

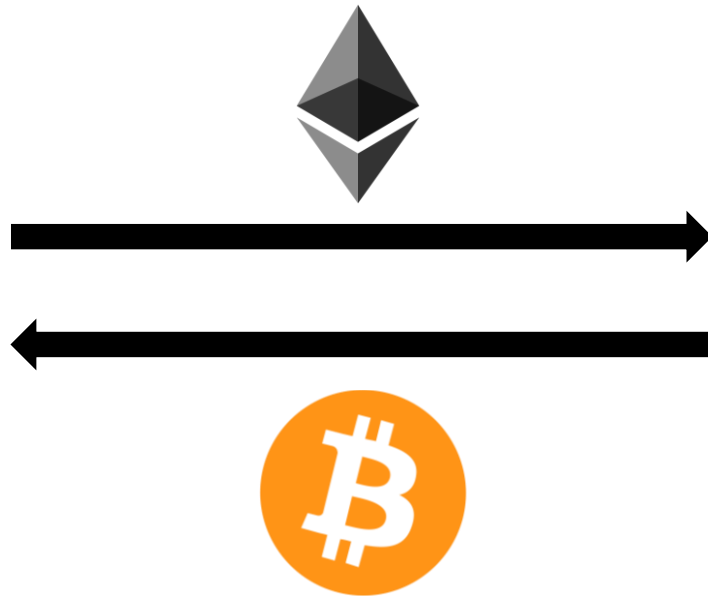
# Exploring Price Accuracy on Uniswap V3 in Times of Distress



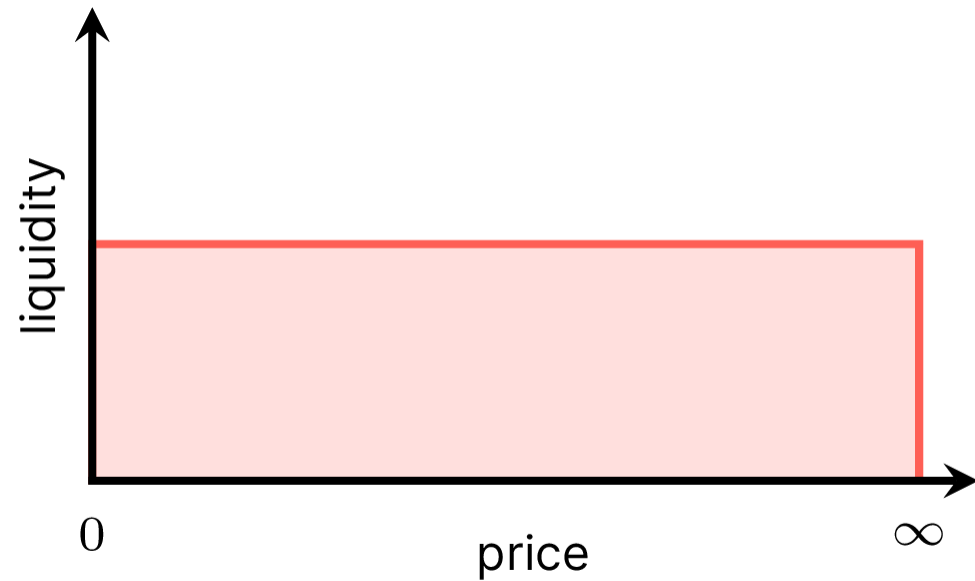
ACM DeFi 2022

**Lioba Heimbach**, Eric Schertenleib, Roger Wattenhofer  
ETH Zurich – Distributed Computing – [www.disco.ethz.ch](http://www.disco.ethz.ch)

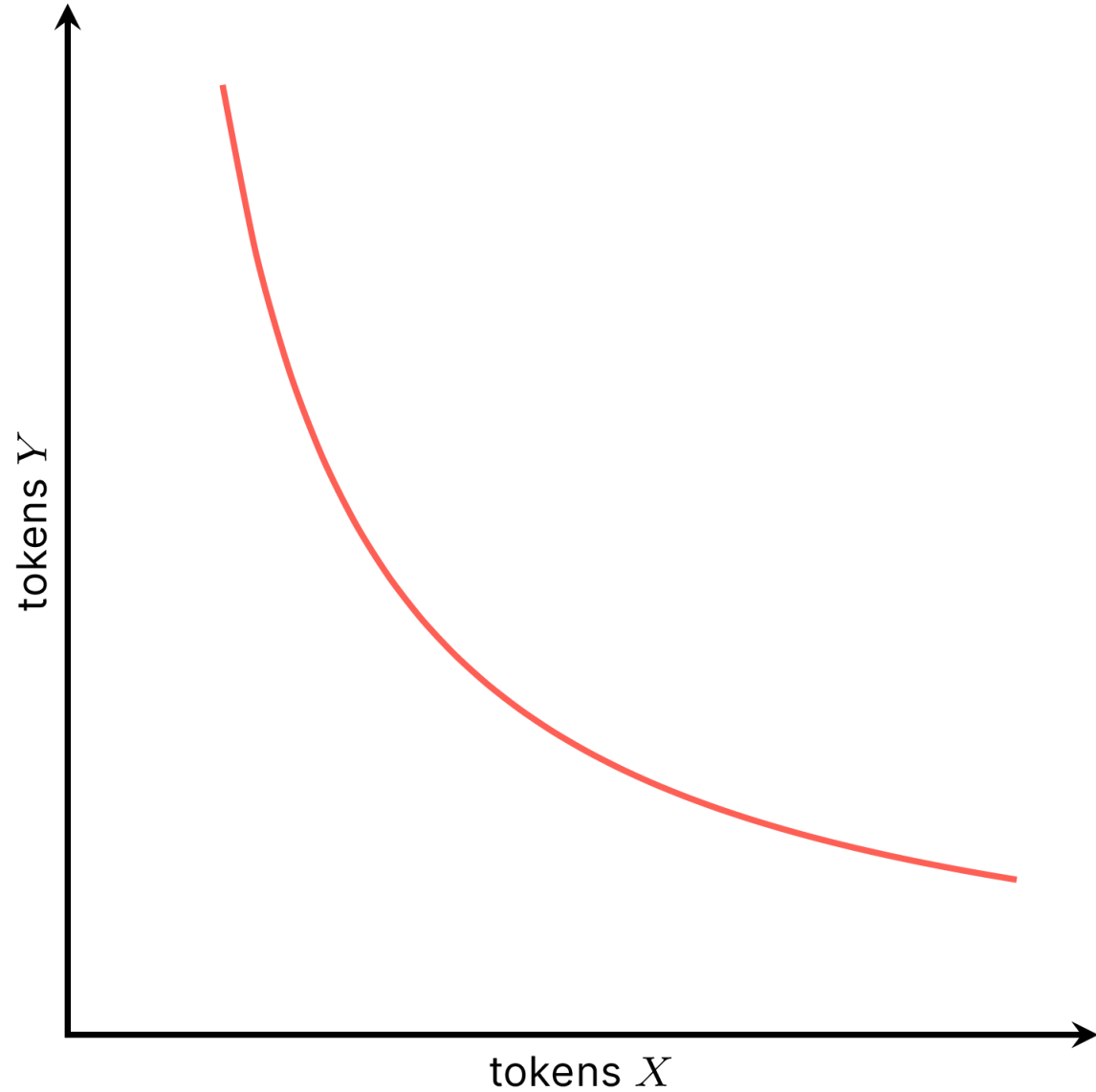
# Decentralized exchanges (DEXes)



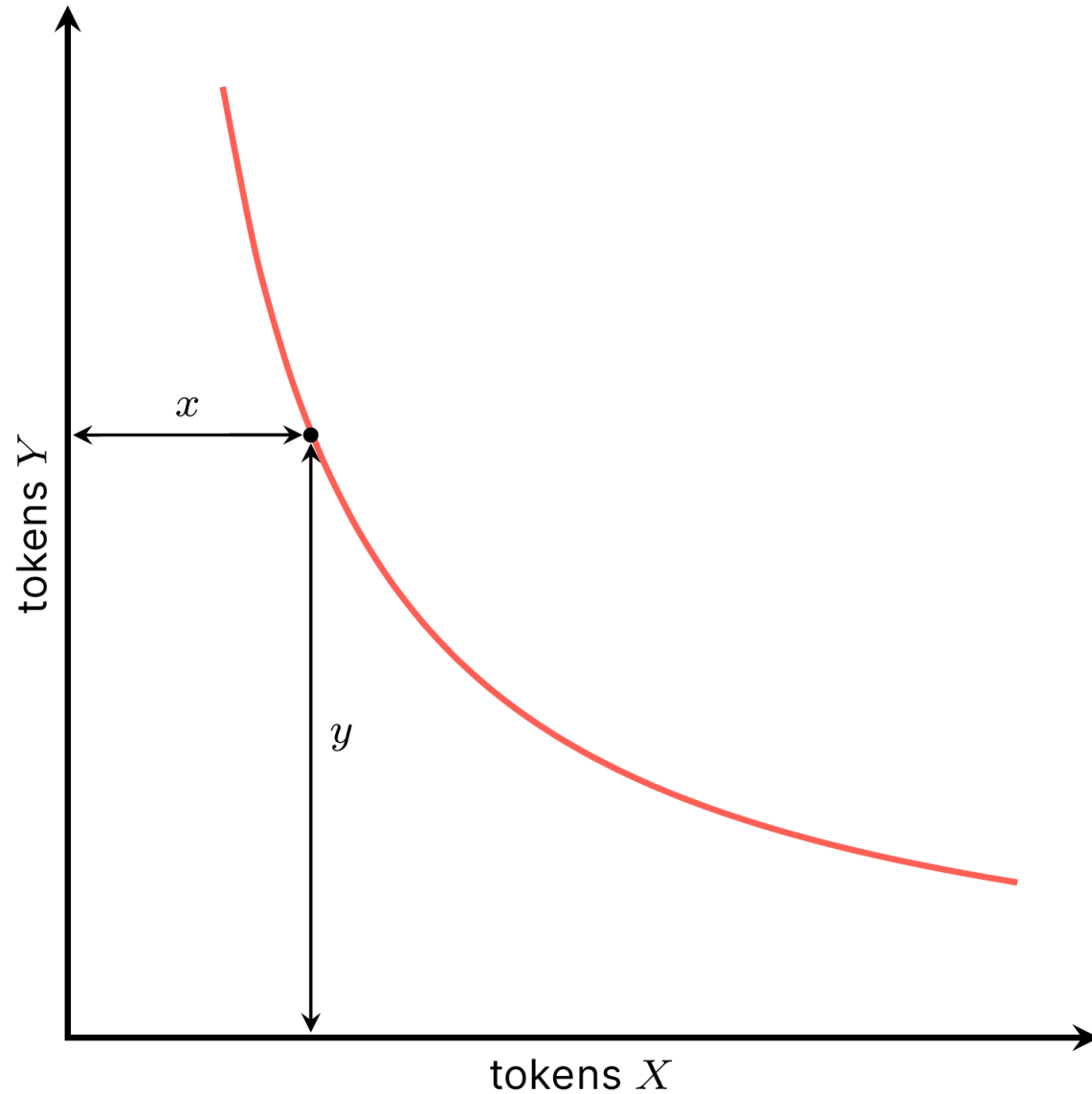
# Constant product market makers (CPMMs)



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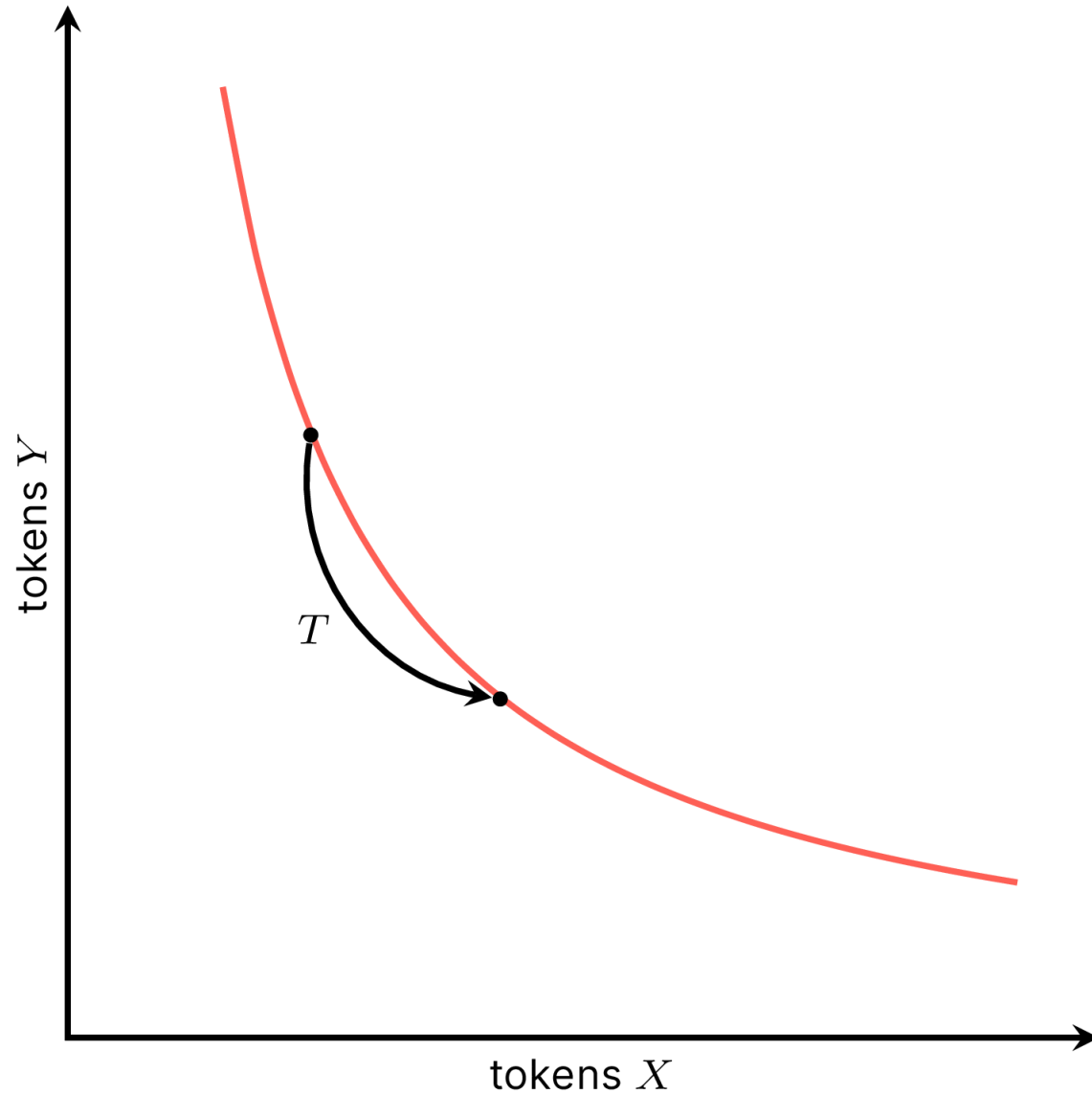


# Constant product market makers (CPMMs)



marginal price:  $S = y/x$

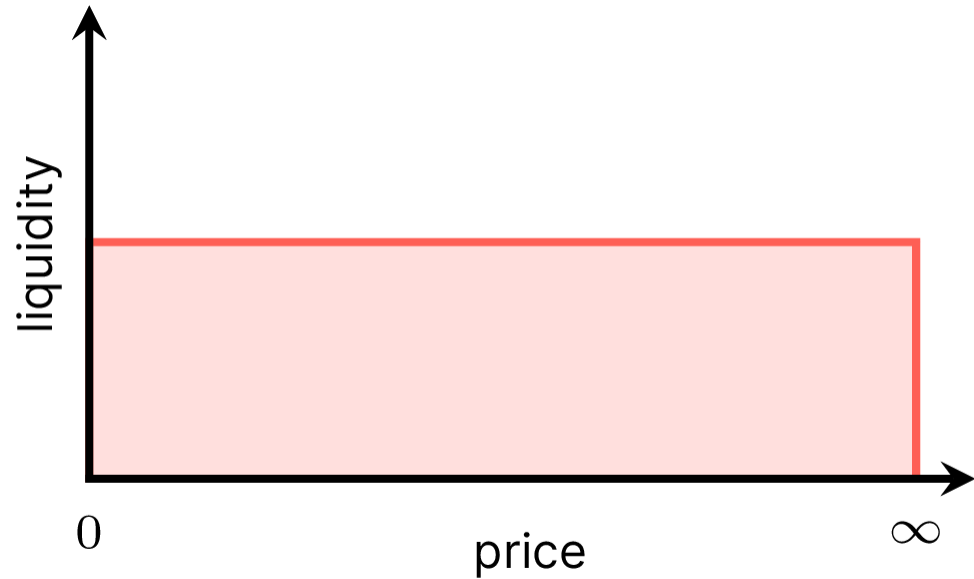
# Constant product market makers (CPMMs)



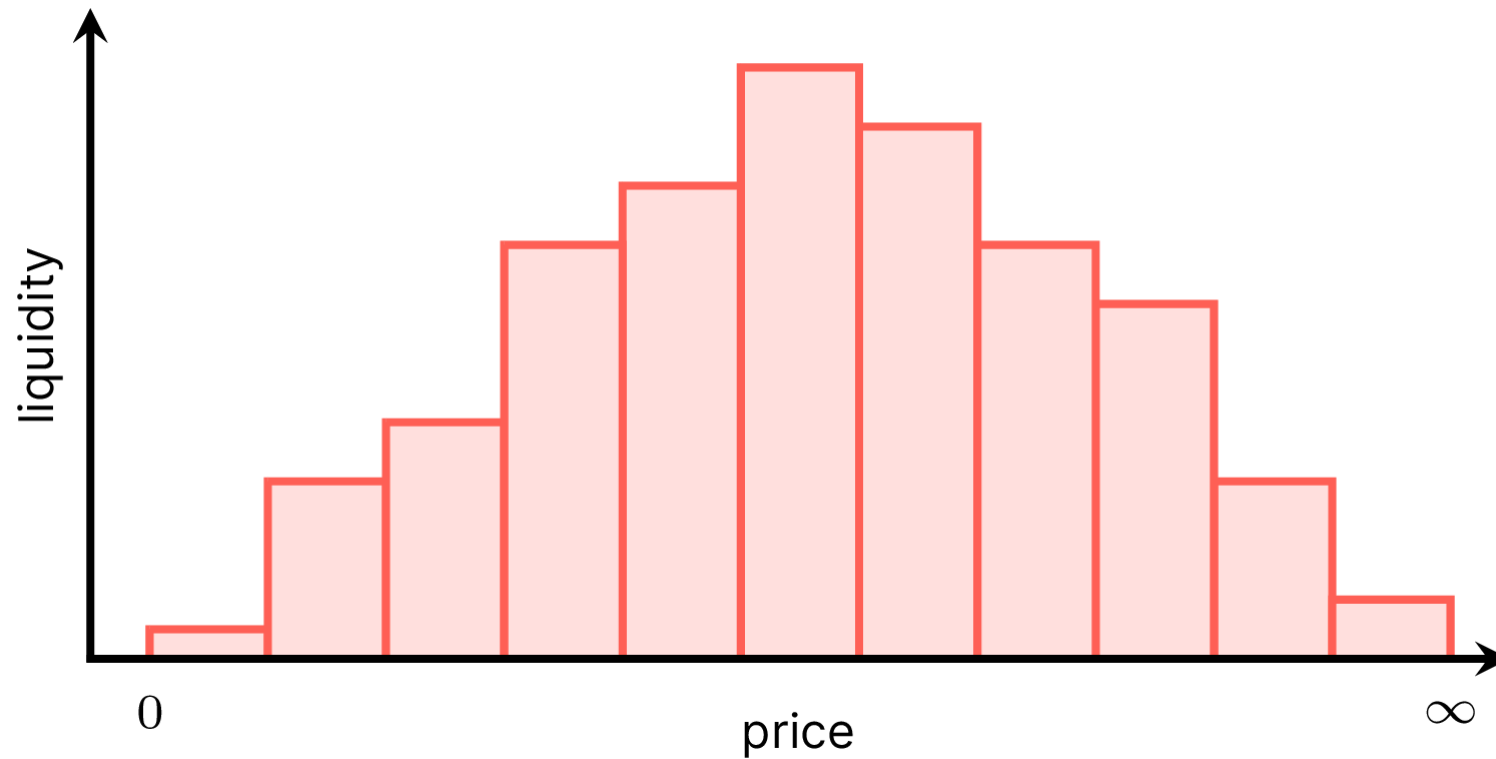
marginal price:  $S = y/x$

trading along price curve

# Concentrated liquidity CPMMs

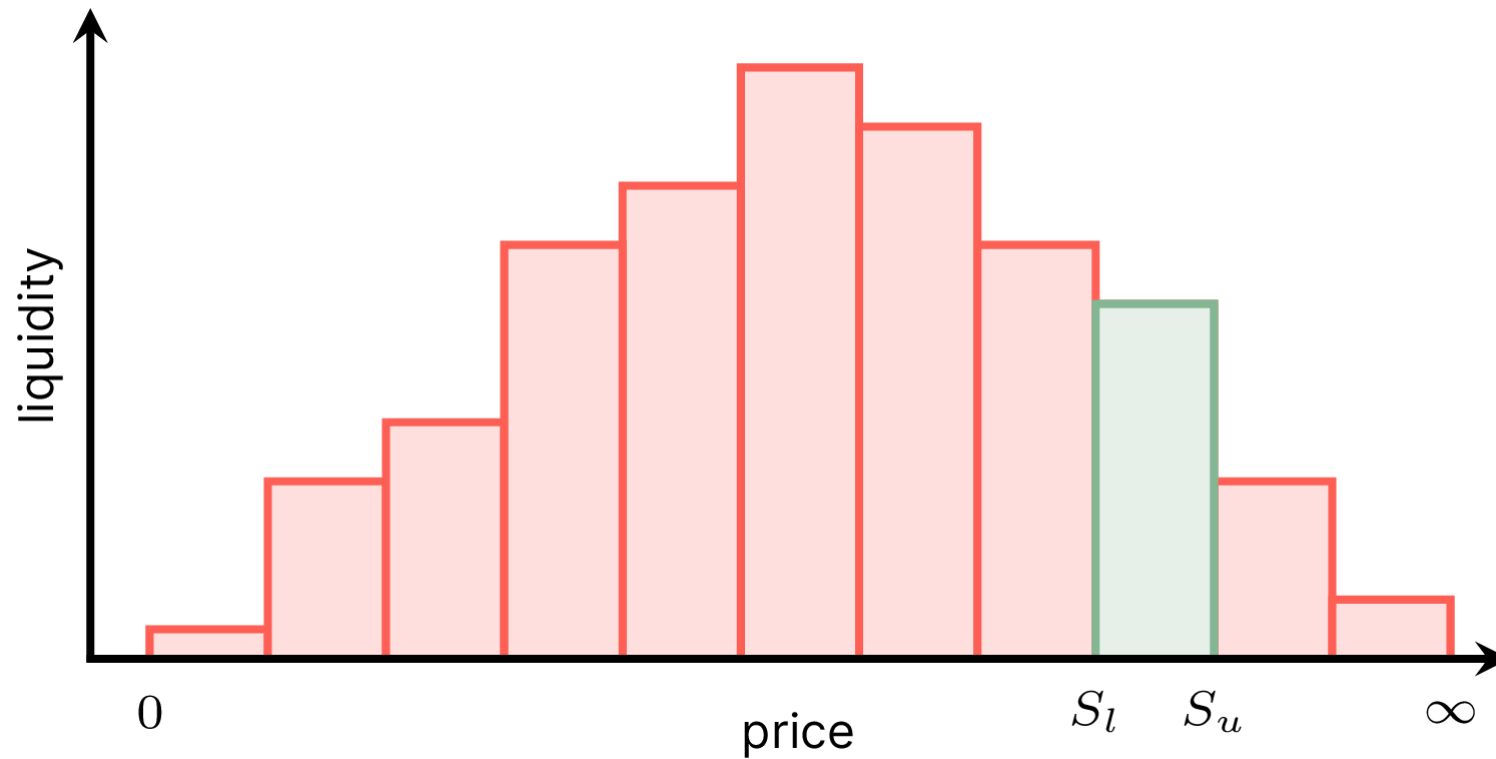


# Concentrated liquidity CPMMs

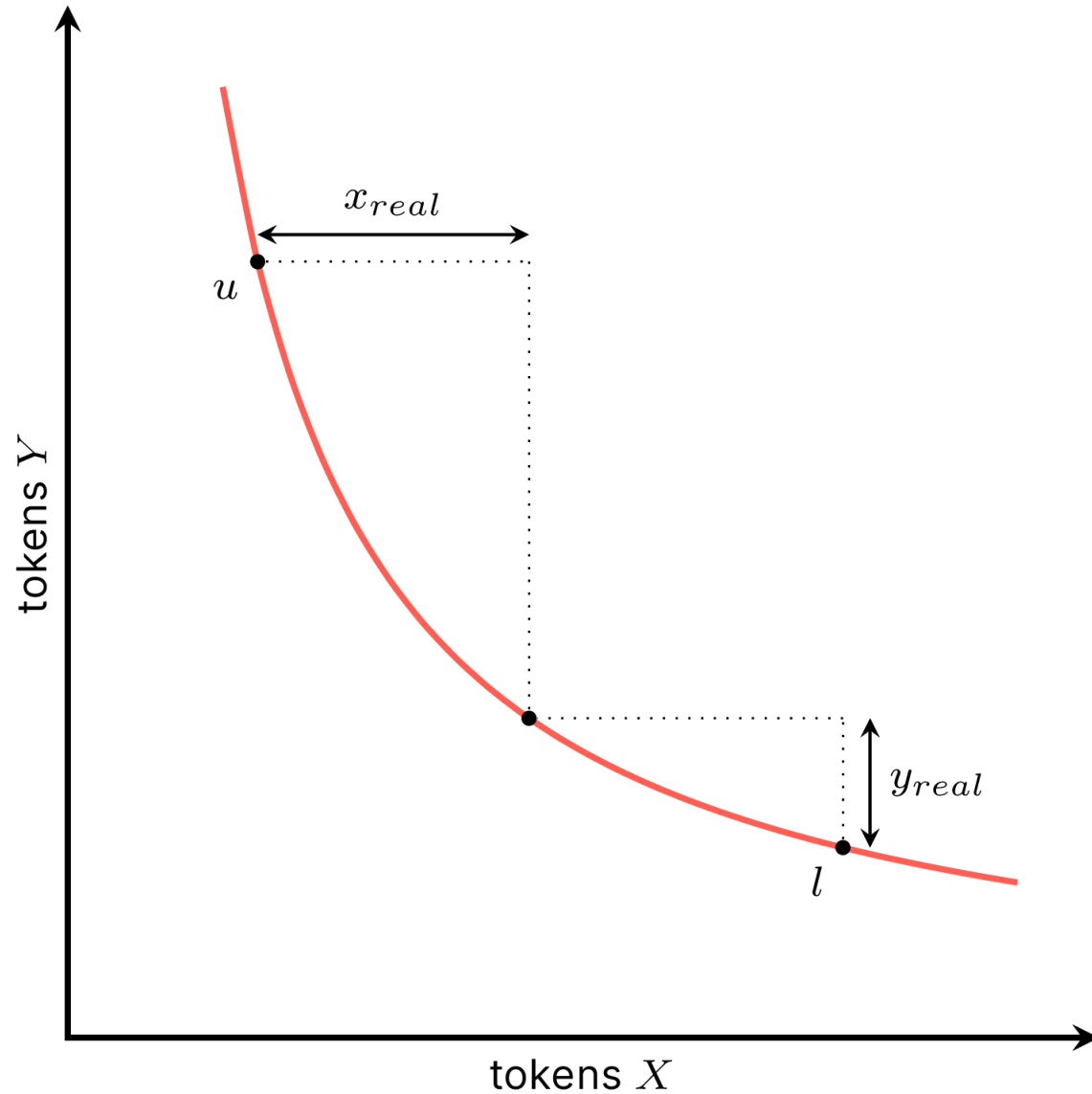




# Concentrated liquidity CPMs

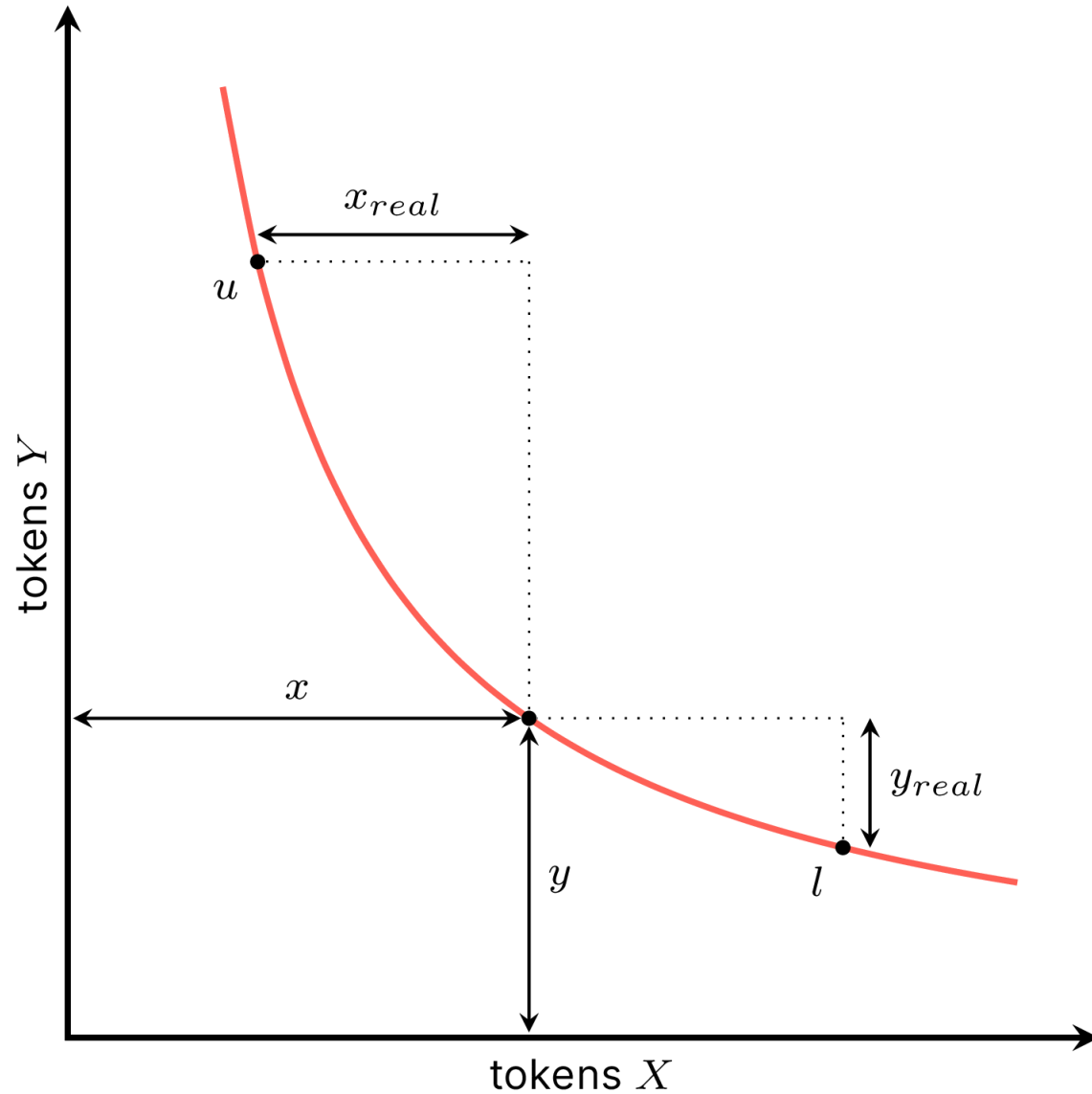


# Concentrated liquidity CPMs



real reserves support trading  
up to price boundaries

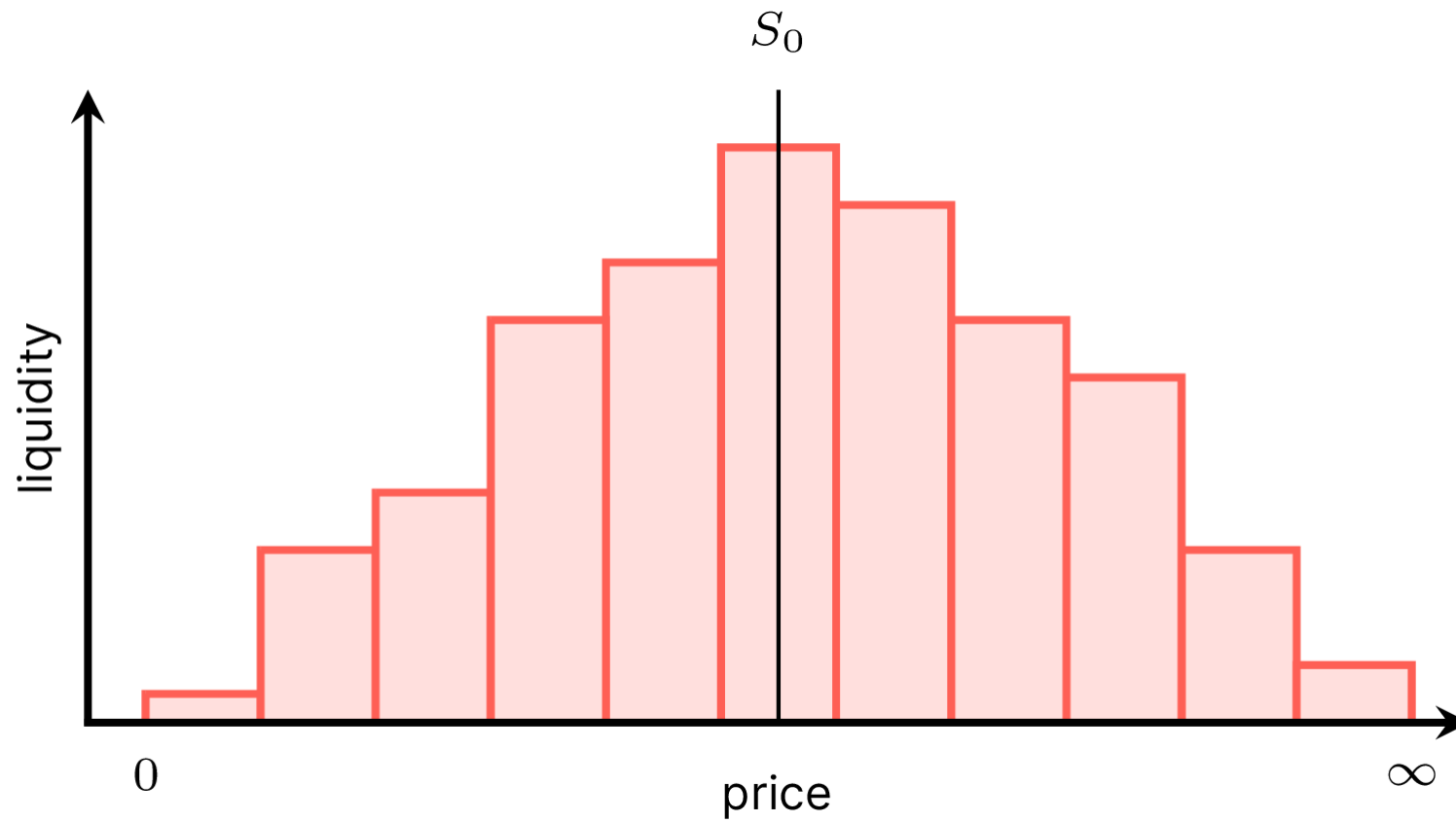
# Concentrated liquidity CPMMs



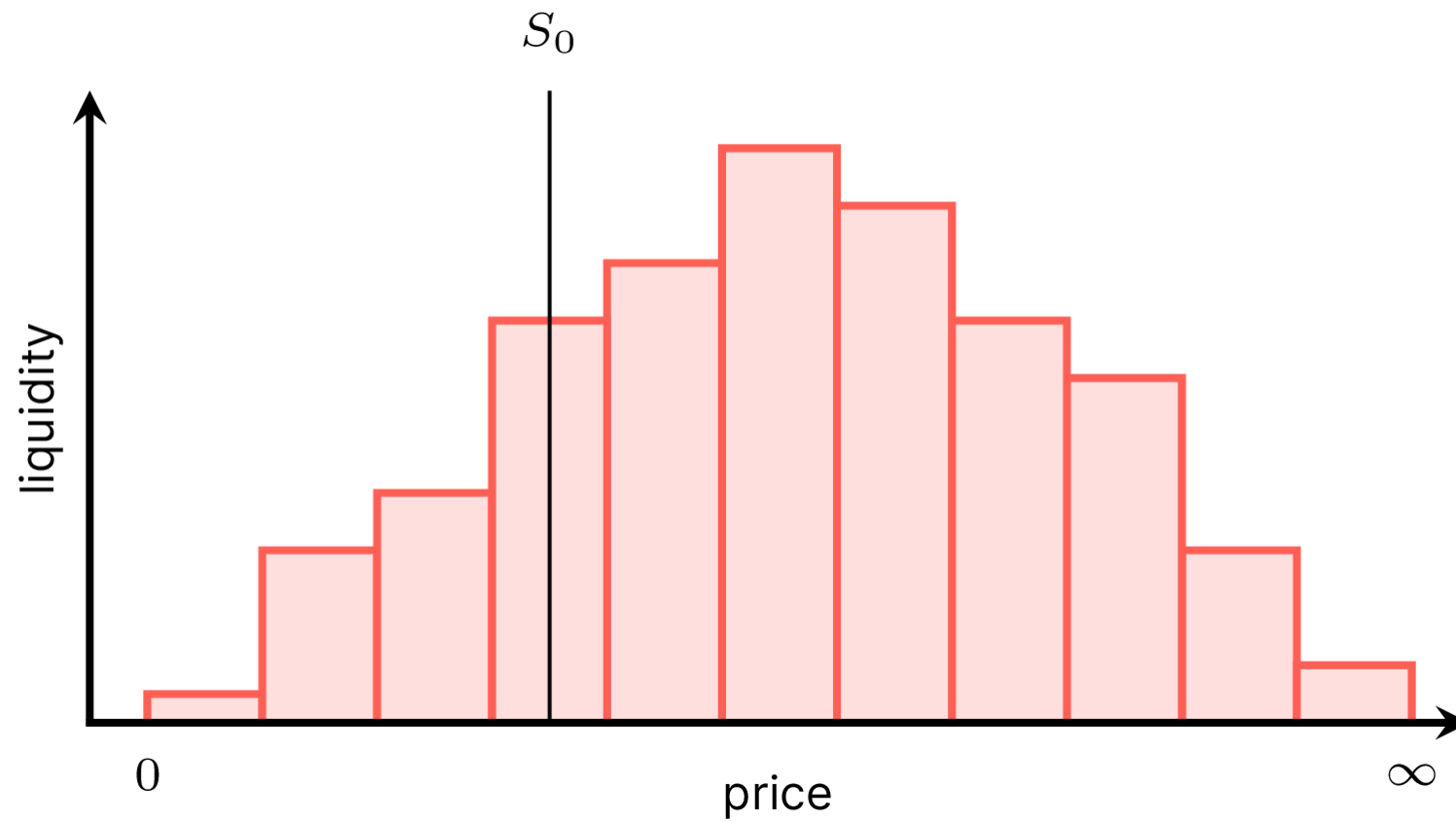
real reserves support trading  
up to price boundaries

virtual reserves used  
to simulate CPMM

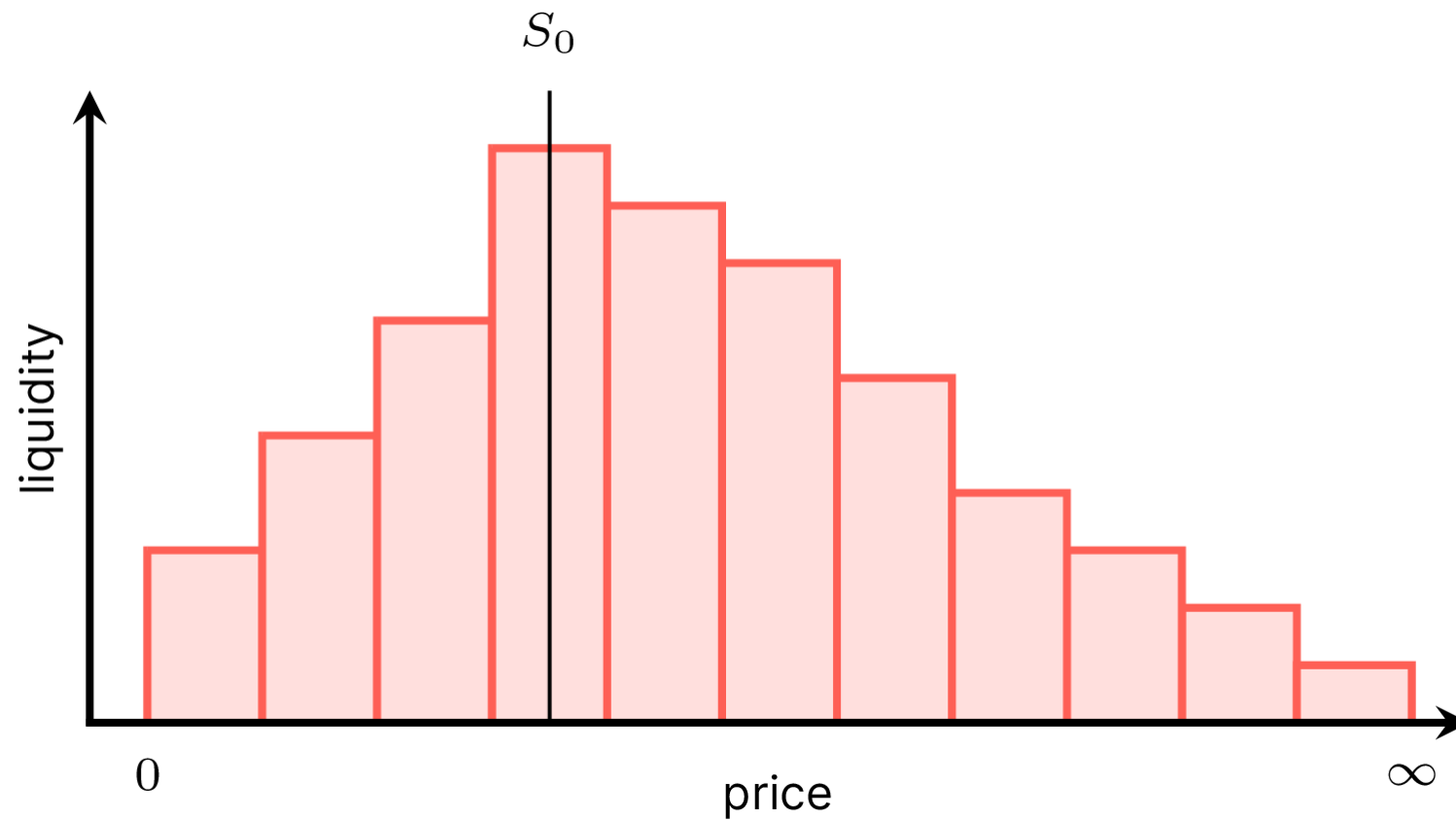
# Price movement



# Price movement



# Price movement

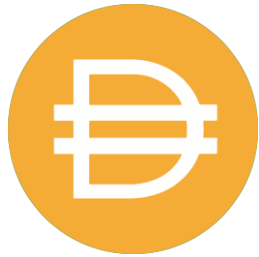


# Stable pairs

both tokens traded in the  
pool are stable coins

# Stable pairs

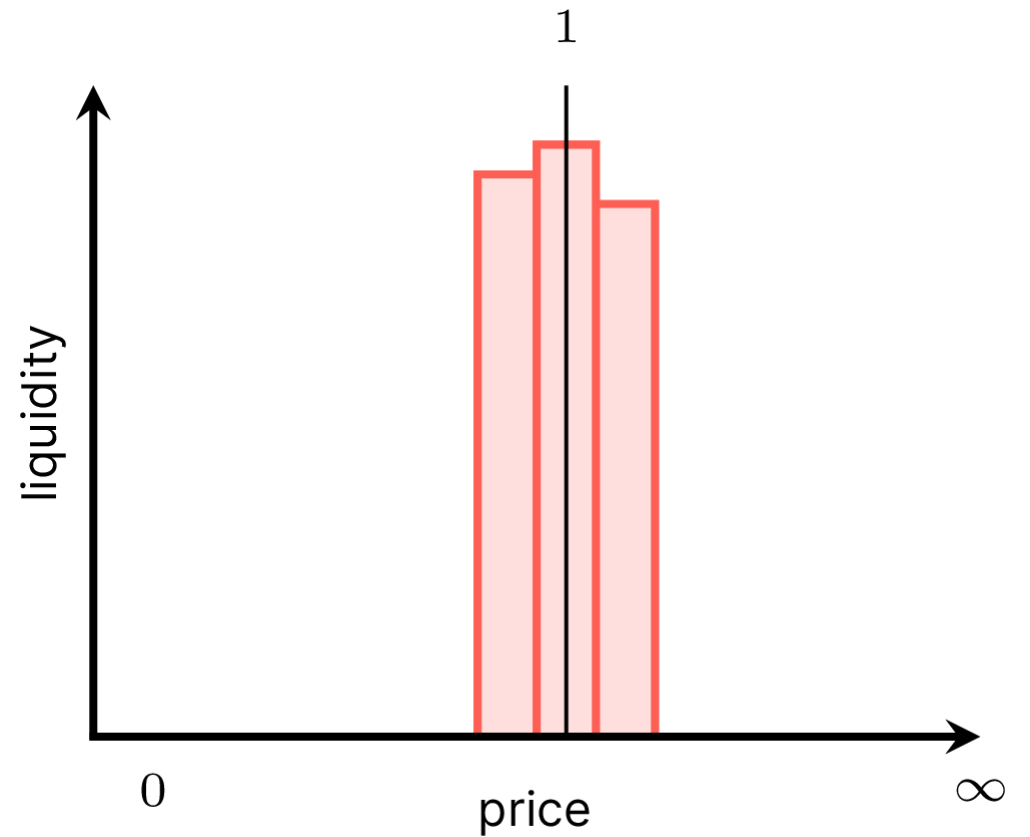
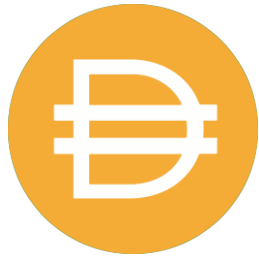
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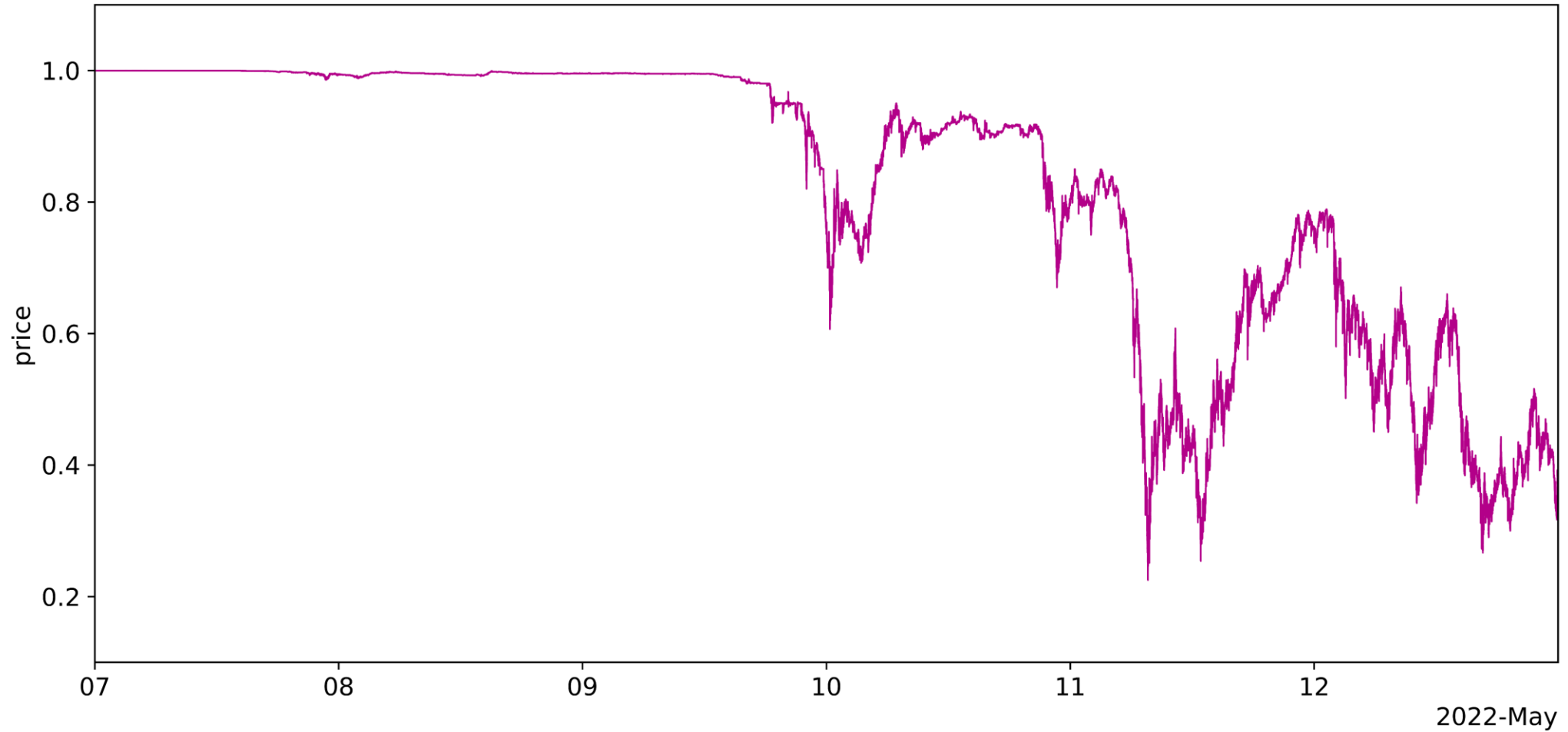


# Stable pairs

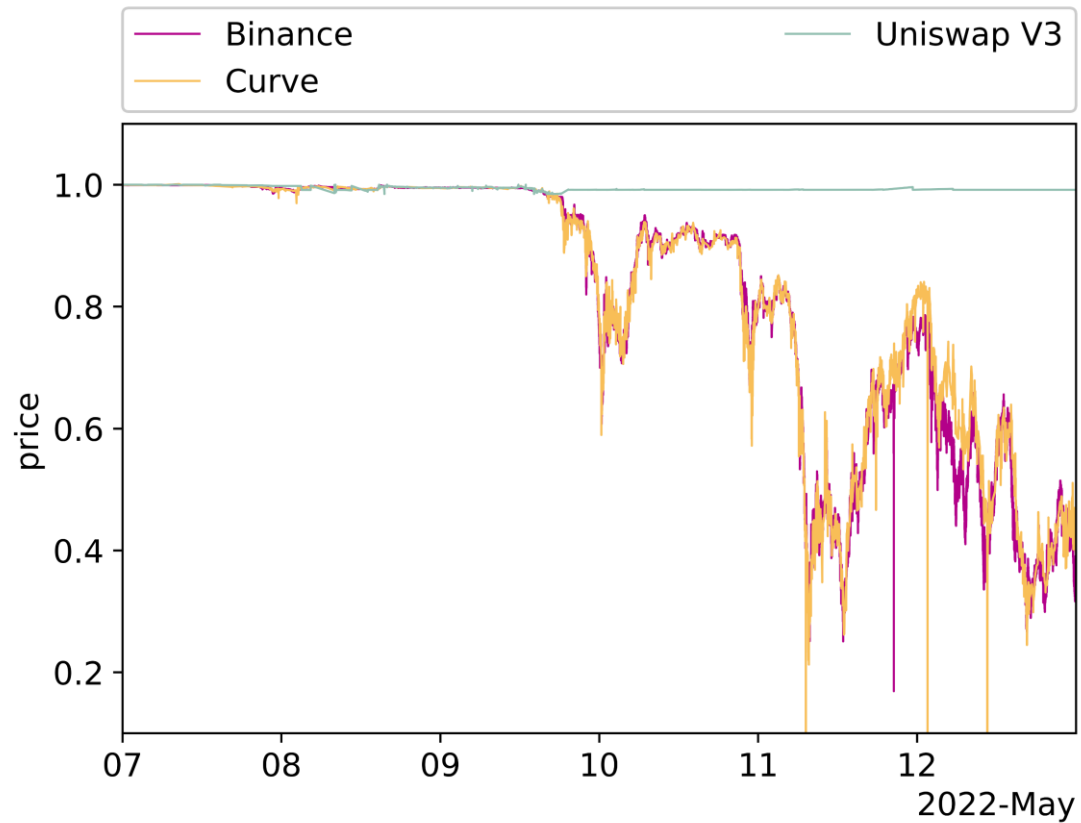
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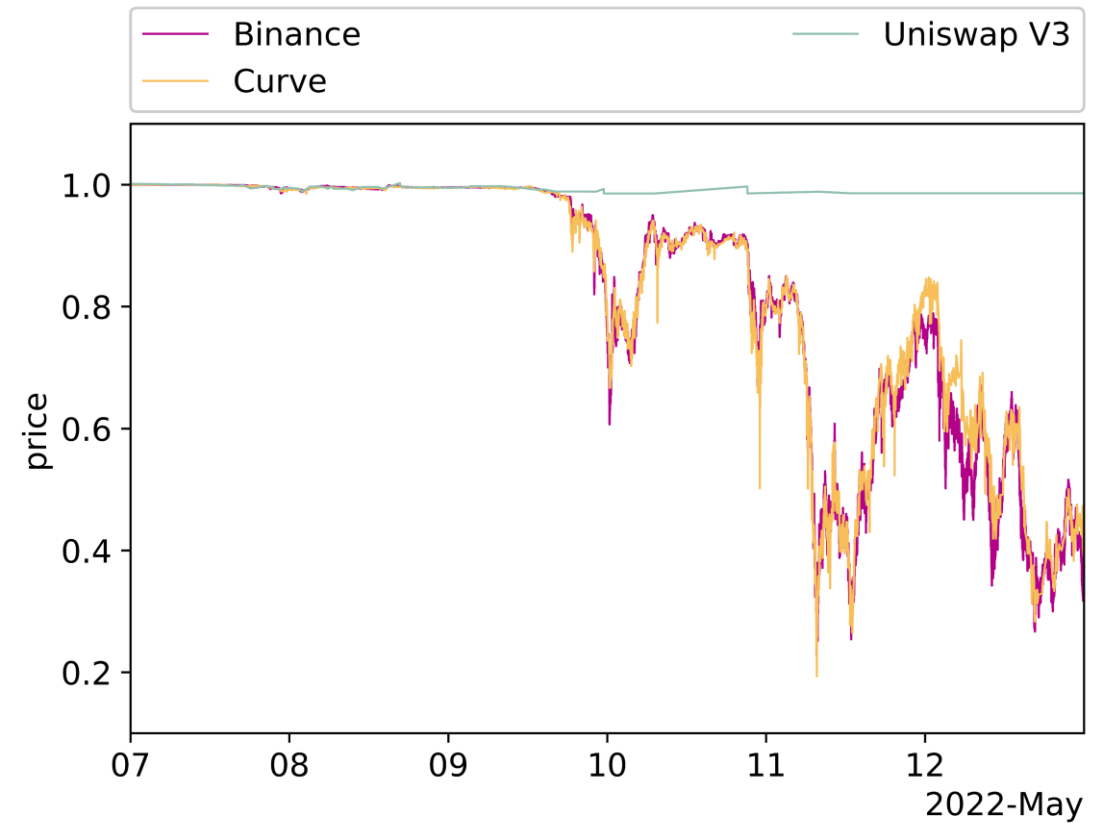
# UST price



# Price accuracy

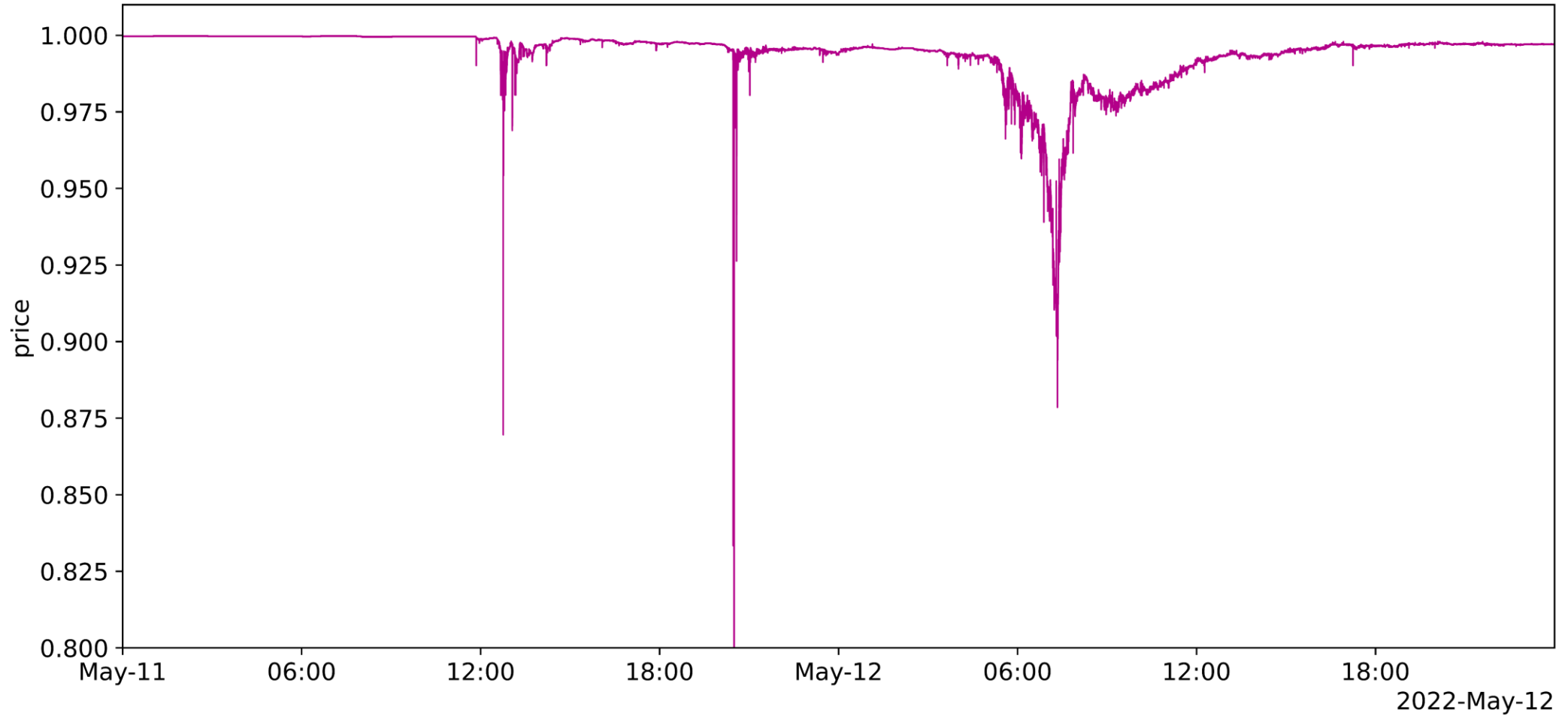


UST-USDC ( $f = 0.01\%$ )

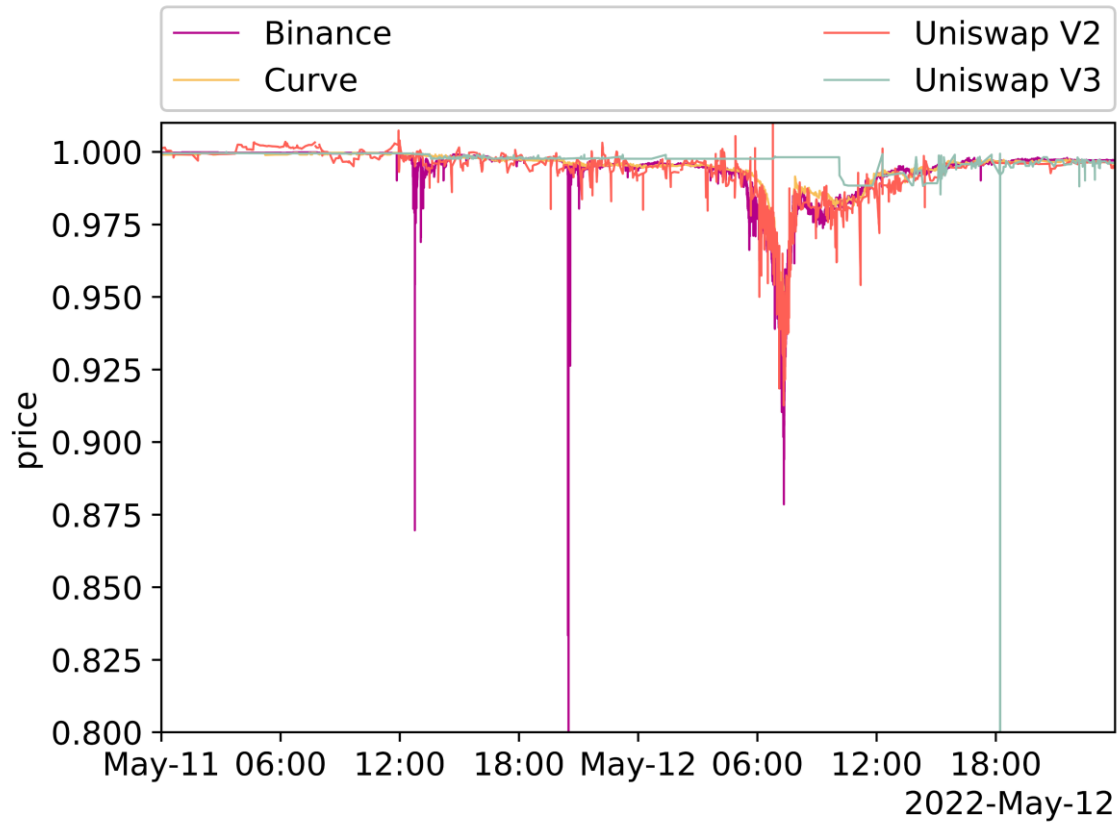


UST-USDT ( $f = 0.05\%$ )

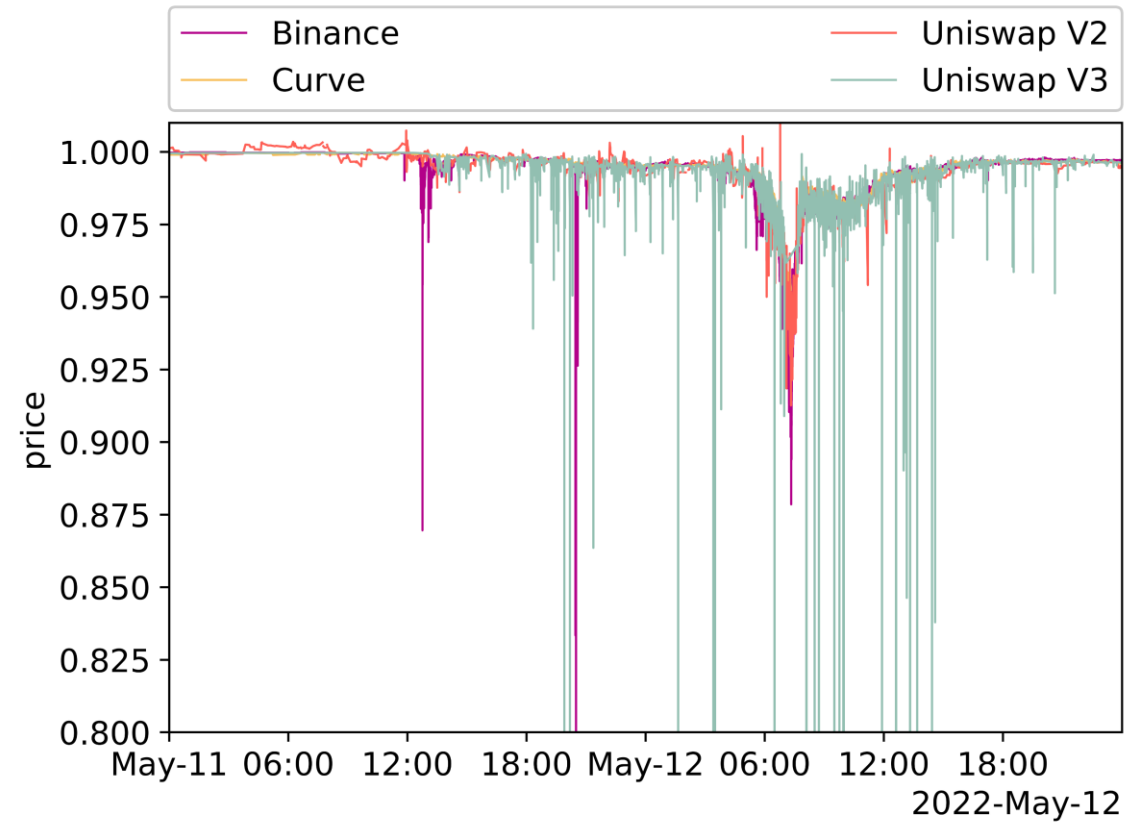
# USDT price



# Price accuracy

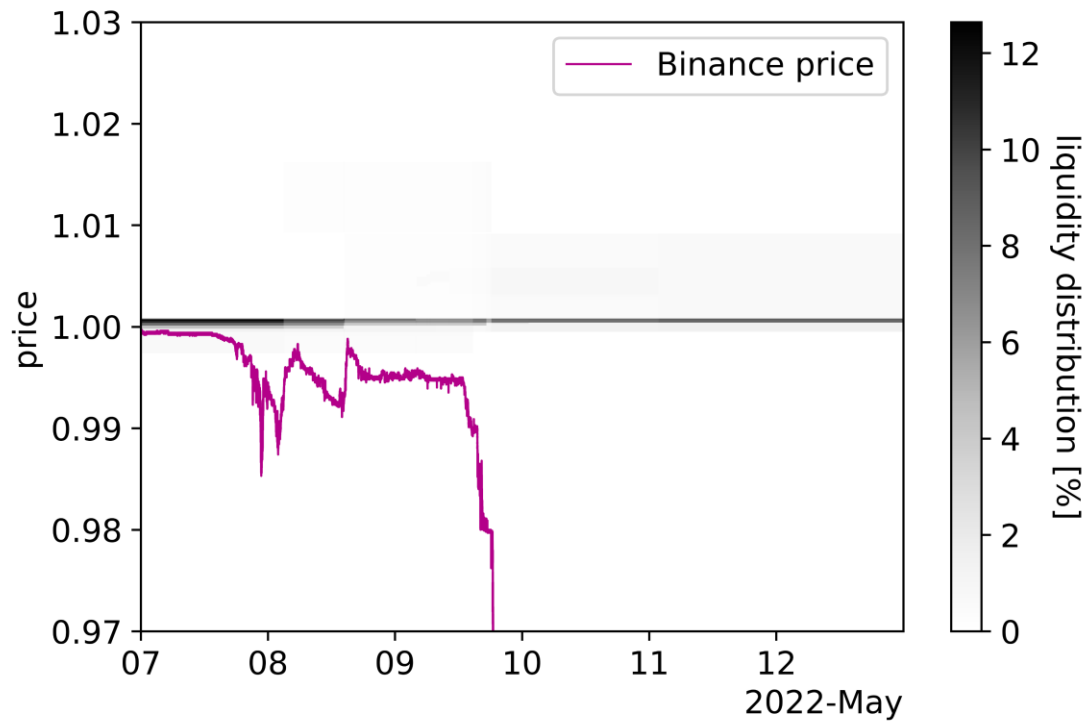


USDT-USDC ( $f = 0.01\%$ )

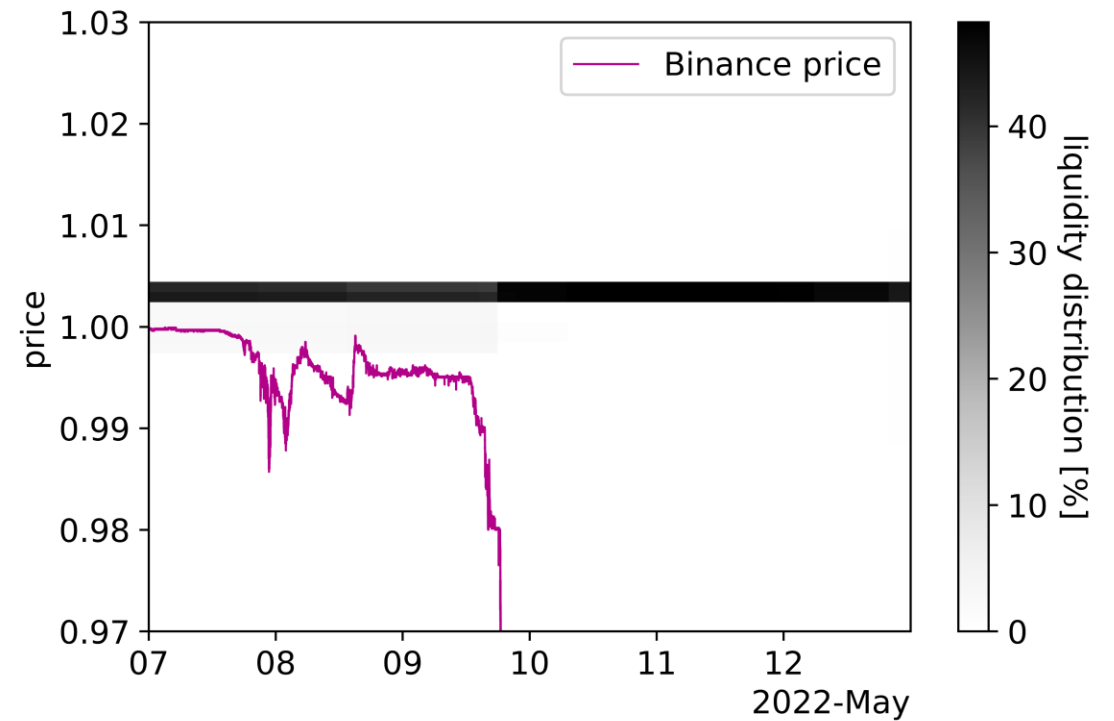


USDT-USDC ( $f = 0.05\%$ )

# Liquidity distribution

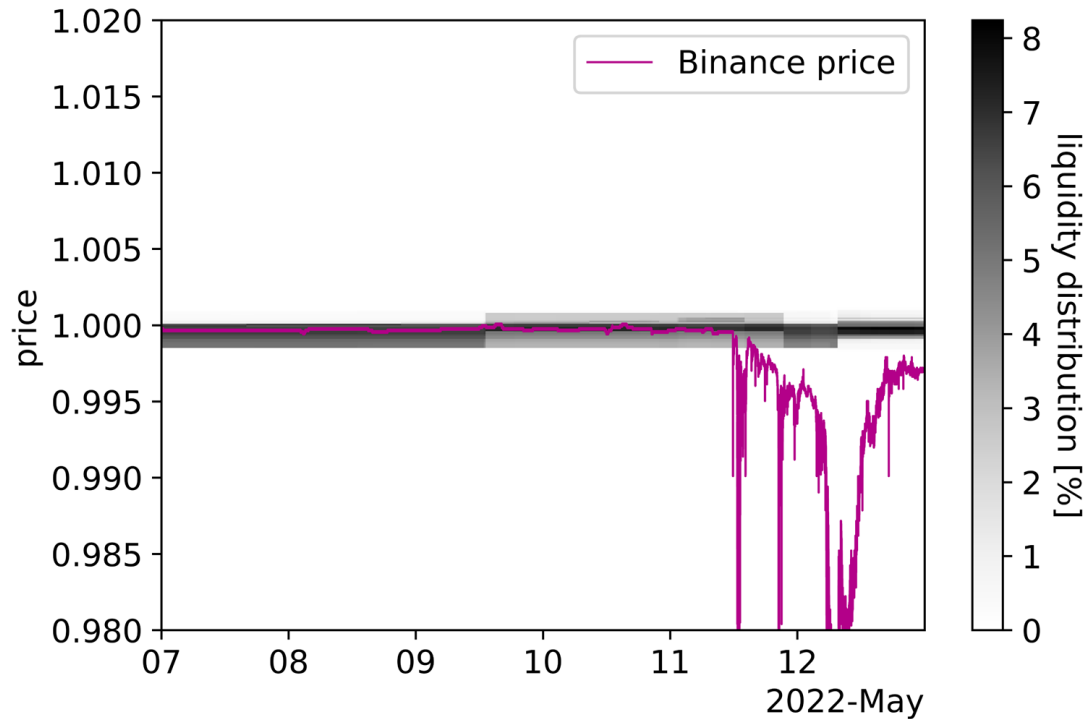


UST-USDC ( $f = 0.01\%$ )

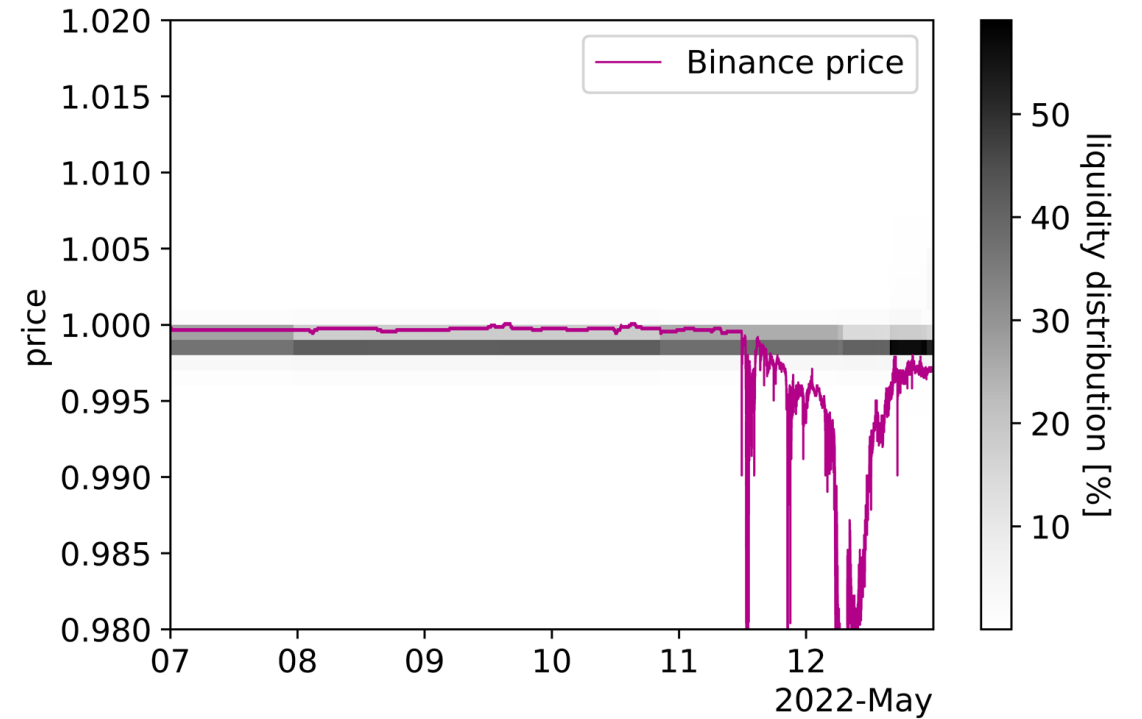


UST-USDT ( $f = 0.05\%$ )

# Liquidity distribution

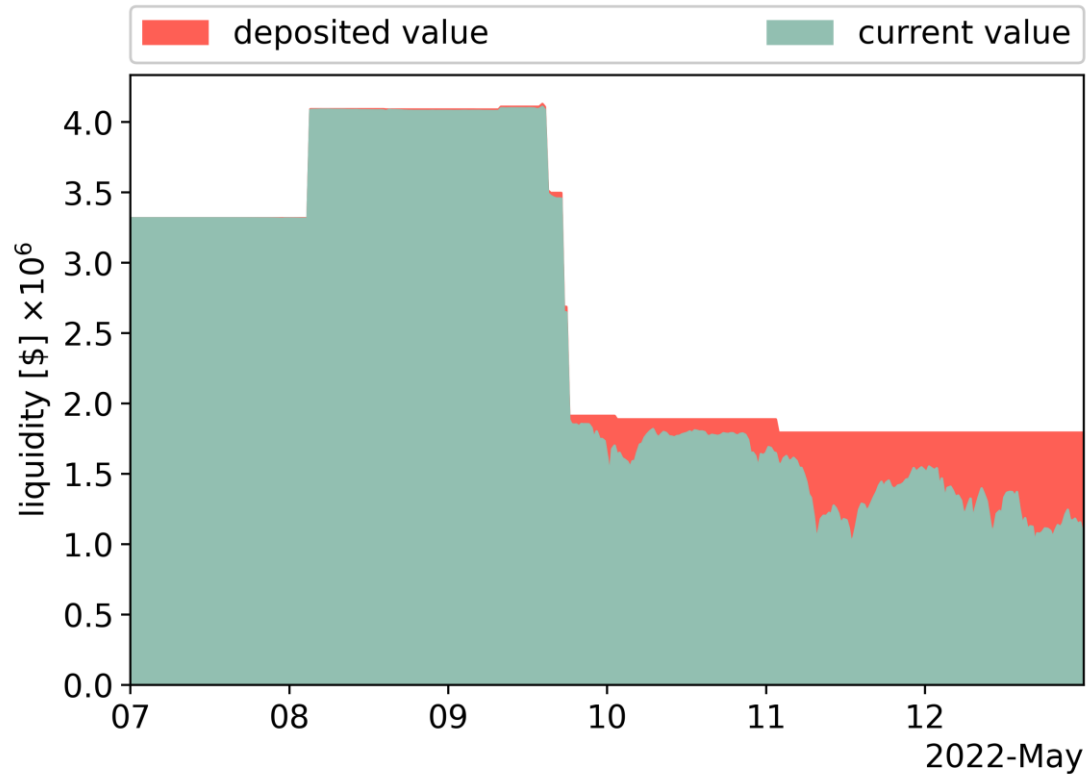


USDT-USDC ( $f = 0.01\%$ )

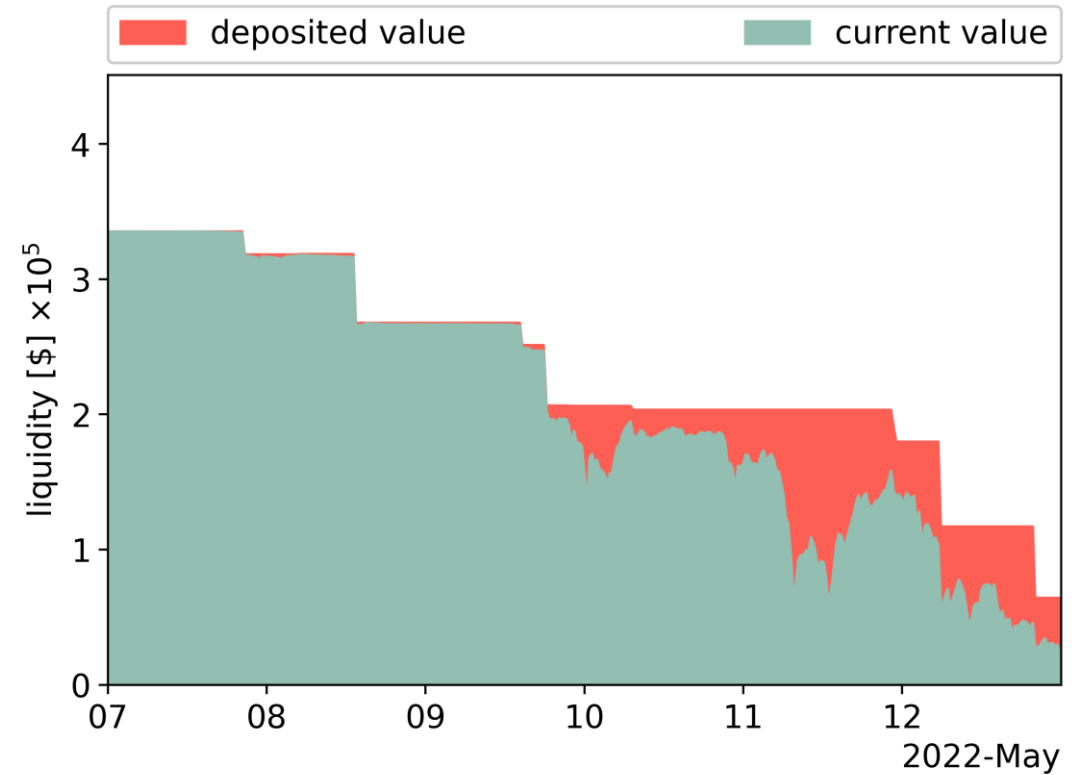


USDT-USDC ( $f = 0.05\%$ )

# Liquidity value



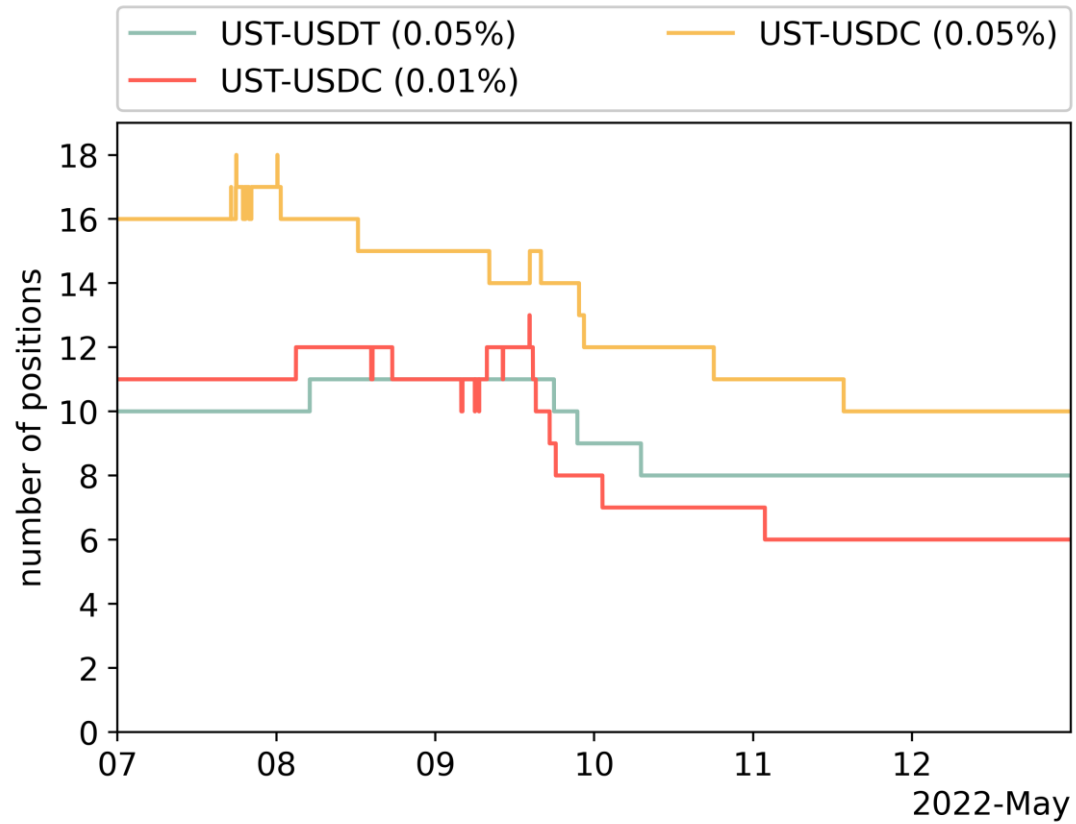
UST-USDC ( $f = 0.01\%$ )



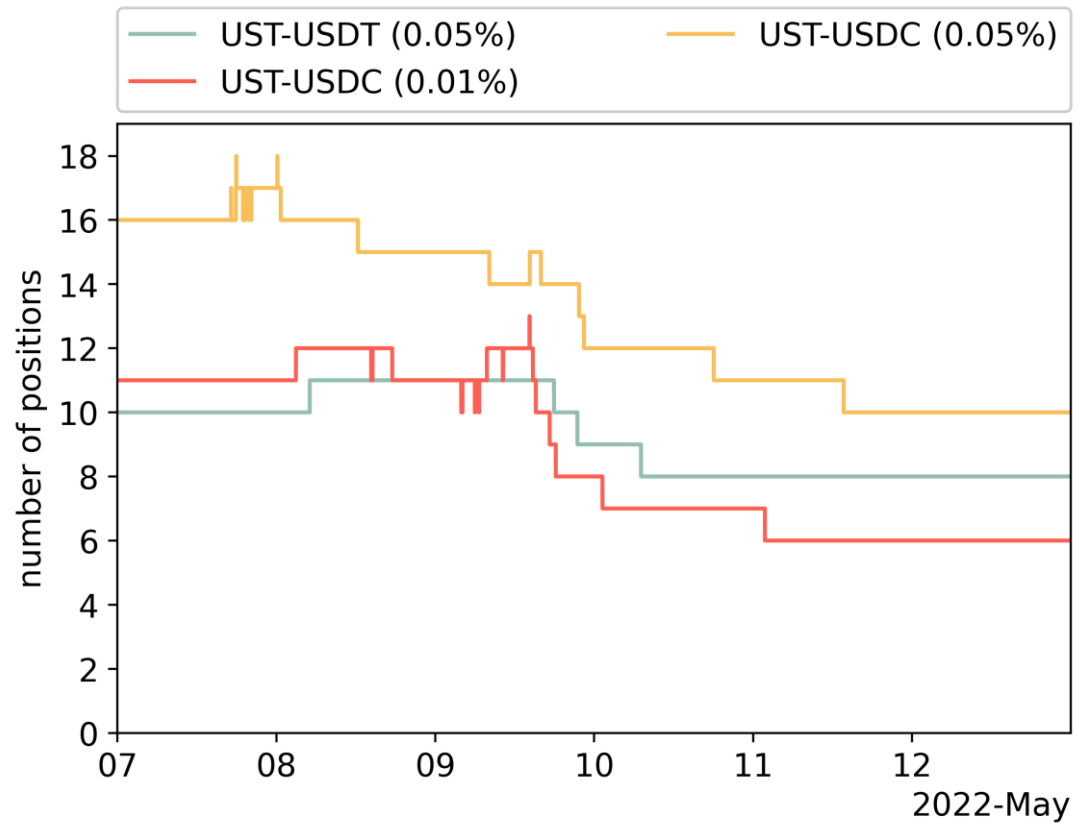
UST-USDT ( $f = 0.05\%$ )



# Liquidity positions



# Liquidity positions



most liquidity providers remained in pools as liquidity became worthless

# Summary

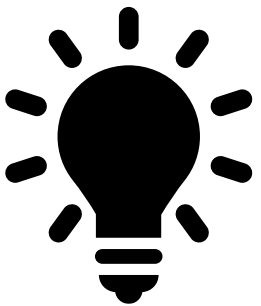


Uniswap V3 cannot be used as a TWAP oracle

# Summary



Uniswap V3 cannot be used as a TWAP oracle

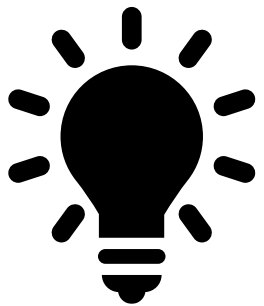


check liquidity around current Uniswap V3 price

# 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

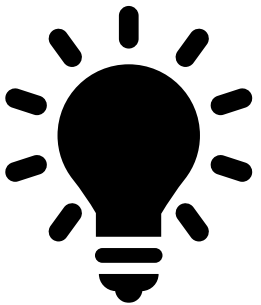


liquidity providers lack sophistication  
and agility for complex market making

# Summary



liquidity providers lack sophistication  
and agility for complex market making

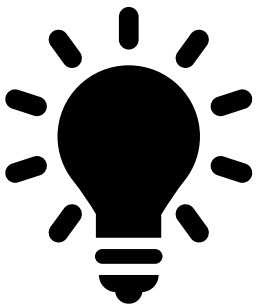


raise awareness amongst  
liquidity providers

# 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

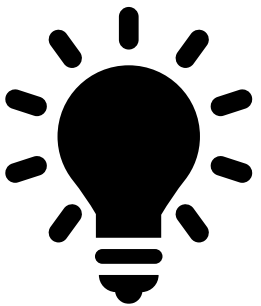


unfavorable risk-reward ratio for liquidity providers to deposit liquidity around new price during market distress

# 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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