Building Lower and more stable transactions fees for different blockchains

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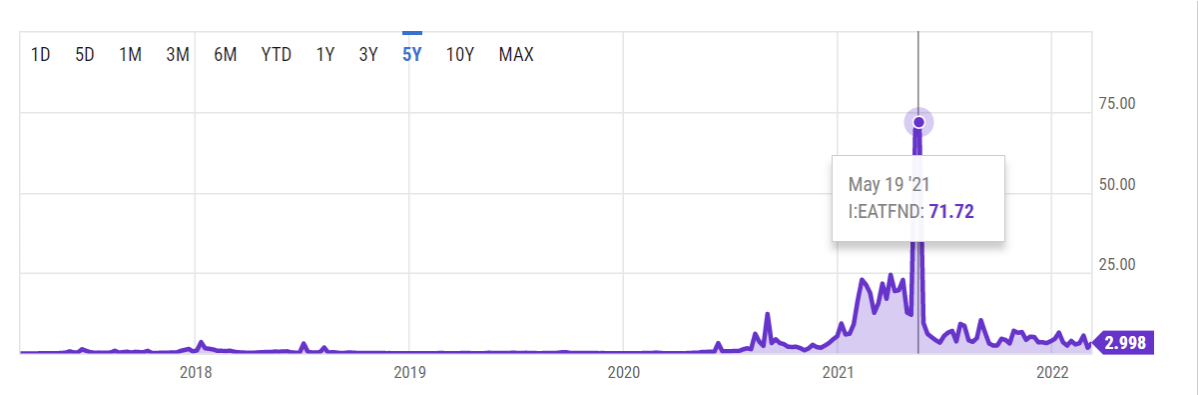
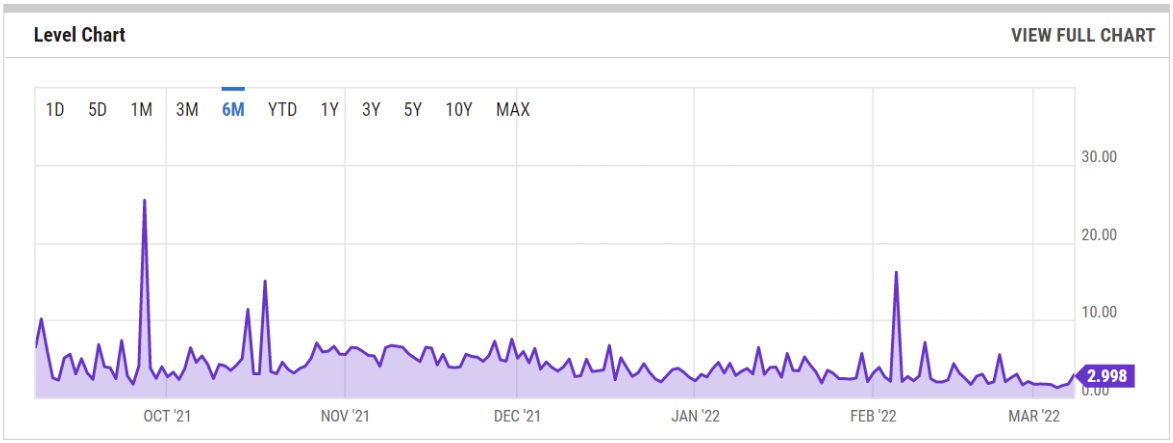
1. Introduction

A blockchain is a distributed ledger across the network that is composed of a chain of blocks, each of them containing data. The use of blockchain has been very popularized in the past few years, especially with digital currencies and nowadays there are used in many different fields. One of the most popular blockchain is Ethereum, that uses the Ether as cryptocurrency. In order to perform a transaction each user must pay a transaction fee. Transactions fees are priced as gas. (Gas refers to the unit that measures the amount of computational effort required to execute specific operations on the Ethereum network). One of the issues with transaction fees is that they are not dependent on the transaction rather they are flat (for the Ethereum blockchain). Transaction fees have increased over the years. One solution offered by the Ethereum blockchain is the London Upgrade in august 2021. According to recent evidence the solution wasn't entirely successful

Transactions fees over the last 5 years (Ether):

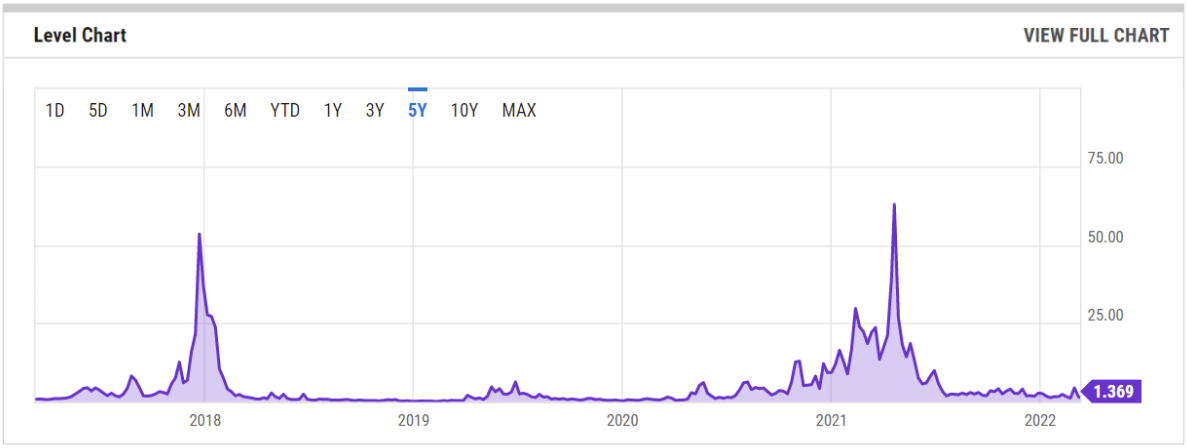


Transactions fees over the last 6 months (Ether):



Even though the transactions fees are built differently the same instability is also present in the bitcoin. Moreover, the surge occur at the same time and there is a similarity between their amplitude.

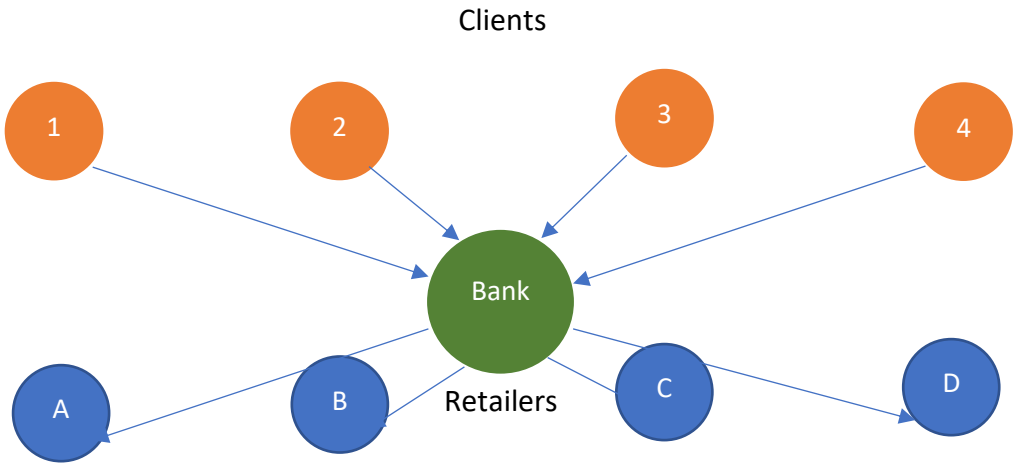
Transactions fees over the last 5 years (bitcoin):



2 The Middleman

A middleman acts as an intermediary between the producer of goods and the retailer or consumer. Instead of having a direct channel between consumer and retailer we offer to base the solution on a system similar to a bank account. An entity would act in a role of a bank. The consumer wouldn't make the transaction to the retailer but rather order the bank to do it in his place.

The account serving as a bank would aggregate payments in the following way. Each client would make an earlier global payment to the bank (serving as its account). Every time a client of the bank needs to make a payment to 'store A' the bank would make a note of the request (using for example 'Aave' to send encrypted demands of payment to the bank 'Aave' charges no fees for such transactions) and at an asynchronous time (a time where the network is less congested) the bank would make the aggregated payment to 'store A'. Graphically the solution offered is the following:



The numbers of payments are reduced from n^2 to about $2n$ thus reducing the congestions of the network. The bigger the increase in transactions demands will only increase the importance of a linear solution which won't cause such a spike in traffic. Because surges are due to a high demand in transaction process making the payments asynchronous allows for a smoother repartition of the traffic and therefore reduced fees because the number of transactions is smaller and there are for larger sum making the cost for each customer lower than what it would have been if he performed all of that alone.

3 Limitations

Our solution is based on a large adherence to the system and thus will not be profitable or stable at the beginning because in the case of a single client we added an extra fee for the bank and made a total of 2 transactions instead of one. Moreover, because the payment is asynchronous it requires trust in the middleman and also introduces a single point a failure. We believe that implementing a system based on stake such as the POS implements allows to solve the trust issue. A solution to the single point of failure would be to allow multiple banks to work in parallel making for a greater competition and thus driving fees down and providing an alternative in case one middleman wasn't available.

4 Results

After downloading a few blocks from the Ethereum blockchain, we made an analysis of the improvement obtained. The total number of transactions analyzed is 1112. We found a total of different 721 senders and a total of 602 different receivers. The number of transactions in our model would be 1323 (721 send to the middleman and 602 sent to the different receiver by the middleman). Because our study looks only at more than 1112 transactions there is no improvement in our case but even on such a small scale the number of added transactions is small, and we still would benefit from a reduced transactions fees as they can happen at a more convenient time.

5 Future Work

Test the hypothesis of the paper calculating the impact it would make on transactions fees on the blockchain using a wider analysis of blocks and a cost estimation of the reduced fees for each customer.