Data Overview

Num.	Name	Description	Frequency
1	AAVE Raw Transfer	The Aave token raw transfer data records every transaction with Aave, including the address of the sender, and receiver, the transaction timestamp in each block and the transaction value.	Block timestamp
2	AAVE Transfer after Preprocessing	Deviated from the raw transfer data, after converting timestamp to date and dropping all the transaction records that contain null addresses, the transaction values between the same two addresses are added together to one aggregated transaction by date. This dataset could be directly used for network feature calculation.	Daily
3	Network Features	This dataset contains 19 daily network topological features calculated from the Aave transaction data.	Daily
4	Merged Dataset	The final dataset contains all the DeFi token-related economic features and network features, which could be directly used for quantitative analysis	Daily
5	Core Addresses Appearance	This dataset records all core addresses that appear at the selected time period and the number of days they become core, based on the daily networks constructed using a core-periphery algorithm. The type and information link of the addresses are contained as well.	Daily

Data Dictionary

Dataset1: AAVE Raw Transaction

Name	interval	Description
from_address	1 transaction	Address of the sender
to_address	1 transaction	Address of the receiver
value	1 transaction	Amount of tokens transferred (ERC20)
block_timestamp	1 transaction	Timestamp of the block where this transfer was in

Dataset2: AAVE Transfer after Preprocessing

Name	interval	Description
from_address	Aggregated transaction	Address of the sender

to_address	Aggregated transaction	Address of the receiver
value	Aggregated transaction	Daily aggregate amount of tokens transferred (ERC20)
timestamp	Aggregated transaction	Date of the block where this transfer was in

Dataset3: Network Features

Name	interval	Description
num_nodes	1 day	Total number of unique addresses in daily transaction network
num_edges	1 day	Number of transactions in daily transaction network
Degree mean	1 day	The number of edges a node has, an average of nodes.
Degree std	1 day	The number of edges a node has, the standard deviation of nodes.
Top10Degree mean	1 day	Average degree of the addresses with top 10 highest degree values during the whole period.
Top10Degree std	1 day	Standard deviaation of the degree of the addresses with top 10 highest degree values during the whole period.
Top10 Degree mean ratio	1 day	Top 10 addresses' degree mean divided by the general degree mean
Relative degree	1 day	Network density. The portion of the potential connections in a network that are actual connections
DCmean	1 day	The average value of degree centrality.
DCstd	1 day	The standard deviation of degree centrality.
Cluster_mean	1 day	Mean of clustering coefficient. The degree to which nodes in a graph tend to cluster together
Cluster_std	1 day	Standard deviation of clustering coefficient. The degree to which nodes in a graph tend to cluster together
Modularity	1 day	The significance of a node given the significance of its neighbors
Transitivity	1 day	Transitivity is the overall probability for the network to have adjacent nodes interconnected, thus revealing the existence of tightly connected communities
eig_mean	1 day	Mean of eigenvector centrality. Measures the degree to which the division of a network into communities
eig_std	1 day	Standard deviation of eigenvector centrality. Measures the degree to which the division of a network into communities
closeness_mean	1 day	Mean of closeness centrality. The reciprocal of the farness
closeness_std	1 day	Standard deviation of closeness centrality. The reciprocal of the farness

Components_cnt	1 day	Number of components in daily transaction network
core_cnt	1 day	Number of cores in daily transaction network
giant_com_ratio	1 day	Size of the giant component divided by the total number of nodes in the daily transaction network

Dataset4: Merged Datasets

Name	Interval	Description
AdrActCnt	1 block	The sum count of unique addresses that were active in the network.
CapMVRVFF	1 day	The ratio of the free-float market capitalization to the sum "realized" USD value of the current supply.
CapMrktCurUSD	1 day	The sum USD value of the current supply. Also referred to as network value or market capitalization.
NVTAdj	1 day	The ratio of the network value (or market capitalization, current supply) is divided by the adjusted transfer value.
PriceUSD	1 day	The fixed closing price of the asset as of 00:00 UTC the following day in USD.
VtyDayRet30d	30 days	The 30D volatility, measured as the standard deviation of the natural log of daily returns over the past 30 days.
tvlUSD	1 day	The total amount locked in that particular token in USD.
tvlETH	1 day	The total amount locked in that particular token in ETH.
num_nodes	1 day	Total number of unique addresses in daily transaction network
num_edges	1 day	Number of transactions in daily transaction network
Degree mean	1 day	The number of edges a node has, an average of nodes.
Degree std	1 day	The number of edges a node has, the standard deviation of nodes.
Top10Degree mean	1 day	Average degree of the addresses with top 10 highest degree values during the whole period.
Top10Degree std	1 day	Standard deviaation of the degree of the addresses with top 10 highest degree values during the whole period.
Top10 Degree mean ratio	1 day	Top 10 addresses' degree mean divided by the general degree mean
Relative degree	1 day	Network density. The portion of the potential connections in a network that are actual connections

DCmean	1 day	The average value of degree centrality.
DCstd	1 day	The standard deviation of degree centrality.
Cluster_mean	1 day	Mean of clustering coefficient. The degree to which nodes in a graph tend to cluster together
Cluster_std	1 day	Standard deviation of clustering coefficient. The degree to which nodes in a graph tend to cluster together
Modularity	1 day	The significance of a node given the significance of its neighbors
Transitivity	1 day	Transitivity is the overall probability for the network to have adjacent nodes interconnected, thus revealing the existence of tightly connected communities
eig_mean	1 day	Mean of eigenvector centrality. Measures the degree to which the division of a network into communities
eig_std	1 day	Standard deviation of eigenvector centrality. Measures the degree to which the division of a network into communities
closeness_mean	1 day	Mean of closeness centrality. The reciprocal of the farness
closeness_std	1 day	Standard deviation of closeness centrality. The reciprocal of the farness
Components_cnt	1 day	Number of components in daily transaction network
core_cnt	1 day	Number of cores in daily transaction network
giant_com_ratio	1 day	Size of the giant component divided by the total number of nodes in the daily transaction network

Dataset5: Core Addresses Appearance

Name	**Description**
Address	Address of the core member
Days count	Number of days the address becomes a core over the whole selected period
Type	Either as a Address or Contract
Link	The specific link to the address information on Etherscan.oi

Coding Notebooks

Notebook 1: Network and Core-periphery Analysis

Notebook 2: Generate Merged Dataset

Notebook 2: Visualization, Data Science and Economics Analysis