ADALend

Litepaper

adalend.finance

Abstract

ADALend is building a scalable and decentralized **lending protocol** on Cardano, **governed by the community**.

Cardano is the market leader in PoS as a collection of protocols for economic support to billions of people.

Over the last decade, the decentralized Finance (DeFi) space has been forced to evolve to keep pace with the development of the digital asset market.

ADALend protocol will power foundational the new wave of flexible financial markets by providing a layer for instant loan approval, automated collateral, trustless custody, and liquidity.

Permissionless

Lend on any pairing. Our governance will ensure that the best offers are available and that only the safest oracles are used.

Incentivised Liquidity

Liquidity is predicated on having enough assets in each pool in order to facilitate lending. ADALend addresses this requirement by incentivising users to deposit assets and provide liquidity.

Community Governance

Token holders can establish consensus by voting on governance proposals or introducing new proposals for a vote.

Ecosystem Foundation Layer

Attract assets and build incentives that can empower an ecosystem of financial products.

By fully leveraging power of Cardano, ADALend is building the next generation of lending protocol.

Secure

Cardano is a proof of stake protocol that ensures mathematically proven safety. Given the increased number of cyberattacks in the crypto sector, security is crucial.

Academic backing

Cardano benefits from being one of few coins that have been reviewed by academics who largely praise it.

Multiple layers

Cardano ensures unlimited scalability and quick transactions by implementing a settlement and a computational layer.

Third-generation blockchain

Cardano is considered more reliable than other cryptocurrencies as ADA keeps overcoming challenges other platforms have encountered.

We believe Cardano will mature to be the Layer 1 platform of choice as developers and investors recognize the network’s potential to challenge the embedded status quo of monopolistic power structures within the world of crypto. As such, Cardano focuses on moving toward an all-inclusive technological standard and open platform with unmatched security and tremendous blockchain speed, all of which result in lower transaction fees. Since the Cardano project is under the administration of a non-profit foundation and offers many advanced functionalities, we project that most future blockchain and crypto projects will look to Cardano as the better option against its competitors.

Motivation

People’s interest in Cardano: More and more people are interested in the Cardano ecosystem, as seen in the Cardano chart

Difficulty of implementation: Cardano ecosystem’s smart contract language is Plutus - similar to Haskell - functional programming language. Only experts use functional programming languages, but it’s pretty efficient.

With a higher level of experienced developers in Plutus contract language, ADALend is looking to be one of the pioneers of the Cardano ecosystem.

Use Cases

The Cardano ecosystem is growing, and it is looking to have more and more assets in the ecosystem.

Margin traders mostly conquer the Lending / Borrowing market to have leveraged positions for tokens’ growth.

ADALend is looking to scale and provide various assets, including LP tokens as collateral to support leveraged yield farming on the Cardano ecosystem.

Architecture

ADALend building a scalable non-custodial lending protocol that aims to improve the efficiency of capital. The protocol manages several lending pools by the reserve currency.

Each pool has several key components - liquidation model, utilization ratio, borrowing, and lending interest rate.

1. Concepts

There are multiple lending pools; each pool holds a single currency. The pool accepts deposits from lenders by giving interest. Users can borrow these assets if they deposit the other assets that work as collateral.

The amount of assets that can be borrowed depends on the total amount of collateral deposited and the amount of assets already borrowed.

As time goes by, for the lending assets, it grows for lending interest rates, and for borrowed assets, it grows based on borrowing interest rates.

Borrows have infinite duration, and there is no repayment schedule: partial or full repayments can be made anytime.

In case of price changes, a borrow position might be liquidated. A liquidation event happens when the price of the collateral drops below the liquidation threshold.

Anyone can liquidate this, and liquidators are incentivized to liquidate the position that is under the liquidation threshold.

All of these borrowable amounts and liquidatable positions rely on price oracle driven by trustworthy price data providers.

2. Backbone

2.1 Core

The core contract manages the references of each pool and interest rates per pool.

2.2 Lending Pool

Lending pools have functionalities for

- Deposit
- Borrow
- Liquidation
- Repay
- Redeem

The protocol provides tokenized assets for deposited assets to users, transfer the ownership of lending positions to other users. These assets are different per pool.

If you deposit 1 USDT, you can get 1 $ADAL, the standard asset you can transfer. And the amount of adaUSDT users hold grows as time goes by based on the token's lending interest rate.

2.3 Interest Rate Strategy

ADALend protocol provides a variable interest rate for all the lending users.

For borrowers, the protocol will provide 2 kinds of interest rates - stable and variable rates.

Usually, the stable rate is larger than variable rates, but it’s persistent to the change in interest rates. A stable interest rate is suitable for long-term loans, and variable rates are good for short-term loans.

Both borrowing interest rates and lending interest rates rely on the utilization ratio of each pool.

Utilization ratio = total borrowed amounts / total deposited amounts

The utilization ratio will be changed based on the utility of this token and the liquidity mining program supported by the ADALend Governance.

The interest rate curve is different per asset. The optimal utilization ratio for stable coins is high, and the optimal utilization ratio for non-stable-coin is relatively lower.

When the utilization ratio is lower than the optimal ratio, the interest rate grows gently, but it proliferates when it is more than the optimal ratio.

The rapid growth lets borrowers return, and the lenders to lend more until the target utilization ratio is met.

When we define

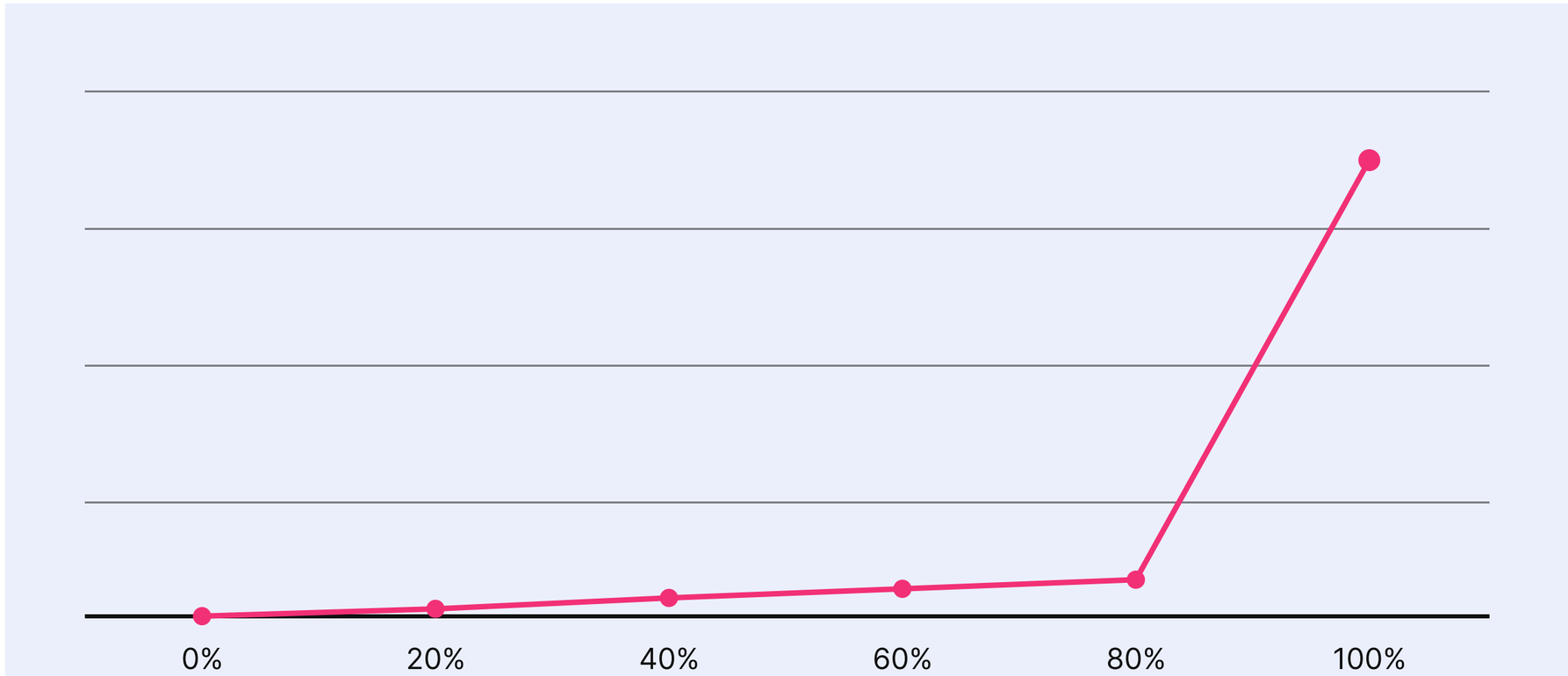
- Base borrow rate as R_{vo}
- Interest rate slope below optimal utilization as R_{slope1}
- Interest rate slope beyond optimal utilization R_{slope2}

Then interest rate is calculated as below

$$R_v = R_{v0} + \frac{U}{U_{optimal}} R_{slope1} \quad \text{when } U \leq U_{optimal}$$

$$R_v = R_{v0} + R_{slope1} + \frac{U - U_{optimal}}{1 - U_{optimal}} R_{slope2} \quad \text{when } U > U_{optimal}$$

It is visualized as the following graph for the case of 80% $U_{optimal}$



2.4 Utilization of Idle Assets

Partial amounts will be put on stable swap platforms where no impermanent loss is available within the allowed range to reduce idle assets on the platform.

3. User flow

3.1. Lending

The lending operation does not have any conditions to meet, and anyone can deposit any amount and get the equivalent value of share tokens.

3.2. Redeem

The redeem operation is to convert share tokens to underlying tokens. As part of this operation, share tokens are burnt, and the underlying token is returned to the user. Underlying tokens are already grown at this time as the share token’s value increases as time passes.

3.3. Borrowing

The borrow operation sends the underlying asset to the user when the user’s collateral amount is larger than the underlying asset he wants to borrow.

3.4. Repay

The repay operation is to pay back the borrowed amount and the interests they need to pay. If the repayment amount is lower than the amount to repay, the borrowing amount is subtracted by the repayment amount.

If the repayment amount is larger than the amount to repay, it is set as a lending amount.

3.5. Liquidation

The liquidation operation is when the collateral amount is lower than the threshold amount based on the borrowed amount for price changes.

The liquidators can safely take out the borrower's collateral, and the borrower’s loan amount is set to zero, and the collateral is removed.

3.6 Flash Loan

The flash loan operation is to borrow a high amount of tokens without collateral based on the guarantee that the full repayment with interest will be made on a single transaction.

4. Oracles

The key dependency in the lending protocol is **Price oracle**. We will be utilizing multiple oracles for protocol security - Chainlink and Ergo are good oracles to start with.

4.1. External oracles

The information provided by external oracles is the primary source of maintaining the liquidation model.

4.2. Internal oracles

Internal oracles are used when external oracles are not ready or not available

4.3. Mixed oracles

Adalend will use the mix of external and internal oracles for its liquidation model.

5. Protocol Security

The security of the project is enhanced by protocol architecture, code quality, health monitors, and active liquidation bots and insurance.

The collateralization ratio is helping the loan amount to be consistently lower than a specific percentage of collateral. And the origination fee for borrowing also prevents spam on the contract.

Liquidity Mining Program

Liquidity mining programs is published on the lending pool and control each asset's utilization ratio.

All the actions on the protocol are incentivized by importance level.

- Lending
- Borrowing
- Liquidation
- Flash loan
- Governance votes
- Governance token LPs

The amount of tokens allocated for the liquidity mining program will soon be published in the Tokenomics paper.

Liquidity mining programs will need to be approved by the DAO. Until DAO approves the assets, they will be in the DAO multisig wallet.

Governance

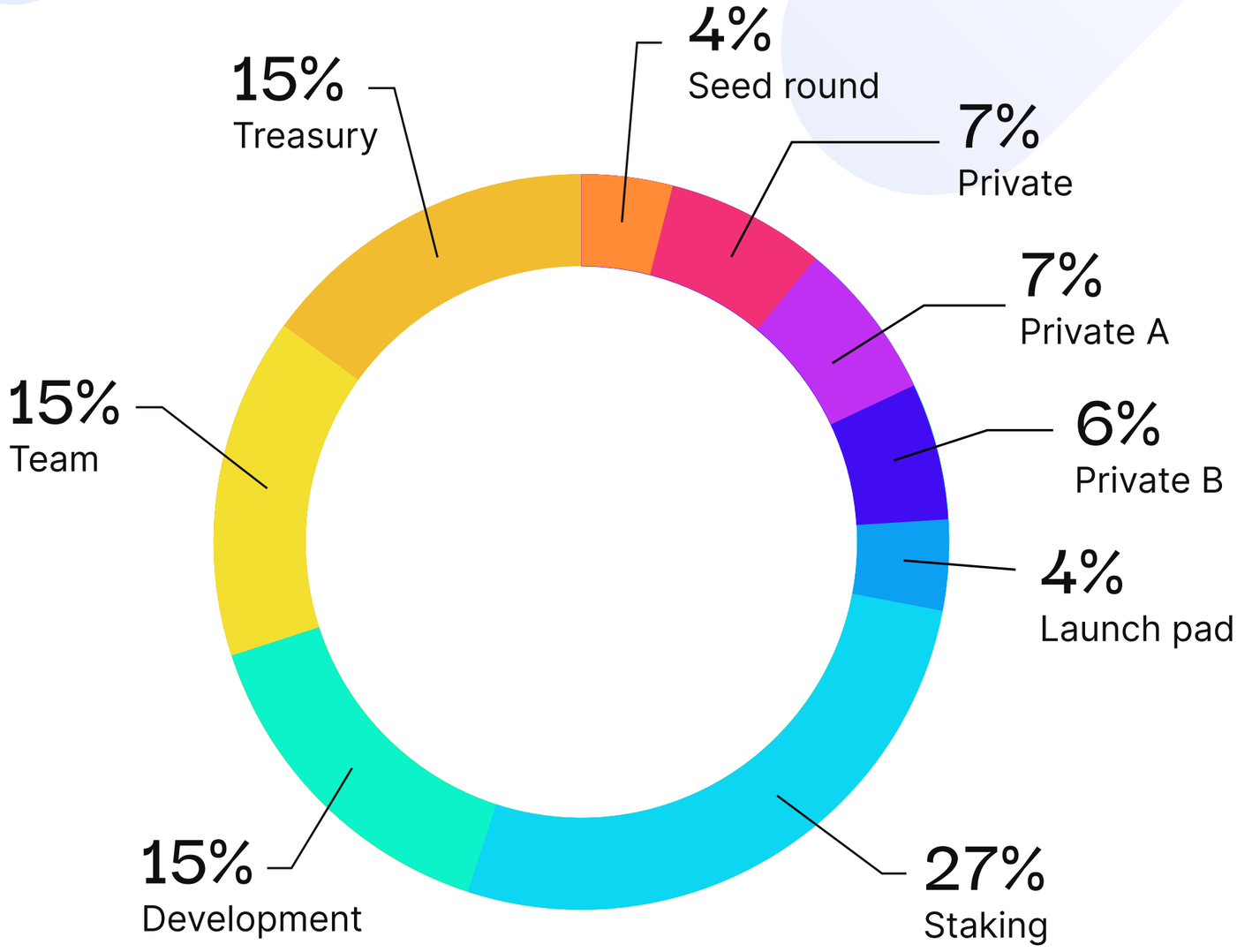
ADALend is looking to bring a new governance system to build a scalable system truly controlled by active users and backers of the community.

The voting power will be calculated by both native token balance and their on-chain and off-chain activity analysis.

The governance decides critical decisions and parameters for the lending pools. These include:

- Assets – adding and removal
- Collateralization ratio per asset by asset’s risk ratio
- Yield programs
- Fee rates / Usage of the fees
- Protocol upgrades

Token metrics



$ADAL
Token name

45,000,000
Token supply

$451,125
Initial market cap

	Tokens	Price	Supply	Timeline	Vesting
Seed round SOLD OUT	1,800,000	0,3$	4%		5% at TGE, 2 months cliff, 10% release monthly, except last batch on month 9 at 15%
Private SOLD OUT	3,150,000	0,4$	7%	Till December 31	5% at TGE, 2 months cliff, 10% release monthly, except last batch on month 9 at 15%
Private A SOLD OUT	3,150,000	0,55$	7%	January 1-31	5% at TGE, 2 months cliff, 10% release monthly, except last batch on month 9 at 15%
Private B	2,700,000	0,7$	6%	February 1-28	5% at TGE, 2 months cliff, 10% release monthly, except last batch on month 9 at 15%
Launch pad	1,800,000	1$	4%	March 14	10% at TGE, 1 month cliff, 10% released monthly for 9 months
Staking	12,150,000	-	27%		5% at TGE, 10% release monthly
Development	6,750,000	-	15%		1 month cliff, 10% released monthly
Team	6,750,000	-	15%		6 month cliff, 10% released monthly
Treasury	6,750,000	-	15%		1 month cliff, 10% released monthly