

Token Bonding Curves

@daveytea

very
bonding

such wow

An introduction

much
romantic

(Crypto) Background

2014: ETH

2015: Coinbase 'analyst'

2016: Coinbase app

2017: 'Crypto' Investor

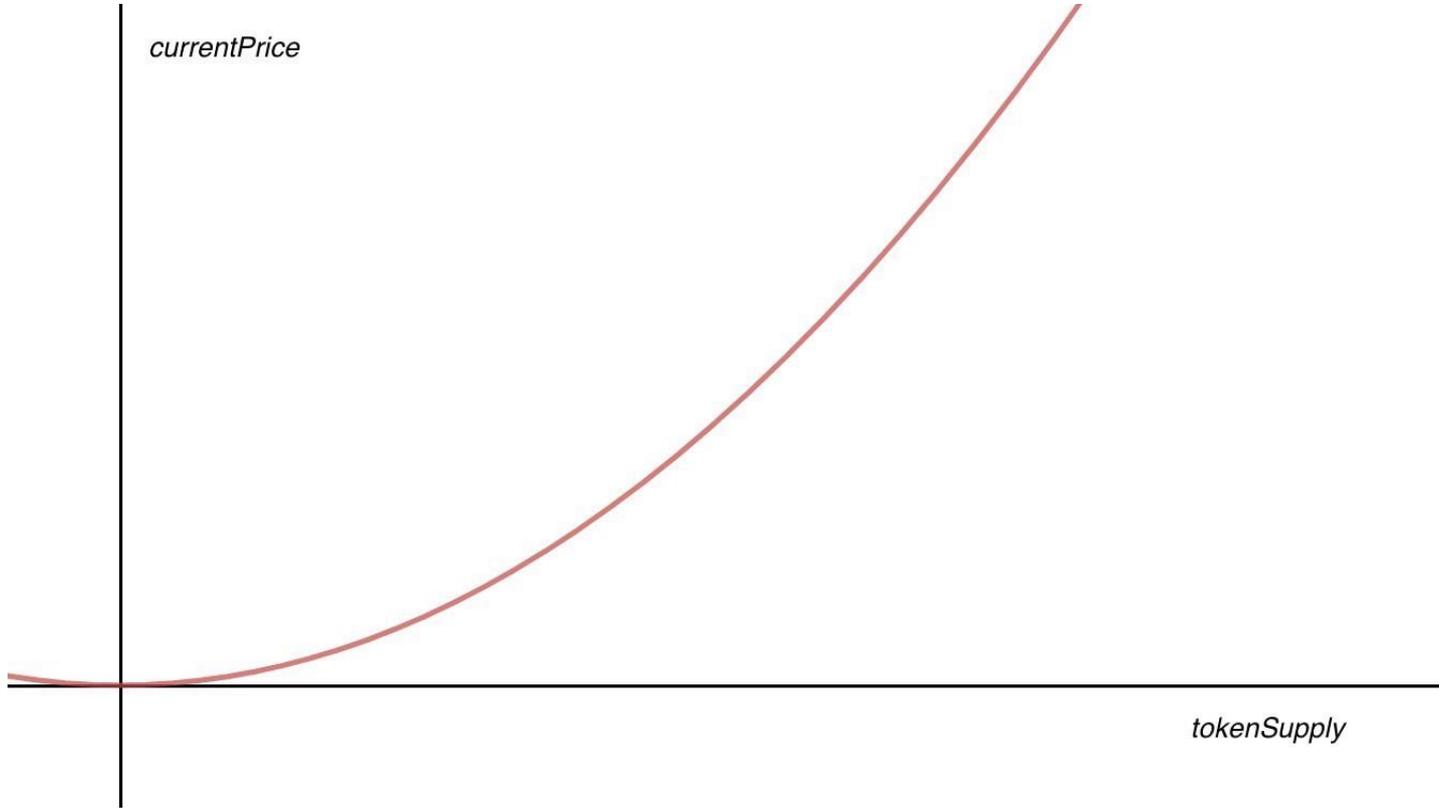
2018: #BUIDL - R&D, Solidity,
khana.io, buidl.amsterdam

2019: ??





$$\text{currentPrice} = \text{tokenSupply}^2$$



$$\text{currentPrice} = \text{tokenSupply}^2$$



Buys \$100

Receives 1.0 token



(0) tokenSupply = 10 tokens, backed \$100

(1) Price per token: $(10 \text{ tokens})^2 = \100

(2) Price per token: $(11 \text{ tokens})^2 = \121

(3) tokenSupply = 11.826446281
Total backing funds = \$300



Buys \$100

Receives 0.826446281 tokens

$$\text{currentPrice} = \text{tokenSupply}^2$$



Sells 1.0 token

Receives
\$139.8648316374



(0) tokenSupply = 11.826446281
Total backing funds = \$300

(1) Price per token: $(11.826446281 \text{ tokens})^2 = \139.8648316374

(2) Price per token: $(10.826446281 \text{ tokens})^2 = \117.2119390754

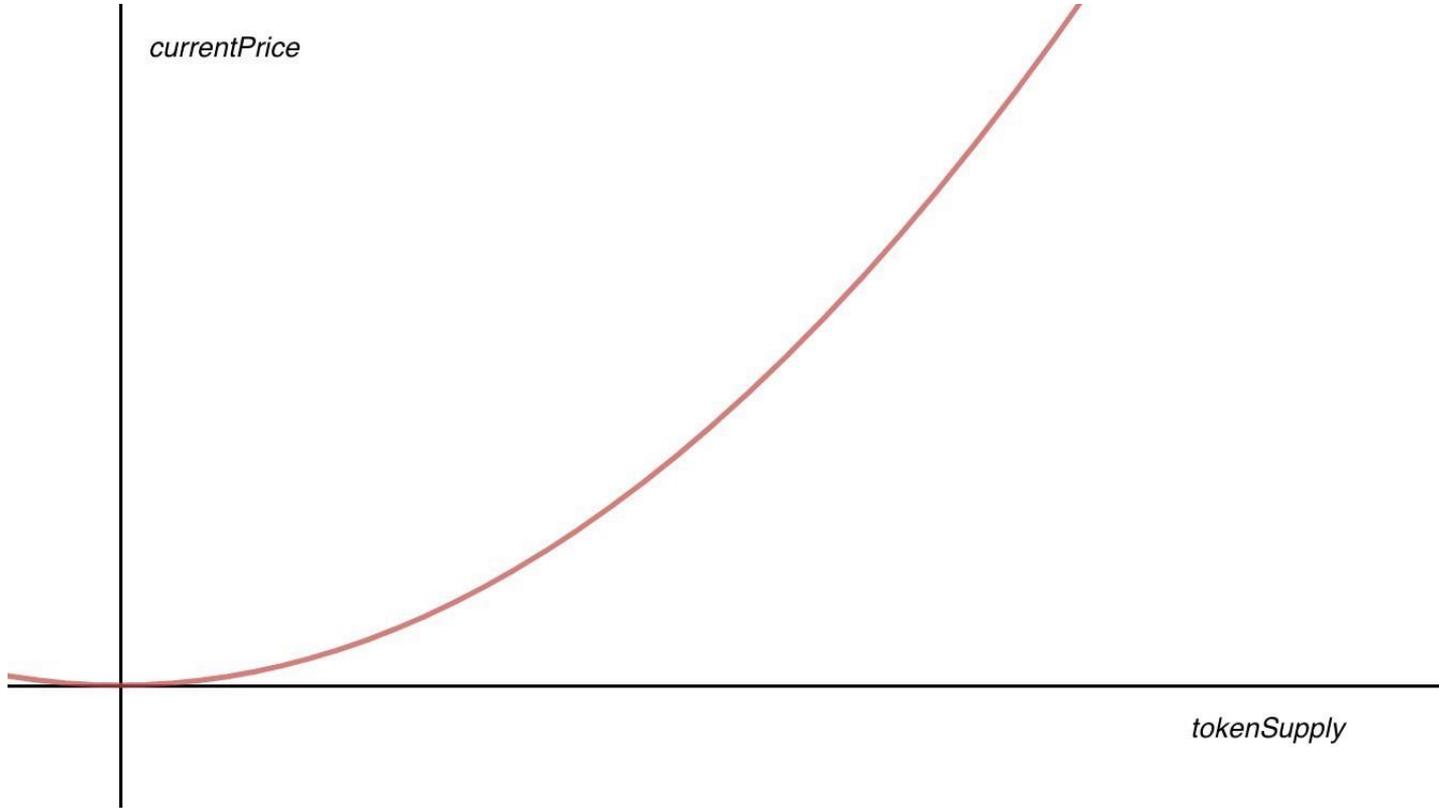
(3) tokenSupply = 10
Total backing funds = \$63.2657972249

Sells 0.826446281
token

Receives \$96.8693711377

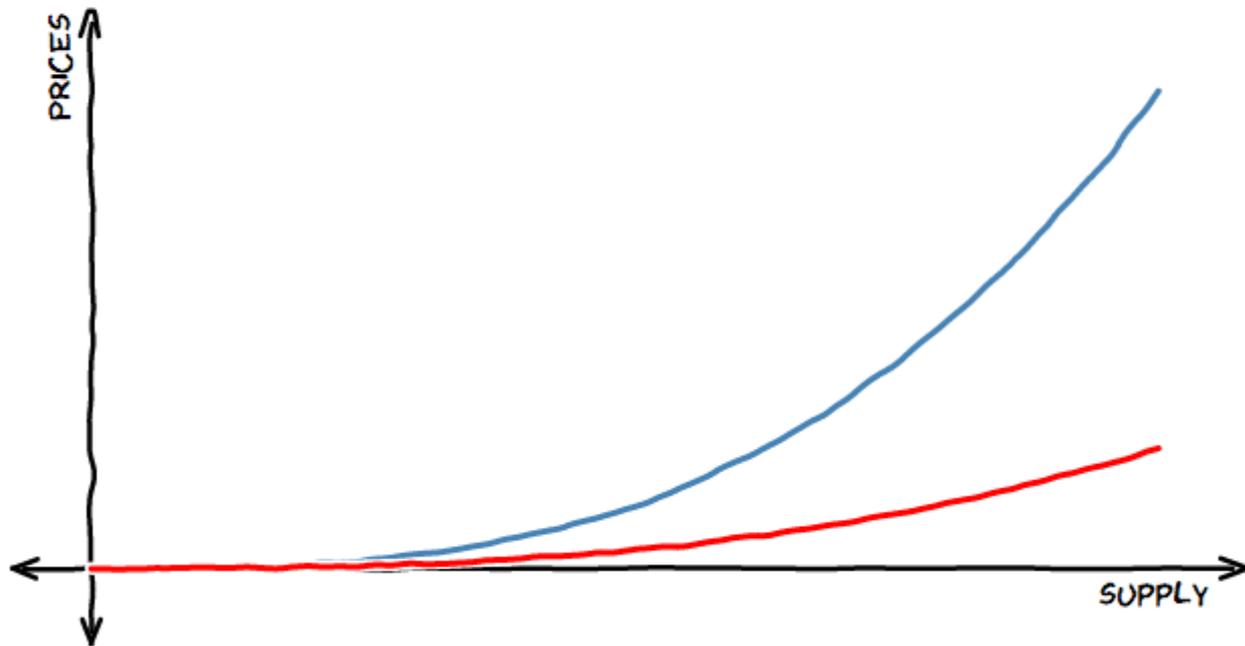


$$\text{currentPrice} = \text{tokenSupply}^2$$



Exponential

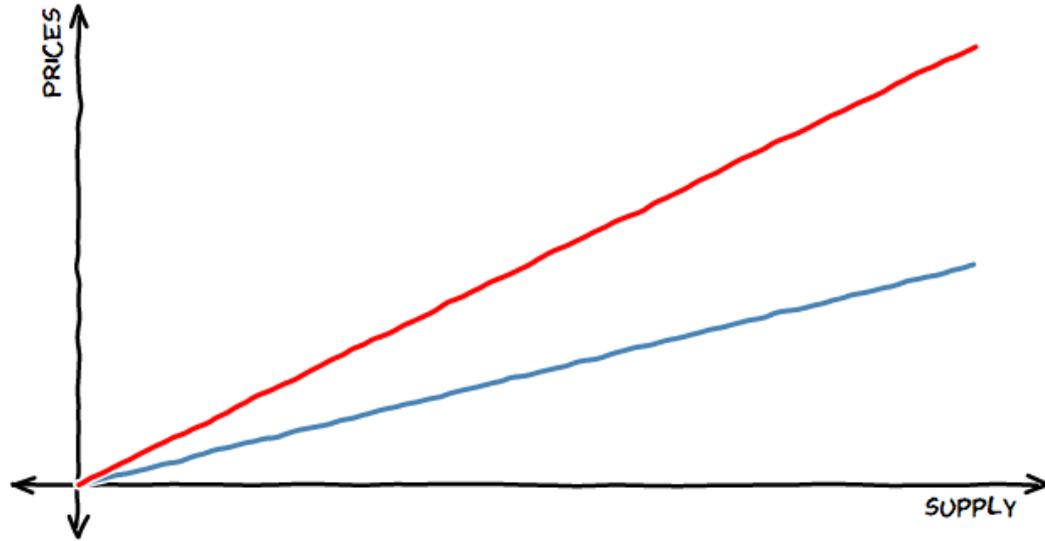
DIFFERENT IN (CEILING) & OUT (FLOOR)



Floor != Ceiling

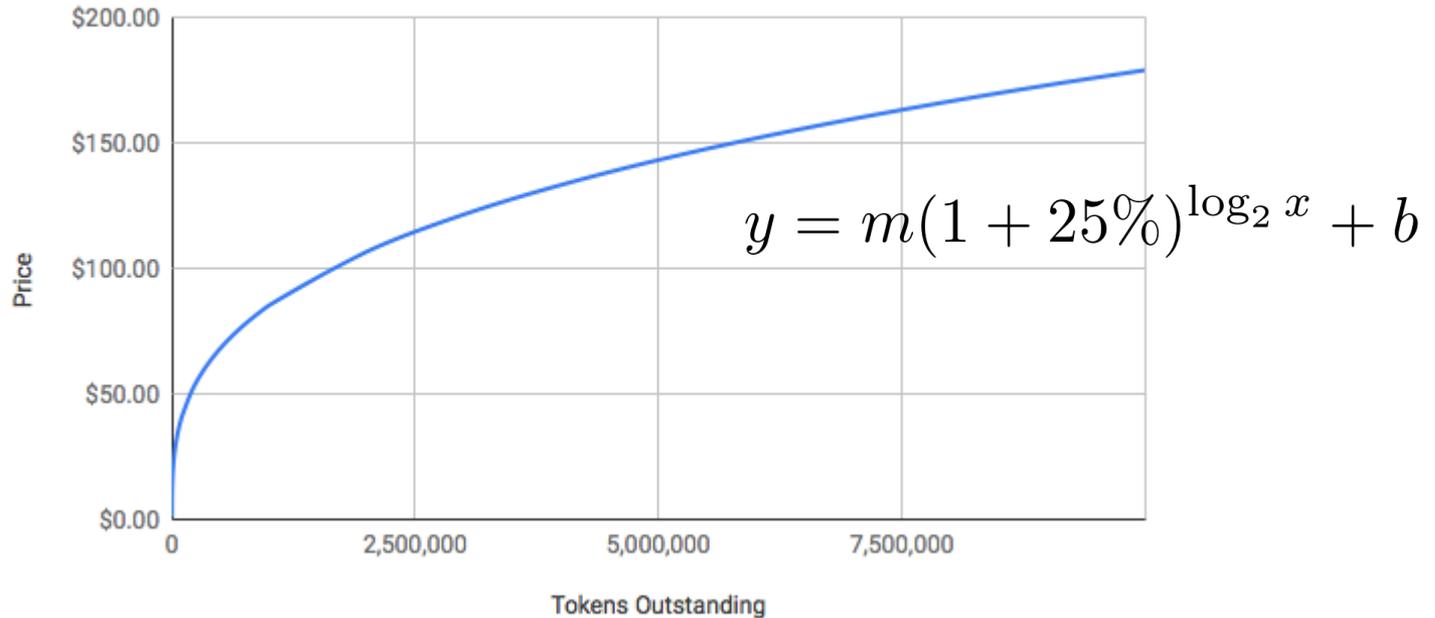
Linear

DIFFERENT IN (CEILING) & OUT (FLOOR)



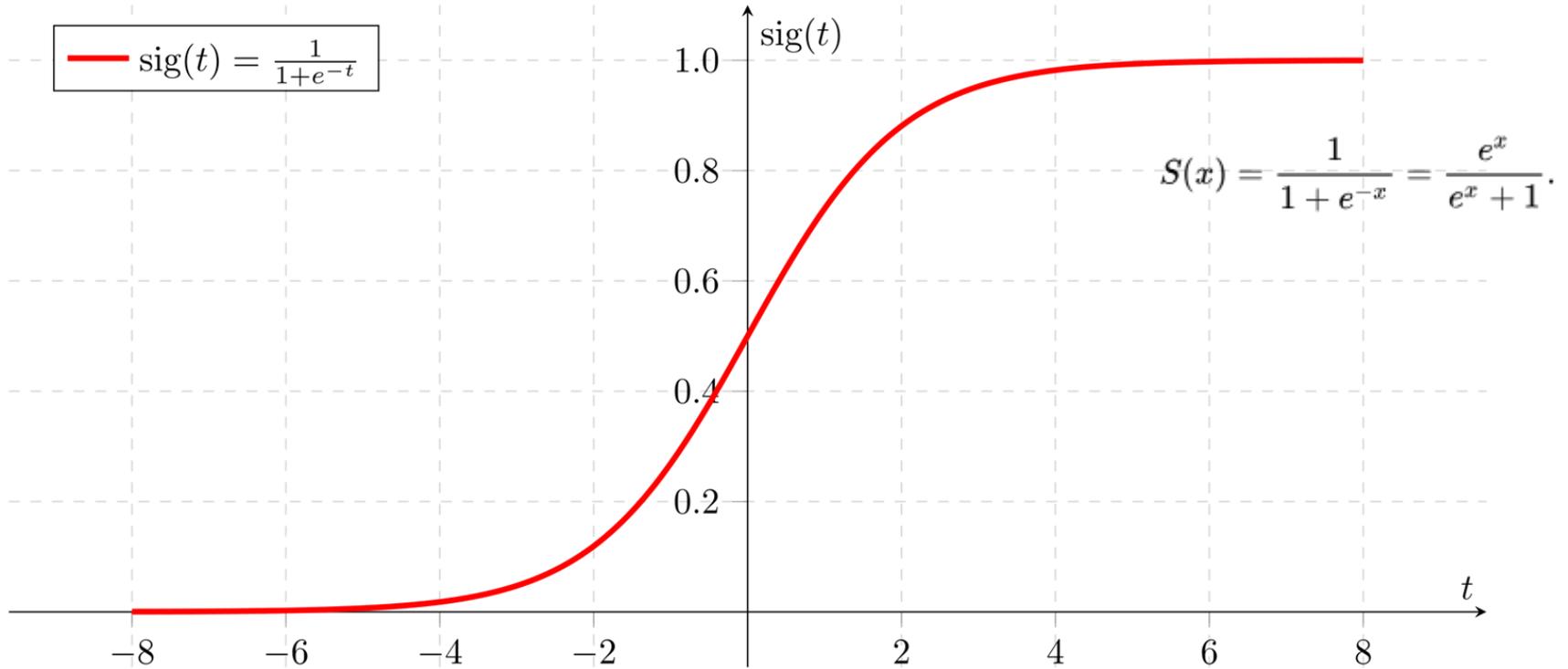
Rule based function

Price as a function of Tokens Outstanding



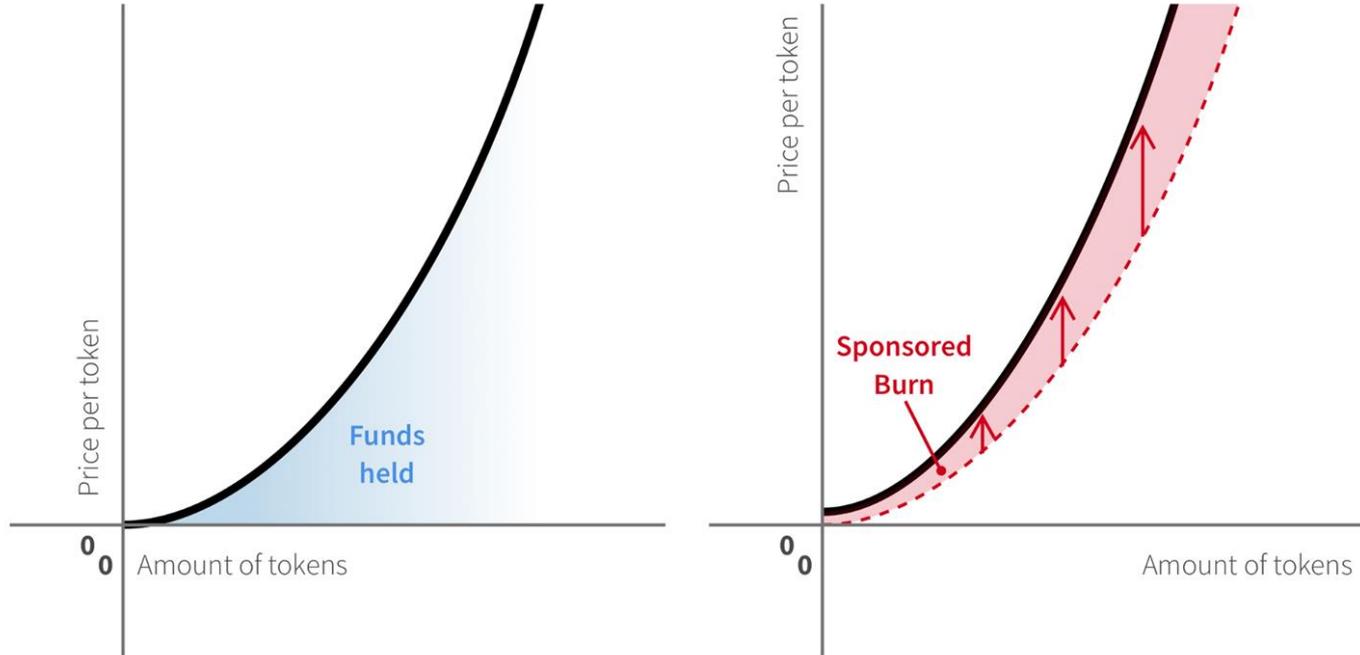
Token will appreciate by 25% for every doubling of the number of tokens issued

Sigmoid function



If we want price to stabilize after a certain point

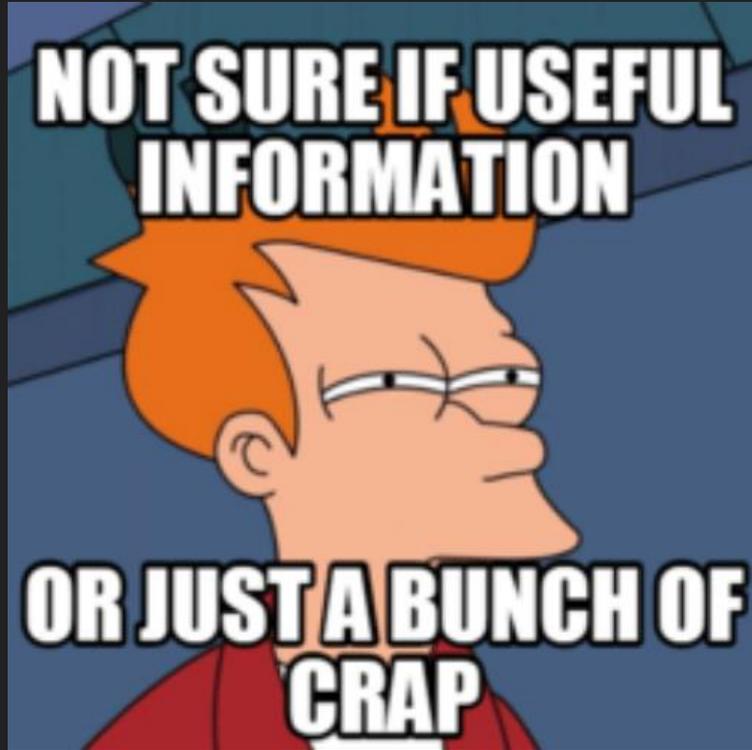
Sponsored burn



Everyone profits as curve is funded

**NOT SURE IF USEFUL
INFORMATION**

**OR JUST A BUNCH OF
CRAP**



Bancor

Bancor Tokens Relays Bounties

Pay With ETH → Enter Amount → Receive BNT → Enter Amount → Convert

NAME	24H CHANGE	PRICE USD	24H VOLUME	LIQUIDITY DEPTH	7D GRAPH	Buy	Sell
BNT Bancor	-0.06%	\$1.37	\$659,219	\$10,739,672		Buy	Sell
STORM Storm	+0.96%	\$0.007618	\$7,120	\$355,071		Buy	Sell
RVT Rivetz	+0.21%	\$0.104733	\$1,363	\$321,266		Buy	Sell
DBET Decent.bet	-2.22%	\$0.084694	\$49,014	\$302,407		Buy	Sell
BMC Blackmoon	+0.56%	\$0.286259	\$66	\$253,682		Buy	Sell
POE Po.et	+6.11%	\$0.009210	\$3,208	\$238,144		Buy	Sell
KIN Kin	-11.96%	\$0.000057	\$438,843	\$200,598		Buy	Sell
CLN Cebu Local Net...	-0.26%	\$0.017103	\$273	\$192,299		Buy	Sell
BAT Basic Attention ...	+7.72%	\$0.158996	\$25,477	\$186,617		Buy	Sell
DAI Dai	-2.66%	\$0.997174	\$57,539	\$178,228		Buy	Sell
BAX BVX	-1.51%	\$0.001184	\$80,000	\$133,300		Buy	Sell

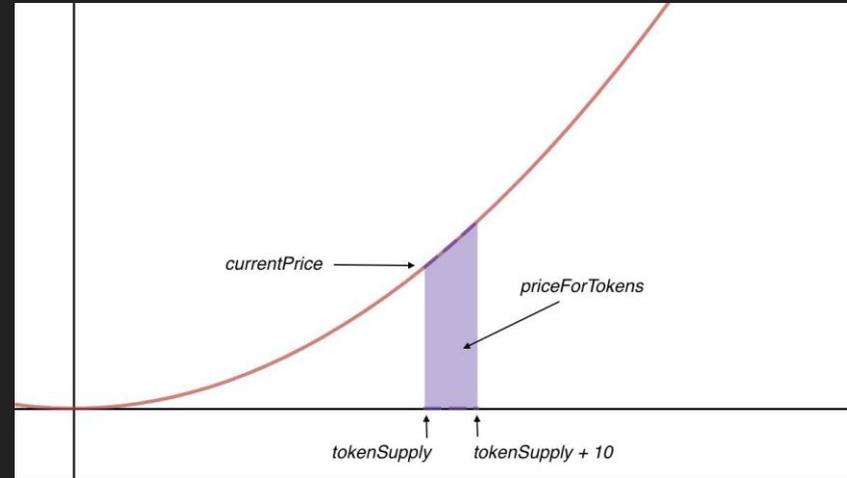
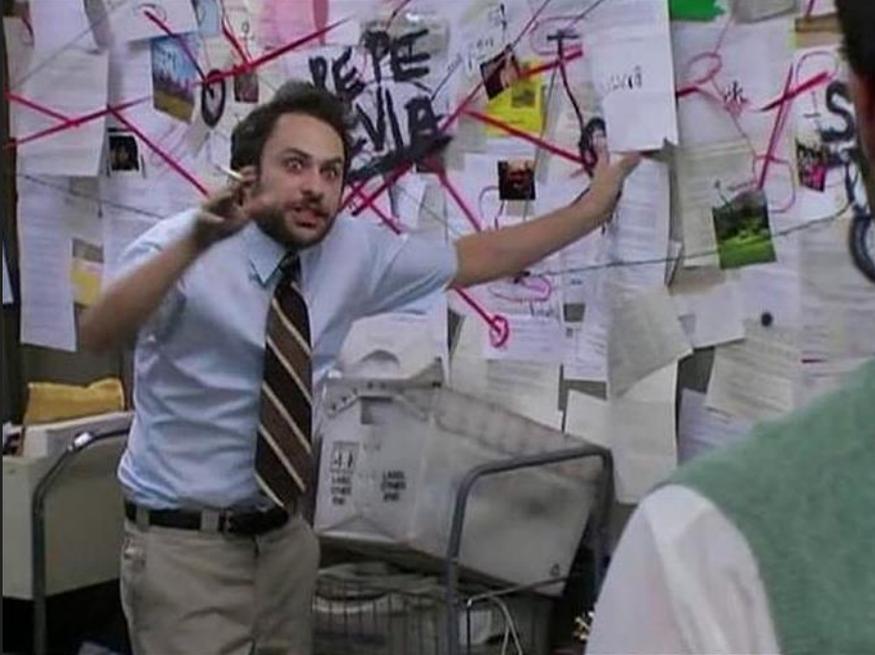
If a user buys a total of T tokens, bringing the total supply from S_0 to $S_0 + T$, the total paid amount is

$$\begin{aligned}
 E &= \int_{S_0}^{S_0+T} P dS = \int_{S_0}^{S_0+T} P_0 (S/S_0)^\alpha dS = \\
 &= P_0 S_0 \frac{(S/S_0)^{\alpha+1}}{\alpha+1} \Big|_{S=S_0}^{S_0+T} = P_0 S_0 \left(\frac{((S_0+T)/S_0)^{\alpha+1}}{\alpha+1} - \frac{(S_0/S_0)^{\alpha+1}}{\alpha+1} \right) = \\
 &= \frac{P_0 S_0}{\alpha+1} \left(\left(1 + \frac{T}{S_0}\right)^{\alpha+1} - 1 \right) = F P_0 S_0 \left(\left(1 + \frac{T}{S_0}\right)^{1/F} - 1 \right) = \\
 &= R_0 \left(\left(1 + \frac{T}{S_0}\right)^{1/F} - 1 \right) = R_0 \left(\sqrt[1/F]{1 + \frac{T}{S_0}} - 1 \right)
 \end{aligned}$$

From this we can deduce the amount of tokens T obtained by paying E :

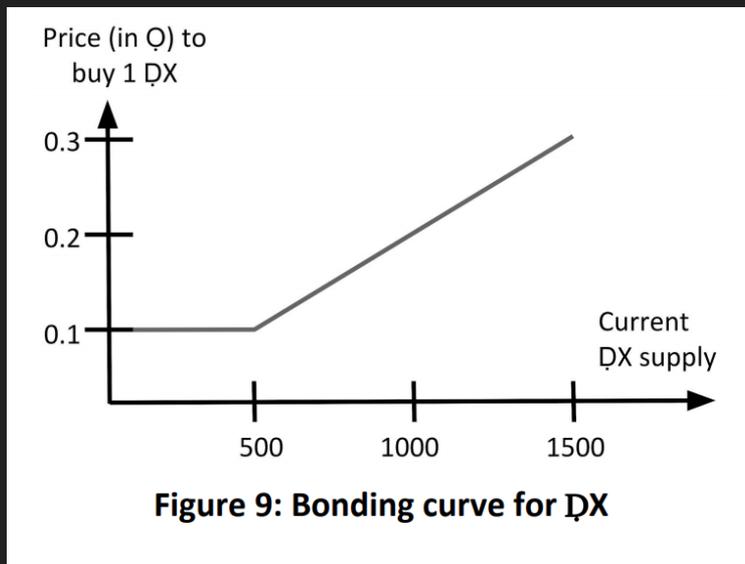
$$\begin{aligned}
 E &= R_0 \left(\sqrt[1/F]{1 + \frac{T}{S_0}} - 1 \right) \\
 1 + \frac{E}{R_0} &= \sqrt[1/F]{1 + \frac{T}{S_0}} \\
 \left(1 + \frac{E}{R_0}\right)^F &= 1 + \frac{T}{S_0} \\
 T &= S_0 \left(\left(1 + \frac{E}{R_0}\right)^F - 1 \right)
 \end{aligned}$$

Bancor

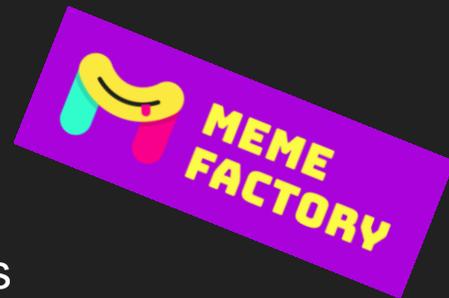


Ocean

Problem: Getting good quality AI datasets
Each datastore gets its own bonding curve



Token Curated Registries (TCRs)

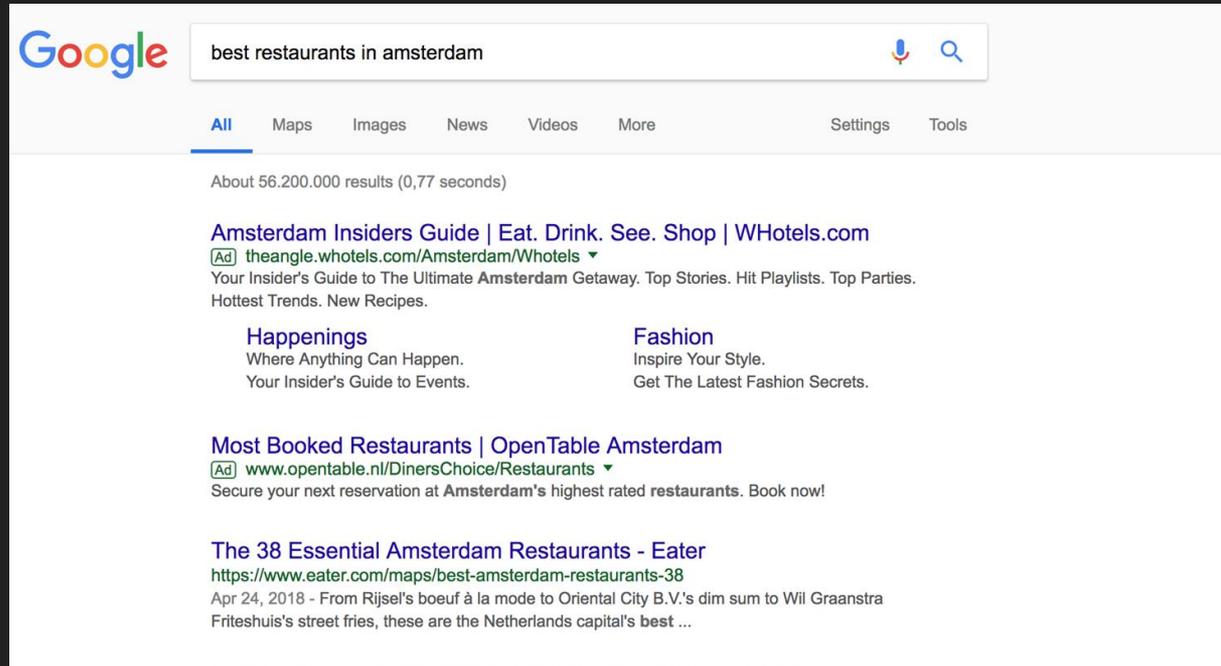


Curate a list, in a decentralised way, using economic incentives



Token Curated Registries (TCRs) / Curation markets

Curate a list, in a decentralised way, using economic incentives



The image shows a screenshot of a Google search page. The search bar contains the text "best restaurants in amsterdam". Below the search bar, there are navigation tabs for "All", "Maps", "Images", "News", "Videos", "More", "Settings", and "Tools". The "All" tab is selected. Below the navigation tabs, it says "About 56.200.000 results (0,77 seconds)". The search results include several advertisements and organic results. The first advertisement is for "Amsterdam Insiders Guide | Eat. Drink. See. Shop | WHotels.com" with a URL "theangle.whotels.com/Amsterdam/Whotels". Below this are two columns of text: "Happenings" with the subtext "Where Anything Can Happen. Your Insider's Guide to Events." and "Fashion" with the subtext "Inspire Your Style. Get The Latest Fashion Secrets." The second advertisement is for "Most Booked Restaurants | OpenTable Amsterdam" with a URL "www.opentable.nl/DinersChoice/Restaurants". Below this is an organic result titled "The 38 Essential Amsterdam Restaurants - Eater" with a URL "https://www.eater.com/maps/best-amsterdam-restaurants-38" and a snippet of text: "Apr 24, 2018 - From Rijssel's boeuf à la mode to Oriental City B.V.'s dim sum to Wil Graanstra Friteshuis's street fries, these are the Netherlands capital's best ...".

Google

best restaurants in amsterdam

All Maps Images News Videos More Settings Tools

About 56.200.000 results (0,77 seconds)

Amsterdam Insiders Guide | Eat. Drink. See. Shop | WHotels.com
(Ad) theangle.whotels.com/Amsterdam/Whotels
Your Insider's Guide to The Ultimate **Amsterdam** Getaway. Top Stories. Hit Playlists. Top Parties. Hottest Trends. New Recipes.

Happenings
Where Anything Can Happen.
Your Insider's Guide to Events.

Fashion
Inspire Your Style.
Get The Latest Fashion Secrets.

Most Booked Restaurants | OpenTable Amsterdam
(Ad) www.opentable.nl/DinersChoice/Restaurants
Secure your next reservation at **Amsterdam's** highest rated **restaurants**. Book now!

The 38 Essential Amsterdam Restaurants - Eater
<https://www.eater.com/maps/best-amsterdam-restaurants-38>
Apr 24, 2018 - From Rijssel's boeuf à la mode to Oriental City B.V.'s dim sum to Wil Graanstra Friteshuis's street fries, these are the Netherlands capital's **best** ...

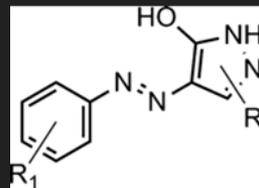
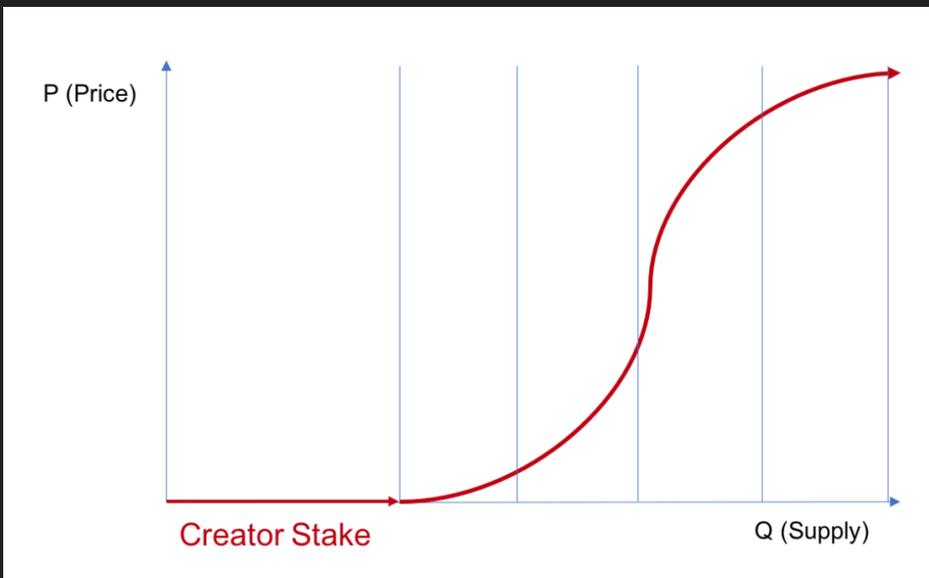
IT'S NOT ENOUGH TO JUST MAKE MEMES



COMBINING MEMES IS TRUE GENIUS

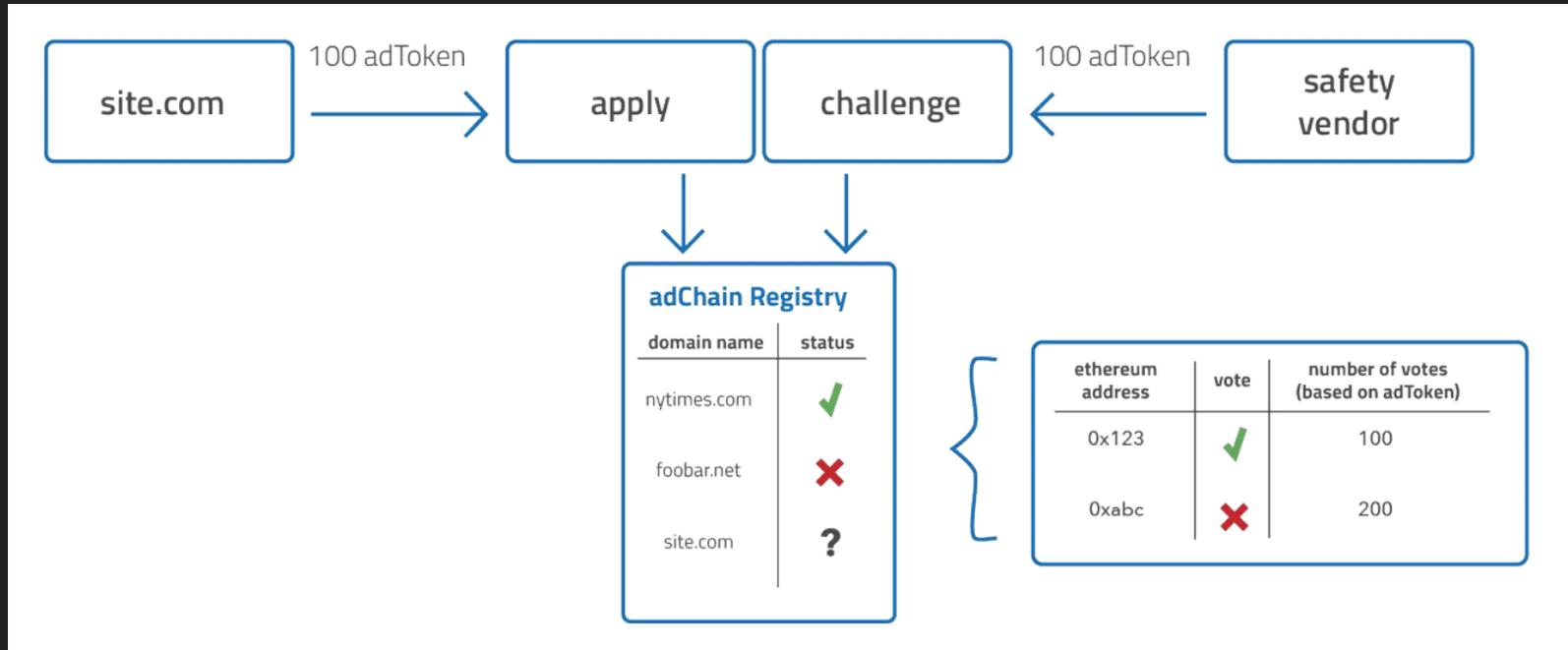
Molecule.to

Problem: funding potentially world changing drugs
NFTs, Funding, TCR, Token bonding curves



AdChain

Problem: Advertisers having the ads shown on fraudulent websites



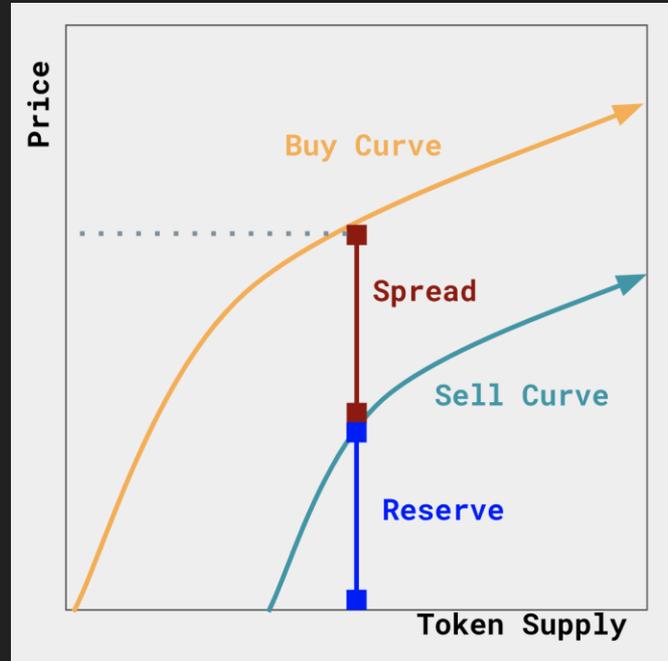


BUT WAIT!

THERE'S MORE!

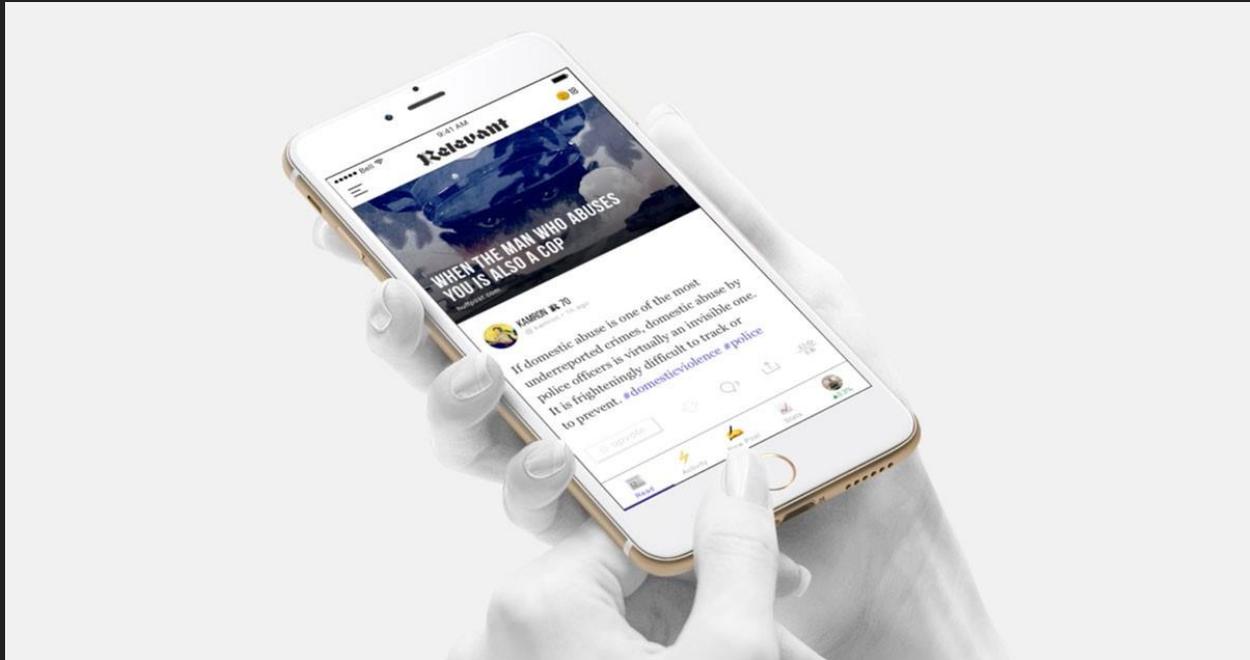
Convergent

Personal tokens to tokenize your work



Relevant

Curating news and content with bonding curves (instead of clicks)

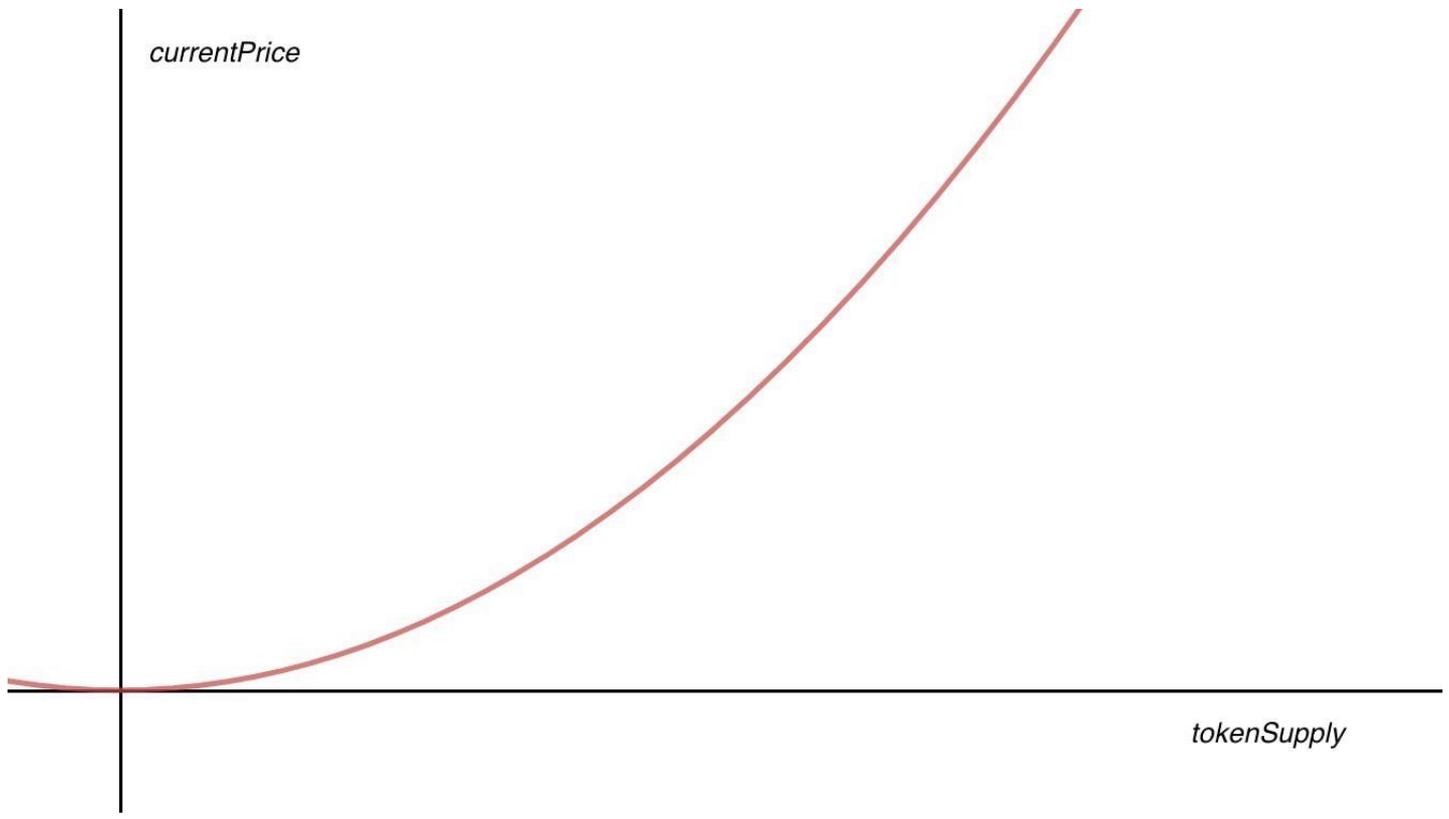


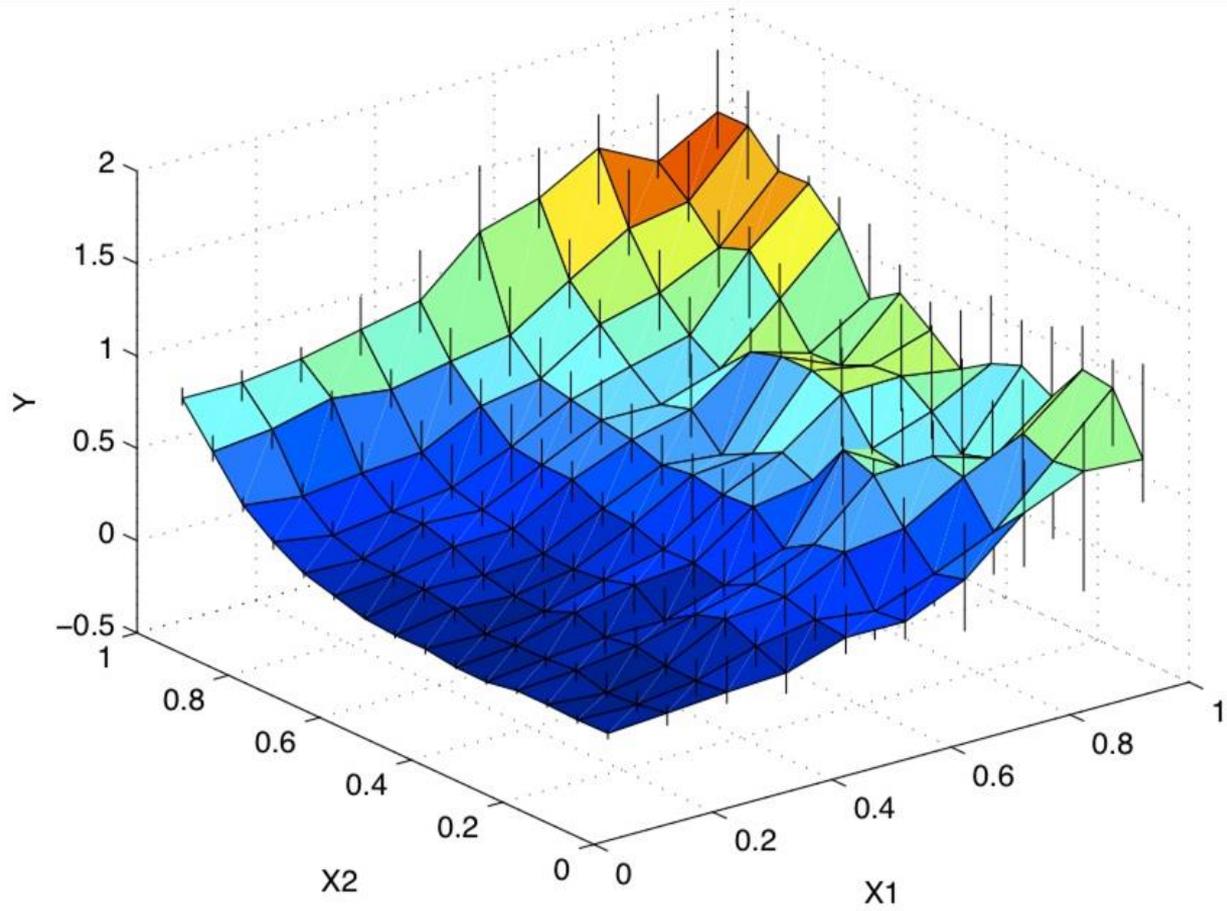


Bonding curves can be multi-faceted

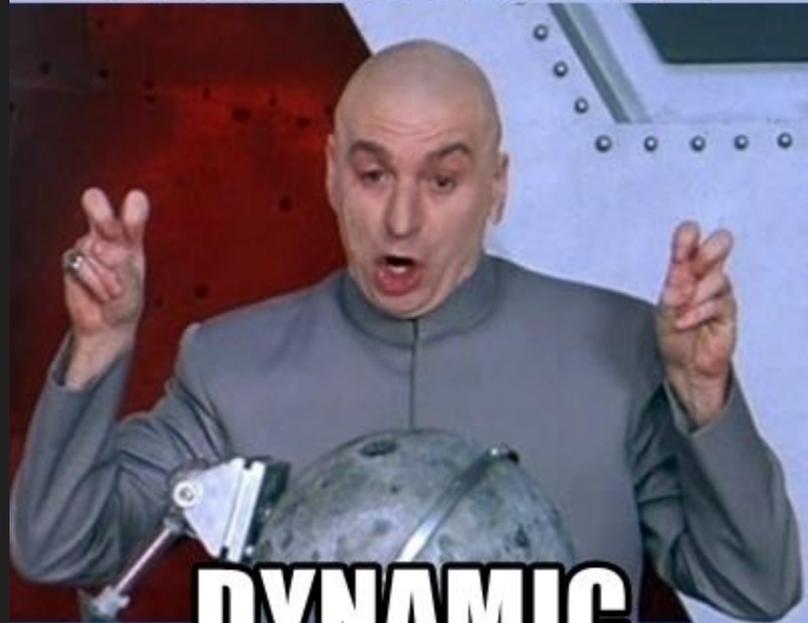
However most of the research and applications focus on 2D







I WANT IT TO BE

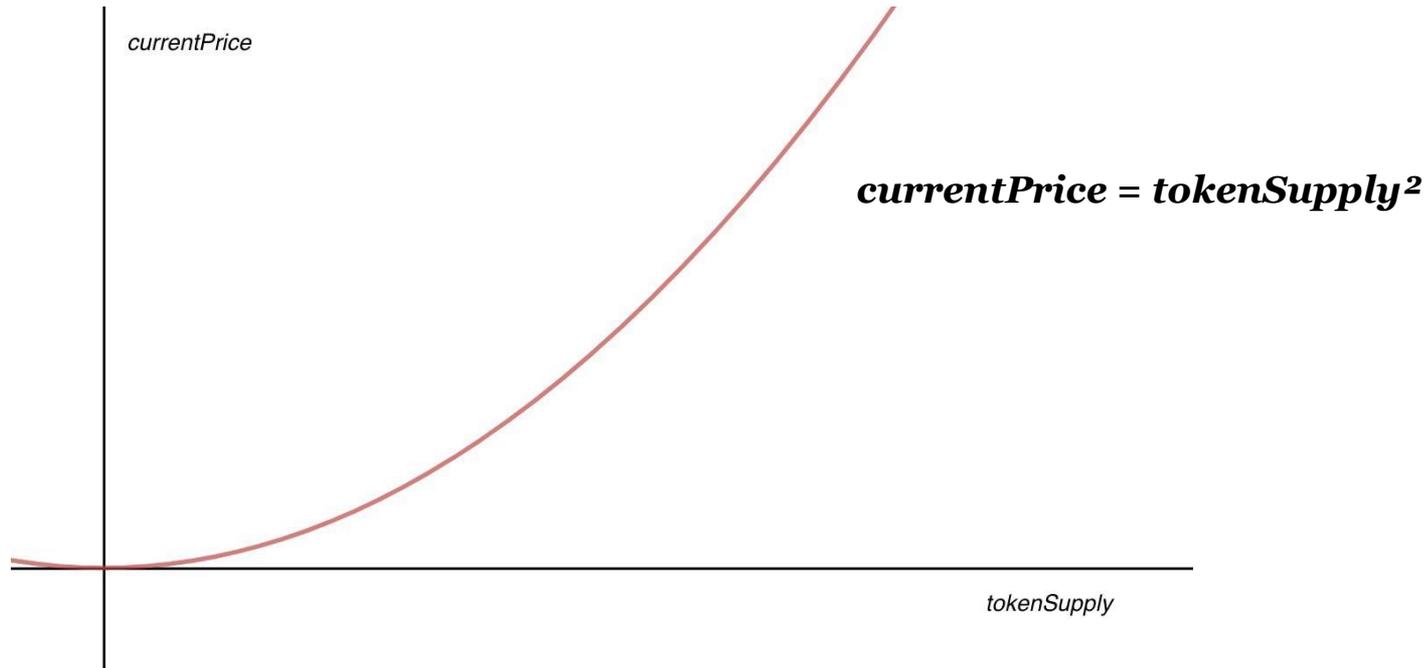


DYNAMIC

memegenerator.net

Dynamic Token Bonding Curves

Problem: how to incentivise and reward early participants fairly, penalise 'free-loaders'



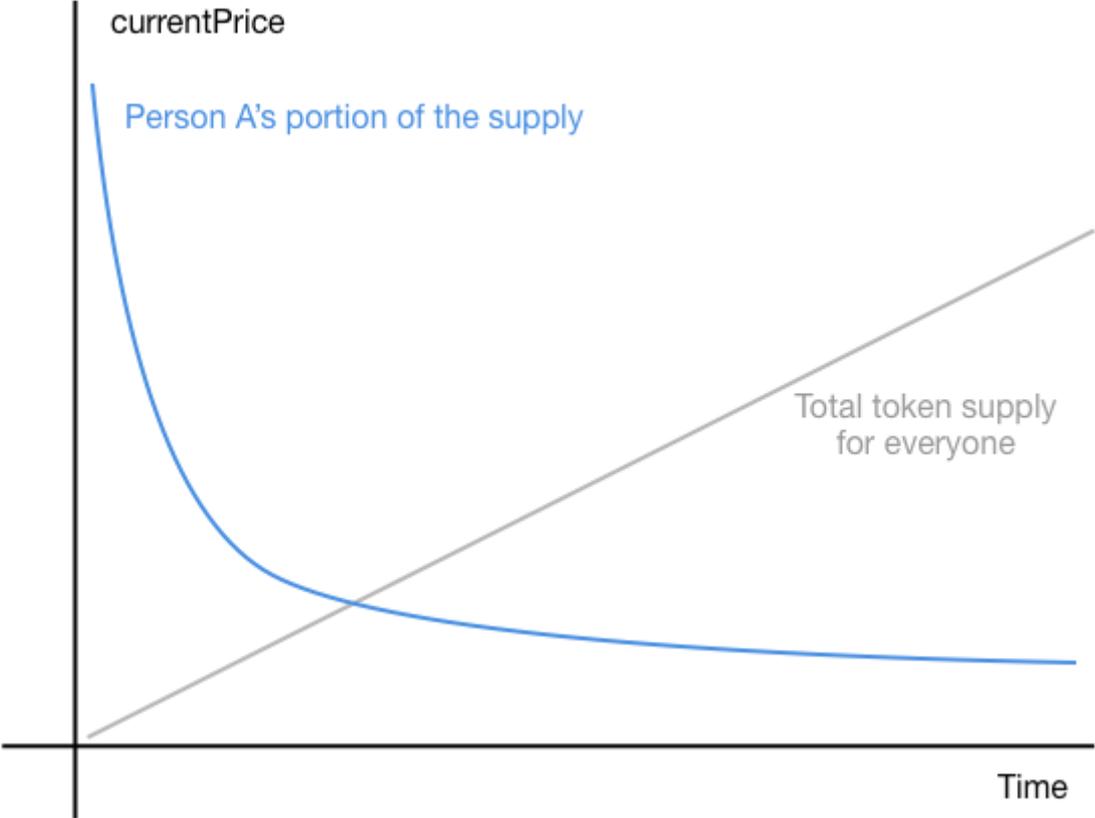
Dynamic Token Bonding Curves

Problem: how to incentivise and reward early participants fairly, penalise 'free-loaders'

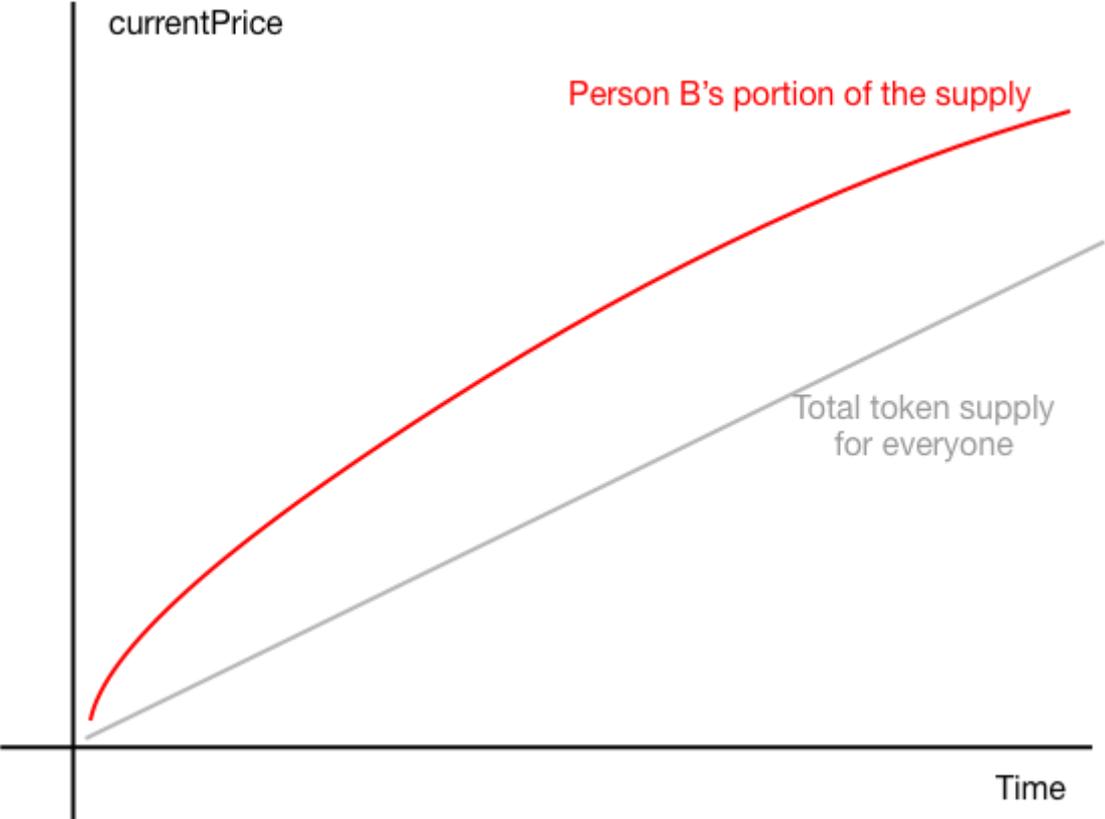
$$\textit{currentPrice}_i = f \left(\frac{\textit{numberOfTokens}_i}{\textit{tokenSupply}_{total}} \right)$$

The current price of the token is a function of the individual's portion of the total supply.

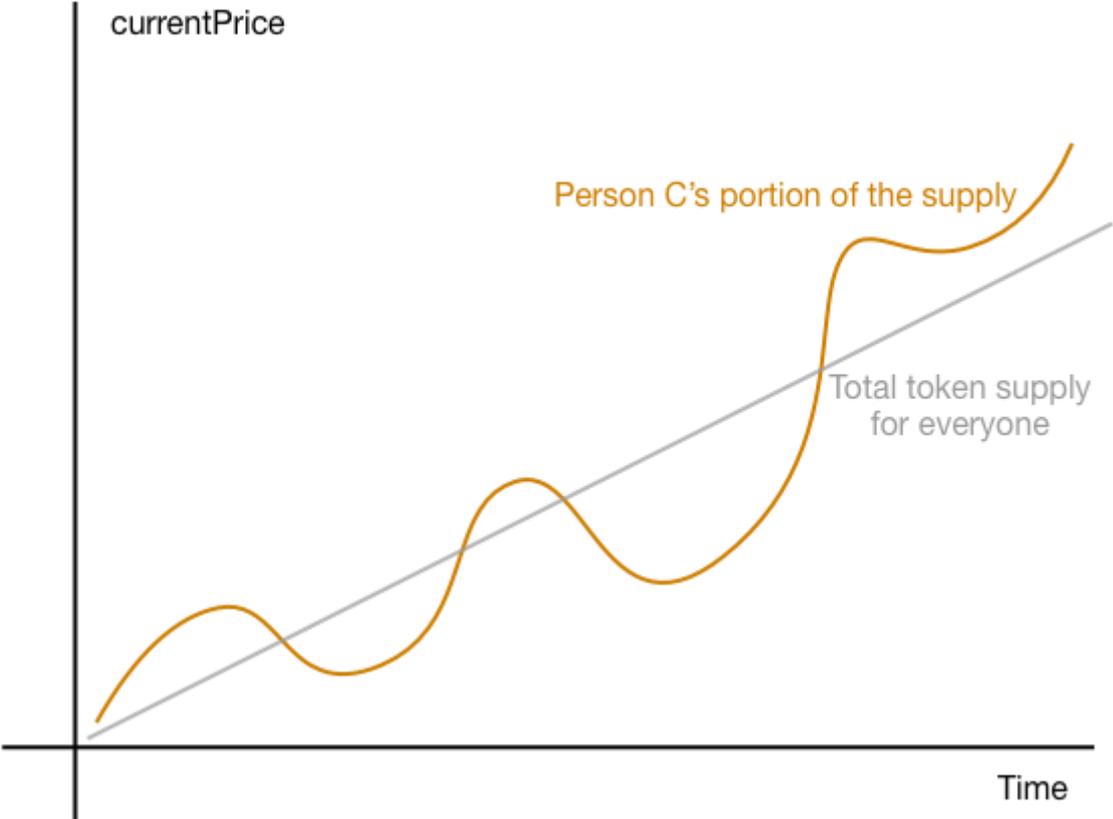
Dynamic Token Bonding Curves



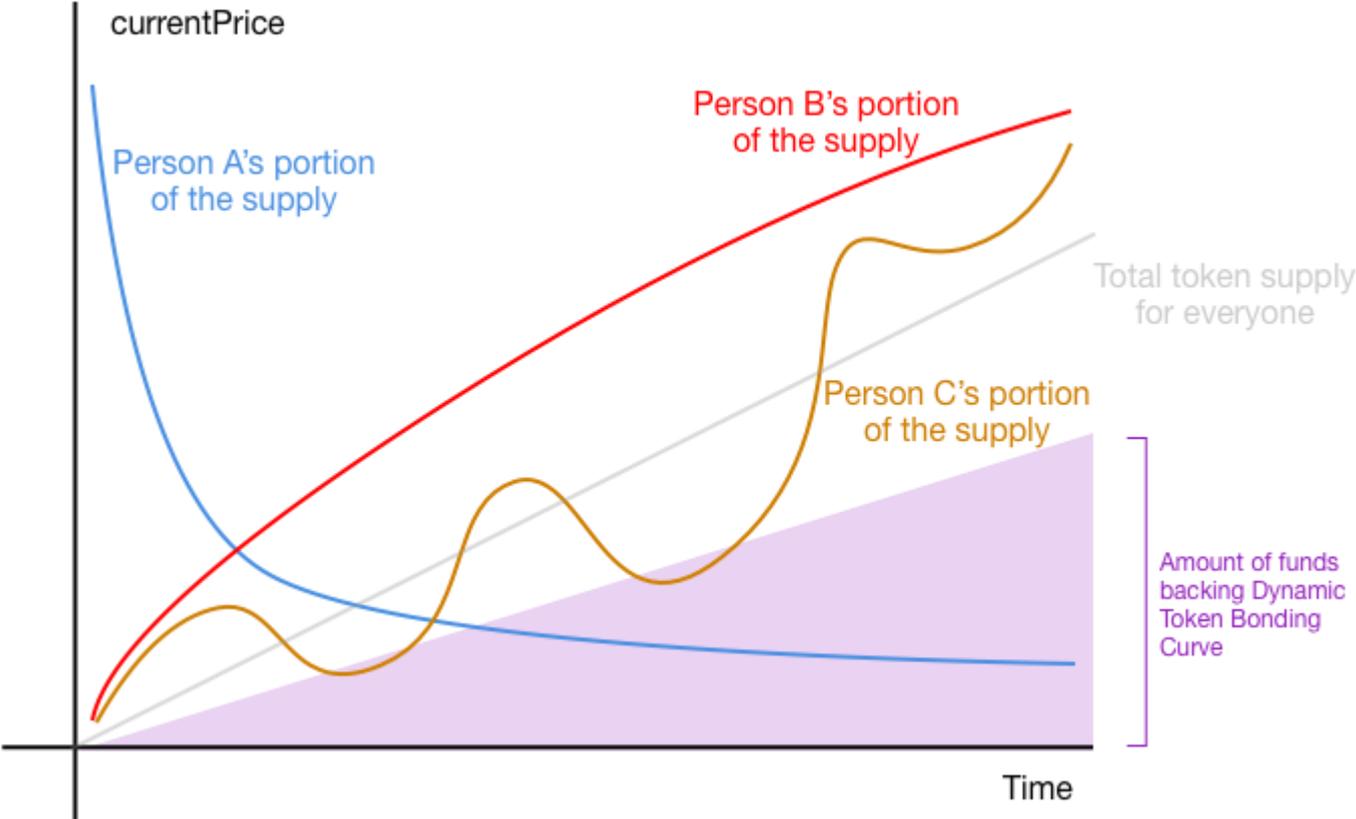
Dynamic Token Bonding Curves



Dynamic Token Bonding Curves



Dynamic Token Bonding Curves



Dynamic Token Bonding Curves

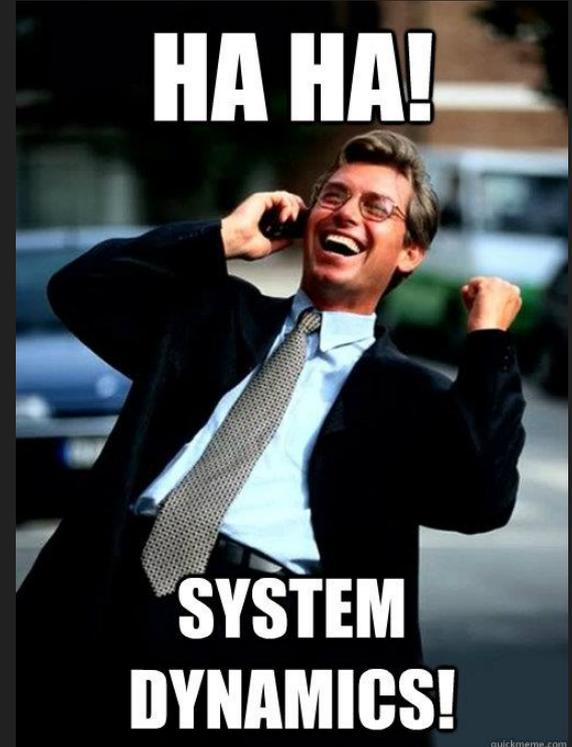
Contribute early and often = very high value

Contribute often = high value

Contribute occasionally = some value

Contribute rarely = small value

Never contribute = no value



Other use cases for Dynamic Token Bonding Curves

Bonded contributions (communities, product development, bounty allocation)

Bonded donations (who has helped charity the most)

Bonded governance (who gets to govern)





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<http://khana.io>

<http://buidl.amsterdam>