Commonwealth: A Savings Fund for the World

Abstract. Commonwealth is a global savings fund that allows its users to own micro-equity and share fees from its use. Whenever a payment is made into Commonwealth, a portion is distributed instantly as a dividend to every participant who holds a "Point" token. Users in the sharing economy can accept Points as currency in exchange for work, and become part-owner of the savings fund. To create new Points to pay or save with, we deposit a base currency into a smart contract which pays a dividend to the whole network. At any time, users can liquidate their Points to withdraw the base currency which distributes more dividends to the network Multiple independent organizations can pay service providers or users in Points and the whole ecosystem wins if any one of the organizations succeeds.

	Gatekeeper Model	Commonwealth Model
Profits	Excess profits and fees goes to intermediaries and processors.	All fees (10% for each transaction) are distributed instantly and proportionally as a dividend to users.
Governance	Entire network controlled by a gatekeeper. Top-down approach.	Neutral economic base layer. Bottoms-up, competitive governance.
Growth	Subsidized, artificial growth.	Localized, organic growth.
Incentives	Gatekeeper charges customers as much as possible, and pays service providers as little as possible.	All participants want Commonwealth to be used as much as possible. Crowds are incentivized via micro-equity.
APIs	Access to system can be revoked at any time. Mutual distrust between gatekeeper and all parties.	Distributed base layer cannot censor any users or companies. Facilitates partnerships and mutual data sharing.

1. Introduction

The development of the Internet has allowed for the creation of the sharing economy. The sharing economy matches individuals that can provide useful goods and services (rides in a car, renting out a room in a house, loaning out an expensive tool, etc.) with customers through a centralized platform. The difference between the price the customer pays, and what the provider receives, is the profit. Currently, all profits are captured by the company that runs the platform. This means if a service provider is unable to work for a period of time, they receive no income from the platform, despite the work they have done in the past. A platform derives a large part of its value from simply having many service providers and users on it, similar to how an exchange needs market makers.

What we propose is a system that can allow providers to sell their goods and services, and continuously earn passive income from the work of others on the platform, a digital cooperative. Repeat customers should also be able to earn a portion of cash profits as a loyalty program to incentivize repeat business. An advantage of Commonwealth, is that it views all stakeholders: providers, users, or speculators similarly — mirroring the fluidity of the sharing economy itself.

Commonwealth does not depend on any particular blockchain protocol to be developed on, since it is fundamentally an accounting program that can run on any computational system. However, currently its peer-reviewed reference implementation [1] exists as a smart contract on the public Ethereum Classic (ETC) blockchain. ETC is a censorship-resistant system which can run Commonwealth without a central controller, and manage frequent international payments with minimal overhead. [2]

2. Accounting

The accounting of Commonwealth is directly inspired by traditional cooperative businesses [3] and consists of four main rules:

1. For a Point (the currency of Commonwealth) to be minted, a base currency must be locked up at the current price. This increases the price of the next Point by the increment amount.
2. When a Point is minted, 10% of the currency being locked up is distributed amongst all Commonwealth participants proportional to the number of Points they own.

3. At any time a Point can be redeemed and destroyed. This retrieves the base currency at the given price, and decreases the price of the next Point by the decrement amount.
4. When a Point is sold, a 10% penalty fee is distributed amongst all other Points holders proportionally.

This system creates a source of passive income for Points holders who receive cashflow from the minting and redemption of a new Point (i.e. the operation of a payment processor). As other users enter or exit the system by either creating Points or being airdropped them as payment for services, the fees this generates is distributed instantly and predictably across the entire network. The way the price increments up and down for the creation of new Points is also important. Because every new Point is slightly more expensive than previous Points, long-term participants are rewarded for growing the network. By incrementing and decrementing the price, the system always remains collateralized in terms of underlying base currency. However, it provides no guarantee to the Points holder that the price they will be receiving when they redeem will be greater than what they received it at, only that they will get something in return.

The canonical implementation of Commonwealth uses the following parameters:

- 0.0000001 ETC for the first Point price.
- 0.00000001 ETC up or down for each new Point created or redeemed.
- 10% as the fee for creating or redeeming Points.

These price to create a single new Point in the system outlined above can be expressed with the following formula:

$$PriceOfShare_k = \sum_{k=1}^{s} (0.0000001 + k * 0.00000001)$$

3. Cooperative Marketplace

For Commonwealth to grow successfully, it needs to be integrated directly into a marketplace that leverages its equity model.

Imagine a ride sharing service, similar to Uber, for a small local area. A group of developers who hold Points can create an app, that mints Points for drivers and users after every ride. If the ride costs $50, the system can process the payment as fiat and give back $4 to the driver, and $1 back to the user in Points, on top of the

$45 fiat payment to the driver. Every time a ride is done, the system fees incurred by generating new Points (+$0.50) goes to all other users globally. The user and driver can then choose to either hold the Points and are now incentivized by the system, or can choose to redeem, which generates fees (+$0.50) for all other participants. The top hat in the figures represent those that receive profits from the ride-share. In Fig. 1, it is the investors in Uber, Lyft, etc. In Figure 2. it is the Points holders themselves (customers, drivers, developers, etc.)
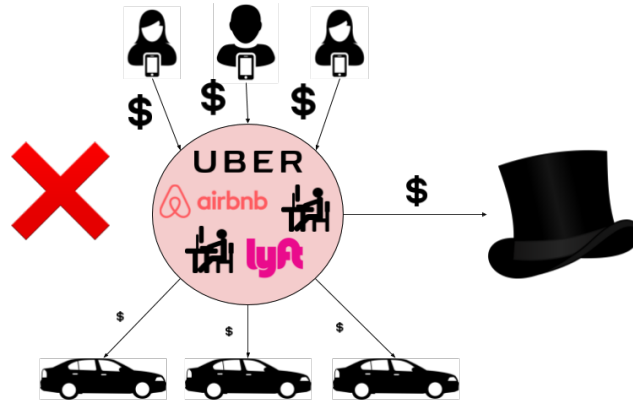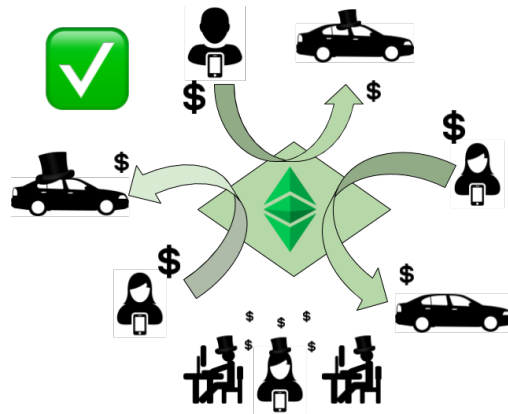

Fig. 1: Traditional "Gatekeeper Model"

Fig 2: Incentivized "Commonwealth Model"

This gives Commonwealth an edge over the centralized ride sharing service, because it allows the network of participants to grow horizontally, by incentivizing participation amongst new users and drivers, and vertically, by giving Commonwealth drivers a reason to provide quality service.

It's important to recognize that there can be multiple competing marketplaces providing similar services built on top of Commonwealth. While one ride sharing

service may charge a premium for making a better app over another, as long as both services create the same underlying Points on every job, users and drivers can go between both of them at will — similar to how miners in a blockchain go between mining pools. These marketplaces are simply intermediaries between customers and service providers and can be swapped out as needed.

Another interesting feature, is that as one marketplace is successful, other marketplaces can crop up in parallel to take advantage of the network effect. They can offer the same Points for a home rental service, or online e-commerce website. This potential for global growth and connectivity between service providers makes it easier for users to not be tied financially to one location or job. Participants now have the ability and incentive to join Commonwealth in another place, and keep working. Technologists can bounce between multiple projects in the ecosystem and earn a passive income from the network.
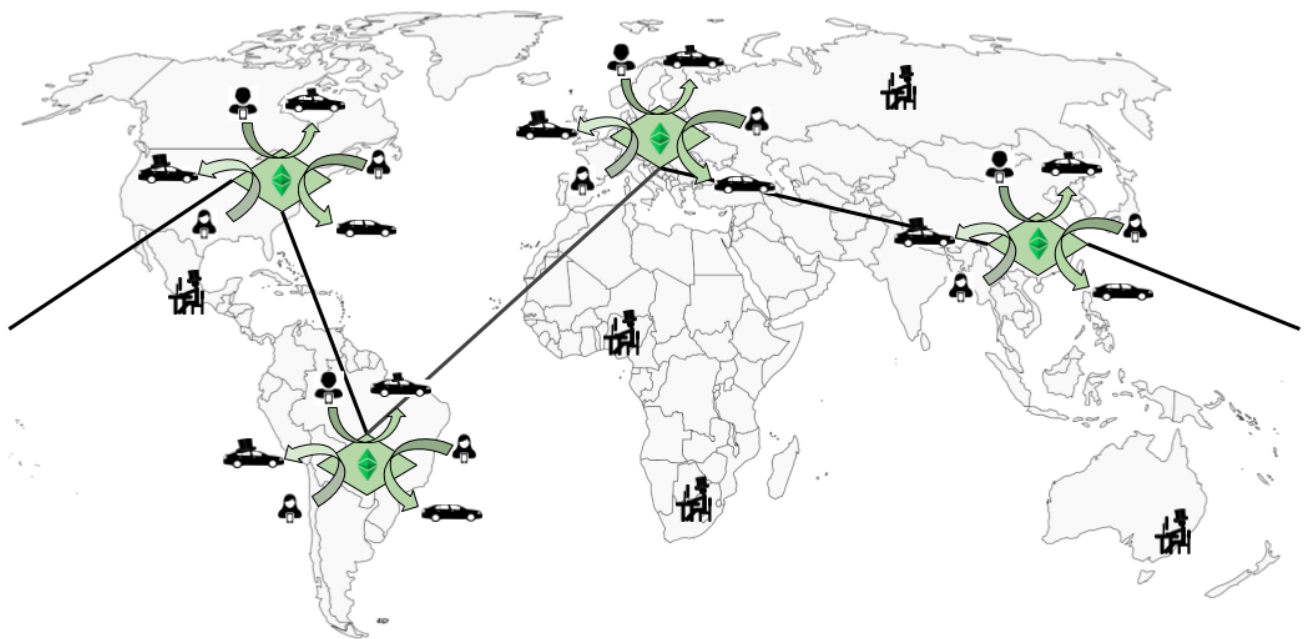

Fig 3: Building a Commonwealth of localized ride-sharing services.

4. Governance

We believe that any governance (voting, account modification, rate mutability) surrounding base-layer distribution of funds in Commonwealth is undesirable. Because of this, the economic parameters are locked in on launch, and cannot be

changed for any reason, unless an entirely new system is deployed. There are a number of reasons for this:

- *Capture***:** If the economics of the system can be changed after millions of participants are now using it, it means that the participants can be coerced into supporting new economics that they may have never signed up for. By separating governance from accounting, members feel safer participating in the governance process.

- *Global Growth:* This separation also allows Commonwealth to grow globally amongst users who may not speak the same language or have access to the governance system. These users know that the economics of the system isn't going to change without them being able to give proper input.

- *Governance in Upper Layers:* Any governance of a system built on top of Commonwealth should be decided by the layers above the core accounting system. If a platform needs to charge higher or lower prices in a geographic area, whether or not there should be an extensive or minimal background checks for providers, what currency providers should be paid in, how much, etc. are all not in the purview of Commonwealth, and instead rely on systems built on top of it to define these norms.

- *Computational Complexity:* If the system changes its input parameters often or introduces administrative features — it can be broken or incorrectly modified causing the entire system to malfunction. Mutability in code exponentially increases the possibility of bugs.

5. Use as Currency

Points can also be used to pay for things, similarly to Bitcoin [4]. Each Point can be split up to 18 decimal places and used to settle debts or airdropped as a gift. One interesting property, is that if Points is accepted at face value by both users and service providers - the entire community benefits from the money multiplier effect. For example, imagine the sell price of one Point is $1 - and we are spending one of them to pay for a slice of pizza. If it is immediately redeemed by the pizza shop, then they receive $1 worth of the underlying currency and the global price of the next Point goes down to a lower number, $0.999. However, if we transfer 1,000 P3C at a current price of $1 to settle a $1,000 debt, it means that if the receiver were to immediately redeem all their Points, they would have less than $1,000. The first Point would give them back $1, the next one $0.999, the

third one $0.998, etc. This sum is slightly less than $1,000. We call this difference "Purity" and it can be tracked with the following equation:

$$Purity = ContractBalance / (SellPrice * AvailableSupply)$$

Variable purity is a good property of Commonwealth because it allows all participants in the network to benefit from new money creation. Effectively this turns Commonwealth into a low-overhead algorithmic bank, with its operations and collateral reserves entirely open and auditable at any time. Every holder can view the reserves, and the contract is not modifiable by any party, mitigating the fear of bank runs or an exit scam. Unlike with traditional banks, with Commonwealth, equity and the currency itself is directly fused to the payment processor. This allows Commonwealth to provide service globally with much lower overhead, extremely high availability, and all usage fees distributed amongst users instead of a third party intermediary like Visa or PayPal.

Appendix 1: Commonwealth Use Cases

Commonwealth is useful for any peer to peer marketplace that involves many participants transacting frequently. Some examples are:

1. *Ridesharing* - Anything that involves consumers paying to use something they don't own, like a car or house, which is provided by others in the network. Points provide a stake of the network cash flow to car owners and drivers.

2. *Livestreaming* - Purchasing a sponsorship on IRL or gaming streams in real time via Points, can lead to incentivized ad pools. An online community is paid via the creation fee of new Points every-time an ad is purchased on a stream. These created Points can also provide income security to the streamer while hyping up the community.

3. *Online retail* - Selling goods and services and receiving some Points in return for every purchase is a very effective form of decentralized rewards points. They allow customers to collect a portion of the retailer's revenue.

4. *Games* - A community might be interested in collectively playing a game, similar to an MMO-RPG if the users need to purchase Points in order to join. Any game that requires a critical mass of players or modders can benefit from Commonwealth.

These are a few of the possible usecases, but the system is flexible to accommodate any ideas its users can think of.

References

[1] ETC Address: 0xDe6FB6a5adbe6415CDaF143F8d90Eb01883e42ac, (November-30-2018: Block: 7027833)

[2] G. Wood, "Ethereum: A Secure Decentralized Generalized Transaction Ledger," https://ethereum.github.io/yellowpaper/paper.pdf, 2014.

[3] M. Lund, "Cooperative Equity and Ownership: An Introduction" https:// web.archive.org/web/20190328191508/https://uwcc.wisc.edu/pdf/ cooperative%20equity%20and%20ownership.pdf, 2013.

[4] S. Nakamoto, "Bitcoin: A Peer-to-Peer Electronic Cash System" https://bitcoin.org/ bitcoin.pdf, 2009.

Revision History

v1.0.0 - Initial Release of Whitepaper
v1.1.0 - New images, Purity Formula, Typos
v1.1.1 - Typos, reworded Abstract
v1.2.1 - Changed P3C to Points
v1.2.2 - Algorithmic Bank to Savings Fund
v.1.2.3 - Change Abstract