Shared sequencing solutions (such as Espresso or Astria) for rollups propose to jointly process transactions for several rollups, with the ultimate aim of improving user experience and increasing the overall value created. In particular, shared sequencing unlocks the possibility of atomic execution of bundles that combine transactions on different rollups. An obvious advantage of this is that shared sequencing makes it more likely that cross-chain arbitrage opportunities are realized.

In a new paper, we look at the economics of cross-domain arbitrage competition in the shared and separate sequencer regime and propose a minimal non-trivial game-theoretic model that captures cross-domain arbitrageurs' behavior. We are mainly interested in how shared and separate sequencing changes the investment and bidding decisions of arbitrageurs. In the simple latency competition induced by First Come First Serve ordering, which is currently used in most rollups, shared sequencing creates more wasteful latency competition compared to separate sequencing. For bidding-based sequencing, the most surprising insight is that the revenue of shared sequencing is not always higher than that of separate sequencing and depends on the transaction ordering rule applied and the arbitrage value potentially realized.

There are many other interesting economic and game theoretic questions about shared sequencing: How shall rollups share cost or revenue from a shared sequencer? How should shared sequencer order transactions? What will be the future market structure in rollup sequencing once shared sequencers are ready to run?