MarketVector™ Indexes

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Digital Asset Categories

MarketVector™ diversified Smart Contract indexes

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MarketVector Indexes

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Smart Contract Platforms

MarketVector Indexes™ ('MarketVector') has developed a classification scheme for digital assets and provides category indices that allow users to measure, benchmark, and capture the performance and characteristics of targeted categories within digital assets, making the ecosystem more digestible to traditional finance investors while giving crypto native funds additional benchmarking capabilities. This article focuses on smart contract platforms (Layer-1s)[1].

According to the data provider Coingecko, there are over 180 different platforms. While each of these Layer-1 chains appear to be successful today, it's impossible to know which of them will eventually support the largest and most robust ecosystems or which will survive the competitive landscape. No single Layer-1 chain is necessarily perfect for every application. Therefore, the future of Layer-1 chains will encompass many smart contract chains that are popular today and some that have yet to be created. The MarketVector diversified Smart Contract indexes enable investors to measure and access the broader Layer-1 chains market without worrying about picking any specific Layer-1 chain.

What are smart contracts?

Smart contracts are programs stored on a blockchain that run when predetermined conditions are met. Just like your bank account, they have an address and keep account of your balance. Unlike bank accounts, however, there is no intermediary managing the account; rather, smart contracts take their instructions from their code, which anyone can execute provided certain conditions are met (required funds deposited, special permissions satisfied, or an arbitrary piece of logic). This feature enables a host of seamless, smart capabilities. For example, a lottery smart contract would only pay a jackpot to users who exchange funds to purchase tickets; a time-locked smart contract might only disburse funds to a beneficiary designated by the user who deployed and funded the contract. Smart contracts are one of the killer apps of blockchain technology.

The main benefits of smart contracts are:

- Speed & accuracy: no need to rely on mediator or other third party; instructions automatically executed with code.
- Trust: blockchain transparency & transaction irreversibility ensure there is only one definitive contract shared with all involved parties, which decreases the risk of fraud and manipulation.
- Cost reduction: automation & removal of intermediaries is the compelling economic argument.

While enterprises and governments can build closed blockchains to exploit smart contract functionality, it's often more practical to use existing blockchain platforms that support smart contracts.

[1] Layer 1 chain refers to a base network, such as Ethereum, and its underlying infrastructure. Layer-1 blockchains can validate and finalize transactions without the need for another network.

What are smart contracts platforms?

Smart contract platforms host and execute smart contracts, similar to operating systems, like iOS or Android, that host and deploy Apple and Android apps. Led by Ethereum, smart contract platforms are open-source blockchain software protocols that enable instant, permission less 365/24/7 global value transfer. They act as global, censorship-free computing systems that can execute arbitrary code (smart contracts) and power other decentralized applications.

These platforms charge fees based on the amount of computational power required to execute and deploy the smart contracts. Each platform offers different tradeoffs regarding speed, security, cost, degree of centralization and hardware required to run anode. Each also offers its own execution environment, smart contract programming language, fee structure, and governance.

The Smart Contract Landscape:

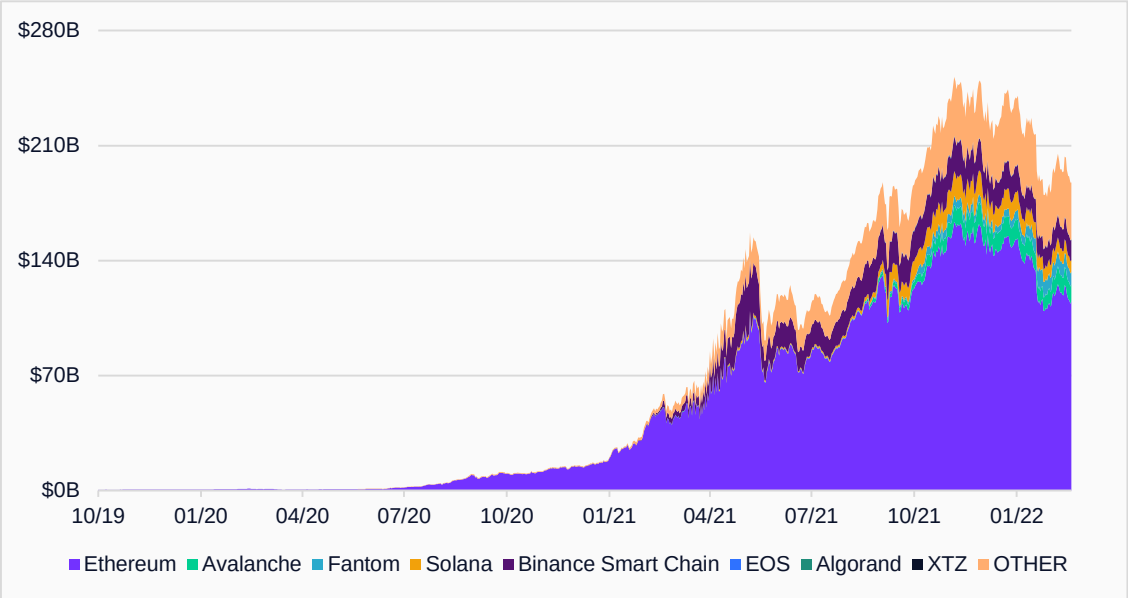
Ethereum is by far the largest smart contract platform. But other competitors are catching up. Layer-1 blockchains saw a dramatic increase in quantifiable user activity, largely driven by the emergence of DeFi ecosystems across the various platforms. Average transaction fees on Ethereum rose to record-high levels, at times leaving users paralyzed with exorbitant gas fees[2] and long confirmation times during times of extreme network demand.

In this environment of significant network demand and rapidly increasing costs, non-Ethereum Layer-1s with comparatively lower fees began to take center stage as users sought alternatives for activities they typically performed on Ethereum.

A popular ratio for quantifying the success of a smart contract platform is the Total Value Locked (TVL). TVL is the overall value of crypto assets deposited in a smart contract. This number is predominantly used in DeFi protocols. It is a key metric for gauging interest in that particular sector of the crypto industry. Exhibit 1 shows the development of the TVL over time. Although Ethereum continues to maintain the largest share, newer protocols are gaining traction.

[2] Gas Fees: Gas refers to the fee, or pricing value, required to successfully conduct a transaction or execute a contract on the Ethereum blockchain platform (see https://www.investopedia.com/terms/g/gas-ethereum.asp).

Exhibit 1: DeFi TVL on smart contract platforms



Source: MarketVector, DeFi Llama.

All Layer-1 chains aim to solve the so called blockchain trilemma. This expression was coined first by Ethereum founder Vitalik Buterin and describes the problem of finding the right balance between security, decentralization and scalability. Scalability and decentralization are often held back by security, but security tends to be compromised by any shifts on a network that offer scalability. Projects either choose to focus on two out of three or work on finding a solution to tackle the trilemma once and for all. Ethereum is on its way to a new model including sharding and Layer-2 solutions.[3] Polkadot is betting on collaborating with other blockchains. Solana is setting up a relative expensive infrastructure on order to maximize scalability. Avalanche is a Proof of Stake blockchain that uses its own complex mode of consensus that allows for robust security and extremely high throughput. Similar to Binance Smart Chain, Avalanche is EVM compatible, allowing Ethereum developers to bridge over their applications very easily. Terra is another Layer 1, that has achieved meaningful adoption. It's built on Cosmos, a network which calls itself the "Internet of Blockchains". Cosmos allows anyone to build its own Layer 1 blockchain and each of these Layer 1s are able to seamlessly send and transact value between one another. The following table illustrates the different attributes of smart contract blockchains:

[3] Sharding is a database partitioning technique used by blockchain companies with the purpose of scalability, enabling them to process more transactions per second. Sharding splits a blockchain company's entire network into smaller partitions, known as "shards." Each shard is comprised of its own data, making it distinctive and independent when compared to other shards (see https://www.investopedia.com/terms/s/sharding.asp). Layer 2 refers to a secondary framework or protocol that is built on top of an existing blockchain system. The main goal of these protocols is to solve the transaction speed and scaling difficulties that are being faced by the major cryptocurrency networks (see https://academy.binance.com/en/glossary/layer-2).

Exhibit 2: Characteristics of different Smart Contract Protocols

	Algorand	Avalanche	BSC
Architecture	Single-Chain	Multi-chain (subnets)	Single-chain (synchronous)
Consensus	Proof-of-Stake	Avalanche Proof-of-Stake	Proof-of-Stake
TPS	1100	4500	220
Finality Time (sec)	4-5	2	35
CPU Cores	2	2	8
RAM (GB)	4	4	16

	Cosmos	Ethereum	Polkadot	Solana
Architecture	Multi-Chain (IBC-compatible)	Single-chain (synchronous)	Multi-Chain (Parachains)	Single-Chain (synchronous)
Consensus	Tendermint Proof-of-Stake	Proof-of-Work	Nominated Proof-of-Stake	Proof-of-History
TPS	4000	20	100000	50000
Finality Time (sec)	7	78	12-60	2
CPU Cores	4	4	8	12
RAM (GB)	16	8	32	128

Source: Coin98 Analytics, the Block Research. TPS is the number of transactions a blockchain network can process each second or the number of transactions executed per second. Finality Time is an accurate gauge of speed for blockchain networks and indicates how long it takes, till a transaction is confirmed and final in. The hardware date CPU & RAM indicate how large the requirements are to run a node in the network.

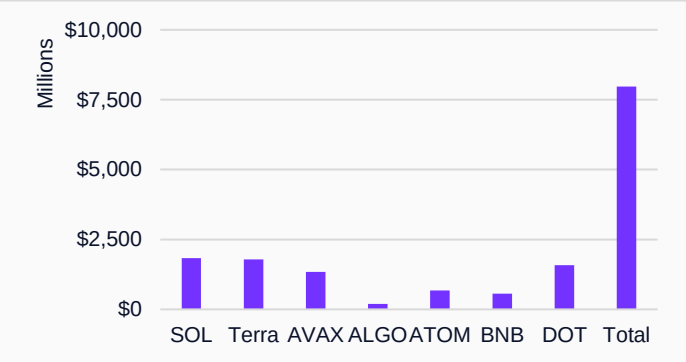
While most of them focus on different kind of Proof-of-Stake algorithms, they all come with different hardware needs. The Ethereum competitors all shine, when it comes to Transaction Throughput (TPS). When it comes to decentralization, it's much harder to assess the respective blockchains. Very often, the transaction speed is at the expense of security and promotes centralization. Therefore, if you're thinking of investing in any Layer-1 blockchain tokens, you have to consider the different strength and weaknesses. All blockchains differ in terms of scalability and composability. Those terms indicate, how many transactions can the network process at one time and can developers combine various components of the blockchain to design specific products and services such as DeFi or NFTs. Finally, investor should always care

about the adoption rate of those smart contract chains. Assessing the engagement of the community of users and developers is key for valuing the network.

Valuing smart contract protocols

Most smart contract platforms collect transaction fees denominated in the native tokens and mint new issuance rewarded to network validators or to other users who delegate tokens to network validators. This consensus algorithm is called Proof-of-Stake, which selects validators in proportion to their quantity of holdings in the associated token[4]. Multiplying the percentage of a given token's supply which is staked, by the interest rate (APY) on offer by delegated validators or directly from the protocol, yields the market's expectations of value creation over the next year. As of March 2022, the following sample of smart contract platforms "market-implied revenue" totals $8.0bn on a combined market cap of $172bn, putting the universe on a price-to-sales ratio of ~22x forward estimates.

Exhibit 3: Smart Contract 1 year forward revenue implied by current staking rates



Token	Staking Rate
SOL	5.88%
LUNA	6.39%
AVAX	9.23%
ALGO	9.42%
ATOM	13.45%
BNB	8.24%
DOT	13.97%

Source: MarketVector, stakingrewards.com, Staking Rewards are APYs. Data as of March 9, 2022.

4 Ethereum is still a Proof-of-Work chain. The migration to a Proof-of-Stake network is planned for Q2 22.

Smart Contract Methodology & Performance:

MarketVector puts the Smart Contract token in different indexes according to size and liquidity criteria. Broad indices will capture the performance of coins with $250mn market cap and $10mn average daily transaction volume (ADTV). Leaders capture the performance of coins with $1bn market cap and $25mn ADTV, and introduces additional screening requiring the coins to be traded on a major US exchange and supported by a reputable crypto custodian.

The categorization is split into 3 layers: Category, Industry Group and Industry. MarketVector differentiates platforms by their architecture:

- Single-Chain: A platform, which records all transactions on the same base layer. Scalability is usually solved by layer-2 solutions such as rollups or state channels.
- Multi-Chain: A multichain ecosystem is one in which several blockchains are interconnected. Very often, multiple blockchains work in parallel and require cross-chain interoperability.

Exhibit 4: MarketVector Category Scheme for Smart Contracts

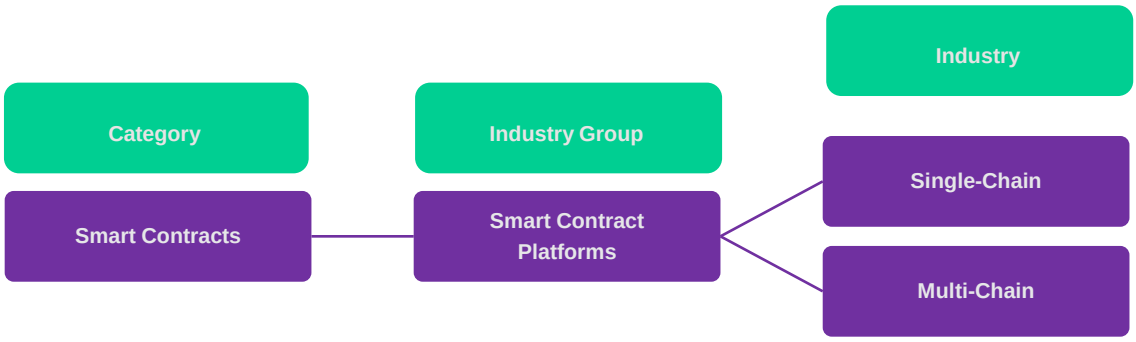
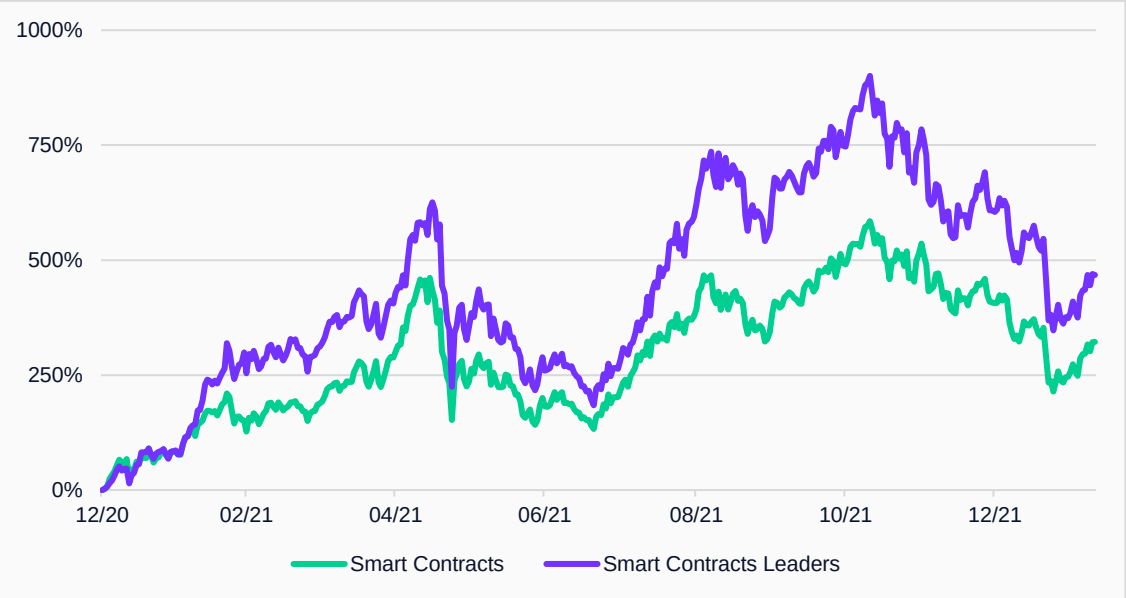


Exhibit 5: Cumulative Performance

Shows the cumulative performance of the MarketVector Smart Contract Indexes since January 2021.



	Leaders	Broad
1-Year Performance	92.50%	68.08%
1-year Volatility	106.9	100.41
Market Cap bn USD	569.69	599.98
# Constituents	15	28

Source: MarketVector, data as of March 9, 2022.

As shown in Exhibit 5, the leaders outperform the broad index. Nevertheless, both indexes show a strong cumulative performance. While the competition between smart contract platforms may be fierce, the cost-advantage of these layer 1 protocols vs. traditional finance and web 2.0 platforms is becoming more evident to market participants. A diversified exposure to this growing sector can be an attractive foundation of growth-oriented portfolios. MarketVector smart contract indexes provide investors a simple and robust solution to create innovative products.

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Martin Leinweber is an expert in fundamental and quantitative trading strategies. He sees crypto assets as a fundamental building block for investors to achieve their return targets in a low interest rate environment. He works as a Digital Asset Product Strategist at MarketVector Indexes™ providing thought leadership in an emerging asset class. His role encompasses product development, research and the communication with the client base of MarketVector Indexes™. Prior to joining MarketVector Indexes™, he worked as a portfolio manager for equities, fixed income and alternative investments for almost two decades. He was responsible for the management of active funds for institutional investors such as insurance companies, pension funds and sovereign wealth funds at the leading German quantitative asset manager Quoniam. Previously, he held various positions at one of Germany's largest asset managers, MEAG, the asset manager of Munich Re and ERGO. Among other things, he contributed his expertise and international experience to the establishment of a joint venture with the largest Chinese insurance company PICC in Shanghai and Beijing. Martin Leinweber is co-author of "Asset-Allokation mit Kryptoassets. Das Handbuch "(Wiley Finance, 2021). It's the first handbook about integrating digital assets into traditional portfolios. He has a Master in Economics from the University of Hohenheim and is a CFA Charter holder.

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