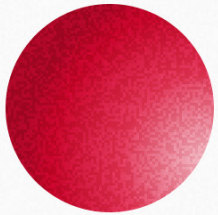
Investment Navigator

General Purpose Smart Contract Platforms



Q1 2023
A Bitcoin Suisse Publication
by Dominic Weibel, Research Analyst

With a market cap of $1.2 trillion and almost 11’000 projects tracked, the crypto industry offers all kinds of flavors yet challenges the investor in navigating the space due to its complexity, dynamics, and range.

The Investment Navigator aims to unpack that ecosystem on a quarterly basis utilizing the Bitcoin Suisse Global Crypto Taxonomy (GCT) as a structural framework. The Investment Navigator contains quarterly sector analysis and dedicated sector deep dives. The reader can expect a data-driven publication with a focus on market perspective, orientation and guidance for enhanced decision-making.

It aims to help investors in identifying investment opportunities, analyzing specific sectors and sub-sectors on key metrics derived from adoption, economics by ecosystem and benchmarking the performance of a digital asset against its peers.

The deep roots never doubt spring will come.
— Martin Rubyn

While the industry kept building heads down across last year's crypto winter, a good amount of on- and off-chain metrics signal spring's arrival in the industry: crypto's overall market capitalization is up ~52.8% QTD, heavily outperforming the S&P at 6.4% QTD.

As such, most assets are up across all crypto sectors in the first quarter, fundamentals got stronger and crucial indicators turned green, a remarkable performance amidst a major banking crisis, a crypto clampdown in various jurisdictions and a tight monetary policy.

From an overall industry perspective, the cryptocurrency sector still leads the charge with ~61% dominance while the DeFi sector saw the most splendid Q1 performance, up ~138%.

General purpose smart contract platforms remain the breeding ground for innovation, blockspace demand and economic activity within the industry.

Ethereum serves as a great proxy for the sector: while 95% of blockspace was allocated to simple transactions in 2015, only 6% are at present, a sustained trend that implies exceptional smart contract utilization and demand.

Following an overview of the sectors based on the Global Crypto Taxonomy, this report provides a general purpose smart contract sector deep dive analyzing the 12 most relevant platforms based on 46 different key metrics across economics, adoption and network.

Trends we observed include strong EVM dominance, a continued drift of value and activity towards Layer 2 ecosystems, higher dominance across deflationary platforms that print positive earnings, a consistent stream of innovation in new Layer 1 like Aptos and Sui, Layer 2 like Optimism's Superchains, Arbitrum's Orbit or the whole bandwidth of upcoming zkEVMs.

Tron's and BNB's low transaction fees proved to attract high user adoption be it in DeFi or for micropayments. As such, both managed to print positive earnings together with Ethereum.

With consistently remarkable earnings and a successful Shanghai upgrade, ETH might morph into a scarce, yet liquid commodity that features the risk-free rate of the decentralized and permissionless financial ecosystem. Based on these indicators and the long-term sentiment score, it is one of the highest conviction bets within the community.

Despite its mainnet scaling issues, Ethereum remains the central hub for novel applications, the most capital heavy smart contract platform with the highest value staked despite a low staking ratio and the dominant Layer 1 in developer mindshare, economic activity, and deployed protocols, that serve as a catalyst for Ethereum's network effect.

Overall however, we still observe healthy competition and the upcoming modular narrative might shake the space up. And while rollup technology is still immature and comes with a basket of risks such as upgradeability, centralized sequencers and non-existing fraud proofs, it drives most adoption in recent months and we expect that trend to even accelerate. The era of Ethereum killers seems to fossilize and other Layer 1 platforms will now likely compete with Layer 2.

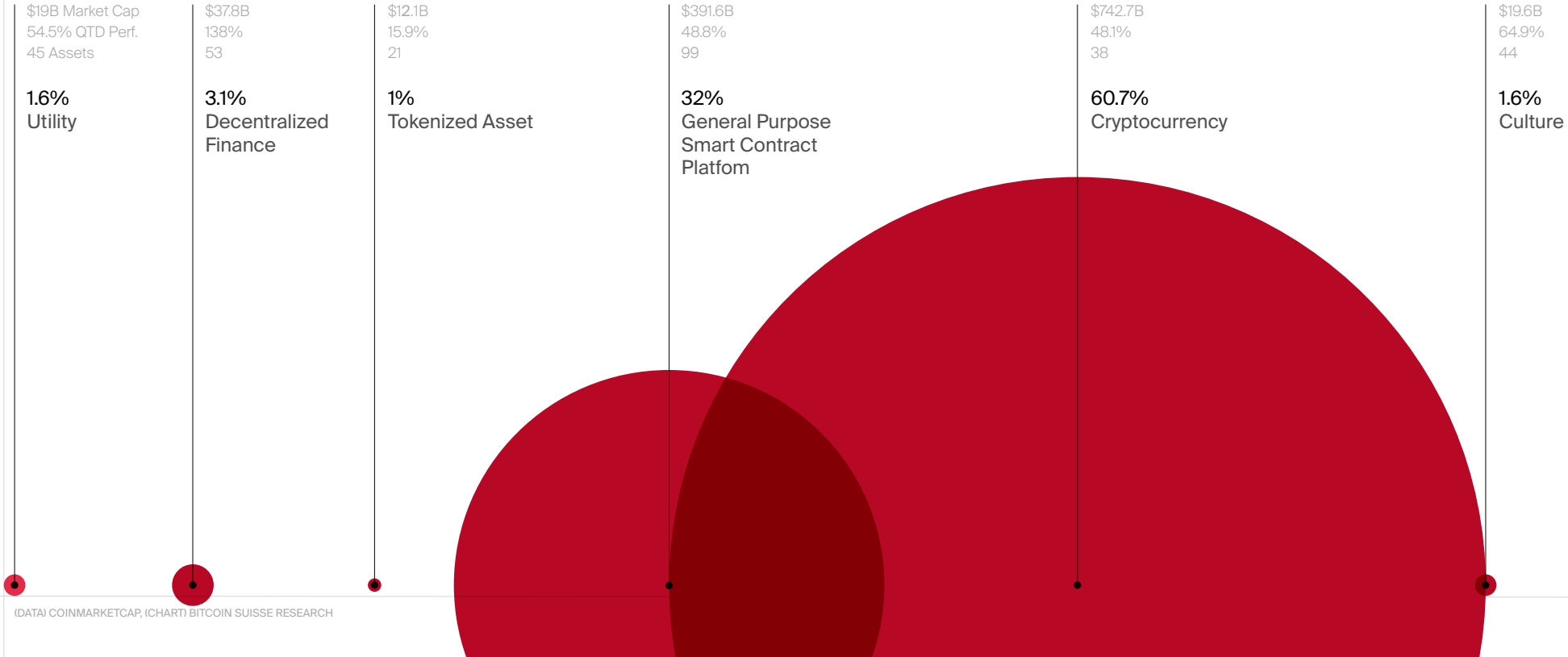
Whoever makes it to the end of this report will find a digestible and lightweight key performance score based on 9 metrics we consider to be the most expressive. We won't tell more, but the scores might catch you off guard.

We hope this report supports the reader in successfully navigating the crypto space, which often is a bumpy ride. However, even if this spring turns out to be slightly extended and partwise rainy, we all know: after spring comes summer.

Overview of Sectors

Led by Bitcoin, the Cryptocurrency sector is dominating the crypto industry with 60.7%

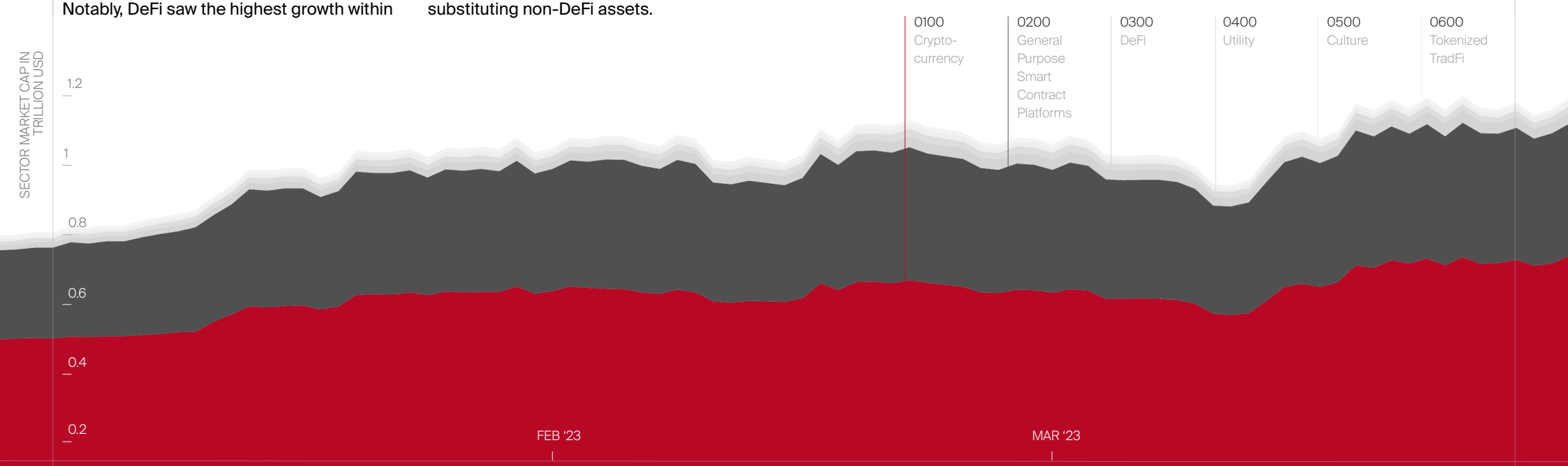
The GCT defines and captures sectors that share intra-sector attributes and differ in inter-sector characteristics, making them clearly distinguishable from other sector whereas assets inside a sectors share attributes in common. The same logic applies to the sub sector level. For a robust classification, our taxonomy provides explicit inclusion and exclusion criteria. With a lean yet flexible 2-tier structure of 6 sectors and 25 sub-sectors designed to remain stable over a multi-year period, the GCT also supports the analysis and identification of growth sectors and general market trends over time. The 6 sectors are composed of Cryptocurrencies, General Purpose Smart Contract Platforms, Decentralized Finance, Utility, Culture and Tokenized Assets, see below.



(DATA) COINMARKETCAP, (CHART) BITCOIN SUISSE RESEARCH

DeFi saw the highest growth rate in Q1 2023 with 138% due to liquid staking and an innovation race on Layer 2

The most capital heavy sector is Cryptocurrency, mostly led by Bitcoin. 38 assets fall into that sector according to the top 300 by market cap that were classified according to the GCT. Following up, the General Purpose Smart Contract Platform sector ranks second consisting of 99 assets representing 32% of the total crypto market with a size of $391.6b. Finally, DeFi 53 assets, Utility with 45 assets, Culture with 44 assets and Tokenized Assets with 21 assets make up for only around 7% of the entire crypto market, see chart below. Notably, DeFi saw the highest growth within Q1 2023, increasing 138%, mostly owed to two catalysts. Ongoing DeFi innovation on Layer 2s that drive competition and pull in new money such as decentralized perpetual exchanges, new decentralized options protocols and on-chain asset management solutions. Furthermore, Liquid Staking Protocols such as Lido or RocketPool saw exceptional performance driven by the Shanghai upgrade. Based on these factors, various protocols within DeFi not only significantly outperformed other sectors, but also managed to enter the top 300 substituting non-DeFi assets.



(DATA) COINMARKETCAP, (CHART) BITCOIN SUISSE RESEARCH

Sector Deep Dive
General Purpose Smart Contract Platforms

Smart contract platforms enable the hosting and execution of smart contracts and decentralized applications such as decentralized exchanges, lending protocols or prediction markets.

Smart contract platforms foster a flourishing breeding ground for innovation, attracting a high level of developers proficient in a range of programming languages, funding, and users that are enabled to take ownership. Interacting with smart contracts demand fees, usually paid in the platform's native token while the fee amount is generally determined via the platform's blockspace demand and how good the underlying architecture scales. We distinguish between general-purpose and application-specific smart contract platforms.

General-purpose smart contract platforms are currently most popular and face most adoption and blockspace demand. They come with different flavors regarding their technology, degree of decentralization, monetary policy, security, or scalability. General-Purpose Smart Contract Platforms can be divided into Layer 1 protocols such as Ethereum, Avalanche, or Solana, and Layer 2 protocols like Polygon or Arbitrum. Usually, Layer 2 protocols can be considered scaling solutions built on top of Layer 1 networks. Compared to general-purpose smart contract platforms, application specific blockchains are exclusively designed to perform one specific-application. These can be completely individual and sovereign Layer 1 that focus on a specific use case or, the more popular architecture, chains within certain ecosystems that often have dependencies on other infrastructure within that ecosystem. Among them are Cosmos Zones, Polkadot Parachains, or solutions like Optimism's Superchains, zkSync's Hyperchains or Polygon's Supernets. With the launch of the Arbitrum token, Offchain labs announced Arbitrum Orbit, that will also enable application specific Layer 3 on top of Arbitrum. The modular blockchain narrative might boost applicationf-specific solutions even further. In this report, we exclude application specific chains from the analysis. From an architecture perspective however, one can distinguish smart contract platforms between monolithic and modular approaches. Both approaches are possible for general-purpose smart contract platforms and hence, included in this report.

0200

General-Purpose Smart Contract Platform

The "general purpose smart contract platform" sector contains blockchains that offer functionality 'beyond money', usually in the form of decentralized applications consisting of smart contracts that utilize the native coin of the blockchain and oracles as external data sources.

0201

Layer 1

A base blockchain with the primary function to deploy and run smart contracts using a native token as 'gas' and that has an inherent source of cryptoeconomic security and thus, does not rely on an external security source.

inclusion criteria
+ Base layer blockchain with a native token
+ Smart contract functionality

exclusion criteria
– No smart contract functionality
– No base layer blockchain

0202

Layer 2

A blockchain that technically depends on another Layer 1 and inherits fully or partially its cryptoeconomic security (e.g., rollups, side chains, etc.). It can but does not have to feature its own native token.

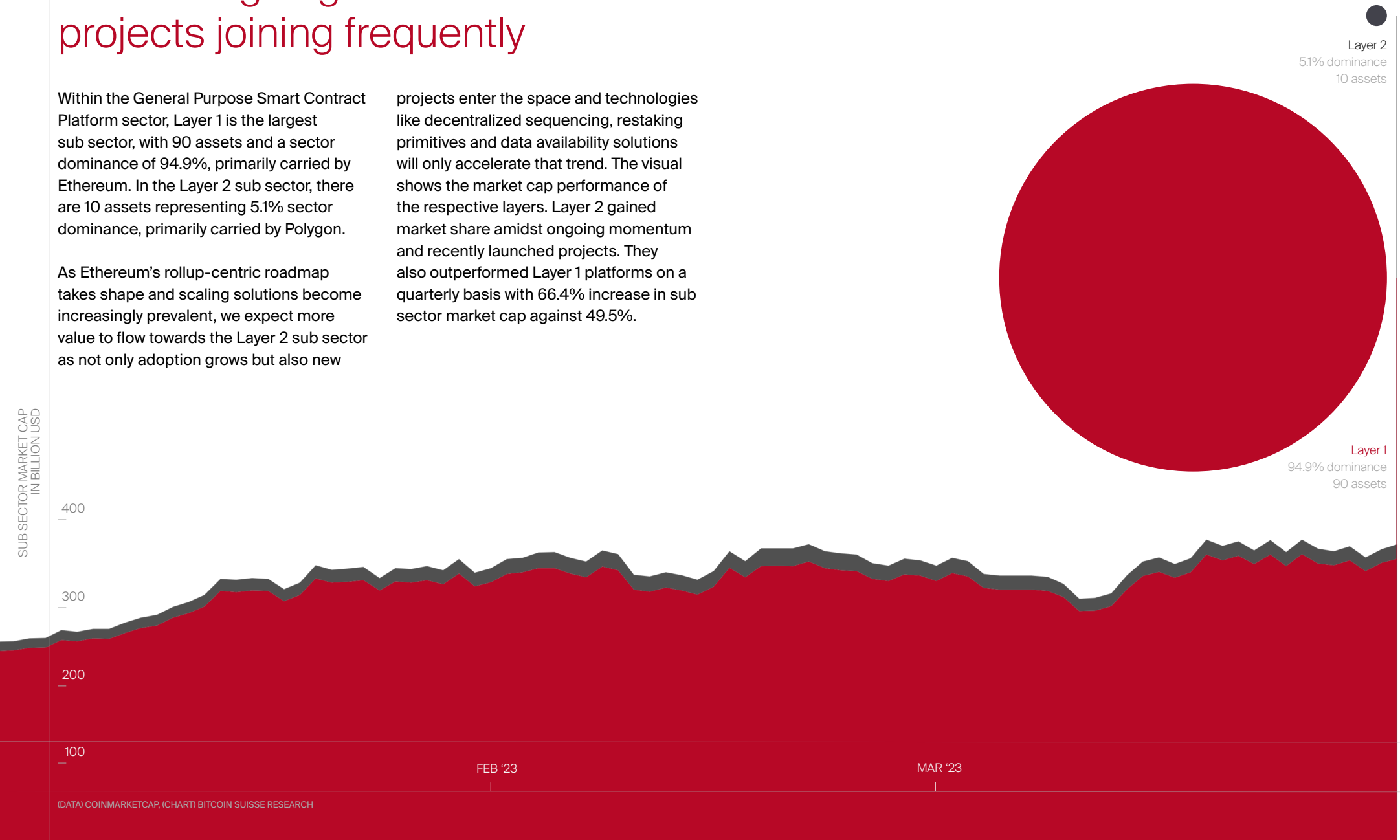
inclusion criteria
+ Smart contract functionality
+ Technical dependence on another layer
+ Cryptoeconomic security inheritance

exclusion criteria
– No smart contract functionality
– Layer 1 blockchain

Layer 2 gained more market share amidst ongoing momentum and new projects joining frequently

Within the General Purpose Smart Contract Platform sector, Layer 1 is the largest sub sector, with 90 assets and a sector dominance of 94.9%, primarily carried by Ethereum. In the Layer 2 sub sector, there are 10 assets representing 5.1% sector dominance, primarily carried by Polygon.

As Ethereum's rollup-centric roadmap takes shape and scaling solutions become increasingly prevalent, we expect more value to flow towards the Layer 2 sub sector as not only adoption grows but also new projects enter the space and technologies like decentralized sequencing, restaking primitives and data availability solutions will only accelerate that trend. The visual shows the market cap performance of the respective layers. Layer 2 gained market share amidst ongoing momentum and recently launched projects. They also outperformed Layer 1 platforms on a quarterly basis with 66.4% increase in sub sector market cap against 49.5%.



Highest age, highest market cap: Ethereum's network effects are sticky and its long-term sentiment score shows

This report focuses on general purpose smart contract Layer 1 and Layer 2 platforms that rank highest based on key **economic** (e.g. market capitalization), **adoption** (e.g. developers), and **network** (e.g. TVL) metrics. Market capitalization ranks among the most crucial selection factors as it entails a blend of market confidence in fundamentals, development, roadmap execution, decentralization, and sustainable network effects to capture less noisy data. Especially adoption metrics are subject to high fluctuations and are hence more expressive as an average over time.We consider the following networks in order of the aforementioned selection approach along with generic key metrics, see table below.

Selected assets within the Layer 1 sub sector include Ethereum the most capital heavy smart contract platform, BNB, Binance's EVM chain, Cardano, with its unique peer-review approach and strong ambassador base, Polygon, Ethereum's swiss army knife for scaling, Solana, the monolithic, TPS-heavy solution for low transaction fees, Polkadot, the interoperability hub, Avalanche, with its Subnet approach and disruptive Snowman consensus engine yielding fast finality, Tron, that massively scales stablecoin adoption, Cosmos, pushing sovereign, application specific blockchains via IBC, Cosmos SDK and Tendermint, Aptos, leading the charge of modern blockchains based on the Move programming language and finally Arbitrum and Optimism, Ethereum's most adopted and fully operational optimistic rollups.

For the following comparison, it's key to highlight variances in the platform's design and architecture. Interoperability protocols like Cosmos or Polkadot aim to provide trustless cross-chain messaging across compatible blockchains. Polkadot for instance provides security to all its connected Parachains while Cosmos Zones leverage their sovereign validator set and hence, maintain their own security instead of sourcing it from the Cosmos Hub. The Cosmos Hub announced that it will soon add additional functionality to its validator set by enabling Consumer Chains via Interchain Security (ICS), that can then tap into the economic security from the Cosmos Hub and thereby create additional revenue for the validators. Both the Polkatdot relay chain and the Cosmos Hub have minimal functionality by design. As such, the Polkadot relay chain offers no smart contract features while Cosmos Hub strives for a hub minimalism philosophy with limited features to decrease security vulnerabilities and conflicts of interest. As a result, the Cosmos Hub and Polkadot relay chain are in some metrics such as TVL hard to compare to other selected platforms, and we therefore added ecosystem metrics where it was reasonable to provide more context. For instance, if we'd compare TVL of all chains a certain validator set is providing security to as a means of shared security, of course all parachains would fall into that aggregate TVL. However, we would then have to add all Layer 2 such as Arbitrum or Optimism that source their security from Ethereum. Regardless of how one tries to compare the selected platforms, each comparison will come with its trade-offs.

Alongside the more common and generic metrics, the table also indicates the long-term sentiment, a metric of how positive or negative Twitter content was over the last 50 days measured vs. the previous 200 days. Above 50 implies an overall positive sentiment vs. the previous 200 days and vice versa.

Platform	Ticker	Sub Sector	Launch	Market Cap	Consensus	Validator Set/Chains	VM	Sentiment
Ethereum	ETH	Layer1	2015	$226.7b	PoS (Gasper)	One/Multiple	EVM	62
BNB	BNB	Layer1	2020	$51.5b	PoS (PoA)	One/One	EVM	34
Cardano	ADA	Layer1	2017	$13.8b	PoS (Ouroboros)	One/One	Non-EVM	29
Polygon	MATIC	Layer2	2020	$9.5b	PoS (Peppermint)	One/One	EVM	15
Solana	SOL	Layer1	2020	$8.6b	PoS (Tower BFT)	One/One	Non-EVM	41
Polkadot	DOT	Layer1	2020	$7.0b	PoS (Grandpa/Babe)	One/Multiple	EVM (possible)	47
Avalanche	AVAX	Layer1	2020	$5.8b	PoS (Snowball)	Multiple/Multiple	EVM (possible)	37
Tron	TRX	Layer1	2018	$5.8b	PoS (dPoS)	One/One	TVM (compatible)	23
Cosmos	ATOM	Layer1	2019	$3.2b	PoS (Tendermint)	Multiple/Multiple	EVM (possible)	18
Aptos	APT	Layer1	2022	$2.0b	PoS (AptosBFT)	One/One	Non-EVM	50
Arbitrum	ARB	Layer2	2021	$1.9b	(Fraud Proof)	Ethereum/(One)*	EVM	N/A
Optimism	OP	Layer2	2021	$0.7b	(Fraud Proof)	Ethereum/(One)*	EVM	N/A

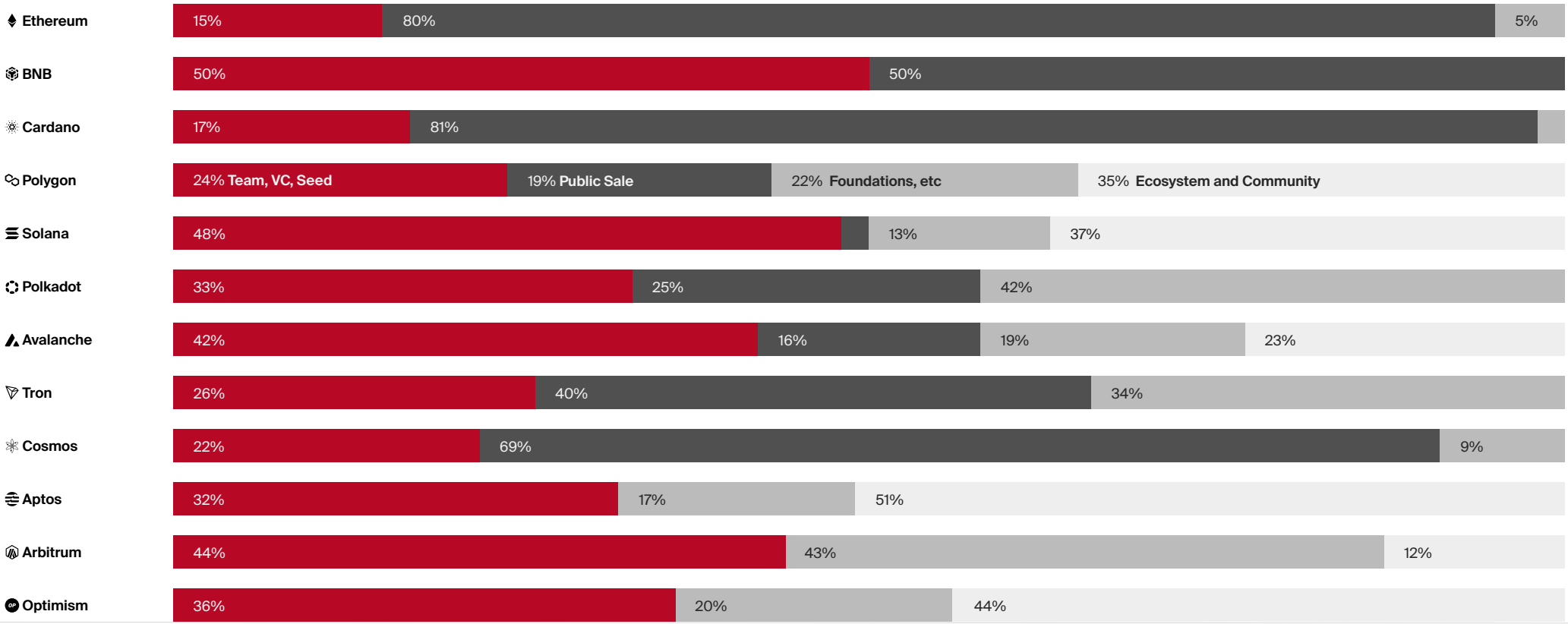
*ARBITRUM WILL ENABLE L3S WITH ORBIT, OPTIMISM WILL ENABLE OTHER L2S, L3S, ... WITH SUPERCHAINS (SEE COINBASE'S BASE)
(DATA) COINMARKETCAP, THE TIE, THE BLOCK, (CHART) BITCOIN SUISSE RESEARCH

Public sales of the initial token allocation trend down, while Ecosystem allocations trend up

Ethereum's network effects are sticky and its long-term sentiment score indicates confidence. Overall, age and market cap indicate a slight correlation. Moreover, the PoS mechanism as a means of Sybil attack protection is utilized by all Layer 1 platforms and EVM compatibility is omnipresent too. As the dominant rate limiting mechanism is PoS, the initial token distribution, see Illustration below becomes an even more important metric since native tokens provide access to the platform's security, consensus and validation layer. Notably, Ethereum's hybrid approach, PoW first then PoS, turned out to be crucial in bootstrapping the distribution of its native asset ETH and therefore enabled a higher degree of decentralization heading into PoS. As most networks that launched in recent years utilized PoS as consensus mechanism, it can now also be considered to be more battletested.

As the illustration below indicates, public sales trend down especially in recent launches, while ecosystem allocations trend up. After the massive ICO era, most funding rounds unfortunately exclude public access as the shift towards VC funding implies. This could spell trouble for new PoS chains, leaving users with platforms of high wealth and hence, power concentration. This development however is to some degree compensated by higher ecosystem funding that is usually leveraged to incentivize DeFi activity. As Ethereum consolidates its decentralized trust layer and starts to scale via a plethora of Layer 2 protocols, new Layer 1 should aim at maximizing their token distribution and bootstrapping their trust layer. If not, Ethereum's lead, that might even be reinforced by restaking primitives, might no longer be caught up by any competitor.

INITIAL TOKEN ALLOCATION



(DATA) MESSARI, APTOS, TOKENUNLOCKS, (CHART) BITCOIN SUISSE RESEARCH

Economics

Only 4 platforms have positive earnings based on their economic activity, the remaining lack blockspace demand or a burning feature

Financial and economic metrics are of key importance in deriving sound investment decisions. While traditional metrics such as returns, Beta, or Sharpe already provide good insights regarding risk-adjusted returns, the most important metric for the sustainability and economic activity of smaco platforms is earnings. The earnings metric tells us if burning outperforms inflation. Only four platforms have positive earnings based on their economic activity, the remaining lack blockspace demand, a burning feature or suffer from high inflation, see page 22 for metric.

Ethereum is not only the sector leader with 56% sector dominance, but also provides 19.3% of the overall crypto market capitalization. Solana, once ranked in the top 10 and one of the most promising projects in 2021, tumbled down a whopping 91.6% from its ATH due to connections to entities that blew up in 2022. Aptos on the other hand returned 226% QTD followed by Optimism at 148.9%. Arbitrum had little upside yet since it recently airdropped their token which induced sell pressure of recipients that aimed to exit their position.
The P/F ratio allows for a quantitative assessment of the network activity with regard to the market cap. A low P/F ratio is considered desirable. Tron leads that metric with a 5.8x P/F while Cosmos and Polkadot stand out with a rather high P/F. Notably, neither fees generated in Cosmos Zones nor parachain auctions are included in the P/F metric. Parachain auctions however could be considered a proxy for blockspace or rather infrastructure demand. These auctions saw a steep drop-off in winning bids for parachain slots and a continued decline in total DOT bonded during Q1 2023. This in result led to more parachains self-funding their slot. Overall, we consider that a rather bearish development and worth monitoring. For Cosmos Hub, the economic activity will likely increase with the launch of consumer chains and ICS.

Platform	Market Cap	Down from ATH	QTD Return	Beta	Sharpe (90d)	NVT	Fees (90d) sum	Δ*[%]	P/F ratio[×]	Δ*[%]	Earnings (* sum)
Ethereum	19.30%	-65.5%	52.5%	1.212	1.25	24.17	$546.8m	103.10	85.7	-47.50	$202.9m
BNB	4.41%	-52.2%	28.2%	0.782	0.93	82.01	$59.8m	8.70	212.3	-7.50	$6.0m
Cardano	1.16%	-87.1%	59.8%	1.32	0.66	35.35	$690.4k	-2.10	5'262.9	8.40	N/A
Polygon	0.81%	-64.9%	48.3%	1.244	0.48	29.48	$13.7m	123.60	194.4	-61.40	$-48.1m
Solana	0.74%	-91.6%	110.5%	1.522	-0.22	18.73	$3.7m	28.10	604.7	-24.00	$-131.4m
Polkadot	0.60%	-89.2%	46.8%	1.262	0.07	38.13	$118.9k	-0.40	18'179.4	-1.80	N/A
Avalanche	0.48%	-88.2%	63.19%	1.442	0.45	27.65	$2.6m	82.50	329.4	-63.10	$-56.8m
Tron	0.52%	-78.1%	21.6%	0.381	0.56	26.94	$209.3m	110.70	5.8	-54.50	$74.4m
Cosmos	0.27%	-75.4	18%	1.242	-0.70	21.55	$174.1k	32.80	4'846.9	-38.40	N/A
Aptos	0.17%	-48.1%	226%	1.79	0.21	8.57	N/A	N/A	N/A	N/A	N/A
Arbitrum	0.16%	-87.5%	0.9%	2.015	-	1.80	$16.0m	492.00	18.7	N/A	$5.5m
Optimism	0.06%	-49.6%	148.9%	1.67	0.90	4.93	$7.9m	52.70%	21.85	N/A	$-88.5m

* REFERS TO A 90-DAY PERIOD
(DATA) MESSARI, TOKEN TERMINAL, THE TIE, (CHART) BITCOIN SUISSE RESEARCH

Glossary:

Beta
volatility of a coin relative to the volatility of the rest of the crypto market, high-beta indicates higher risk-adjusted returns and vice versa

Earnings
revenue minus token Incentives

Fees
total transaction fees paid by users

NVT
market cap relative to the average trading volume over the last 30 days, a higher NVT ratio implies that an asset is trading at a high multiple of its average daily volume and vice versa. NVT is sometimes considered to be the P/E ratio of the crypto industry

Price to Fees (P/F): circulating market cap relative to annualized fees, a lower P/F ratio implies that the market prices the asset more accurate to its current demand and revenue

Revenue
share of transaction fees that are burned and mostly accrue to holders of the native asset

Sharpe
average return relative to the standard deviation of returns over the specified rolling window, a higher Sharpe implies higher risk-adjusted returns and vice versa

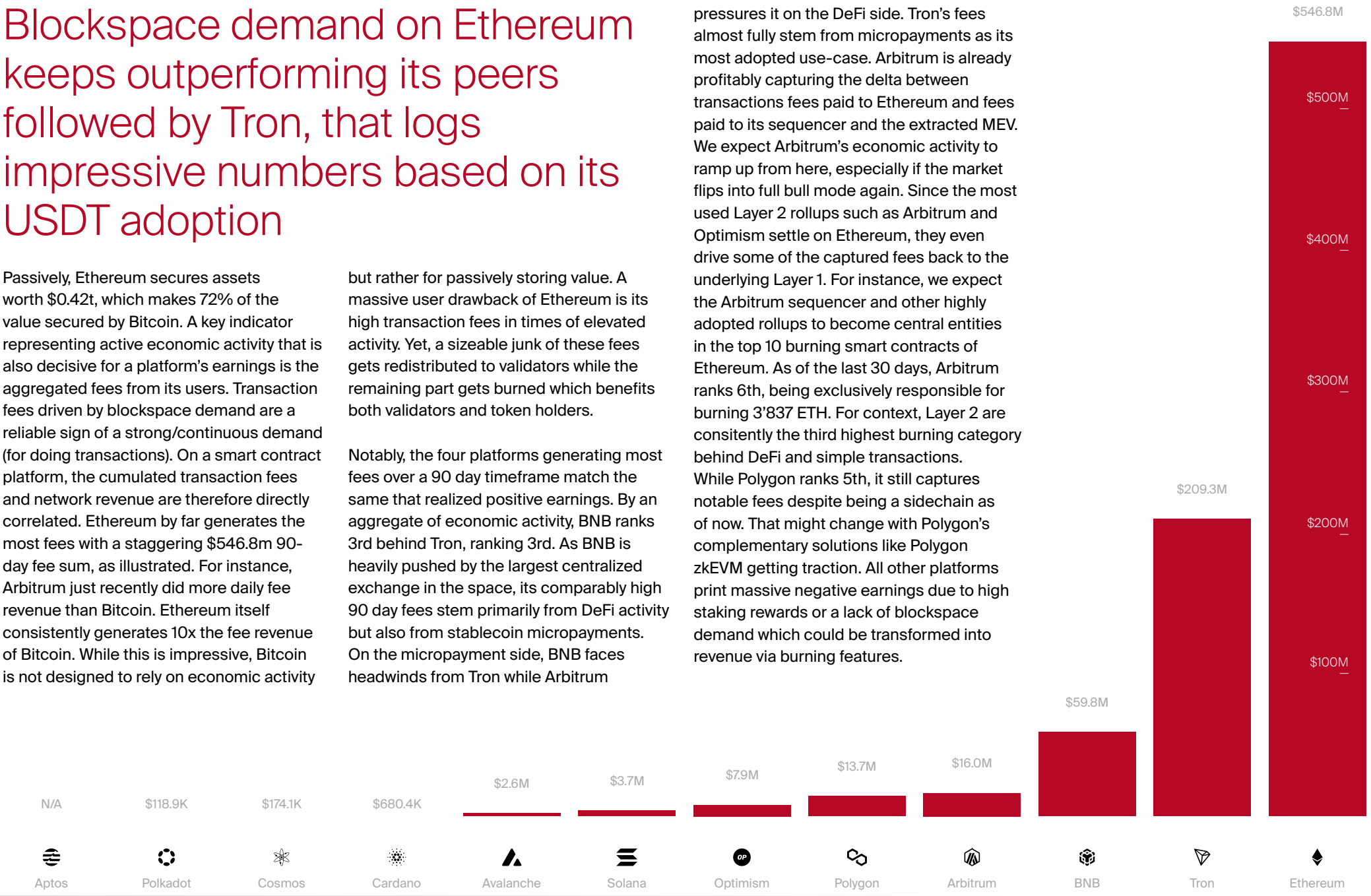
Supply-side fees: share of transaction fees that are distributed to validators

Token incentives
staking rewards distributed to validators

Blockspace demand on Ethereum keeps outperforming its peers followed by Tron, that logs impressive numbers based on its USDT adoption

Passively, Ethereum secures assets worth $0.42t, which makes 72% of the value secured by Bitcoin. A key indicator representing active economic activity that is also decisive for a platform's earnings is the aggregated fees from its users. Transaction fees driven by blockspace demand are a reliable sign of a strong/continuous demand (for doing transactions). On a smart contract platform, the cumulated transaction fees and network revenue are therefore directly correlated. Ethereum by far generates the most fees with a staggering $546.8m 90-day fee sum, as illustrated. For instance, Arbitrum just recently did more daily fee revenue than Bitcoin. Ethereum itself consistently generates 10x the fee revenue of Bitcoin. While this is impressive, Bitcoin is not designed to rely on economic activity but rather for passively storing value. A massive user drawback of Ethereum is its high transaction fees in times of elevated activity. Yet, a sizeable junk of these fees gets redistributed to validators while the remaining part gets burned which benefits both validators and token holders.

Notably, the four platforms generating most fees over a 90 day timeframe match the same that realized positive earnings. By an aggregate of economic activity, BNB ranks 3rd behind Tron, ranking 3rd. As BNB is heavily pushed by the largest centralized exchange in the space, its comparably high 90 day fees stem primarily from DeFi activity but also from stablecoin micropayments. On the micropayment side, BNB faces headwinds from Tron while Arbitrum pressures it on the DeFi side. Tron's fees almost fully stem from micropayments as its most adopted use-case. Arbitrum is already profitably capturing the delta between transactions fees paid to Ethereum and fees paid to its sequencer and the extracted MEV. We expect Arbitrum's economic activity to ramp up from here, especially if the market flips into full bull mode again. Since the most used Layer 2 rollups such as Arbitrum and Optimism settle on Ethereum, they even drive some of the captured fees back to the underlying Layer 1. For instance, we expect the Arbitrum sequencer and other highly adopted rollups to become central entities in the top 10 burning smart contracts of Ethereum. As of the last 30 days, Arbitrum ranks 6th, being exclusively responsible for burning 3'837 ETH. For context, Layer 2 are consitently the third highest burning category behind DeFi and simple transactions. While Polygon ranks 5th, it still captures notable fees despite being a sidechain as of now. That might change with Polygon's complementary solutions like Polygon zkEVM getting traction. All other platforms print massive negative earnings due to high staking rewards or a lack of blockspace demand which could be transformed into revenue via burning features.

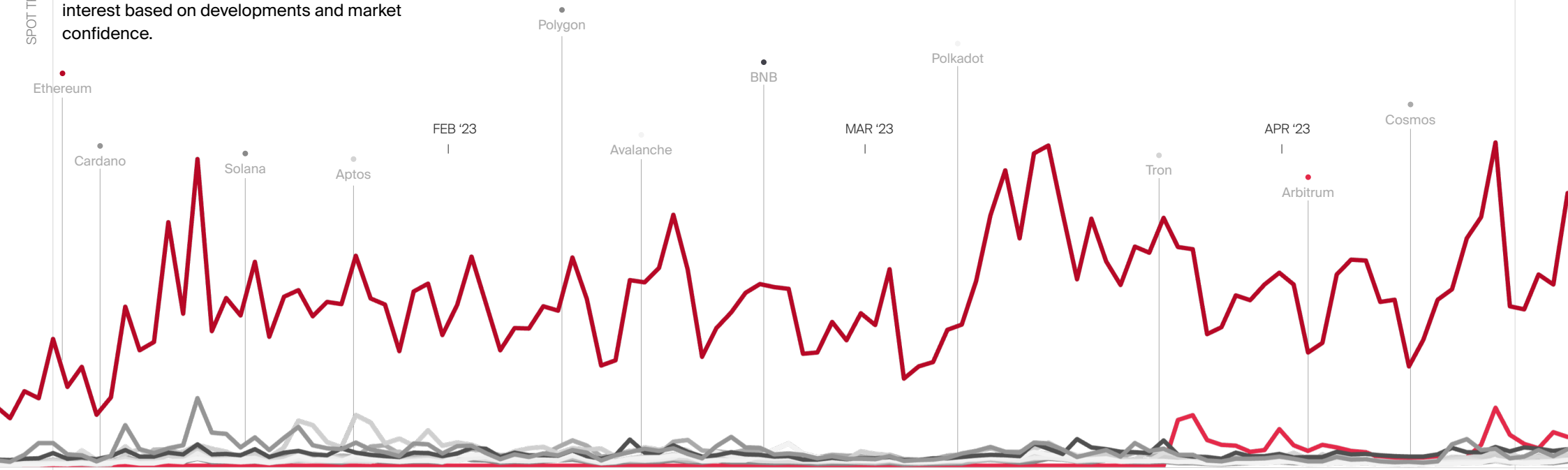


(DATA) TOKEN TERMINAL, (CHART) BITCOIN SUISSE RESEARCH

By a huge margin, Ethereum is the most traded platform with +$7b average daily volume while being listed on at least 50 spot exchanges

The spot trading volume is another important indicator in order to identify momentum or shifts in trend. With the recent price developments, most platforms saw a slight increase in average spot traded volume. One would think that volume correlates with market cap, yet that is not always true as interest might be exhausted both on the sell and the buy side whereas volume usually picks up with news and sustainable interest based on developments and market confidence.

By a huge margin, Ethereum is the most traded platform with +$7b average daily volume. It is also the asset offering the highest accessibility as it is listed on at least 50 spot exchanges, more than any other smart contract platform. Arbitrum ranks second in the 30 day average volume, gaining lots of traction with the highly anticipated launch of their ARB token.



(DATA) THE TIE, (CHART) BITCOIN SUISSE RESEARCH

Most platforms show high price correlation, Tron and Arbitrum are outliers

With the highest beta among the selected platforms, Arbitrum traded in a rather volatile environment alongside lower correlations to its peer, see chart below. As most of these platforms launched within the last couple of years and experienced similar hype cycles, the intra-sector correlations are fairly high among most of the selected assets.

To quantify the correlation, the Pearson Correlation Coefficient is used to estimate the strength of the linear relationship between two price variables while +1 equals a perfect positive linear correlation, -1 equals a perfect negative linear correlation, and 0 equals no linear correlation.

30d	ETH	BNB	ADA	MATIC	SOL	DOT	TRX	AVAX	ATOM	APT	OP	ARB
ETH	1.00											
BNB	0.69	1.00										
ADA	0.72	0.65	1.00									
MATIC	0.86	0.70	0.71	1.00								
SOL	0.68	0.65	0.65	0.73	1.00							
DOT	0.83	0.69	0.78	0.85	0.74	1.00						
TRX	0.45	0.38	0.38	0.42	0.38	0.42	1.00					
AVAX	0.73	0.61	0.61	0.75	0.73	0.75	0.34	1.00				
ATOM	0.66	0.58	0.62	0.69	0.64	0.71	0.31	0.66	1.00			
APT	0.66	0.63	0.6	0.72	0.7	0.7	0.37	0.67	0.67	1.00		
OP	0.81	0.63	0.67	0.8	0.63	0.76	0.37	0.66	0.65	0.69	1.00	
ARB	0.67	0.52	0.53	0.66	0.57	0.63	0.32	0.55	0.51	0.55	0.72	1.00

(DATA) CRYPTOWATCH, (CHART) BITCOIN SUISSE RESEARCH

Adoption

Ethereum dominates in most metrics based on its lindyness, user retention and network effects, Arbitrum shines with user growth

Adoption metrics such as daily active addresses or on-chain DEX volume heavily feed into a platform's value proposition. The table below contains some of the key metrics in order to identify the best and worst performers. As the Layer 1 architectures become increasingly more granular and diversified with modular vs. monolithic or monochain vs. multichain narratives, there is always some nuance hidden in comparing them asset by asset. For the adoption metrics we focus on the respective core assets of multichain projects such as Cosmos, Polkadot or Avalanche as these should to some degree represent a proxy of their ecosystems. Where it is misrepresentative, we provided ecosystem metrics to provide more context.

Tron absolutely surprises in some of the most important adoption metrics. As such, it is a venue for 1.48m daily active users on the 1st rank, is listed on 44 spot exchanges and holds $1.26b in stablecoins, mostly USDT (95.9%) and a daily USDT volume of $11.7b. USDT is Tron's prevalent use case and the stablecoin of choice for transferring between centralized exchanges. It also managed to build out network effects and proved great user retention. It's a network that is actually used in places that seek alternatives to their financial systems such as Argentina or Venezuela. USDT also dominates on BNB (84%) with almost $1b in daily volume.

On the flipside, USDC dominates on most other chains such as Ethereum: 73% ($12.5b daily), Arbitrum: 68% ($408.3m daily), Optimism: 83% ($802.5m daily), Polygon: 68% ($342.7m daily) or Avalanche: 66% ($159.1m daily). As stablecoins are also crucial in DeFi protocols where liquidity is king, is serves as a great proxy for ecosystem growth. Arbitrum is exceptional in that regard printing a stablecoin growth of +105% in Q1 2023.

It's no surprise however that Ethereum dominates in most other adoption metrics, where Tron or BNB could not dethrone it. It ranks first in holders (note that not all data was available for the set of selected platforms), exchange listings, available wallets, and total developers. While younger chains opt in to providing compatibility with developer-friendly programming languages like Aptos, Radix or Agoria and Near (both open the industry up to 18.8m Javascript developers), Ethereum successfully pulled in most total developers (5'835) ranking 1st despite Solidity's infancy, amount of libraries and overall high barrier to entry. Notably, Aptos recorded the highest annual growth in total developers.

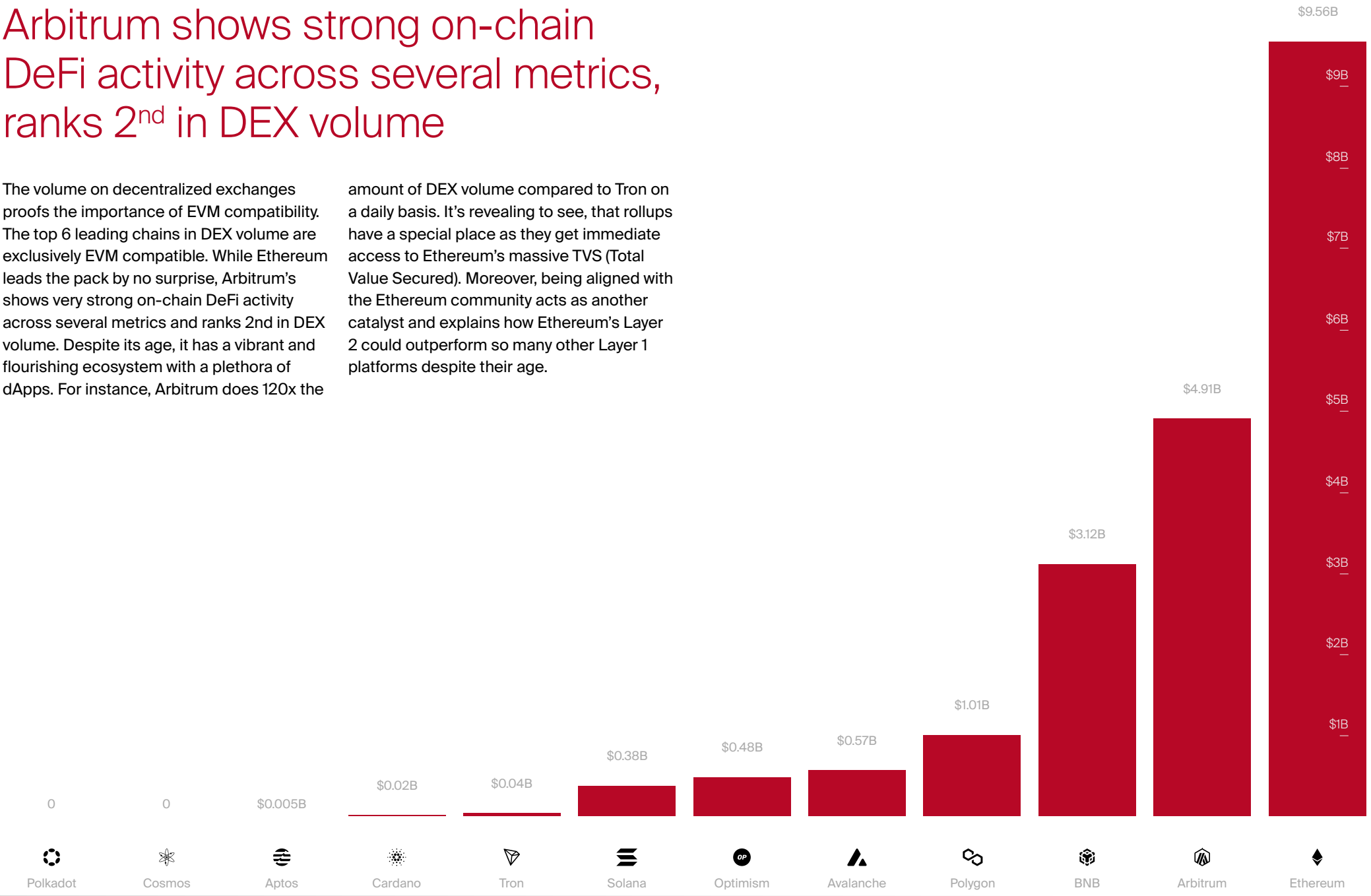
Developers are a crucial part to keep the flywheel effect for the network sound. The more developers are part of the ecosystem, the more dApps become available, the more attractive the ecosystem becomes for users, the more users it pulls in, the more attractive the ecosystem becomes for developers. It's also a very common indicator for value creation in emerging tech ecosystems. For the total developers, only original code authors are counted. A developer who merges a pull request, developers from forked commits or bots are not counted. The big developer base and network effects of Ethereum is the reason why most smart contract platform fork Ethereum's EVM or at least provide EVM compatibility within their

Platform	Active users (daily)	Δ90d	Holders	Δ90d	Spot USD pairs	Exchanges	Wallets	Total Devs (04/2023)	Δ365d	Stablecoin TVL
Ethereum	261.86k	-13.80%	97.99m	5.30%	35	50	59	5'835	-9%	$70.30b
BNB	1.09m	52.90%	71.39m	19.80%	7	40	37	480	-45%	$6.40b
Cardano	N/A	N/A	N/A	N/A	14	41	16	486	-7%	$0.16b
Polygon	276.31k	-16.30%	32.67m	22.60%	15	44	44	714	-44%	$1.52b
Solana	161.65k	24.30%	N/A	N/A	15	44	20	1'234	-17%	$1.48b
Polkadot	3.30k	-33.10%	N/A	N/A	19	43	19	1'997	-18%	$0.04b*
Avalanche	35.75k	52.20%	N/A	N/A	12	38	32	314	-46%	$1.26b
Tron	1.48m	-19.70%	N/A	N/A	11	44	13	78	+13%	$1.26b
Cosmos	21.45k	31.80%	N/A	N/A	11	38	30	1'871	-1%	$0.44b*
Aptos	N/A	N/A	N/A	N/A	5	26	9	213	+294%	$0.061b
Arbitrum	367.68k	775.50%	348.79k	N/A	3	23	27	168	-24%	$1.95b
Optimism	45.19k	45.60%	596.62k	34.40%	3	26	27	210	11%	$0.65b

*CALCULATED BASED ON ECOSYSTEM TVL
(DATA) MESSARI, ALCHEMY, L2 FEES, COINMARKETFEES, COSMOS, POLYGON, COINCARP, DEVELOPER REPORT, (CHART) BITCOIN SUISSE RESEARCH

Arbitrum shows strong on-chain DeFi activity across several metrics, ranks 2nd in DEX volume

The volume on decentralized exchanges proofs the importance of EVM compatibility. The top 6 leading chains in DEX volume are exclusively EVM compatible. While Ethereum leads the pack by no surprise, Arbitrum's shows very strong on-chain DeFi activity across several metrics and ranks 2nd in DEX volume. Despite its age, it has a vibrant and flourishing ecosystem with a plethora of dApps. For instance, Arbitrum does 120x the amount of DEX volume compared to Tron on a daily basis. It's revealing to see, that rollups have a special place as they get immediate access to Ethereum's massive TVS (Total Value Secured). Moreover, being aligned with the Ethereum community acts as another catalyst and explains how Ethereum's Layer 2 could outperform so many other Layer 1 platforms despite their age.

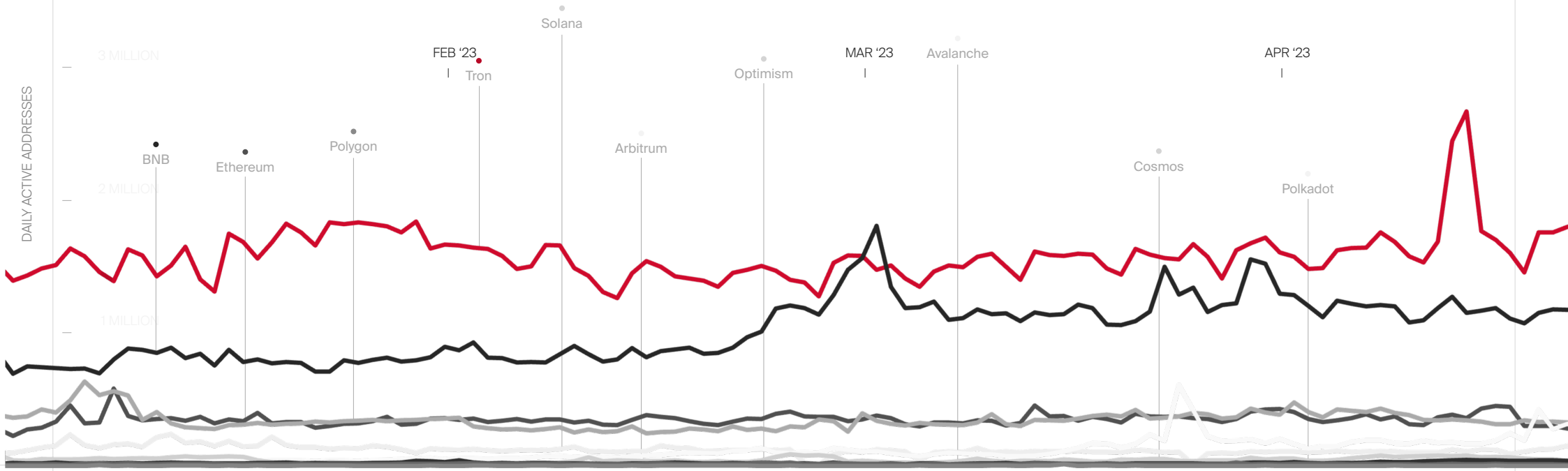


(DATA) DEFILLAMA, (CHART) BITCOIN SUISSE RESEARCH

Tron and BNB have the most active users by far, proving that low fees can drive adoption

When it comes to daily active addresses, Tron and BNB have the most active users by far proving that low fees can drive adoption, see chart below. The metric measures the total number of unique addresses that were involved in a transaction on a daily basis. One should take that metric with a grain of salt however, as these transactions might also involve certain non-transactional actions such as block signatures, governance, account creation or claiming of staking rewards. It might moreover be subject to manipulation especially on platforms with very low fees. Hence, the more precise metric to monitor is fees and revenue or analyzing daily active addresses relative to the generated fees in order to identify outliers.

Overall, there is a uptrend in active addresses across BNB, Solana, Avalanche, Cosmos, Optimism but especially Arbitrum (775.5%) in Q1 2023 which was arguably linked to its airdrop. BNB managed to record 52.9% growth despite its previous size, a remarkable performance. A look at the peers within multichain ecosystems such as Polkadot and Cosmos does also reveal some degree of growth, especially for emerging Cosmos Zones such as Osmosis.



(DATA) TOKEN TERMINAL, (CHART) BITCOIN SUISSE RESEARCH

Network and Ecosystem

Despite a low staking ratio, most value is staked and secured by Ethereum

Finally, we have a look at some of the key network and ecosystem metrics. As such, the table below provides key metrics for our platform selection ranging from monetary policy to the platforms staking infrastructure. One of the most important metrics in that context is adjusted staking reward, which adjusts for inflation in order to predict the real reward. Ethereum's post-Merge inflation-adjusted yield (nominal staking yield minus inflation rate) is among the highest of all leading smart contract platforms together with BNB, Polkadot and Cosmos. Notably, these yields influence the floor for DeFi lending rates due to arbitrage mechanics.

The rather high staking yields of Polkadot or Cosmos imply a high inflationary monetary policy that dilutes users who do not opt to stake. The adjusted yields are outlined for the highest barrier of entry staking solutions such as running your own validator. BNB and Ethereum polarize when it comes to inflation, standing out as the only two chains that are deflationary due to their economic activity and monetary policy. BNB's impressive adjusted rewards are owed to its additional burning feature called BNB-auto-burn that complements BEP-95 which is equivalent to EIP-1559. Auto-burn currently burns team allocations based on BNB's price and the number of blocks generated on a quarterly basis. One could therefore argue that it should not be counted on top of the common earnings equation as the supply is planned to be burned.

Despite a low staking ratio, most value is staked and secured by Ethereum. Notably, the staking ratio of Ethereum still ranges lowest by a significant margin compared to other PoS platforms. We expect that the Shanghai upgrade will be actking as a catalyst for staking participation and boost Ethereum's staking ratio in the months ahead and in turn increase its security while reducing its free-floating supply. While the volatility in withdrawals seems to slow down, activation queues (~20'000 validators waiting) are outpacing exit queues (~5'000 validators waiting). More catalysts such as liquid staking upgrades, distributed validator technology or restaking primitives are on the horizon. Meanwhile Shanghai derisked Ethereum staking, opening it up to institutional staking that express increased interest in crypto's risk free rate. While not really expressive due to platform design specifics, Ethereum also holds the highest amount of validators with 571'045.

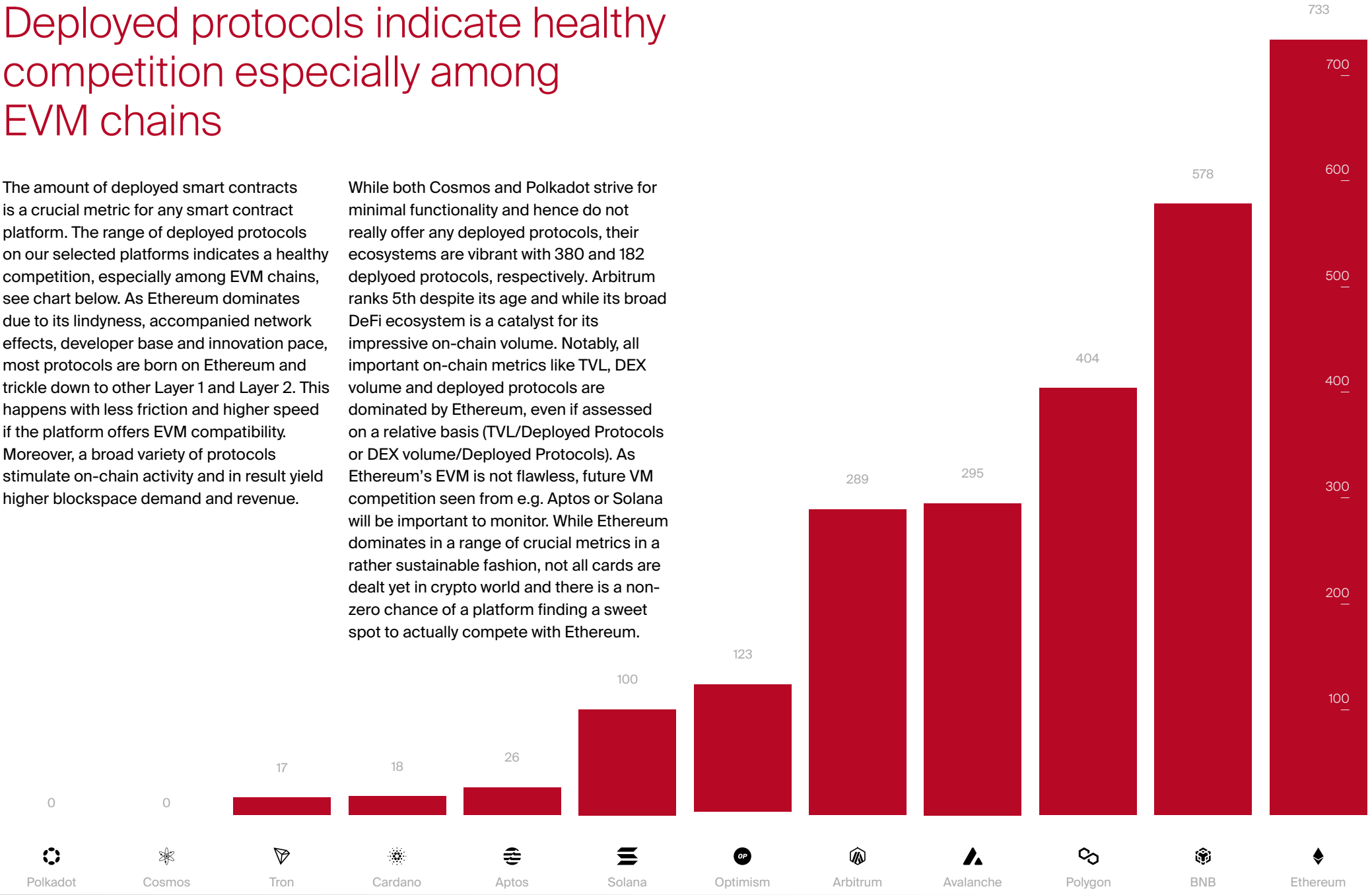
Platform	Inflation	Adjusted Rew.*	Staking Ratio	Staked Value	Stake/TVL	MCAP/TVL	Slashing	Capped Val. Set	Validator Count**
Ethereum	-0.03	4.86%	14.87%	$34.9b	1.2	7.8	Yes	No	571'045
BNB	-6.56%	8.36%	14.93%	$7.5b	1.5	11.1	Yes	Yes	500
Cardano	3.83%	1.84%	66.53%	$9.6b	59.3	89.85	No	No	3'175
Polygon	1.87%	2.26%	38.95%	$3.8b	3.5	9.0	Yes	Yes	100
Solana	6.19%	0.92%	72.53%	$8.8b	30.9	31.5	Yes	No	4'192
Polkadot	7.78%	7.5%	47.35%	$3.8b	19.0****	35.6****	Yes	Yes	297
Avalanche	6.69%	1.66%	61.56%	$4.7b	5.6	7.0	No	No	1'272
Tron	2.1%	2.66%	42.97%	$2.6b	0.5	1.1	No	Yes	27***
Cosmos	18.44%	5.38%	69.68%	$2.7b	2.2****	2.7****	Yes	Yes	486
Aptos	5.81%	1.19%	83.04%	$9.4b	151.6	32.2	No	No	106
Arbitrum	-	-	-	-	N/A	0.9	(Yes)	(Yes)	Single Sequencer
Optimism	-	-	-	-	N/A	0.8	(No)	(Yes)	Single Sequencer

*OPERATING A VALIDATOR OR POOL, **TOTAL VALIDATOR COUNT, ***SUPER REPRESENTATIVES, ****CALCULATED BASED ON ECOSYSTEM TVL
(DATA) POOLBAY, STAKING REWARDS, COINCODEX, BNBBURN, POLKADOT

Deployed protocols indicate healthy competition especially among EVM chains

The amount of deployed smart contracts is a crucial metric for any smart contract platform. The range of deployed protocols on our selected platforms indicates a healthy competition, especially among EVM chains, see chart below. As Ethereum dominates due to its lindyness, accompanied network effects, developer base and innovation pace, most protocols are born on Ethereum and trickle down to other Layer 1 and Layer 2. This happens with less friction and higher speed if the platform offers EVM compatibility. Moreover, a broad variety of protocols stimulate on-chain activity and in result yield higher blockspace demand and revenue.

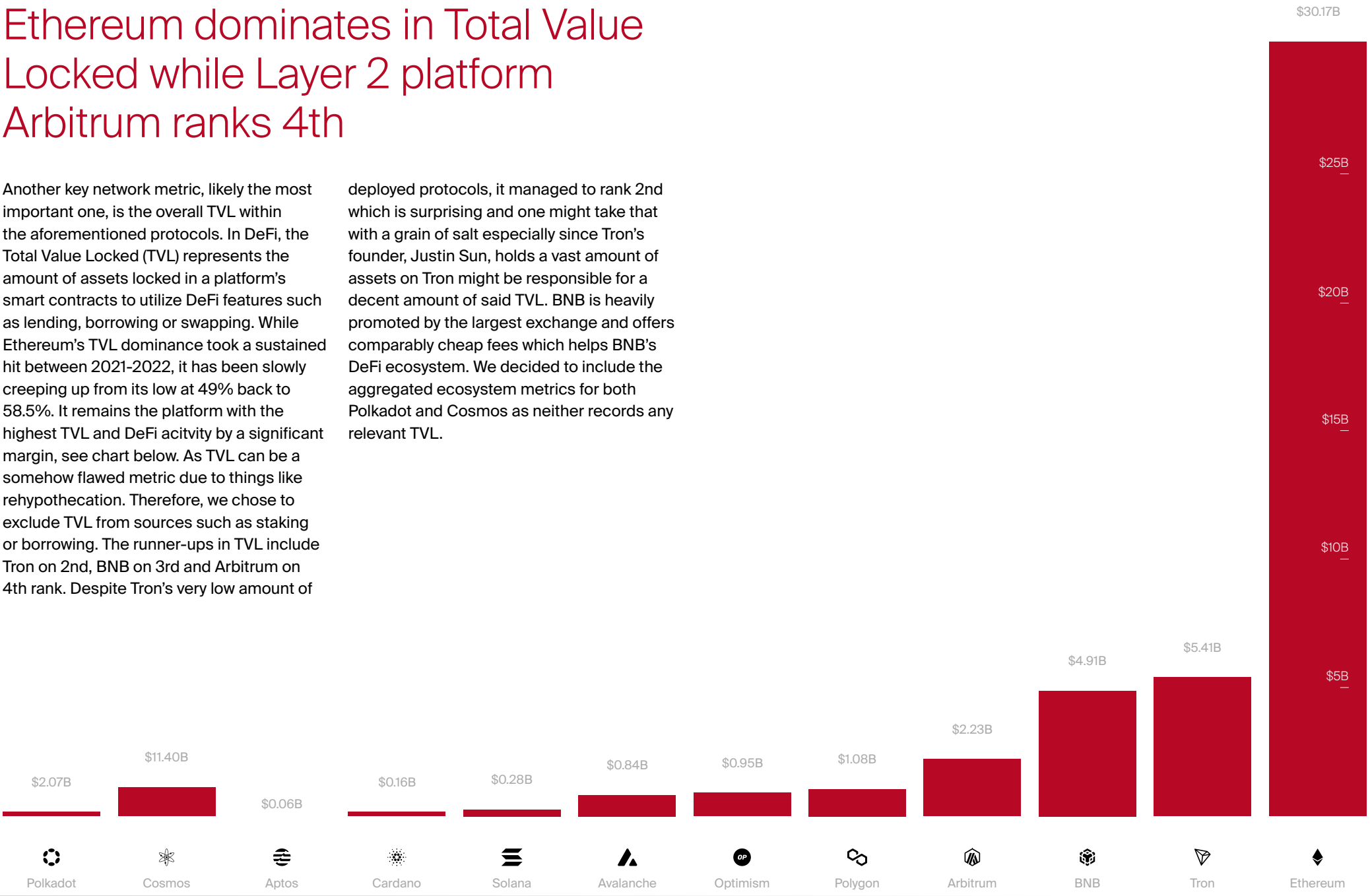
While both Cosmos and Polkadot strive for minimal functionality and hence do not really offer any deployed protocols, their ecosystems are vibrant with 380 and 182 deplyoed protocols, respectively. Arbitrum ranks 5th despite its age and while its broad DeFi ecosystem is a catalyst for its impressive on-chain volume. Notably, all important on-chain metrics like TVL, DEX volume and deployed protocols are dominated by Ethereum, even if assessed on a relative basis (TVL/Deployed Protocols or DEX volume/Deployed Protocols). As Ethereum's EVM is not flawless, future VM competition seen from e.g. Aptos or Solana will be important to monitor. While Ethereum dominates in a range of crucial metrics in a rather sustainable fashion, not all cards are dealt yet in crypto world and there is a non-zero chance of a platform finding a sweet spot to actually compete with Ethereum.



(DATA) DEFILLAMA, (CHART) BITCOIN SUISSE RESEARCH

Ethereum dominates in Total Value Locked while Layer 2 platform Arbitrum ranks 4th

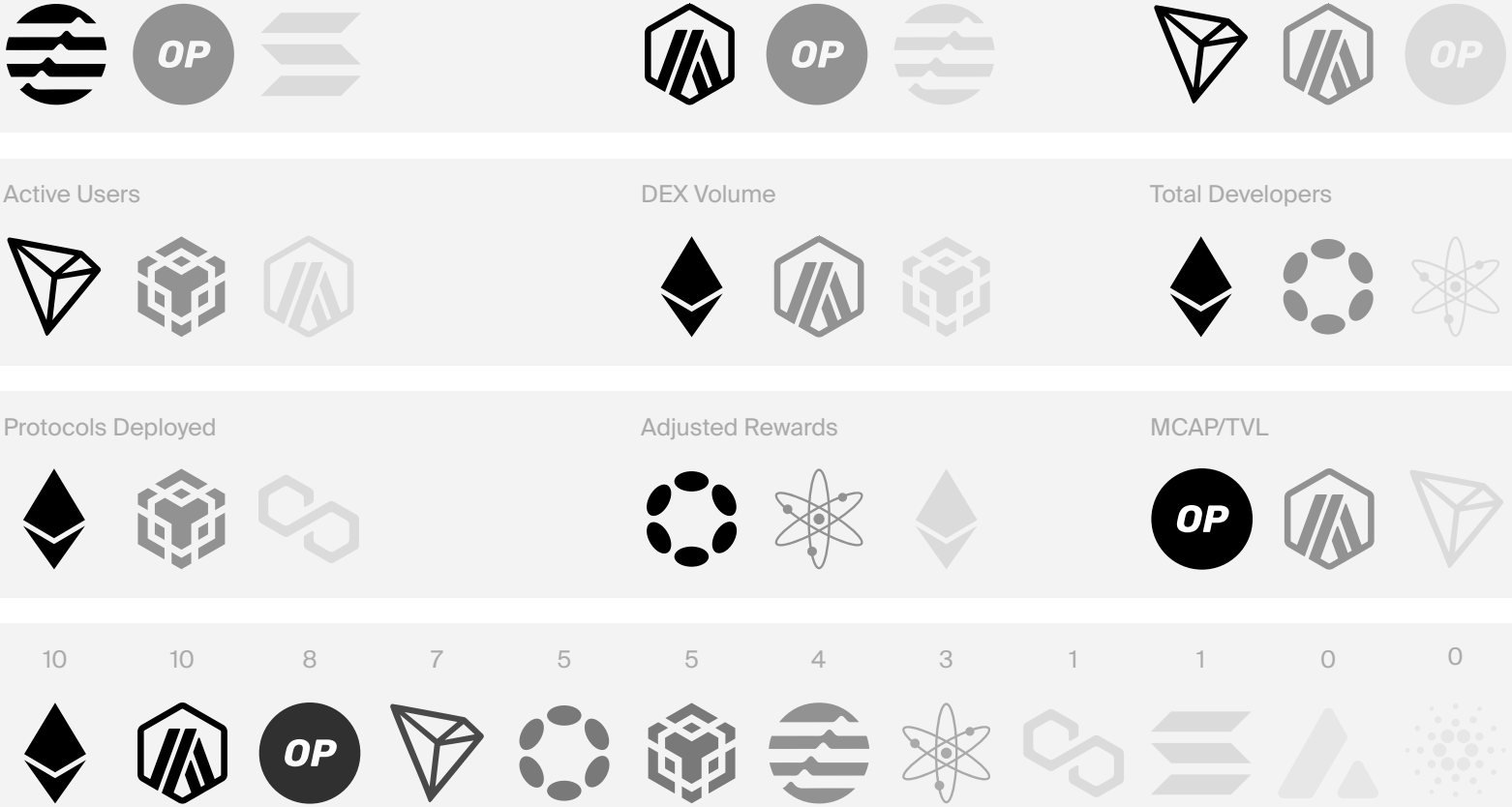
Another key network metric, likely the most important one, is the overall TVL within the aforementioned protocols. In DeFi, the Total Value Locked (TVL) represents the amount of assets locked in a platform's smart contracts to utilize DeFi features such as lending, borrowing or swapping. While Ethereum's TVL dominance took a sustained hit between 2021-2022, it has been slowly creeping up from its low at 49% back to 58.5%. It remains the platform with the highest TVL and DeFi acitvity by a significant margin, see chart below. As TVL can be a somehow flawed metric due to things like rehypothecation. Therefore, we chose to exclude TVL from sources such as staking or borrowing. The runner-ups in TVL include Tron on 2nd, BNB on 3rd and Arbitrum on 4th rank. Despite Tron's very low amount of deployed protocols, it managed to rank 2nd which is surprising and one might take that with a grain of salt especially since Tron's founder, Justin Sun, holds a vast amount of assets on Tron might be responsible for a decent amount of said TVL. BNB is heavily promoted by the largest exchange and offers comparably cheap fees which helps BNB's DeFi ecosystem. We decided to include the aggregated ecosystem metrics for both Polkadot and Cosmos as neither records any relevant TVL.



(DATA) DEFILLAMA, (CHART) BITCOIN SUISSE RESEARCH

High-level, non weighted performance benchmark across economic, adoption and network metrics

Economics	QTD Return	NVT	P/F
Adoption	Active Users	DEX Volume	Total Developers
Network and Ecosystem	Protocols Deployed	Adjusted Rewards	MCAP/TVL



increasing transparency indicates lower ranking

SCORING RULE: FOR EACH KEY METRIC, THE 3 BEST PERFORMING PLATFORMS YIELD SCORES ACCORDING TO THEIR RANK (1-3, 2-2, 3-1)

The author likes to thank Vinicius Bloise for the valuable data support.

At time of writing, the author holds ETH, ARB, MATIC, AVAX.

Designed by Jonas Leupe for Bitcoin Suisse.