JLP fees proposal

I would like to propose completely **new fees model for JLP pool, based on regular adjustment of platform fees according to target utilization**.

Jupiter-perps projects is a "peer-to-pool" model for trading perpetual futures. It attracts liquidity by redistributing fees, which traders pay. The platform acts as counterparty between participants, holding a portion of fees. The main difference with traditional "funding fee" model is that trader always pays a comission on his open position, while funding fee sometimes can be negative and trader can get paid for holding position. We can distinguish **following roles of project participants**:

- Traders (users): they pay fees, they open position, without them the whole project is useless.
- Liquidity providers (investors): they have to put their money into the project before there are any users. They are attracted by fees and care about token volatility.
- New investors: they are not a participants yet, but we should not forget about them, because they are essential for project grow.

We can decide, which group is more important to the platform. For example, when there is need for AUM growth, this would mean that we want to incentivize new investors and current ones, while traders experience becomes less important (but they still must be treated well!). If the platform wants to keep AUM stable it can prioritize traders and existing investors over new ones. I can suggest some basic weight schemas:

Platform priorities	Traders	Investors	New investors
Growth	0.25	0.35	0.4
Maturity	0.45	0.35	0.2
User experience	0.6	0.25	0.15

This weights will be used for calculations of which action to do, see below. Again, exact values in priority schema are not very important and can be discussed. In future calculation I will assume, that we use "Maturity" priority schema.

This participants interact on JLP-perps platform, traders open positions, investors provide platform with liquidity. This **interactions are governed by following parameters**:

- Trading fee: how much trader pay for opening new position.
- Borrow fee: how much trader should pay for keeping position
- Mint fee: how much new investor should pay for adding liquidity in given asset.
- Burn fee: how much current investor should pay for withdrawing liquidity in given asset.
- Incoming Swap fee: how much fee is charged when someone want to bring more liquidity to this asset.

- Outgoing Swap fee: how much fee is charged when someone wants to remove liquidity for this asset.

A small note on trading fees. I believe, that for better user experience, the closing fee must always be zero, the trader already opened position and while he holds - he is paying borrow fees, thus disallowing him to close position is unethical. So we can not freely adjust closing trade fee, so best decision will be to set it to zero and adjust only open trade fee. When I am using "trading fee" I am assuming it is a fee charged when trader opens (increases) position.

Each fee is unique, so we need to carefully set max and min caps, to prevent edge cases, as well as to calculate minimal adjustment value. Values below are just a proposals and can be discussed and modified later.

Parameter	Minimal cap	Maximal cap	Adjustment step	Commentary
Trading fee	0.01%	0.5%	0.002%	Assiming that only opening positions trades are charged.
Borrow fee	0.0001%	0.05%	0.0001%	From 1% APR to 500% APR, per hour
Mint / Burn fees	0.01%	5%	0.01%	Based on historical market premiums
Both swap fees	0.01%	0.3%	0.01%	Based on popular swap pools fee size

Initial values can be set as current ones in the system. Adjustment steps are expecting adjustments to be made every hour.

> We can assume, that project participants are rational and well-informed. So they choose higher profit / lower fees when possible and they monitor alternatives and will move there, when platform offering is worse then competition.

We can describe interaction between participants as simple microeconomics supply demand model. Supply is the amount of asset available for traders, demand is the amount of positions the traders are willing to hold open. Resulting value is asset utilization, percentage of available liquidity borrowed by traders.

> We assume that all assets used by the pool (SOL, BTC, ETH, and USD) are independent. This means that the supply, demand, and utilization of one asset do not affect the parameters of another. Traders will not open more BTC positions just because SOL has lower fees.

Because of this, we can discuss only one asset, as all of them are independent and should have different fees, governed by same logic.

In the JLP-perps system, we have specific utilization targets. Our targets are based on the following reasons:

- Low utilization means that liquidity is underutilized, generating fewer fees. This results in inefficient capital use. The higher the utilization, the higher the returns for the platform and investors.
- Low utilization can increase the volatility of the JLP token price. While volatility itself is not necessarily a problem, a more stable price tends to attract more investors.
- Excessively high utilization (close to 100%) negatively impacts traders. If utilization is too high, traders may be unable to open positions, making it a situation we should avoid.

From a trader's perspective, if borrow fees do not depend on utilization, they do not care whether they open a position at 8% utilization or 98% utilization—what matters is that liquidity is always available for their orders. Thus, the **optimal utilization is the highest possible level that never becomes 100%** under any circumstances. In this document I will assume, that **optimal utilization is set to 80%**. Still, I believe, that it is worth discussing different targets for each asset. Maybe it should be 80% for non-stable coins and 50% for stables. This is up for future discussions and reasoning.

> We assume that the impact of fees on supply and demand is monotonic. This means that any fee reduction increases demand, while any fee increase reduces demand. We do not know the exact magnitude of this effect for a given fee change, but we are certain that it exists.

Demand and supply curves can be altered by comissions, but can not be fully controlled, as the major factor for willingness of traders to open and hold positions is market sentiment and funding rates on traditional platforms (competitiors). **It does not matter, what is your fee curve or how your borrowing or trading fee is. It is about whether it is within the market range or not**. At the moment, market offers negative-zero funding rates for SOL/BTC/ETH. Because of this any smart trader will open position on traditional exchange, not jupiter, because the difference in fees is too high. If fees are about the same - then trader could get attracted by decentralized nature or convenient interface or ability to make large instant trades or anything else, what makes jup-perps great product. But when the difference is high, traders will go where it is cheaper (or more profitable) for them.

So to keep utilization within desired range the borrow and trade fees should be within the market. And market is always different. During bullruns 50% apr is very cheap, when market is down even 5% apr may be too much. What was “low” two months ago and lead to highest utilization, where traders benefited from platform by paying lower fees, than market demands, might be “high” tomorrow and lead to low utilization when no one is interested in opening positions, because it is too expensive. So to set correct fee value you have the only option: to actively react to market conditions, by adjusting fees.

In case utilization is lower then necessary, we can make it higher by stimulating demand and limiting supply. Here is a list of actions, we can do to stimulate demand (moving its curve up) and limit supply (move its curve down):

Stimulating demand (amount of open positions):

1. Decrease borrow fee: holding position becomes less expensive and more traders will want to keep them open.

2. Decrease trading fee: stimulate traders to open new positions.

Lowering supply (amount of liquidity on platform):

1. Increase mint fee: prevents new investors from adding their funds to platform.
2. Decrease burn fee: helps existing investors to withdraw excessive funds from platform.
3. Increase incoming swap fee: prevents more liquidity to be swapped into this asset.
4. Decrease outgoing swap fee: helps liquidity from this asset to be swapped to something else.

Each action has unknown impact on the supply/demand curves (because it depends on market conditions and competitors offers, which constantly change). But we can understand, how each role likes (or dislikes) every action. Let's try to set numbers for every action and every role, where 0 is worst possible, 10 is best possible and 5 is neutral attitude. Again, I will write down numbers only for stimulating utilization, lowering it is the same, but from the opposite side (for example instead of 1 there will be 9, instead of 4 there will be 6). I will not explain, why I have chosen this or that weight, they can be always discussed and changed later. After setting the weights to each action, we can use platform priorities to calculate impact of every action on platform interest. I will use "Maturity" priority for this example, so decrease borrow fee impact will be calculated as 9 x 0.45 + 0 x 0.35 + 2 x 0.2 = 4.45. If we choose "Growth" priprity this will be 9 x 0.25 + 0 x 0.35 + 2 x 0.4 = 2.6, much lower, because when we are talking about growth, we care less about traders, who benefit most from decreasing borrow fee.

Action	Traders	Investors	New Investors	Priority weighted impact	Short commentary
Decrease borrow fee	9	0	2	4.45	Traders like this, investors don't, new investors also prefer high fees.
Decrease trading fee	10	1	3	5.45	Traders like this, Investors do not, but not that much, as lots of trading might be more profitable in the end.
Increase mint fee	5	10	0	5.75	New investors has to pay more, traders don't care, current investors are very happy, that pool is not dilluted
Decrease burn fee	5	10	5	6.75	Traders and new investors does not care, current investors are happy, that they have an option to withdraw liquidity cheap.
Increase incoming swap fee	5	7	6	5.9	Traders don't care, Investors are happy, free money with increased fees.

Action	Traders	Investors	New Investors	Priority weighted impact	Short commentary
Decrease outgoing swap fee	5	3	4	4.1	Traders don't care, investors are a bit unhappy, but this is not very important source of their profits.

We can see, that "best" action to take to increase utilization is to decrease burn fee and the "worst" is to decrease outgoing swap fee. Again, this is very important to understand: **there is no way to estimate, how much this or that action will affect utilization**, so we won't even try to do this. Instead we will do what is the best to platform priorities, which we can understand and calculate.

But as long as impact of every action is uncalculable, we want to do all of them. But some actions are more usefull to the platform priorities, then others and this impact is kind of fixed (unless priorities changed and new weights are used). Still, we can not always decrease burn fee every time we want to reduce utilization. We will hit the hard cap and this will be it. The most simple approach is to do randomly weighted action, so we will decrease burn fee roughly 65% more frequently, then decrease outgoing swap fees (so burn fees should be decreased in 6.75 / (4.45 + 5.45 + 5.75 + 6.75 + 5.9 + 4.1) = 20.8% of actions, while outgoing swap fees should decrease in 4.1 / (4.45 + 5.45 + 5.75 + 6.75 + 5.9 + 4.1) = 12.6%) . The addition of random (pseudo-random will do as well) adjustment will make the fee model more unpredictable to possible exploits, as well as **help to balance the actions according to priorities**.

Now we know, which actions and how frequently we want to take, but it is important, how far we are from the optimal utilization value. It is good idea to use multipliers, depending on where is the current utilization. Here are proposed values of multipliers to be applied to adjustments values, depending on this. They are calculated for 80% utilization, by splitting whole range above and below it into equal parts.

Name	Utilization range	Multipliers
Critical low	0% - 16%	8
Very low	16.01% - 32%	4
Low	32.01% - 48%	2
Little low	48.01% - 64%	1
Optimal low	64.01% - 80%	0
TARGET utilization	80%	
Optimal high	80.01% - 84%	0
Little high	84.01% - 88%	1
High	88.01% - 92%	2
Very high	92.01% - 96%	4

Name	Utilization range	Multipliers
Critical high	96.01% - 100%	8

The last important question is how frequently adjust fees. In this document I assume, that this is done every hour. In case it is decided, that adjustments should be made less frequently, multipliers or adjustment steps should be changed accordingly.

Now we are ready to work! Below is the algorithm, which should be run every hour against every asset in the pool. I will use current values for SOL.

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1. Retrieve current utilization rate = 30%, this is lower then target.
2. Choose randomly weighted action from list of actions to increase utilization
(decrease borrow fee, decrease trading fee etc.) = "Decrease borrow fee" for
example
3. Retrieve current value for this parameter, current borrow fee = 0.0033%
4. Calculate adjustment multiplier for given utilization rate = 4
5. Calculate new value of parameter "borrow fee": 0.0033% - 4 x 0.0001% = 0.0027%
6. Check that new value is within max/min caps, otherwise set it to cap.
7. Save new value and start using it for calculations.
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Simple as that. No curves, no assumptions, no backtesting. Small incremental changes allow to quickly (or slowly, depending on the settings) react to market conditions, traders sentiment and investors demand. In the end utilization of assets will be as close to target, as possible under current market conditions.