

# EquitySwap - Redefining DEX

Topo Labs

July 6, 2023

## Abstract

When studying the Web3 application landing, **Topo Labs** found that the common DEX is difficult to realize the complete decentralization of trading <sup>1</sup>, and also unable to meet the listing demand of various initial volume projects. Particularly, the development of some small-and medium-sized volume projects is easily limited by the AMM model from DEX. After the project rises to high multiples, not only is the liquidity not enough to support normal trading, but it also already reaches the bottleneck when the market value is not too large, and it is difficult to keep healthy development. The above problem can only be solved if enough users add liquidity, but due to the high impermanent loss of adding liquidity on conventional DEX, users mostly will not actively add liquidity as well.

To change this situation, **Topo Labs** created **EquitySwap**. It is designed to enable projects with different initial volumes to choose the appropriate DEX for listing. It can maintain better liquidity when its market cap rises to the ten trillion dollar level without externally adding liquidity <sup>2</sup>.

**Topo Labs** combines real-world business applications and thought continually refining and optimizing mathematical models. It has launched two sets of DEX:

A set of  $3 - in - 1$  **EquitySwap Pro** is applicable to **new projects**. It can be simply analogized to NYSE, NASDAQ, and AMEX. Because for start-up projects, liquidity is essential. Projects with different initial volumes can choose an appropriate DEX for their listing from the following three DEXs. It can maintain better liquidity when its market cap rises to the ten trillion dollar level without externally adding liquidity.

- AntSwap:  $X^4Y = K$
- ElephantSwap:  $X^2Y = K$
- WhaleSwap:  $XY = K$  (same as Uniswap)

The other set of  $3 - in - 1$  <sup>3</sup> **EquitySwap Pro** is applicable to **Listed Projects**. Because for mainstream coins like BTC, the important demand from users is stable profitability (while reducing impermanent loss). The following three DEXs enable users to enjoy the dividends of the rising price while getting a good annualized trading rate and balancing fund utilization rate.

- MoonSwap:  $X^8Y = K$
- EarthSwap:  $X^{16}Y = K$
- SunSwap:  $X^{32}Y = K$

**Topo Labs** combined with real business applications, through continuous refinement and optimization of mathematical models, EquitySwap launched two sets of DEX: a set of  $3 - in - 1$  for **new projects** <sup>4</sup> DEX

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<sup>1</sup>When a project reaches a certain volume, it often needs to move to CEX for further development.

<sup>2</sup>When the initially added liquidity pool is more than 1000 USDT, and the funds added to the liquidity pool are more than or equal to 10% of the market value. When the market cap reaches 10 trillion, the ratio of market cap to total liquidity pool value is less than 150 times.

<sup>3</sup>To facilitate the choice by project owners and users, three market maker formulas have been refined that can cover all initial volume projects.

<sup>4</sup>To enable easy and direct selection by project owners and users, We have refined three market-maker formulas that can cover all initial volume projects.

**EquitySwap Air**, it can be simply analogized to NYSE, NASDAQ, and AMEX, the other set of 3 - in - 1 DEX **EquitySwap Pro** applicable to **Listed Projects**.

**EquitySwap Air** is an innovative decentralized trading platform that provides projects with greater market depth compared favorably with centralized exchanges as well as unlimited development space by refining the corresponding mathematical model and continuously optimizing it. This frees projects from dependence on centralized exchanges and achieves completely decentralized trading.

Compared with common decentralized trading platforms (like Uniswap), EquitySwap has the following significant advantages:

- the market depth can automatically increase substantially during the trading process <sup>5</sup>;
- when the project's market value rises, its market depth can be tens to hundreds of times higher than **Uniswap** <sup>6</sup>;
- Impermanent loss is significantly reduced, encouraging more users to add liquidity, thereby increasing EquitySwap and the ecosystem public chain's TVL, which makes it easier for projects to be top in their corresponding tracks;

This article will focus on the superior technical indicators of **EquitySwap Air & Pro** and the important value it brings in business activities.

## 1 Mathematical Model

The **EquitySwap** is based on the *AMM* (Automated Market-Makers) protocol. That is, *Liquidity Provider* deposits trading pairs (*TokenA*, *TokenB*) in an *liquidity pool* which is based on a certain mathematical model to make the *quantity* of *TokenA* and *TokenB* conform to a deterministic relationship <sup>7</sup>.

In order to carry **PeopleEquity's** entire ecosystem protocol and meet the demands of various start-up projects' listing and development, *EquitySwap* has many technical advantages that are beneficial to **users**, **project owners**, and **market makers** multiple parties.

In order to accommodate the different initial volumes of *projects*, we optimized three mathematical models for the constant project formula of *AMM* to guarantee its better market performance.

The following are some of the superior technical indicators of **EquitySwap Air**:

- Greater market depth.
- Smaller impermanent loss.
- Higher trading profits.
- Superior incentive dividends.

### 1.1 Model Refinement

#### EquitySwap Air

To enable startups to achieve better market performance, **Topo Labs** launches **EquitySwap Air**, which is designed to ensure better benefits for projects and users by automatically increasing the depth of market, smaller impermanent loss, and higher trading profits.

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<sup>5</sup>The total value of the liquidity pool can be tens to hundreds of times higher than in Uniswap when the price of the project rises to the same figure.

<sup>6</sup>Motivating more users to add liquidity, increasing the TVL of EquitySwap and public chains where listed projects are based.

<sup>7</sup>The Swap that conforms to the *AMM* protocol is a quantitative relationship (not a price relationship) between the two Tokens in the trading pair (*TokenA*, *TokenB*), and the price relationship is only indirectly represented by the quantitative relationship

The mathematical model of *WhaleSwap* (using models from well-known DEXs like Uniswap and PancakeSwap, etc.):

$$X * Y = K \quad (1)$$

The mathematical model of *ElephantSwap*:

$$X^2 * Y = K \quad (2)$$

The mathematical model of *AntSwap*:

$$X^4 * Y = K \quad (3)$$

## EquitySwap Pro

For Bitcoin or Altcoin and projects that have added liquidity in other DEXs, **Topo Labs** launched **EquitySwap Pro**, which contains **MoonSwap**, **EarthSwap**, **SunSwap**. By having an incredibly small **impermanent loss** to ensure that users can both enjoy the dividends of the token price increase and receive a high annualized transaction rate (about 36.5% if the daily trading volume is equal to the value of the pool).

The mathematical model of *MoonSwap*:

$$X^8 * Y = K \quad (4)$$

The mathematical model of *EarthSwap*:

$$X^{16} * Y = K \quad (5)$$

The mathematical model of *SunSwap*:

$$X^{32} * Y = K \quad (6)$$

## 1.2 Price Calculation Method

In *AMM*-based Swap, the price of a *TokenA* is denominated in another *TokenB*. As here *PE* is priced at *USDT*, that is, for every *PE* is worth the amount of *USDT*.

Derivation of the price formula Based on the **AMM** model of DEX, assume that its mathematical model is  $X^n * Y = K$ , that are,  $Y = X^{-n} * K$ , and deriving both sides of it, there is  $Y' = (-n) * \frac{1}{X^{n+1}} * K$ , substituting  $(X_0, Y_0)$ , there are  $X = X_0$  and  $K = X_0^n * Y_0$ . Thus

$$Y' = (-n) * \frac{Y_0}{X_0} = -P \quad (7)$$

conclude that

$$P = n * \frac{Y_0}{X_0} \quad (8)$$

When *PE*'s price fluctuates, the **price** of *PE* is calculated as follows.

From the formula 1 the price in **Uniswap** (initially adding  $(PE, USDT)$  with the value ratio of 1 : 1):

$$P = \frac{Y}{X} = \frac{K}{X^2} \quad (9)$$

From the formula 3 the price in AntSwap (initially adding  $(PE, USDT)$  with the value ratio of 4 : 1):

$$P = \frac{4 * Y}{X} = \frac{4 * K}{X^5} \quad (10)$$

Because one Token ( $PE$ ) is denominated in another Token ( $USDT$ ).

Assume that the liquidity added in Uniswap is  $(X_1, Y_1)$  and the liquidity added in AntSwap is  $(X_4, Y_4)$ , in which  $X_1$  and  $X_4$  are the same token (and the quantitative relationship is  $X_4 = 4X_1 = 4X_0$ ) while  $Y_1$  and  $Y_4$  are the same token (assuming the initial added USDT of Y is equivalent, denoted as  $Y_0$ ), at which the price  $P$  of X in both liquidity pools are equal.

For Uniswap, it is easy to get

$$P = \frac{K}{X^2} = \frac{Y_1^2}{K} = \left(\frac{Y_1}{Y_0}\right)^2 = \left(\frac{X_0}{X_1}\right)^2$$

For AntSwap, according to the formula 10 and 9, that is

$$P = \frac{4 * K}{X^5} = \frac{4 * Y_4^{\frac{5}{4}}}{\sqrt[4]{K}} = \left(\frac{Y_4}{Y_1}\right)^{\frac{5}{4}} = \left(\frac{4X_0}{X_4}\right)^5$$

Because  $P$  is equal, thus we have

$$P = \left(\frac{Y_1}{Y_0}\right)^2 = \left(\frac{Y_4}{Y_0}\right)^{\frac{5}{4}}$$

$$P = \left(\frac{X_0}{X_1}\right)^2 = \left(\frac{4X_0}{X_4}\right)^5$$

According to the above calculations, we can get

$$\frac{Y_4}{Y_1} = P^{\frac{3}{10}} \quad (11)$$

$$\frac{X_4}{X_1} = 4 * P^{\frac{3}{10}} \quad (12)$$

### 1.3 Quantity Calculation Method

#### The proportion of adding liquidity in the initial period

From the formula 8, the **token value ratio**<sup>8</sup> should be  $n : 1$  when initially adding liquidity  $(TokenA, TokenB)$ . For Uniswap is 1 : 1, for AntSwap are both 4 : 1, and so on for other Swaps.

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<sup>8</sup>TokenB is usually a legal tender or denominated token like USDT, BTC, etc.

## To select different mechanisms of Swap in EquitySwap Air

After **Topo Labs**'s large amount of data simulation, and combining the characteristics of **EquitySwap Air**'s three underlying mathematical models of Swap, we propose the following recommendations for projects with different initial volumes to **listing**<sup>9</sup>

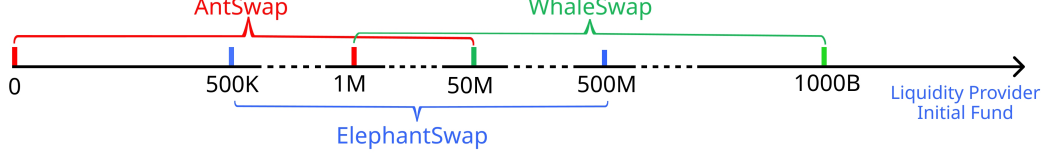


Figure 1: Reference on how to choose Swap for projects of different initial volumes

The two tokens in the liquidity pool will change in quantity as the price fluctuates. This quantity and the corresponding price are calculated as follows.

The amount of  $PE$  in **Uniswap** (according to the formula 9)

$$X = \sqrt{\frac{K}{P}} \quad (13)$$

The amount of  $USDT$  in **Uniswap** (according to the formula 9)

$$Y = \sqrt{K * P} \quad (14)$$

The amount of  $PE$  in **AntSwap** (according to the formula 10)

$$X = \sqrt[5]{\frac{4 * K}{P}} \quad (15)$$

The amount of  $USDT$  in **AntSwap** (according to the formula 10)

$$Y = \sqrt[5]{\frac{K * P^4}{4^4}} \quad (16)$$

The following are all examples of **AntSwap** (compared to the mathematical model used for conventional Swap), and all of them have added  $(X, Y) = (PE, USDT)$  liquidity to the pool.

## 2 Technical Features - EquitySwap Air

### 2.1 Smaller Impermanent Loss

Impermanent loss, that is, after *LiquidityProvider* adds liquidity ( $TokenA, TokenB$ ), when the trading pair's one token (or two tokens) in price rises, and then removes the liquidity, the return is lower than the gains obtained by directly holding the Token, the lower part is the impermanent loss.

Assuming that  $n$  denotes the proportion of liquidity added by an LP to the entire liquidity pool; using  $r_{bto}$  denote the rate of price increase.

<sup>9</sup>In this way, the project can continuously develop and expand in a decentralized environment and has almost unlimited space for development.

The following section shows a comparison of the difference in revenues between **Uniswap** and **AntSwap** in **Holding Token** and **Add Liquidity**.

### 2.1.1 Uniswap

According to [Uniswap: A Protocol for Decentralized Exchange on Ethereum](#) It can be derived that the **impermanent loss rate** of Uniswap is

$$f(r) = \frac{r + 2 - 2 * \sqrt{r + 1}}{r + 2} \quad (17)$$

### 2.1.2 AntSwap

#### Holding Token

When the price of  $PE$  is increasing (Assuming that the trading pair with added liquidity is  $(PE, USDT)$  in this article), according to the formula 15, at the moment the amount of  $PE$  in **liquidity pool** is

$$X = \sqrt[5]{\frac{4 * K}{P}}$$

Then the amount of the corresponding proportion owned by the **Liquidity Provider** is

$$X = n * \sqrt[5]{\frac{4 * K}{P}}$$

The value of this portion of  $PE$  is

$$X = n * \sqrt[5]{\frac{4 * K}{P}} * P * (r + 1) \quad (18)$$

Similarly, according to the formula 16, the amount of  $USDT$  in the liquidity pool at that time is

$$Y = \sqrt[5]{\frac{K * P^4}{4^4}}$$

Then the amount and value of the corresponding proportion owned by the **Liquidity Provider** is

$$X = n * \sqrt[5]{\frac{K * P^4}{4^4}} \quad (19)$$

Therefore, if the **Liquidity Provider** chooses **Holding Token**, then after  $PE$  price has increased by  $r$ , the total value of the two Tokens is (formula 18 + formula 19)

$$value = n * \sqrt[5]{\frac{4 * K}{P}} * P * (r + 1) + n * \sqrt[5]{\frac{K * P^4}{4^4}} = n * \sqrt[5]{\frac{K * P^4}{4^4}} * (4r + 5) \quad (20)$$

## Adding liquidity

When **Liquidity Provider** initially adds  $(PE, USDT)$  to the liquidity pool by the ratio of 4 : 1 value. According to the formula 15, the amount of  $PE$  in the **liquidity pool** at that time is

$$X = \sqrt[5]{\frac{4 * K}{P * (r + 1)}}$$

Then the amount of the corresponding proportion owned by the **Liquidity Provider** is

$$X = n * \sqrt[5]{\frac{4 * K}{P * (r + 1)}}$$

The value of this portion of  $PE$  is

$$value = n * \sqrt[5]{\frac{4 * K}{P * (r + 1)}} * P * (r + 1) = n * \sqrt[5]{4 * K * P^4 * (r + 1)^4} \quad (21)$$

Similarly, according to the formula 16, the amount of  $USDT$  in the liquidity pool at that time is

$$Y = \sqrt[5]{\frac{K * P^4 * (r + 1)^4}{4^4}}$$

Then the amount and value of the corresponding proportion owned by the **Liquidity Provider** is

$$value = n * \sqrt[5]{\frac{K * P^4 * (r + 1)^4}{4^4}} \quad (22)$$

Therefore, if the **Liquidity Provider** chooses **Add liquidity**, then after  $PE$  price has increased by  $r$ , the total value of the two Tokens is (formula 21 + formula 22)

$$n * \sqrt[5]{4 * K * P^4 * (r + 1)^4} + n * \sqrt[5]{\frac{K * P^4 * (r + 1)^4}{4^4}} = 5n * \sqrt[5]{\frac{K * P^4 * (r + 1)^4}{4^4}} \quad (23)$$

In summary, from the formula 20 - and the formula 23, the **impermanent loss** is

$$loss = n * \sqrt[5]{\frac{K * P^4}{4^4}} * (4r + 5) - 5n * \sqrt[5]{\frac{K * P^4 * (r + 1)^4}{4^4}} = n * \sqrt[5]{\frac{K * P^4}{4^4}} * (4r + 5 - 5 * (r + 1)^{\frac{4}{5}}) \quad (24)$$

That is, **impermanent loss rate** is ( formula 24 / formula 20)

$$f(r) = \frac{n * \sqrt[5]{\frac{K * P^4}{4^4}} * (4r + 5 - 5 * (r + 1)^{\frac{4}{5}})}{n * \sqrt[5]{\frac{K * P^4}{4^4}} * (4r + 5)} = \frac{4r + 5 - 5 * (r + 1)^{\frac{4}{5}}}{4r + 5} \quad (25)$$

As shown above, for Swaps that rely on the **AMM** mechanism, their **impermanent loss rate** depends only on the price growth rate.

Combining the impermanent loss rates of **Uniswap** and **AntSwap**, the impermanent loss curves of both can be compared as follows, the X-axis is the rate of the token price increase and the Y-axis is the impermanent loss rate.

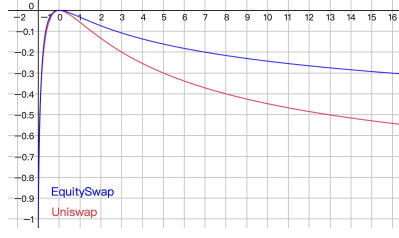


Figure 2: Comparison diagram between Uniswap and EquitySwap (AntSwap) for impermanent loss



Figure 3: Comparison diagram(detail image) between Uniswap and EquitySwap (AntSwap) for impermanent loss

## 2.2 Greater Market Depth

Assumptions: The initial adding liquidity ( $Token, USDT$ ) has the same amount of  $USDT$  and the same price of  $Token$ . According to the formula 11, when the price is  $P$ , the multiples of **AntSwap**'s  $USDT$  with respect to **Uniswap**'s  $USDT$  is

$$f(P) = P^{\frac{3}{10}}$$

As is shown in the figure, the X-axis is the unit price of the Token, and the Y-axis is the ratio of  $USDT$  in AntSwap versus  $USDT$  in Uniswap.

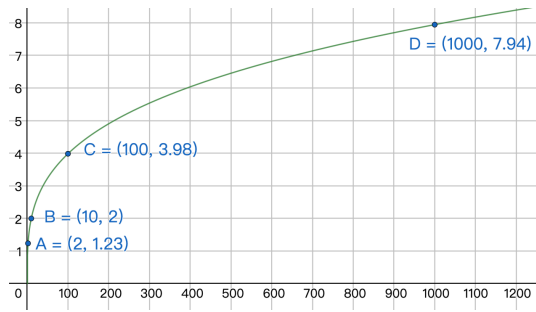


Figure 4: The curve of the  $USDT$ 's ratio with price variation in AntSwap and Uniswap



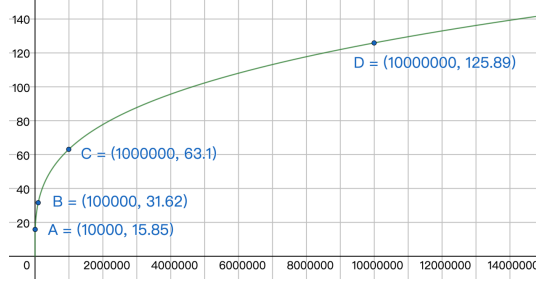


Figure 5: The curve of the USDT's ratio with amount variation in AntSwap and Uniswap

According to the formula 12 when the price is  $P$ , the multiples of **AntSwap's tokens** with respect to **Uniswap's tokens** is

$$f(P) = 4 * P^{\frac{3}{10}}$$

As shown in the figure. the X-axis is the unit price of the Token, and the Y-axis is the ratio of the Token in AntSwap versus the Token in Uniswap.

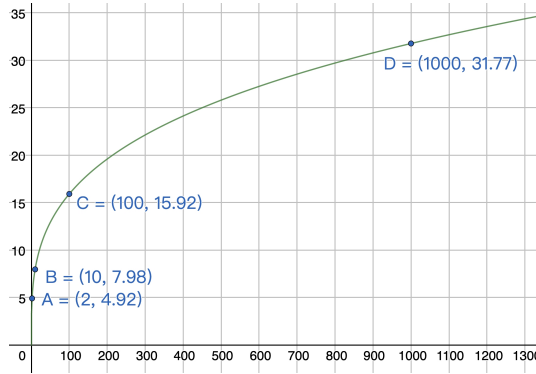


Figure 6: The curve of the Token's ratio with price variation in AntSwap and Uniswap.

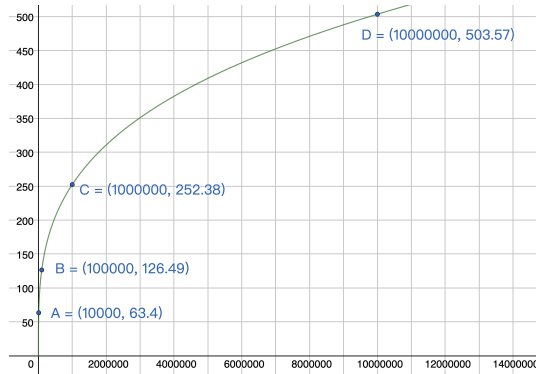


Figure 7: The curve of the Token's ratio with price variation in AntSwap and Uniswap.

Note: X-axis - multiple of price increase (current price / initial price); Y-axis - multiple of Swap value increase (current value / initial value)

From the above, it can be seen that **EquitySwap** has greater market depth compared to **Uniswap** when the token price rises.

## 2.3 Higher Trading Profits

More trading profits means that compared to Uniswap, **AntSwap** can exchange more tokens by the same amount of *USDT* and more *USDT* can be exchanged by the same amount of tokens. In short "**Buy more, sell more**".

Compared to common DEX, after adding liquidity with the same amount of *USDT* and the same token price, at the same token price in any subsequent development process, EquitySwap can realized using the same amount of *USDT* to swap more tokens, and using the same amount of tokens can also be exchanged for more *USDT*.

For Swap based on the **AMM** model, that is, conforming to the generic mathematical model

$$X * Y^{\frac{b}{a}} = K \quad (26)$$

### 2.3.1 Buy More

Again, this article is illustrated with  $(PE, USDT)$  trading pairs. Thus,  $X$  added to **Uniswap** and **AntSwap** is  $PE$  and  $Y$  added is *USDT* when the amount of *USDT* is the same, there are,  $Y_4 = Y_1 = Y$  and  $P_1 = P_2$ ,  $4 * X_1 = X_4$ .

Scenario assumption: a user uses the same amount of *USDT* to exchange  $PE$ , i.e.  $\Delta Y = \Delta Y_1 = \Delta Y_4$  then finds  $\Delta X$

which is

$$(X - \Delta X)(Y + \Delta Y)^{\frac{b}{a}} = K$$

That is

$$\Delta X = X * (1 - (\frac{Y}{Y + \Delta Y})^{\frac{b}{a}})$$

For **Uniswap**, when **Liquidity Provider** initially adds  $(PE, USDT)$  to the liquidity pool by the value ratio of 1 : 1. Then there are

$$\Delta X_1 = X_1 * (1 - \frac{Y}{Y + \Delta Y})$$

For **AntSwap**, when **Liquidity Provider** initially adds  $(PE, USDT)$  to the liquidity pool by the value ratio of 4 : 1. Then

$$\Delta X_4 = X_4 * (1 - (\frac{Y}{Y + \Delta Y})^{\frac{1}{4}}) = 4 * X_1 * (1 - (\frac{Y}{Y + \Delta Y})^{\frac{1}{4}})$$

Set  $\Delta X_1 = \Delta X_4$ , and let  $\frac{Y}{Y + \Delta Y} = T$ , that is

$$X_1 * (1 - T) = 4 * X_1 * (1 - T^{\frac{1}{4}})$$

The solution is  $T = 1$ , and at that time  $\Delta Y = 0$ , so it is rounded off. That is, when  $\Delta Y > 0$ ,  $\Delta X_4 > \Delta X_1$ , which means

It is possible to buy more  $PE$  with the same amount of *USDT* in **AntSwap** than in **Uniswap**.

Therefore, the multiplicity of  $PE$  obtained by **AntSwap** compared to **Uniswap** is

$$\frac{\Delta X_4}{\Delta X_1} - 1 = \frac{4 * (1 - (\frac{Y}{Y+\Delta Y})^{\frac{1}{4}})}{1 - \frac{Y}{Y+\Delta Y}} - 1$$

The curve is shown below, where the X-axis is the amount of USDT and the Y-axis is the multiple of the number of  $PE$  exchanged by AntSwap compared to Uniswap

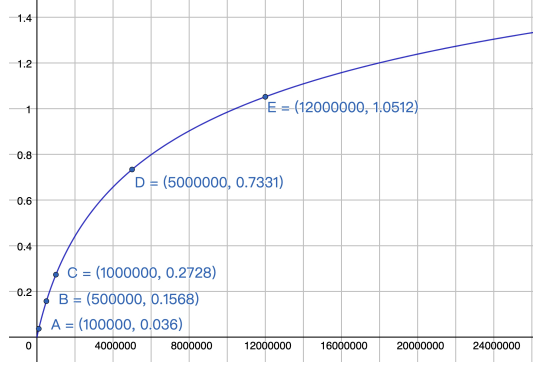


Figure 8: When adding liquidity with 1 million USDT, and pricing is the same, the multiplier that the USDT swap tokens can reach (up to 3 times more).

### 2.3.2 Sell More

Scenario assumption: a user uses the same amount of  $USDT$  to exchange  $PE$ , i.e.  $\Delta X = \Delta X_1 = \Delta X_4$  then finds  $\Delta Y$

There are

$$(X + \Delta X)(Y - \Delta Y)^{\frac{b}{a}} = K$$

Combining the formula 26 yields

$$\Delta Y = Y * (1 - (\frac{X}{X + \Delta X})^{\frac{b}{a}})$$

For **Uniswap**, when **Liquidity Provider** initially adds  $(PE, USDT)$  to the liquidity pool by the value ratio of 1 : 1. Then there are

$$\Delta Y_1 = Y * (1 - \frac{X_1}{X_1 + \Delta X})$$

For **AntSwap**, when **Liquidity Provider** initially adds  $(PE, USDT)$  to the liquidity pool by the value ratio of 4 : 1. Then

$$\Delta Y_4 = Y * (1 - (\frac{X_4}{X_4 + \Delta X_4})^4) = Y * (1 - (\frac{4X_1}{4X_1 + \Delta X})^4)$$

When  $\Delta X > 0$ ,  $(\frac{X_4}{X_4 + \Delta X_4})^4 < \frac{X_1}{X_1 + \Delta X}$ , that is,  $\Delta Y_4 > \Delta Y_1$ . That means

When selling the same amount of  $PE$ , it is to get more  $USDT$  in **AntSwap** than in **Uniswap**.

Therefore, compared to **Uniswap**, the multiplier of *USDT* that can be obtained more by **AntSwap** is

$$\frac{\Delta Y_4}{\Delta Y_1} - 1 = \frac{1 - \left(\frac{4X_1}{4X_1 + \Delta X}\right)^4}{1 - \frac{X_1}{X_1 + \Delta X}} - 1$$

The curve is as follows, with the X-axis as the amount of tokens and the Y-axis as a multiple of the amount of USDT can be exchanged more.

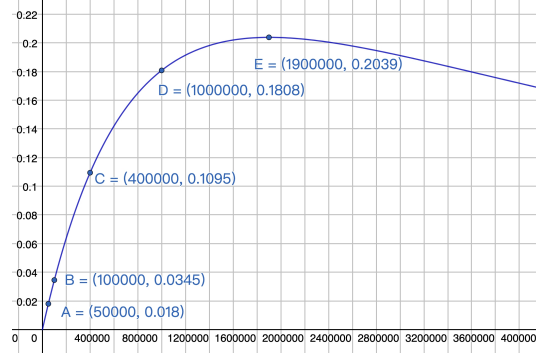


Figure 9: When adding liquidity with 1 million USDT and pricing is the same, the multiplier that tokens can be more exchanged for USDT

As can be seen in Figures 4 and 5, after the price of a token rises, the amount of USDT in AntSwap can be several times to hundreds of times more than in Uniswap. When the price rises by a certain figure, the corresponding same amount of tokens can be exchanged for more USDT with several times or even hundreds of times.

### 3 Technical Features - EquitySwap Pro

Many users hold mainstream coins such as BTC, ETH and BNB for a long time, and this part of the token has not generated enough value. The reasons are

- **concern about CEX:** The centralized exchange of **RUG** may result in the loss of users' assets;
- **impermanent loss is too high:** The current impermanent loss of the commonly used *DEX* is too high, after the user adds liquidity, when the price rises and then withdraws the liquidity, the impermanent loss may be greater than the gain in transaction fees, and result in an overall **loss** of varying degrees;

In order to enable users who holding mainstream coins such as *BTC*, *ETH*, *BNB*, etc. To enjoy the dividends of price increase in the "bull market" and enjoy good profits from trading rates<sup>10</sup> (e.g. 0.1%).

After balancing **smaller impermanent loss** and **sufficient capital utilization**, **EquitySwap** provides a 3-in-1 version of **Pro** to adapt to **mainstream coins**. Namely, formula 4, formula 5, and formula 6.

Analogously, the derivation of **AntSwap in EquitySwap Air25** shows that

Formula 4 of **impermanent loss rate**

$$loss = 1 - 9 * \frac{(X+1)^{\frac{8}{9}}}{8X+9} \quad (27)$$

<sup>10</sup>The total daily trading volume of the trading pairs with better liquidity on chain can reach 1 – 10 times of the pool. The corresponding annualized yield rate can reach 36.5% – 365%.

Formula 5 of **impermanent loss rate**

$$loss = 1 - 17 * \frac{(X + 1)^{\frac{16}{17}}}{16X + 17} \quad (28)$$

Formula 6 of **impermanent loss rate**

$$loss = 1 - 33 * \frac{(X + 1)^{\frac{32}{33}}}{32X + 33} \quad (29)$$

The X-axis in the figure below is the rate of token price increase, and the Y-axis is the rate of impermanent loss. The green curve, purple curve, and red curve indicate the impermanent loss curves of SunSwap, EarthSwap, and Uniswap, respectively.

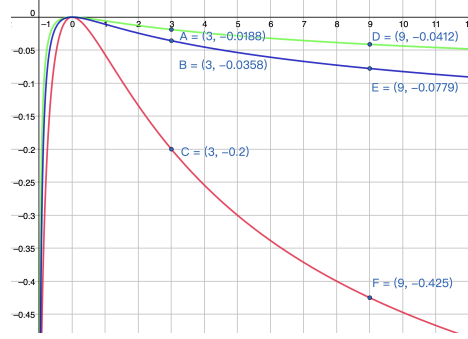


Figure 10: When the price rises to n times of the original after withdrawing the liquidity, the value of AntSwap is a multiple of Uniswap

The following analysis is combined with a graph. Assuming the cost of adding liquidity is the same (i.e., the total value of tokens and USDT is the same), in which the X-axis is the multiple of the token price increase, and the Y-axis is the ratio of the liquidity value in EarthSwap/SunSwap and Uniswap.

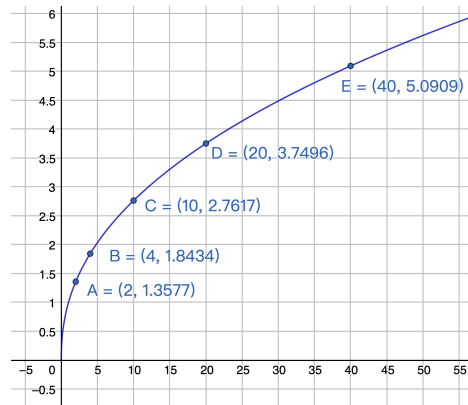


Figure 11: After the price has risen to n times its original value, the value of EarthSwap is a multiple of Uniswap when liquidity have been withdrawn

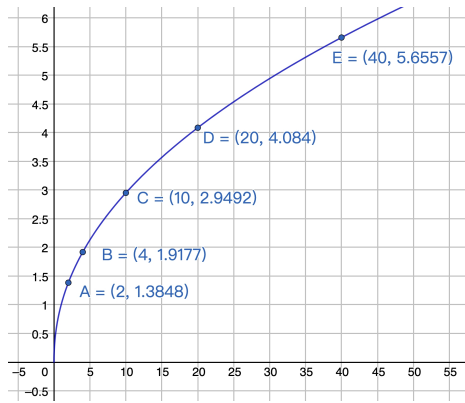


Figure 12: After the price has risen to  $n$  times its original value, the value of SunSwap is a multiple of Uniswap when have been withdrawn

As can be known from the chart above. Assuming that the current price of BTC is 30,000, users add liquidity to Uniswap with 0.5 BTC and 15,000 USDT (total cost of 30,000 USDT), and withdraw liquidity when the price of BTC rises to 120,000 USDT, the total value that the user can obtain is 60,000 USDT, if the total value that the user can obtain by holding the coin is 75,000 USDT, the impermanent loss is 20%; The users can get 110,600-115,100 for the same cost (30,000 USDT) of adding liquidity to EquitySwap (with the impermanent loss of 1.8%-3.6%). Thus, the user will get 84%-92% (50.06-55.1 thousand) more than the value obtained by adding liquidity in conventional DEX.

Assuming the current price of ETH is 2,000 USDT, if the users add liquidity to Uniswap with 10 ETH and 20,000 USDT (total cost 40,000 USDT), and withdraw liquidity when the price of ETH rises to 20,000 USDT, users can get the total value of about 126,500 USDT, or 220,000 USDT if users holding the coin, impermanent loss is 42.5

## 4 Summary

**EquitySwap(in the case of AntSwap)** has great technical advantages compared to the conventional **Swap(in the case of Uniswap)**.

- **Greater Market Depth:** Automatically increases the depth of market (liquidity) during the trading process, and the depth of market can be tens to hundreds of times greater than Uniswap after the project rises a certain number of times. Enables projects to grow and develop independently on DEX, free from dependence on centralized exchanges.
- **Smaller Impermanent Loss:** Solves the problem of high Impermanent Loss and users' weak willingness to add liquidity. Impermanent Loss is significantly reduced compared to Uniswap, which means more users are willing to add liquidity and makes it easier for projects to be top in their corresponding tracks and get higher TVL.
- **Higher trading profits:** Users who use the same amount of USDT can exchange more tokens and use the same tokens can exchange more USDT. Therefore users are more willing to choose.
- **More comprehensive projects:** EquitySwap can cover both the listing demands of new projects of different volumes and activate **dormant** mainstream projects or projects that have been added with liquidity in other DEXs.

## 5 Community Incentive

**EquitySwap Air** is a 3-in-1 DEX for new launch programs with a rate of 0.3%. The usage is as follows:

- 0.15% for rewarding liquidity providers;
- 0.05% for distributing labor income and equity income<sup>11</sup>;
- 0.10% of the profits, after deducting the daily operating costs of the Foundation, is fully allocated to the community.
  - For the first 24 months, 70% of the profit is used for dividends or repurchase, 20% is used for build team, and 10% is used for fund reserve;
  - After 24 months, 80% of the profit is used for dividends or repurchases, 20% goes to the fund reserve<sup>12</sup>;

## 6 License

EquitySwap follows the BSL protocol<sup>13</sup>

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<sup>11</sup>sharing the incentive revenue for use, more details [People's Equity, World's Equality](#)

<sup>12</sup>reserve funds for public welfare R&D or investment, if it is to be used needs to pass the community proposal

<sup>13</sup>[Protocol \(valid until 2026-06-20\)](#)