Block Builder Profitability | November 2023

This report offers insight into block-building profitability for November 2023.

TL;DR

- We introduce the concept of adjusted profit to explain a builder's on-chain net profit.
- Total adjusted profit in the month of November is 1,246 ETH
- Five builders dominate the market (with 92% of total adjusted profit)
- 14 builders each exceeded adjusted profit of 1 ETH in the month of November (on-chain profit only)
- There are still examples of successful, lesser-known builders, example: Anon:0x83bee
- Currently available leaderboards do not show accurate profits
- Impostor builders continue to spoof Flashbots builder

Most Profitable Builders - Earned at least 1 ETH:

[

profits

1788×850 96.4 KB

](https://collective.flashbots.net/uploads/default/original/2X/3/39402cec64b3df0a497e85d107dc19e556c0e14a.png)

Rank

Builder

Adj. Profit

MEV-Boost Value

Blocks

Profitable Blocks

Subsidy Blocks

Zero Profit Blocks

Total Subsidy

1.

beaverbuild

712.299

8,322.352

57,713

30,546

0

27,167

0

2.

rsync-builder

230.291

8,451.581

58,046

16,811

9,626

31,609

-21.375

3.

Anon:0x83bee

77.413

207.993

293

293

0

0

0

4.

builder0x69

69.569

1,081.899

9,567

1,849

7,718

0

-2.436

5.

Titan Builder

59.053

5,165.841

43,996

12,094

5,449

26,453

-1.77

6.

Anon:0xb3a6d

54.068

472.634

176

176

0

0

0

7.

BuildAI

24.253

134.329

469

370

99

0

-74

8.

Gambit Labs

19.822

180.223

2,608

575

1,754

279

-6.763

9.

f1b-test.io

5.824

5.878

2

2

0

0

0

10.

payload.de

4.223

8.475

62

46

16

0

-9

11.

f1b.io

3.371

31.967

396

165

231

0

-113

12.

https://eth-builder.com

2.423

133.912

293

208

85

0

-122

13.

lokibuilder.xyz

1.320

66.106

1,536

183

1,283

70

-7.136

14.

nfactorial.xyz

1.233

72.589

109

109

0

0

0

15-35.

Others, with profit

2.370

1,979.781

20,503

360

96

20,047

-0.0047

Notes:

1. Official builder pubkeys were used when available (published on docs or websites of the builder), for other builders extra_data was used to identify the builder
2. Two anonymous builders (tagged as Anon:0x...

) were tagged as they were significantly profitable, compared to other builders that did not use any extra data

1. The category ‘Others’ is grouped by all block builders that still made some profit or were balance neutral; all builders with negative profit were excluded
2. Query for generating this results can be found here: BigQuery stored query

Methodology For Profit Calculations and Their Adjustments

Block builder profit is defined as a difference between total value received by the builder address and value sent. The simple formula for block builder profit is:

(miner_rewards + builder_payments) - sent_from_builder

This simple method calculates the balance differences on block builder addresses (similar to the method relayscan uses), but we apply specific adjustments to arrive at an adjusted profit value.

Why Adjustments Are Needed

The main reason for adjustments is the fact that some builders deviate from standard practices of building blocks and paying MEV-Boost rewards to the validators resulting in inaccurate calculations and leaderboards.

Summary of Adjustments

In the process of writing and researching for this report, five adjustments were considered:

1. Account Linked to Builder Profit
2. Account Linked to Builder Costs
3. High-fee Transactions from Account Linked to Builder
4. Withdrawals Considered in Block Value
5. Impostor Builders

Refer to the appendix for more detail about each adjustment.

Impact of Adjustments on Report

- Total profit with adjustments: 1246.20 ETH
- Total profit without adjustments: 1189.75 ETH

Note: Actual impact is higher as some adjustments are done in both directions, positive and negative, gross impact is closer to 70 ETH.

Most Affected Builders

- PenguinBuild
- Profit with adjustments: -13.46 ETH

(without: -6.92 ETH

) * High-fee Transactions from Account Linked to Builder

- Withdrawals Considered in Block Value
- High-fee Transactions from Account Linked to Builder
- Withdrawals Considered in Block Value
- Profit with adjustments: -13.46 ETH

(without: -6.92 ETH

) * High-fee Transactions from Account Linked to Builder

- Withdrawals Considered in Block Value
- High-fee Transactions from Account Linked to Builder
- Withdrawals Considered in Block Value
- Flashbots:
- Profit with adjustments: 0.009 ETH

(without: 6.15 ETH

) * Imposter Builders

- Imposter Builders
- Profit with adjustments: 0.009 ETH

(without: 6.15 ETH

) * Imposter Builders

- Imposter Builders
- Rsync
- Profit with adjustments: 230.29 ETH

(without: 154.98 ETH

) * Account Linked to Builder Profit

- Account Linked to Builder Costs
- Account Linked to Builder Profit
- Account Linked to Builder Costs
- Profit with adjustments: 230.29 ETH

(without: 154.98 ETH

) * Account Linked to Builder Profit

- Account Linked to Builder Costs

- Account Linked to Builder Profit
- Account Linked to Builder Costs

Most Profitable Blocks (Adjusted)

Builder

Block Number

Adj. Profit

MEV-Boost Value

Builder Received

Profit Margin

Anon:0xb3a6d

18552552

17.246

9.413

26.660

64.69%

beaverbuild

18545397

11.933

21.065

32.998

36.16%

builder0x69

18680805

11.775

34.357

46.133

25.52%

beaverbuild

18621443

11.491

9.260

20.752

55.37%

builder0x69

18686685

11.276

16.038

27.315

41.28%

Anon:0x83bee

18622526

10.439

13.59

24.029

43.44%

beaverbuild

18531923

10.296

3.890

14.187

72.57%

Gambit Labs

18502213

10.087

0.050

10.137

99.5%

beaverbuild

18535507

9.188

12.422

21.614

42.51%

rsync-builder

18535505

8.631

7.227

15.862

54.41%

Notes:

1. Profit Margin is calculated with the following formula: 100 * (profit / (sent_to_builder + miner_rewards))
2. Builders are identified where possible with pubkey tags and extra_data

as a fallback

1. Query for generating this results can be found here: BigQuery stored query

Conclusions

- Five builders dominated the market
- Adjusted profit methodology is needed that goes beyond simple balance changes on the builder's coinbase address
- Currently available dashboards do not accurately display profits for some builders
- Impostor builders can also affect calculations, use of pubkey mapping table helps avoid this

Next Steps

There are a few improvements that could make this report better and more detailed:

- Consideration of integrated Builder-Searcher profit
- Estimation of off-chain profits (as part of cross-domain activity)
- Sources of block profit (exclusive/private searchers, MEV-Share/MEV Blocker, bundle analysis, etc.)

Appendix

Methodology For Calculating Block Builder Profit

Block builder receivables

Block builders on Ethereum have two ways of accumulating block value (from where they extract some profit):

1. Priority fees
2. Transfers to block coinbase address

Priority fees are calculated using this formula:

(receipt_effective_gas_price - base_fee_per_gas) * receipt_gas_used

Transfers to coinbase are calculated with data from the traces and transactions table.

We sum all of the transfers to builder address (usually coinbase, with some exceptions)

Block builder outgoing transfers

A block builder has one main outgoing transfer on its blocks, mev-boost payment to proposer_fee_recipient

(address of the validator, chosen for proposing the block).

To capture that transaction and all other outgoing transfers from the builder are summed and grouped by block_number

.

proposer_fee_receipent

is sourced from eden-data-public.mev_boost.payloads

To just find the value of transfers not being transferred to proposer_fee_receipent (important for finding adjustments in the logic for calculating profit),recipient address is used as filter and all other trace values are summed.

Methodology for Adjustments

Account Linked to Builder Profit

If the builder decides to cash out part of its profit in their own blocks, this results in underestimation of their total profit as this transfer is categorized as outgoing transfer. To avoid this, the Account Linked to Builder Profit

must be omitted in the sum of outgoing transfers.

Based on the timeframe of this research (November 2023) only rsync-builder used an Account Linked to Builder Profit

:

- 0x6d12cfdf3929eeabe0a73e4674d43864388e6ee1

In order to correctly calculate profits and include the profits that were sent to linked addresses, we added an adjustment to the methodology, where all transfers to this address are considered in the adjusted profit.

This resulted in a more accurate profit calculation for rsync-builder and the logic can also be reused for other builders if they decide to use Accounts Linked to Builder Profit

for cashing out their profits.

Account Linked to Builder Costs

Block builders must deliver the promised value of the block to the proposer fee recipient (in other words, pay their costs), but there is no rule that the reward must come from the block coinbase/miner address.

Based on the timeframe of this research (November 2023) only rsync-builder used Account Linked to Builder Costs

:

- 0xb4e29628cacea3567cf00ca0721234bd37fa0c10

High-fee Transactions from Account Linked to Builder

If an account linked to the builder is sending transactions with unusually high priority fees, the simple profit calculation considers those fees receivable.

Based on the timeframe of this research (November 2023) only jetbldr used High-fee Transactions from Account Linked to Builder

:

- 0xf0d96e4648bfe7322c146bf77f0b8d043e9f2a6a

We found that this adjustment considerably changes the perception of the block builder as profitable.

Withdrawals Considered in Block Value

Some builders use the proposer fee recipient as the block coinbase address rather than using their own distinct coinbase address. As a result, withdrawals to the proposer fee recipient counts towards MEV-Boost value.

Because there is no way to collect profit without a transfer from the coinbase address (which is owned by the proposer), the simple profit methodology overestimates gross revenues generated by the builder.

Based on the timeframe of this research (November 2023) only PenguinBuild was affected by this adjustment.

Impostor Builders

Three Impostor Builders

have been identified in the dataset, all impersonating Flashbots builders. What makes them special is that they use the Flashbots coinbase address, but send MEV-Boost payments to the proposer fee recipient from an address not associated with Flashbots.

As Impostor Builders

do not profit from these blocks, but rather pay for from their own funds, profits have been subtracted as part of the adjusted methodology.

Based on the timeframe of this research (November 2023) , here is the list of Impostor Builders

pubkeys:

0xa95b3a3cfc35a77663d6a5a9ac133bf1b68b4118f7f7a6f4ec43b298211441d1ebd1a1063446fea18138e7ef6c1379b6
0xb61a17407826a0c7a20ce8a0e9c848350bb94bf258be9c40da0dafd5be83be240c3d24c901e1d4423cc2eb90703ff0bc
0xa003117a3befd6d4f4f5a6db633caf7a2038d3f195c97a6b83ce6760cbbb1c0d09c11c33286fb14eb64c33ffb47f93cf

Data Sources

Data sources used in this research:

- eden-data-public.ethereum_auxiliary.tags_pubkey
- eden-data-public.mev_boost.payloads
- bigquery-public-data.crypto_ethereum.transactions
- bigquery-public-data.crypto_ethereum.blocks
- bigquery-public-data.crypto_ethereum.traces

Learn more about Eden Public Datasets