

We study shared sequencing from an economic efficiency perspective and its effects on arbitrage searcher (bidder) behavior. We assume that the only source of arbitrage is backrunning or price adjustment between decentralized exchanges on different chains. In order to win the race, an arbitrage searcher should win races on all chains simultaneously. That is, its transaction should be scheduled (and therefore, executed) earlier than the transactions of all other players on all chains.

The main reason for having a shared sequencer in our model is uncertain latency. That is, the time a transaction from each user reaches each sequencer is a random variable, maybe with low variance. With this assumption, users always benefit with the shared sequencer, as the shared sequencer guarantees that one of them wins the race. With separate sequencers, it can be that different users win races on different chains, and therefore, none of them win the global race.

First, we consider a first come first serve transaction ordering policy. We show that in a simple latency competition, in which users try to reduce their average transaction delivery times, total expenditure in case of shared sequencer is lower than the sum of expenditures with separate sequencers. This goes in favor of shared sequencing.

With transaction ordering policies that try to extract some value from arbitrage searchers, the value of interest is total revenue. Surprisingly enough, in a simple example with 2 bidders and 2 chains, we show that the total revenue with the shared sequencer is not always higher than the sum of revenues with separate sequencers. A general question whether the revenue with shared sequencer is larger than the sum of revenues of separate sequencers heavily depends on the transaction ordering policy, and the bidding scheme associated with it. The minimal formal model and examples are work in progress, and we will update with a short paper soon.

Apart from an obvious economies of scale for having a shared sequencer and the friction that we introduce about uncertain latencies, what can drive economic efficiency of a shared sequencer?