Disclaimer: This topic is going to be very basic but I think we deeply need it.

TLDR: What is the filter that is needed to qualify some set of transactions as MEV or not?

I often find myself trying to explain MEV to friends who are quite familiar with financial markets but not with the blockchain. And this yields the questions of what really is considered MEV or not?

To help myself thinking on the topic I wrote a small article to summarize my thoughts. And then remembered that here

is probably the best place to share them and to have some discussion.

Below is a summary of the article:

What fundamentally characterizes MEV?

MEV was first defined as Miner Extractable Value, in Flashboys 2.0, as a term used to describe the "value that is extractable by miners directly from smart contracts as cryptocurrency profits. One particular source of MEV is ordering optimization (OO) fees, which result from a miner's control of the ordering of transactions in a particular epoch. PGAs and pure revenue opportunities provide one source of OO fees".

While the above definition encompasses transaction (re-)ordering

it does not limit MEV to it.

I did find 2 definitions from Flashbots:

1. "MEV is a measure devised to study consensus security by modeling the profit a miner (or validator, sequencer, or other privileged protocol actor) can make through their ability to arbitrarily include, exclude, or re-order transactions from the blocks they produce."

(source)

1. "a measure of the total value that can be extracted permissionlessly (i.e. without any special rights) from transaction ordering.

" (source)

The above definitions do really talk about transaction (re-)ordering being the necessary condition for a set of transactions or a strategy to be considered as MEV.

I personally do very much agree with this second definition that puts transaction (re-)ordering as the central piece of the MEV puzzle.

Can we talk about MEV on L2s with no mempool?

While there is a mempool on Polygon where MEV is similar to MEV on Ethereum (pre- block builders a la Flashbots but that's another story), not all L2s are the same: on Arbitrum and Optimism, there is a centralised sequencer that determines the transactions ordering and there is no mempool. Searchers have no control over the re-ordering of transactions. They cannot frontrun, only backrun. Therefore, the question arises: when searchers send arbitrage transactions, is it still MEV, or is it just arbitrage?

Searchers can only a) impact latency by being closer to the sequencer and b) spam transactions to probabilistically increase their chances of being the first to backrun the target tx. And this, in a way, is just classical arbitrage.

Therefore the question arises: Can we still talk about MEV when discussing such strategies?

I would be very happy to get everyone's opinion here. I think it's important to agree on a basic taxonomy, this will help be discussions and research be more precise and make the field clearer to everyone. So tell me, what or how do you think we should qualify some transactions as MEV or not?