed in a few different ways:

- **Liquidity pools** which incentivize users to provide liquidity for a token and often provide automated market making within the pool.
- **Liquidity mining programs** that reward users for staking tokens into a liquidity pool.
- **Greater rebase frequency**, where rebases react more frequently with the price fluctuations of an underlying asset.
- **Supply smoothing**, where supply expansions / contractions occurs incrementally over a period of time rather than all at once.

While the Base Protocol does integrate these mechanisms and will adjust their parameters alongside adoption (Section 3.1 - Stabilization), it has one very novel stabilizing mechanism of its own.

For now, we refer to it as the **Base Protocol Hypothesis**.

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2.3 The Base Protocol Hypothesis

Assumption

When the crypto industry enters bull or bear markets, an individual crypto often absorbs its market activity. This is often related to speculation on the specific crypto, but is usually also related to sentiment on cryptocurrencies as a whole. In other words, when overall sentiment is bullish, prices rise for most tokens. When overall sentiment is bearish, prices fall for most tokens. We base this assumption on the historical data and behavior for most cryptocurrencies.

Hypothesis

Because BASE is a cryptocurrency asset, its price action should absorb the bull and bear runs of the overall industry. This built-in characteristic should act as an additional force to ensure target price equilibrium and mitigate lag & freeze problems.

This characteristic isn't unique to BASE. It is a historical tendency that affects most cryptocurrencies, often negatively disrupting their utility. But it is uniquely valuable for BASE, because it supports its utility. It makes it so BASE price corresponds with the overall crypto market, which is exactly what BASE seeks to do.

This is a unique proposition in the current ecosystem of synthetic rebase tokens, because while it is a boon for BASE, it is a hindrance for others. Let's revisit the example of DOL, a crypto whose function is to peg to the dollar: if the overall crypto market goes bullish or bearish, it disrupts DOL's price peg for reasons not related to its underlying asset. But it supports BASE's peg – because the crypto market is BASE's underlying asset.

This characteristic is also a novel proposition in the overall ecosystem of traditional finance. We illustrate an analogy to explain this:

Imagine you buy a contract that represents ownership of $1k in gold from a bank. As the price of gold fluctuates, so does the price of your gold in the bank's vault – and so *should* the value of your contract. But who knows; you might try to trade that contract for goods at a shop, and find out the shop doesn't trust your bank, so they don't accept the contract. This means your contract is effectively less useful, which creates a negative discrepancy between the market value of your contract and the market value of gold.

But imagine you bought a contract that represents ownership of $1k gold from a different bank. Uniquely, this bank gives you a contract that is printed on a $300 gold sheet of paper. This means as the price of gold fluctuates, so does the price of gold in your bank's vault – and so *will* the value of your contract. You can take that contract to the same shop, and while you might not be able to buy $1k in goods, the shop will certainly accept your $300 golden contract. While there is still a negative discrepancy between the market value of your contract and the market value of gold, that discrepancy is hedged.

The golden contract inherently pegs better to the market value of gold because it is gold;

BASE inherently pegs better to the market value of crypto because it is crypto.

This is the Base Protocol's most novel feature; a characteristic that naturally supports its function of pegging to its underlying asset – cryptocurrencies. There is no conventional synthetic trading instrument with such a property:

that it is the underlying asset it seeks to represent.

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Technical

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Stabilization
Liquidity Pool
Liquidity Mining
Rebase Frequency
Supply Smoothing
Programming
Data Sourcing
Supply Allocation

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3.1 Stabilization

The Rebase Protocol is a price fixing protocol, but it cannot fix price directly. It can only influence price through supply rebases. These rebases should incentivize the market to correct BASE's price to its target equilibrium price. But as mentioned, this may not work as intended, especially early on.

There is basically a stability spectrum, or "slider" for how BASE's programming can be approached. This slider ranges from a less stabilized approach to a more stabilized approach.

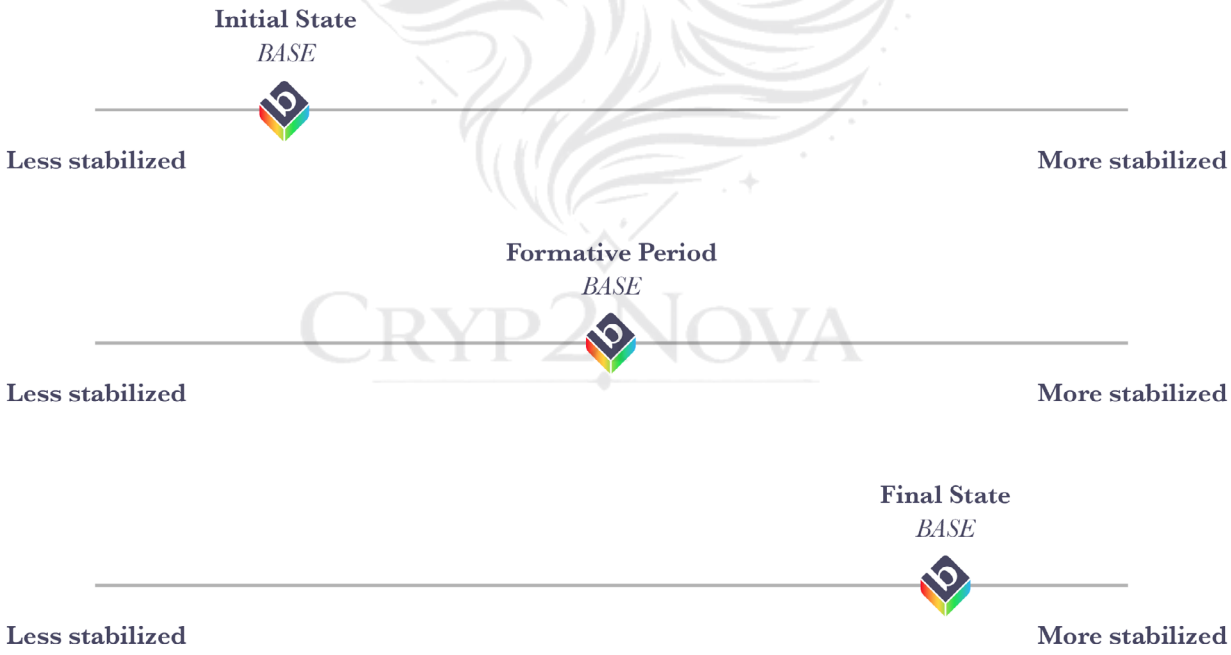
If the protocol is initially programmed with a more stabilized approach, it could peg more effectively early on. This supports its functionality but means early adoption can be less rewarding for arbitrage actors.

If the protocol is initially programmed with a less stabilized approach, it might not peg as effectively early on. This undermines its functionality but means early adoption can be more rewarding for arbitrage actors.

Remember, arbitrage actors are necessary for price corrections to happen. This means rewarding arbitrage engagement is as important as stable pegging early on.

To balance these factors, it makes sense to take a less stabilized approach initially, and stabilize programming as adoption occurs. This incentivizes early participation in the network and gradually stabilizes functionality as the network grows.

Through community consensus, BASE's stability will transition along a slider:



There are two kinds of stabilizing mechanisms that influence BASE's position on this slider;

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Network features whose stabilizing effectiveness is derived from network participation.

- Liquidity pool
- Liquidity mining program

Rebasing parameters whose stabilizing effectiveness is derived from programmed rule-sets.

- Rebase frequency
- Supply smoothing

Liquidity Pool

Liquidity pools like Uniswap create incentive for token holders to provide liquidity into a pool where they can earn a percentage of transaction fees generated in the pool. Also, Uniswap pools integrate automated market making. This liquidity and market making helps ensure that buyers are able to find sellers and sellers are able to find buyers, mitigating lag and freeze problems.

The Base Protocol utilizes a liquidity pool through Uniswap.

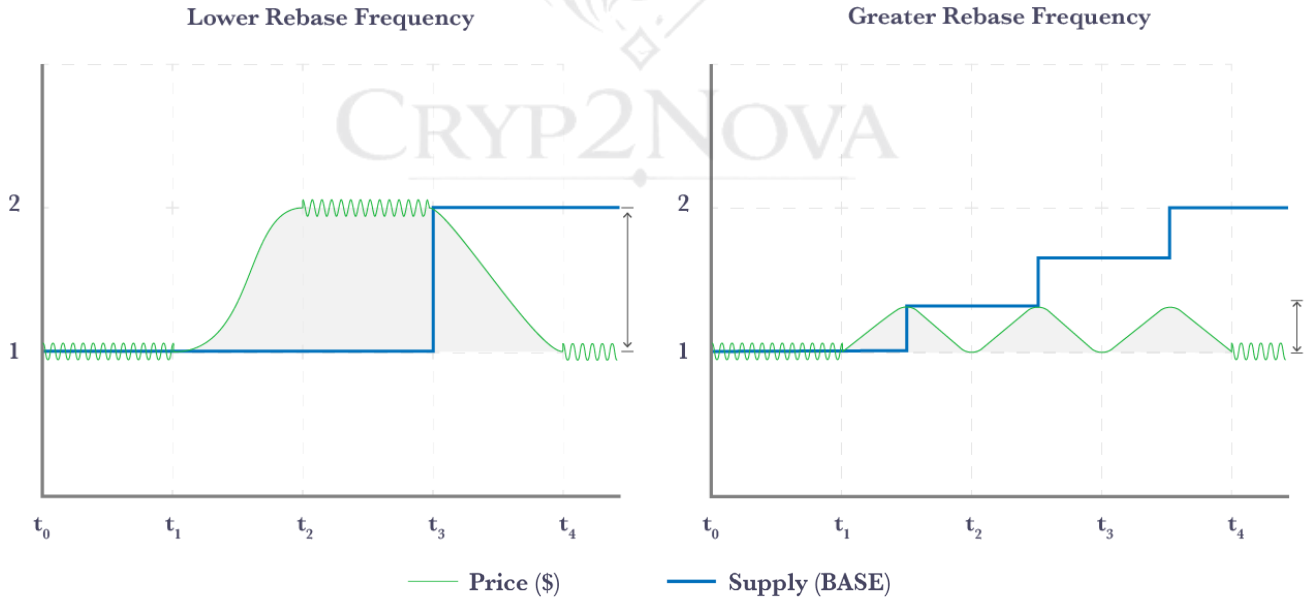
Liquidity Mining Program

Liquidity mining programs further incentivizes users to stake their tokens into a liquidity pool. These programs typically issue rewards based on how long a user stakes their tokens in the pool – where the more liquidity provided, and for longer, the greater share of rewards they receive.

The Base Protocol offers a liquidity mining program (Section 4.0 The BASE Cascade).

Rebase Frequency

The greater the rebase frequency, the less lag there is between what token supply is and what it should be. Rebasing once a week would mean longer supply disruption periods than rebasing once a day or every few hours. Lower rebase frequency means bigger expansion/contraction events, while greater rebase frequency means smaller, more stable events.

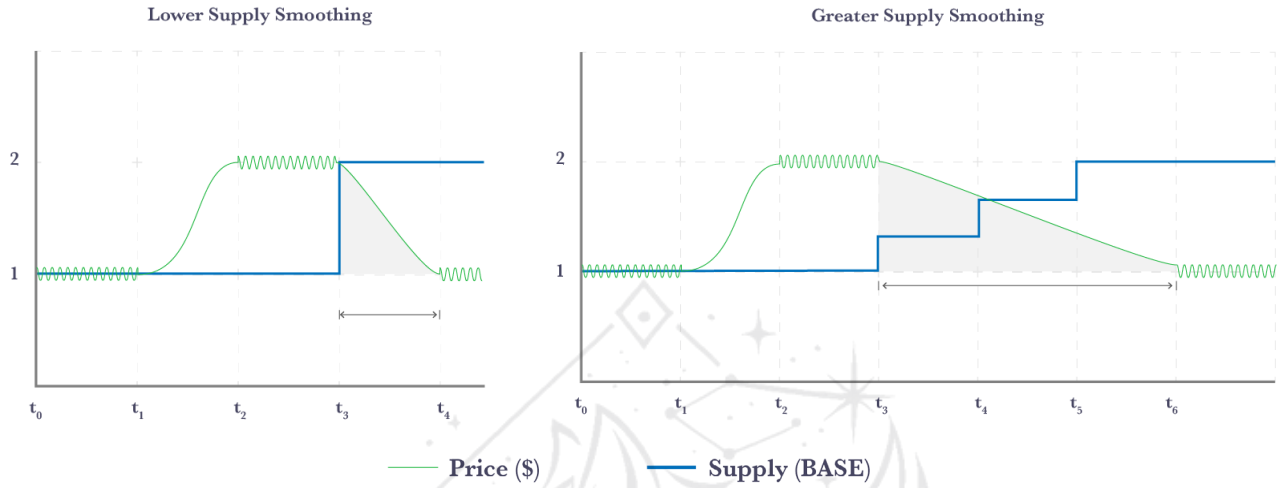


The Base Protocol starts with a 24 hour rebase frequency. Community consensus determines changes in the rebase frequency, which should trend toward greater frequency (greater stability) as the network grows.

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Supply Smoothing

Rebases can occur all at once, or can be graded over time. If a 30% supply expansion is deemed necessary by the protocol, it could issue that expansion uniformly over a 3 day period at 10% a day. Lower supply smoothing periods mean sharper expansion/contraction events, while greater periods mean slower, more stable events.



The Base Protocol starts with an instantaneous rebase period, where 100% of rebases will occur at once. Community consensus determines changes in supply smoothing periods, which should trend toward longer smoothing periods (greater stability) as the network grows.

With these mechanisms and parameters in place, BASE starts at the less stabilized side of the stability slider.

As network engagement in the liquidity pool / mining program grows, as rebase frequency increases, and as supply smoothing periods increase, the Base Protocol can move toward the more stabilized side of the volatility slider.

In its initial state, BASE is a generally stabilized synthetic asset that seeks to derive price from the crypto market. In its final state, BASE is a highly stabilized synthetic asset whose price is firmly pegged to the crypto market.

3.2 Programming

Base Protocol code is open-source and accessible at the Base Protocol GitHub.

https://github.com/base-protocol

The Base Foundation may add technical programming details to this section if deemed necessary in the future.

3.3 Data Sourcing

For the Base Protocol to achieve its price peg, it requires one key data point: the total market cap of all cryptocurrencies (cmc). At launch, 11 off-chain cryptocurrency data APIs will be polled at regular intervals for market cap information by a quorum of Chainlink oracles operated by the Base Protocol team. The Chainlink oracles calculate the median value of cmc across those 11 providers. The median is used rather than the average so as to better protect against extreme outlier values reported by any of these APIs, whether erroneously or maliciously.

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For an inaccurate value to find its way on-chain, at least 6 of the 11 providers would have to be compromised or conspire together to defraud the network. At present, we consider this an acceptable mitigation against a highly unlikely scenario. Nevertheless, the more decentralized the Base Protocol's oracle network is, the more resilient it will be against fraud and single point of failure risks; as such, the team plans to onboard third-party node operators in the future.

Regardless of how the data is sourced, there will frequently be a small discrepancy between the cmc used for BASE and the data that appears on any individual cryptocurrency data aggregator. To allay concerns, users will be able to consult a BASE dashboard surfacing all of the underlying data used to calculate the median market cap, and by extension, expansions and contractions to the BASE token supply.

3.4 Token Supply Allocation

Supply allocation details coming soon.

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BASE Cascade

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How to Participate
Replenishing Rewards Pool
Supporting BASE Development

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4.1 How to Participate in the Cascade

The purpose of the BASE Cascade is to reward BASE holder for contributing liquidity to the Uniswap liquidity pool. To participate, a user must first deposit BASE and ETH into the Uniswap liquidity pool. While these tokens are deposited, the user gets a percentage of the transaction fees produced from trading activity in the pool, proportionate to the network percentage that was deposited. The user's Uniswap balance is still affected by supply rebases.

Once a user's BASE and ETH are deposited into Uniswap, the user is issued LP tokens in return. These tokens represent proof that the user's BASE and ETH are deposited in the pool. The user can now stake those LP tokens to earn additional rewards through the Cascade.

This is how the BASE Cascade it works:

1. Deposit BASE & ETH in Uniswap liquidity pool in exchange for LP tokens
2. Visit the BASE Cascade dashboard
3. Deposit LP tokens into the Cascade
4. Track rewards multiplier / balance

When a user first stakes in the Cascade, their rewards multiplier starts at 1x. After 30 days staked, the multiplier reaches 2x. After 60 days staked, the multiplier reaches 3x. This works linearly, so the multiplier is progressively growing every day. 3x is the ceiling for the multiplier.

A user can deposit as much or as little liquidity as they'd like to participate in the Cascade. They can withdraw their liquidity whenever they'd like, but would lose the bonus progress they've made up to that point. So if you've been staking for 45 days, you would have a 2.5x bonus multiplier. If you withdrew, you would miss the opportunity to reach the 3x multiplier over the next 15 days.

The Cascade dashboard displays these relevant metrics to the user:

- Deposited balance
- Time staked
- Annual % yield
- Rewards multiplier
- % of rewards pool
- Rewards balance

The main takeaway is this – if you deposit tokens into the liquidity pool and use the Cascade, you should to try to stay in the Cascade for at least 60 days to maximize rewards.

Note: Due to the potential for impermanent loss, users may receive a different distribution of tokens upon redemption to Uniswap than initially added.

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4.2 Replenishing Rewards Pool

The BASE Cascade rewards pool is perpetually funded by the network at rebases.

When there is a supply expansion, an extra 8% of that expansion is minted – these tokens are deposited into the Cascade rewards pool. For example, if there is a 10% expansion, 0.8% extra is minted and goes to the Cascade.

When there is a supply contraction, 10% of the contraction doesn't get destroyed – these tokens are deposited into the Cascade rewards pool. For example, if there is a 10% contraction, 1% is exempted and goes to the Cascade.

This is how the Cascade sustains itself through the course of adoption. It encourages staking during "bullish periods" of supply expansion and further encourages staking during "bearish periods" of supply contraction.

4.3 Supporting BASE Development

At supply expansions, an additional mint percentage goes to support the Base Protocol Foundation (2%).

If a 10% supply **expansion** occurs, 11% of token supply is minted.
10% expansion affects market balances | 0.8% goes to Cascade pool | 0.2% goes to foundation

If a 10% supply **contraction** occurs, 9% of token supply is destroyed.
9% contraction affects market balances | 1% is exempted and goes to Cascade pool

This means the foundation is only supported following supply expansions (market cap growth) that indicate BASE adoption. This ensures that the foundation has the means to support further development proportionate to growth in the network.

The Cascade acts as a highly rewarding incentive for users to stake their token early on. However, as adoption occurs and BASE achieves price peg stability, rebases become less frequent, which means less Cascade issuances. In BASE's final state, Cascade rewards diminish. This works logically because BASE stability indicates sufficient liquidity.

This also means that in BASE's final state, foundation issuances diminish. This works logically because BASE stability indicates successful functionality – at which point foundation issuances are less necessary.

Foundation issuances are only administered when new adoption occurs and diminish as the protocol reaches its final state.

These rebase issuances are an algorithmic, sustainable, and transparent way to reward early adopters / equitably support the development team.

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Credits & References

We would like to credit Uniswap, whose innovative decentralized exchange platform will provide early liquidity support for BASE. For those interested in Uniswap and how its liquidity pools work, learn more here: https://uniswap.org/

We would like to credit Chainlink, whose decentralized oracles will be an instrumental data sourcing tool for BASE. For those interested in Chainlink and how its data oracles work, learn more here: https://chain.link/

We would also like to credit Ampleforth, whose project we consider a pioneer and inspiration for elastic supply protocols like BASE. The Base Protocol wouldn't exist today if not for the blueprint laid out by this project. For those interested in Ampleforth and the economics of elastic supply, learn more here: https://ampleforth.org/

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