Exploring Price Accuracy on Uniswap V3 in Times of Distress

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Decentralized exchanges (DEXes)
Constant product market makers (CPMMs)
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marginal price: $S = \frac{y}{x}$
Constant product market makers (CPMMs)

- Marginal price: $S = \frac{y}{x}$
- Trading along price curve
Concentrated liquidity CPMMs
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real reserves support trading up to price boundaries
Concentrated liquidity CPMMs

- Real reserves support trading up to price boundaries.
- Virtual reserves used to simulate CPMM.
Price movement

![Diagram showing the distribution of price movement with a peak at $S_0$.](image)
Price movement

![Graph showing price movement with liquidity on the y-axis and price on the x-axis. The graph has a peak at $S_0$.](image-url)
Price movement
Stable pairs

both tokens traded in the pool are stable coins
Stable pairs

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Stable pairs

both tokens traded in the pool are stable coins
UST price
Price accuracy

UST-USDC ($f = 0.01\%$)

UST-USDT ($f = 0.05\%$)
USDT price
Price accuracy

USDT-USDC \( (f = 0.01\%) \)

USDT-USDC \( (f = 0.05\%) \)
Liquidity distribution

UST-USDC ($f = 0.01\%$)

UST-USDT ($f = 0.05\%$)
Liquidity distribution

USDT-USDC ($f = 0.01\%$)

USDT-USDC ($f = 0.05\%$)
UST-USDC ($f = 0.01\%$)

UST-USDT ($f = 0.05\%$)
Liquidity positions

![Graph showing liquidity positions]

- UST-USDT (0.05%)
- UST-USDC (0.05%)
- UST-USDC (0.01%)
Liquidity positions

most liquidity providers remained in pools as liquidity became worthless
Summary

Uniswap V3 cannot be used as a TWAP oracle
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Uniswap V3 cannot be used as a TWAP oracle

check liquidity around current Uniswap V3 price
Uniswap V3 cannot be used as a TWAP oracle

check liquidity around current Uniswap V3 price

do not utilize Uniswap V3 as a TWAP oracle
Summary

liquidity providers lack sophistication and agility for complex market making
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raise awareness amongst liquidity providers
Summary

- Liquidity providers lack sophistication and agility for complex market making
- Raise awareness amongst liquidity providers
- Let the protocol move the liquidity instead of the liquidity providers
Summary

unfavorable risk-reward ratio for liquidity providers to deposit liquidity around new price during market distress
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compensate liquidity providers for taking on this risk, i.e., adopt a fee structure that would increase with volatility
Thank You!

Questions & Comments?

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