Homework 3 - Analyzing DeFi

Exercise 1 - VRF Oracle (5 + 6 + 1 points)

Part A - Exploring direct funding VRF

Two screenshots showing the two events on Etherscan. One with Hex values and one with number values.

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What were the 2 random numbers the oracle generated for you?

G

RequestSent returns 2 fields and RequestFulfilled returns 6 fields. Explain what information each of these fields conveys.

G

Part C - Contrast data serving methods

Do some research and write a few sentences on the difference between subscription and direct funding and which use cases are suitable for each method.

Direct Funding and Subscription are two methods for accessing Chainlink's VRF to generate random numbers for smart contracts.

In the Direct Funding model, each request for a random number requires a payment of LINK tokens. The contract will then send a request to the Chainlink VRF oracle and pay for the service when requesting randomness. This method is best suited for contracts where individual requests for randomness are infrequent (ideal for smaller projects or one-off use cases). However, this methods required the contract to manage funds manually and each random number request incurs a separate fee.

The Subscription model works by creating a LINK token subscription where the contract pays periodically for randomness requests. This method is more suitable for long-term projects or cases where randomness is needed frequently over time. (ideal for larger contracts). However, this method might be overkill for contracts that only need randomness occasionally.

Exercise 2 - MakerDAO 2.0 Tokenomics (3 + 3 + 2 points)

Part A - Meta assessment of DeFi projects through aggregators

Write 500 words, including some graphs which you got from BOTH of the aggregators, to describe the current state of the CDP market and MakerDAOs position amongst its competitors. Make sure you include at least 2 metrics from lecture 5.

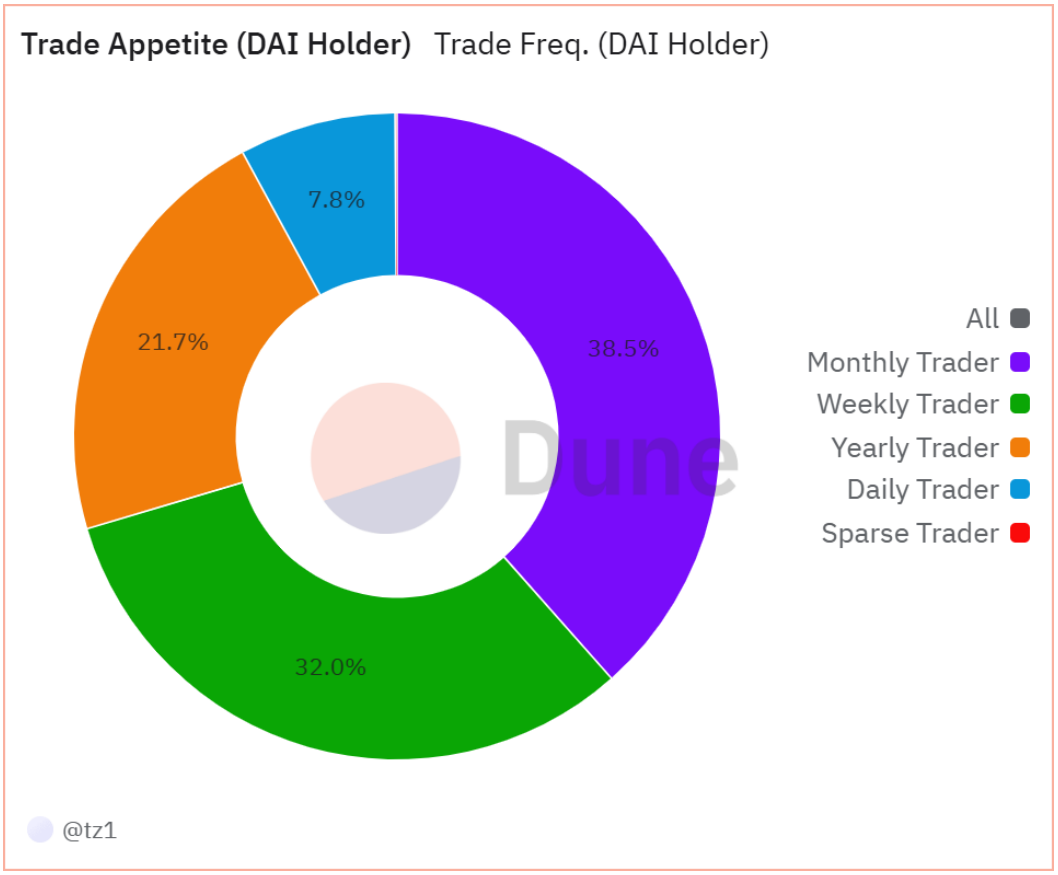
The Collateralized Debt Position (CDP) market currently holds a Total value locked (TVL) of nearly $7 billion. This market reached its peak between late 2021 and early 2022, driven by strong DeFi adoption and rising crypto asset values. However, since then, the market has experienced a decline. With 167 participants, the market is quite diverse, though there are significant disparities in the size and influence of the different players. As of now, CDP ranks as the 10th largest category in DeFi, behind Real World Assets ($8,526b) and Basis trading ($8,194b).

MakerDAO remains the first protocol in the CDP space based on TVL, surpassing competitors such as Avalon USDa and Liquity. This high TVL is a key indicator of the protocol's adoption and trust within the DeFi space.

Beyond TVL, MakerDAO also performs well on other metrics. The Network Value to Transactions (NVT) ratio, calculated as Market Cap to Transaction Volume, is 0.2, suggesting a high level of protocol activity relative to its valuation.

While MakerDAO leads the CDP market, Avalon USDa and Liquity are two notable competitors. In fact, Avalon USDa is gaining traction due to its optimized risk management system and lower collateralization requirements compared to MakerDAO. On the other hand, Liquity differentiates itself by eliminating interest rates on loans and offering a more capital-efficient borrowing model.

The stablecoin market capitalization is currently $222.86 billion, with DAI ranking as the 4th largest stablecoin, holding a market cap of $4.57 billion, behind Ethena USDe ($6,05b) and USDC ($55,689b). Unlike centralized stablecoins such as USDT or USDC, DAI is decentralized and backed by overcollateralized crypto assets like ETH, WBTC, and Real World Assets (RWAs). From Dune Analytics, we are able to observe that Dai continues to maintain an active user base, with almost 40% of monthly users and 32% of weekly users, indicating consistent engagement and trust in its stability.



Users can also stake their DAI to earn passive income. Currently, the annual percentage yield (APY) is 11.25%, according to DefiLlama, though it is expected to fall below 9% within the next four weeks. Compared to other stablecoin staking options on Aave or Ethena, MakerDAO's staking yield remains highly competitive.

Liquidation happened when user's collateralization ratio falls below the required threshold (e.g., 150% for ETH-backed loans in MakerDAO). As a result, MakerDAO charges a penalty fee which is a percentage of your collateral and sold off the rest of you collateral at a discount price to repay your debt. This ensures that the solvency of the protocol and also gives arbitrage opportunities for those who are buying the collateral at a discounted price. Looking at MakerDAO's Income Statement, liquidation revenues have fluctuated: $30 million in 2022, $376K in 2023, and $4.14 million in 2024. The sharp decline after 2022 can be attributed to market stabilization after the volatility of 2022 (e.g., Terra collapse, crypto bear market). Nonetheless, liquidation revenues make up a small fraction of MakerDAO's overall income(except it 2022 when it represented 46% of net income), contributing 2.29% of net income in 2024 and 0.5% in 2023.

Sky - PNL - Yearly

Yearly PnL since 2020, in DAI

item	2025 YTD	2024	2023	2022	
Revenues					
Trading Revenues	0	47,163	121,925	1,356,079	4,932
Liquidations Revenues	2,904,990	4,140,850	376,091	30,135,527	20,993
Interest Revenues	38,649,897	311,936,408	107,695,311	44,960,462	87,354
DSR	-26,991,540	-135,058,847	-32,710,230	-10,101,231	-5
Net Revenues	14,563,347	181,065,575	75,483,096	65,020,808	112,376
Operating expenses					

13 rows Search...

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Part B - Examining MKR tokenomics

Describe the change in the value of the MKR token. What changes were implemented to bring about the change that you observed? Write around 300 words on this subject.

On Black Thursday (March 12, 2020), the MKR token saw a dramatic drop in value, mirroring the broader market crash caused by the economic turmoil surrounding the COVID-19 pandemic. During this period, MKR fell to a low of approximately $217. This sharp decline was mainly due to liquidation events triggered by the undercollateralization of DAI stablecoin. The protocol's liquidation mechanism led to the issuance of a large number of MKR tokens to cover the debt, which diluted the token's value. As the supply of MKR increased, its price continued to fall. However, by late 2020, the price of MKR began to recover, reaching over $1,500 by early 2021, as confidence in the MakerDAO protocol was restored and market conditions stabilized.

In response to the crisis, MakerDAO took strategic steps to enhance the stability of both DAI and MKR. First, they diversified their collateral types to reduce the risk of undercollateralization. New assets, such as WBTC (Wrapped Bitcoin), were added to the protocol, offering more robust backing for DAI. Additionally, MakerDAO adjusted the governance model, giving MKR holders greater control over protocol parameters, including risk models, collateral types, and other critical governance decisions. The protocol also introduced several new stabilization mechanisms, such as the Surplus Buffer, which helped mitigate the risk of liquidation during periods of high volatility. These changes made the system more resilient and reduced the likelihood of large MKR issuances during future market downturns. As a result, MKR's value continued to recover, and the token became more attractive to investors and users alike.

Part C - Personal reflection on the current and future state of MakerDAO

Write a 200 - 300 word reflection on your own assessment of MakerDAO and its future. Some points to consider:

- *Maker is rebranding to Sky, what does this entail?*
- *What is the tokenomics of SKY and why was this change implemented?*
- *More generally, how will the evolution of technology, for example AI, quantum computing, affect the future of blockchain?*

MakerDAO's rebranding to Sky is a key part of founder Rune Christensen's strategy for a major overhaul. This rebranding marks the platform's shift toward sustainable growth and the integration of AI, along with a broader expansion beyond just stablecoins. The goal is to diversify into other areas and attract a wider audience. This move is intended to make MakerDAO more appealing and adaptable in the fast-evolving DeFi ecosystem, while showcasing its ambition to incorporate innovative technologies such as AI and real-world assets. The new identity could be a strategic effort to attract mainstream users and institutional partners, ensuring MakerDAO remains competitive in an increasingly crowded market. With the rebranding came changes in the token structure. Specifically, DAI has become USDS, and MKR has transitioned to SKY, with a conversion rate of 1 MKR = 24K SKY and 1 DAI = 1 USDS. The evolving tokenomics may introduce new approaches to community governance, staking rewards, and ecosystem incentives, which will encourage long-term involvement while reducing dependence on volatile market conditions.

As of recently, the rebranding has yielded mixed results. While the new USDS stablecoin has experienced significant growth, reaching a market capitalization of $1.26 billion, the reception of the SKY governance token has been less successful, with approximately 10.7% of MKR token holders have converted to the new SKY token, indicating a lukewarm response from the community. This mixed response highlights the difficulties of a rebranding. In one hand, I believe the rebranding of MakerDAO to Sky is a smart strategic move, especially with the growing interest in the DeFi space. As the industry continues to expand, regulations are likely coming, and by diversifying beyond stablecoins and borrowing platforms, MakerDAO is positioning itself to capture a broader user base. On the other hand, the challenge lies in preserving the core identity of MakerDAO while branching out. The risk is that in attempting to attract new users and institutional partnerships, MakerDAO could alienate its existing community, especially those who value the protocol's foundational focus on decentralization.

Looking ahead, the intersection of AI and quantum computing with blockchain will shape its future in meaningful ways. AI could enhance blockchain's efficiency, allowing for more

intuitive smart contracts and decentralized applications. Quantum computing, on the other hand, could present both challenges and opportunities. While it might threaten current cryptographic standards, it could also lead to the development of more secure, quantum-resistant blockchain systems.