

# Dynamic Blockchain Mechanisms



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# Overview

We will focus on **two** topics

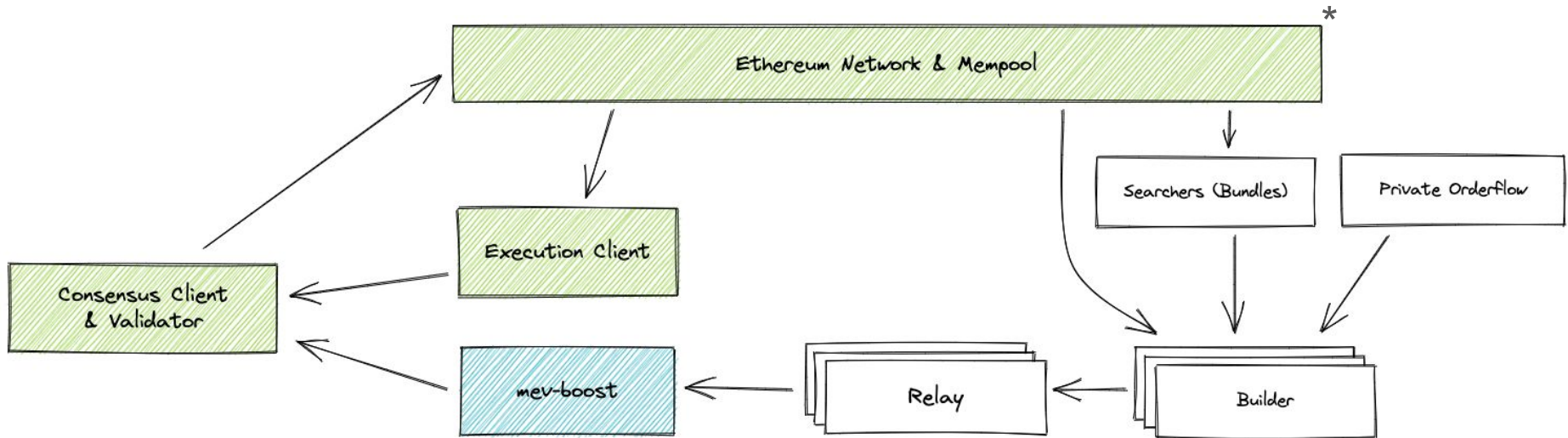
1. **MEV-Boost auctions**
2. **MEV sharing mechanisms**

**MEV = Miner/Maximal Extractable Value**

# MEV-Boost auctions\*

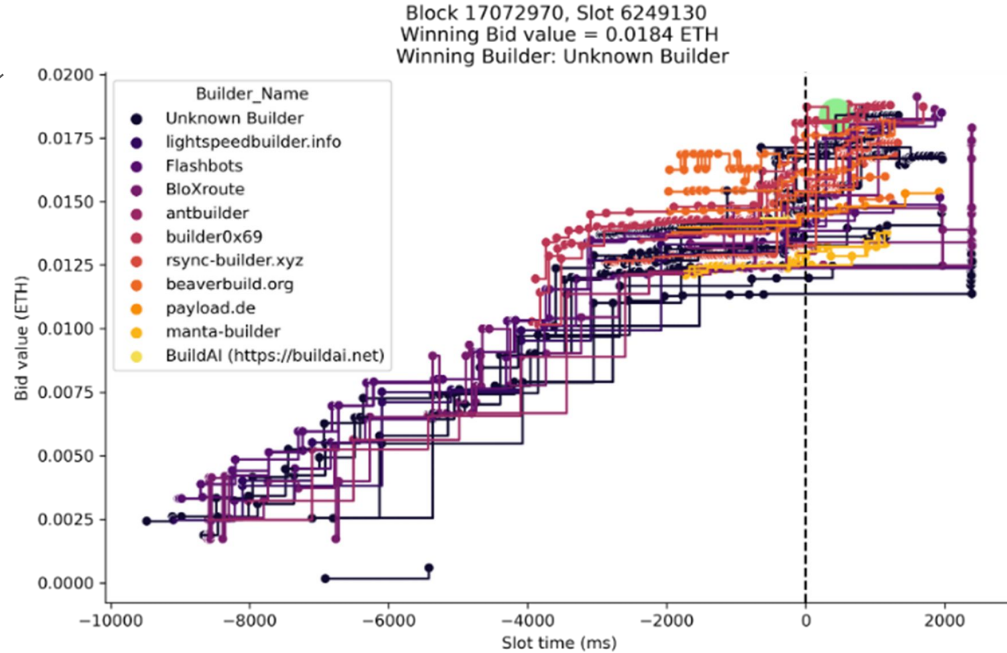
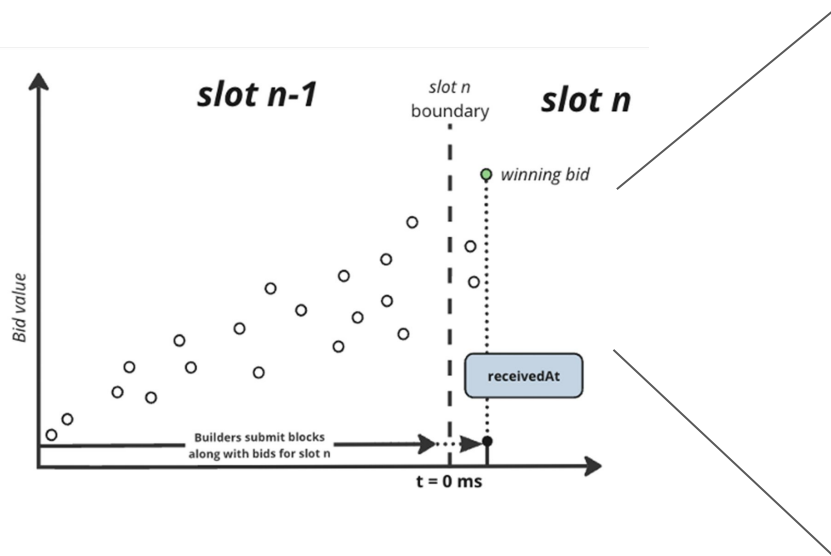
\*slides credit: Fei

# MEV-Boost

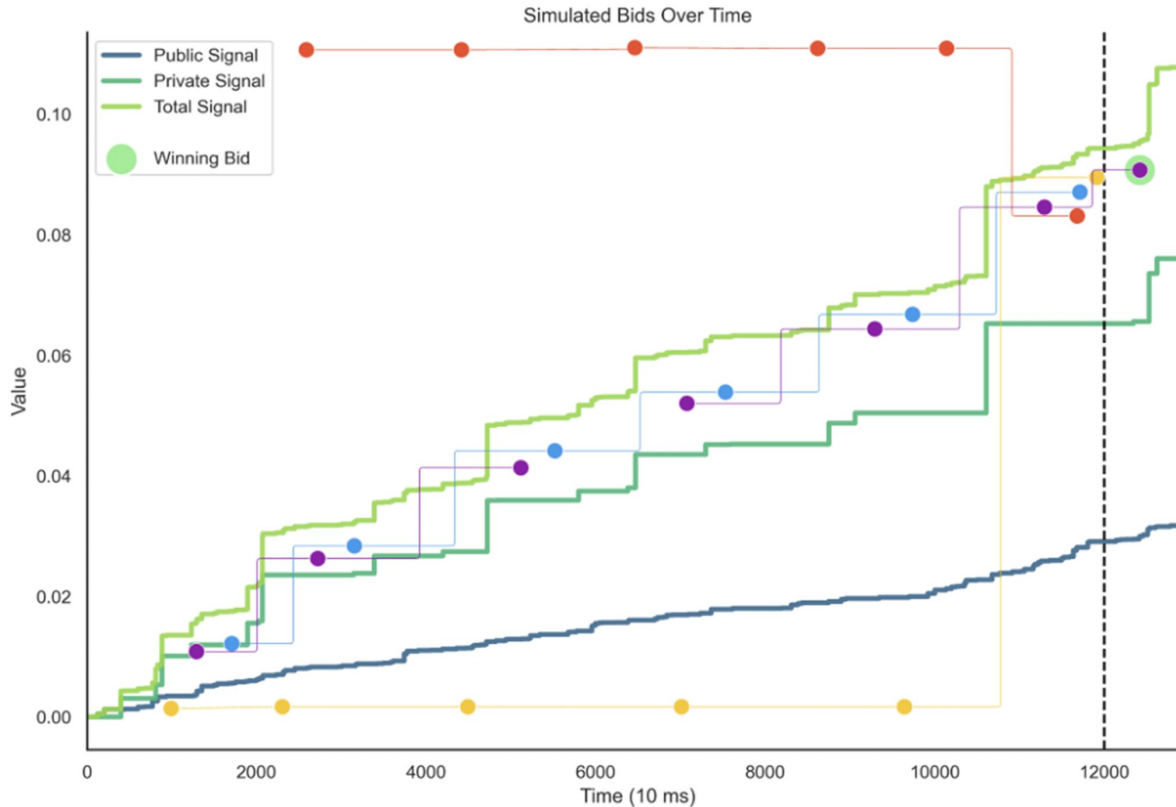


\*source: <https://github.com/flashbots/mev-boost>

# MEV-Boost auctions



# Bidding strategies

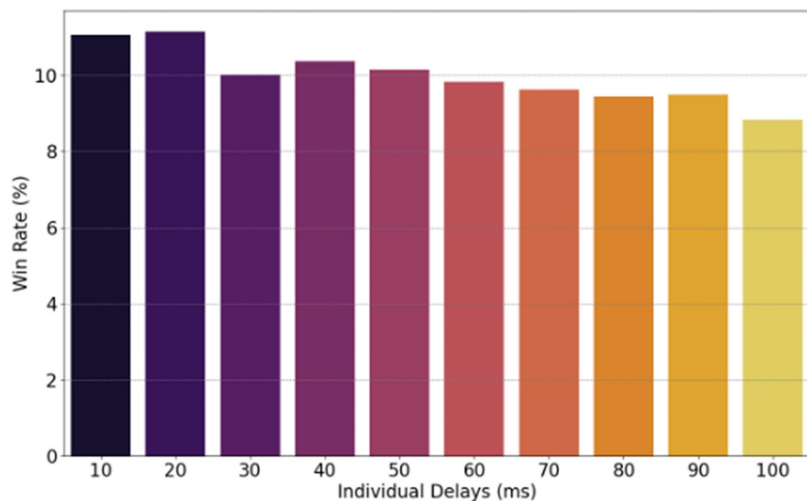


- Naive Strategy\*
- Adaptive Strategy
- Last-Minute Strategy
- Bluff Strategy

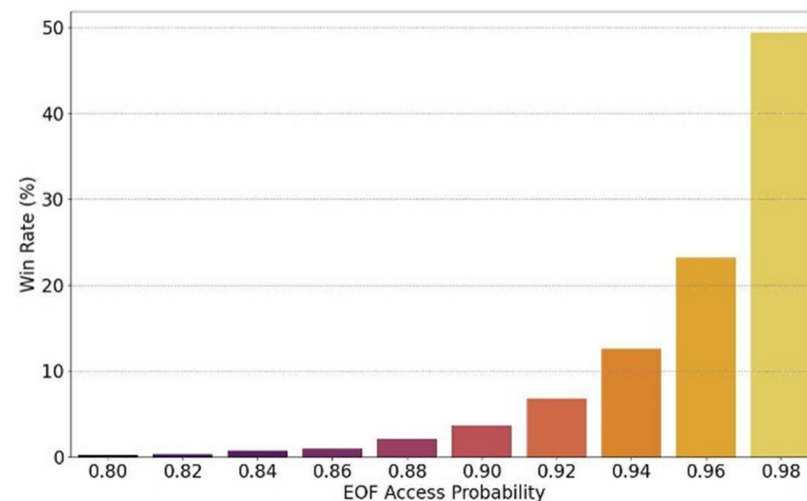
\*Naive = truthful

# Main Results: latency vs orderflow

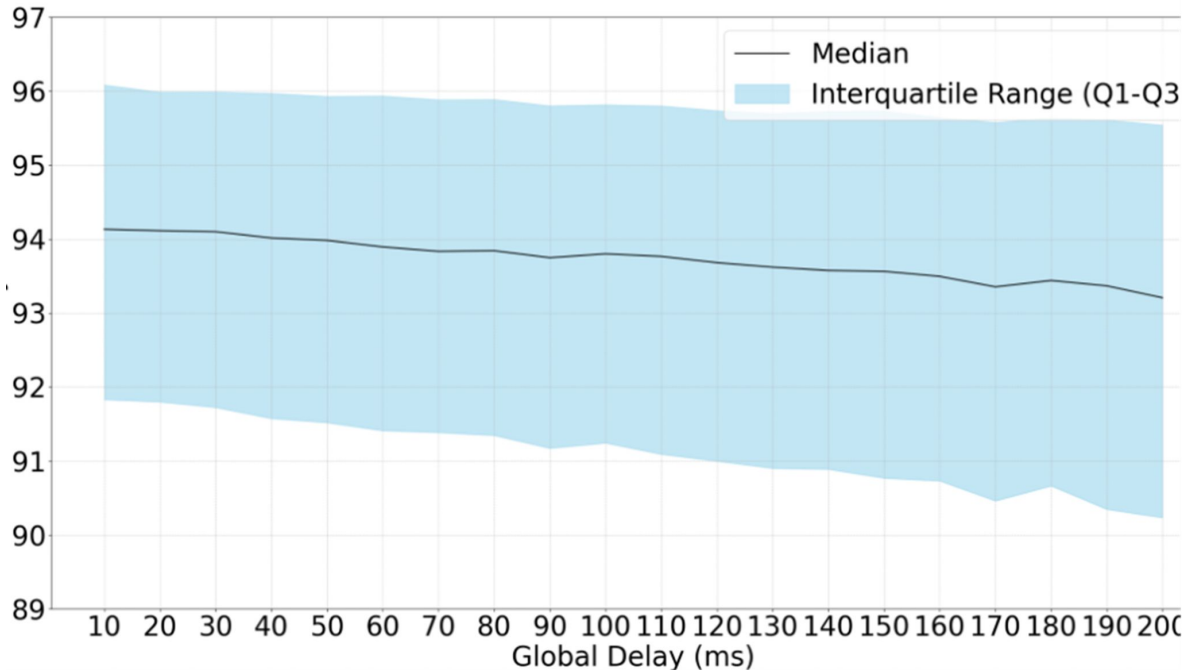
## Individual latency



## Private transaction access



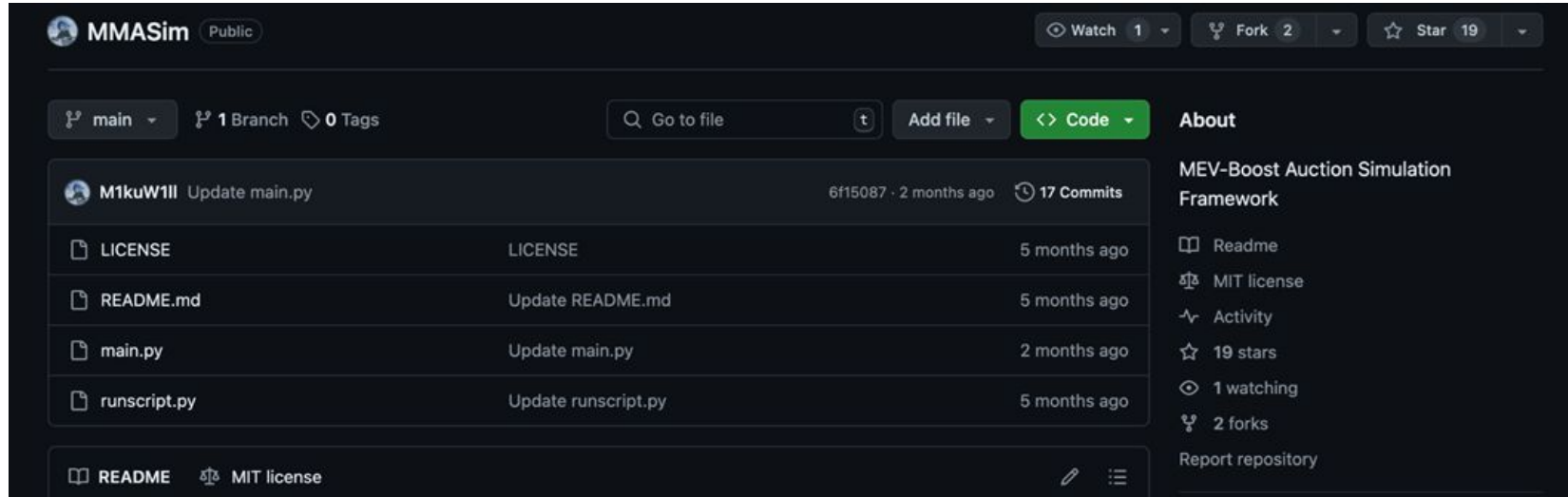
# Main Results: auction efficiency



Optimistic  
relays



# Code - simulation framework



MMASim Public

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main 1 Branch 0 Tags

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About

MEV-Boost Auction Simulation Framework

- Readme
- MIT license
- Activity
- 19 stars
- 1 watching
- 2 forks

Report repository

File	Commit	Time
LICENSE	LICENSE	5 months ago
README.md	Update README.md	5 months ago
main.py	Update main.py	2 months ago
runscript.py	Update runscript.py	5 months ago

MIT license

All the code is open source (credit to Fei):

<https://github.com/M1kuW1ll/MMASim>



# MEV-Sharing

# MEV-sharing

Design goals:

- **Participation incentives:**
  - reduce harm/cost for users
  - maintain participation incentives for miners (stabilise prices)
- **Posted extraction rates:** publicly known
- **Dynamic:** adjust to changing *market conditions*

# Can “EIP-1559 designs” solve other problems?

Abstract away EIP-1559’s design elements:

- **Target:** balance participation incentives between
  - MEV-generators (users) and
  - MEV-extractors (miners)
- **Signal:** participation in previous time frame (epoch)
- **Learning:** use learning rate and target deviations to balance *updates*

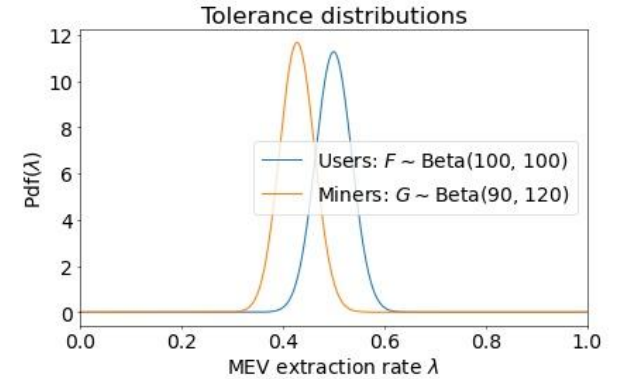
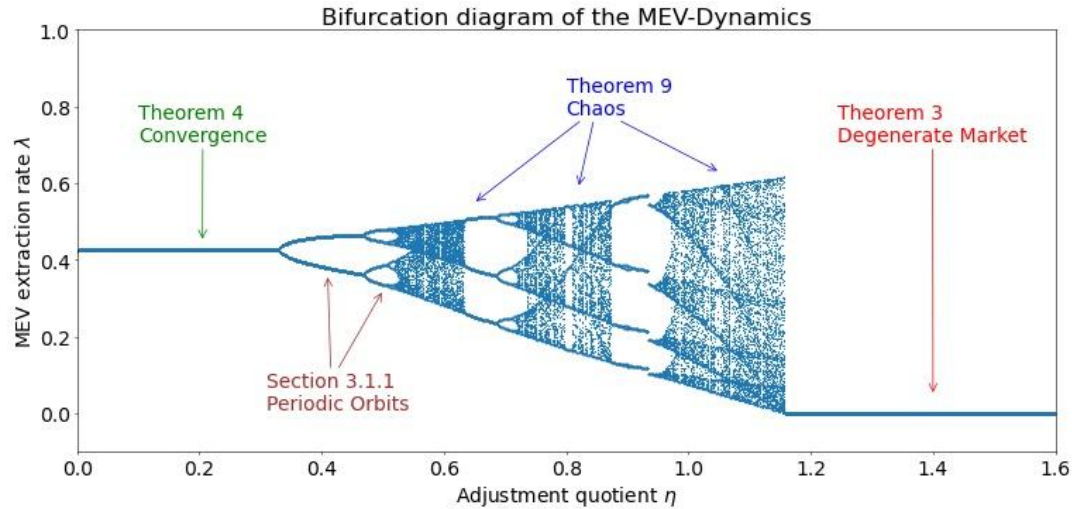
# Dynamic MEV extraction rates

MEV-sharing *update rule*:

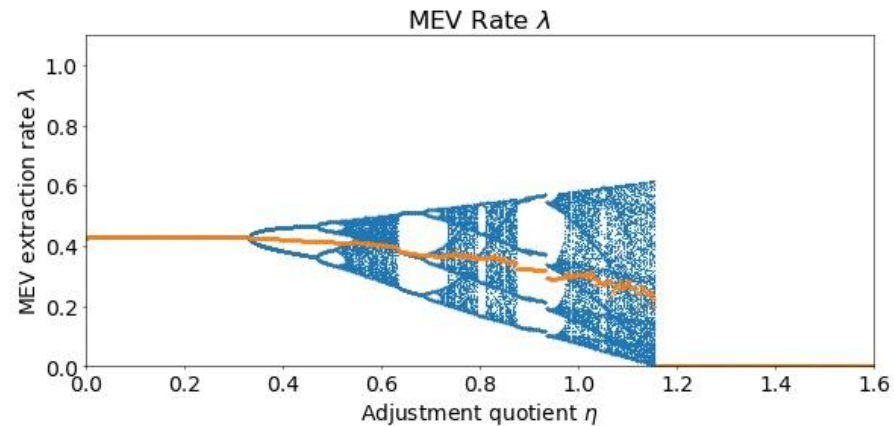
$$\lambda_{t+1} = \lambda_t + \eta \lambda_t (1 - \lambda_t) (\bar{F}(\lambda_t) - wG(\lambda_t))$$

- $\lambda_t$  = *extraction rate* time t.
- $\Delta_t$  = *participation imbalance* at time t.
- $\eta$  = *adjustment quotient*
- $w$  = *target participation ratio*.

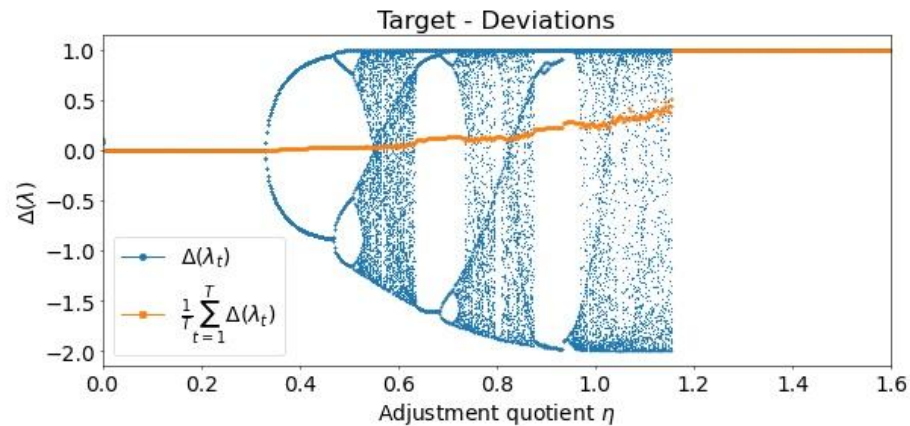
# MEV-sharing: dynamics



# MEV-sharing: performance



Bifurcation diagrams



Thank you