Bitcoin as a novel economic institution

What we have learned so far, and where we're going

CASTLE ISLAND
VENTURES

Contents

I. Taking Stock

Most approaches to quantitatively measuring Bitcoin are terrible

Bitcoin's ***economic throughput*** is paramount

'Market cap' sucks, let's replace it

II. Looking Ahead

Bitcoin is an ***industrial network***, dominated by exchanges

Let's aim to maximize ***economic density***

We ***can*** keep intermediaries in check

Container ships, not parcels

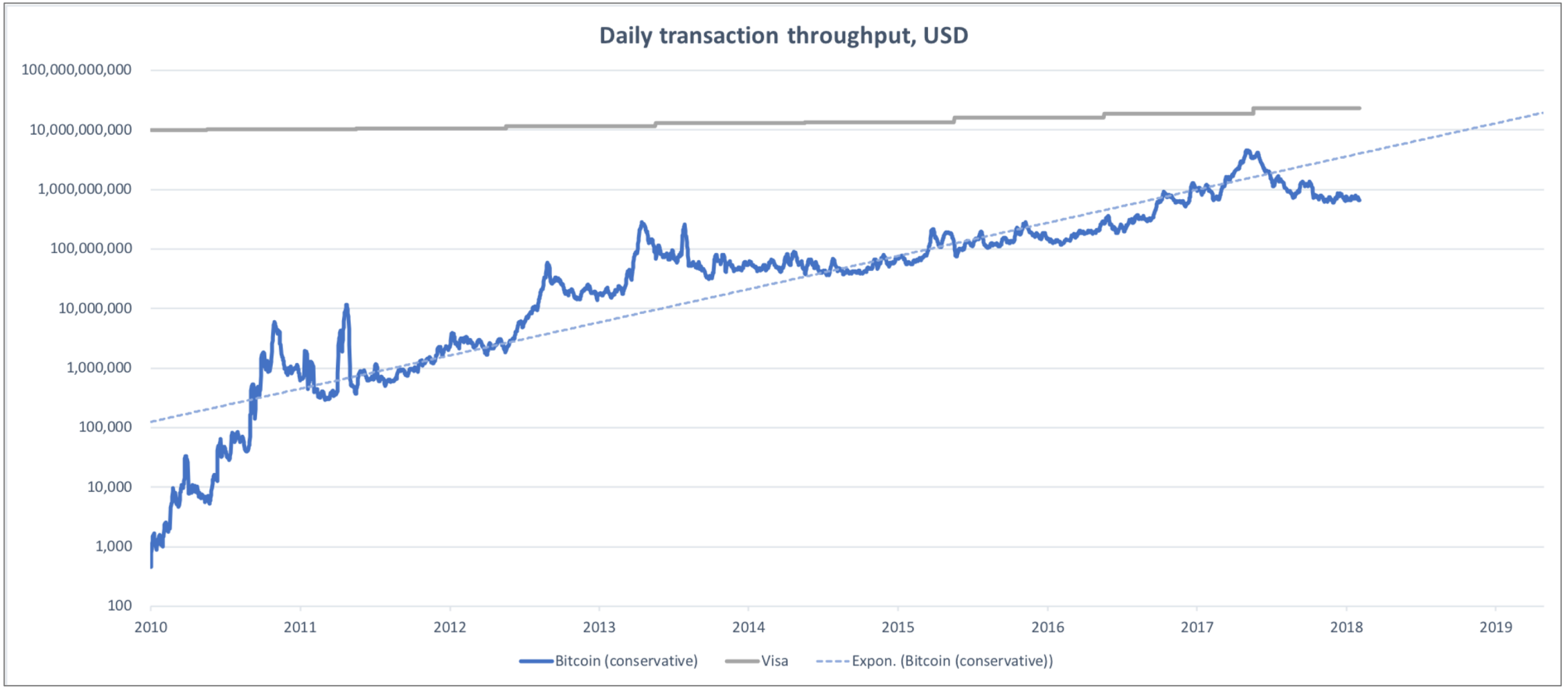
What is Bitcoin's actual economic throughput?

Method	Daily txn value	Annualized	Velocity [2]
Raw output (*bitinfocharts*)	$6.5 billion	$2.37 trillion	25.4
With knowable changed removed (*coinmetrics*)	$3.6 billion	$1.3 trillion	14.1
With more change + churn removed (*coinmetrics*)	$1.8 billion	$0.65 trillion	7.04
Even more adjustments (*blockchain.info*)	$0.69 billion	$0.25 trillion	2.7
Merchant payments at major processors [1]	$3 million	$1.09 billion	0.01

[1] *Bitpay, Coinify, GoCoin*

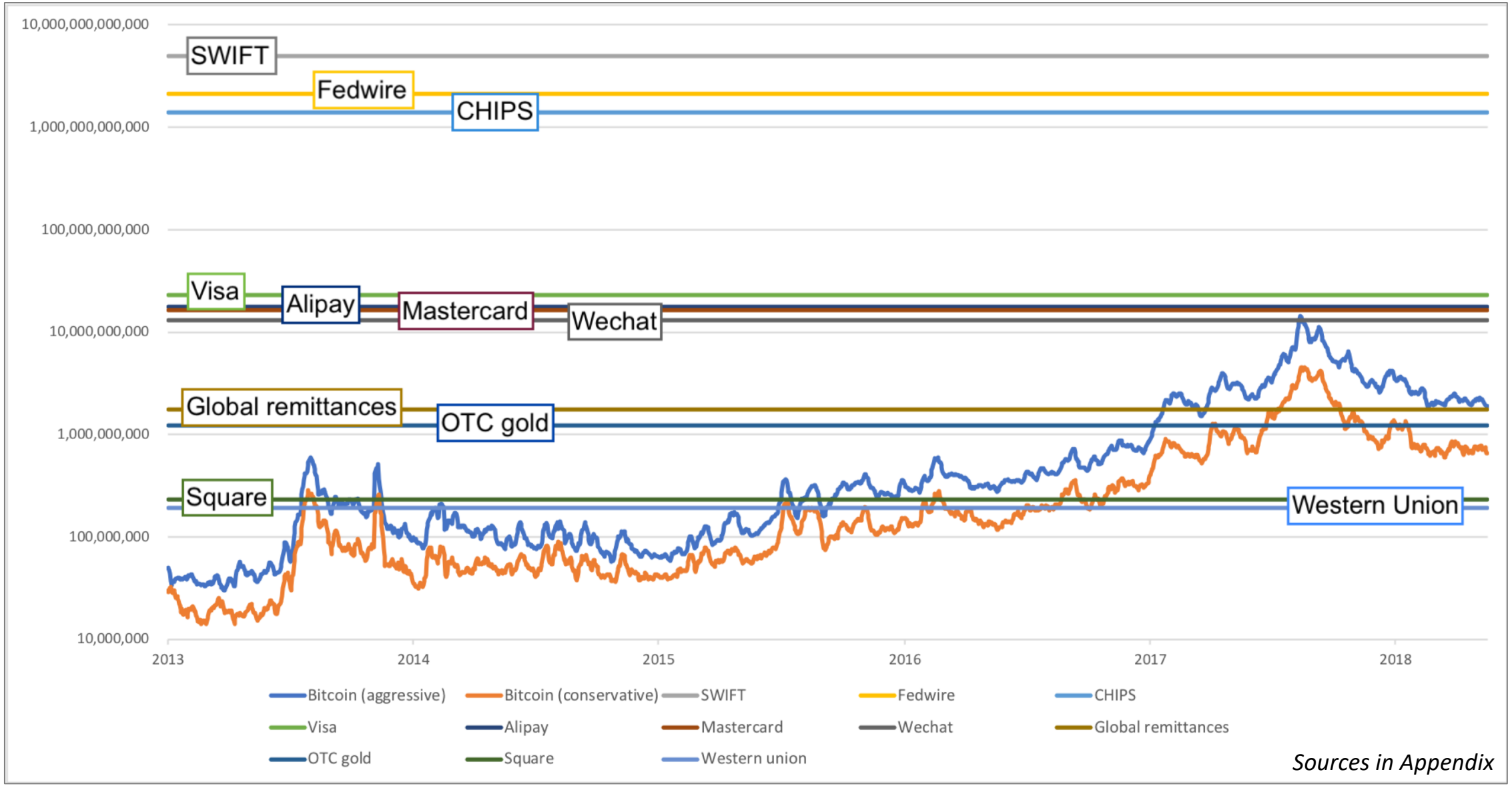
[2] *Supply reduced by 15% to account for lost coins*

The long road to Visa



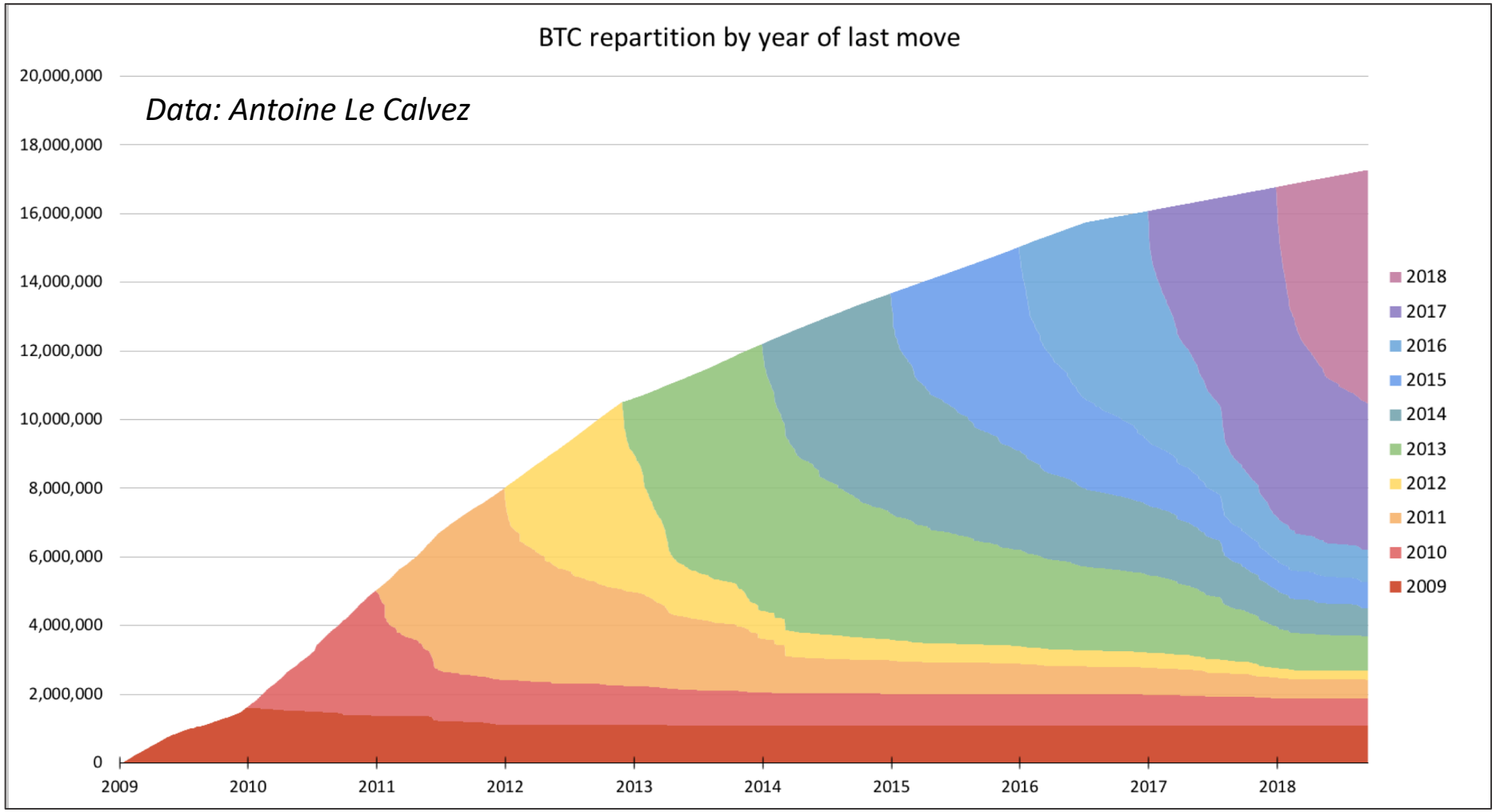
Sources in Appendix

Bitcoin transaction volumes in context



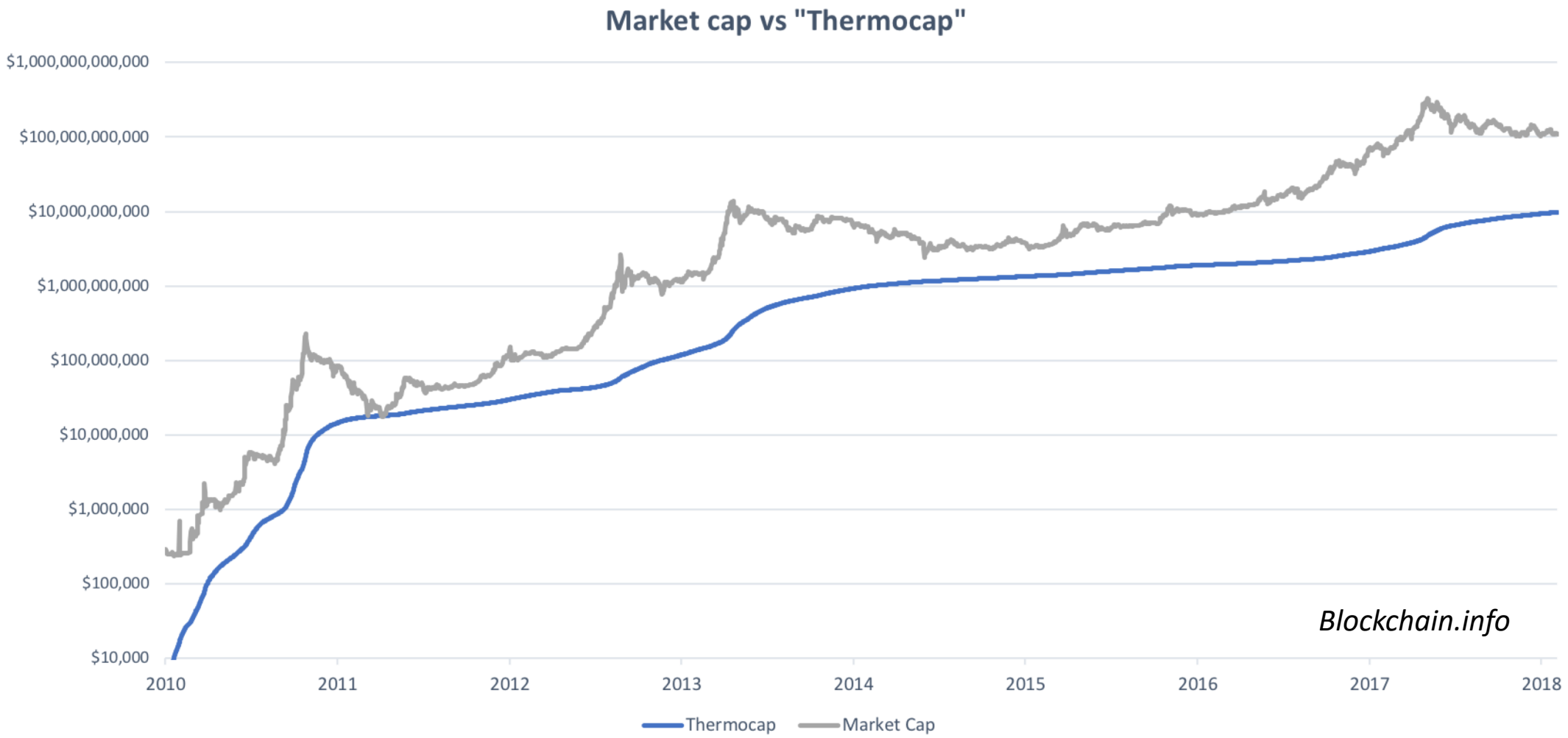
Sources in Appendix

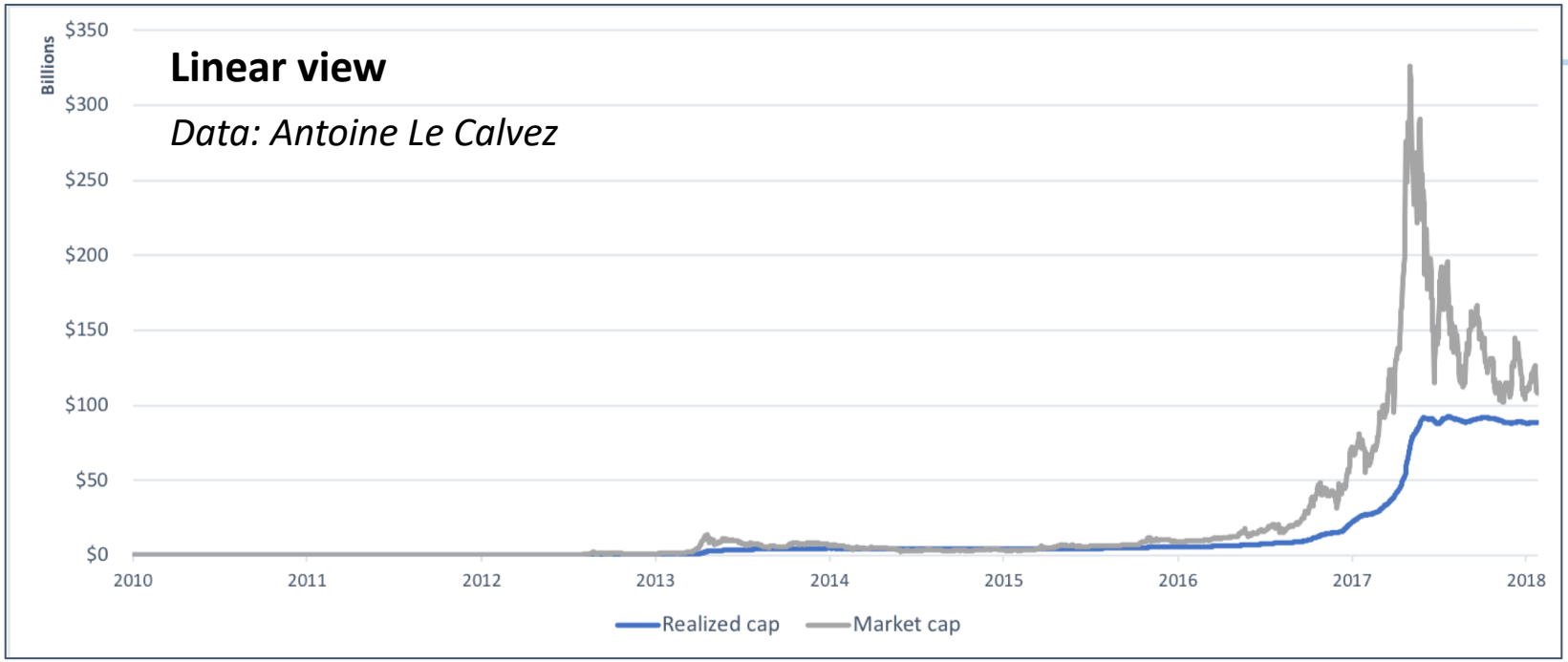
Measuring BTC wealth stock: the problem with ‘Market Cap’



- This is a chart of units of Bitcoin based on when they were last active
- This is also the Unchained Capital HodlWaves chart with the axes flipped
- This chart lets you estimate lost or inactive BTC

Market cap alternatives: accumulated security spend

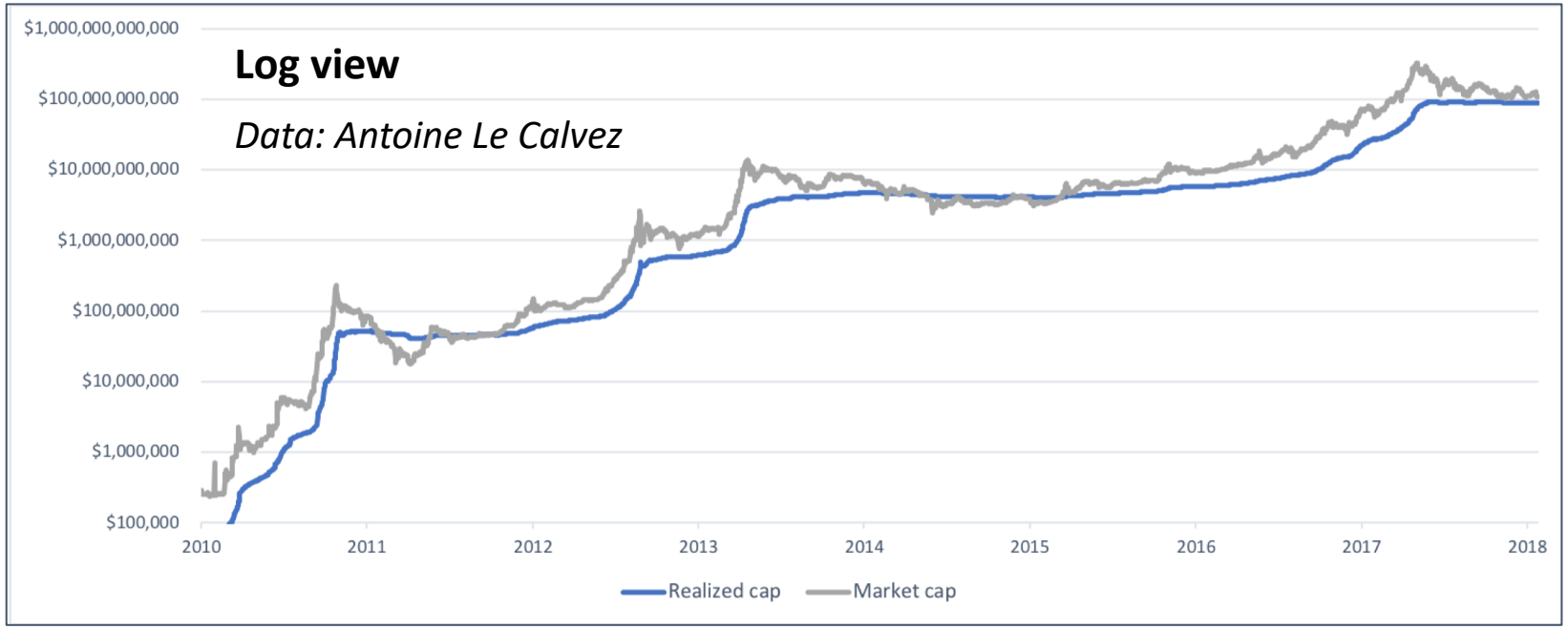


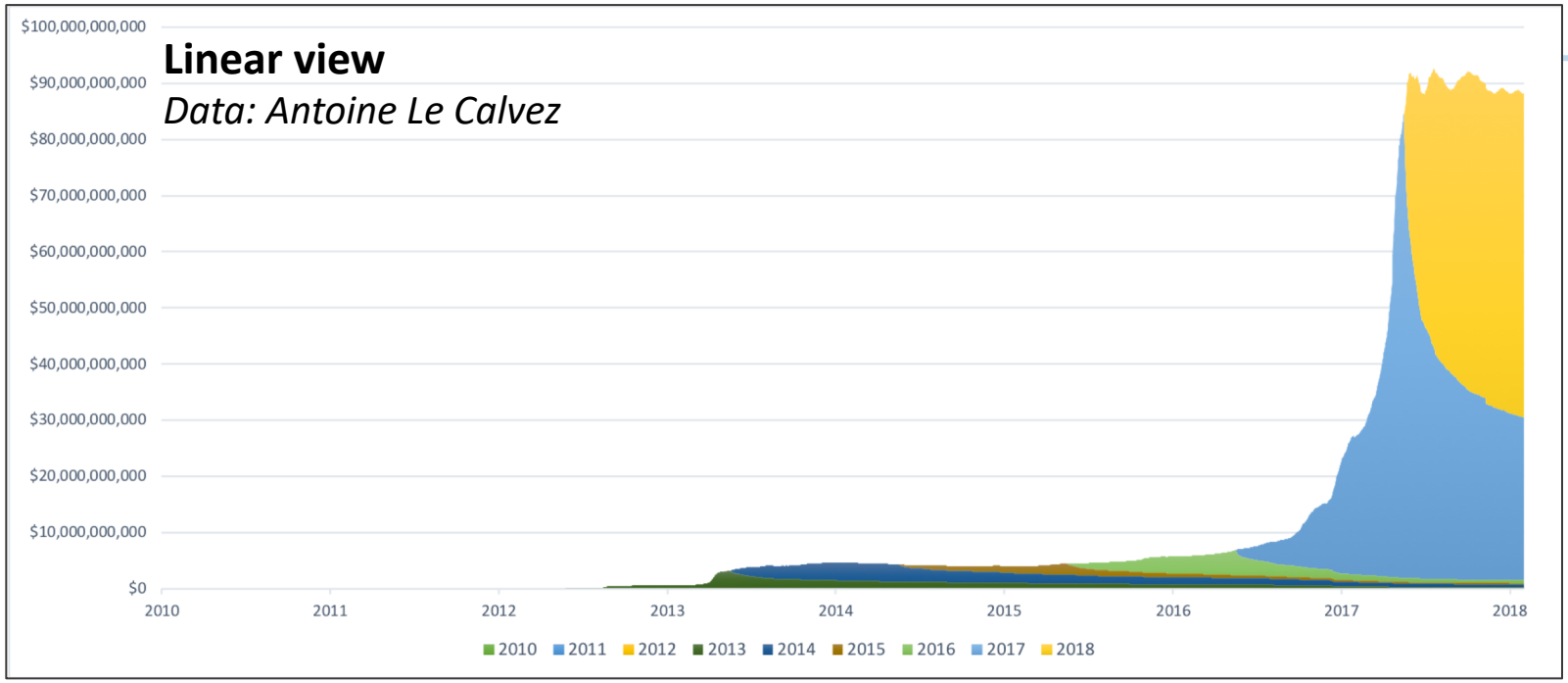


Realized cap:

- Aggregate value of UTXOs priced by their value when they last moved
- Avoids counting long-lost coins
- Bitcoin current RealCap: ~$88b, versus $110b mcap

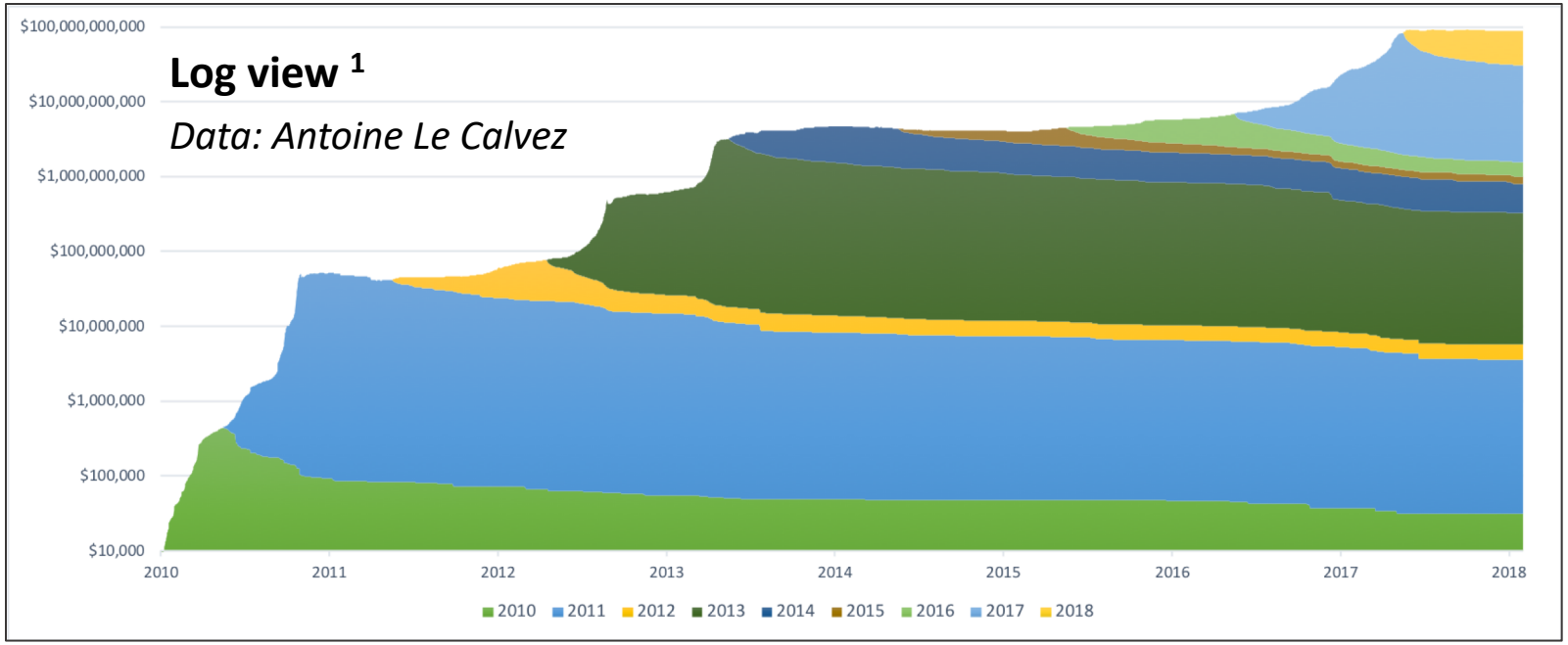
Market cap alternatives: Realized Cap





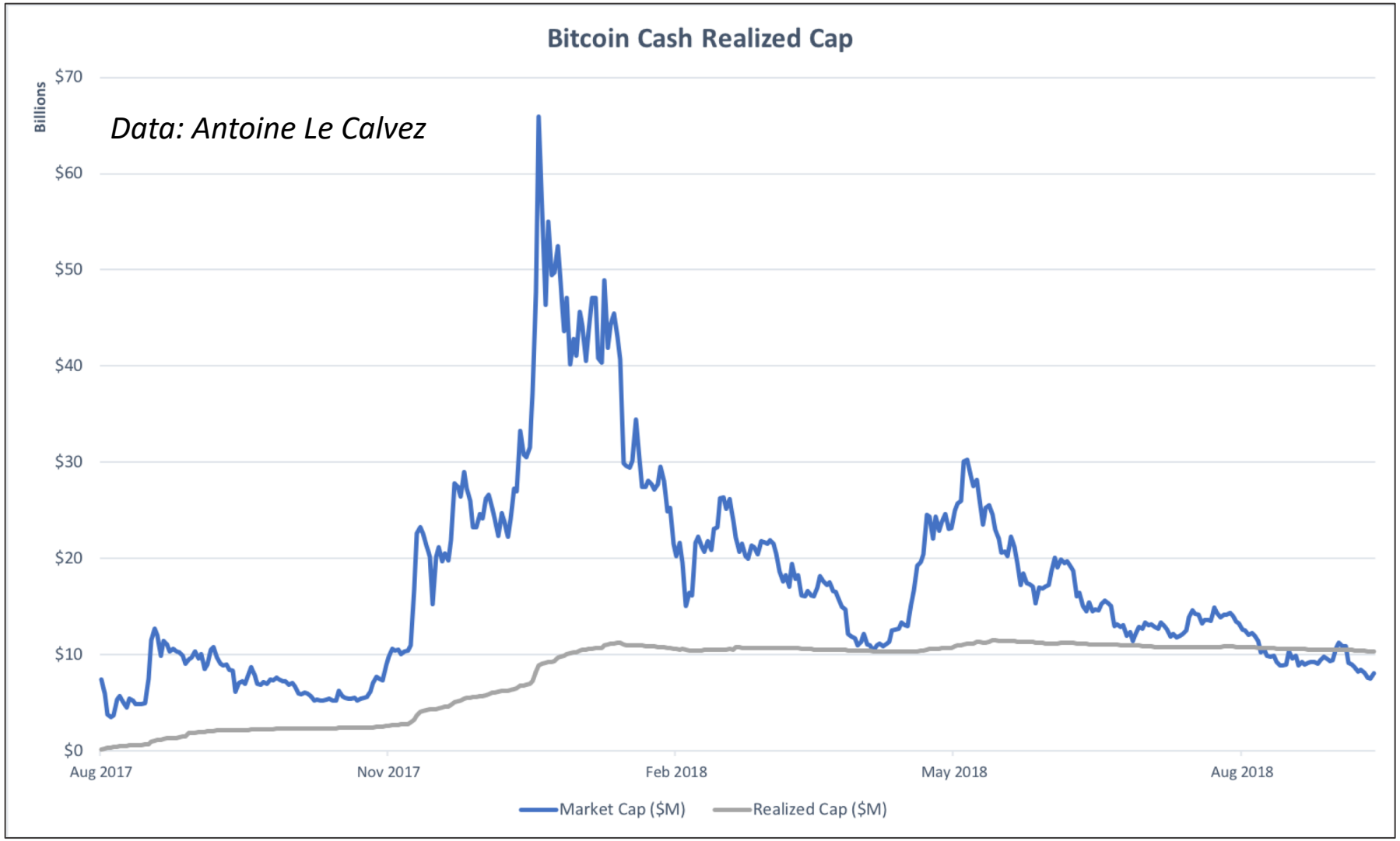
Realized Cap contribution by year

- UTXOs created in 2018 account for 65% of current RealCap
- UTXOs created in 2017 and 2018 account for 98% of current RealCap



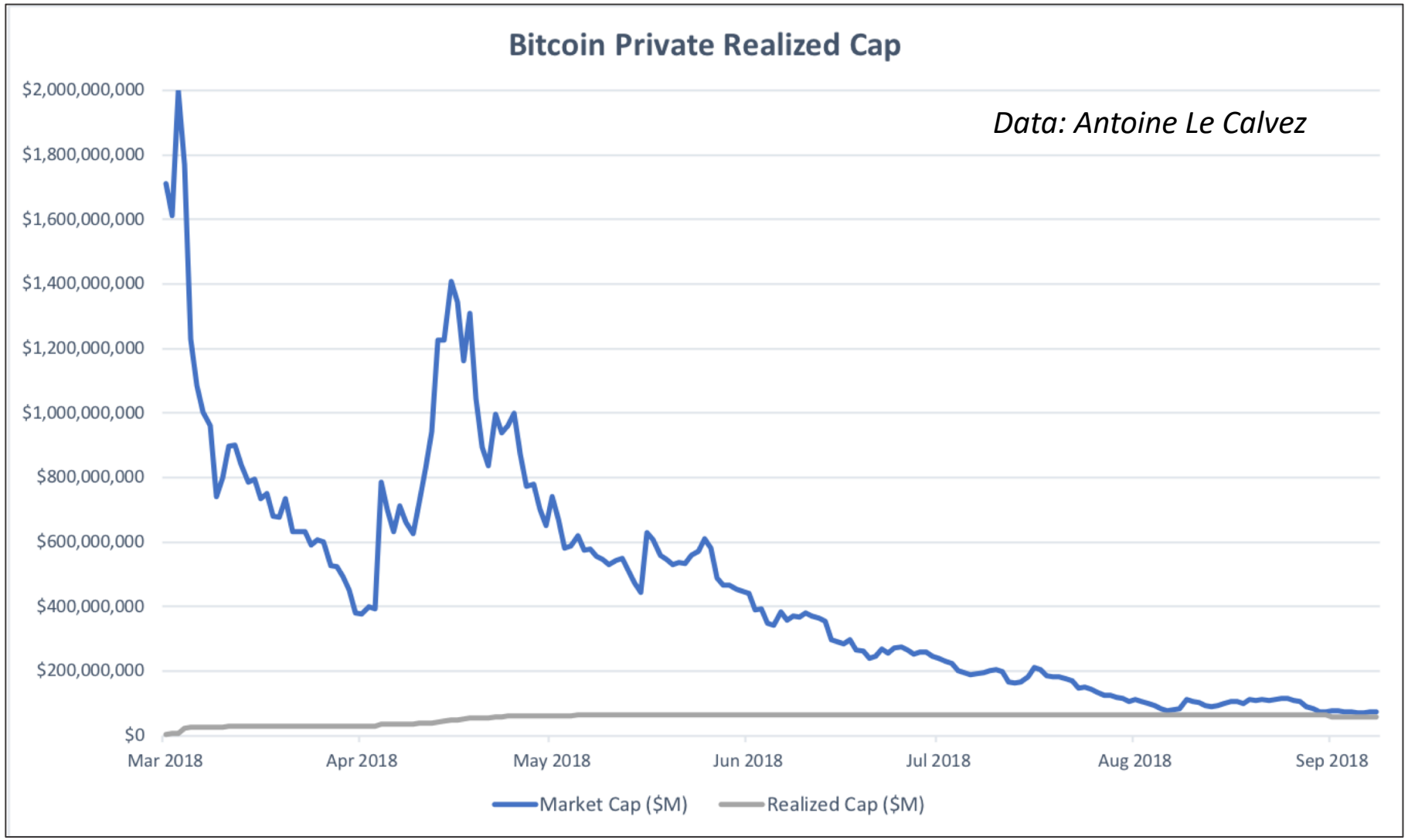
[1] *The log view chart is truncated at a lower bound of $10,000*

Realized Cap case study: Bitcoin Cash

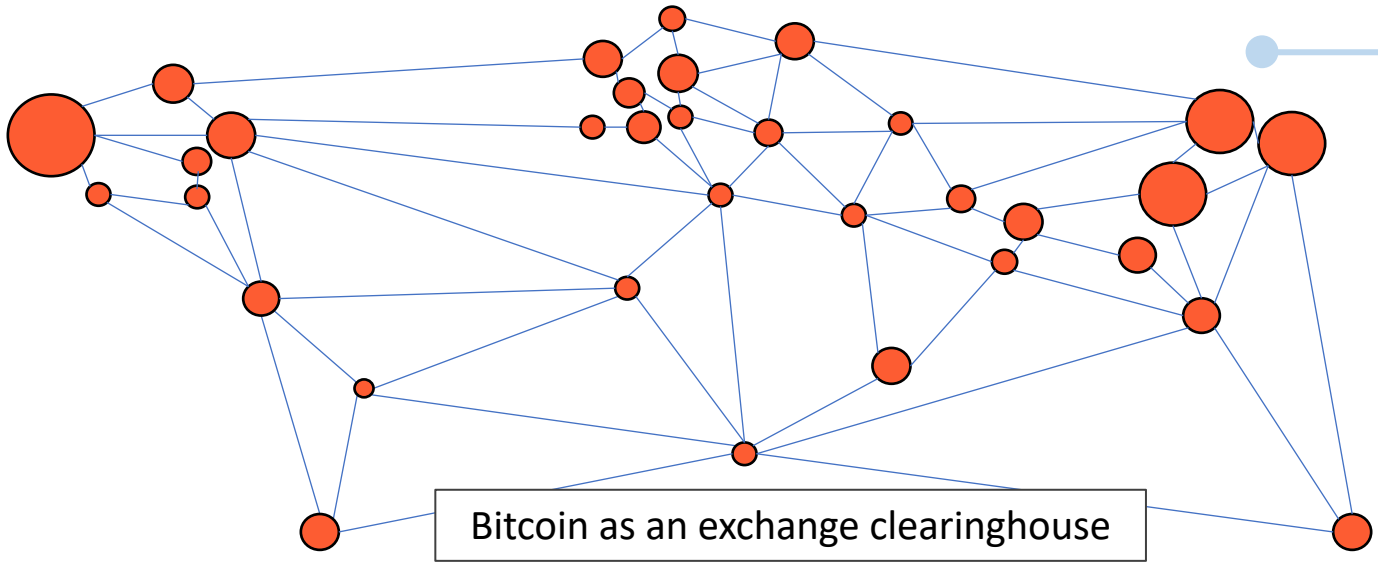


- While Bitcoin Cash market cap exceeded $60B, Real Cap topped out at $11B
- Real Cap demonstrates a more effective measure of wealth in illiquid markets
- Bitcoin Cash market cap was inflated partially due to unclaimed fork coins which were never activated but counted as supply; Real Cap does not count these

Realized Cap case study: Bitcoin Private

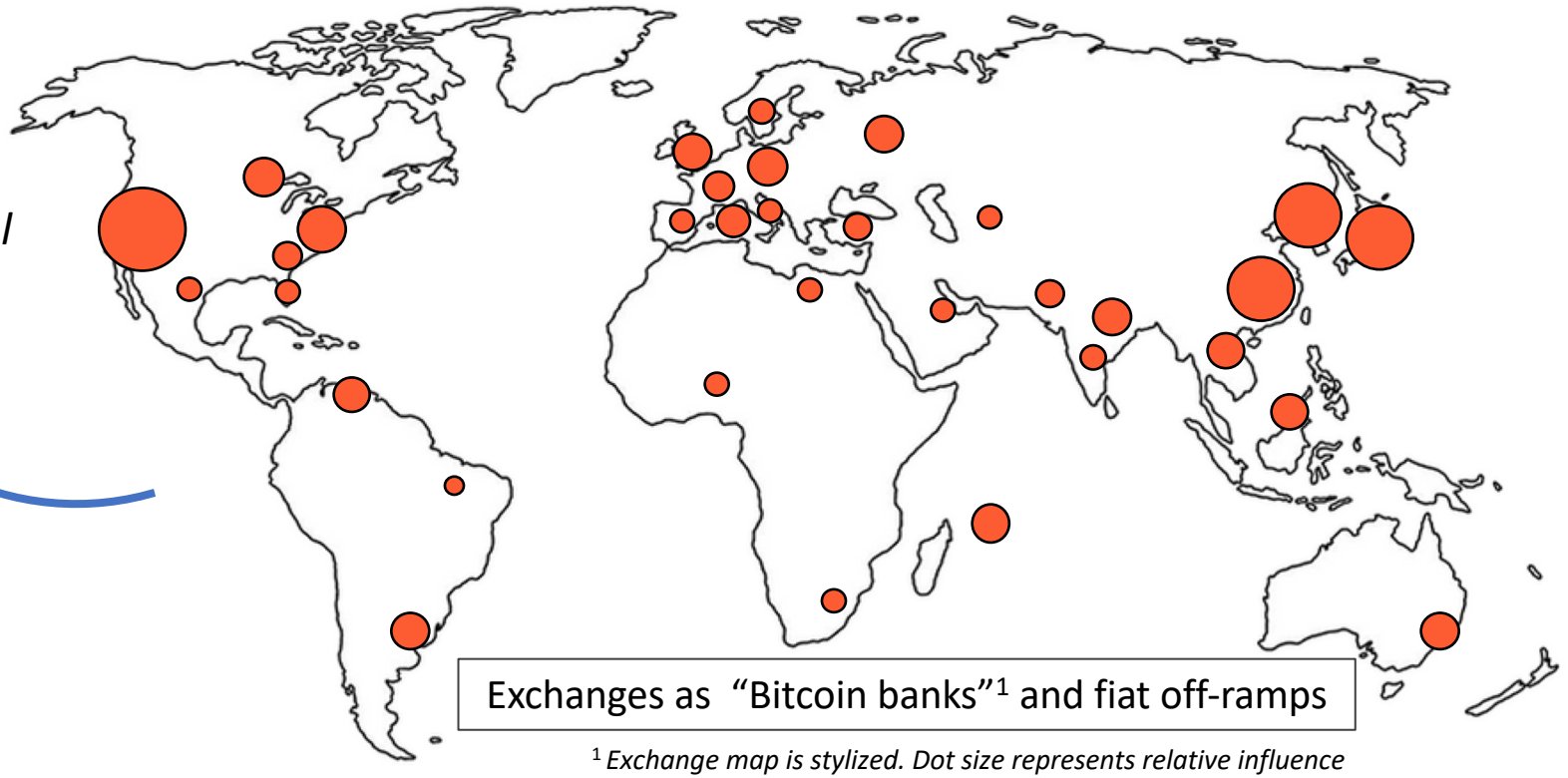


- Bitcoin Private conjoined the UTXO sets of Zclassic and Bitcoin; this led to massive overestimates in supply
- Market cap topped $2b but **realized cap never exceeded $65m** – a 30x difference!
- Most BTCP from BTC were never activated and should not have counted in supply; Real Cap fixes this



Bitcoin as an exchange clearinghouse

Liquidity *ponds* settled within the liquidity *pool*



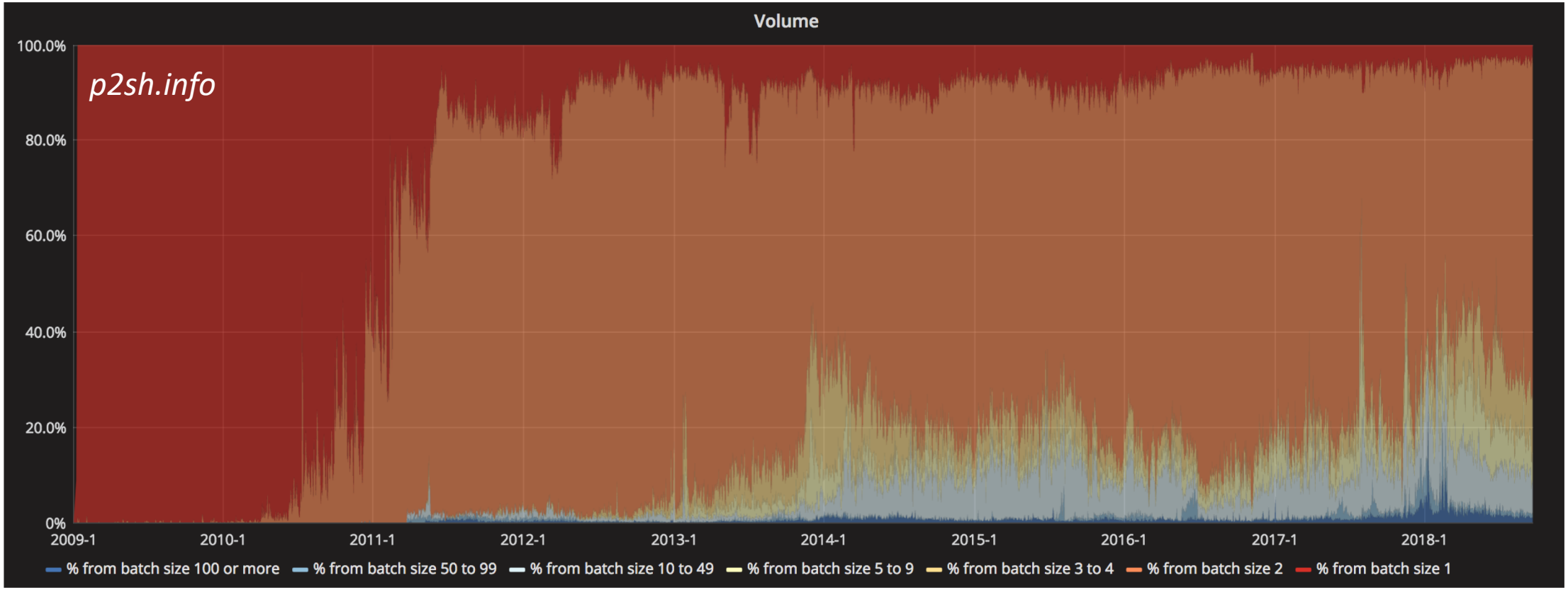
Exchanges as "Bitcoin banks"[1] and fiat off-ramps

An Industrial Network

[1] *Exchange map is stylized. Dot size represents relative influence*

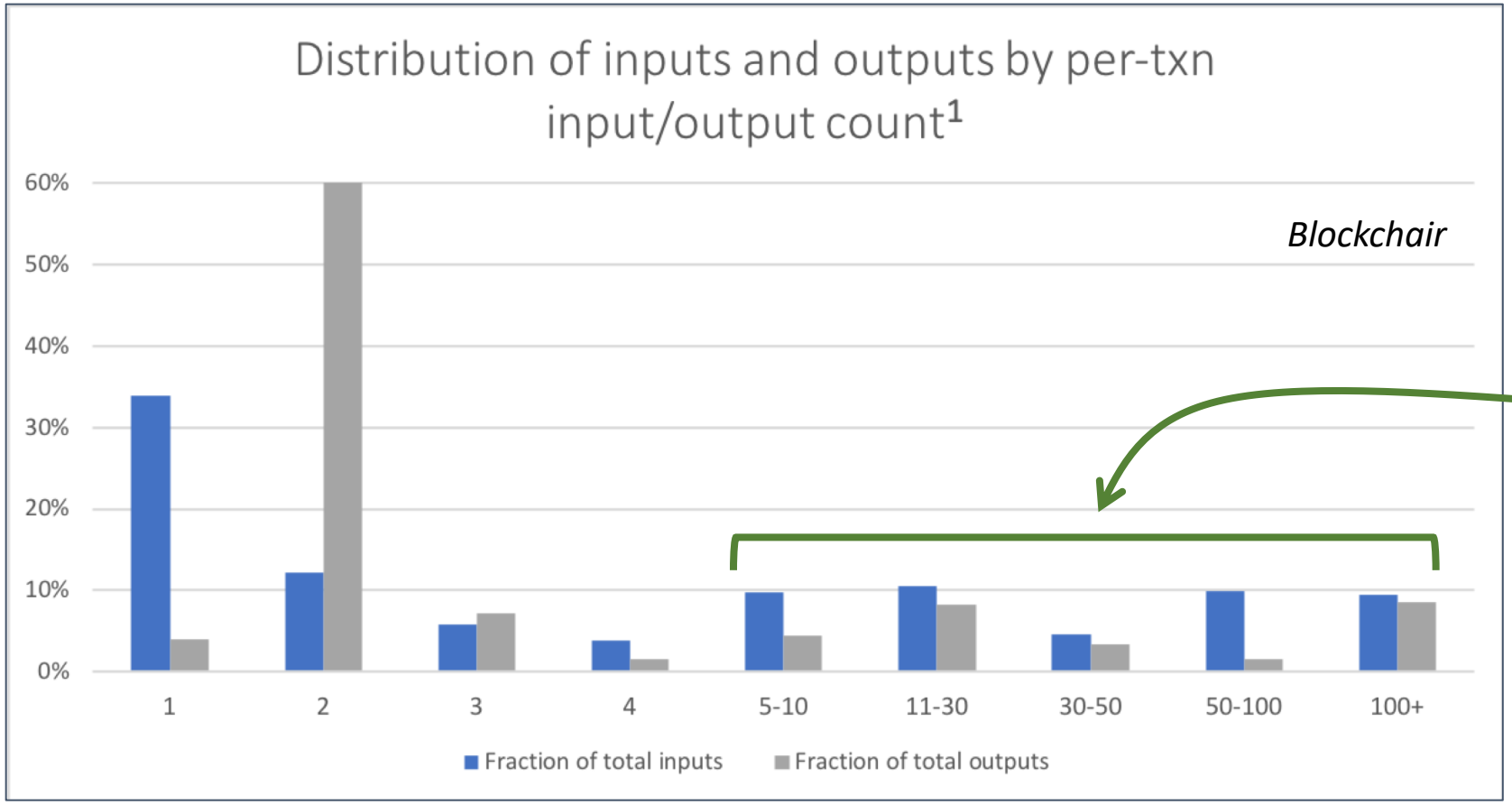
Exchange dominance today

- **30-40 percent** of all on-chain transaction volume (in output terms) [1]
- **~18 percent** of all value stored in the Bitcoin network [2]



[1] *Coinmetrics, "An Analysis of Batching in Bitcoin", p2sh.info*
[2] *Diar.co, "Circulating Bitcoin Majority Remain Sequestered to Investment Wallets"*

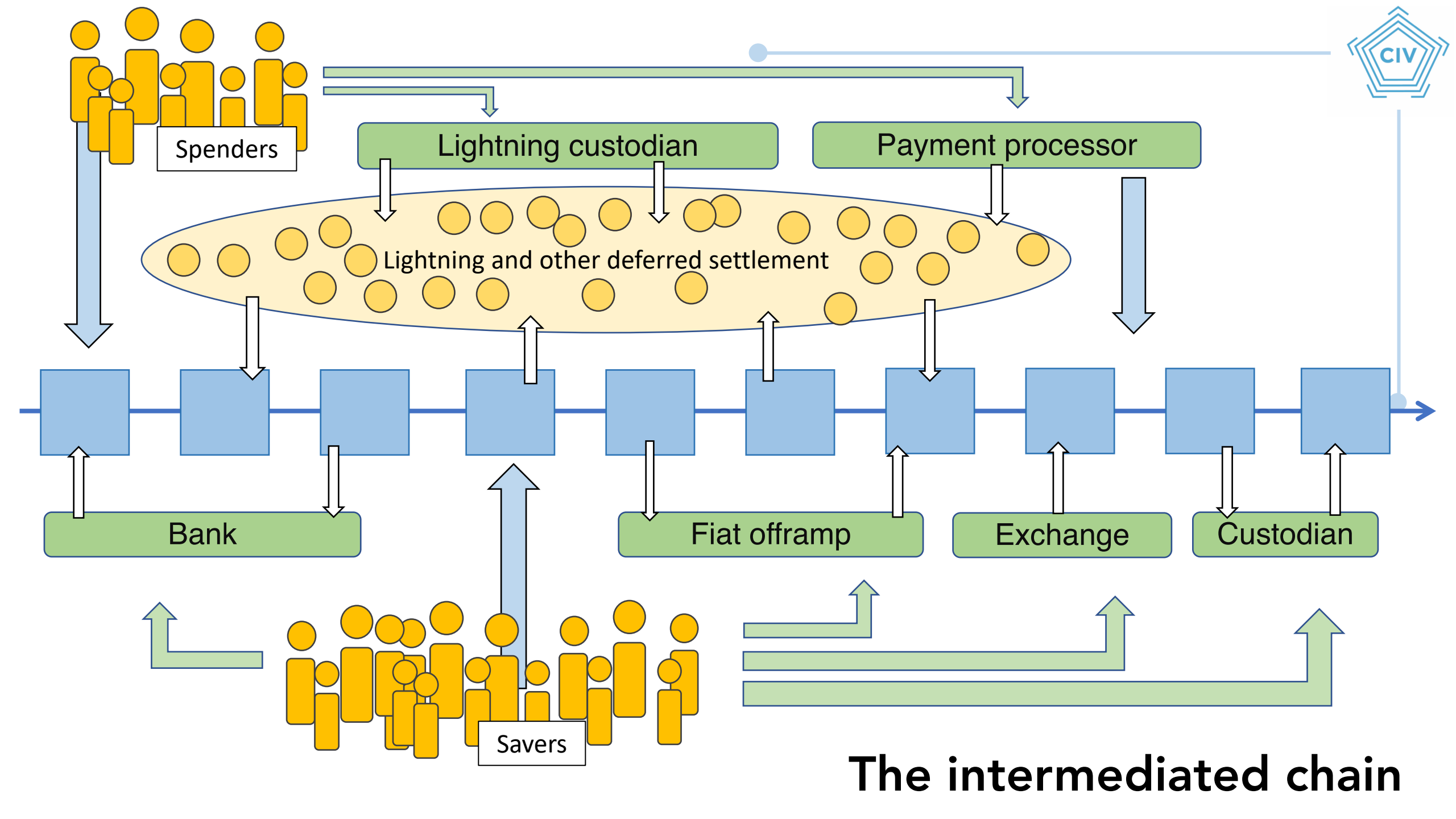
Exchange dominance II



Input consolidation and batched output transactions represent a significant fraction of the total network load

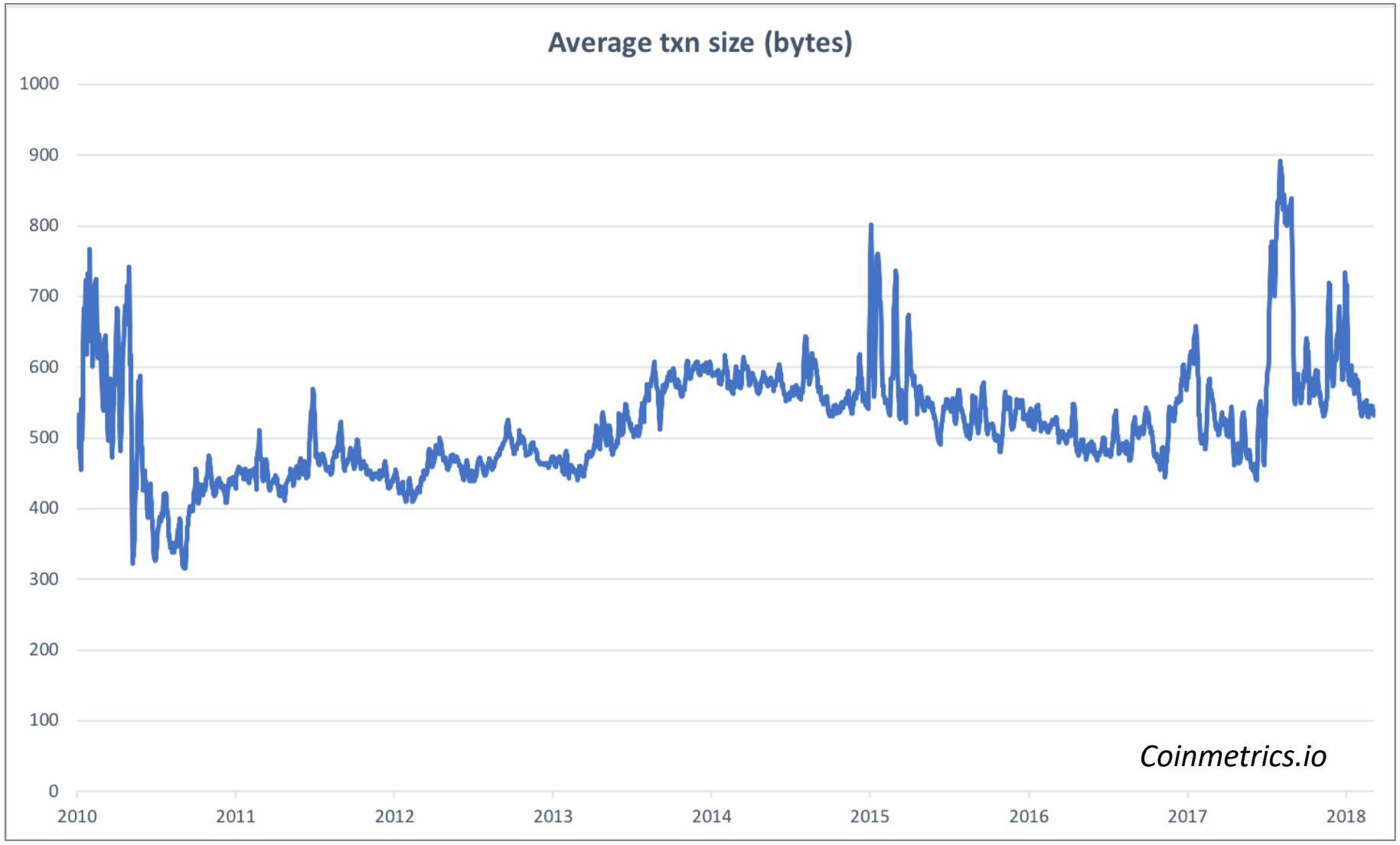
These are the hallmarks of “industrial” users – exchanges, payment processors, mining pools, custodians

[1] *The sample includes all transactions that took place in the week ending 09/19/2018*



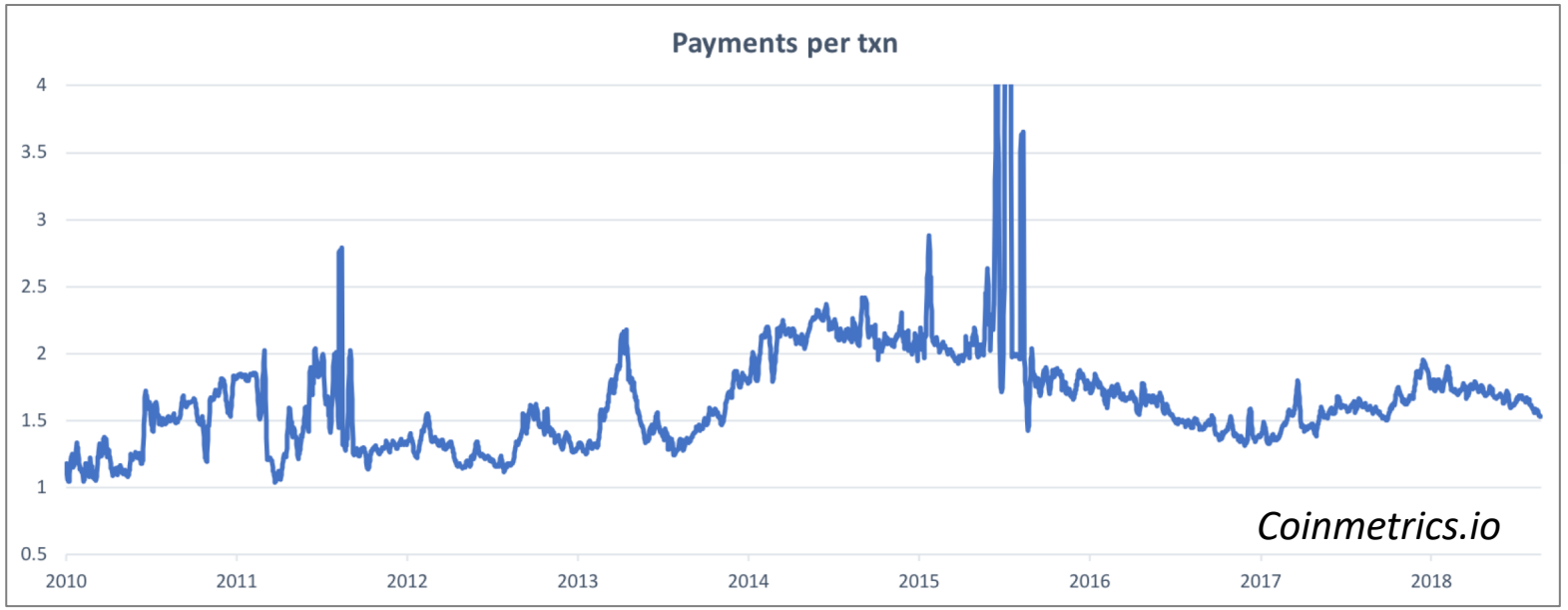
The intermediated chain

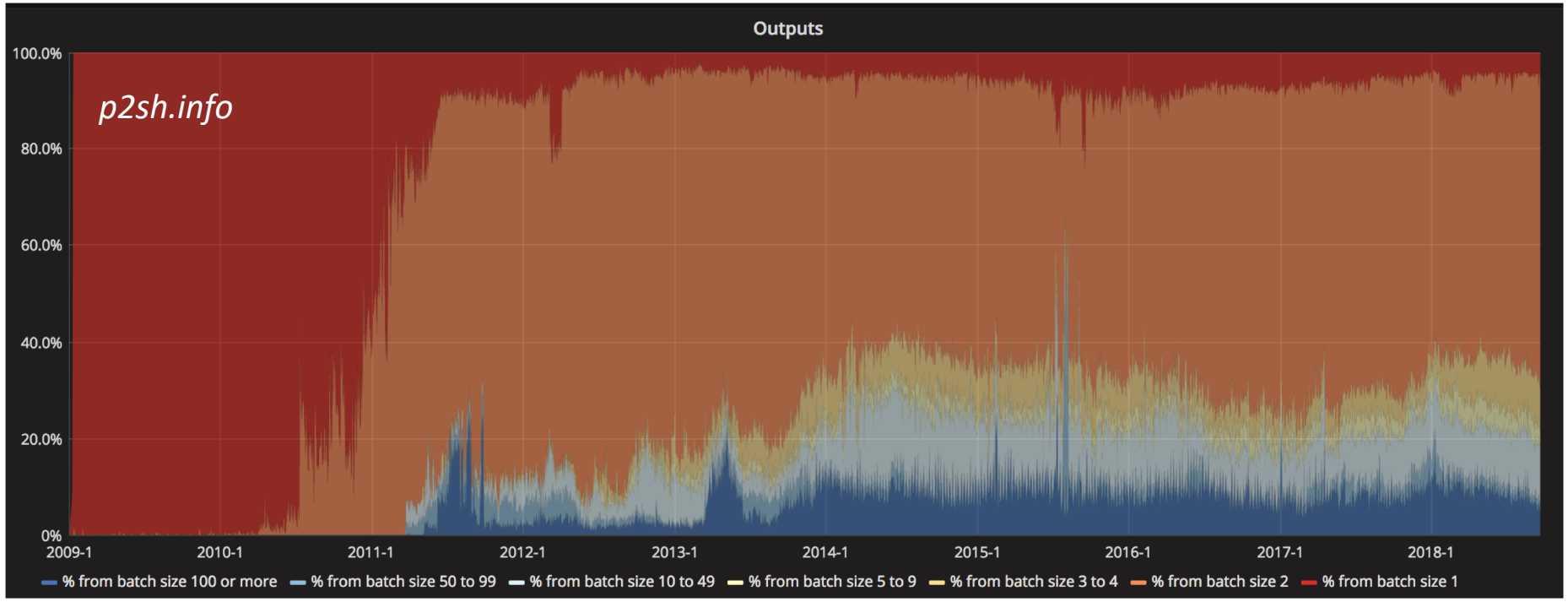
New KPIs: chain stewardship



Little progress in compressing the per-transaction footprint…

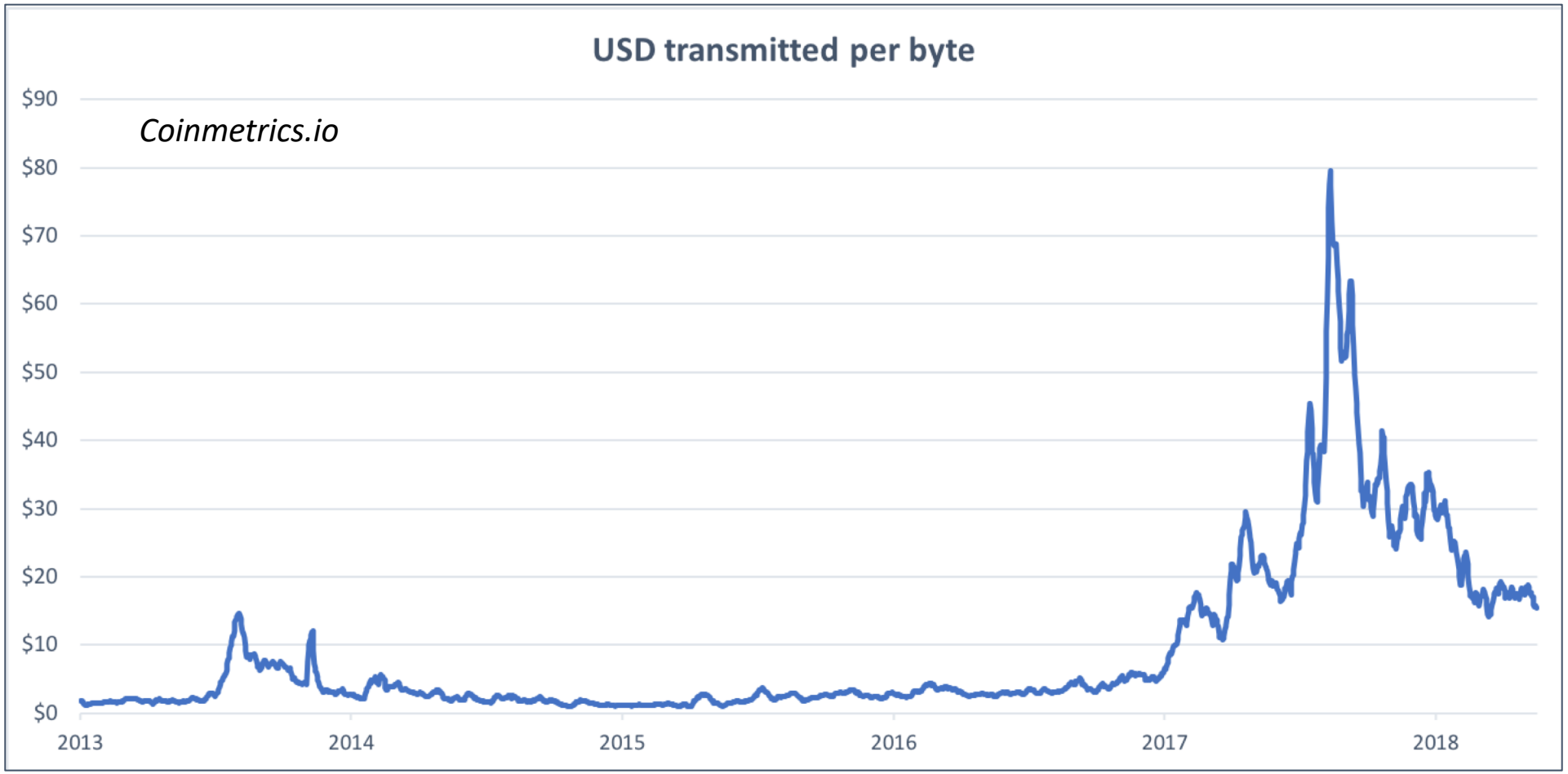
New KPIs: chain stewardship





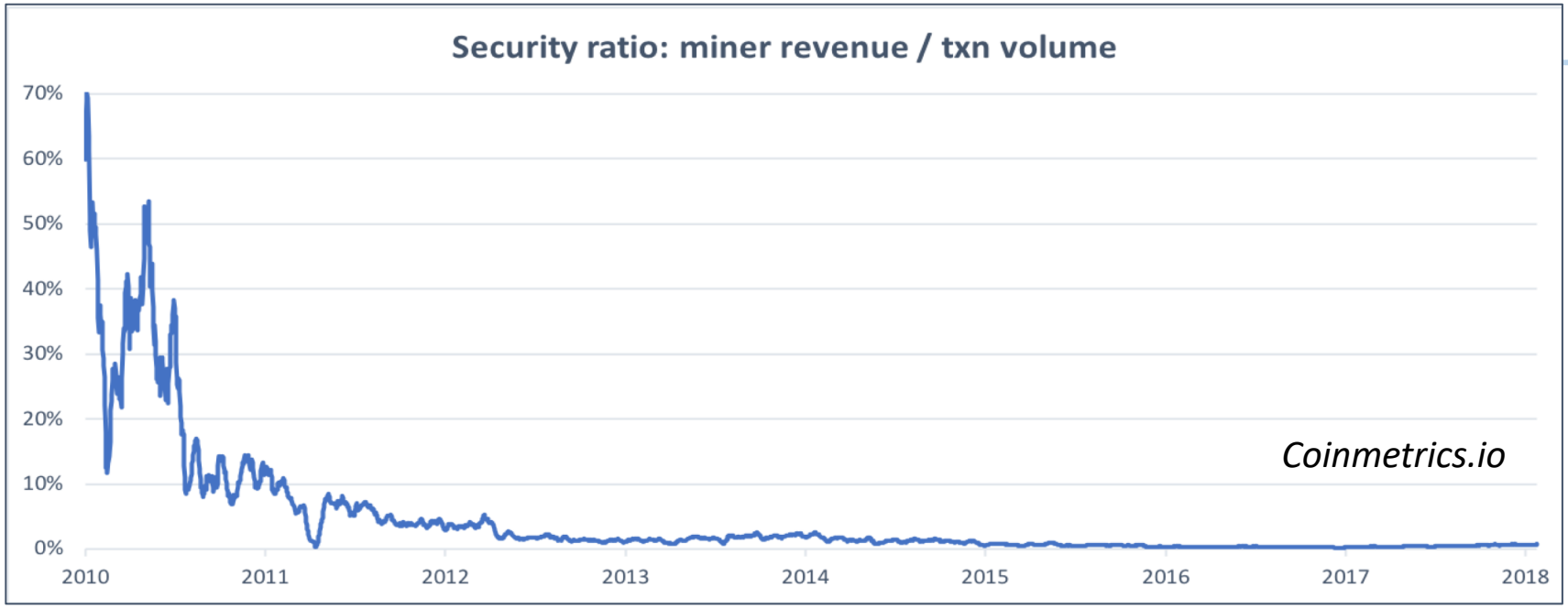
…and comparatively little progress in economizing with batching

New KPIs: economic density



Economic density weighs the output of the chain against the cost (to full nodes)

The economic weight of a byte continues to increase…



Q: “If block rewards went to 0 tomorrow, what percent of economic volume would we have to pay in fees to replace them?”

A: About 0.6% of economic volume would have to be paid in fees to support an equivalent level of security

New KPIs: fee ratio

Wait… aren't we trying to dis-intermediate?

- You can't fight reality – they are here to stay
- Hal Finney was right about the Bitcoin banks – we just call them exchanges
- Most users prefer the UX of intermediated custody, payments, exchange
- Intermediaries allow users to select scale and convenience tradeoffs

but…

- Intermediation and trust-minimization are not incompatible!
- Bitcoin's hard money and scarcity properties can still remain intact

Let's encourage responsible behavior

- Users: focus on chain stewardship
  - Lobby for **Segwit**, **batching** – minimize on-chain impact
  - Reward institutions that **respect Bitcoin's design philosophy** and **p2p network governance** process, don't support hostile forks
  - Demand **segregated accounts** at custodians & **proofs of reserves**
- Allocators: support hybrid intermediaries which leverage BTC's settlement guarantees
  - Non-custodial custodians, p2p exchanges, contract arbitrators, noncustodial payment processors
- Maintain focus on verification cost, long-term sustainability
  - Give users the option of running a node so exit costs are low
  - Developers: explore the transition from issuance-funded security to fee-funded security

Takeaways

- Let's have an honest conversation about measuring wealth held in Bitcoin
  - Proposed alternative: **Realized Cap**
  - Or, just reduce supply appropriately
- *Economic throughput*, not transaction count matters – because txns can pack a huge punch!
  - Proposed KPIs: economic density, fee ratio, payments per transaction
- Let's be realistic about the Bitcoin economy today – intermediation exists, and is here to stay
- But – we can keep them in check

Appendix

Settlement/payments volume for various services

Service	Type	Annual throughput (Billion USD)	Source
SWIFT	Messaging	1,825,000	https://www.fincen.gov/sites/default/files/shared/Appendix_D.pdf
Fedwire	Realtime settlement	766,500	https://www.fincen.gov/sites/default/files/shared/Appendix_D.pdf
CHIPS	Realtime settlement	511,000	https://www.fincen.gov/sites/default/files/shared/Appendix_D.pdf
Visa	Payments	8,400	https://www.digitaltransactions.net/visa-surpasses-2-trillion-in-payment-volume-in-its-third-quarter/
Alipay	Payments	6,480	https://www.scmp.com/tech/apps-gaming/article/2134011/china-pulls-further-ahead-us-mobile-payments-record-us128-trillion
Mastercard	Payments	6,000	https://www.pymnts.com/news/retail/2018/mastercard-sees-cross-border-volumes-up-19-percent/
Wechat	Payments	4,800	https://www.scmp.com/tech/apps-gaming/article/2134011/china-pulls-further-ahead-us-mobile-payments-record-us128-trillion
Bitcoin (aggressive)	Settlement	2,372	Coinmetrics
American express	Payments	732	https://247wallst.com/banking-finance/2018/06/26/will-amazon-deal-drive-american-express-volume-past-mastercard/
Bitcoin (conservative)	Settlement	657	blockchain.info
Global remittances	Settlement	636	https://sibc.nd.edu/assets/228986/bain_wu_final.pdf
OTC gold (LBMA)	Physical settlement	446	http://www.lbma.org.uk/clearing-statistics
Square	Payments	86	https://www.pymnts.com/earnings/2018/transaction-volume-subscriptions-square-q2-earnings-beat/
Western union	Settlement	70	https://sibc.nd.edu/assets/228986/bain_wu_final.pdf

Historical Visa payment volume

Year	Payments volume (billion USD)	Source
2010	3,592	http://www.annualreports.com/HostedData/AnnualReportArchive/v/NYSE_V_2012.pdf
2011	3,700	https://s1.q4cdn.com/050606653/files/doc_financials/Visa%20Q1%202012%20Operational%20Performance%20Data.pdf
2012	3,900	https://s1.q4cdn.com/050606653/files/doc_financials/Visa%20Q1%202012%20Operational%20Performance%20Data.pdf
2013	4,230	http://www.annualreports.com/HostedData/AnnualReportArchive/v/NYSE_V_2012.pdf
2014	4,700	http://www.annualreports.com/HostedData/AnnualReportArchive/v/NYSE_V_2012.pdf
2015	4,900	https://s1.q4cdn.com/050606653/files/doc_financials/annual/Visa-2016-Annual-Report.pdf
2016	5,800	https://s1.q4cdn.com/050606653/files/doc_financials/annual/Visa-2016-Annual-Report.pdf
2017	6,800	https://s1.q4cdn.com/050606653/files/doc_financials/annual/Visa-2016-Annual-Report.pdf
2018	8,400	https://www.digitaltransactions.net/visa-surpasses-2-trillion-in-payment-volume-in-its-third-quarter/