3Jane Protocol: The Credit-Based Money Market

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Abstract

3Jane is a credit-based money market on Ethereum enabling unsecured lines of credit underwritten against verifiable proofs of crypto & bank assets, future cash flows, and credit scores. This unlocks a three-dimensional collateral space within crypto financial markets by introducing future-backed loans alongside existing asset-backed loans. 3Jane integrates onchain address credit scoring models via Cred Protocol and Blockchain Bureau with offchain VantageScore 3.0 credit scores via zkTLS, enabling risk-adjusted underwriting at scale. To maintain protocol solvency, 3Jane operates onchain auctions where U.S. collections agencies can bid on non-performing debt. By expanding access to unsecured credit, 3Jane unlocks a new era of capital efficiency, empowering a new class of high-productivity economic actors — including cryptonative sole proprietors, businesses, and AI agents — to borrow against future productivity.

1 Motivation

Crypto needs credit expansion. The modern capitalist financial system is built on two fundamental pillars: a medium of exchange & the creation of credit — specifically, the ability to borrow against creditworthiness and future growth rather than existing assets. The global unsecured credit market across consumer and commercial segments is estimated at $5.3 trillion.[1] More specifically, cash flow-based financing in the USA represents a $1.3 trillion market through credit lines, revenue-based loans, merchant cash advances, and trade credit.[2] While stablecoins have convincingly delivered on the first pillar over the past decade, DeFi growth remains constricted by the absence of a scalable and capital-efficient mechanism for credit creation.

DeFi lending is still currently split into two extremes: (1) overcollateralized loans backed by a limited set of DeFi assets (à la Aave and Morpho), or (2) uncollateralized loans to offchain private credit firms (à la Goldfinch), institutional market makers, and reputation-based social circles (à la Union). And despite traditional banks and banking-as-a-service fintech lenders having lower costs of capital under a fractional reserve system, they remain unable, unwilling, or restricted from underwriting cryptonative assets and cash flows due to regulatory and risk constraints.

Crypto financial markets need a scalable and permissionless credit primitive that can extend uncollateralized loans to cryptonative entities (ie. farmers, traders, businesses, and/or AI agents), underwritten against the entire universe of DeFi assets, offchain assets, and future assets (ie. cash flows). This not only unlocks significant capital efficiency and borrowing power for existing asset-rich entities, but more importantly it lays the foundation for enabling high productivity asset-light entities to borrow against their cash flows, creating a self-sustaining cycle of economic expansion native to the Ethereum network. To truly become the internet-native financial system — free from bank liquidity — a cryptonative credit primitive must emerge to enable economic expansion backed by future growth.

[1] Market Research Future. *Unsecured Business Loans Market Size.* https://www.marketresearchfuture.com/reports/unsecured-business-loans-market-24673

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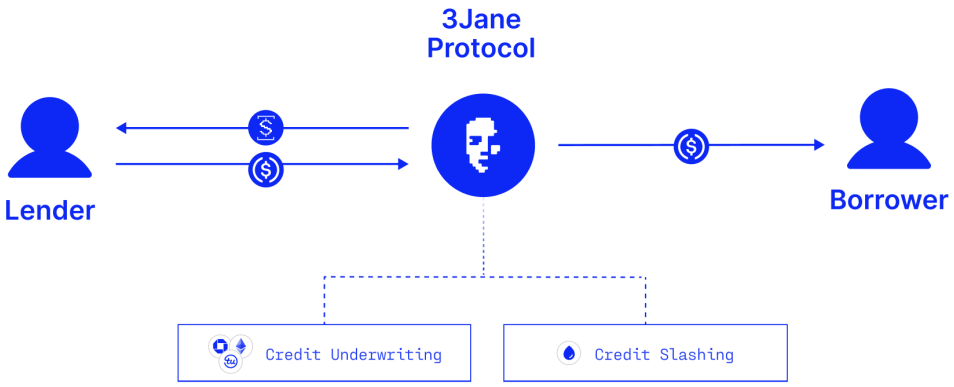

Figure 1: 3Jane Protocol

2 Introduction

3Jane protocol is a peer-to-pool credit-based money market enabling algorithmic, real-time uncollateralized USDC credit lines for yield farmers, traders, businesses, and/or AI agents. By leveraging onchain and offchain credit underwriting, 3Jane introduces a scalable and permissionless lending system that extends capital to borrowers based on verifiable financial proofs rather than posting onchain collateral. 3Jane expands instant capital access across two key borrower segments: (1) greater borrowing power and capital-efficiency for asset-rich yield farmers and traders by leveraging their entire financial profile across all DeFi assets [3], centralized exchanges, brokerage, and bank assets and (2) enables capital access to high-productivity asset-light businesses and AI agents for working capital and growth financing across financial markets, service markets, and resource markets, underwritten against their future cash-flows.

The protocol has three primary functionalities:

1. **Core money market**: two-sided market where suppliers deposit USDC into the pool to mint USD3, and optionally stake for sUSD3, and get exposure to a diverse pool of credit lines to crypto borrowers. On the other side, borrowers permissionlessly connect their ETH address and bank account via Plaid and instantly generate a 0% collateral open-term variable-rate USDC credit facility

2. **Credit underwriter**: 3Jane-operated offchain credit underwriting algorithm *3CA* that underwrites credit lines against all of a user's verifiable (1) DeFi assets, offchain assets, and future assets (ie. cash flows) and (2) onchain/offchain credit scores. It derives the credit line amount, default credit risk premium interest rate on top of the base money market interest rate, and the repayment rate

3. **Credit slasher**: 3Jane maintains protocol solvency by implementing two mechanisms for incentivizing repayment: (1) slashing a user's 3Jane credit score and (2) running an onchain dutch auction with licensed U.S.-based collections agencies who may bid on collecting the debt on a contingency basis.

[3] farms, majors, altcoins, stables, staking, restaking, money market, DEX LP, CDP, derivatives DEX (hyperliquid), bridge, NFT, SoFi, and RWA assets across all EVM chains.

3 Protocol Architecture

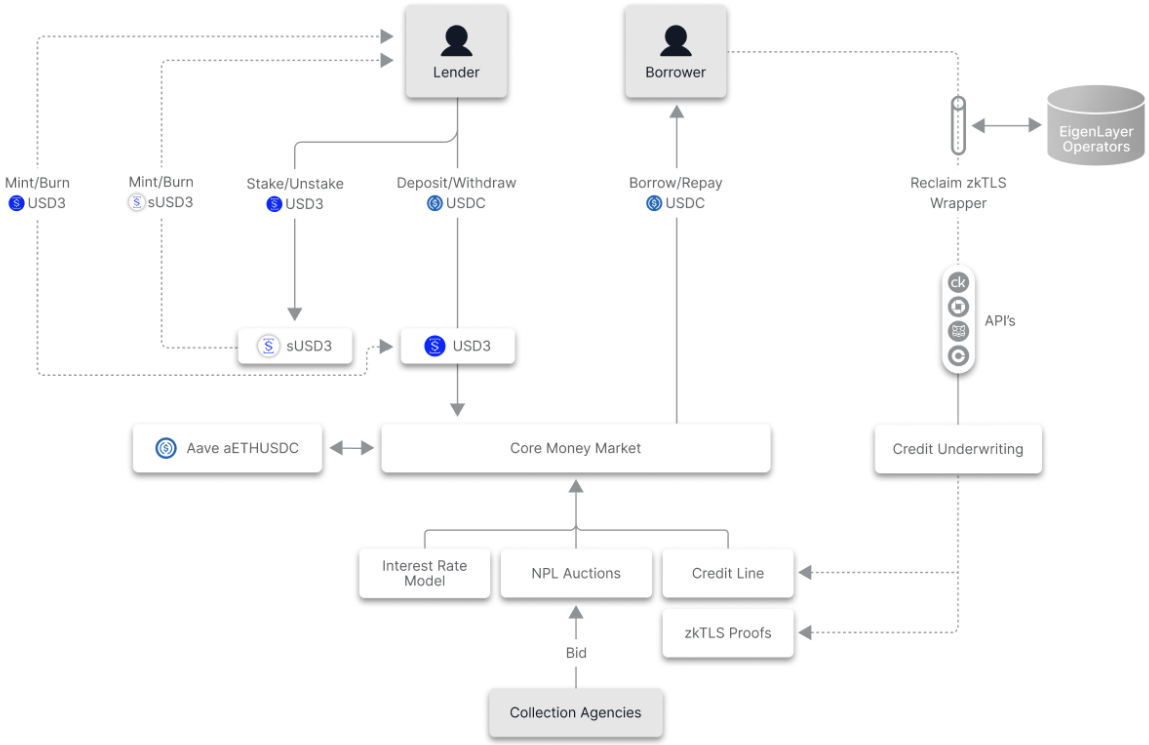

Figure 2: Protocol Architecture

3.1 Core Money Market

3.1.1 Suppliers: USD3 and sUSD3

Suppliers can permissionlessly deposit USDC to mint USD3. USD3 is a stablecoin-denominated yield-coin (ERC-4626) backed by the pool of credit lines. USD3 has a senior claim on interest repayments from the pool and has real-time liquidity for withdrawals based on the market reserves.

Suppliers can also permissionlessly[4] stake USD3 for sUSD3 (ERC-4626) which gives holders levered yield on the pool of credit lines while absorbing first-losses in the case of defaults, net recoveries. sUSD3 is subordinate debt to USD3 and has a cooldown period before it can be withdrawn for USDC.

All USDC supply is first deposited into the Aave V3 USDC pool, and aETHUSDC is then redeposited into the core money market. Funds are withdrawn from Aave as 3Jane borrowers draw down their USDC credit lines. This ensures a base Aave money market return on idle capital.

See 3.1.3 for USD3 and sUSD3 APY.

3.1.2 Borrowers

All U.S.-based borrowers can permissionlessly access 0% collateral USDC credit lines in real-time within two minutes. The connection flow is as follows:

1. **User connects their wallet** and signs a message verifying ownership

[4] staking capacity is capped at W_{sUSD3}. See 3.1.3.

2. **User logs into bank account** via Plaid. 3Jane retrieves the asset and income responses within a zkTLS wrapper (zkFetch), with Reclaim acting as the proxy for added proof of provenance (PoP). 3Jane securely stores asset, income, and user identity. See 3.2.2 for more on zkTLS and 3.2.4 for more on privacy. 3Jane runs the credit underwriting algorithm (3CA) to generate a user's USDC credit line size CL, credit default risk interest rate $\text{IR}_{\text{DRP},n}$, and repayment rate RR_n. See section 3.2 for more on the 3CA methodology. 3Jane's credit underwriting module posts credit line terms onto the `CreditLine` contract and the zk proofs and signature on the `zkTLSProofs` contract

3. **User signs an MCA legal clause message** for repayment

4. **User borrows USDC** up to their credit line CL

Optionally, the user can further boost their credit line and rate by (1) signing more addresses to create a composite address (2) login to Credit Karma to connect more credit data (3) login to CEX's and other banks.

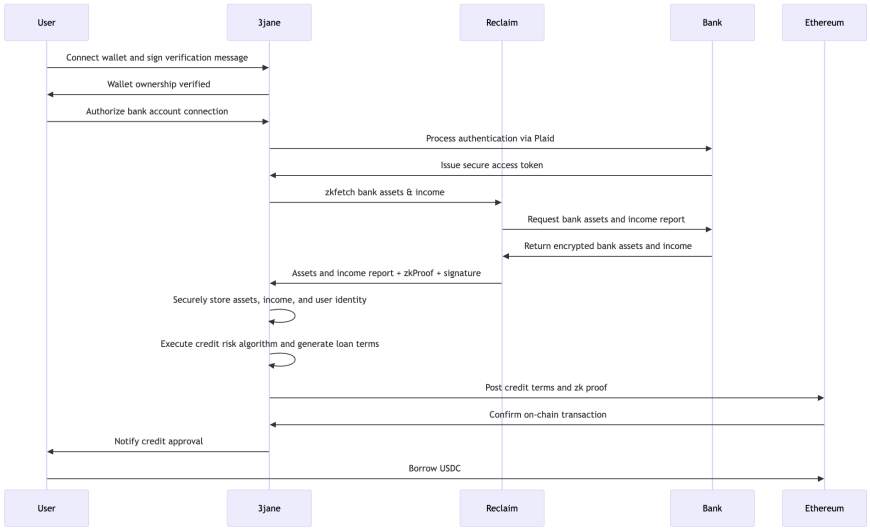

Figure 3: Borrower Connection Sequence

3.1.3 Core

The core money market is an instantiation of the Morpho Blue contract with a single market[5] and the following augmentations:

1. Collateral position is replaced by the *credit underwriter* module via the `CreditLine` contract

2. Liquidation LTVs are replaced with credit slashing logic via the *credit slashing* module to incentivize repayment and maintain protocol solvency

3. Positions have an additional (1) address-specific credit default risk interest rate (2) market-wide late penalty interest rate on top of the base IRM rate and (3) repayment rate

The formula for borrower interest rates, total pool interest rate, and tranche-specific APY's and weights is as follows:

$$\text{IR}_{\text{n}} = \text{IR}_{\text{Base}} + \text{IR}_{\text{DRP},n} + 1_{\text{late},n} \cdot \text{IR}_{\text{LP}} \tag{1}$$

$$\text{IR}_{\text{3Jane}} = \text{W}_{\text{Aave}} \cdot \text{IR}_{\text{SOFR}} + \sum_{n=0}^{N} \text{W}_n \cdot \text{IR}_{\text{n}} \tag{2}$$

[5] loanToken = aETHUSDC, collateralToken = USDC, oracle = USDC oracle, lltv = 100%

$$W_{\text{USD3}} \cdot \text{IR}_{\text{USD3}} + W_{\text{sUSD3}} \cdot \text{IR}_{\text{sUSD3}} = \text{IR}_{\text{3Jane}} \tag{3}$$

where
$$\begin{cases} \text{IR}_{\text{n}} = \text{User-specific interest rate} \\ \text{IR}_{\text{Base}} = \text{3Jane base variable interest rate, based on AdaptiveCurve IRM utilization rate. Always greater than SOFR. See 3.1.3} \\ \text{IR}_{\text{DRP},n} = \text{3Jane default credit risk interest rate of borrower} \\ \text{IR}_{\text{LP}} = \text{3Jane late penalty interest rate. Applied if delinquent past repayment block timestamp} \\ \text{IR}_{\text{3Jane}} = \text{Variable composite interest rate of total borrower pool} \\ \text{IR}_{\text{SOFR}} = \text{Aave's USDC market secured overnight financing rate} \\ \text{IR}_{\text{USD3}} = \text{Interest rate of USD3 tranche. Subject to protocol risk parameter updates} \\ \text{IR}_{\text{sUSD3}} = \text{Interest rate of sUSD3 tranche. Subject to protocol risk parameter updates} \\ W_{\text{Aave}} = \text{Weight of pool in Aave USDC market} \\ W_n = \text{Weight of outstanding loan to borrower n} \\ W_{\text{USD3}} = \text{Fixed at 85\% pool weight} \\ W_{\text{sUSD3}} = \text{Fixed at 15\% pool weight} \end{cases}$$

3.1.4 IRM

The interest rate model is a variant of the AdaptiveCurve IRM which (1) in lieu of interest rate arbitrageurs enforcing market dynamics, programmatically sets the interest rate at 0% utilization to be at minimum IR_{SOFR} and (2) makes the curve steepness C and target utilization U_t adjustable protocol risk parameters based on credit risk changes due to market conditions.

$$r(U_t) \geq C \cdot \text{IR}_{\text{SOFR}}$$

$$r(0\%) = \frac{1}{C} \cdot r(U_t) \geq \frac{1}{C} \times (C \cdot \text{IR}_{\text{SOFR}}) = \text{IR}_{\text{SOFR}}$$

Thus, the relationship ensures:

$$r(U_t) \geq C \cdot \text{IR}_{\text{SOFR}}, \quad \text{which implies} \quad r(0\%) \geq \text{IR}_{\text{SOFR}}$$

3.1.5 Repayments

Each *month* the borrower must make the following minimum payment to maintain good standing:

$$\min\left(LA, P \cdot \left(\frac{\text{IR}_{\text{Base}} + \text{IR}_{\text{DRP},n}}{12} + \text{RR}_n\right)\right)$$

$$\text{where} \quad LA = \text{lifetime appreciation} \ , P = \text{outstanding principal}$$

3Jane credit lines are structured as a purchase on future receivables, meaning the required repayment may not surpass lifetime portfolio growth via asset appreciation and/or cash flows since first drawing down the credit line[6] Therefore, the borrower must only repay the minimum between lifetime appreciation since drawing down the credit line and the interest rate plus repayment rate.

The borrower has a grace period G_p to repay the debt after the new repayment is triggered. After the grace period, the borrower enters the delinquency period D_p where they begin accruing an additional late interest rate IR_{LP} on the outstanding principal. If the credit line has not been repaid before the delinquency period block timestamp, the credit line enters default status at which point the 3Jane *credit slashing* module is automatically triggered which initiates an NPL auction. See 3.3 for more.

[6] asset appreciation is summed up on an hourly basis.

3.2 Credit Underwriter

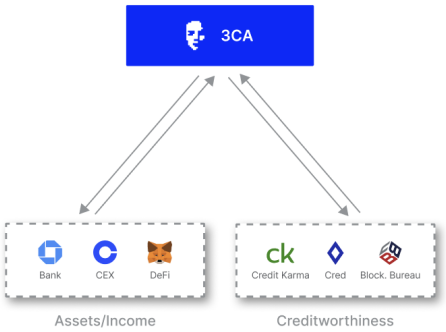

Figure 4: 3Jane Credit Underwriting Algorithm (3CA)

The 3Jane Credit Risk Algorithm (3CA) generates a user's credit line, credit default risk interest rate, and repayment rate, underwritten against assets (DeFi, CEX, Bank, Brokerage), cash flows (income, vote-escrowed tokens, revenues), and creditworthiness [7] (Cred score, Blockchain Bureau score, and Equifax / TransUnion VantageScore 3.0), and posts it onchain alongside zkTLS proofs.

3.2.1 3CA

Algorithm 1 3CA

procedure 3CA(a, u) ▷ Address and user
  $a_{\text{composite}} \leftarrow sign(a_1, \ldots, a_n)$ ▷ User cryptographically signs addresses 1 to n
  $cred \leftarrow \text{CRED}(a_{\text{composite}})$
  $bcb \leftarrow \text{BCB}(a_{\text{composite}})$
  $ck \leftarrow \text{CK}(u)$
  $s \leftarrow \text{SCORE}(cred_s, bcb_s, ck_{\text{eq}}, ck_{\text{tu}}, a_r)$ ▷ 3Jane score
  $v_w, c_w \leftarrow \text{DEBANK}(a_{\text{composite}})$
  $v_b, c_b \leftarrow \text{BANK}(u)$
  $v_c \leftarrow \text{CEX}(u)$
  $v \leftarrow \text{DVALUE}(v_w, v_b, v_c, c_w, c_b)$ ▷ 3Jane value
  $q \leftarrow \text{QUALIFY}(cred, bcb, ck, s, v)$
  if q **then**
    $\text{IR}_{\text{DRP},a} \leftarrow \text{DRP}(s)$ ▷ Credit default risk premium
    $\text{RR}_a \leftarrow \text{RR}(s)$ ▷ Repayment rate
    $\text{CL}_a \leftarrow \text{CL}(s, v)$ ▷ Credit line
    return $(\text{IR}_a, \text{RR}_a, \text{CL}_a)$
  else
    return
  end if
end procedure

See figure 6 in the appendix for more detail.

[7] both Cred protocol and Blockchain Bureau up a robust credit underwriting framework based on on-chain activity. Combined, both credit scoring services scan over +500m address across 8 EVM chains and +100 DeFi protocols to feed +1000 features into its scoring algorithms. Model is trained on +1000 features, 54bn transactions, and 1PB of data. Every transaction you make - from loan borrows, repayments, liquidation, coins held, age of address, yield generated, exchanges you interacted with, etc. contributes to a user's creditworthiness.

3.2.2 zkTLS Proofs

3Jane uses Reclaim protocol, which leverages the zkTLS[8] proxy model, in order to fetch and prove the integrity of HTTPS responses of a user's VantageScore 3.0 score via Credit Karma, CEX assets, and Bank cash & other cash flows via Plaid, without introducing additional trust assumptions on the user or protocol itself. Furthermore, 3Jane utilizes EigenLayer's cryptoeconomic security to ensure a collusion resistant set of designated verifiers that scales with credit line sizes. Proofs will be posted onchain by the *credit underwriting* module alongside the corresponding data, giving depositors the ability to audit the health of the borrower pool. This is critical for 3Jane's architecture for two reasons:

1. **Extracting offchain credit data:** traditionally, in order to access a user's credit data the borrower must (1) provide their social security number (SSN) and (2) the lender must be onboarded with 1-2 of the major credit bureaus, after which point the lender uses your SSN to do a hard check with the credit bureaus to receive your credit report. 3Jane avoids collecting SSN's and hard checks entirely by leveraging zkTLS to trustlessly and privately extract your credit data directly from your Credit Karma account upon log in without introducing additional trust assumptions onto the user

2. **Selective disclosure of offchain balances:** in order to maximize the auditability of the borrower pool by lenders, 3Jane leverages zkTLS to make onchain proofs about some statement on the API response, in particular whether the CEX and bank balance is *greater than or equal* to some floor V_f

3.2.3 zkCoprocessor Proofs

3Jane leverages Lagrange protocol's zero-knowledge coprocessor (zkCoprocessor) to prove arbitrary current or historical state of any EVM chain pertaining to an address, ensuring onchain failsafes for credit underwriting and turning away flagged sybils, fraud, or uncreditworthy users on the smart contract level.

3.2.4 Privacy

Realistically, 3Jane doesn't need to know who you are unless you default. Upon bank connection, 3Jane retrieves your *full name, email address, phone number, and city/state*, which is subsequently sharded and encrypted across multiple cloud providers. Data is retrieved only if a user is delinquent on their credit line repayment. This approach strikes a balance between collecting minimal viable personal data and maintaining effective collection strategies by outsourcing skip tracing to licensed collections agencies with access to commercial databases via TLOxp [9]. The user will have the option to delete their data once the credit line is repaid, with the option of reconnecting their bank account.

[8] zero-knowledge TLS (zkTLS) allows one to obtain and prove the provenance of arbitrary HTTPS traffic, and without revealing personal identifiable information associated with that HTTPS session.

[9] TLOxp is a powerful skip tracing and debt recovery tool that equips licensed collections agencies with 100 billion public and proprietary data points that helps agencies locate debtors and verify identities.

3.3 Credit Slasher

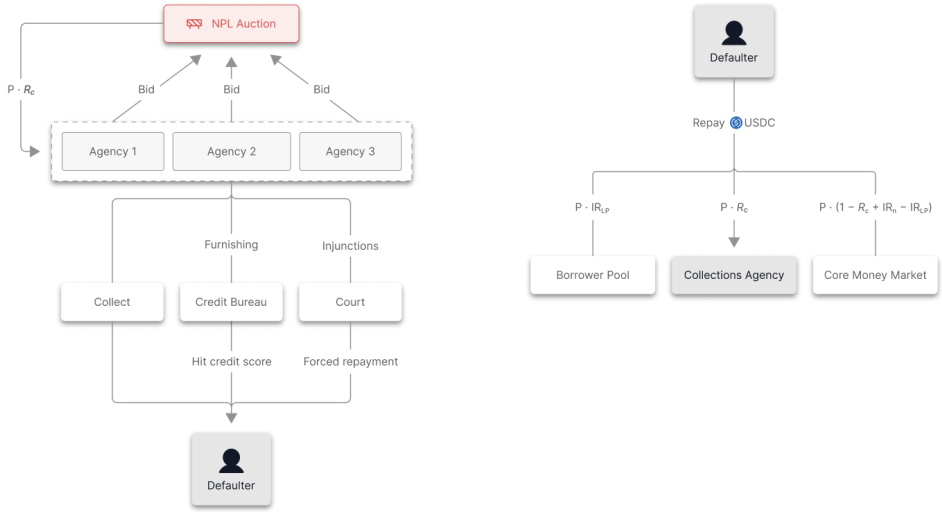

Figure 5: NPL Auction and Repayment

The *credit slashing* module executes two strategies for deterring defaults, namely (1) slashing the 3Jane score which decreases future credit line sizes and increases future interest rates (2) pooled upside model where late interest repayments from defaulters is distributed pro-rata across all existing borrowers (3) initiating a non-performing loan (NPL) auction which engages collections agencies.

3.3.1 NPL Auction

3Jane initiates an onchain dutch [10] auction for licensed U.S.-based collections agencies [11] to bid on collecting the debt on a contingency basis, meaning if they are successful in collecting they get to keep a share R_c of the principal repaid. The lifecycle is as follows:

1. Auction is triggered by delinquency and 3Jane shares borrower profile with all onboarded collections agencies, including onchain/offchain credit data, assets, and cash flows. Does not include PII

2. The contingency rate R_c decreases over time until an agency accepts. 3Jane shares private user data with the particular collections agency

3. Agencies proceed to collect on the debt via skip tracing. These agencies have multiple means of incentivizing repayment, including the right to furnish defaults to offchain credit bureaus to slash offchain credit scores and increase future credit exclusion, and get a court injunction to force repayment

4. If successful, borrower directly repays outstanding balance onchain. $\mathrm{P} \cdot (1 - R_c + \mathrm{IR_n} - \mathrm{IR_{LP}})$ is sent back into the money market, $\mathrm{P} \cdot R_c$ is routed to the collections agency, and $\mathrm{P} \cdot \mathrm{IR_{LP}}$ is split pro-rata across all existing borrowers

3.4 Debt Write-Off

When a credit line becomes delinquent, its market value should reflect both the probability of loss and the probability of recovery. Instead of an immediate full markdown to zero, we introduce a model which dynamically adjusts the markdown based on the probability-weighted expected recovery. This ensures that the markdown reflects real-world expectations while preserving the option for future recoveries. The total adjusted market value $M(t)$ of a delinquent credit line is given by:

[10] dutch auctions ensure rapid price discovery, which is essential for quickly offloading NPLs. Collection agencies will only bid when they believe they can profitably recover a portion of the debt.

[11] these agencies specialize in collections for merchant cash advances

$$L(t) = \frac{1}{1 + e^{-k(t-t_c)}} \tag{4}$$

$$R(t) = \frac{R_{\max}}{1 + e^{k_r(t-t_r)}} \tag{5}$$

$$M(t) = (1 - L(t)) + R(t) \tag{6}$$

$$\text{where} \begin{cases} t = \text{Time in days since delinquency began} \\ t_c = \text{Half-life (time when the credit line is 50\% marked down)} \\ t_r = \text{Time threshold beyond which recoveries significantly decline} \\ k = \text{Steepness of the markdown curve} \\ R_{\max} = \text{Maximum expected recovery rate} \\ L(t) = \text{Loss probability markdown} \\ R(t) = \text{Expected recovery rate} \\ M(t) = \text{Market value multiplier} \end{cases}$$

This model ensures an accurate valuation of non-performing credit lines while maintaining protocol solvency and preventing market panic from sudden markdowns to zero. This function ensures that at the early stages of delinquency, recoveries are still probable, reducing the markdown severity. However, as delinquency time increases, the likelihood of successful recovery diminishes. By dynamically adjusting for expected recovery, it provides a more nuanced and realistic approach to loss recognition. Credit lines are pre-emptively marked down to 0 cents on the dollar upon delinquency status in order to disincentivize runs on the money market.

3.5 Default Game Theory

One of Ethereum's superpowers is around the idea of game warping — the ability to alter the game theory equilibrium by ensuring perpetual credible commitments onchain through code. Turns out, unsecured lending is the perfect application for this — by creating (1) perpetual credible commitments of triggering off-chain collections and (2) creating an immutable record of the default we significantly alter the game theory payoff for strategically defaulting [12]. Essentially, the ledger creates both certainty of enforcement and an undeniable evidence trail that makes traditional legal remedies more effective and increases the opportunity cost of attempting to strategically default compared to traditional off-chain lenders. This increases lending market efficiencies, tightens the spreads, and minimizes credit rationing.

4 Borrow Examples

4.1 Farmer 1

Option 1: Overcollateralized Borrowing

- Collateralize 52K ETH and borrow 25K USDC against it @ 5.33% variable APR via Aave (50% LTV)
- Collateralize 27K S and borrow 13K USDC against it @ 3.27% variable APR via **Aave Sonic**(50% LTV)
- Result: **38K USDC** @ blended **4.63% APR**

Option 2: 3Jane Unsecured Borrowing

[12] initially, any defaults that do occur will be strategic in that the borrower can repay but does not want to. This type of borrower maps high on "ability to repay" and extremely low on "willingness to repay", and short of fraud, credit furnishing and collections is historically effective particularly for mass-affluent/high-net worth individuals.

Asset	Value (K)
USD (JP Morgan Bank)	441.00
BTC (Coinbase)	90.10
WETH+BERA LP (Infrared)	78.67
ETH (Ethereum)	52.66
CVX (Ethereum)	34.39
ETH+USDC (Bunni)	47.74
ETH 3x (Hyperliquid)	34.10
WETH+PT-sw-wstkscETH-1751241605 (Spectra)	28.89
S (Sonic)	27.13
USR+PT-wstUSR-27MAR2025 (Pendle)	23.06
USRRLP (Curve)	19.96
WETH+USDC.e (Beets)	18.23
S+WETH (Gamma)	11.83
scETH (Rings)	8.44
BITCOIN (HPOS10I)	7.13
iBGT (Infrared)	6.86
SDC.e+WETH+S+SolvBTC+USDT (Navigator)	2.48
Total	**932.67**

Credit Venue	Score
Cred Protocol	890/1000
BCB	700/732
TransUnion	780/850
Equifax	700/850
3Jane Score	**9.3K/10,000**

- 3CA underwrites against onchain transactions, offchain credit score, and entire DeFi/CEX/Bank financial profile. Generates a 141K USDC credit line (15.1% of asset value) at 7.93% variable APR (including a fixed 2.6% credit default risk premium above 5.33% SOFR)
- Borrow up to 141K USDC
- Result: **141K USDC** @ blended **7.93% APR**

4.2 Trader 1

Asset	Value (K)
USD (Wells Fargo Bank)	221.32
ETH (Coinbase)	57.10
PENDLE (Ethereum)	49.43
OHM+BERA (Kodiak)	43.12
stSYRUP (Syrup)	42.11
veVELO (Velodrome)	39.56
wstETH+TANGO (Contango)	28.78
LBTCv (Lombard)	29.89
xGRAIL (Camelot)	26.89
AB-KODIAK-rUSD-rUSDOT-500 (Beradrome)	19.24
LINK (Chainlink)	19.93
THE (Thena)	18.21
wTAO (Tao)	12.93
CXT (Covalent)	12.93
Total	**621.44**

Credit Venue	Score
Cred Protocol	750/1000
BCB	650/732
TransUnion	700/850
Equifax	730/850
3Jane Score	**8.4K/10,000**

Option 1: Overcollateralized Borrowing

- Collateralize 19.9K LINK and borrow 10K USDC against it @ 5.33% variable APR via **Aave**(50% LTV)
- Result: **10K USDC** @ blended **5.33% APR**

Option 2: 3Jane Unsecured Borrowing

- 3CA underwrites against onchain transactions, offchain credit score, and entire DeFi/CEX/Bank financial profile. Generates a 68K USDC credit line (11% of asset value) at 8.73% variable APR (including a fixed 3.4% credit default risk premium above 5.33% SOFR)
- Borrow up to 68K USDC
- Result: **68K USDC** @ blended **8.73% APR**

5 Future Work

3Jane credit lines are based on a hybrid asset-based vs. cash-flow based credit underwriting model, with significant skew towards assets. This caters primarily towards asset-rich borrowers engaging in farming and trading. Over time we wish to shift the underwriting towards enabling *pure* cash-flow underwriting to high productivity businesses with exogenous revenue sources.

Further, we believe DeFi's true potential as the internet-native financial system lies in its ability to empower a new class of internet-native economic actors: AI agents. One of the many unlocks of verifiable AI backed by EigenLayer's cryptoeconomic security is if you can prove that the agent is programmatically obliged to follow debt covenants, then the credit risk of strategic defaults by AI agents converges to zero which means you can lend to them unsecured at much lower rates.

3Jane envisions itself as the global credit primitive for a new tomorrow driven by an agentic economy. By offering programmatic stablecoin lines of credit underwritten by other AI agents, 3Jane will enable other AI agents to meet liquidity needs across any financial flow, including issuing commercial paper on behalf of corporations or securing cash advances for small and medium-sized enterprises.

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[13] Lagrange Protocol https://www.lagrange.dev/zk-coprocessor

6 Appendix

Variable Definitions:

Variable	Description
$cred$	cred report. Includes the credit score $cred_s$ (300-1000) and several other address variables. See cred api for more.
bcb	blockchain bureau report. Includes the credit score bcb_s (400-732) and several other address variables. See bcb api for more.
ck	credit karma report. Includes the transunion ck_{tu} and equifax ck_{eq} VantageScore 3.0 (300-850) as well as the credit age, credit utilization, derogatory marks, num. hard inquiries, payment history, and total accounts from both credit bureaus.
a_r	address' 3Jane repayment, delinquency, and default info
s	based on the Cred score, BCB score, TransUnion score, Equifax score, and 3Jane credit line repayments with private weights. It is intended to serve as an aggregate score that also more aggressively rewards and penalizes 3Jane-native repayment behavior to create a tighter feedback loop.
v_w, c_w	both assets and cash flows across majors, alts, stables, staking, restaking, money market, DEX LP, CDP, farms, derivatives DEX (hyperliquid), bridge, NFT, SoFi, and RWA's across all EVM chains.
v_b, c_b	both bank cash and income. Operates on all major U.S. commercial banks. See plaid assets and income api for more.
v_c	majors and alts held in a CEX via Reclaim and/or Plaid investments api. Operates on all U.S.-based CEX's like Coinbase, Gemini, Kraken, etc.
v	discounted value of assets D_a and cash flows D_{cf}. Derived as $$D_{\text{a}} = (1 + d_i - s) \cdot \sum_{v \in \{v_w, v_b, v_c\}} v_i \cdot (1 - H_i)$$, where d_i is a portfolio correlation boost off the discount floor (protocol risk parameter), s is a stress buffer for high vol portfolios (protocol risk parameter), and H_i is the haircut for an individual asset based on volatility (historical drawdowns, standard deviation, etc.), liquidity (volume, slippage, etc.), and risk profile (smart contract risk, counterparty risk, etc.). $$D_{\text{cf}} = \sum_{i \in c_w, c_b} \sum_{t=1}^{T_i} \frac{C_{i,t} \times (1 - H_i)}{(1 + r_i)^t}$$, where T_i is the time horizon for each cash flow source based on its stability (from inflationary rewards to income), $C_{i,t}$ is cash flow from source i at time t, H_i is haircut for cash flow source i based on volatility, r_i is the risk-adjusted discount rate for cash flow source i, and t is the time period within the horizon T_i. $$v = D_a + D_{cf}$$
q	boolean if user qualifies for credit line based on onchain activity, 3Jane score and value.
$\text{IR}_{\text{DRP},a}$	user credit default risk interest rate. Bounded between protocol risk parameters [$\text{IR}_{\text{DRP},min}$, $\text{IR}_{\text{DRP},max}$]
RR_a	user repayment rate. Bounded between protocol risk parameters [RR_{min}, RR_{max}]
CL_a	user credit line size. Bounded between protocol risk parameters [CL_{min}, CL_{max}]

Figure 6: Variable definitions for the model