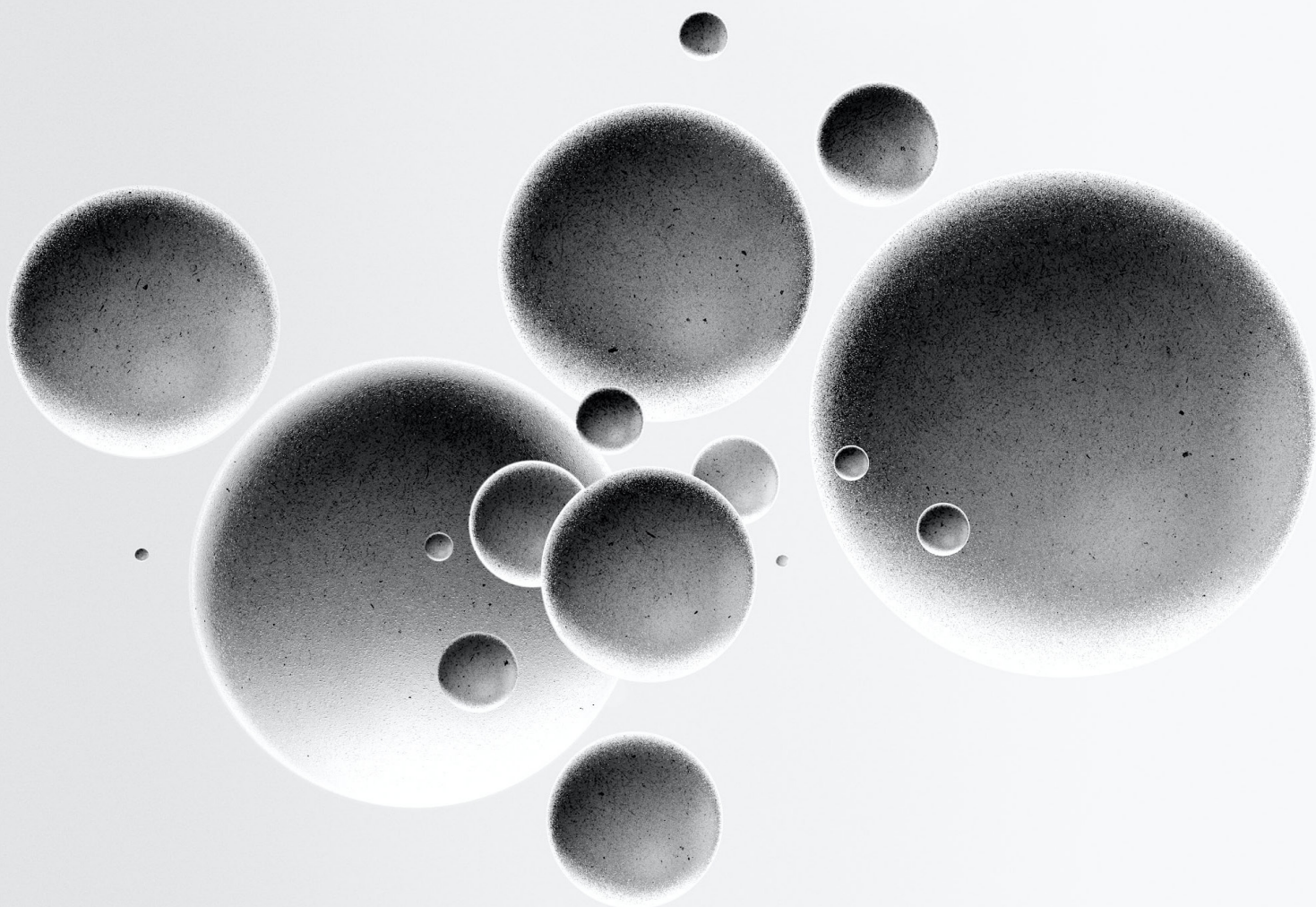


DeFi Decoded

**Democratizing financial access and
eliminating centralized intermediaries**



Martin Leinweber, CFA
Digital Asset Product Strategist

 **MarketVector™**

Contents

| | |
|---|----|
| Introduction | 3 |
| What is DeFi and which major initiatives in this field should you be aware of?..... | 3 |
| The DeFi Ecosystem..... | 4 |
| Project valuation for DeFi..... | 5 |
| Real yield, the next big thing? | 9 |
| Challenges and risks | 11 |
| Decentralized Finance Methodology & Performance:..... | 11 |
| The correlation of DeFi assets..... | 14 |
| Conclusion | 15 |
| Contact..... | 16 |
| Bibliography..... | 17 |
| IMPORTANT DEFINITIONS AND DISCLOSURES..... | 18 |

Introduction

MarketVector Indexes™ ('MarketVector') has developed a classification scheme for digital assets and offers category indexes that enable users to measure, benchmark, and capture the performance and characteristics of targeted categories within digital assets, thereby making the ecosystem more digestible for traditional finance investors and providing crypto native funds with additional benchmarking capabilities. The following introduces the MarketVector category decentralized finance applications.

What is DeFi and which major initiatives in this field should you be aware of?

Decentralized finance, or DeFi for short, refers to initiatives that seek to democratize financial access and eliminate centralized intermediaries like banks and businesses. The idea is that of a cooperative: a business that is owned and run by its members.

The distinction with DeFi is that theoretically no one owns or manages the projects. DeFi protocols function independently. A group of supporters keeps the code updated. They either do this voluntarily or in exchange for an agreed-upon reward. Anyone can create a protocol on top of Ethereum that operates in accordance with predefined rules thanks to the smart contract capabilities it provides.

Typically, projects begin as projects with centralized teams. The initiative is frequently funded and supported by a VC (Venture Capital). Occasionally, DeFi projects raise money through an ICO (Initial Coin Offering) or an IDO (Initial DEX Offering)¹. The founding team distributes governance tokens to engaged community members once the initiative gets going. Communities of supporters can be found on Twitter, Discord, and Telegram. Immersing yourself in some of the initiatives is the only way to truly comprehend this field.

¹An Initial DEX Offering (IDO) is a way for projects to sell their freshly created crypto tokens to the community through a decentralized exchange (DEX). A typical IDO lets investors lock their money into a smart contract right before a project's native token is released. When a project launches its token, at the token generation event, investors get these new tokens in exchange for the locked funds, which are sent to the project.

The DeFi Ecosystem

Decentralized finance (DeFi) protocols are computer programs that run on top of another protocol such as Ethereum, Solana, Avalanche and use that other protocol's assets, along with their own and maybe others, to automate financial services. DeFi protocols link buyers and sellers, as well as lenders and borrowers, without the need for a centralized institution. The DeFi protocols can be further broken down into a number of subcategories that focus on specialized applications (Sigel, 2021):

- **Decentralized exchanges**, or DEXs (Uniswap, SushiSwap), enable peer-to-peer trading of digital assets. Even when the volume of the underlying asset is too low for larger exchanges to pay attention to, DEXs nonetheless offer access to trading pairs. Either a decentralized order book or an algorithm for matching orders and determining prices can be used for transactions.
- **Platforms for lending and borrowing** (Compound, Aave): These include linking lenders and borrowers to issue interest-bearing instruments that must be repaid at maturity.
- **Derivatives** (Synthetix): Users can create "shares" that represent a piece of the value of outcomes like elections, sporting events, or market events in prediction markets, or they can trade real-world assets like stocks, FX, and commodities in the form of crypto-denominated tokens.
- **Asset management** (Mirror, Numeraire): Enables users to build and maximize the value of an asset portfolio, by using risk indicators, time horizons, diversification and other criteria.
- **Insurance** (Nexus): Offers risk protection by exchanging the ability to receive a payout in the event of a predetermined event for the payment of a premium.
- **Aggregators** (yearn.finance): Protocols that provide a variety of financial products and services.
- **Asset-backed reserves** (Olympus Dao): Protocols that seek to offer protocol-owned liquidity using a combination of rebasing, bonding, and the accumulation of more stable coins or digital assets.

The majority of DeFi apps do not request personal information during registration. Anyone can utilize DeFi products, by accessing the website of an application and connecting using a wallet (i.e. MetaMask) or equivalent protocol. DeFi is a rapidly expanding field, but it is still in its infancy, with numerous unresolved economic, technical, operational, and public policy challenges that need to be addressed.

Key differences between DeFi and TradFi

| | Traditional Finance | DeFi |
|----------------------------------|--|--|
| Custody of Assets | Held by regulated service provider or custodian. | Held directly by users in non-custodial wallet or via smart contract-based escrow. |
| Units of Account | Fiat. | Denominated in digital assets or stablecoins. |
| Execution | Intermediaries process transactions between parties. | Via smart contracts operating on the users' assets. |
| Clearing & Settlement | Processed by service providers or clearinghouses, typically after a period of time. | Writing transactions to the underlying blockchain completes the settlement process. |
| Governance | Specified by the rules of the service provider, marketplace, regulator and/or self-regulatory organization. | Managed by protocol developers or determined by users holding tokens granting voting rights. |
| Auditability | Authorized third-party audits of proprietary code or potential for open-source code that is publicly verified. | Open-source code and public ledger allow auditors to verify protocols and activity. |
| Collateral Requirements | Transactions may involve no collateral, or collateral less than or equal to the funds provided. | Overcollateralization generally required, due to digital asset volatility and absence of credit scoring. |

Source: VanEck, Crypto Categories: Defining DeFi, Matthew Sigel.

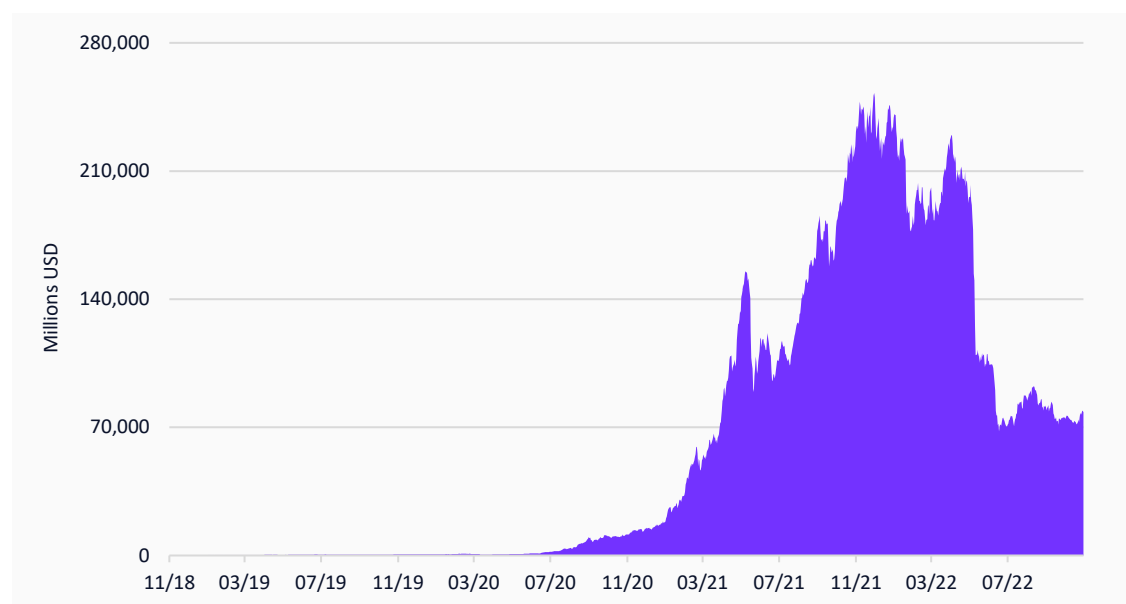
Project valuation for DeFi

Similar to growth-stage startups, DeFi build products can generate cash flows for token holders in the future. While Total Value Locked (TVL) is a valuable technical indicator for assessing the value deposited into a protocol's smart contracts, it does not always provide information for investors regarding the protocol's financial health (Lucius Fang, 2021). For instance, in the case of Compound, TVL is the difference between assets deposited and assets borrowed. This is due to the fact that a portion of these deposits are taken out of the markets when users borrow the assets of other users on Compound. Concentrating on borrowing volume (current debt) and interest paid would be a more accurate way to assess the success of a lending protocol.

When you look at the overall development of the TVL in DeFi protocols, you can see that after a strong rise in 2020, DeFi is in a constant bear market (Exhibit 1). The drag of value accrual can be attributed to the fact that it is simple to replicate a protocol because everything is open-source. This has resulted in a proliferation of imitators and a fee race to the bottom. In addition, numerous investors were alarmed by the statements of global regulators.

However, this has resulted in appealing valuations and inspired protocols to develop new methods of creating token value for users.

Exhibit 1: Total Value Locked in DeFi



Source: MarketVector, Defillama. Data as of November 1, 2022

Similar to smart contract platforms, DeFi protocols typically make money by collecting transaction fees. The fees are either paid out to token holders as payouts or through “burns,”² which lower the number of tokens in circulation. While burning tokens raises each user's relative share of the network similarly to a share repurchase, payouts provide a direct reward to market participants.

Where does the yield come from in DeFi?

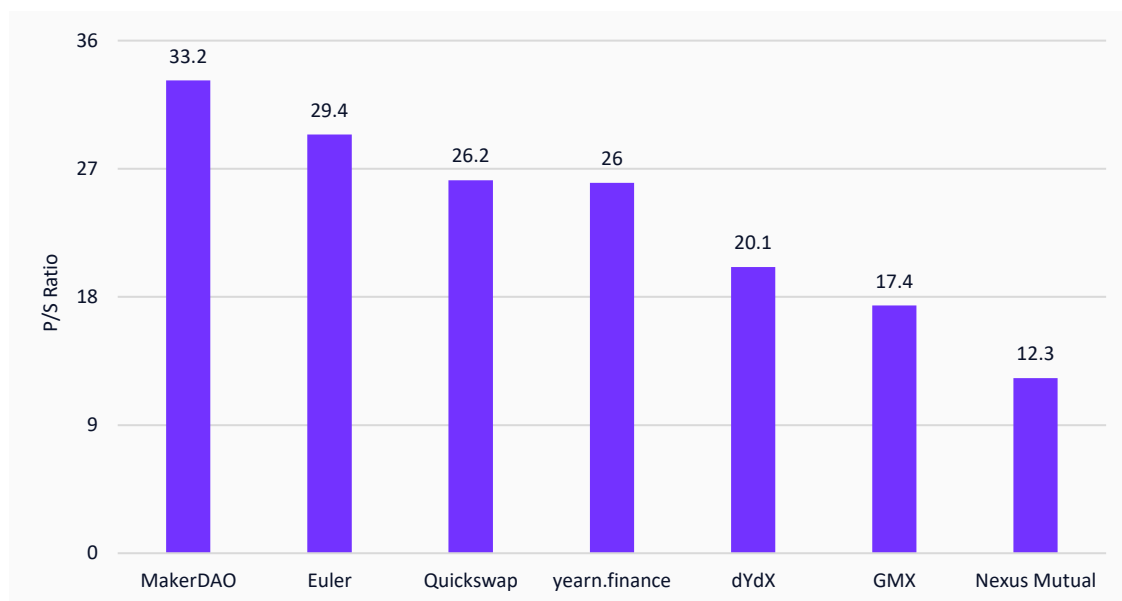
- **DEXs:** DEXs charge a low fee, around 0.3% for exchanges like Uniswap.
- **Lending:** DeFi lending protocol helps lenders to earn interest on crypto assets.
- **Options:** Through earning premiums.
- **Staking derivatives:** Earning block rewards and transaction fees
- **All protocols:** governance token incentives
- **Yield aggregators:** all of the above

Alternatively put, the Yield originates from the fees paid by demand-side users of these platforms and token inflation. Investors can see the projects' effective “price to sales” (P/S) and “price to fee” ratios by comparing the market cap of the DeFi protocol with the fees earned by the protocol (Exhibit 2)³.

² Burning tokens depletes a cryptocurrency's supply of coins overall. Usually, this entails transferring the money to a wallet whose private keys are unknown. Assets are inaccessible since this wallet can only accept them.

³ A price to sales ratio compares a protocol's fully diluted market cap to its total revenues. Total revenue is calculated as the total fees paid by the user of the protocol.

Exhibit 2: Top DeFi applications based on lowest Price/Sales ratio in the past 365 days.



Source: tokenterminal. Data as of November 1, 2022.

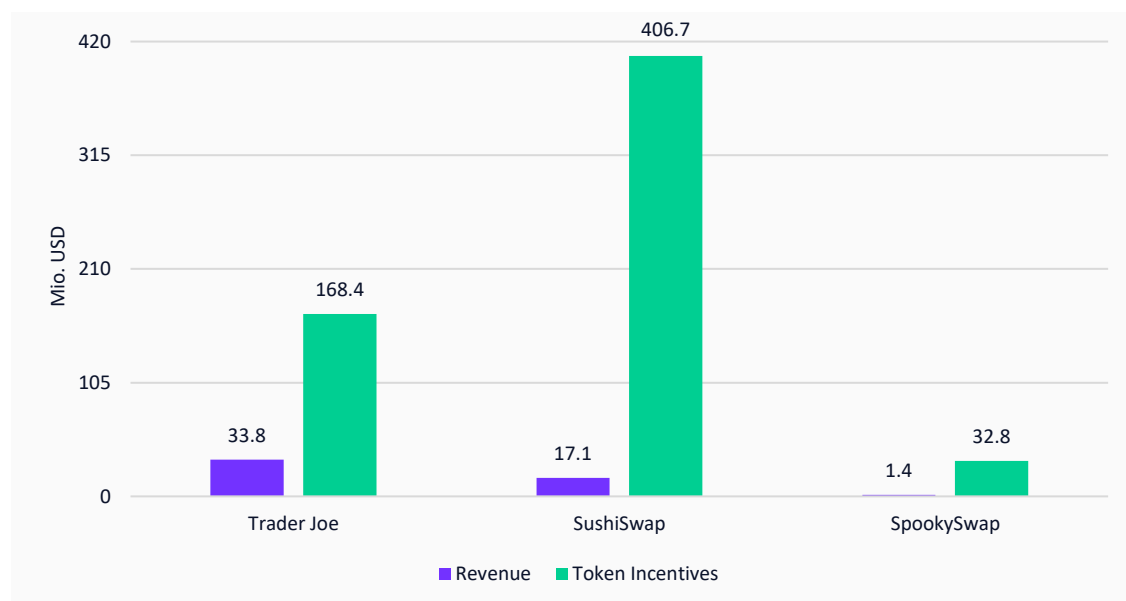
Although the Price/Sale ratio (P/S) is a very helpful and precise tool for comparative examination of various early-stage crypto protocols, it is always important to take into account how much of the fee revenue or usage is linked to token incentives that are paid to users. Token incentives are supplementary rewards offered for the protocol's basic usage, often focusing on the protocol's supply-side users.

Bootstrapping growth with token incentives is a common way to get more users to sign up, but it's not clear if this method will work in the long run. One could look at this metric as the cost of customer acquisition, as emissions eventually lead to more liquidity, which increases traders' ability to put on positions in size. SushiSwap and its "vampire attack" on its main competitor, Uniswap, is the most well-known example of a DEX that uses token incentives to grow on its own⁴. After launching in September 2020, SushiSwap gave users close to \$400M in incentives, which helped it reach \$2.2B in monthly trading volume in its first month. During the first part of the vampire attack, the number of daily active users on Uniswap dropped significantly (whiteboardcrypto.com, 2021).

⁴ A vampire attack is when one DeFi protocol offers better rates to attract investors from another platform to theirs.

In Exhibit 3 you see that early on in an exchange's development, revenue tends to be significantly outweighed by token incentives. This is also typical for many other DeFi protocols.

Exhibit 3: Cumulative revenue and token incentives of DEXs in their first six months of launch



Source: tokenterminal, Weekly fundamentals. Data as of October 31, 2022.

But there's another hurdle to increasing user base. You have to have a more nuanced approach because different DeFi coins have different reward structures. For instance, revenue is shared between interest payments from borrowers and trading fees from traders, with the latter potentially being more important to the long-term viability of the protocol.

However, when taken as a whole, the Median P/S ratio of DeFi is 31.2x, which is significantly less than that of smart contract platforms (which is 6200x), reflecting the lack of clarity surrounding the regulatory landscape and entry barriers⁵.

⁵ Based on data from tokenterminal as of November 3, 2022.

Real Yield, the next big thing?

A protocol can earn a portion of its revenue, known as Real Yield, by deploying or locking its governance token. In contrast to revenue obtained through the issuance of tokens, the Real Yield is a return that results from producing real revenue. This system is called DeFi 2.0 and distributes revenue in the form of a dominant token, either ETH or USDC (Jie Xuan Chua, 2022).

Additionally, Real Yield paves the path for users to pay with the tokens of their choice by allowing them to participate in the platform's earnings. The return provided to users increases in direct proportion to a cryptocurrency project's revenue generation. In order to reward token holders, individuals who wager on real yield projects wager on their capacity to draw in new users and grow their revenue over time.

Why Real Yield?

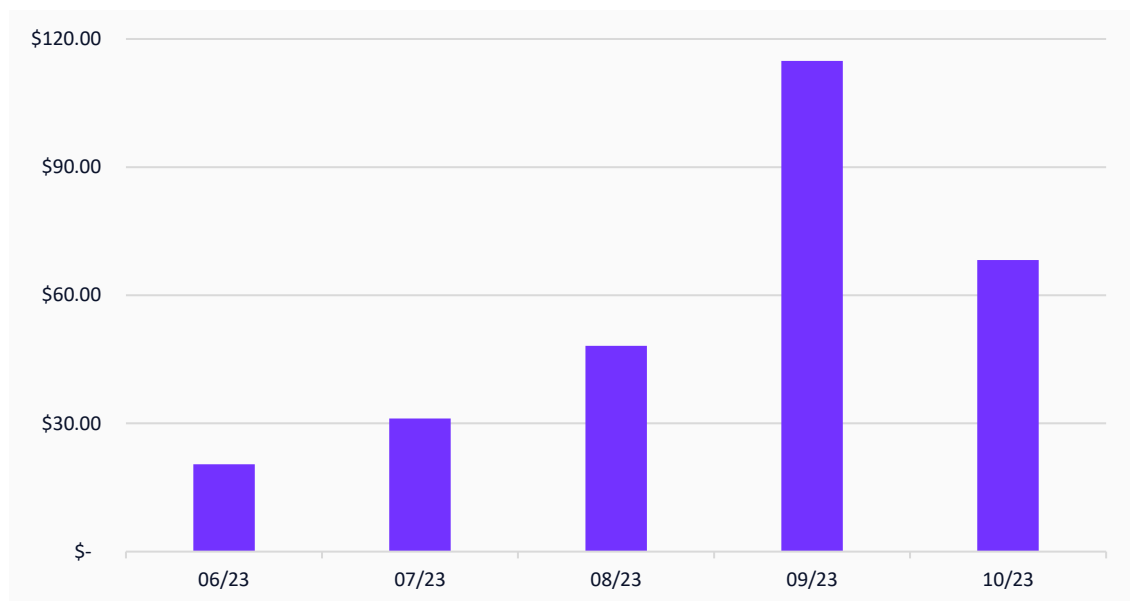
Because it varies from traditional user acquisition we know from the early DeFi protocols, Real Yield is a game-changer. In the early days, to boost the amount of user cash deposited, investors received excessively inflated, unsustainable annual returns.

Even if the returns are alluring to investors, they cannot be maintained by issuance of tokens or fraudulent returns.

Higher inflation issuances are not required for a project that exhibits the traits of a true return. These genuine initiatives produce returns through real income and are gaining momentum. They have more advantages and offer leveraged trading with abundant liquidity and affordable costs. These include the DEXs such as DYDX, GMX, GNS, SNX, and UMAMI. The success of the derivatives exchange GMX and its cash flow token model has recently made it a shining example of Real Yield. Liquidity providers get 70% of GMX's revenue in the form of the token GLP. The other 30% is given to users who lock up their GMX tokens in the form of ETH or AVAX, depending on the chain.

A quick calculation can reveal whether the project is viable and capable of producing actual results. Knowing how much of their revenue is retained in relation to how much of a token is emitted is another crucial ratio. Numerous large DEXs brag about their high TVL and revenue, but these figures pale in comparison to the value of tokens used as subsidies. With \$114 in revenue per GMX token in September and \$68 in October, GMX has a reputation for its ability to provide token holders with a high return (Exhibit 4).

Exhibit 4: esGMX Arbitrum - Protocol Revenue Per esGMX Token Emitted (Monthly)



Source: Blockworks, Dune Analytics. Data as of November 4, 2022.

Regardless of how juicy the yield appears, it is essential for investors to evaluate the business model and ensure its viability. People should utilize the token because they use the protocol, not because they are just speculating on its price and yield.

Challenges and risks

DeFi has a lot of benefits, but there are also drawbacks and trade-offs to take into account. According to Fabian Schär, professor of distributed ledger technology and fintech at the University of Basel, there are several challenges and risks (Schär, 2022).

Transparency around decentralization. What is commonly referred to as DeFi is frequently highly centralized. DeFi protocols are frequently influenced by centralized data feeds and are prone to highly concentrated governance token allocations held by individuals. It is crucial to distinguish between true decentralization and businesses who advertise themselves as DeFi but actually offer centralized infrastructure.

Immutability is not always an advantage. Investor protection may be more difficult to enforce, and programming errors in smart contracts may have grave repercussions.

Privacy concerns may be raised by the blockchain's openness and decentralized approach to block formation. All transactions are documented on-chain. This permits the extraction of rents by widespread front-running also known as maximum extractable value (MEV). Sophisticated market participants who see a transaction with an instruction to trade assets on a decentralized exchange can attempt to foreclose (or sandwich) that action by issuing their own transaction. Potential remedies exist; however, they come with trade-offs and may only partially alleviate the issue.

Another problem are transaction costs. It is difficult to scale public blockchains without sacrificing some of their distinctive characteristics. High frequency of transactions is often associated with high costs of transactions. So-called Layer 2s are a potential fix. It is helping Ethereum run computations off-chain and only publish transaction data on-chain in a bid to drastically reduce gas fees. Although this is a good strategy, it frequently still needs trust and different kinds of centralized infrastructure.

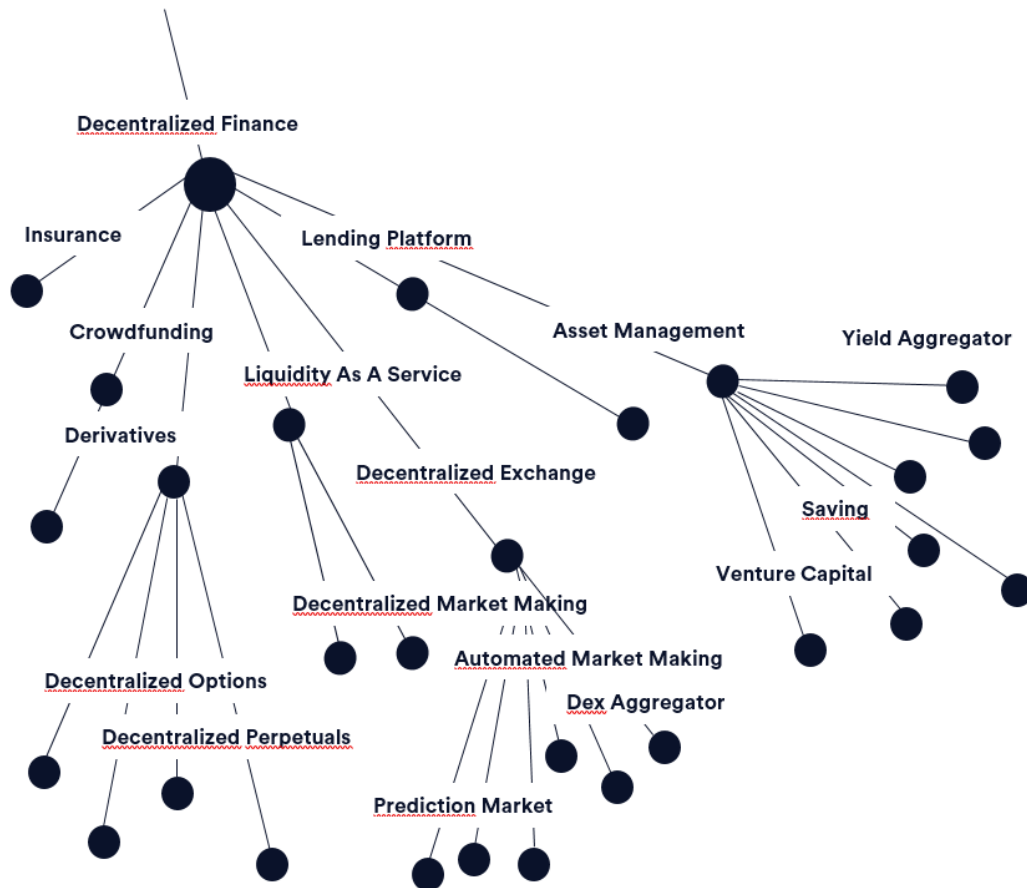
DeFi can nevertheless significantly enhance the current financial system, despite its difficulties. The cost structure is greatly enhanced by the absence of an intermediary. Improvements to a completely decentralized protocol also help the world's ongoing issue of financial inclusion. These networks seem to be attracting new talent helping to drive innovation, which is generally considered a good thing.

Decentralized Finance Methodology & Performance:

MarketVector categorizes DeFi tokens in different indexes according to size and liquidity criteria. Broad indexes will capture the performance of coins with \$250mn market cap and \$10mn average daily transaction volume (ADTV). Leader indexes 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. To increase diversification, the leaders index has a maximum cap per token of 30%. Importantly, MarketVector places a strong emphasis on investability. The market capitalization and liquidity requirements ensure that our clients can replicate the index.

The categorization is split into 3 layers: Category, Industry Group and Industry. MarketVector differentiates platforms by their use case (Exhibit 5). For example Decentralized Finance is the category, Decentralized Exchange an industry group and the Automated Market Maker is an industry:

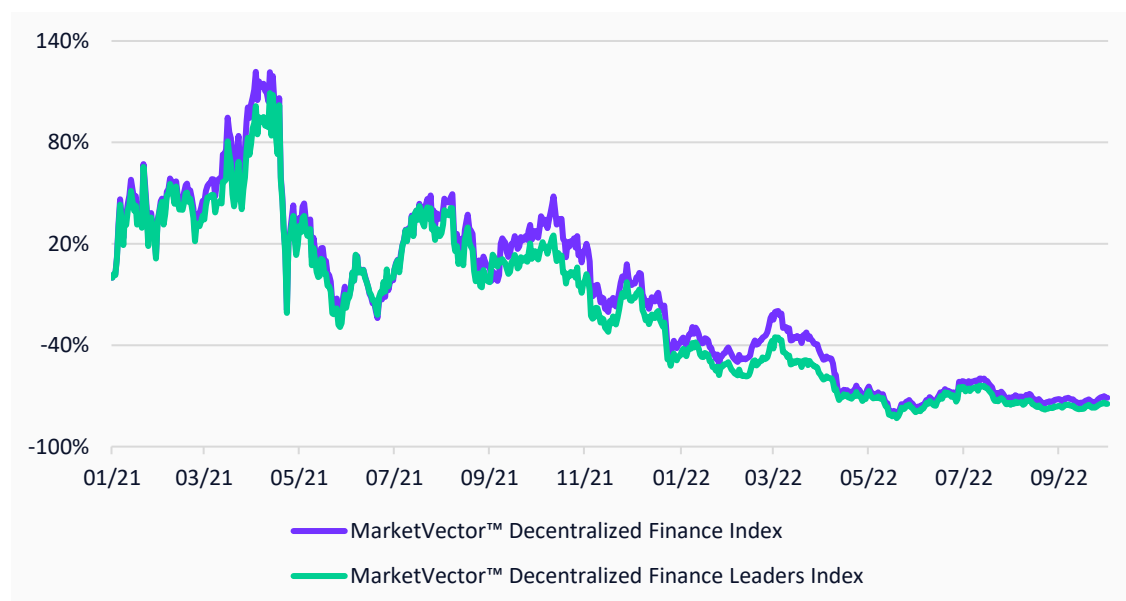
Exhibit 5: Decentralized Finance Category Scheme



Source: MarketVector. Data as of November 2, 2022. You can find the whole category scheme and a definition on our website: <https://marketvector.com/digital-assets-classification>.

DeFi has been stuck by both crypto-specific chaos and macroeconomic turmoil. Terra collapsed, the dissolution of Three Arrows Capital prompted billions of dollars of forced selling, and rising interest rates drained liquidity from higher-risk assets such as crypto assets. Consequently, the average DeFi protocol's market capitalization has decreased by 90% since the peak in April 2021 (Exhibit 6).

Exhibit 6: Cumulative Performance of the MarketVector™ Decentralized Finance Indexes since February 2021



| | Leaders | Broad |
|------------------------------|---------|---------|
| Annualized Return | -41.91% | -38.72% |
| Annualized Volatility | 99% | 96% |
| Market Cap bn USD | 8.38 | 10.77 |
| # Constituents | 5 | 11 |

Source: MarketVector. Data as of November 3, 2022.

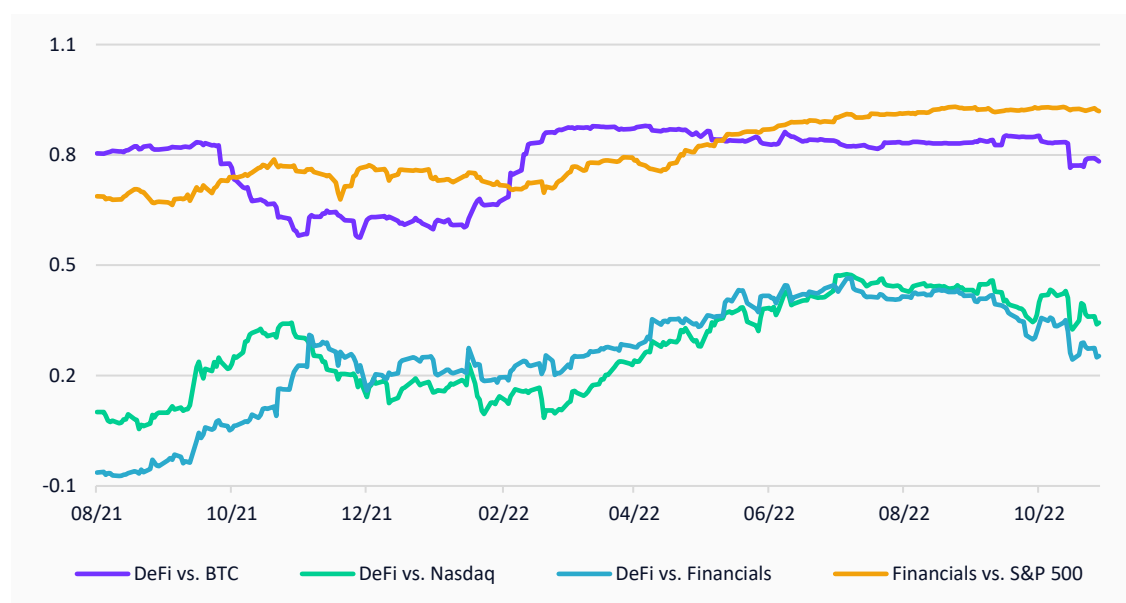
You can find the current specifications, performance & components here:

- [MarketVector™ Decentralized Finance Index](#),
- [MarketVector™ Decentralized Finance Leaders Index](#).

The correlation of DeFi assets

Crypto assets have historically demonstrated correlations comparable to those of stocks within the same asset class. Exhibit 7 compares the 90-day rolling correlations between the DeFi category and Bitcoin (the largest coin) as well as stock indexes. We also compare blue chip equities (SPDR S&P 500 Trust) with financial stocks held by the largest financials ETF, the Financial Select Sector SPDR Fund.

Exhibit 7: Rolling 90-day correlations



Source: MarketVector, Yahoo Finance. ETFs used SPY, QQQ, XLF. Data as of November 3, 2022.

The similarity in correlations between crypto assets and stocks makes sense. Crypto, as an asset class, is affected by common factors, including evolving regulation, emerging education, liquidity, and new entrants, just as financial stocks are buffeted by their own macro factors, such as interest rates and economic growth.

The claim that the correlations between crypto assets is excessively high is faulty because correlations between equity sectors are similarly high. Nonetheless, everyone agrees that it makes sense to diversify across different equity sectors.

That said, the numerically high correlations between crypto assets do not adequately depict the widely divergent long-term returns delivered by those assets over time.

Conclusion

As we've seen in past cycles, bear markets dampen overly optimistic expectations and bring the market's attention back to what's really important about a project. In the past few months, the prices of DeFi tokens fell along with the rest of the market, but the protocols themselves carried on as usual. DEXs were busier than other parts of the market because traders used them to move into stable coins.

During the recession, the synthetics sector of DeFi gained traction. Also, new derivative exchanges popped up, which brought back growth in users and gave users a new way to share in revenue. As we've seen with MakerDAO, more and more real-world assets are moving to DeFi (Zach, 2022).

Last but not least, big banks like JP Morgan are getting into the market and using public blockchains to tokenize foreign currency deposits (Ledger Insights, 2022). This is a sign that DeFi is here to stay and that big players want to be a part of it in any way they can. Even if prices keep going down in the short term, the best DeFi projects will use this time to build momentum for the long term. DeFi poses a danger to TradFi by eliminating intermediaries; either traditional big financial companies find a way to participate, or they will go the way of dinosaurs.

Contact

info@marketvector.com

Martin Leinweber, CFA

mleinweber@marketvector.com

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.

Bibliography

(2021). Retrieved from whiteboardcrypto.com: <https://whiteboardcrypto.com/what-is-a-vampire-attack-in-crypto/>

Jie Xuan Chua, C. (2022, November). Retrieved from research.binance.com: <https://research.binance.com/en/analysis/emergence-of-real-yield>

Ledger Insights. (2022, November). Retrieved from ledgerinsights.com: <https://www.ledgerinsights.com/jp-morgan-dbs-sbi-digital-asset-complete-defi-tokenization-trials-on-public-blockchain/>

Lucius Fang, B. H. (2021). *How To Defi Advanced*. teaspoonpublishing.com.

Schär, F. (2022, September). Retrieved from imf.org: <https://www.imf.org/en/Publications/fandd/issues/2022/09/Defi-promise-and-pitfalls-Fabian-Schar>

Sigel, M. (2021, December). Retrieved from vaneck.com: <https://www.vaneck.com/us/en/blogs/digital-assets/matthew-sigel-crypto-categories-defining-defi/>

Zach, A. (2022, July). Retrieved from messari.io: <https://messari.io/report/makerdao-s-dive-into-real-world-assets>

IMPORTANT DEFINITIONS AND DISCLOSURES

Copyright © 2023 by MarketVector Indexes GmbH ('MarketVector') All rights reserved. The MarketVector family of indexes (MarketVector™, Bluestar®, MVIS®) is protected through various intellectual property rights and unfair competition and misappropriation laws. MVIS® is a registered trademark of Van Eck Associates Corporation that has been licensed to MarketVector. MarketVector™ and MarketVector Indexes™ are pending trademarks of Van Eck Associates Corporation. BlueStar®, BlueStar Indexes®, BIGI® and BIGITech® are trademarks of MarketVector Indexes GmbH.

Redistribution, reproduction and/or photocopying in whole or in part are prohibited without written permission. All information provided by MarketVector is impersonal and not tailored to the needs of any person, entity or group of persons. MarketVector receives compensation in connection with licensing its indexes to third parties. You require a license from MarketVector to launch any product that is linked to a MarketVector™ Index to use the index data for any business purpose and for all use of the MarketVector™ name or name of the MarketVector™ Index. Past performance of an index is not a guarantee of future results.

It is not possible to invest directly in an index. Exposure to an asset class represented by an index is available through investable instruments based on that index. MarketVector does not sponsor, endorse, sell, promote or manage any investment fund or other investment vehicle that is offered by third parties and that seeks to provide an investment return based on the performance of any index. MarketVector makes no assurance that investment products based on the index will accurately track index performance or provide positive investment returns. MarketVector is not an investment advisor, and it makes no representation regarding the advisability of investing in any such investment fund or other investment vehicle. A decision to invest in any such investment fund or other investment vehicle should not be made in reliance on any of the statements set forth in this document.

Investments into crypto currencies and/or digital assets are subject to material and high risk including the risk of total loss. The calculated prices may not be achieved by investors as the calculated price is based on prices from different trading platforms. Furthermore, an investment into crypto currencies and/or digital assets may become illiquid depending on the trading platform or investment product used for the specific investment. Investors should carefully review all risk factors disclosed by the relevant trading platform or in the product documents of relevant investment products.

Prospective investors are advised to make an investment in any such fund or other vehicle only after carefully considering the risks associated with investing in such funds, as detailed in an offering memorandum or similar document that is prepared by or on behalf of the issuer of the investment fund or other vehicle. Inclusion of a security within an index is not a recommendation by MarketVector to buy, sell, or hold such security, nor is it considered to be investment advice.

All information shown prior to the index launch date is simulated performance data created from back testing ("Simulated past performance"). Simulated past performance is not actual but hypothetical performance based on the same or fundamentally the same methodology that was in effect when the index was launched. Simulated past performance may materially differ from the actual performance. Actual or simulated past performance is no guarantee for future results.

These materials have been prepared solely for informational purposes based upon information generally available to the public from sources believed to be reliable. No content contained in

these materials (including index data, ratings, credit-related analyses and data, model, software or other application or output therefrom) or any part thereof (Content) may be modified, reverse-engineered, reproduced or distributed in any form by any means, or stored in a database or retrieval system, without the prior written permission of MarketVector. The Content shall not be used for any unlawful or unauthorized purposes. MarketVector and its third-party data providers and licensors (collectively “MarketVector Parties”) do not guarantee the accuracy, completeness, timeliness or availability of the Content. MarketVector Parties are not responsible for any errors or omissions, regardless of the cause, for the results obtained from the use of the Content. THE CONTENT IS PROVIDED ON AN “AS IS” BASIS. MARKETVECTOR PARTIES DISCLAIM ANY AND ALL EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, ANY WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR USE, FREEDOM FROM BUGS, SOFTWARE ERRORS OR DEFECTS, THAT THE CONTENT’S FUNCTIONING WILL BE UNINTERRUPTED OR THAT THE CONTENT WILL OPERATE WITH ANY SOFTWARE OR HARDWARE CONFIGURATION. In no event shall MarketVector Parties be liable to any party for any direct, indirect, incidental, exemplary, compensatory, punitive, special or consequential damages, costs, expenses, legal fees, or losses (including, without limitation, lost income or lost profits and opportunity costs) in connection with any use of the Content even if advised of the possibility of such damages.