

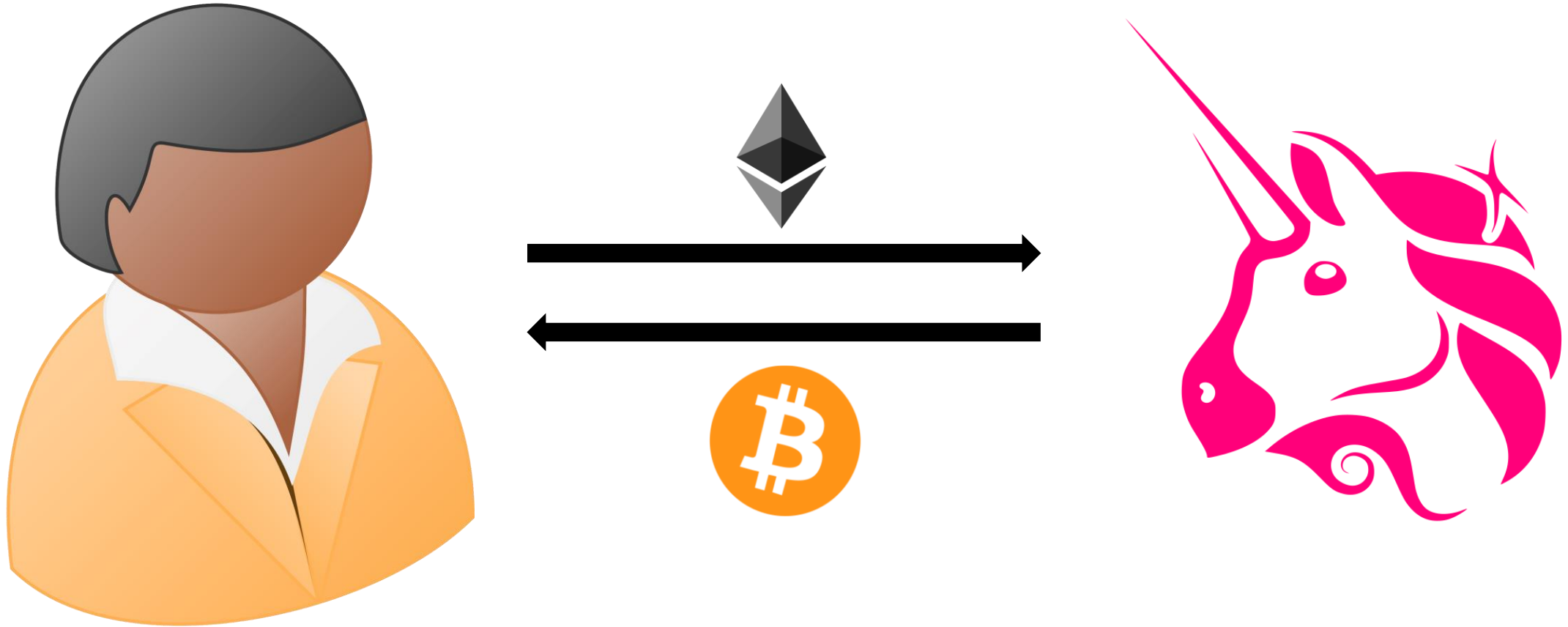
Exploring Price Accuracy on Uniswap V3 in Times of Distress



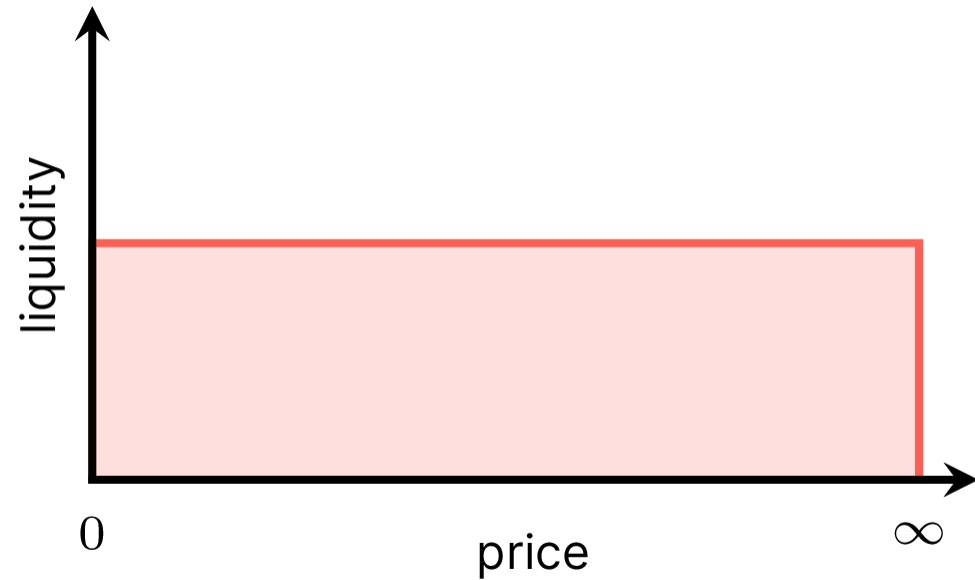
ACM DeFi 2022

Lioba Heimbach, Eric Schertenleib, Roger Wattenhofer
ETH Zurich – Distributed Computing – www.disco.ethz.ch

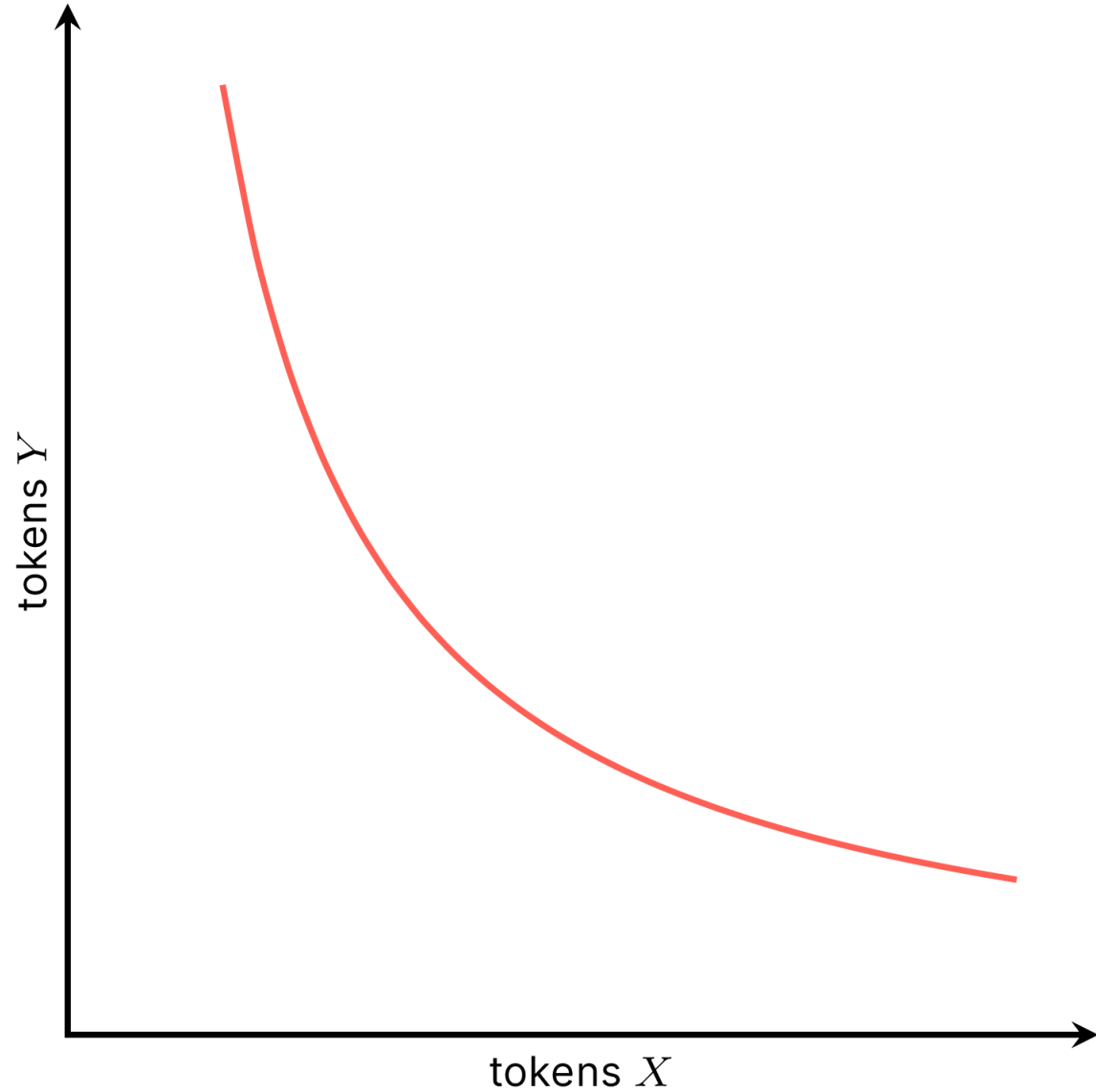
Decentralized exchanges (DEXes)



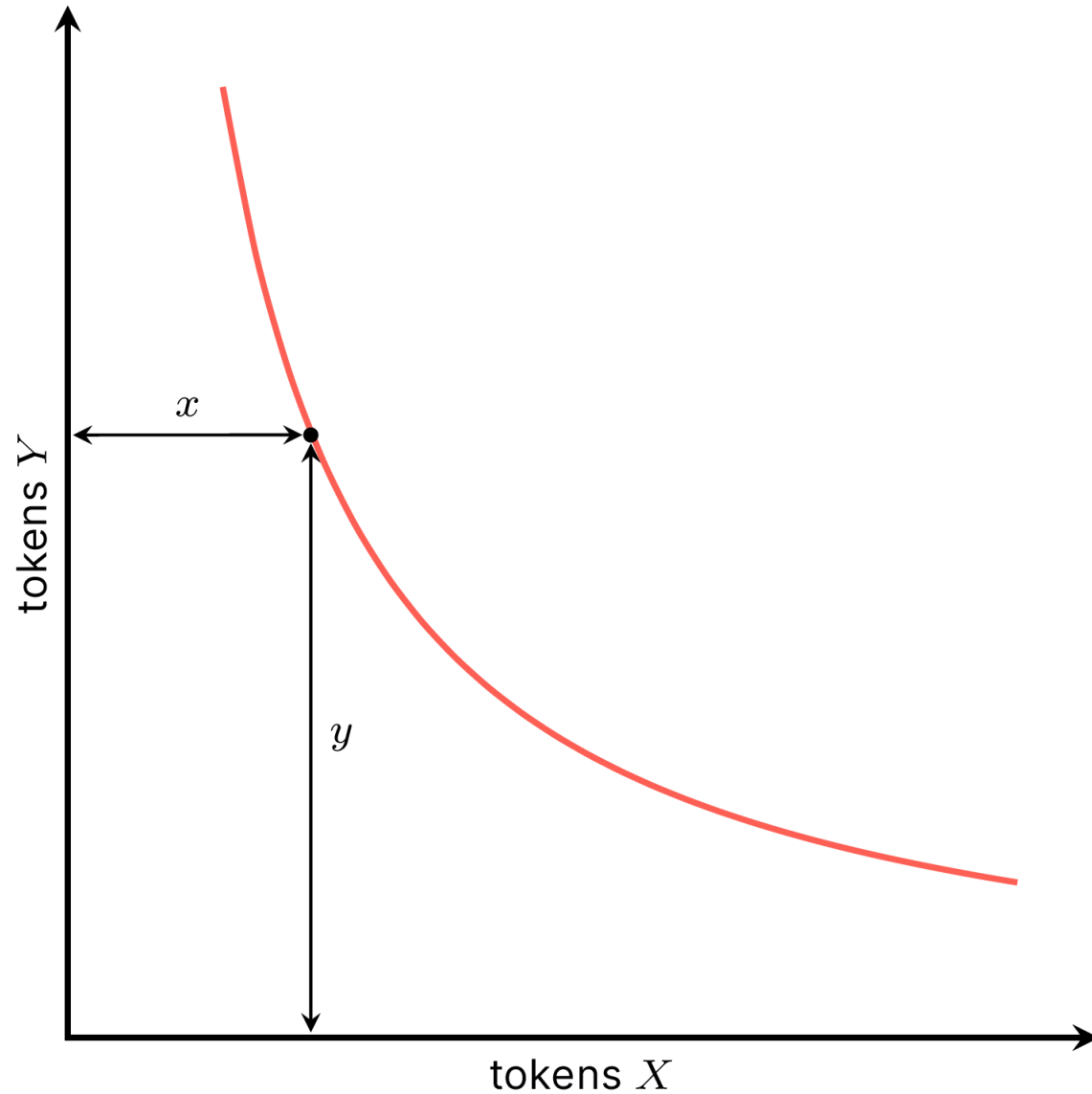
Constant product market makers (CPMMs)



Constant product market makers (CPMMs)

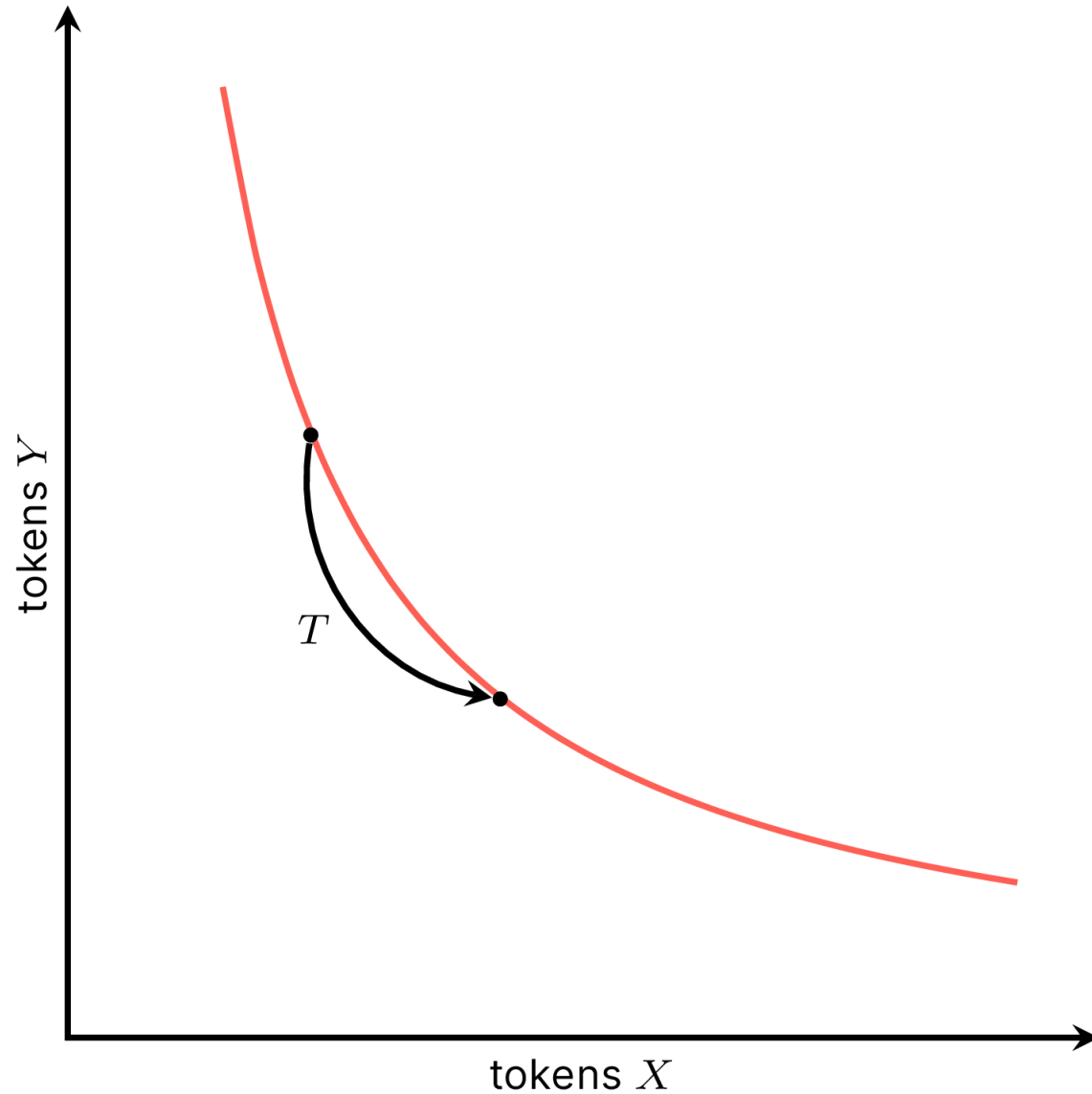


Constant product market makers (CPMMs)



marginal price: $S = y/x$

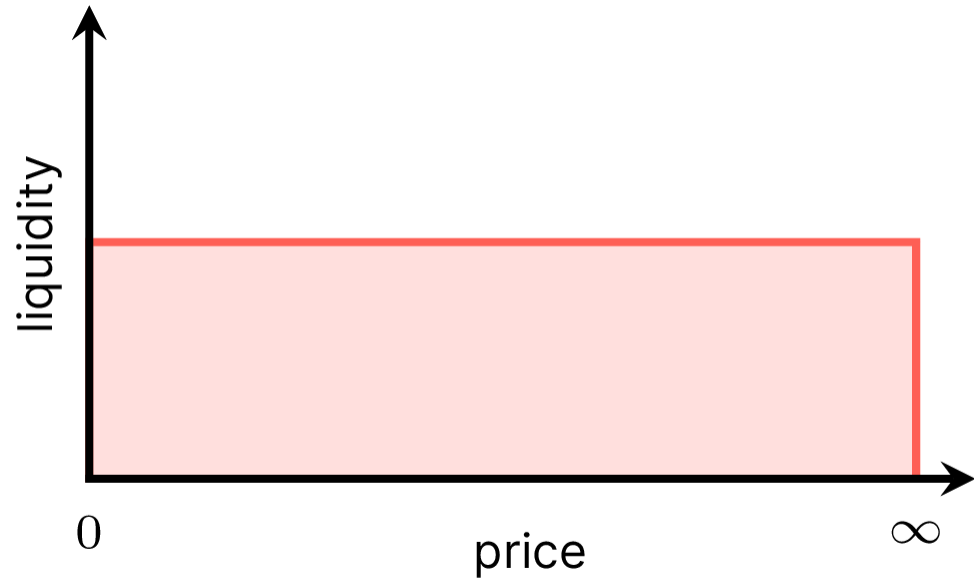
Constant product market makers (CPMMs)



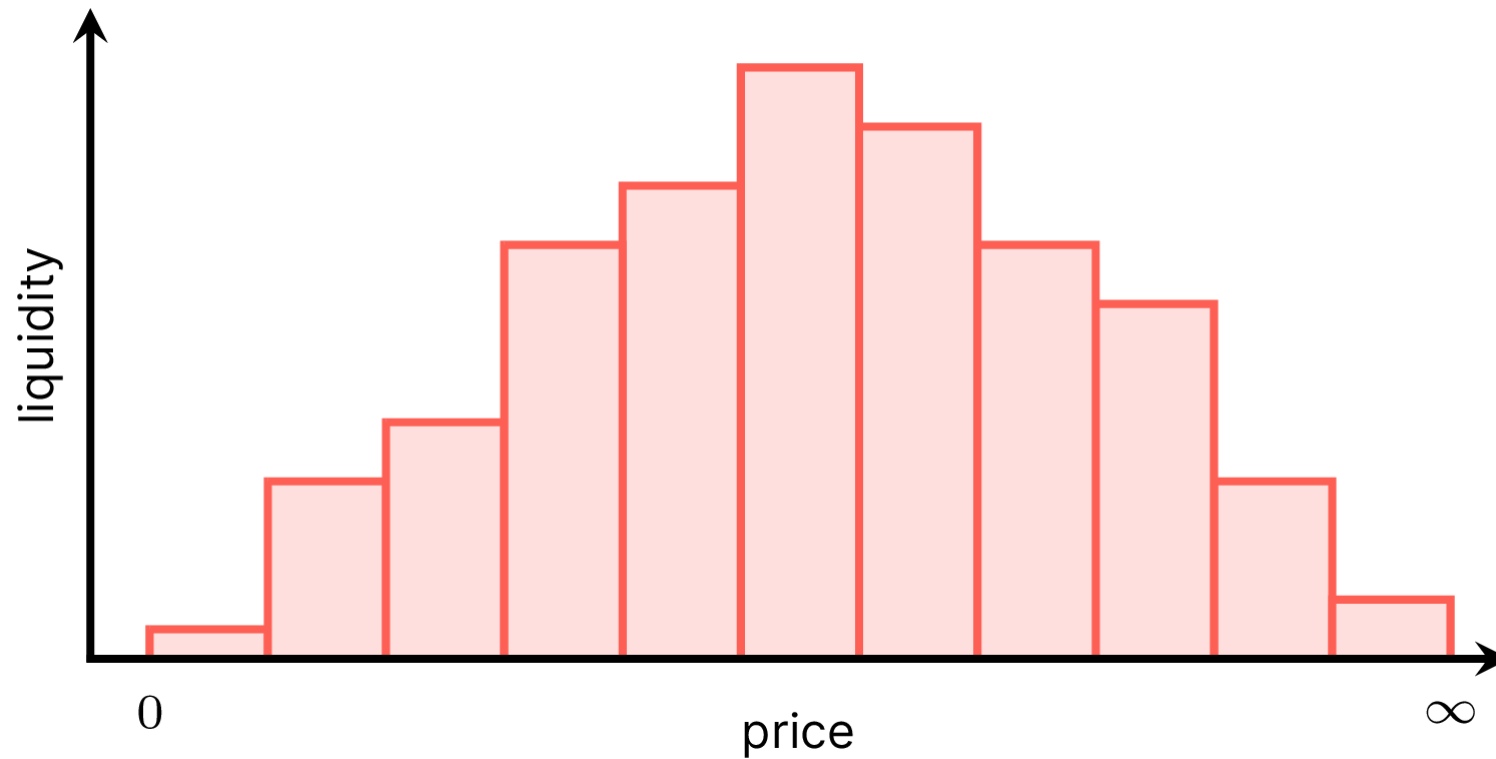
marginal price: $S = y/x$

trading along price curve

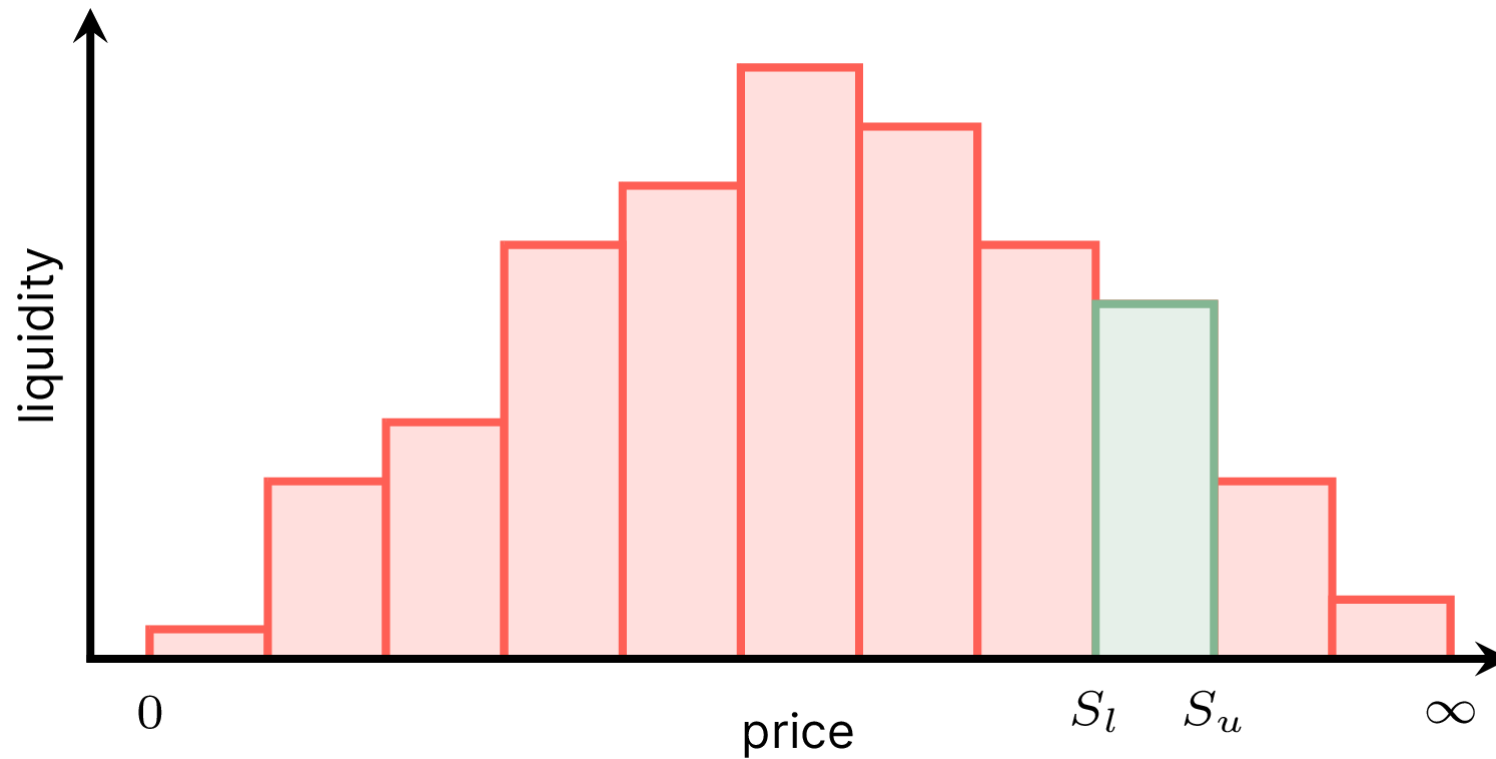
Concentrated liquidity CPMs



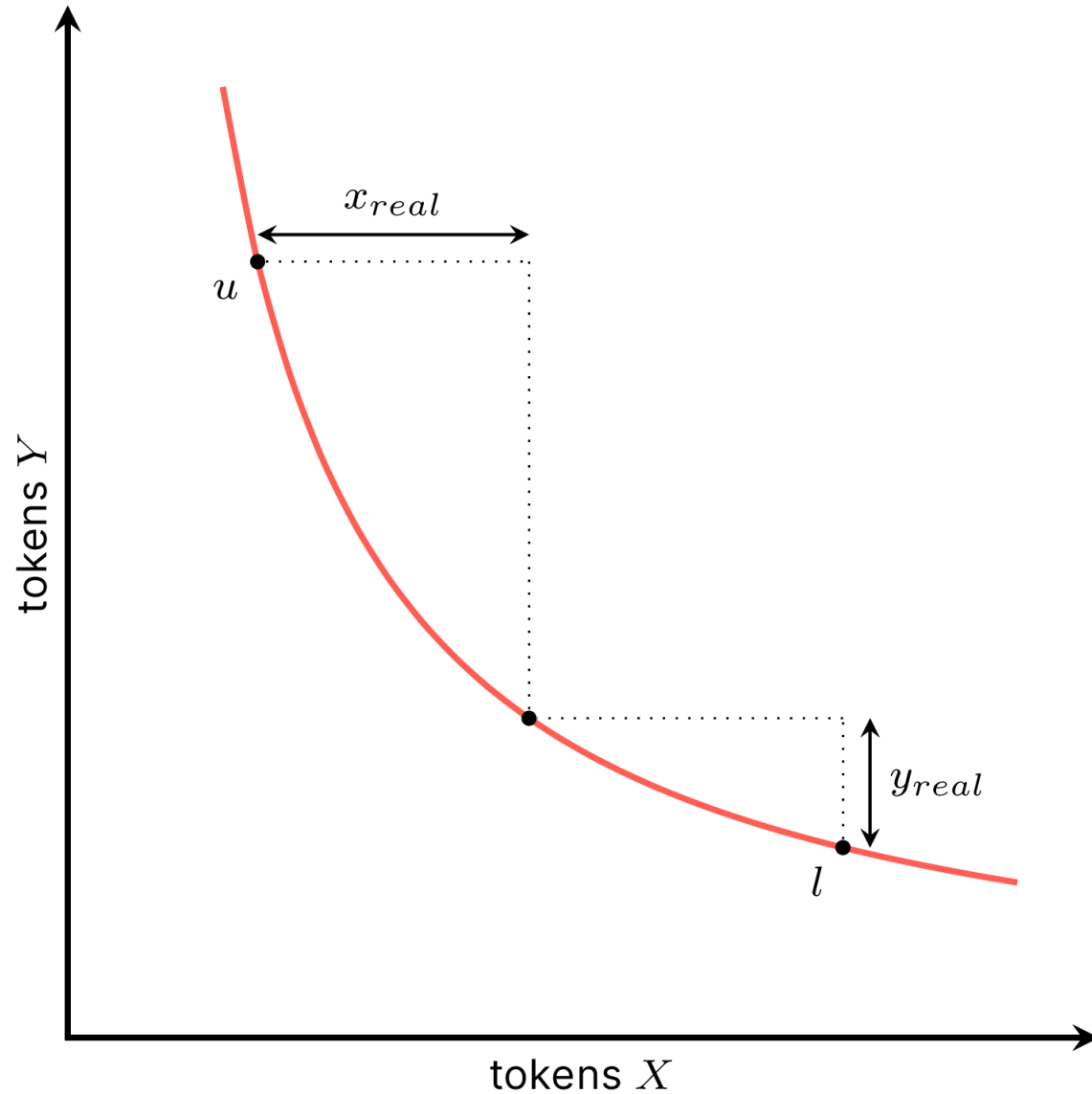
Concentrated liquidity CPMMs



Concentrated liquidity CPMs

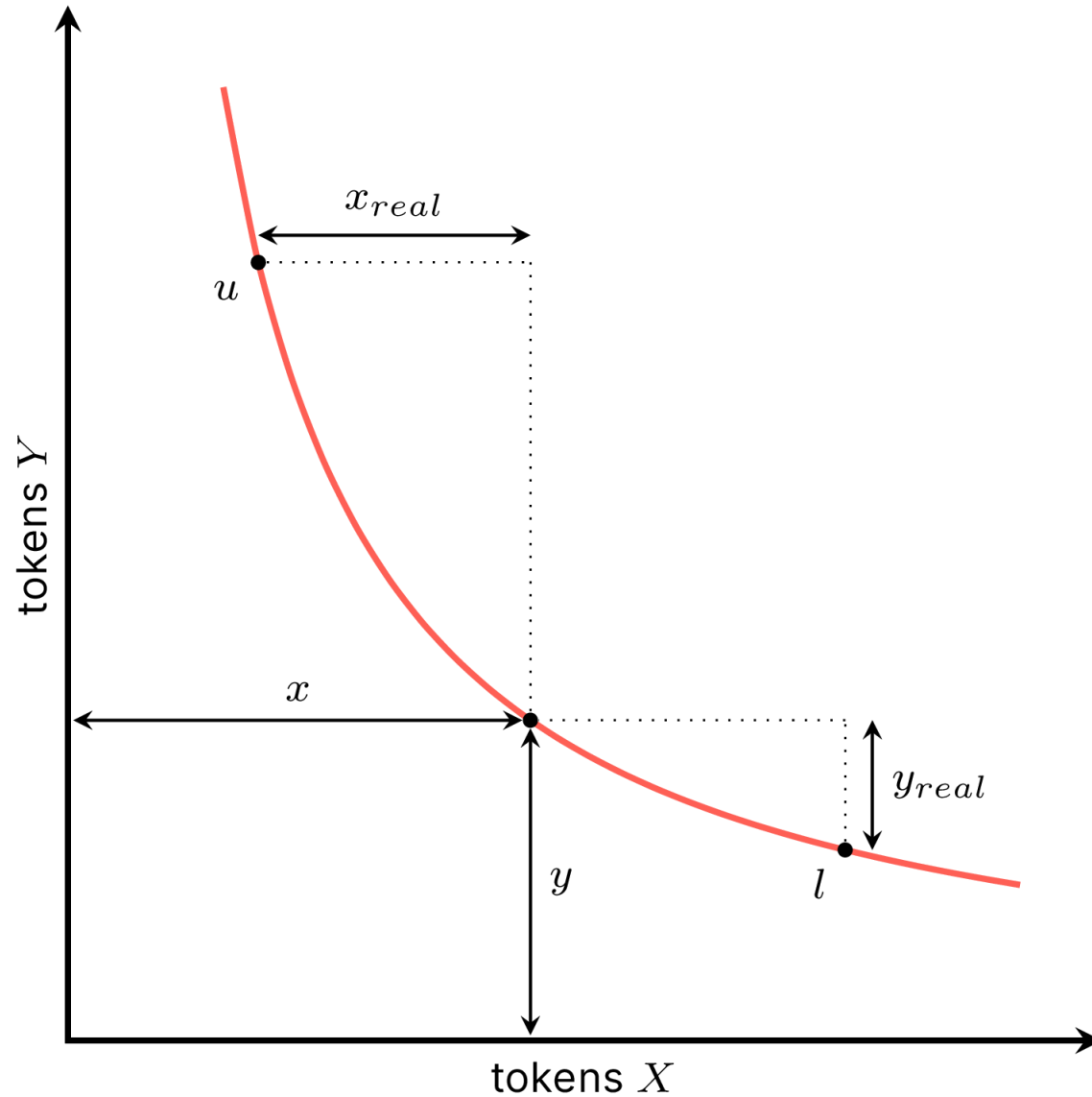


Concentrated liquidity CPMMs



real reserves support trading
up to price boundaries

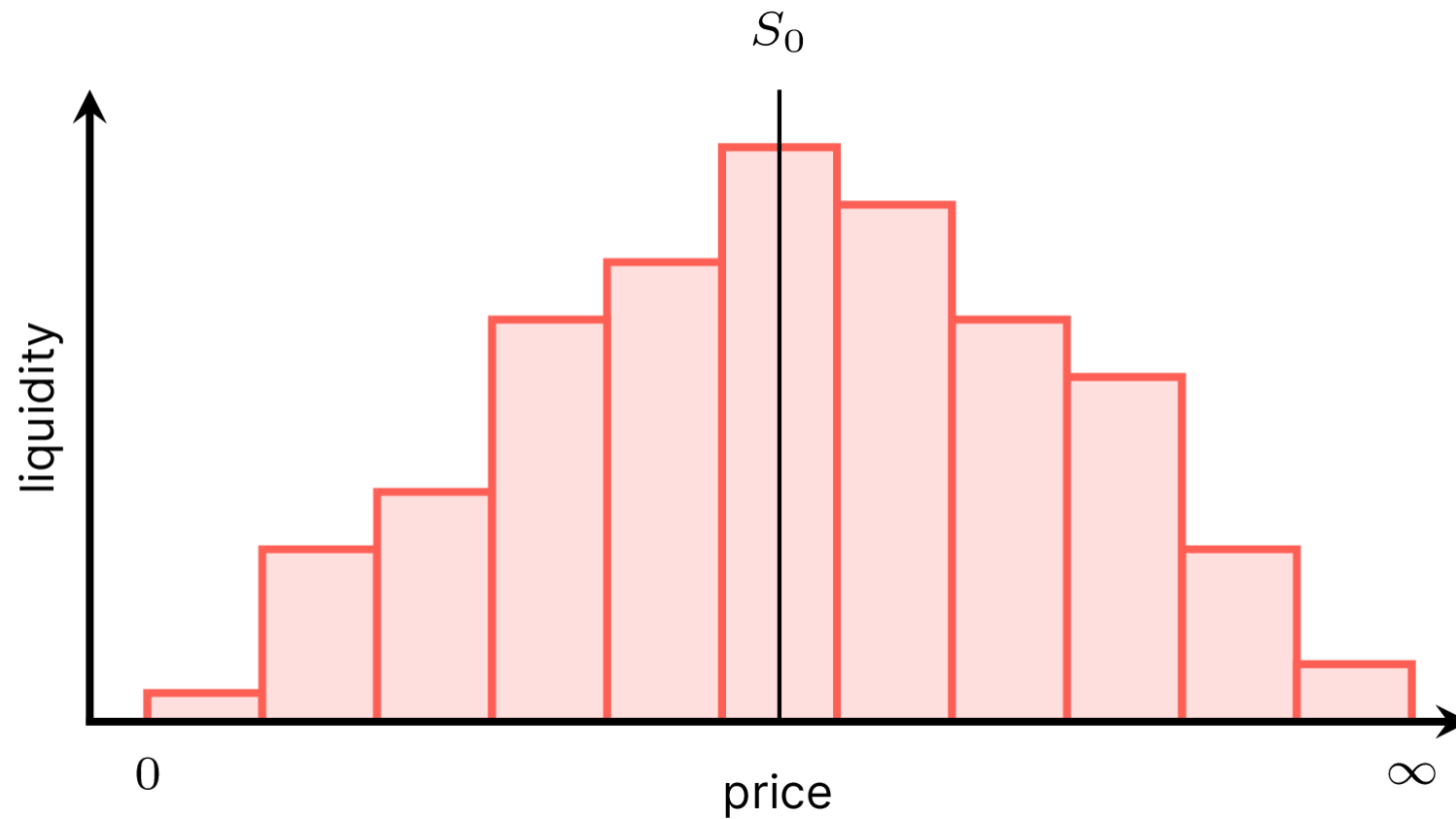
Concentrated liquidity CPMMs



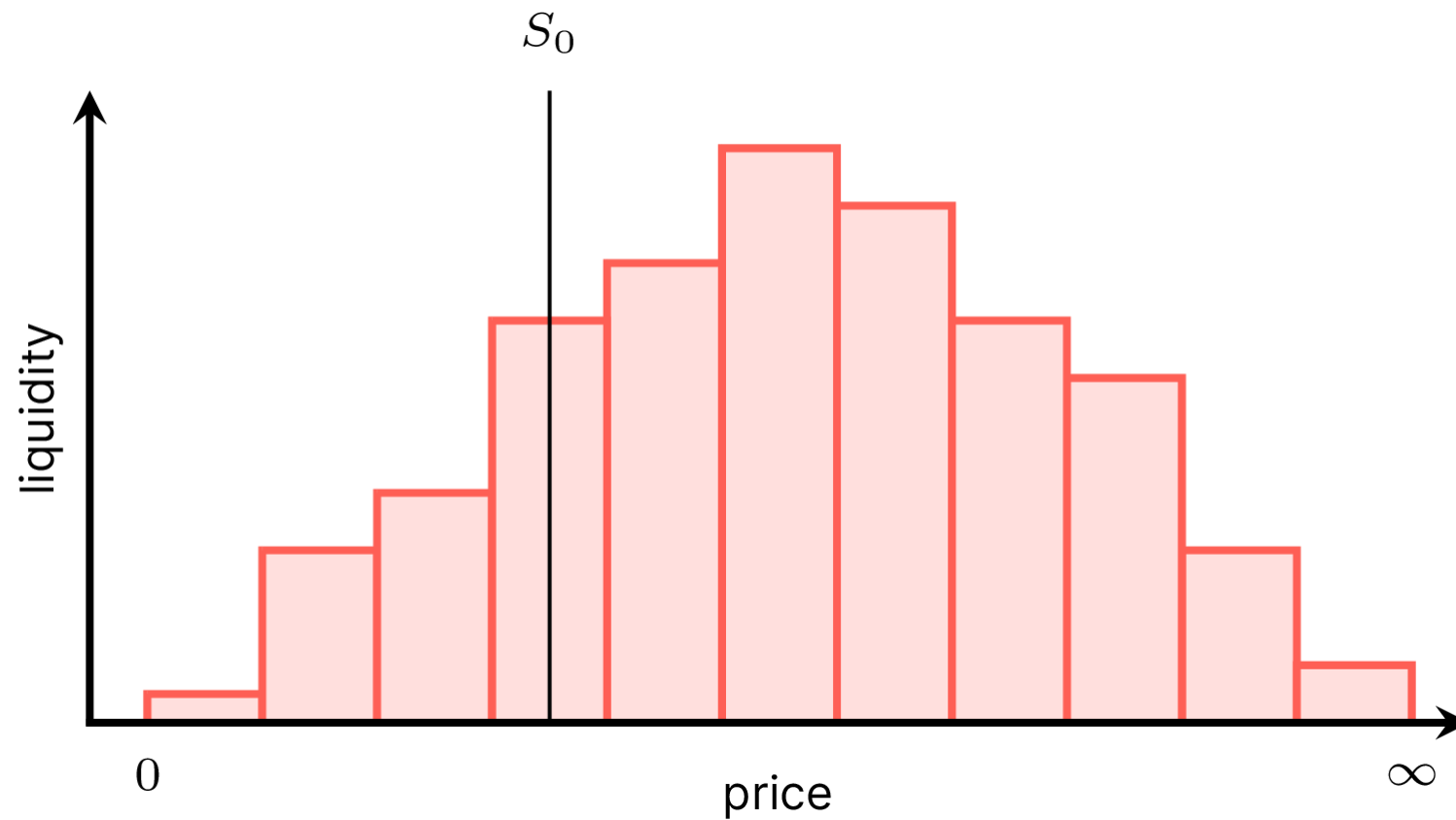
real reserves support trading
up to price boundaries

virtual reserves used
to simulate CPMM

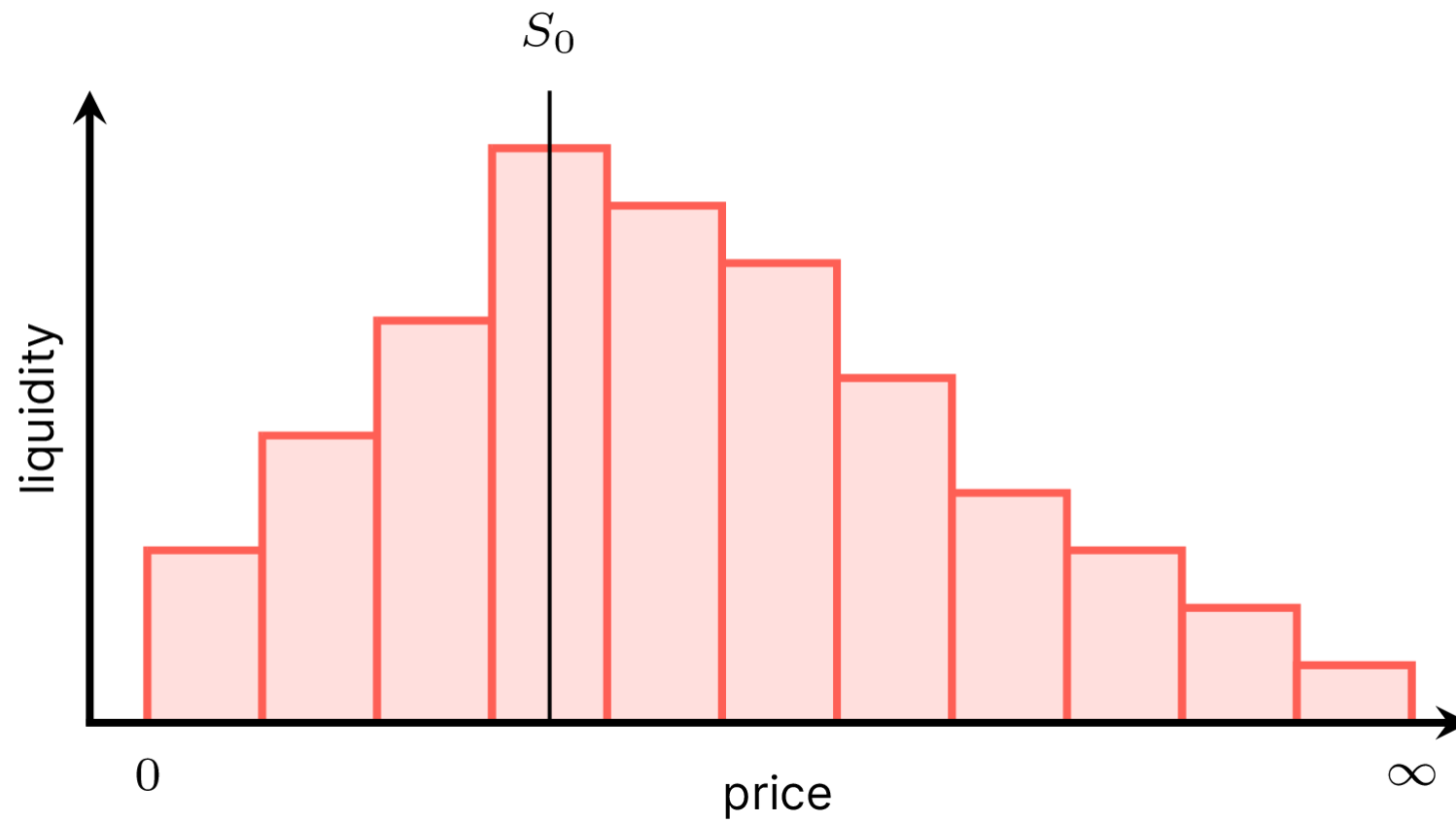
Price movement



Price movement



Price movement

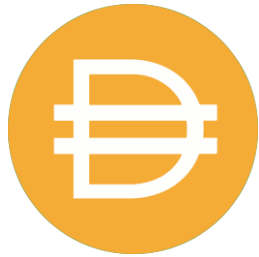


Stable pairs

both tokens traded in the
pool are stable coins

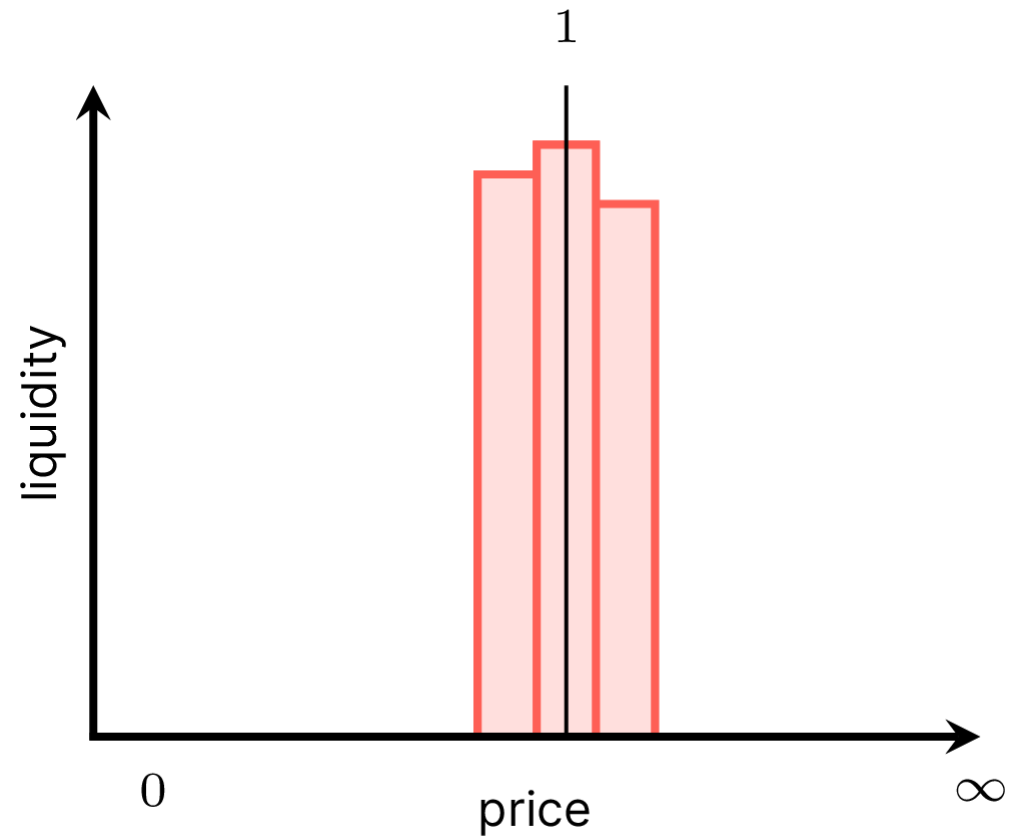
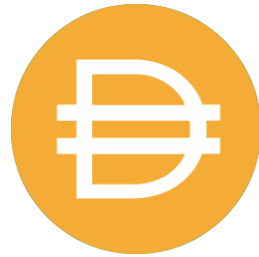
Stable pairs

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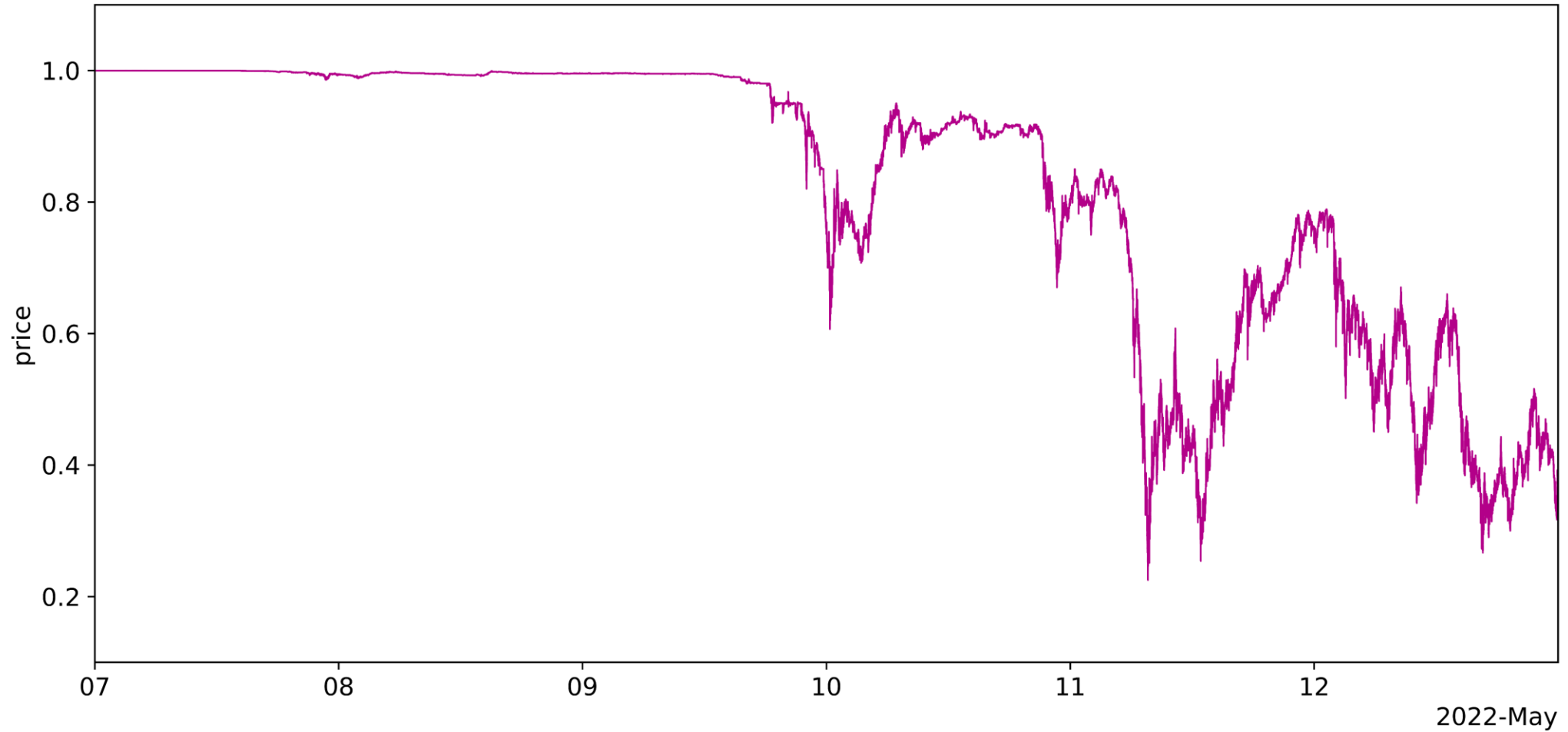


Stable pairs

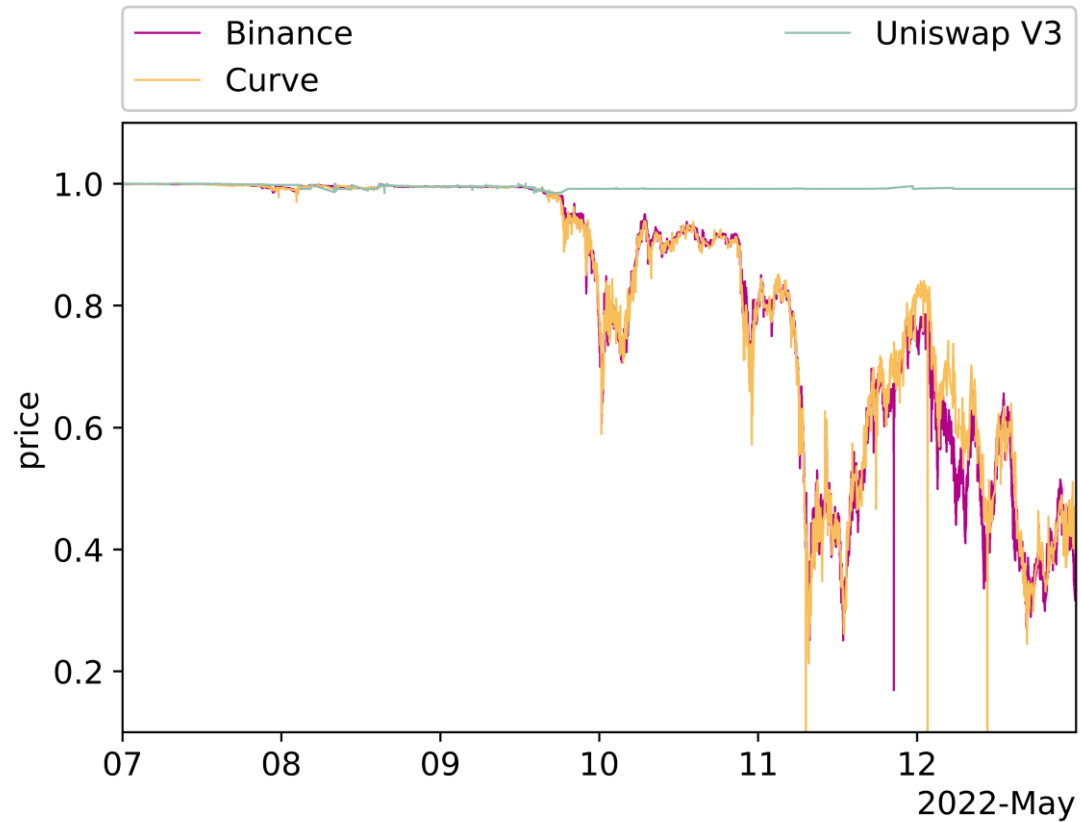
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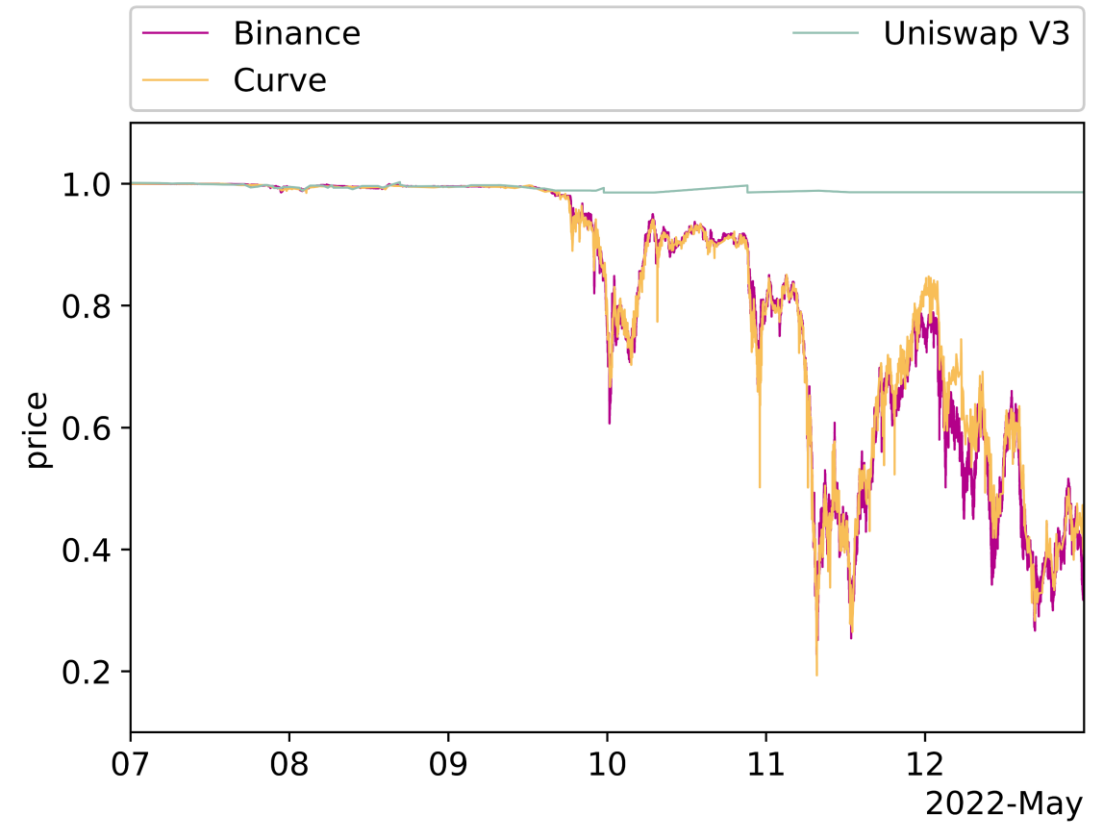
UST price



Price accuracy

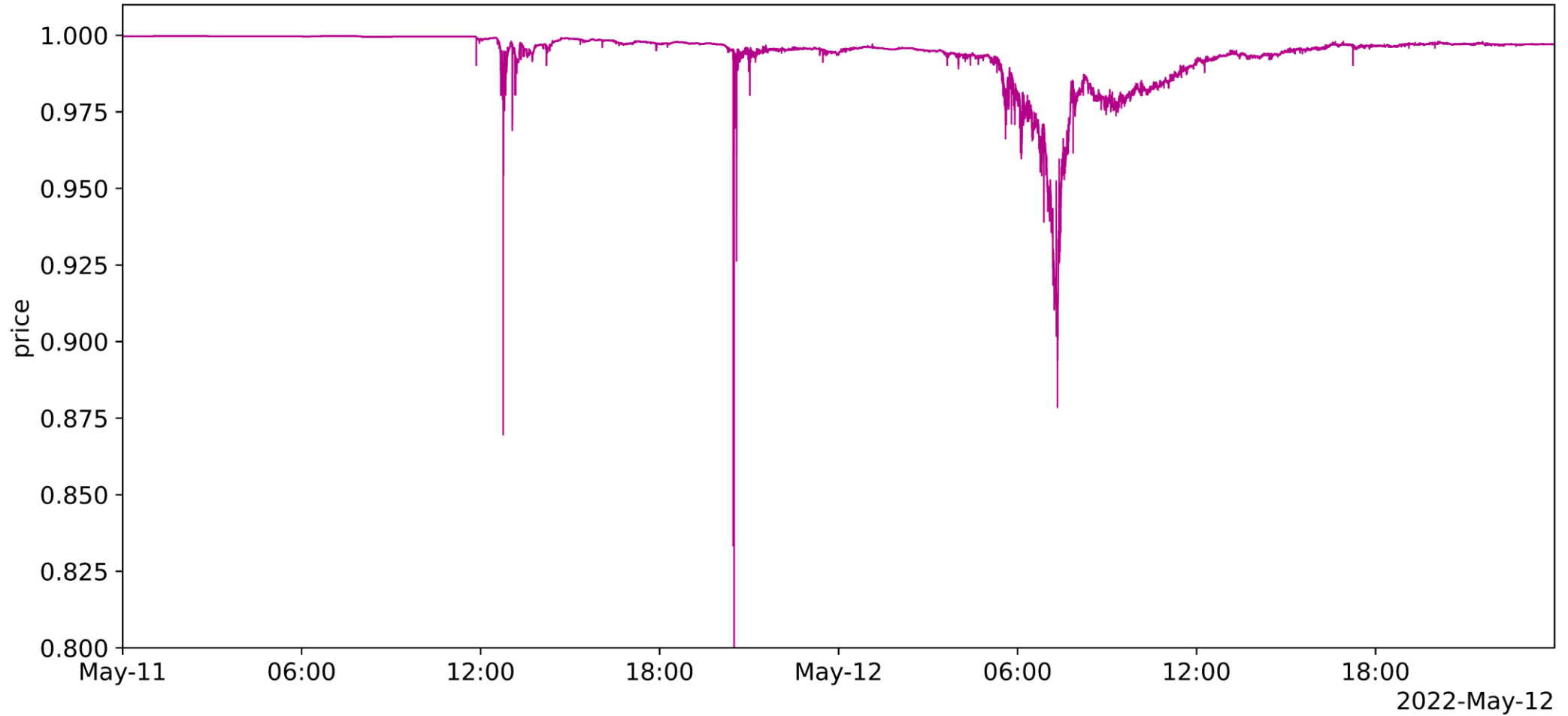


UST-USDC ($f = 0.01\%$)

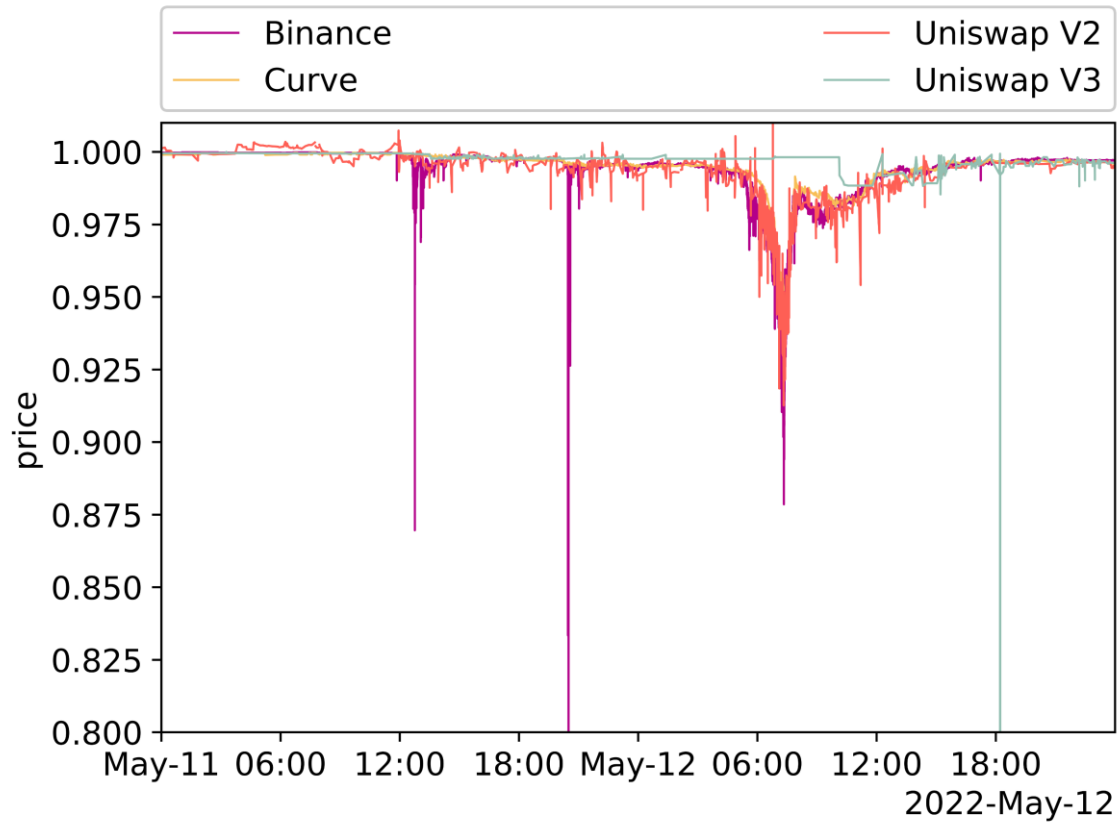


UST-USDT ($f = 0.05\%$)

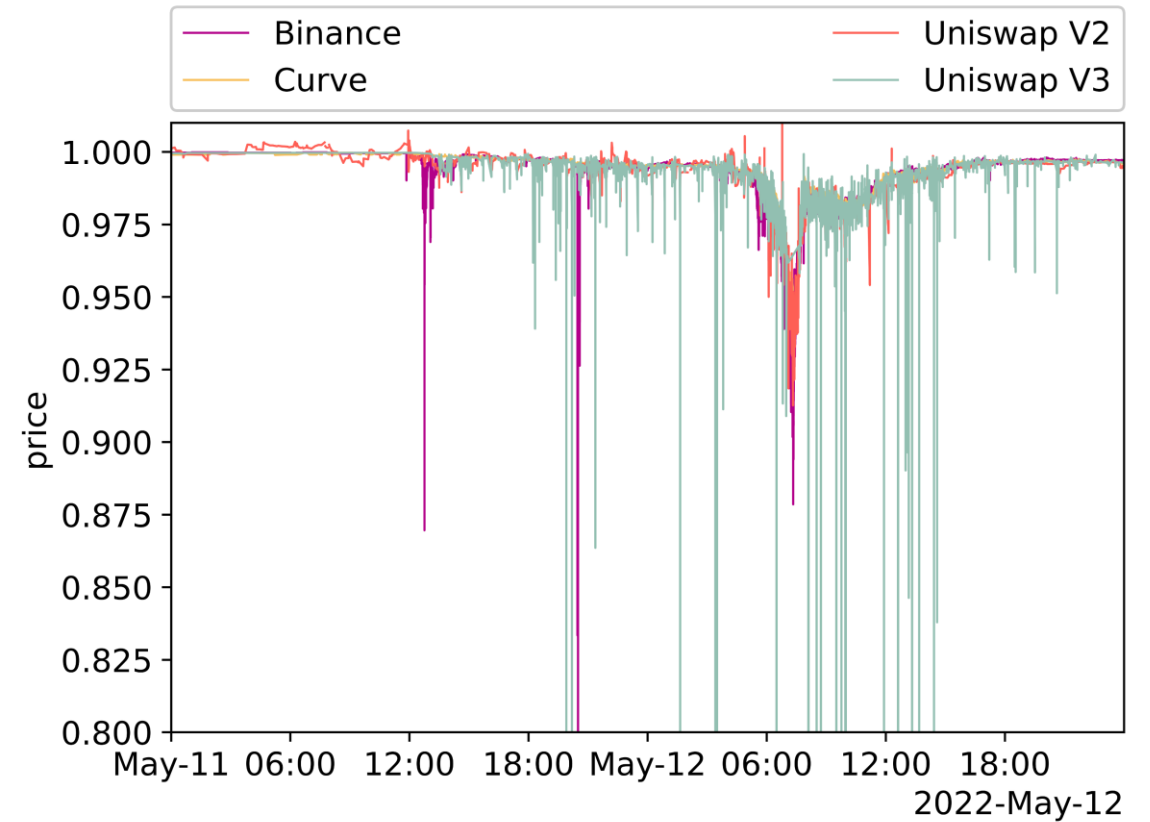
USDT price



Price accuracy

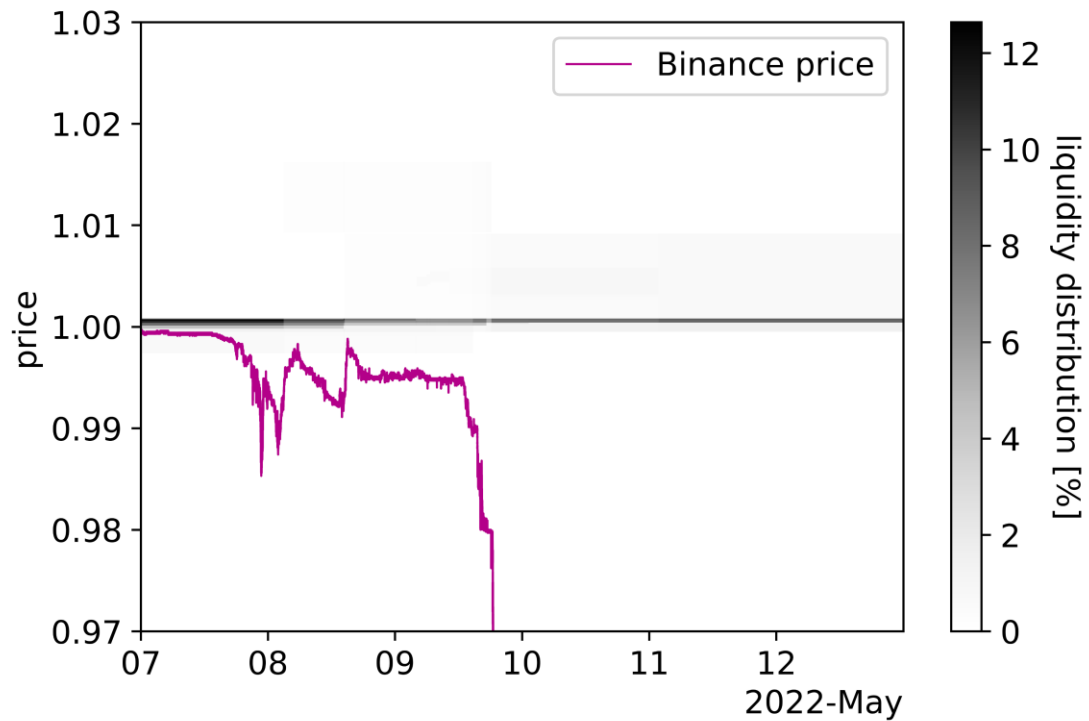


USDT-USDC ($f = 0.01\%$)

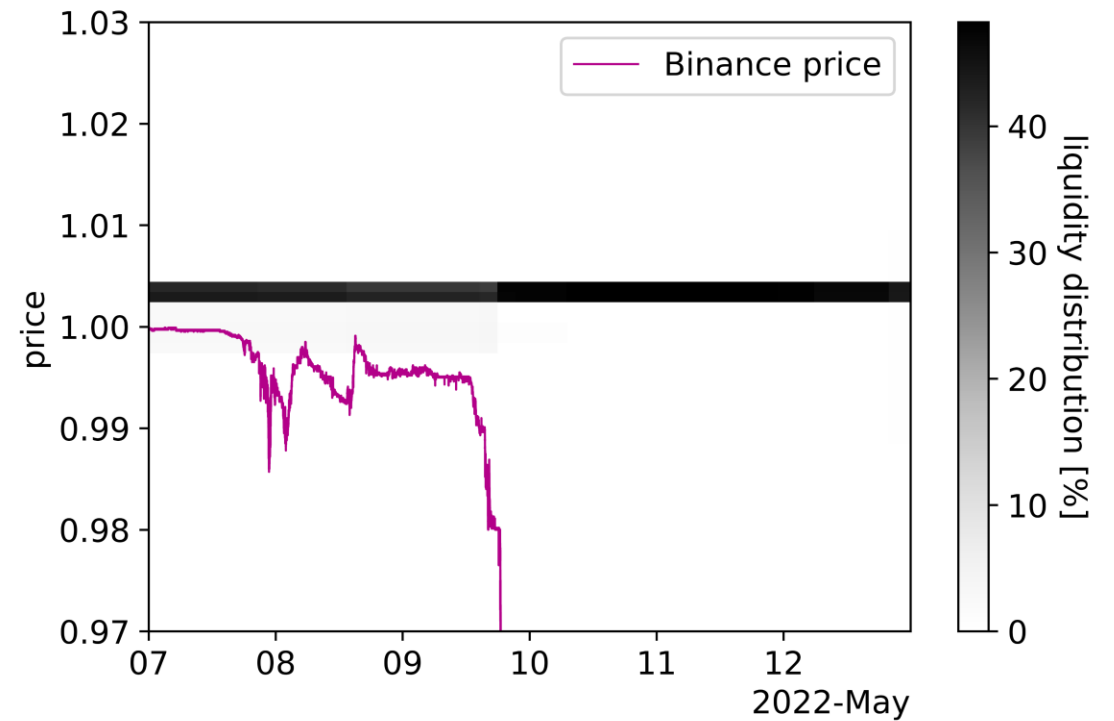


USDT-USDC ($f = 0.05\%$)

Liquidity distribution

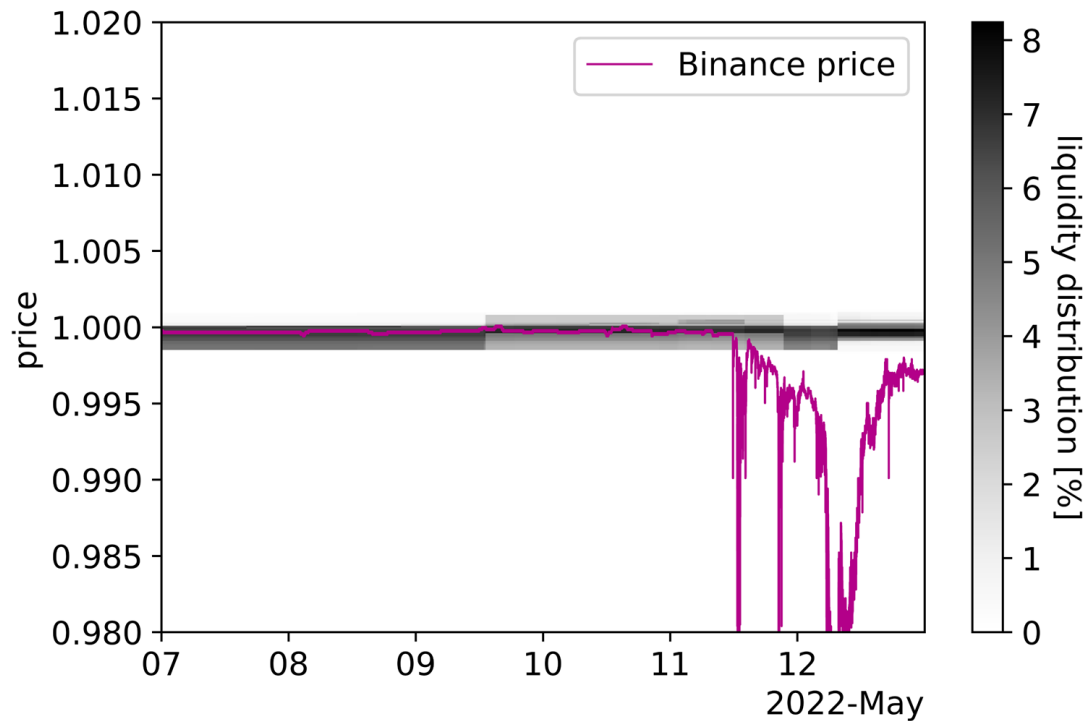


UST-USDC ($f = 0.01\%$)

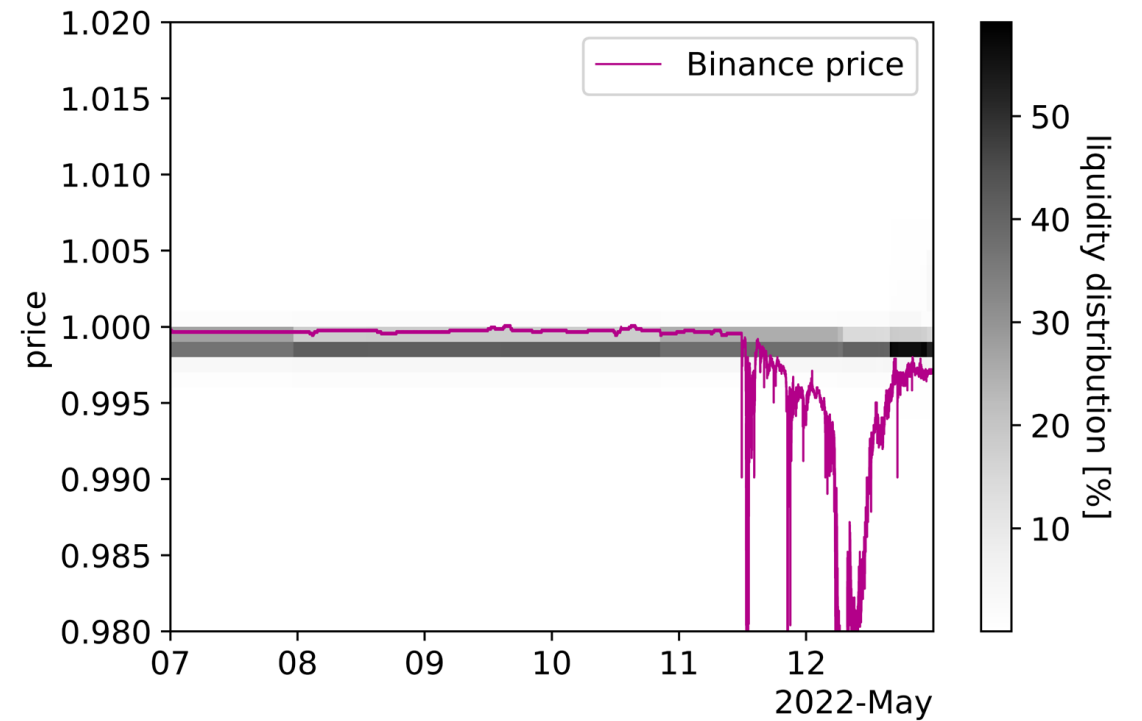


UST-USDT ($f = 0.05\%$)

Liquidity distribution

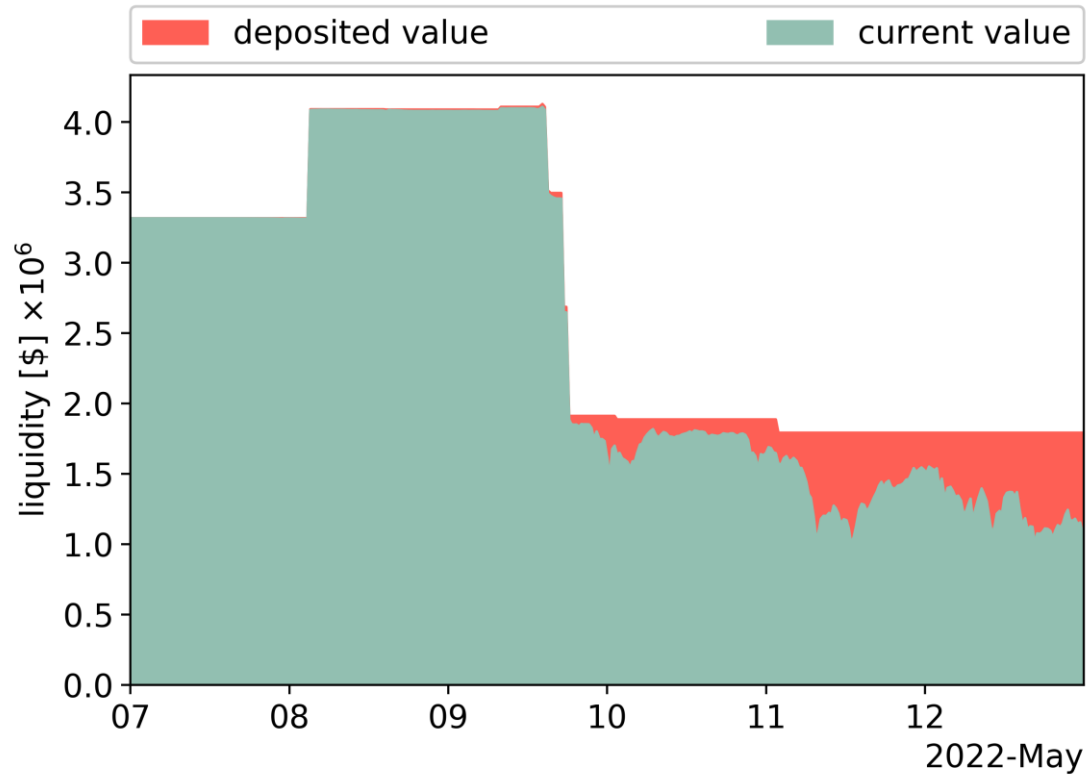


USDT-USDC ($f = 0.01\%$)

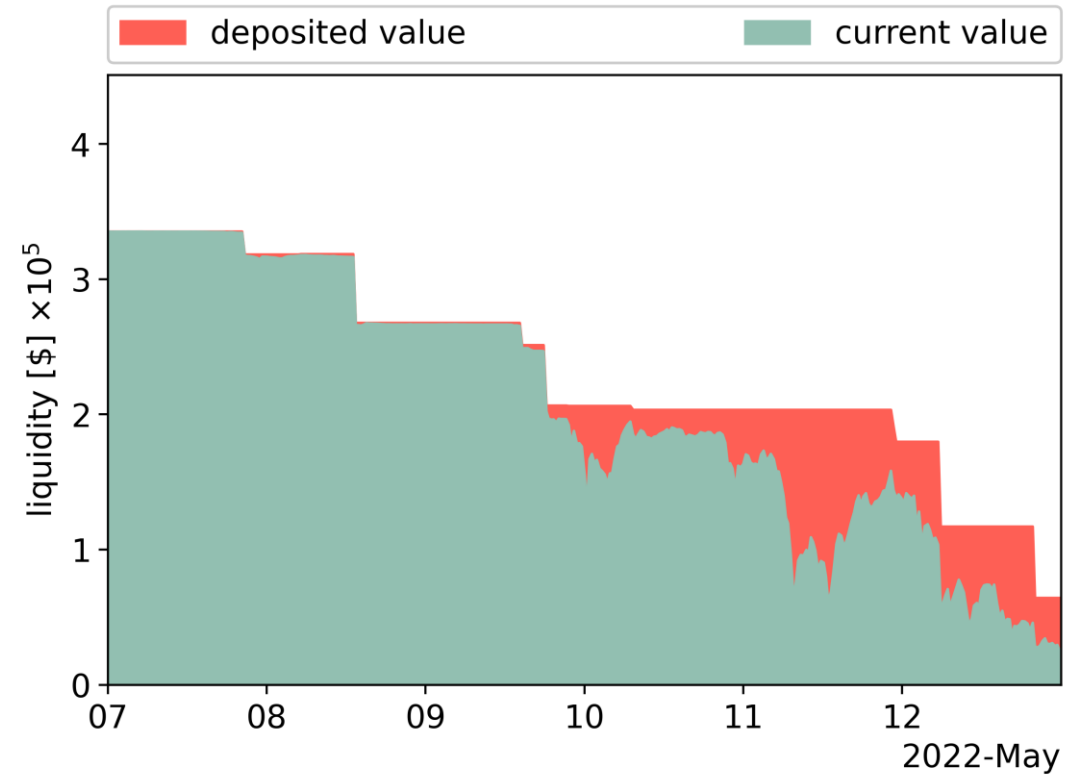


USDT-USDC ($f = 0.05\%$)

Liquidity value

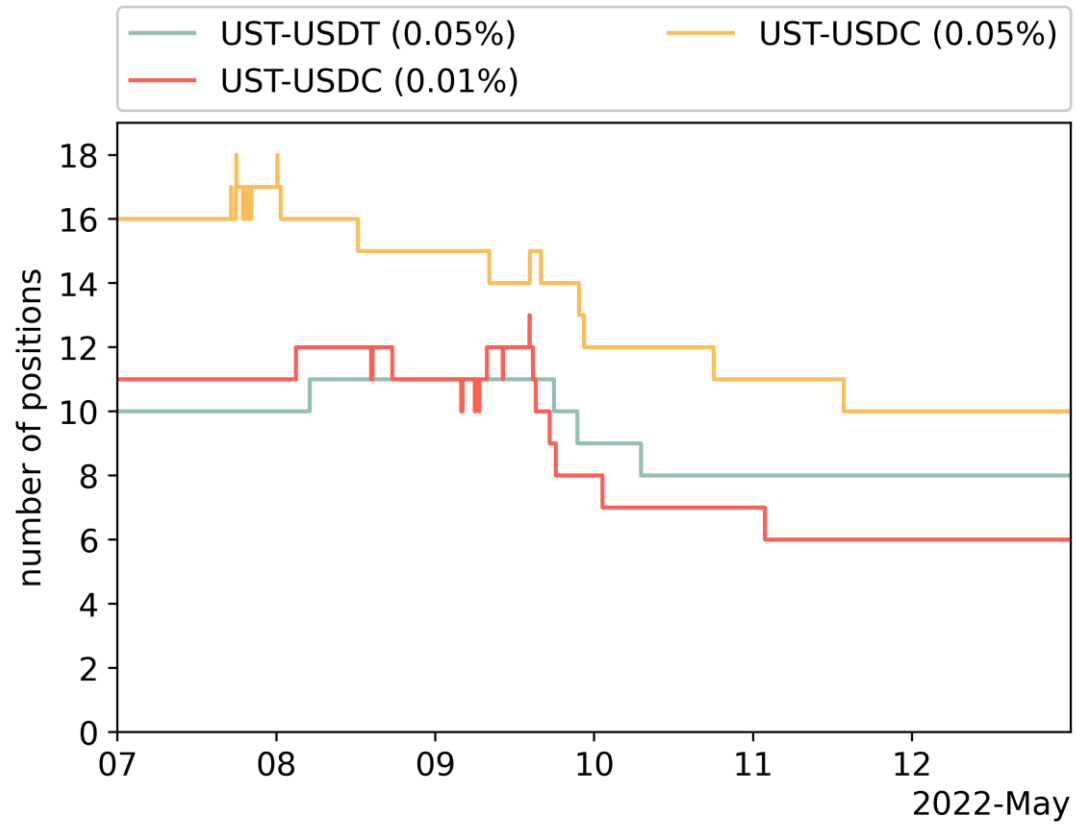


UST-USDC ($f = 0.01\%$)

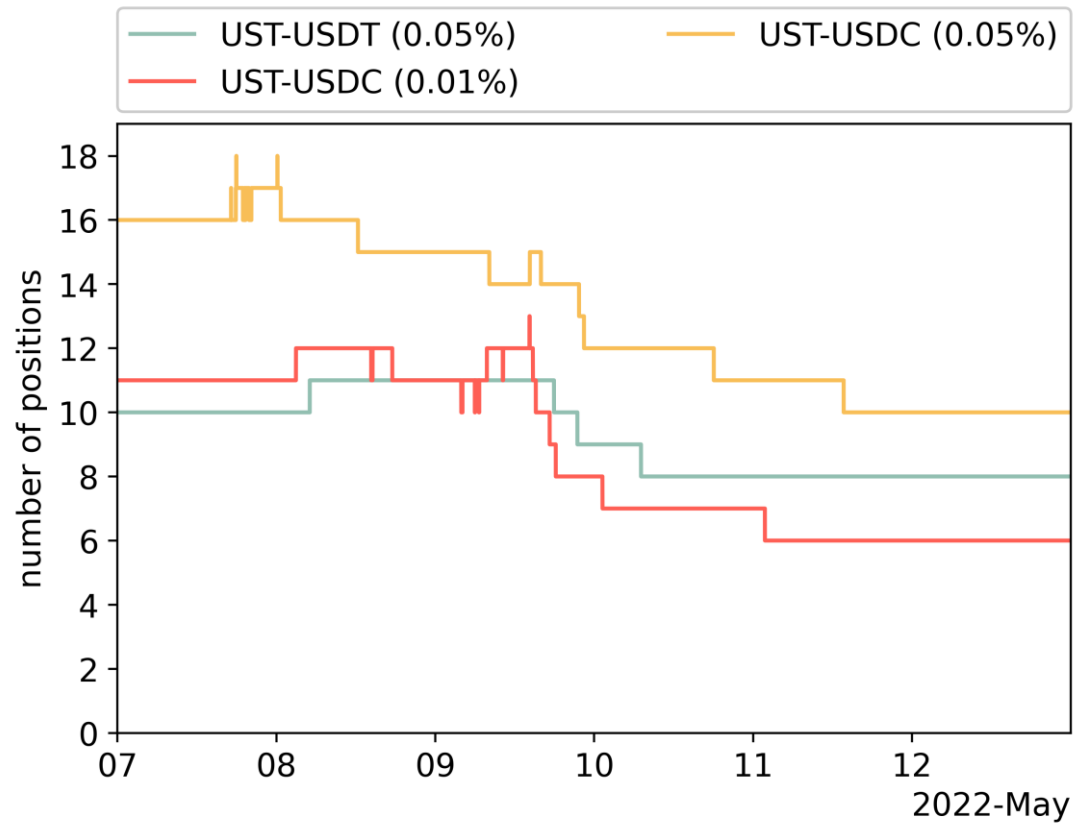


UST-USDT ($f = 0.05\%$)

Liquidity positions



Liquidity positions



most liquidity providers remained in pools as liquidity became worthless

Summary

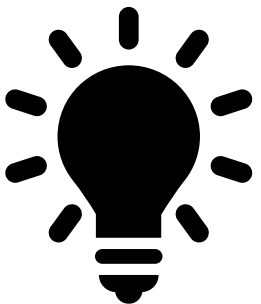


Uniswap V3 cannot be used as a TWAP oracle

Summary



Uniswap V3 cannot be used as a TWAP oracle

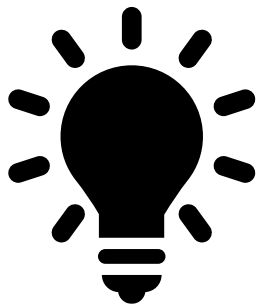


check liquidity around current Uniswap V3 price

Summary



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

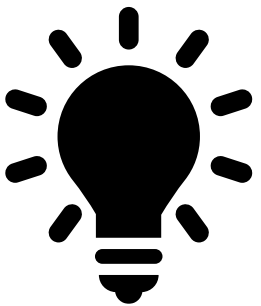


liquidity providers lack sophistication
and agility for complex market making

Summary



liquidity providers lack sophistication
and agility for complex market making

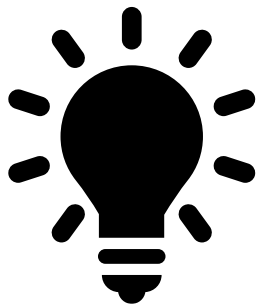


raise awareness amongst
liquidity providers

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

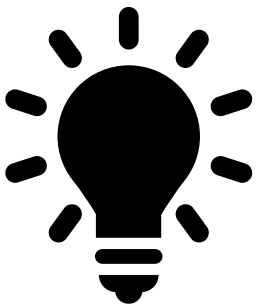


unfavorable risk-reward ratio for liquidity providers to deposit liquidity around new price during market distress

Summary



unfavorable risk-reward ratio for liquidity providers to deposit liquidity around new price during market distress



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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Price accuracy

