

FairShare: a self-regulating digital currency managed by groups

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Abstract. The money supply and distribution of a digital currency is managed by a group of individuals who periodically vote on a transaction fee and daily income. Different groups can exchange their currencies with each other, allowing global trade. For each group, fees and income provide a distributed mechanism for offsetting the gradual growth of wealth inequality that is inherent in existing monetary systems. Globally, exchange rates between groups provide protection against free-rider or multiple identity attacks, removing the need for strong identity for participants.

1. Introduction

The vital function of money is to provide a means of sharing between individuals wishing to engage in exchange but lacking a social bond that would facilitate reciprocity. As social animals, we have evolved to seek opportunities for collaboration in which there is likely to be roughly equal exchange over time. Agreeing on some portable token which can be easily exchanged as a unit of value is a well-known and widely reproduced historical means of achieving fairness in exchange, but has two important flaws: The first is that the production and distribution of these tokens may initially or eventually become manipulated or controlled in a way that is broadly perceived as unfair. The second is that in all free markets, independent of the skills or intentions of individuals, money tends to move toward those who already have it, leading to growing wealth inequality and therefore broadly perceived unfairness¹. This perceived unfairness eventually leads to some sort of disruptive events in which resources are re-distributed and debts are forgiven. These periodic resets are usually accompanied by violence and other forms of social upheaval.

Cryptocurrency² provides a novel means to decentralize the production of currency units, but is still broadly perceived as unfair. Initial and ongoing allocation of cryptocurrency tokens has been to a small fraction of people fortunate enough to have early access to computing hardware and techniques, and ongoing transactions serve to further concentrate wealth. Objective metrics of inequality such as the Gini Index³ provide a means of quantifying this problem.

What is needed is a form of currency that is managed in such a way as to remain broadly perceived as fair for a long duration. In this paper, we propose a solution in which democratic groups establish their own digital currencies and manage them by periodically voting on two key mechanisms: a transaction fee which is applied to all exchanges and serves to reduce the amount of currency in circulation, and a recurring income amount which is granted to all group members and serves to increase the money supply. Groups can furthermore choose to exchange currencies with each other, allowing traditional

¹ <https://www.scientificamerican.com/article/is-inequality-inevitable/>

² <https://bitcoin.org/bitcoin.pdf>

³ https://en.wikipedia.org/wiki/Gini_coefficient

market mechanisms to price the various currencies against one another and allow global exchange between any two individuals.

2. Establishing Groups

Each group controls its own distinct currency. Groups can be established in any means desired, but the requirement for perceived long-term fairness and the voting mechanism as described herein seems likely to result in groups whose membership is established and maintained by a democratic process.

Newly proposed members of a currency group can be endorsed by a simple majority of existing members made using a secret vote. This mechanism can be achieved on-or-offline by broadcasting to existing group members details regarding proposed new members. Endorsement votes by existing members continue until a majority is reached, at which time new members are immediately accepted. The requirement of a majority vote to accept new members is likely to produce an upper bound on average group size, consistent with the goal of having groups small enough that members are likely to similarly perceive economic conditions and therefore fairness.

Groups can use a similar democratic mechanism of proposed expulsion of members via a super-majority vote to enact sanctions in cases where group members are found to have violated whatever conditions for ongoing membership the group requires. For example, groups might require periodic participation in on-or-offline gatherings as a means of establishing that group members are unique individuals who are committed to the economic well-being of the group.

3. Regulation of Money Supply

The money supply is regulated by the group through the process of continuously voting for changes to two rates:

1. A **transaction fee**, which is applied as a percentage to all movements of currency between group members. The transaction fee is charged to the group member making the payment, and is removed from the money supply.
2. A **daily income**, which is an amount of currency minted and granted to each group member on a daily basic, increasing the money supply.

Each group member can secretly vote at any time for what change they would like to make to the two rates. Once a super-majority of votes for new rates have been received, the median rate for the votes received are immediately applied as the new rates for all future transactions, and all group members are notified of the new rates. In this way, voting on monetary rates can be continuous rather than at arbitrary periods.

Aggregate statistics of the group's economic health are made available to all group members, including the volume of transactions, inequality index, and balance of trade with other group's currencies. In this way, group members can make informed decisions about their voting. Different groups may choose to have different levels of internal transparency about transactions, for example deciding to share names or amounts of transactions between group members.

Groups do not need to share any information about transactions outside of the group, maintaining an appropriate level of privacy. Groups may choose to disclose information but the design of the currency does not force disclosure.

4. Exchanges between groups

Group members from different groups can exchange currency with each other at mutually agreeable rates by each funding a balance and setting a rate which will be used for exchange between the two. These exchanges are searchable globally, allowing discovery of exchange paths between currencies. When an exchange path exists between two currencies, group members can instantly make payments to individuals in other groups by requesting exchange. In some cases, currencies may require multiple exchanges which can be done without any additional complexity for transaction participants.

Optionally, group members can elect to use automatic market maker algorithms to set exchange rates, as is commonly done between cryptocurrencies.

5. Identity

Currency systems which include basic income or other forms of per-capita distribution have the challenge that a means of positively identifying individuals is needed. This proposal replaces the difficult and dangerous need for a universal form of unique identification by instead entrusting groups with validation of their members. Dishonest groups which allow duplicate or unproductive members will trade at a low currency price due to low demand for their currencies, as well as risking being cut off completely due to being unable to find trading partners in other groups. This strikes a sensible balance between privacy and public information: groups have detailed knowledge of their membership, but this information is not globally accessible.

5. Conclusion

We have proposed a system of digital currency which remains fair over long time periods by relying on multiple groups with different currencies to regulate their individual money supply by voting on income and transaction rates to maintain acceptable levels of inequality, while enabling groups to trade among themselves by exchanging currency at market prices. The solution does not require public ledgers or universal ID, and can be implemented as a P2P app.