A Revenue Model for Based Rollups

switchboard

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Conor McMenamin, 12/11/2024

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Based Rollup Primer

"A rollup is said to be based, or L1-sequenced, when its sequencing is driven by the base L1."

Intersection of based and L1 proposer sets provides unique L1 shared sequencing guarantees.

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Goals of this Talk

- Introduce the players in based rollups
- Identify their incomes & expenditures
- Discuss how these are likely to change on the Ethereum x Based roadmap.
- Motivate you, the Based Hero, to:

Keep the Based balance sheet healthy with **Phat stacks for all**.

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Based Rollups: Who's playing?

- Users, incl. bots/agents
- Proposers / Sequencers
- ZK Provers
- DAO ; rollup deployment/ maintenance team

Providers

- Other Chains & Rollups

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Setting the Table

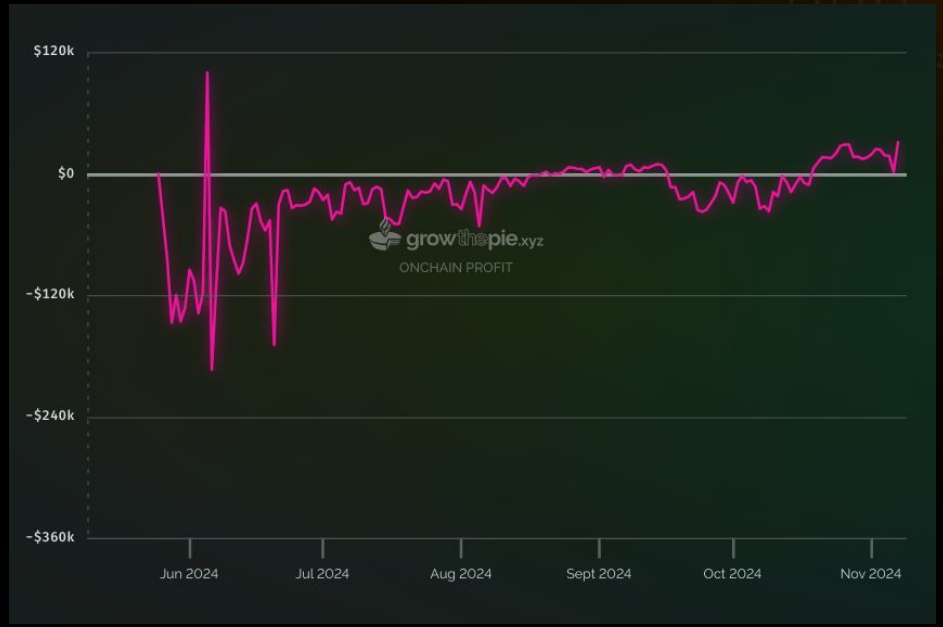
Income and expenditure can be hard to quantify.

Taiko Daily Net Profit (I-E) --->

growthepie computes rollup-

-**Income**: L2 gas fees collected

-**Expenses:** L1 fees paid to post data and proofs.



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Setting the Table

We can come up with more accurate models

	Parameters
Avg. size of a Txn	250 Bytes
Proposing gas / block	170K
SP1 Proving gas / block	450K
Total gas / block	620K
Etheruem Price	2400

L2 Blocks / Day	Avg. Block Time	Max Txns / Block	Monthly Txns Possible	L1 Gas Usage / L2 Block	Monthly Cost (1 Gwei)	Monthly cost (5 Gwei)
24	3600 seconds	500	0.36 million	620,000	0.45 ETH	2.23 ETH
144	600 seconds	500	2.16 million	620,000	2.68 ETH	13.39 ETH
288	300 seconds	500	4.32 million	620,000	5.36 ETH	26.78 ETH
900	96 seconds	500	13.50 million	620,000	16.74 ETH	83.70 ETH
1440	60 seconds	500	21.60 million	620,000	26.78 ETH	133.92 ETH
1800	48 seconds	500	27.00 million	620,000	33.48 ETH	167.40 ETH
3600	24 seconds	500	54.00 million	620,000	66.96 ETH	334.80 ETH
7200	12 seconds	500	108.00 million	620,000	133.92 ETH	669.60 ETH

Revenue required per L2 transaction in order to breakeven and pay off the onchain operating costs.

Monthly Transactions	3600 seconds		600 seconds		300 seconds	
	Min	Max	Min	Max	Min	Max
50,000	$0.0214	$0.2143	$0.1286	$1.2856	$0.2571	$2.5713
100,000	$0.0107	$0.1071	$0.0643	$0.6428	$0.6428	$6.4282
500,000	$0.0021	$0.0214	$0.0129	$0.1286	$0.8035	$8.0352
1,000,000	$0.0011	$0.0107	$0.0064	$0.0643	$0.4018	$4.0176

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Setting the Table

Quantifying all income & expenditure is hard/impossible.

A lot of shooting from the hip being done right now

That being said, metrics like growthepie identify when things are:

📈, 📉, 💩, or 💀

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Setting the Table

- Thanks to rollup 👊, based users can migrate easily when “similar” network effects exist on other rollups.

  ^ the case today ^

- In this setting, provider profits *must* *tend* *to* *0*.
- This “0 profit paradigm” is far away.
- Paths to “0 profit paradigm” are very different.

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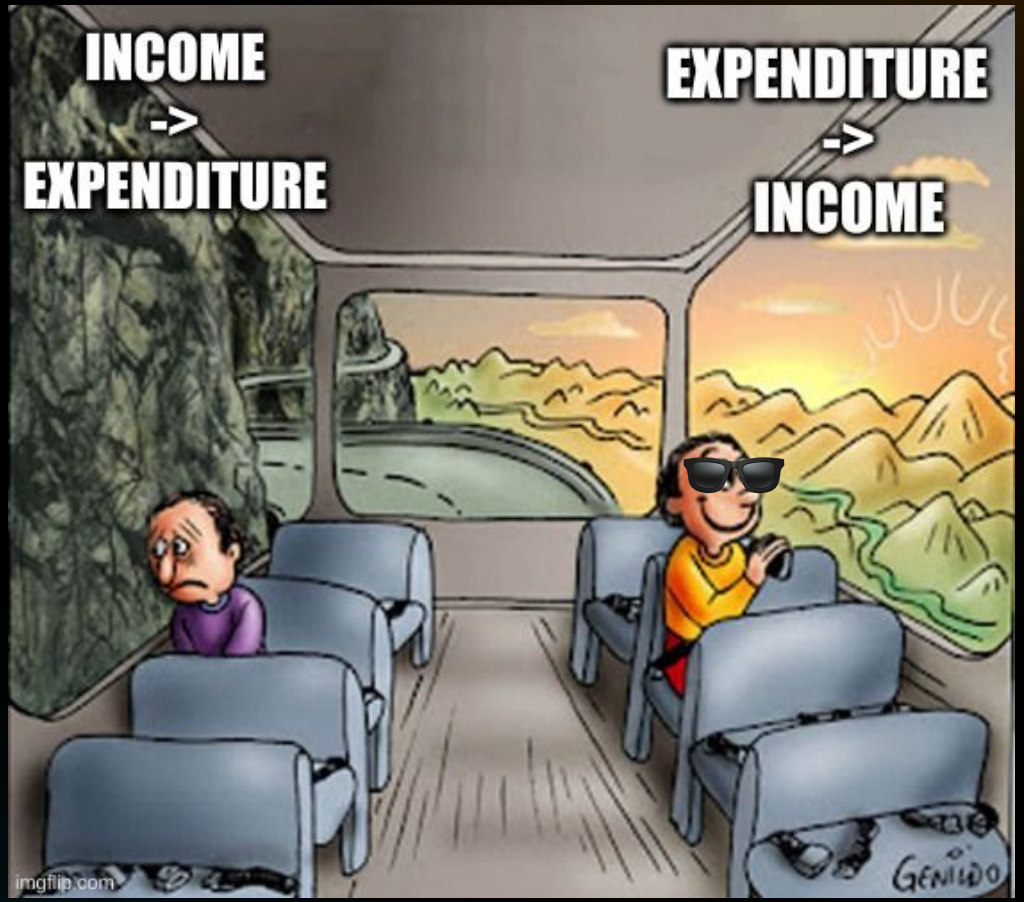

Paths to “0 profit paradigm” are very different.

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Paths to Endgame

The path to the endgame will have many

increases in income & decreases in expenditure

Each change meaningfully impacts based rollup revenue

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Based Income & Expenditure: *The List*

	Income	Expenditure
Users	UX, “utility”	Fees
Proposers	Fee %, MEV, issuance	L1 posting, 🏃
Provers	Fee %, issuance	L1 posting, Set-up, 🏃
DAO	Investors, Fee %, Proposal Fee?	🏃, R&D, Governing
Alt Chains/Rollups	Composition 🤝	Competition 👊

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Income > Expenditure?

In general, yes. If not, pack the suitcase:

- **Proposers?** In expectancy, yes:

  Proposer may have misprice preconfs.
- **Prover?** In expectancy (long-term), yes:

  Prover must invests in proof hardware upfront.
- **DAO?** DAO P&L largely based on investment:

  Long-term, is an investment model sustainable?

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Based Revenue in the Future

“Based Income and expenditure is always in flux. You can’t step into the same based revenue model twice” - Heraclitus Drake

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Based Revenue in the Future

- (- e) Cheaper L1 costs (e.g. DA cost reductions).
- (- e) Proving becomes more efficient.
- (- e) Prover & (+ i) Builder market will mature.
- Shared Everything!
  - (+ i) Bigger network effects (shared seq., composability).
  - (- e) Maximizing blob utilization (share blobs, preconfs)
  - (- e) Shared proving
  - (+ e) Higher running costs

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Based Revenue in the Future

Let’s go through each one in detail

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Cheaper L1 costs (-e)

- Danksharding/ EIP-4844 helped reduce rollup costs by creating a cheaper pipe for rollup tx data.
- PeerDAS is next-level. From Vik:

"PeerDAS is a relatively simple implementation of "1D sampling". Each blob in Ethereum is a degree-4096 polynomial over a 253-bit prime field. We broadcast "shares" of the polynomial,
if we increase the blob count maximum to 256 (so, the target to 128), then we would get to our 16 MB block size target while data availability sampling would only cost each node 16 samples*128 blobs*512 bytes per sample per blob = 1 MB of data bandwidth per slot. "

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ZK Proofs become more efficient (-e)

Last 10 years: constant improvements to ZK proofs in terms of:

- Proof Generation
- Proof Verification

e.g. risc-zero, SP1, Plonk, SuperPlonk

TL;DR: 📉 naming, 📈 proof-system

Quantity & quality of ZK teams increasing too: e.g. Starkware, Succinct, Geometry, Nethermind, Electric Coin Co, ...

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ZK Proofs become more efficient (-e)

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Prover & Builder Market Matures (+i, -e)

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Prover & Builder Market Matures (+i, -e)

- Prover competition:
  - users/sequencer pays less for proofs.
- Builder competition:
  - better UX through efficient block building
  - sequencer gets higher fees.

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Shared- Everything! Oh the (+i, -e) benefits

- -sequencing: >UX, higher MEV, priority fees
- -blobs: 100% full blobs minimize (proposer->user) costs
- -proving: economies of scale, <L1 verification/data required
- Composability: less risks/complexity for proposers
- Preconfs: 100% full blobs, <risk to fee spikes

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Shared- Everything! (+e)xpenses tho

- -sequencing: >cost than sequencing 2 rollups independently
- -proving: (e.g. AggLayer) proving the merge of 2 states is more expensive than proving the 2 independently.

¿Sum of benefits (composing, verify)>increase in proving costs?

- Centralization: Shared- tasks incentivize monopolies

  Can we pay that “cost”? How do we quantify it?

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Conclusion

This presentation identified that incomes and expenditures depend on many factors beyond on-chain data.

The List

	Income	Expenditure
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Based Heroes Assemble

Do your own calculations

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Based Heroes Assemble

Innovate on increasing income, and reducing expenses.

Remember the words of Heraclitus Drake: “You can’t step into the same based revenue model twice”

Less

More