Harberger taxes for virtual property

用哈伯格税支配虚拟资产
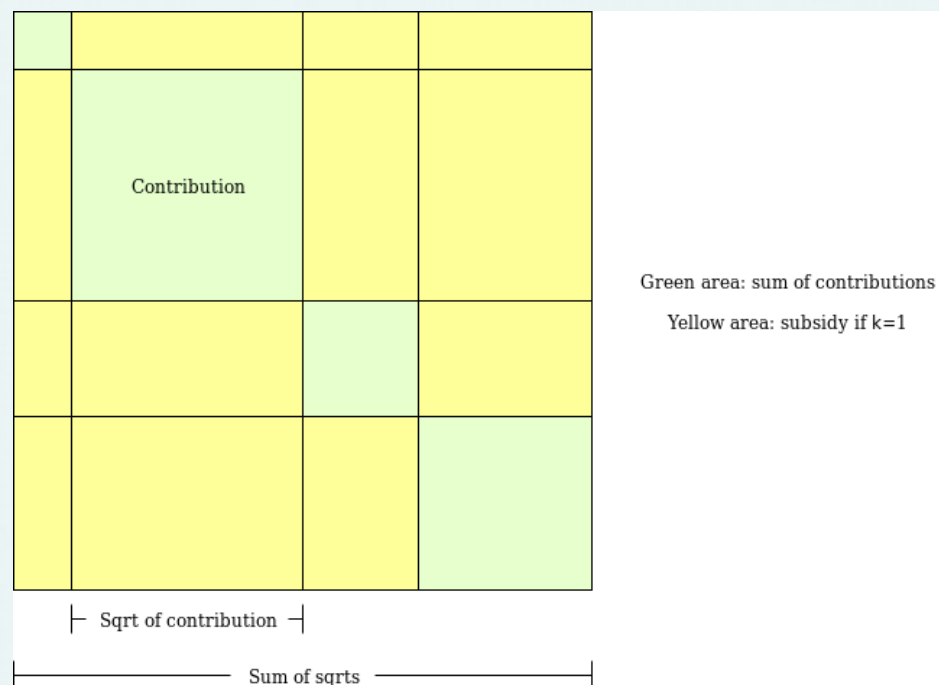
Vitalik Buterin, 2019.07.16

Fees and taxes are unpopular... but we need them!
很多人不喜欢费用和税... 但是我们需要它们

- We love quadratic funding (yay, more money for public good projects!) but the funding needs to come from somewhere

- 我们爱二次融资（公益项目能融资，棒棒哒），但是需要有资金补贴二次融资...

Contribution

Green area: sum of contributions
Yellow area: subsidy if k=1

Sqrt of contribution

Sum of sqrts

Fees and taxes are unpopular... but we need them!
很多人不喜欢费用和税... 但是我们需要它们

- Often, charging fees decreases efficiency (eg. charging $10 to download a movie hurts everyone who is not willing to pay $10 and this is pure *deadweight loss*), but well-designed fees can *increase* efficiency

  很多时候，收费降低经济效率（比如，收取10美元的费用下载电影伤害任何不愿意支付10美元的人 (无谓损失)，但是有时候收费能提高效率


The monopoly solution with zero marginal costs
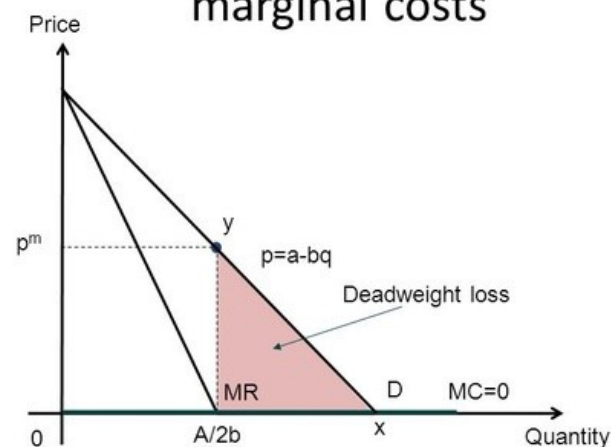
The monopolist will choose output A/2b, at which the marginal revenue equals the marginal cost of zero. At the welfare-optimal output level, x, the price equals zero. The deadweight loss is area (A/2b)xy under the demand curve and between the monopoly and welfare-optimal output levels.

In a perfect economy...
在一个完美的经济体系....

"Tax the congestible and subsidize the increasing returns" - Glen Weyl

"向拥挤公共物品征税以增加对于规模报酬的补贴"

Activity causing congestion 增加拥挤的行为	Tax 征税 → Subsidize 补贴	Activity that helps others 帮助别人的行为
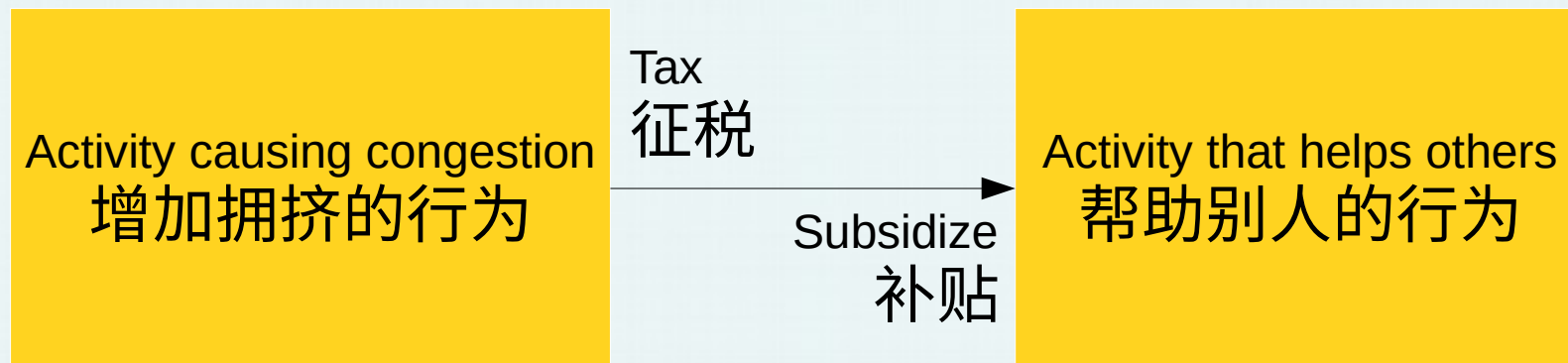
The monopoly problem
垄断的问题

- Suppose I have an apple, and I value the apple at $2 (so I am willing to give it to you if you pay >$2)

  假设我有一个苹果，这个苹果对我的价值等于2美元（也就是说，如果你付给我超过2美元，我愿意给你这个苹果）

- You want the apple, and value it at $3. But I don't know that, I think, maybe you value it at $3, maybe at $10

  你想要这个苹果，你愿意付3美元，但是我不知道你愿意付多少，我认为，可能3美元，可能10美元

- At what price should I offer to sell?

  我应该以什么价格卖给你?

- If I sell at $2.01, you will definitely get the apple if you value it more than me, but then I make no profit

  如果我要2.01美元，如果你愿意在苹果上花的价格比我高，你肯定会买到苹果，但是这样我没有利润

- So I might sell for $2.5, or $4. But then there is a high risk I overestimated how much you are willing to pay, and so a mutually beneficial transaction does not happen

  所以我可能要2.5美元，或者4美元。但是这样有高的风险：我大可能高估你愿意付多少，你不会买，所以一个对双方都有好处的交易会失败

The monopoly problem, hyperloop edition
垄断的问题，hyperloop版本

- Elon Musk wants to buy a row of 10000 farms, to use the land to build a hyperloop

  Elon Musk 想买10000个农场，用这个土地做个hyperloop

- Problem: if 9999 others agree, the last farm owner has incentive to charge extremely high price, as Elon has no choice but to pay up

  问题：即使9999别人都同意，最后一个农场的持有者有激励受非常高的价格，因为Elon不得不买

Harberger taxes
哈伯格税

- For any asset, the owner must specify a price at which they are willing to sell the asset

  任何资产的持有者需要公布一个价格，表示愿意按照这个价格愿意将这个资产卖给任何人

- The owner must pay a percentage of that price (eg. 1%) every year
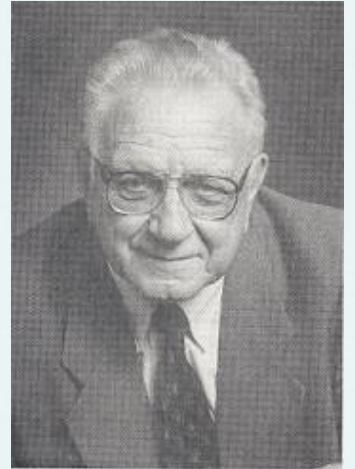
  持有者需要按这个价格（比如，这个价格的1%）每年付费

- Goal: counteract the monopoly effect, encourage more things to be available at reasonable prices

  目标：抵消垄断问题，鼓励更多的资产按合理的价格可得到

- A version of this was proposed by Sun Yat-sen in 1905

  1905年孙中山提出了一个类似的方案：https://www.jstor.org/stable/30027160

ENS domains 域名

- DNS-like name system used inside Ethereum ecosystem 以太坊生态用的区块链上类似于DNS域名体系

- 2017-19: second-price sealed-bid auction 第二價格密封拍賣

- Now: fixed annual fee 现在：固定的年费

- Problems 问题：

  - Often, annual fees are too high (eg. 12 letter names), hurts efficiency 有时候（比如，12字母的域名）年费太高了，伤害经济效率

  - Often (eg. common words, 4 letter names) annual fees are too low, leads to domain squatting and monopoly inefficiencies 有时候（比如，常用的词，4字母的域名）年费太低了，导致域名抢注和垄断问题

  - Unfair, overly privileges people today over people 20 years from now 优惠现在的人，对20年后的人不公平

Option 1: Simple Harberger tax
现象1：普通的哈伯格税

- Every holder of a domain must specify the value of their domain

  每个域名的持有者需要公布域名的价格

- They must pay 3% of that per year

  持有者需要每年付公布的价格的 3%

- Anyone can automatically buy at that price and take control after a 3-month waiting period

  任何人能按公布的价格买你的域名，3个月后开始控制域名

Problems 缺点

- Owners are not good at calculating how much they value their own domains, they are better at evaluating "yes or no" on given sell prices

  持有者不善于计算他们按什么价格愿意卖自己的域名；他們更善于對別人提的价格來評估表示"同意"还是"拒绝"

- Not enough stability for owners

  对持有者而言不够稳定

Option 2: auction-set annual fees
选项2：用拍卖制定年费

- Every domain has an associated bidding smart contract, anyone can place a bid

  每个域名都有绑定的拍卖智能合约，任何人都能投标

- Bidding X on a domain requires sending X ETH to a smart contract (unless the bid is accepted, you can recover the ETH at any time by withdrawing the bid)

  投标 X 需要发 X 以太币给合约（如果你的投标还没被接受，你随时能退出，拿回你的以太币）

- Owner has the ability to accept the top bid at any time

  域名的持有者随时能接受最高的投标

- Owner charged annual fee based on (eg. 3% of) the top bid

  持有者需要按照最高的投标（比如，每年最高的投标的3%）付费

Modifications
改善

- Cap the rate at which fees can change (eg. to 2x per 3 months)

  限制年费的涨幅（比如，3月内只能涨2倍）

- Cap the annual fee (eg. to $100 per year)

  限制年费（比如，每年100美元）

Problems 缺点

- Does not solve monopoly problems as effectively

  - If I see you already bought one domain (eg. ethereum.eth), I can check what other domains you might want (eg. etherium.eth, etereum.eth, ether.eth) and raise the price (under simple Harberger tax you can buy all at the same time)

  - 如果我看到了你已经买了一个域名（比如，ethereum.eth），我能猜你想买什么别的域名，提高价格（如果用普通的哈伯格税，你能同时买所有想要的域名）

Advertising space 广告空间

- Advertising is potentially a good way to fund user-facing software

  广告可能适合为前端软件提供资金

- Incentive tied directly to getting more users

  诱因激励跟用户量是直接绑定的

- Should we use Harberger taxes to sell advertising space?

  我们要不要用哈伯格税卖广告?

任何人能付给我1000台币在这里放你的广告！

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Just use auctions?
直接用普通的拍卖?

- Have an auction every day for what ads appears the next day

  每天用拍卖决定下一天放什么广告

- What's the problem here?

  有什么问题?

Just use auctions?
直接用普通的拍卖?

- Harberger taxes are designed to compromise between **allocative efficiency** (ensuring each item goes to whoever needs it most) and **investment efficiency** (preserving incentive for long-term investments)

  哈伯格税用于分配效率（保证每个资产的持有者是最需要那个资产的人）和投资效率（保持长期投资的激励）之间做妥协

- Domain names need investment efficiency (because making a project with a name is an investment), but do ads?

  域名需要投资效率（因为做一个有名字的产品是一种投资），但是广告需要吗?

- Often no, but sometimes yes (keywords)

  通常不需要，有时候需要（关键字）

Where not to use Harberger taxes?
在哪里不应该用哈伯格税？

- Property is fungible, no monopoly issues (eg. Coins)

- 资产是可互换的，没有垄断问题（比如，币）

- No need for investment efficiency

- 不需要关心投资效率

- Less than perfect ownership stability too risky

- 不完整的持有者稳定性有太高的风险

Where to use Harberger taxes?
在哪里能用哈伯格税？

- Digital assets in games and virtual worlds

  游戏和虚拟世界的资产

- Positions in caches

  高速缓存(快取)的定位

- Future block space in blockchains at specific times

  区块链的特定未来时间的区块空间