# sDOLA: The Organic Yield-Bearing Stablecoin

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**Abstract**

sDOLA is a groundbreaking, yield-bearing, synthetic stablecoin that introduces a novel approach to yield accrual mechanism where FIRM borrowing rights revenue is auto-compounded into additional sDOLA. Comparable to MakerDAO's DAI Savings Rate module and sDAI, sDOLA is differentiated via a fully-decentralized source of yield, censorship-resistance, and superior returns for users due to the price premium of borrowing rights.

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## Background

In 2021, Inverse Finance introduced DOLA, a decentralized, debt-backed stablecoin that utilizes DOLA Feds for real-time liquidity management and USD peg maintenance. To ensure sustained long-term growth, decentralized stablecoins, including DOLA, need to attract un-incentivized sources of organic demand.

A recent approach for generating "semi-organic" demand involves the use of off-chain, "real world" assets, such as government debt securities. Examples of this approach include MakerDAO's sDAI, which today

supports $1.5 billion in TVL, and sFRAX. However, this reliance on off-chain or "real world" assets brings with it real risks for users. To cite but one example, the failure in cryptocurrency markets resulting from the March 2023 Silicon Valley Bank collapse highlights the systemic risks of relying on centralized sources of yield.

Myriad examples of censorship and centralization failure underscore the need for a decentralized, yield-bearing stablecoin that relies on both a decentralized underlying stablecoin and a decentralized source of yield.

Inverse Finance launched FiRM in December 2022, introducing the concept of the DOLA Borrowing Right (DBR) as a DeFi alternative to conventional fixed interest rates. DBR's are issued exclusively by Inverse Finance and each DBR provides the holder with the right to borrow one DOLA for one year. DBR's are traded on the open market and fluctuate in supply and price based on FiRM lending capacity and DOLA borrowing demand. Inverse Finance DAO recognizes DBR's as revenue as they are "spent" by borrowers on FiRM.

Unexplored until now is the distribution of spent DBR's in a manner that results in expanded FiRM lending capacity. One promising path to explore is the creation of a yield-bearing stablecoin that derives yield from these spent DBR's.

## Introducing sDOLA

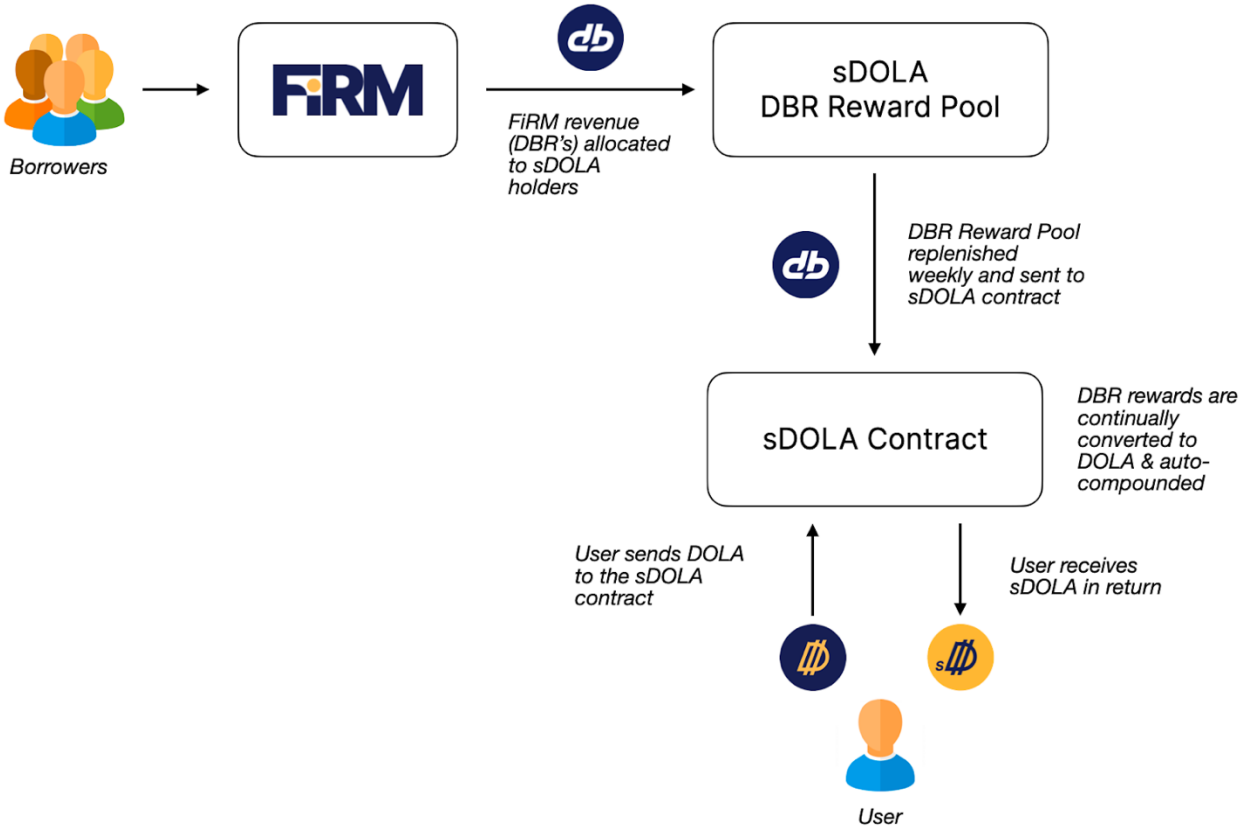
We propose sDOLA, a yield-bearing stablecoin that derives its yield from FiRM revenues. Users who stake DOLA receive a constant stream of spent DBR's, which are auto-compounded into more DOLA, resulting in yield-bearing sDOLA.

The introduction of sDOLA represents an inflection point for Inverse Finance. Depositing DOLA for sDOLA incentivizes the long-term holding of DOLA, resulting in significantly reduced liquidity costs per circulating DOLA and improved overall unit economics of the protocol. Importantly, there is a 1:1 relationship between DOLA staked into sDOLA and additional lending capacity on FiRM given the increased demand for holding DOLA, leading to greater FiRM revenue.

sDOLA therefore harmonizes the DAO's FiRM lending market, DOLA stablecoin, and DOLA Borrowing Rights tokens into a new "flywheel" providing even greater value to INV tokenholders.

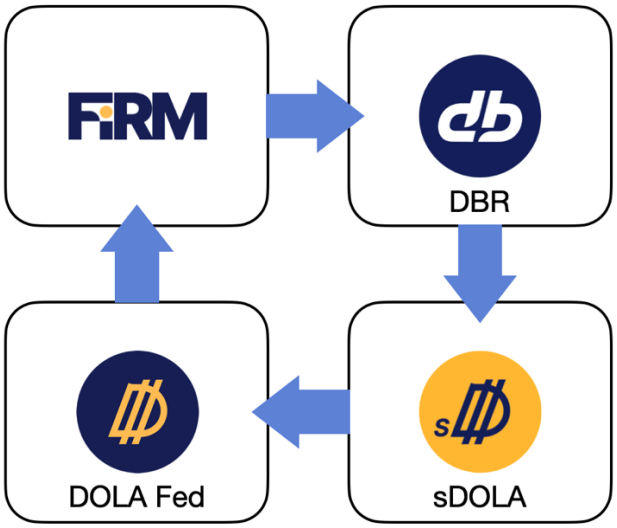
## Protocol Fundamentals

sDOLA is designed as a tokenized ERC-4626 wrapper around a DOLA Savings Account (DSA) smart contract which continually streams DBR rewards to DOLA staked in the contract and auto-compounds those rewards into additional DOLA, leading to the DOLA:sDOLA exchange rate to continuously grow.

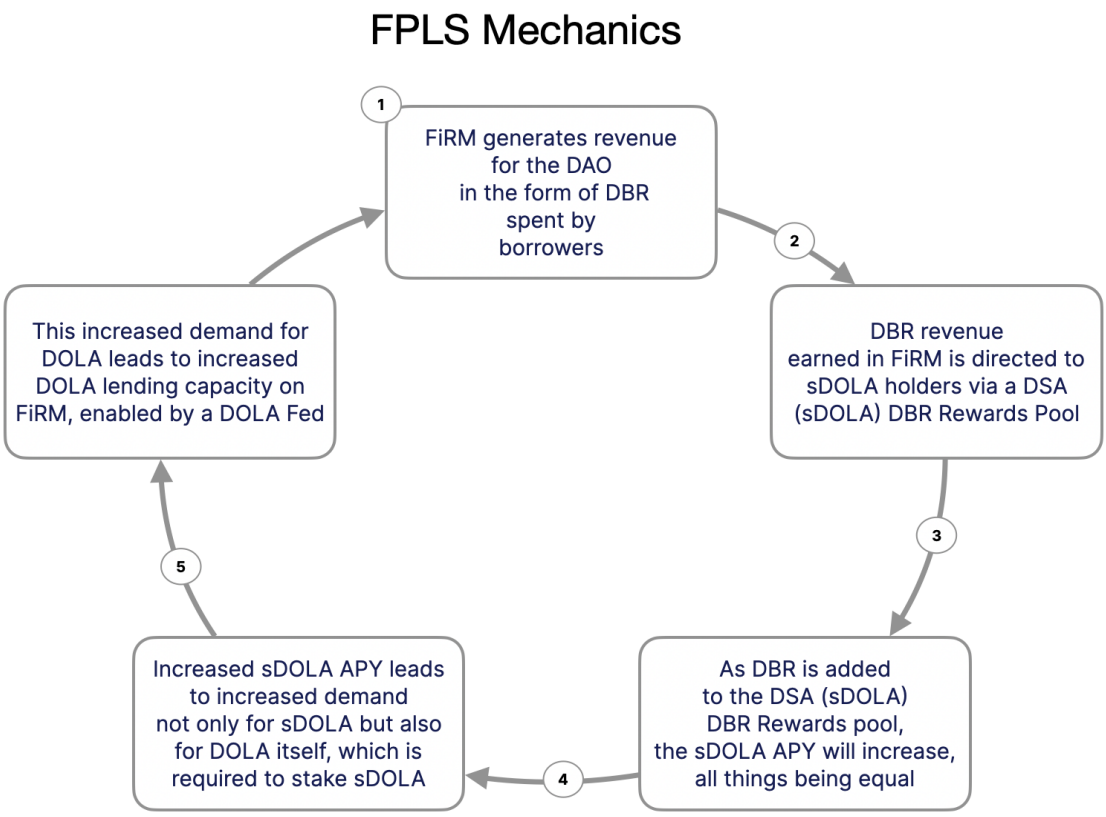



In practice, sDOLA makes an outsized impact on the Inverse ecosystem as it enables a **four-part lending system (FPLS)** for the DAO whereby the improvement or expansion of one system component leads to improvement or expansion of one or more other components supporting FiRM.

Inverse Four-Part Lending System (FPLS)

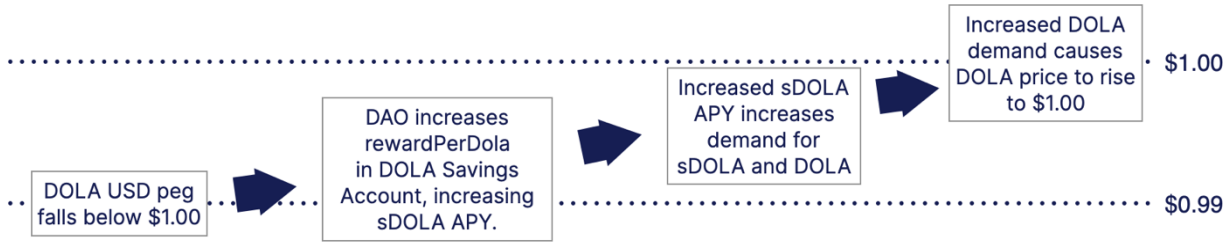


A walkthrough of FPLS mechanics can be viewed as:




As DOLA lending expands, so does the supply of DBR, which repeats the above loop.

An alternative example of this four-part system in operation is the case of DOLA losing its USD peg during a (hypothetical) market downturn. While not the DAO's sole tool for managing DOLA's USD peg, sDOLA provides a useful option where the supply of DBR Rewards is increased to bring DOLA back to peg. For example:




## Design Advantages

- **Decentralized yield source.** An important design consideration of sDOLA and a departure from other yield-bearing stablecoin products is its sourcing of yield from non-centralized sources. sDOLA's reliance on DBR-based yield requires no centralized assets or custodians while DOLA itself is backed by decentralized debt. This contrasts with yield-bearing protocols like sDAI or sFRAX which largely or entirely derive their yield from centralized, U.S. government sources. The

risks of stablecoin centralization are material, as witnessed by the record of frozen USDT and USDC user funds as well as the impact of USDC-custodian Silicon Valley Bank's March 2023 failure, causing an extended USDC depeg and a system-wide downturn.

- **Fixed-rate lending revenue as yield source.** An additional design consideration of sDOLA is its reliance on fixed-rate lending revenues as a source of yield. Compared to variable rate lending protocols, which on average generate a lower rate of return due to the (lender's) shorter maturities and thus lower opportunity cost of capital, FiRM relies on fixed-rate borrowing revenue which are priced at a premium vis-a-vis variable rate lending protocols.

- **No rehypothecation of the underlying stablecoin.** Unlike yield bearing stablecoins that loan user deposits to third parties, DOLA staked as sDOLA is never loaned and remains staked within the sDOLA smart contract until withdrawn.

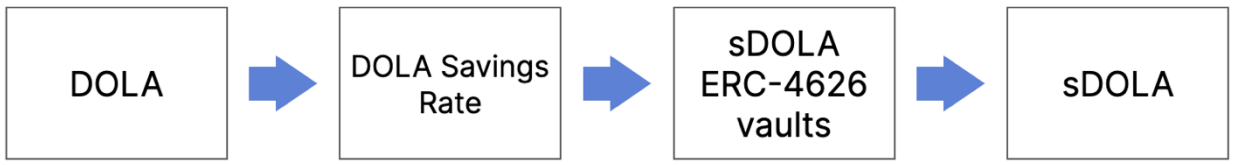
- **Non-dilutive.** Unlike yield bearing stablecoins which rely on new emissions of a governance token as a source of yield, a tax on governance token holders to pay stablecoin yield, sDOLA utilizes no emissions of INV governance tokens as a source of yield and only distributes revenue earned on FiRM.

## Tokenomics

To provide clarity around its tokenomics, the following step-by-step explanation of the sDOLA creation process adds important context in evaluating the proposed protocol.

### Minting sDOLA

The underlying asset for sDOLA is Inverse Finance's DOLA stablecoin, which is borrowable on FIRM or available on Automated Market Makers like Curve or Balancer. To mint sDOLA, a user stakes DOLA in a DOLA Savings Account (DSA) smart contract, which in turn is deposited in an ERC-4626 compliant vault, resulting in a new wrapped token, sDOLA, on Ethereum mainnet.



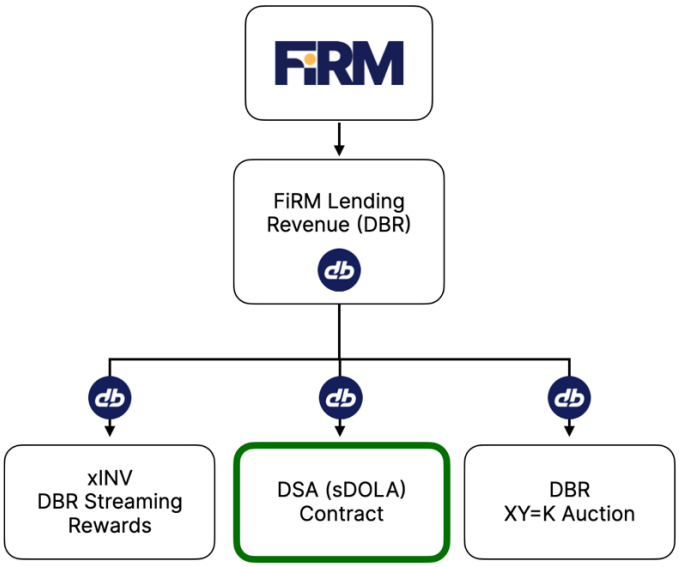

Important points about minting sDOLA:

- DOLA staked to mint sDOLA is never rehypothecated or loaned to third parties.
- The sDOLA token represents pro rata deposits within the ERC-4626 vault and is always withdrawable for DOLA stablecoins at the pro rata rate.
- There is no maximum number of sDOLA that may be minted by a user depositing DOLA.

**Yield Accrual**

sDOLA yield is derived from DBR revenue generated by borrowers on Inverse Finance's FiRM fixed rate lending market. As DBR's are spent by borrowers on FiRM, those spent DBR's are recognized as revenue for the DAO, which is then re-distributed in three ways to:

1. INV stakers, in the form of DBR streaming rewards
2. The DSA (DOLA Savings Account) smart contract, powering sDOLA
3. The DBR XY=K Auction




The yield of sDOLA accumulates continually via growth of the dbrReserves accrued in the DSA (sDOLA) contract. The incremental rate of this growth is determined by the formula:

$$\text{dbrPerDolaPerSecond} * \text{DOLA Deposited in sDOLA}$$

The rate dbrPerDolaPerSecond is influenced by the DOLA Savings Account (DSA), adhering to a DAO-set maximum yearly reward budget.) The rate is calculated as the lesser of:

$$\text{maxYearlyRewardBudget/year}$$

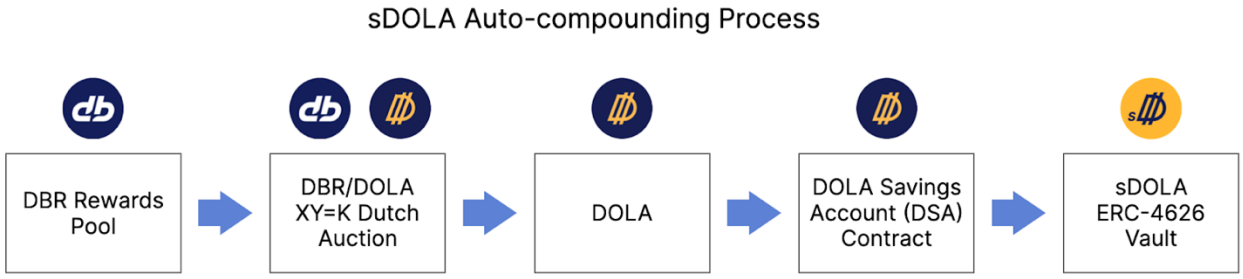
*or*

$$\text{(DOLA Staked/yearlyRewardBudget)/year}$$

The rate is unlikely to surpass 1 DBR per DOLA annually, aligning with DBR's burn rate in the FiRM. When the rate falls below 1, INV stakers benefit from the spread. However, in certain scenarios, the rate may exceed this threshold, especially when the DAO aims to boost short-term DOLA demand, or when the cost per DOLA in circulation (excluding sDOLA holdings) is unusually high.

**Auto-compounding**

A unique aspect of sDOLA is the automatic compounding of the continuous DBR yield accrual into additional DOLA. DBR yield auto-converts to more DOLA, so a user's DOLA balance staked in sDOLA is continually growing. There is therefore no need to claim yield in separate, manual transactions and no human intervention is required by the user or by DAO contributors during the auto-compounding process.




To convert DBR yield into more DOLA for the user, the DBR yield must be first swapped for DOLA. sDOLA implements the DAO's XY=K Auction contract, meaning this will create additional depth to DBR's market and run in a fully automated manner via Miner Extractable Value (MEV).

The XY=K Auction operates as a virtual, x*y = k constant function market maker auction. The purpose is to provide a market-driven, continuous, Dutch auction for DBR, paid in DOLA. DBR reserves increase over time, pushing down the price of DOLA in the auction, until the price is low enough for an arbitrageur to extract profits. Upon a successful trade, the buyer will deposit DOLA in return for freshly minted DBR. Essentially the contracts function very similarly to a Uniswap V2 pool, except one side of the pair is virtual (DOLA), and the other (DBR) has a continuous stream of new tokens being added to the reserves.

After swapping DBR for DOLA, the additional DOLA is staked in the DOLA Saving Rate contract and will accrue value to sDOLA in the following week.

**Yield Distribution**

Yield generated from sDOLA's DBR-DOLA swaps is allocated to sDOLA holders on a pro-rata basis over a 7-day period. This distribution cycle is structured on a weekly basis, with weeks starting and finishing at roughly Thursday 00:00 UTC each time. The yield for any given week is derived from auction activities in the preceding week.

This mechanism implies that as the supply of sDOLA increases, the current yield lags the projected yield, appearing lower. This is because the revenue earned in the previous week was from a comparatively smaller sDOLA supply than the present distribution base. Conversely, if sDOLA supply diminishes due to

withdrawals, remaining holders experience a temporarily enhanced yield until the current and projected yields align. Importantly, sDOLA does not have a predefined minimum or maximum APY.

### Withdrawal

Users may unwrap their sDOLA at any time through a conventional un-staking transaction. There is no maturity date, no waiting period to withdraw DOLA, and users may re-stake into sDOLA at any time.

## Governance

Beyond a governance vote to launch the sDOLA smart contracts, DAO governance is required to adjust the parameters which determine the budget allocated to DSA, and thus sDOLA.

## Use Cases

While conventional decentralized stablecoins have clear use cases in DeFi, payments, and elsewhere, the use cases for decentralized yield bearing stablecoins present a different set of use cases:

- **Stable Store of Value.** Compared to conventional USD-pegged stablecoins, sDOLA helps protect savings from USD inflation by adding more DOLA to a user's position. In lieu of holding "naked" stables in a portfolio for diversification, yield-bearing sDOLA carries no additional opportunity cost beyond the gas costs of staking.

- **Stablecoin Portfolio Diversification.** For individuals, funds, or DAO treasuries holding stablecoins, sDOLA provides a decentralized yield-bearing hedge against the risks of centralized, yield-bearing stablecoins like sDAI or sFRAX.

- **Dollar-denominated savings for unbanked users.** Individuals residing outside the U.S. often lack access to dollar-denominated savings vehicles. sDOLA provides permissionless access, no maturity dates, and high rates of return from anywhere in the world by anyone with access to a browser and a non-custodial wallet.

- **Loan collateral.** While not available as collateral on FiRM, other lending protocols can add sDOLA as a stable form of yield bearing collateral. Borrowers utilizing looping strategies can realize significant returns with minimal risk of liquidation of the underlying asset due to sDOLA's low volatility and yield generation.

- **Yield-bearing liquidity partnerships**. sDOLA is an attractive asset for protocols seeking to pair their stablecoin/token with a yield-bearing stablecoin, which will reduce liquidity costs given the pre-existing yield of sDOLA.

- **Single-sided alternative to stablecoin liquidity pools.** The attractive APY for sDOLA will in many cases provide a comparable return to other stablecoin liquidity pools without the inconvenience and risk of farming on third party protocols.

- **Perpetual Futures.** A perpetual futures DEX can accept DOLA as collateral and rehypothecate it as sDOLA, where the sDOLA yield subsidizes lower trading fees for traders. There is no lockup period for sDOLA, and a futures DEX can deposit or withdraw at any time.

- **Treasury management.** Businesses can earn additional DOLA on their capital float. DOLA that is not committed to operating expenses can be locked into sDOLA and accrue DOLA earnings until the company needs to draw on those funds.

## Competitive Analysis

sDOLA's design exploits the weaknesses of rival yield-bearing stablecoins and presents a large market opportunity for Inverse Finance. An analysis of three competitive offerings illustrates the opportunity:

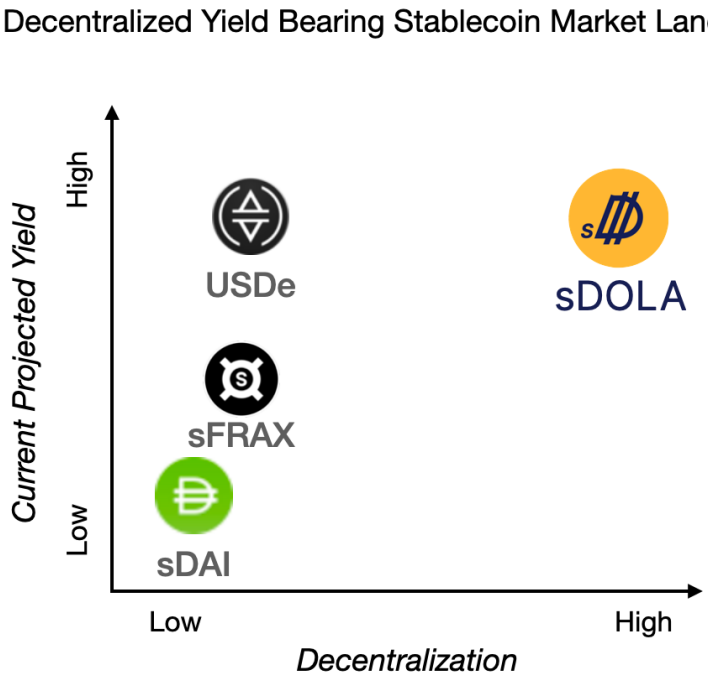
| **Name** | **sDAI (MakerDAO)** |
|---|---|
| **TVL** | $1.1B |
| **Strengths** | • sDAI relies on DAI, the original debt-backed stablecoin with high circulation and robust DEX liquidity.<br>• No waiting period to withdraw. |
| **Weaknesses** | • **Non-competitive yield rate.** As the Federal Reserve cuts rates and Treasury yields fall, the attractiveness of sDAI likely decreases.<br>• **Highly centralized.** Yield generated via lending of collateral to centralized third parties including U.S. Treasury securities.<br>• Significant DAI **exposure to USDC** creates additional censorship risks for the underlying DAI asset. |

| **Name** | **sFRAX (Frax Finance)** |
|---|---|
| **TVL** | $29MM |
| **Strengths** | • sFRAX relies on FRAX, a competitive algorithmic stablecoin with high circulation and robust DEX liquidity.<br>• No waiting period to withdraw. |
| **Weaknesses** | • **Non-competitive yield rate.** As the Federal Reserve cuts rates and Treasury yields fall, the attractiveness of sFRAX likely decreases.<br>• **Highly centralized.** Yield generated via rehypothecation of collateral to centralized third parties into centralized Treasury securities and sDAI, which itself is backed by centralized Treasury securities and USDC. |

| Name | USDe (Ethena Labs) |
|---|---|
| TVL | $131MM |
| Strengths | • Does not rely on Treasury securities for yield.<br>• Potentially higher yield vs sDAI, sFRAX. |
| Weaknesses | • **Highly centralized.** Relies heavily on multiple, centralized third parties for custody of deposits, as well as multiple centralized futures exchanges. Further centralization via LIDO, which operates the stETH derivative, in addition to stETH de-peg risk.<br>• **Lending-based.** Yield is generated via loaning user collateral to centralized third parties. Approximately 50% of stETH collateral is hypothecated to futures markets to short ETH, where losses could potentially exceed yield generated by remaining 50% staked in stETH. Should funding rates in futures markets turn negative, yield for USDe stakers could potentially turn negative.<br>• **Liquidity Risks.** Requires a 7-day delay for withdrawals. Reliance on centralized custodians and liquid staking derivative protocols creates potential liquidity shortages during periods of high volatility or market downturns. |

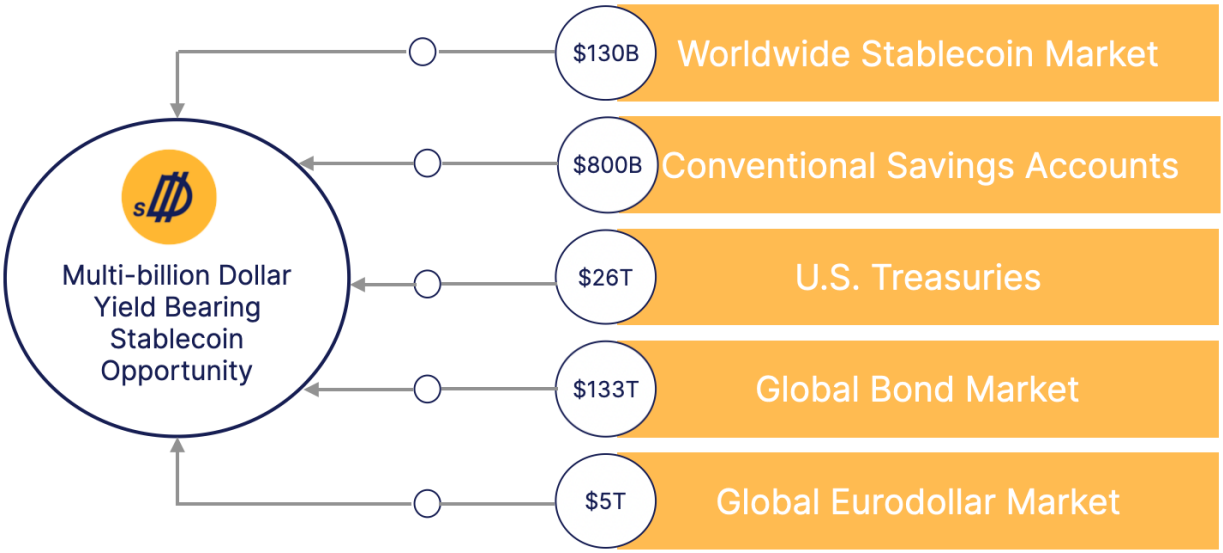
# Market Opportunity

Based on the above competitive analysis, sDOLA's tokenomics provide for a differentiated position in the marketplace:



The competitive advantages of sDOLA combined with the initial use cases can be viewed in the context of broader stablecoin industry trends but also in terms of its potential impact on traditional finance incumbents who remain slow to respond to the disruptive potential of DeFi and stablecoins.

Today's stablecoin market today stands at approximately $135 billion and is expected to grow to $3 trillion by 2028. The yield-bearing stablecoin share of the stablecoin market today is estimated at less than $2 billion but can be expected to grow rapidly due to a variety of factors.




First, using traditional financial markets as a proxy, yield bearing stablecoins can increasingly be seen as 1:1 competitors to conventional savings accounts, an $800 billion industry in the U.S. today paying an average interest rate of only 0.46% APY.

Second, yield bearing stablecoins are already positioned as crypto-native alternatives to U.S. treasury securities, as projects like sDAI and sFRAX effectively offer tokenized versions of a U.S. treasury bill. The U.S. treasury market today is already a $26 trillion dollar market to say nothing of the broader global bond market ($133 trillion) or the global Eurodollar market (approximately $5 trillion). Yield bearing stablecoins become both a way for new users to access treasury yields or for existing bondholders to benefit from tokenized treasuries, enabling additional composability and productivity. This increased demand for tokenized treasury yield leads inexorably towards discovery of still more efficient, permissionless, and higher yielding options like sDOLA.

We leave it to the reader to discern the ultimate market opportunity of a decentralized stablecoin with organic yield paying double-digit annual returns.

**Risk Disclosure**

While the system design of sDOLA has many advantages over rival protocols, it is not without risks.

**DOLA Bad Debt**: sDOLA uses DOLA as its underlying asset. As of today, DOLA carries over $7MM in bad debt as a result of two price oracle manipulation incidents in Q2 2022. This bad debt has led to occasional temporary de-peg events for DOLA.

**DOLA Borrowing Demand:** sDOLA requires demand for DOLA loans on FiRM, a primary source of revenue for the DAO which underpins the yield in sDOLA. While demand for DOLA loans today exceeds supply and the market for fixed rate DeFi borrowing remains largely untapped, a loss in demand for DOLA loans on FiRM would have the effect of reducing DBR price and, consequently, sDOLA yield APY's.

**Yield Volatility.** sDOLA offers a variable rate of return to sDOLA holders due to changes in DBR's price, changes in the dbrPerDolaPerSecond, supply of sDOLA and activity of the sDOLA auction.

## Product Roadmap

sDOLA presents a range of new product line opportunities for the DAO including:

- **Cross-chain sDOLA.** While sDOLA is initially available on Ethereum mainnet, the availability of sDOLA on Ethereum L2's and other EVM-compatible L1's presents attractive liquidity and partnership opportunities with minimal engineering overhead.

- **sDOLA Certificates of Deposit.** Similar to traditional finance instruments like certificates of deposit or bonds, sDOLA users who lock their sDOLA over long time durations could be eligible for additional yield.

## Conclusion

Yield-bearing stablecoins represent a new category of DeFi primitive with the potential to mimic the scale and behavior of savings and other interest-bearing deposit products in traditional finance minus the friction and transaction costs. Within this category, there is a clear delineation between protocols that rely on off-chain or centralized sources of yield and those that retain a "decentralization-first" architecture. Inevitably, yield-bearing stablecoins will also be categorized according to their average annual percentage yield, with protocols recycling low-interest U.S. government yields separated from higher yielding alternatives. sDOLA's design offers the ideal combination of a decentralization and high yield with a scalable architecture helping to proliferate fixed-rate DeFi lending on FiRM.