

A Phased Automated Market Maker

WHITEPAPER

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Abstract

Initial Dex Offerings (IDOs) have become the most common way to launch blockchain tokens, but they come with many problems. From rug pulls to scams to simply no available starting liquidity, there are many ways IDOs can go wrong.

In this paper, we propose a novel Automated Market Maker (AMM) that evolves from a Bonding Curve into a Constant Product Market Maker (CPMM) while maintaining an identical user experience. It combines the best of presales and direct IDOs by allowing teams to raise presale funds while their token is already fully tradeable.

Any type of token may be launched on this exchange, and to users it functions exactly as the most common dexes today do throughout its phases. We then expand on the features of this exchange and benefits to users.



Introduction

Since blockchain tokens have existed protocols struggled with the problem of how to initially offer them to the public.

Originally this was through “mining” where users must devote computing power to token generation. Then came “ICOs” (Initial Coin Offerings) where tokens were usually pre-sold to users for a predetermined flat rate.

After that, “IDOs” (Initial Dex Offerings) began rising in popularity where tokens were offered directly on a decentralized exchange for users to begin trading.

The most popular methods today are doing an immediate Initial Dex Offering or, if funds are needed before the IDO, doing a presale then placing funds from the presale on the dex. **Each of these methods have costs and benefits.**

An IDO allows users to start trading right away and immediately get involved in the excitement of the token. However, it requires teams to have initial funding not only for the liquidity to put in the dex, but also for any marketing or development that must be done.

Presales fix this need for initial funding, but they create a scenario where initial token prices are arbitrary and users cannot trade them until the presale period is over; this often leads to market problems like immediate dumping of tokens once they can be traded.

Initial offerings of tokens also come with great risk to users. Initial token launches can bring huge rewards for users, but also come with great risk of scams.

Nothing is stopping teams from advertising their token as the next big thing, enticing investors to buy into it, then immediately selling their own allocations, thus crashing markets.

There are many partial solutions to protect investors , but none have been built into a cohesive product.

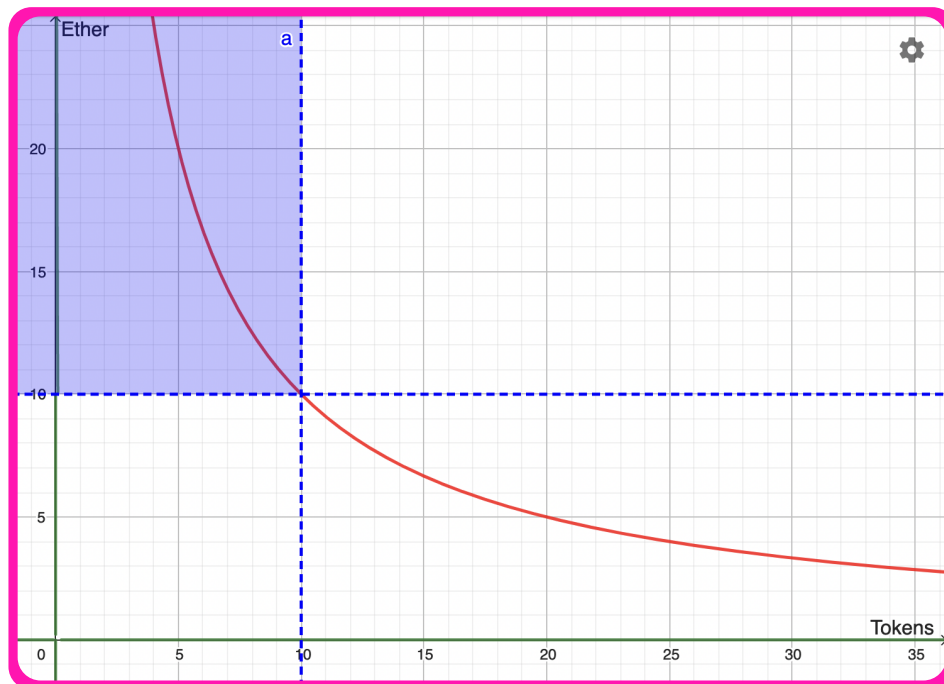


Solution

The Phased Automated Market Maker (PAMM) is an AMM that adjusts its trading algorithm depending on which phase a pool is in. While this fairly general term can encompass many algorithms, and Goat Trading may include multiple different options, Goat Trading's main setup is as a dex that follows the same CPMM algorithm throughout its phases so that a user never notices a change in behavior.

Initially, Goat Trading functions as a bonding curve. The price is set, then it follows an $x * y = k$ curve on buys and sells. Only tokens bought on a bonding curve may be sold back into it, so the price can never drop below where it started. This bonding curve allows the team to set an initial -minimum- price, then have users deposit Ether to buy tokens, which will increase the price.

Once this Ether reaches a certain amount (whatever liquidity for the dex is desired plus any other presale funds needed), **the presale funding is sent to the deployer of the pool and from there on the Bonding Curve turns into a traditional CPMM with the raised liquidity.** At this point the pool functions just like any other $x * y = k$ AMM, allows selling by the team and arbitrage, but includes anti-MEV measures and liquidity locking.



Only the area in blue is able to be reached during presale because no new tokens can be input, then the full curve can be used after.



This solution enables fair launches without any liquidity required. Many prospective protocols do not have 10+ Ether to lock up just so that people can trade their token, so they end up launching with little liquidity. Traders can wreck their charts with low risk buys and sells of large percentages of supply. Goat Trading lowers the barrier to entry for people looking to raise funds greatly, and greatly increases the safety of new launches.

This also allows teams to gain presale funds without needing to determine initial prices, without having periods where no trading is allowed, and without risking violent market activity once trading is opened. During what we call the presale period, tokens are freely tradeable so price discovery will occur and normal trading will be happening.

Along with this novel protocol design, there are many other features to be added that will benefit launching teams and users alike in running a token and being safe from scams respectively.



Equation

The equation controlling it is:

$$\max(v, x - p) * (y + y * \min(\frac{x}{v}, 1 + \frac{p}{v})) = k$$

Where

- x is the amount of Ether in the contract,
- v is the amount of "virtual" Ether to begin with,
- p is the amount of presale Ether needed, and
- y is the amount of tokens in the contract.

Before enough Ether is raised in the presale period (until 'p' is reached), the equation functions as:

$v * (y + y * x / v) = k$, which can be simplified to:

$$(v + x) * y = k$$

Although the equation is more illustrative maintaining a constant Ether value and adjusting tokens.

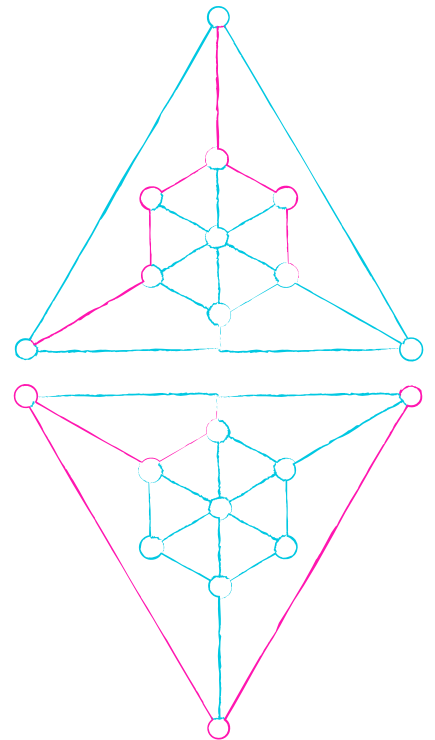
After the presale period ("Ether in" is $\geq p + v$) the equation becomes:

$$x * (2y + \frac{p}{v}y) = k$$

Once the presale period ends and it becomes a normal AMM, the dex can no longer go back to being a bonding curve.

This equation creates a dex that initially starts at $v * y = k$ with no Ether deposit needed, then ends with $x * (y + y * (1 + p / v)) = k$.

For example if there is no 'p' (so the goal is just to raise 'v' Ether for liquidity) the equation will slowly adjust from $(v + x) * y = k$ to $x * 2y = k$. The reason for this is that once we reach the goal amount of Ether raised, we get rid of the "virtual" Ether in the contract. If we were to keep y constant, this would half the price of the token. In a less streamlined scenario we could simply burn half the tokens in the contract at the same time we remove 'v'.



Features

We've established what our PAMM equation entails, but Goat Trading includes many other features as well.



Vesting

Vesting is required for this product to work because a bonding curve must not be able to have tokens sold into it that were not also bought on it. If your curve starts at a price that would equate your tokens to a 10 Ether value and you try to sell team tokens into it with no previous buys, it'll simply fail because it has no Ether to give.

For the entire presale period only tokens that are bought on the curve may be sold into it. This won't be noticed at all by the majority of traders. It will potentially mess up arbitrage if multiple pools are open (although it's unlikely if you're launching a new token on here that you will start with multiple pools), It will disallow selling if you transfer tokens to another address first, and will disallow selling any minted or non-launched tokens.

Liquidity Locking

During the presale period, liquidity will be locked the entire time. Afterwards, however, there will still be a liquidity lock period on the dex. The required liquidity locks will discourage certain malicious behaviors such as immediately removing liquidity from the pool or trading Ether in to fake the price, blocking any sells from occurring with the token, then withdrawing liquidity immediately.

Liquidity unlock will occur bits at a time. For example, up to 25% each week may be able to be withdrawn with this amount not rolling over to the next week. So if you wait 4 weeks to withdraw any amount of liquidity, you may still only withdraw 25% of the original liquidity before you must wait another week. This ensures a scenario where all liquidity from a token can never be removed at once.

$$u = \begin{cases} 0.25 * d & t_{n-p} > t_w \\ 0 & otherwise \end{cases}$$

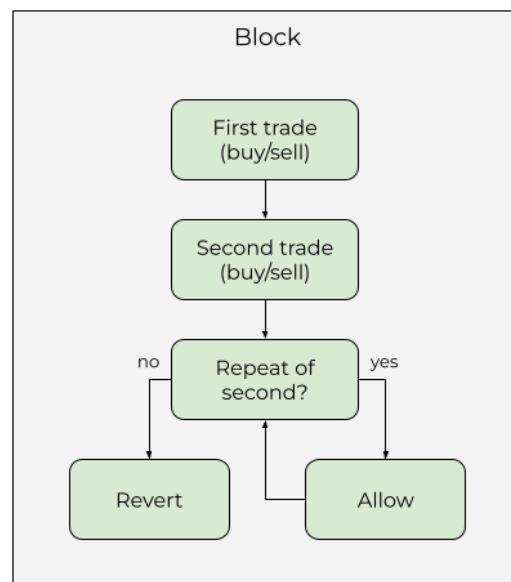
Where u is the unlock amount, d is the initial liquidity, t_n is the current time, p is the period required between withdrawals, and t_w is the time of last withdrawal.



Anti-MEV

The dex will come with anti-MEV measures as well. It will be the same measures the inedibleX currently has. Two trades for a token may always occur in a single block. After that, if further trades all match the direction of the second trade, as many more trades as there are will succeed.

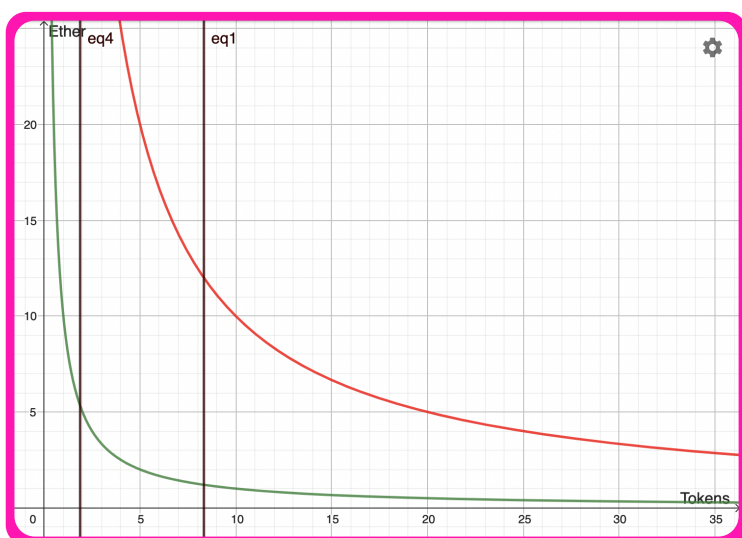
This allows many buys or many sells to all happen at once in times where people are ecstatic or scared, but completely thwarts any scenarios where sandwich attacks are attempted.



Anti-Sniping

Although not a technical feature in the dex, a big reason for its creation is anti-sniping. We achieve this simply by allowing people to start with more liquidity than they otherwise could. Sniping itself isn't necessarily a bad thing, but it becomes bad when there's only a small amount of liquidity so a huge amount of supply can be bought with very little funds, then dumped immediately after.

Any feature that doesn't majorly impact individual traders such as limits on wallets, limits within a timeframe of launch, only accepting wallets with certain histories, etc. can be bypassed fairly easily by any dedicated sniper. So we came to the conclusion that the best way we can deal with sniping is to simply give everyone enough liquidity so the same amount of Ether a sniper risks will have much less of an impact on the pool.



Demonstration of curve differences when starting with a 10 Ether and 3 Ether pair and a 2 Ether purchase.



For example, if a pool for a brand new token starts with 3.33 Ether liquidity, a 2 Ether buy will purchase nearly 50% of the tokens in the pool. A short-term speculator now holds an enormous amount of the supply and is likely to dump a large amount of tokens shortly after, resulting in a crash and loss of momentum of the token's market. If the pool starts with 10 Ether, however, a 2 Ether purchases under 20% of tokens. The sniper now must take on much more risk to do the same amount of damage to the charts.

Anti-Scam

There are many honeypots, rug pulls, and more that malicious actors can use to prey on traders. We've done everything we can with this design to stop those from having any effect.

- Rug pulls are impossible with locked liquidity.
- Vesting makes it so that team tokens and minted tokens are not able to be sold into the dex before the presale period is done.
- We keep track of tokens within the contract rather than checking contract balance so that balance cannot be manipulated to raise or lower price.
- Liquidity locks discourage other scams like blocking all sells from occurring because there's so much time between presale opening and when liquidity can be fully withdrawn; the malicious actor will likely also need to deposit their own funds to meet presale requirements so there will be opportunity cost for a small benefit.

Once the presale period is over, the vesting protections go away, but the goal is that users have a decent amount of time in which they can buy and sell their tokens to determine whether this is a team they can trust to build a legitimate product.

Instantly Accessible Fees

Teams should be able to rely on trading fees that they charge as a way to fund development and marketing. With current dexes, however, they cannot withdraw fees from an $x * y = k$ pool with locked liquidity because all of the current dexes (with the exception of inedibleX) grant fees in liquidity pool tokens.

Goat not only allows you to withdraw fees at any time regardless of whether your liquidity is locked, but Goat also stores fees as Ether at the time of purchase rather than keeping them as liquidity pool tokens. This ensures teams get fees as usable funds rather than in tokens that may not be able to be sold, and that the fees are not exposed to loss that liquidity pool tokens may face.

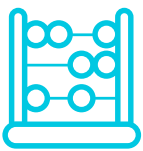




Low Gas Cost Launch

All pools will be launched on the same contract, resulting in much cheaper gas costs for launches than current dexes. Where currently it can be hundreds of dollars to launch a single pool, launches on GOAT will cost just dollars.

This will help to bring new teams on board because there is minimal risk and cost to initially try our product. It also further lowers the barrier to entry for anyone looking to raise funds, just like we're doing with the no liquidity fair launch in the first place.



Customizable Fees

Fees for each pool will be 0-10% and dependent on what liquidity providers require for their service. When depositing liquidity, liquidity providers will be able to choose the fee they'd like. The weighted mean of all liquidity deposits will become the fee for the pool that all liquidity providers will get.

For example, if one provider deposits 50% of the liquidity and inputs that they want a 0% fee, and a second provider deposits 50% of the liquidity and inputs that they want a 10% fee, each provider will get 5% fees on their liquidity. This creates a system where the fees charged will be the average of all demands depending on the volatility and volume of the individual pool.



Token Creator

The Goat Trading frontend will come with a native token creator. This will include a very simple user interface to help teams launch a token with no coding required. Any token, whether created on the website or not, can launch a PAMM pool, but the Token Creator will allow the simplest token-launching experience possible. Token creation involves the customization of name, symbol, total supply, and special features such as including governance abilities, anti-MEV, taxes, and more.

The goal is for any user to be able to create a general purpose token with no expertise needed.



Tokenomics



This dex is being made by the teams behind Inedible and Zoomer with Inedible being the main development team.

The base of the tokenomics is to share in a portion of what liquidity providers charge traders by programmatically doing buybacks and burns. Pools of each token will automatically be purchased from and those tokens sent to the burn address. A share of these liquidity provider charges will likely also be used to further development of the protocol and future versions.

Each community (Inedible and Zoomer) will receive a share of the liquidity provider charges according to a to-be-determined split, and we may also include other communities in that split to encourage collaboration between teams and immediate use of the protocol.

Liquidity provider charges will be determined by a mean of the desired charge of liquidity providers in a pool, so the profits for the protocol will be 20% of those rates rather than a set number such as 0.06%. We believe 20% of the rates that LPs choose will end up being more than 0.06% of trades, as many liquidity providers for newly launched tokens will be desiring bigger returns than the 0.3% common on many other dexes



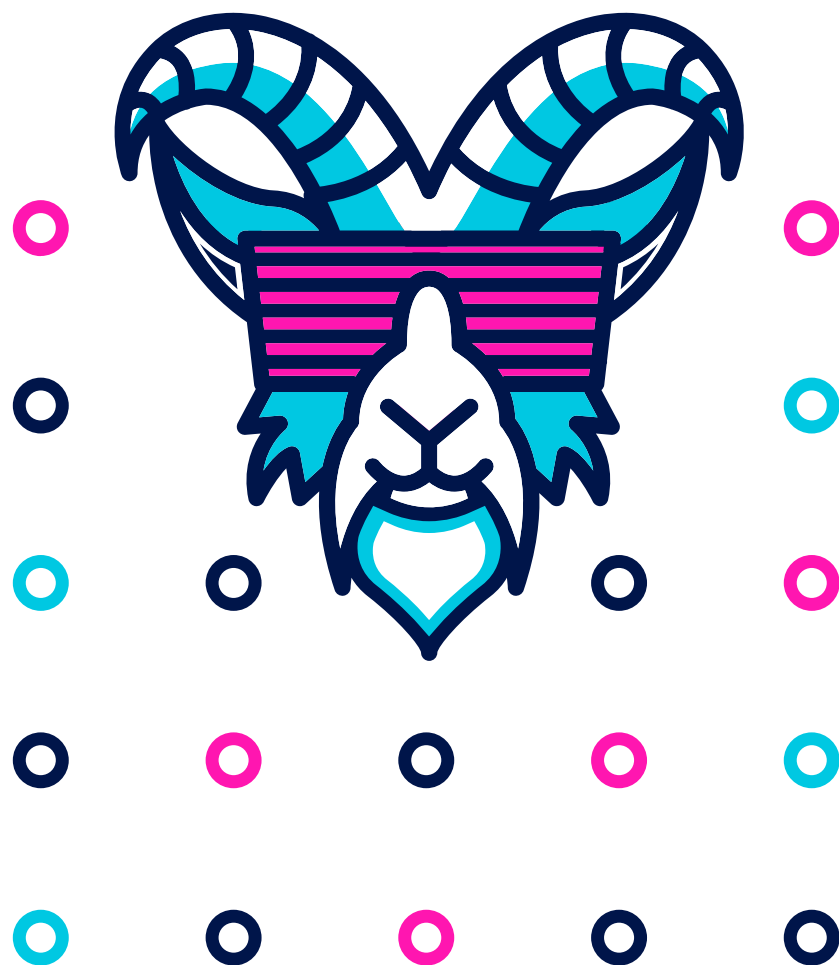
Conclusion

The PAMM creates the ideal way to launch a token with an IDO.

With its ability to transform from a presale Bonding Curve into a traditional CPMM, It combines the best parts of a presale with the best parts of a fair launch.

There is no initial liquidity needed and teams can raise needed presale funds, but users will always be able to trade the token. It adds numerous security features that don't exist elsewhere to protect users from malicious actors.

Goat Trading is how the vast majority of Initial Dex Offerings will occur in the future.



GOAT TRADING