

# Superior Tokenomics Designs

A Structured Step-by-Step Guide to our Designs

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# About BlackTokenomics

## A Firm Specialized in Tokenomics Design for Web3 Projects, Launchpads, Venture Capitals and Funds.

At BlackTokenomics, we provide **an all-in-one solution for tokenomics**.

From economy design to incentive systems and simulations, we cover every aspect of tokenomics, including everything needed for our clients to raise capital from token sales.

We have also developed our own softwares to simulate, audit, optimize, and design superior tokenomics frameworks.

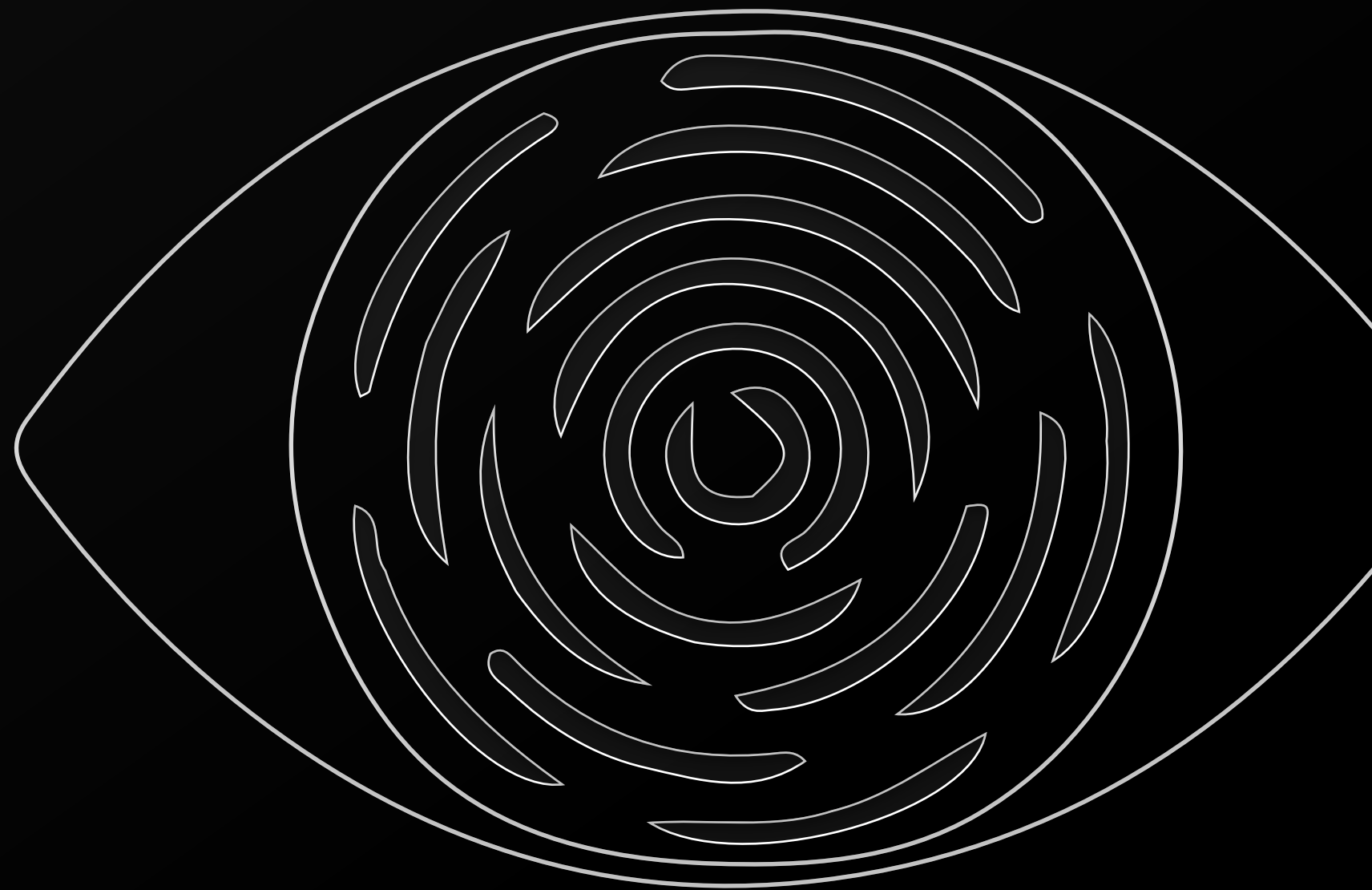
We focus on early-stage projects, where we directly support founders.

Over the past three years, we've proudly supported **83 clients** with two ranked in the top 30 by MCAP and several in the Top 100, we are now extremely selective about whom we work with, maintaining our reputation of only working with the best.

We are a lean, high-quality team of economists, data scientists, and simulation engineers.

Our **headquarters are in Lisbon, Portugal**, with our company registered in Hong Kong.

Apply →



### All-In-One Solution

We cover every tokenomics vertical

# Foreword

By Andres G. Collado

Founder of  
blacktokenomics

This document aims to show clarity on our systematic process to designing tokenomics frameworks, our step by step process and our signature traits.

In this report, we delve into everything we design, from zero to one.

The supply and demand dynamics of tokens, examining the intricate aspects of our token design models, and some of the learning of our past 3 years.

We aim to ensure our clients, project founders, grasp the significance of tokenomics, understand our technical process and why it matters, so they are able to engage in technical conversations when interacting with their community or pitching to investors.

While a strong product is crucial, tokenomics can make or break a crypto project. Even great products can struggle with weak tokenomics, while average ones can excel with the right token strategy.

Tokenomics is a **multifaceted concept**.

Many people think tokenomics is just about:

- A token's max supply number
- A pie chart showing 10%-20% allocated to the team
- An emissions schedule
- An allocation distribution chart

While these are elements of a project's tokenomics, they don't capture the full picture.

A full tokenomics framework covers the following 6 core verticals:

## 1. Purpose and Utility of the Token

**2. Economical Model** (we cover token allocation, inflation, supply shocks and more)

**3. Fundraising Setup** (we cover the potential valuation, terms and conditions for investors, etc)

**4. Value Creation and Accrual** (how the token ecosystem creates and maintains value)

**5. Value Capture** (a business ability to profit out of the transactions)

**6. Incentives system** (to direct users behaviour)

You then need to ensure that these elements work together to create a balanced, sustainable ecosystem, like a perfectly aligned Rubik's Cube.

However, just like every twist in the cube can disrupt its harmony, each design decision must be handled carefully to avoid destabilizing the model.

**There is no such thing as a perfect tokenomics model**, only balanced models. Tokenomics is a multidisciplinary field that blends hard sciences (math, physics), soft sciences (psychology, sociology, economics), and applied sciences (systems engineering).

Since human behavior plays a key role, **tokenomics rarely deals in absolutes**. There are no universally right or wrong answers, **only trade-offs that optimize for specific objectives within unique constraints**

For this reason, while quantitative techniques such as statistical analysis, user segmentation, agent-based modeling, and Monte Carlo simulations are highly relevant, **it is impossible to create a mathematical formula for the correct tokenomics design**. Every model is an evolving system that must be rigorously tested, iterated upon, and adapted to changing market conditions.

But what helps is to have a **data-driven approach**, specifically in the core economic parameters.



# Introduction

While tokens serve many functions, the biggest benefit to a token model is that it provides the economic incentives for your network to get off the ground and overcome the classic chicken and egg problem.

In other words, it gives your users the ability to own a little piece of your network, incentivizing them to start using it at the start. This gives it a higher chance of success with a lot less capital needed.

To illustrate this problem, consider the beginning of Twitter. The value of being one of the first few users on the network was low – no one else was using it, so there was no content! Now millions of people are on Twitter so people find a lot of value in it. In other words, the value of a network goes up a lot when more people join it.

When the network is less populated and useful you now have a stronger incentive to join it. This system has been used by startups for years to attract employees to a young company, and now decentralized apps are using it to incentivize all potential users around the world to join the app early on.

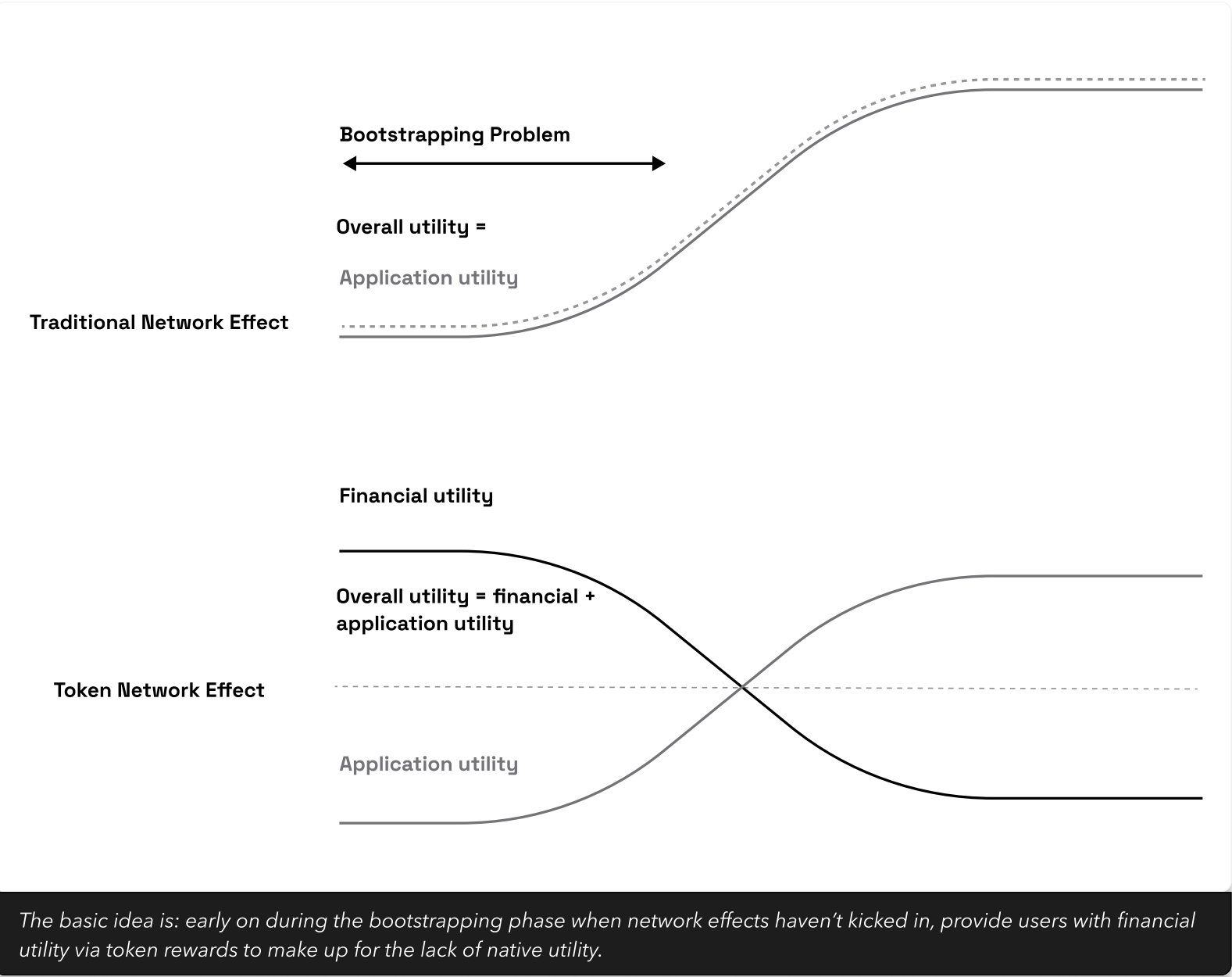
This will make it much easier to get a network going. Networks have tried all sorts of things to bootstrap past the chicken and the egg problem in the past: Reddit generated their own content before users sustained the platform with their own content, Facebook ripped Harvard’s student directory to seed the network, amongst other examples.

Bitcoin and Ethereum were the first to use this decentralized model, and they used it to bootstrap currency/transaction networks.

Establishing metrics is key when launching a new token, as they pave the way for the project's economic model. To create a successful token economics framework, there are several key metrics we need to consider.

But to briefly explain why tokenomics are so important, we can group its major impacts into four key areas:

- 1. Incentivizing and directing user behavior
- 2. Initial bootstrap of Network Effects
- 3. Enabling user ownership
- 4. Fundraising (Token Sales) | SAFTs



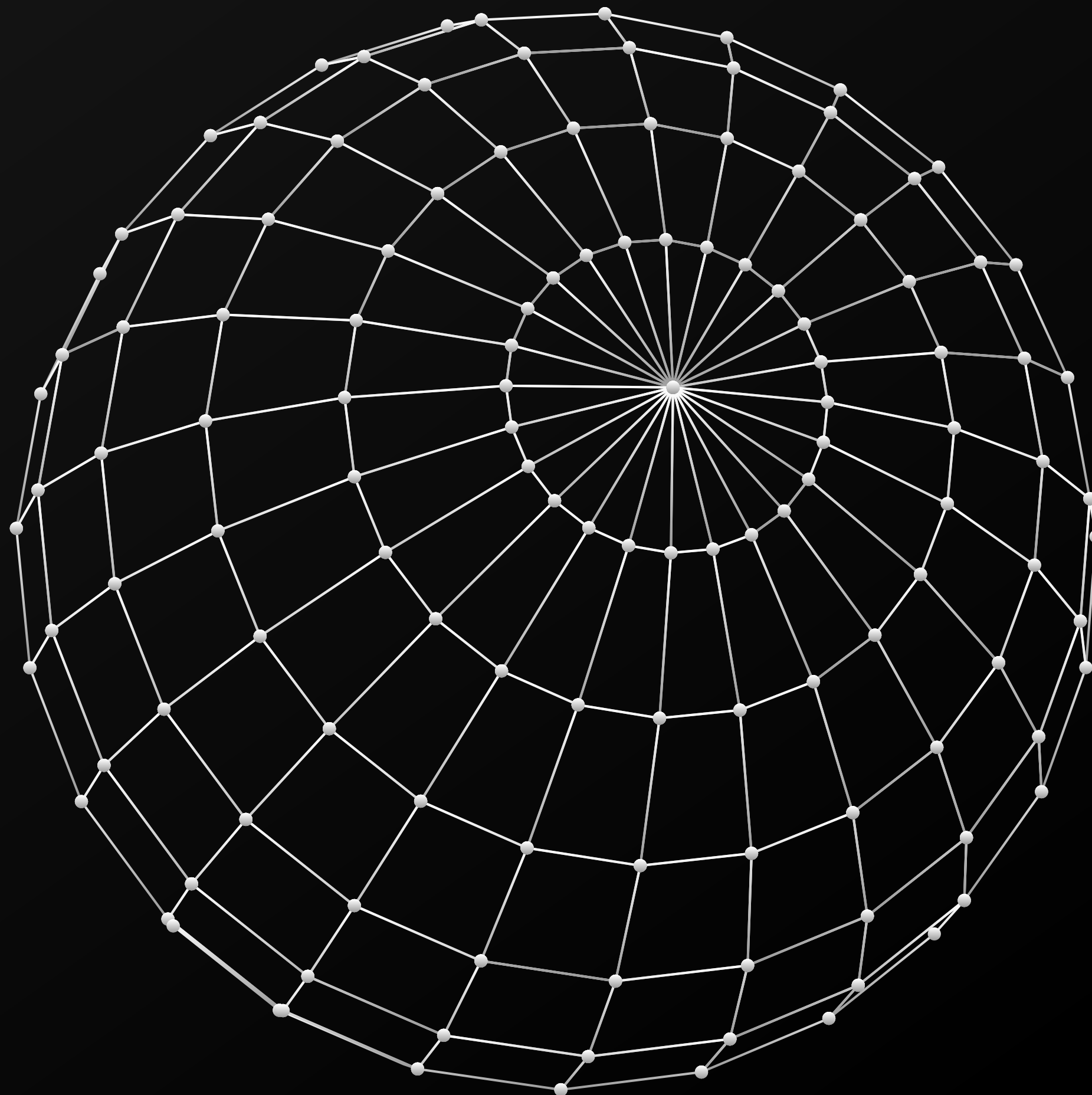
In this report, we stick to our number one rule: **data over opinions** → [How do we do this?](#)

We’ve built a database of **1350+ projects** across RWA, L1s, DePIN, AI, and more. Growing daily with fresh token launch data. We don’t just collect numbers; we **study what actually works**, breaking down successful models from similar protocols to spot the winning patterns.

By cross-referencing the **tokenomics design with real market performance**, we ensure our insights are built on **actual results, not assumptions**.

In a field as technical as **tokenomics**, and just like in **wellness and longevity, without data, you’re just another person with an opinion.**

This way unlike existing models that heavily rely on speculation or opinions, **we implement a completely data-driven approach to tokenomics.** We have also developed our **own softwares** to run simulations on top of the different phases, but specifically on the incentives design phase, with usually take multiple iterations, we will cover this later in the report.



Chapter 1

# Our Process: Step by Step

This chapter aims to show clarity on our systematic process to designing tokenomics frameworks, our step by step process and our signature traits of being **data-driven**, modeling with **python** and cadCad, developing the **documentation** (tokenomics deck and whitepaper) and aligning everything with **incentives**, where each piece fits together seamlessly, like a perfectly aligned Rubik's Cube.



<b>Discovery</b>  01	This is the <b>starting point where we gather all fundamental information</b> and key data necessary for the tokenomics design. This includes understanding the project’s goals, hard caps, market conditions, stakeholder requirements, etc.
<b>Initial design or audit.</b>  02	Based on the insights gathered during the Discovery Phase, <b>we develop the main fundamentals of the tokenomics framework</b> . This initial design outlines the basic economic attributes, supply mechanisms, distribution plans, and utility functions of the token.
<b>Validation and Optimization</b>  03	This process consists of <b>validating the key economical assumptions of the model</b> and iteratively testing through until all parameters have been optimized with respect to their constraints. (Inflation, supply shocks, fair distribution fairness, investors terms and conditions, monetary polices, liquidity, selling pressure, etc)
<b>Documentation and Python</b>  04	In this phase, we introduce an interactive model, transforming the token structure into a <b>dynamic experience for potential investors</b> . We understand that is not enough to have the right numbers you also need to present them in a way that truly resonates with investors.
<b>Incentive Systems</b>  05	We follow a structured, step-by-step approach focused on <b>aligning incentives with desired behaviors within the ecosystem</b> . Using our circle method. By carefully designing and aligning incentives, we ensure that users are motivated to act in ways that create long-term value.
<b>Modeling and Simulations</b>  06	With the full incentives framework in place, including participants, reward systems, penalties, desired and undesired behaviors, we move into <b>stress-testing each interaction</b> . This phase involves running simulations such as liquidity modeling, demand forecasting, and selling pressure scenarios to anticipate outcomes.

Figure 1: Approaching Token Design

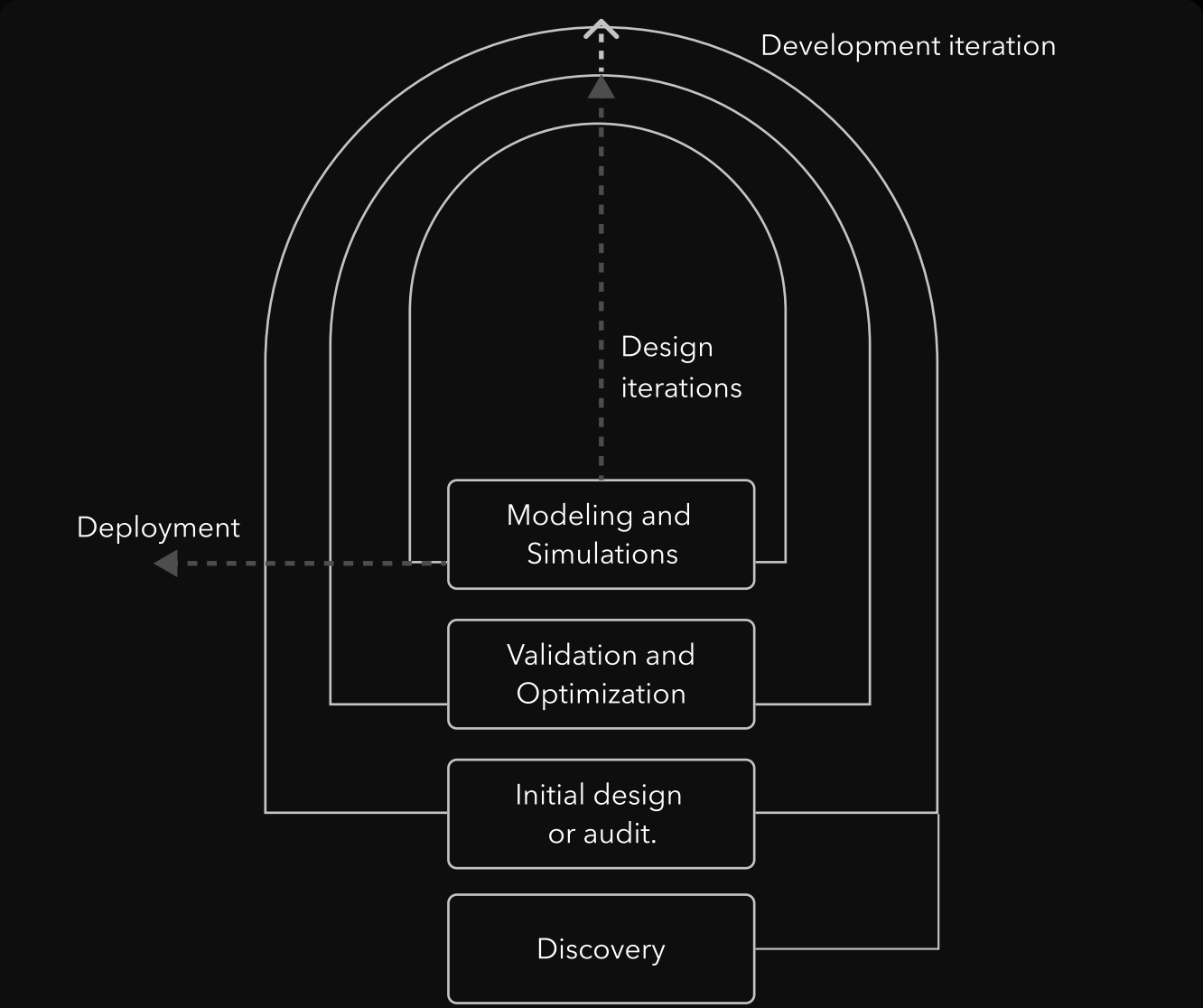
However throughout this document we will refer to team members generically as **Token Architects** .

## 6.2 Our Team and our Skills

There are very few people who can genuinely claim to be tokenomics experts in this emerging field, and no single individual has all the skills, experience, and competencies to effectively do the job.

Thats why we assembled **a diverse and unique team that can collectively apply:**

- Data analysts/Market Research/Market data
- Strategic Listing Strategy
- Mechanism Design and **Game Theory**
- **Liquidity Engineering** and Design
- **Behavioral Economics**
- Market Markets strategy and validation
- Fundraising expertise and Venture Capital background
- Financial **Engineering**
- Advanced Mathematics
- SQL and data driven **simulations**
- Value Mechanisms Engineering (Capture, Accrual)
- **Incentives** systems design
- Data records + database setup.
- Machine Learning for Data Maximization
- Python Simulations
- Complex Systems (nodes, exponential vestings, etc)



Token design is a multidisciplinary process that pulls learnings from many fields.

# Deliverables and Timelines



Phase 1

## Fundamentals Phase

🕒 1 – 2 weeks

- Review **whitepaper**, technical paper, and **fundamentals**.
- Initial team meetings and **set of plan**.
- Develop the **source of truth document**.
- **Database** records (niche-driven).
- **Competitors** analysis (top 5).
- **Define stakeholders** and **agents** participating in the network (i.e. users, validators, nodes, miners, etc)
- Develop the **Token utility flow**, including the participants.

### If possible:

- Define **listing strategy** (to design a model that complies with it)
- Define the **incentives** core:  
(Desired Behaviors; Undesired Behaviors; Motivations for Undesired Behaviors; Incentive Mechanisms)

Phase 2

## Tokenomics Audit and Economy Design

🕒 1 week

- **Tokenomics Audit** (hexagonal analysis)
- Define the **fundraising targets**
- Design the **rounds for investors** (algorithmically balanced)

- **Economy Design**

Using the core fundamentals established in the previous phase, leveraging database records, competitor analysis, and other insights.

Phase 3

## Validation and Optimization

🕒 1 week

- **Validation** involves data-driven analysis, comparing the model against market standards, and competitors
- **Optimization**: We ensure that the design aligns with the project's goals and operates within the set parameters. Key areas like inflation, supply shocks, dilution risk, distribution fairness, investor balance, and other supply metrics.
- Generate the **final iterations** (investors, community and SAFT)

Phase 4

## Fundraising Documentation and Python for Investors

In this phase, we turn the static tokenomics into an interactive model, transforming the token structure into a dynamic experience for potential investors.

We understand that is not enough to have the right numbers you also need to present them in a way that truly resonates with investors.

- Python interactive streamlit model
- Tokenomics for PitchDeck
- Community Documentation
- Investors Report

🕒 1 week

Phase 5

## Incentives System (2-3 months)

On the Incentives layer we will work on 4 main verticals:

### 1. Initial Distribution (Bootstrap phase)

How we will integrate the token into the ecosystem, while designing mechanisms **to reduce potential selling pressure** and achieve a sustainable **high float model**.

### 2. Ecosystem Rewards

Incentive structures **to reward behaviors that enhance product value**, ensuring sustained engagement and growth beyond initial bootstrapping phase. Our systems are usually designed to support **passive participation over active**. (which work the best on DePIN and RWA)

### 3. Utilities and Sinks

We'll establish various token utilities within the platform to manage circulating supply and stabilize token value, including. Creating circular systems that not only bring value to the token but that decreases selling pressure.

### 4. Governance Model

If needed for decentralization, increase user participation, etc.

We are known for our Vote Escrow (ve) where we incentivize users to stake for the longest possible in exchange of voting power and other utilities like revenue share in some cases.

Phase 6

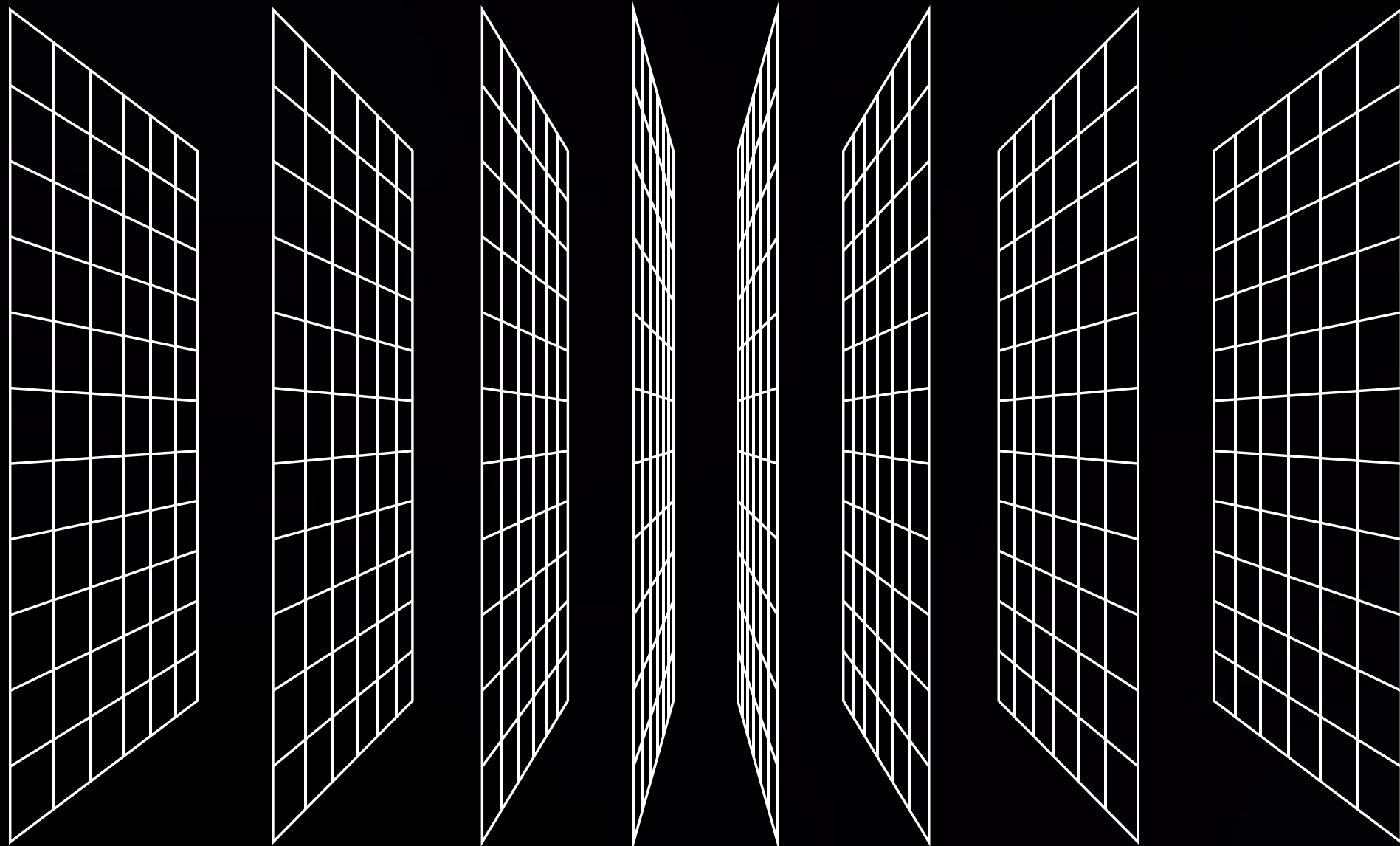
## Simulation and Modeling Based Iterations (1 month)

With the full incentives framework in place, including participants, reward systems, penalties, desired and undesired behaviors, we move into stress-testing each interaction.

This phase involves **running simulations such as liquidity modeling, demand forecasting, and selling pressure scenarios** to anticipate various outcomes and refine the model.

Using tools like:

- **cadCad**
- **Machinations**
- **Stochastic Modeling**
- **Streamlit**.



Phase 1

# Discovery and Fundamentals

In the Discovery and Fundamentals phase, we lay the groundwork for the tokenomics model by reviewing core documents (whitepaper, technical paper) and holding initial team meetings to set a clear plan.

We establish a source of truth document and conduct niche-specific research, including a top 10 competitors analysis.

This foundational approach ensures all essential elements are captured for the next phases of tokenomics design.

# Fundamentals Phase

The discovery phase is critical for **defining the core problem** to be solved and **identifying the key stakeholders involved**. It’s about understanding what holds value for each stakeholder and how that value is exchanged within the ecosystem.

This phase requires a deep comprehension of market dynamics and the project’s broader context to ensure alignment with long-term objectives.

At this stage, we gather all essential data needed for the tokenomics framework. This includes understanding the project’s overarching goals, hard caps, market conditions, and specific stakeholder needs. By identifying these key factors early, we set the foundation for a tailored and effective tokenomics design.

A crucial element in establishing the foundation of any new ecosystem is identifying key stakeholders and understanding **how value flows between them**.

Defining potential stakeholders and **distinguishing the different archetypes** within each group is essential for creating a **Taxonomy of Actors**. This step is vital for token design, as it not only helps justify and evaluate design parameters but also establishes a framework for testing and validating assumptions about user behavior.

Stakeholder mapping is an essential tool for identifying the actors within an economy and understanding how they interact.

This process clarifies stakeholder roles and illustrates their interrelationships. Through in-depth analysis, we gain a clear view of the dynamics in play, which allows us to frame these relationships within the broader problem we’re aiming to solve, subject to any relevant constraints.

This comprehensive mapping is critical for optimizing the system. It helps identify unnecessary intermediaries and ensures that as many stakeholder needs as possible are addressed, leading to a more stable and resilient ecosystem. By doing so, we **reduce the risk of system fragility**, minimize value leakage, and avoid potential forks that could be value-destructive. Ultimately, this creates a win-win outcome that benefits the majority of participants and strengthens the overall system.

Here we follow our core principle and take a data-driven approach, leveraging market standards and comparing **data records from our clients niche** such as DePIN, RWA, and more.

**Competitive analysis** plays a crucial role, as we utilize data from similar projects that have already launched, known as **“comps”** (short for comparables). Looking at comparable products is essential for making informed strategy decisions.

Using comps goes beyond valuing products and companies, it allows you to build on the successes and lessons learned from others. While it’s important not to copy blindly, comps provide valuable insights for making decisions around tokenomics and product design.

Innovation is key when developing:

- Unique use cases and utility
- Sustainable incentive mechanisms
- Governance structures
- Technology and architecture
- Value creation and capture mechanisms

However, standing out in the wrong areas can be risky, especially when it comes to:

- Legal and regulatory structures
- Value accrual or profit-sharing mechanisms
- Token allocation splits
- Token vesting periods

For instance, if market standards allocate around 15% of tokens to the core team with multi-year vesting, but you allocate 50% with a 3-month vesting period, this can signal instability and create skepticism about your project’s long-term outlook. This could lead to reduced adoption, less loyal users, and limited capital.

Choosing between two similar products, people will likely favor the one that follows **industry best practices** over one with an abnormal token allocation.

Later in the report, we’ll cover market best practices for token supply, including allocation, emissions, and vesting periods in detail.

### Discovery Phase Objectives:

- Review whitepaper, technical paper, and fundamentals.
- Hold initial team meetings and set the plan.
- Create the source of truth document.
- Analyze niche-specific database records.
- Conduct a top 10 competitors analysis.
- Define stakeholders and agents (users, validators, nodes, miners).
- Develop token utility flow with participants.
- Define listing strategy (if applicable).
- Outline core incentives: desired/undesired behaviors, motivations, and incentive mechanisms.



# Fundamentals Phase

For the Discovery Phase, **we've curated a Problem Statement Sheet** containing **essential questions** that founders need to address to establish the core fundamentals **for the tokenomics design**.

This sheet ensures that each foundational element is set in stone, providing a solid base for future tokenomics planning.

Here are the seven steps of our tokenomics discovery process:

## Problem Statement



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Go to the fundamentals sheet →

### 1. What is the Objective of the Token?

- What primary purpose does the token serve in the ecosystem?
- Is the token meant to provide utility (e.g., governance, access to services) or act as a store of value?
- How does this token fit into the broader vision of the project?

### 2. What Problem is the Token Solving?

- What specific challenge within the ecosystem does the token address?
- How does the token create value for the participants, and how does it improve the functionality or growth of the ecosystem?
- What are alternative solutions (if any), and why is a tokenized solution superior?

### 3. What is the Project's Niche?

- Which sector or niche does the project target (e.g., DeFi, NFTs, gaming, infrastructure, etc.)?
- What differentiates this project from other projects within the same niche?
- How does the niche influence token design

### 4. Who are the Key Stakeholders Involved?

- What are the main groups of participants (e.g., users, developers, investors, validators)?
  - How does each stakeholder group interact with the token?
  - What are the roles and incentives for each type of stakeholder? For example:
    - Users: What's their primary interaction with the token?
    - Investors: What return do they expect, and over what timeline?
    - Developers: What incentives are provided to build on the platform?
    - Validators or Miners: How do they contribute to the ecosystem?
- Who are the Key Stakeholders Involved?

### 5. What are the Token's Core Utility Flows?

- How does the token flow between the different participants in the ecosystem?
- What mechanisms drive demand for the token? (e.g., staking, governance, transaction fees)
- How will token utility evolve over time as the project scales?

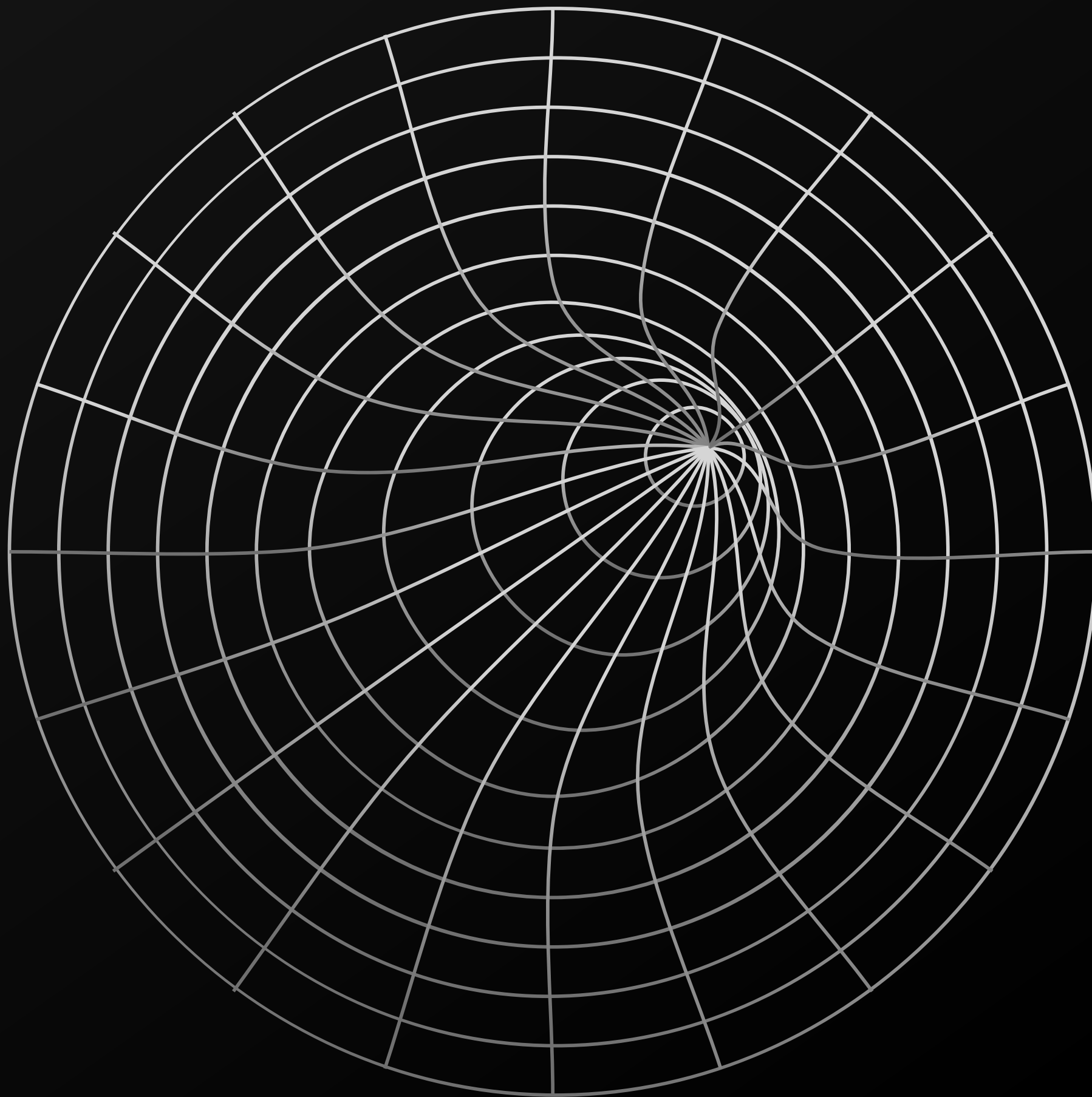
### 6. What is the Token's Significance?

Some p

- Token
- Token
- Distributing tokens to whales
- Inflation
- Network participation
- What is the token's significance?

### 7. What is the Token's Role?

- Will the token be used for governance, delegating, etc.
- What is the token's role in the ecosystem?



Phase 2.1

# Tokenomics Audit

If a tokenomics model is already in place, we conduct an audit to identify areas for optimization. If no framework exists, and we are working with a client from zero ground we execute the audit after the tokenomics design phase.

# Tokenomics Audit

Our audit follows a hexagonal analysis, focusing on key areas for improvement:

- **Inflation:** Measures the rate at which new tokens are added to the circulating supply, considering supply control mechanisms (e.g., token burns, staking incentives) that may mitigate excessive inflation. This analysis addresses how inflationary pressures might impact token value and scarcity.
- **Supply Shocks:** Evaluates the strength of sudden changes in token supply, considering both planned unlocks and unexpected token sales. These shocks affect liquidity depth and price stability, making it a crucial area to monitor.
- **Risk of Dilution:** Assesses long-term price stability as tokens unlock over time, reviewing whether the vesting structure encourages sustained buying and holding or generates sell pressure that could dilute early investors.
- **Distribution Fairness:** Measures the token distribution among stakeholders, looking at their initial allocations and incentive structures for various groups. This analysis checks for any disproportionate benefits to specific parties and ensures fairness.
- **Investor Balance:** Measures the fairness and balance between different investor price entries and vesting conditions, considering the initial investment amounts and the timing of token releases.
- **Supply Metrics:** Compares circulating supply versus locked token supply within the vesting schedule, taking in supply control mechanisms like token burns and token velocity, where lower velocity signals long-term holding, and higher velocity suggests speculative trading affecting market dynamics.

You'll receive a detailed report from our tokenomics team that provides a comprehensive analysis. This report can be used effectively in investor presentations, for fundraising efforts, or to communicate the strengths of your tokenomics to the community.

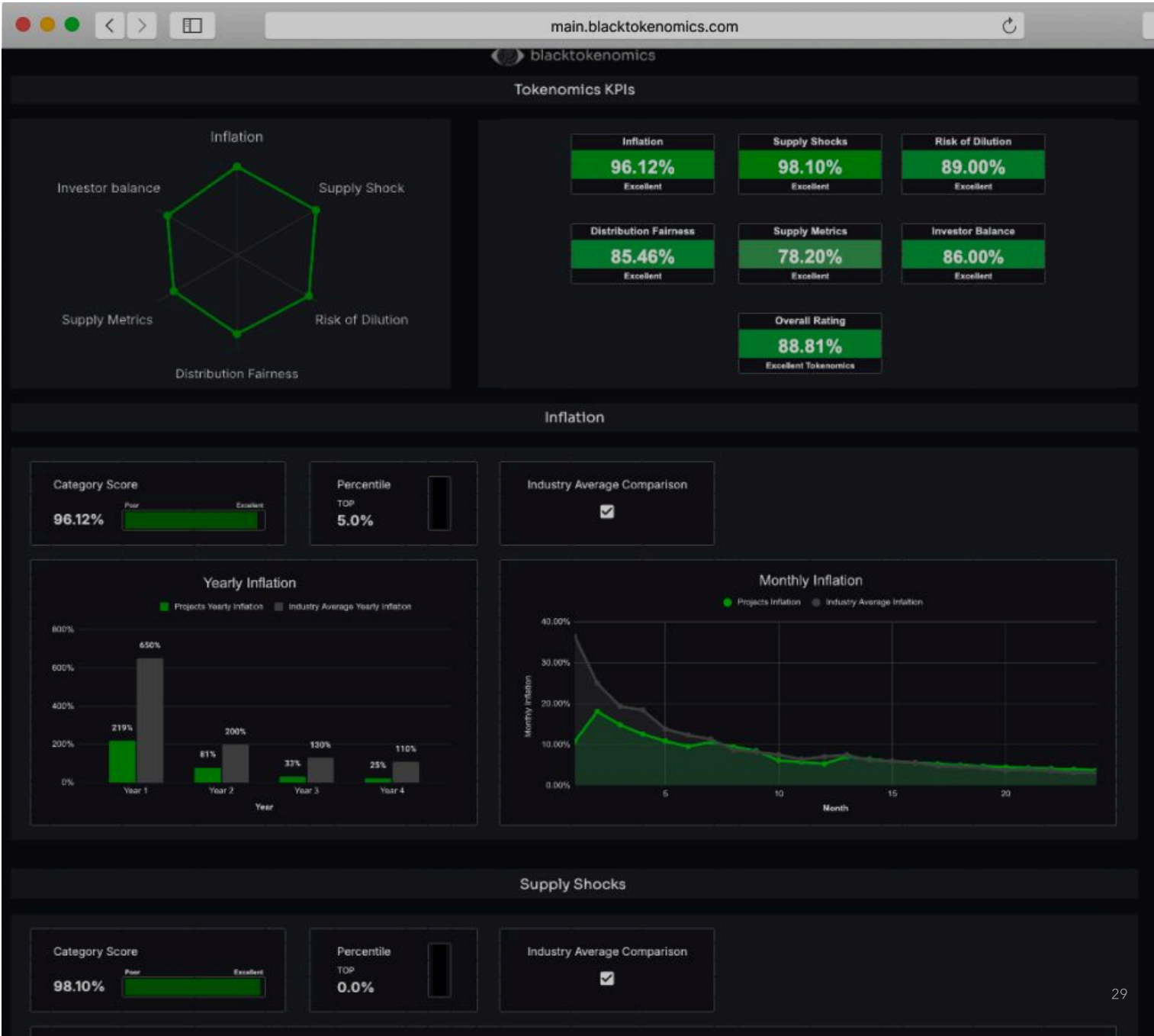
Our tokenomics audits are backed by a vast database of over 1350 unique records across a variety of niches, including gaming, layer one solutions (L1s), DePIN, artificial intelligence, and more.

Our data analysts continuously update this database with fresh data from new token launches every day. This allows us to cross-reference tokenomics models with actual price performance, ensuring that our insights are rooted in real-world data, not just theoretical analysis.

Each audit receives a score from 1 to 100, where every vertical is compared to the top-performing projects within our database. The project is assigned a rank (e.g., #001) and a percentile (e.g., top 3%), offering a clear picture of how it stands relative to the best in the market.

## The Documentation

Figure 1: Detailed tokenomics audit report





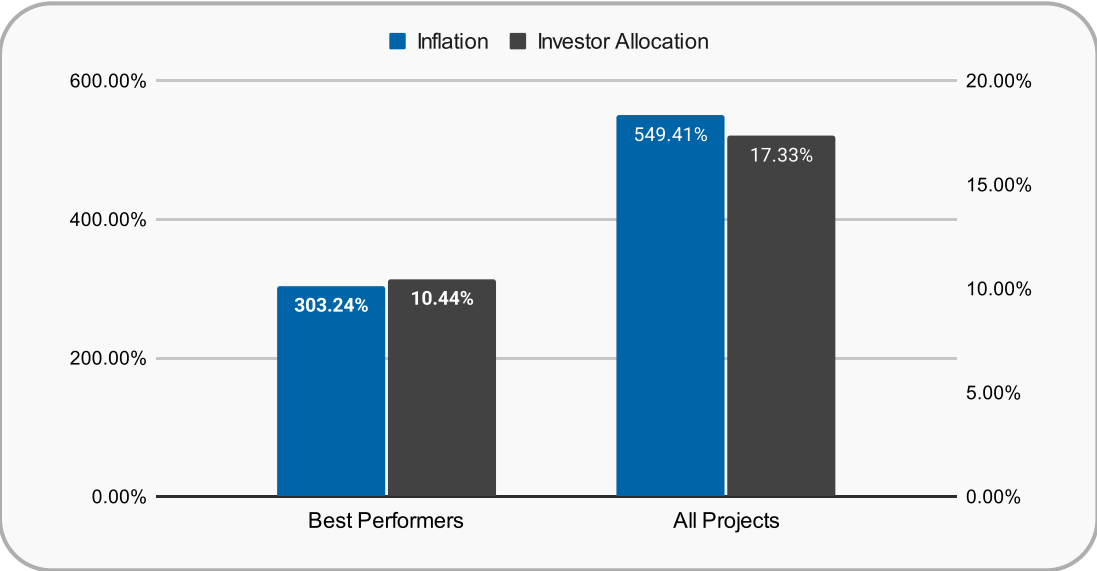
# Tokenomics Audit

One of the biggest mistakes projects make when designing tokenomics is failing to take a **true economic data driven approach**.

We define **best performers** as projects that have been listed for more than two years since their launch (or half of the Bitcoin halving cycle) and have a positive ROI, which is determined by comparing their Current FDV / Launch FDV, which must not be below 1.

When analyzing this group in our database, we **notice a clear difference in the following parameters**:

### Inflation & Investor Allocation (Best Performers vs. All Projects)



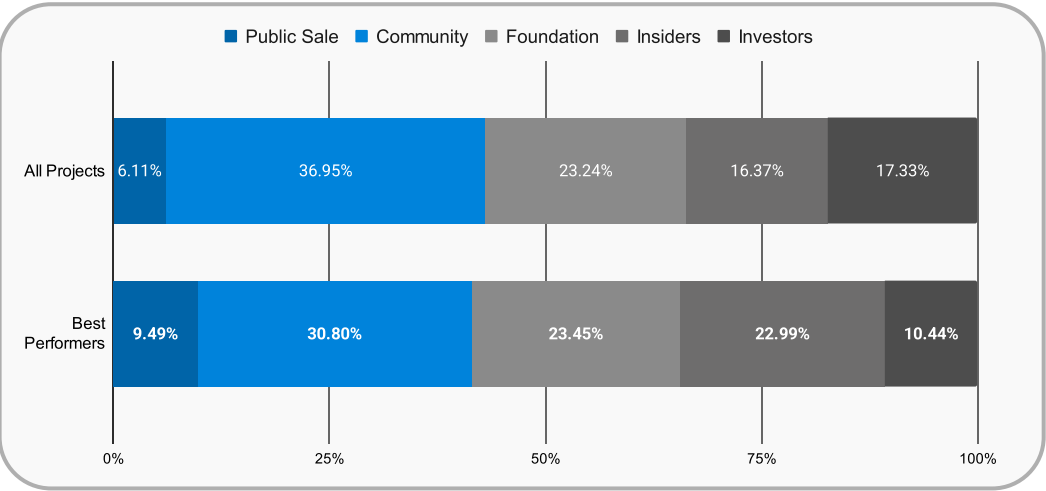
#### Year 1 Inflation Rate (Blue bar)

While **all other projects** experience a much higher inflation rate of **(549.41%)** in the first year, the most successful projects have a significantly lower inflation level of **(303.24%)**, which means that **Best Performers** have a more controlled token emission strategy, which is one of the factors that contributes to their long term success.

#### Investor Allocation (Gray bar)

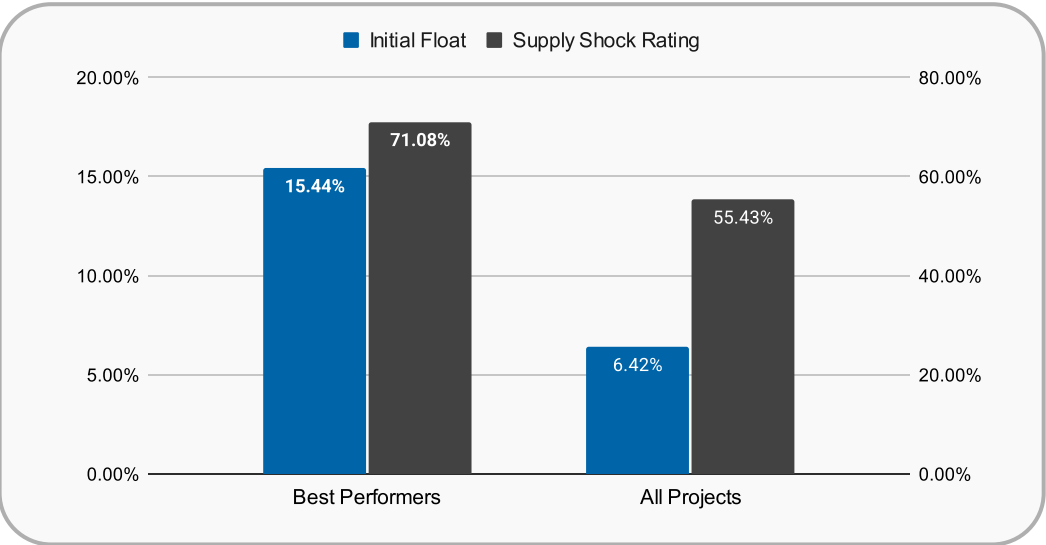
When it comes down to raising funds, **Best Performers** allocate only **10.44%** of their total token supply to **private investors**, compared to **17.32%** in all other projects. This is a strategic advantage, as successful projects have to limit investor allocations to meet listing requirements on top-tier CEXs like **Binance or OKX** or to conduct a public ICO on platforms like **CoinList**, which always prioritize tokens with low selling pressure.

### Distribution Fairness (Best Performers vs All Other Projects)



From the data-driven analysis, it's clear that selected **"Best Performers"** prioritize a more decentralized token distribution by allocating a larger portion to public sales **(9.49%)**, compared to **only 6.11%** in all other projects.

### Supply Shock Rating & Initial Float (Best Performers vs. All Projects)



**Best Performers** tend to launch with a higher initial float **(15.18%)** than all other projects **(6.42%)**, reducing initial volatility and future dilution. Additionally, they maintain a higher supply shock rating **(71.09%)**, meaning supply shocks do not generate such a huge impact when a token unlock occurs from one day to another.

# Audit Dashboard

We've also developed our own custom dashboards that let projects share their tokenomics publicly with their community before listing or going through a launchpad public sale.

This step is crucial, providing a clear and transparent breakdown of the tokenomics helps build trust with potential retail investors and users.

The dashboard explains all the verticals of the tokenomics audit in detail, showing the score for each one. It provides an easy-to-understand view of key metrics like token supply, emissions schedules, vesting periods, and allocation splits.

This way, all relevant stakeholders have full access to the tokenomics information, which is essential for a successful listing or public sale.

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Search

Discovery

Trending

Top

KPI Leaderboard

Inflation

Distribution Fairness

Supply Shocks

Supply Metrics

Risk of Dilution

Investor Dilution

KPI Leaderboard

DeFi

Gaming

DePIN

RWA

Request Audit

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ChronoForge

ChronoForge

100%

100%

100%

Summary

Inflation

Supply Shock

Risk of Dilution

Distribution Fairness

Investor Dilution

Supply Metrics

ChronoForge Info

Ticker: \$RIFT  
Listing Price: \$0.3  
Total Supply: 100,000,000  
Niche: Gaming  
TGE Date: 2000-01-01  
Website: https://chro...orge.gg  
Tokenomics Source: https://guid...usdrift



Tier 1  
Tokenomics



Tokenomics  
Audited



Investor  
Information

Tokenomics Rating



Rank

#46

Percentile

Top 10%

7-day Ranking History



Inflation

Inflation Rating

90.77



Percentile

Top 10%

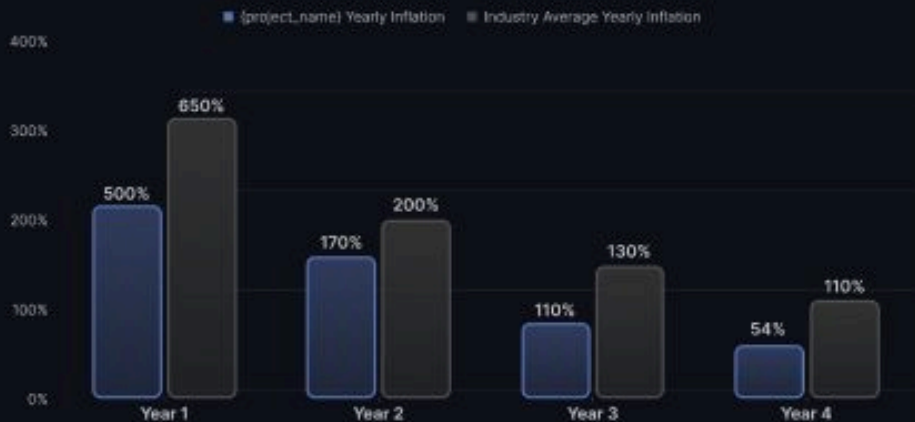
Inflation

Measures the rate at which new tokens are added to the circulating supply, from yearly and monthly perspectives.

Industry Comparison

ON

Yearly Inflation



Monthly Inflation



Supply Shock

Supply Shock Rating

90.77



Percentile

Top 10%

Supply Shock

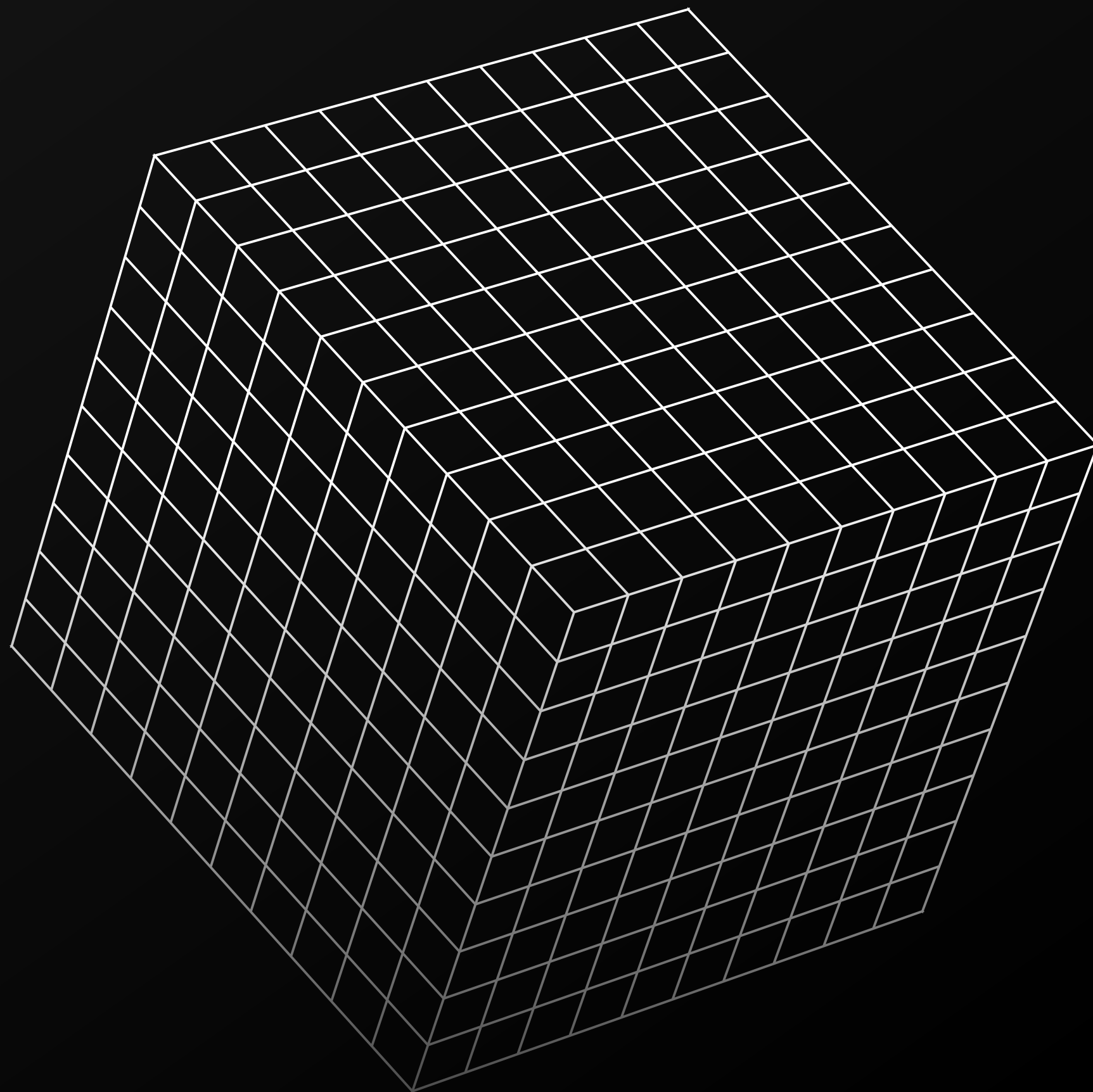
Measures the strength of sudden changes in token supply, impacting the market at a given period.

Industry Comparison

ON

Monthly Unlocks





Phase 2.2

# Tokenomics Design

Tokenomics is a multifaceted term that goes beyond simple metrics like a token's max supply, emissions schedule, or staking yields.

It's the set of rules: both monetary and non-monetary that guide how a protocol incentivizes users to align their actions with the network's goals, even when individual objectives differ. Just as countries need strong economic policies to grow, Web3 projects need carefully designed tokenomics to succeed.

At BlackTokenomics, we specialize in every aspect of tokenomics from governance models and incentive structures to distribution fairness and listing strategies. We ensure all elements work together to create a balanced, sustainable ecosystem, much like a perfectly aligned **Rubik's Cube**.

However, just like every twist in the cube can disrupt its harmony, each design decision must be handled carefully to avoid destabilizing the model.

This is why we offer an all-in-one solution for tokenomics, not just focusing on the economy or supply mechanics, but covering the full layer of incentives, game theory, and utility flows to ensure long-term success.



# Tokenomics Design

## Allocation distribution

We are known for our robust tokenomics frameworks that not only ensure economic stability but also facilitate fundraising.

Our designs are rigorously simulated and validated across 35+ models.

### But what makes our designs unique?

Unlike existing models in the space that heavily rely on speculation, we have a completely data driven approach to tokenomics.

### How do we do this?

Our database contains **over 1350 unique records** across various niches, from gaming, layer ones solutions (L1s), DePIN, artificial intelligence, and more. Our team of data analysts continuously expands our database, adding fresh data from new token launches every day.

By cross-referencing tokenomics records with actual price action, we then ensure our insights are grounded in real- performance.

In a field as technical as tokenomics, **opinions simply don't suffice**, data is the cornerstone of building effective, robust tokenomics strategies.

When designing a tokenomics framework, we build on the insights gathered from the initial phases, the fundamentals and audit.

From there, we focus on establishing the:

- A) Allocation Distribution
- B) Vesting release schedule

Following the market standards, and best practices to make sure we have the core economic parameters under control. (which we will cover later in this report)

## Allocation Distribution

Which is a crucial part of the token's monetary policy. It dictates how tokens are allocated among various stakeholders, such as the team, investors, community, and ecosystem participants.

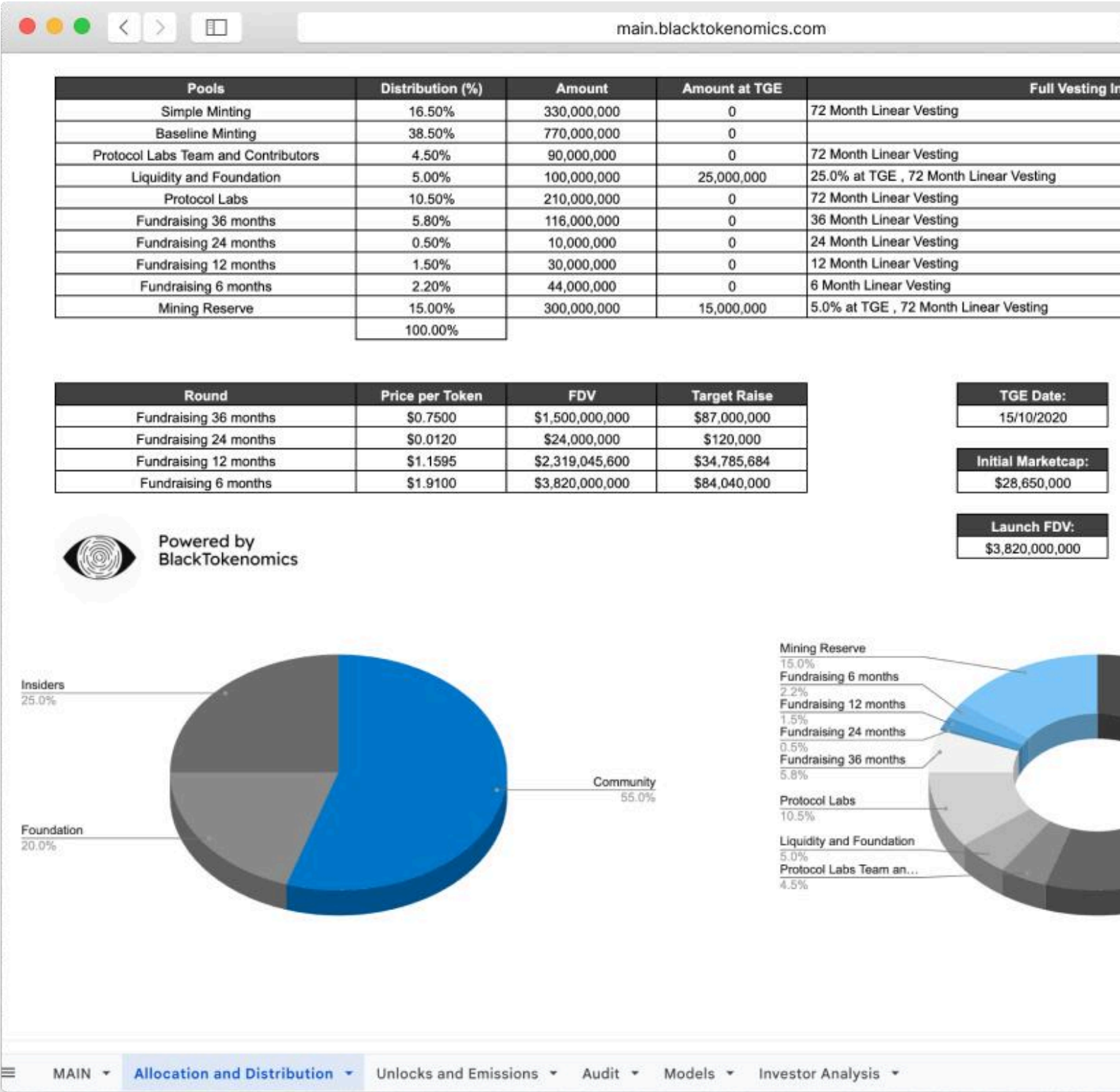
When formulating a token distribution strategy, we consider several crucial factors:

- Alignment with project goals

We make sure the distribution aligns with the project's mission and vision. It's about ensuring that tokens are distributed in a way that drives the right actions from participants. For example, a decentralized lending platform might allocate tokens to both borrowers and lenders, while a gaming platform could focus on game developers and players.

- Fair and equitable distribution

Fairness is critical here. Tokens need to be distributed in a way that reflects each participant's contribution or engagement with the network. We always aim to avoid centralization risks, because too much concentration of tokens among insiders can lead to governance imbalances and decision-making challenges.



# Tokenomics Design

## Vesting release schedule

Next, we focus on the:

### Vesting release schedule

At the heart of this process is our proprietary algorithm, which balances different funding rounds by running multiple models to ensure fairness for every stakeholder.

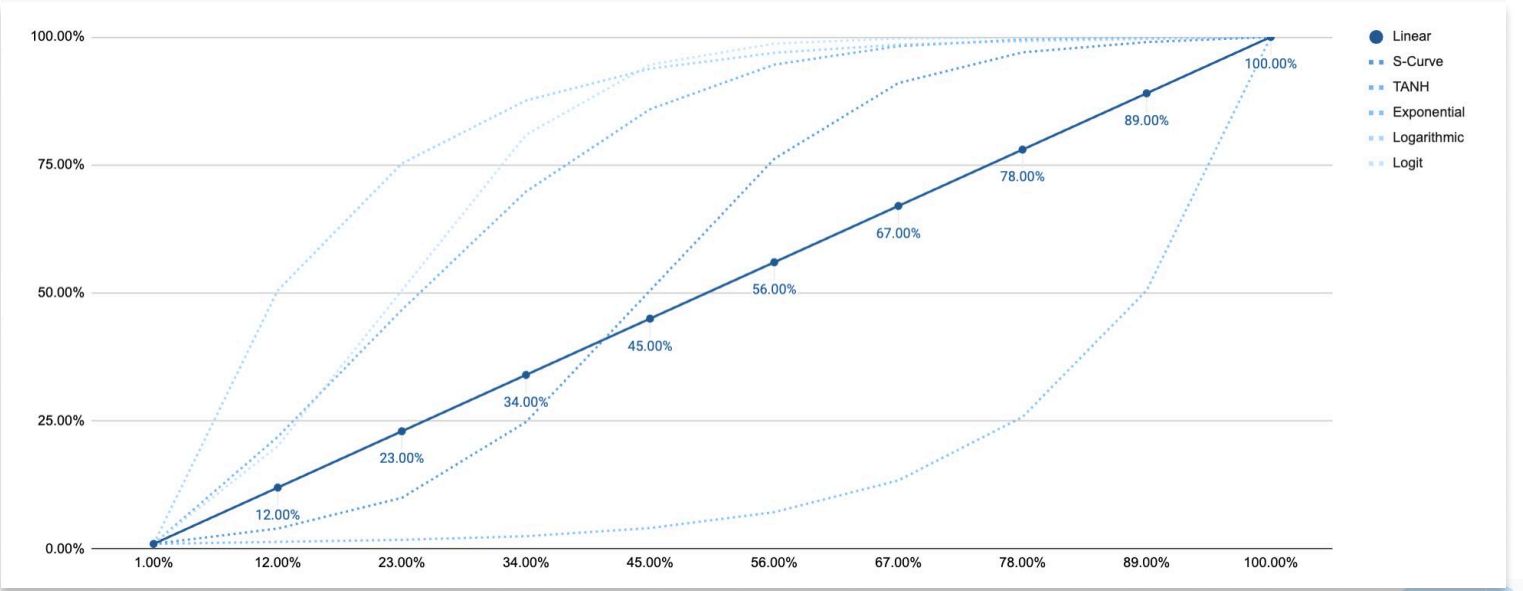
The vesting release schedule isn’t just about timing—it dictates how and when new tokens enter the market. This policy has a direct impact on the project’s inflation rate, potential supply shocks, and how fairly tokens are distributed among stakeholders. Ultimately, it influences the entire economic balance within the ecosystem.

How does our algorithmic balance work? Our investor balance algorithm is designed to create fairness across investment rounds—Seed, Private, and Public—by analyzing price entries and vesting lengths. We use the Public round as the benchmark and compare it with earlier rounds to ensure no one round has an unfair advantage.

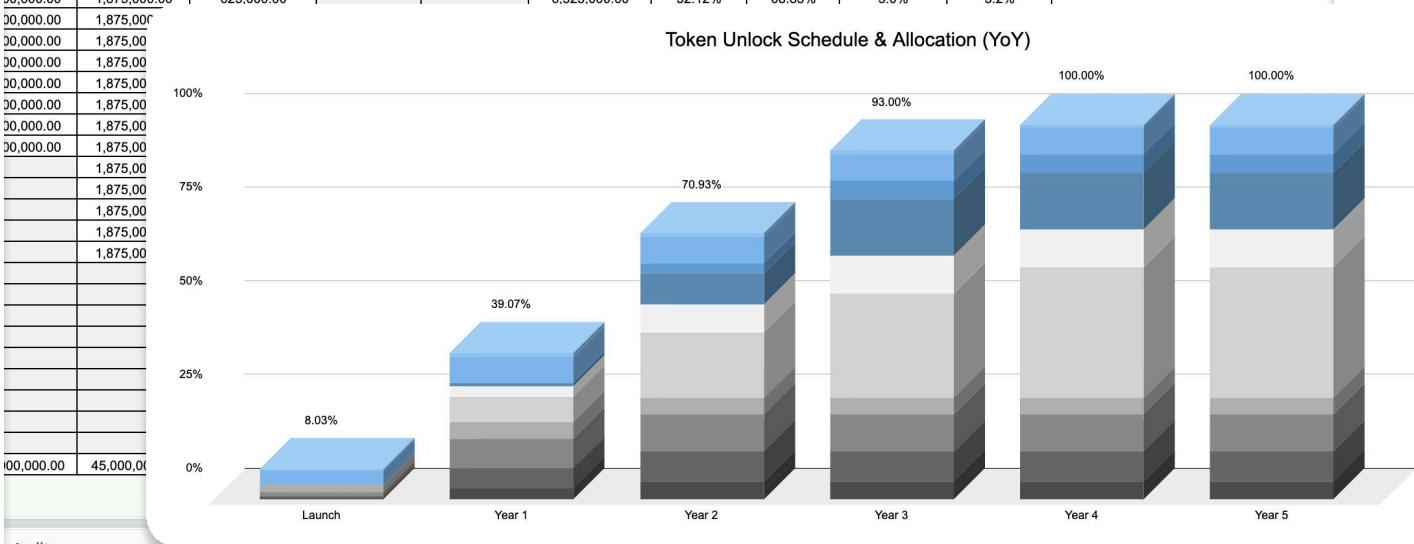
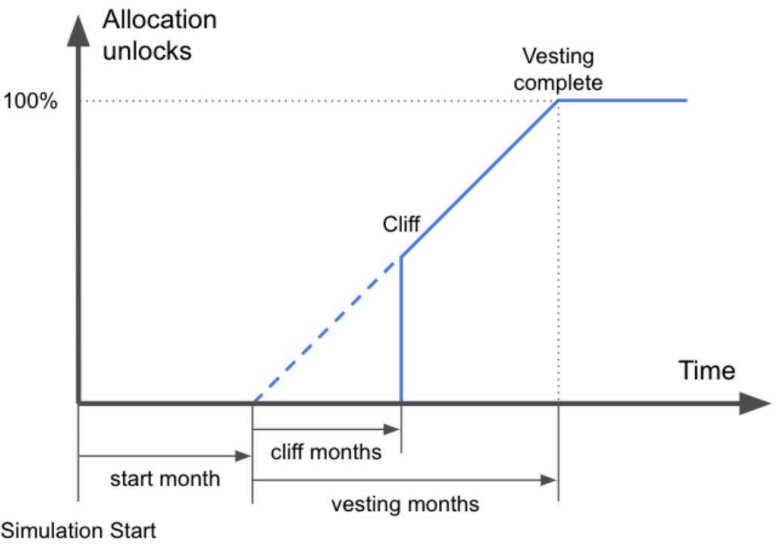
The algorithm calculates how much cheaper or more expensive earlier rounds were, and how much longer or shorter their vesting periods are compared to the Public round. The goal is to balance the ratio of price entry to vesting length, ensuring no round becomes disproportionately advantageous in terms of price or vesting benefits.

In essence, the formula ensures equity across all rounds, balancing the cost of entry (price) with the vesting period. This prevents any single round from being overly beneficial or detrimental.

When it comes to vesting strategies, we use a range of approaches tailored to the needs and long-term goals of each project. These include S-Curve, TANH, Exponential, Linear, Logarithmic, and Logit models. Each type of vesting curve plays a unique role in managing token distribution and circulation, ensuring the project’s economic health and sustainability over time.



Technical Model Example 2																		Share			
File Edit View Insert Format Data Tools Extensions Help BlackTokenomics																					
Q Menus																					
AE5001																					
	A	B	C	D	E	F	G	H	I	J	K	L	W	X	Y	Z	AA	AB	AC	AD	AE
1	TIME UNIT	TOKEN EMISSIONS	Angel Round	Seed Round	Private Round	Public	Ecosystem Rewards	Development & Marketing	Team	Advisors	Liquidity Provision	Airdrop	Monthly Emissions	Circulation	Unlocks	Circulating Supply shock	Unlocks Supply shock	Highlight Allocation			
2	TGE	01/01/2000	705,000.00	1,920,000.00	3,000,000.00	6,450,000.00	0.00	0.00	0.00	0.00	10,500,000.00	1,500,000.00	24,075,000.00	4.53%	8.03%	-	-	Selling pressure (Investors) <input type="checkbox"/>			
3	1	01/02/2000	Cliff	Cliff	Cliff	1,290,000.00	Cliff	Cliff	Cliff	Cliff	1,750,000.00	214,285.71	3,254,285.71	5.03%	9.11%	11.1%	13.5%	Community Rewards <input type="checkbox"/>			
4	2	01/03/2000	Cliff	Cliff	Cliff	1,290,000.00	Cliff	Cliff	Cliff	Cliff	1,750,000.00	214,285.71	3,254,285.71	5.53%	10.19%	10.0%	11.9%	Team Control <input type="checkbox"/>			
5	3	01/04/2000	Cliff	Cliff	Cliff	1,290,000.00	Cliff	Cliff	Cliff	Cliff	1,750,000.00	214,285.71	3,254,285.71	6.03%	11.28%	9.1%	10.6%	Circulating Supply <input type="checkbox"/>			
6	4	01/05/2000	Cliff	Cliff	2,250,000.00	1,290,000.00	Cliff	Cliff	Cliff	Cliff	1,750,000.00	214,285.71	5,504,285.71	7.28%	13.11%	20.8%	16.3%	Emissions Type Tokens			
7	5	01/06/2000	Cliff	1,840,000.00	2,250,000.00	1,290,000.00	2,625,000.00	Cliff	Cliff	Cliff	1,750,000.00	214,285.71	9,969,285.71	10.02%	16.44%	37.6%	25.3%				
8	6	01/07/2000	1,116,250.00	1,840,000.00	2,250,000.00		2,625,000.00	1,200,000.00	Cliff	Cliff	1,750,000.00		10,995,535.71	12.70%	20.10%	26.8%	22.3%				
9	7	01/08/2000	1,116,250.00	1,840,000.00	2,250,000.00		2,625,000.00	1,200,000.00	Cliff	Cliff		214,285.71	9,245,535.71	15.38%	23.18%	21.1%	15.3%				
10	8	01/09/2000	1,116,250.00	1,840,000.00	2,250,000.00		2,625,000.00	1,200,000.00	Cliff	Cliff			9,031,250.00	17.99%	26.19%	17.0%	13.0%				
11	9	01/10/2000	1,116,250.00	1,840,000.00	2,250,000.00		2,625,000.00	1,200,000.00	Cliff	Cliff			9,031,250.00	20.60%	29.21%	14.5%	11.5%				
12	10	01/11/2000	1,116,250.00	1,840,000.00	2,250,000.00		2,625,000.00	1,200,000.00	Cliff	Cliff			9,031,250.00	23.22%	32.22%	12.7%	10.3%				
13	11	01/12/2000	1,116,250.00	1,840,000.00	2,250,000.00		2,625,000.00	1,200,000.00	Cliff	Cliff			9,031,250.00	25.83%	35.23%	11.2%	9.3%				
14	12	01/01/2001	1,116,250.00	1,840,000.00	2,250,000.00		2,625,000.00	1,200,000.00	1,875,000.00	625,000.00			11,531,250.00	29.06%	39.07%	12.5%	10.9%				
15	13	01/02/2001	1,116,250.00	1,840,000.00	2,250,000.00		2,625,000.00	1,200,000.00	1,875,000.00	625,000.00			11,531,250.00	32.30%	42.91%	11.1%	9.8%				
16	14	01/03/2001	1,116,250.00	1,840,000.00	2,250,000.00		2,625,000.00	1,200,000.00	1,875,000.00	625,000.00			11,531,250.00	35.53%	46.76%	10.0%	9.0%				
17	15	01/04/2001	1,116,250.00	1,840,000.00	2,250,000.00		2,625,000.00	1,200,000.00	1,875,000.00	625,000.00			11,531,250.00	38.77%	50.60%	9.1%	8.2%				
18	16	01/05/2001	1,116,250.00	1,840,000.00			2,625,000.00	1,200,000.00	1,875,000.00	625,000.00			9,281,250.00	41.25%	53.69%	6.4%	6.1%				
19	17	01/06/2001	1,116,250.00				2,625,000.00	1,200,000.00	1,875,000.00	625,000.00			7,441,250.00	43.12%	56.18%	4.5%	4.6%				
20	18	01/07/2001					2,625,000.00	1,200,000.00	1,875,000.00	625,000.00			6,325,000.00	44.62%	58.28%	3.5%	3.8%				
21	19	01/08/2001					2,625,000.00	1,200,000.00	1,875,000.00	625,000.00			6,325,000.00	46.12%	60.39%	3.4%	3.6%				
22	20	01/09/2001					2,625,000.00	1,200,000.00	1,875,000.00	625,000.00			6,325,000.00	47.62%	62.50%	3.3%	3.5%				
23	21	01/10/2001					2,625,000.00	1,200,000.00	1,875,000.00	625,000.00			6,325,000.00	49.12%	64.61%	3.1%	3.4%				
24	22						30,000.00	1,875,000.00	625,000.00				6,325,000.00	50.62%	66.72%	3.1%	3.3%				
25	23						30,000.00	1,875,000.00	625,000.00				6,325,000.00	52.12%	68.83%	3.0%	3.2%				





# Tokenomics Design

## Unlocks and circulation

For a comprehensive understanding of the vesting release schedule and its influence on token price, it's crucial to recognize the key elements that drive it.

The Token Generation Event (TGE) marks the project's official token launch on an exchange, whether centralized or decentralized. This is the moment when investors and stakeholders can begin unlocking and using their tokens, signaling the start of token circulation in the market.

The cliff period represents the initial lockup phase where token holders must wait before receiving their tokens. Typically applied to early investors, the project team, or foundation pools, this phase prevents early sell-offs that could destabilize the market. It also allows for smoother price forecasting, as major unlock dates become known in advance.

Token vesting and lock-up periods serve as essential tools to ensure long-term alignment between developers, insiders, and token buyers. By locking up tokens and releasing them gradually, projects avoid the risk of early investor dumping, protecting the token's price from sharp fluctuations. Vesting schedules also help investors plan around potential price movements as tokens are gradually unlocked.

An additional factor to consider is emissions, which refer to the rate at which new tokens are released into circulation. This concept, rooted in traditional finance, draws parallels to the issuance of new securities or shares. In the context of tokenomics, emissions play a key role in determining inflationary or deflationary pressures within the token economy.

The emission rate directly influences token supply, which, if too high, can create inflation and drive down the token's price. Conversely, burning tokens can lead to deflation and increase scarcity, potentially boosting the token's value.

These emissions are part of the broader monetary policy, which defines how the token supply evolves over time and impacts market stability.

Now, as tokens are unlocked into the market, it's essential to understand how circulating supply and unlocks differ. As more tokens are unlocked, if demand remains constant, it exerts downward pressure on the price.

Initial Circulating Supply refers to the number of tokens actively circulating in the market immediately after a project's launch or at the TGE. These tokens are tradeable from the start, and their availability sets the initial market dynamics.

Token unlocks, on the other hand, refer to the total portion of the total token supply that becomes available for trading after the initial lockup period. These unlocks can lead to supply shocks—sudden increases in supply that influence the token's price if demand does not rise proportionately.

However, unlocks ≠ circulating supply. Just because tokens are unlocked doesn't mean they instantly enter circulation.

Circulating supply refers to the tokens actively traded in the market. Not all unlocked tokens enter circulation immediately; some holders may choose not to sell, keeping their tokens off the market. As a result, circulating supply is a more accurate measure for assessing market capitalization than total supply.

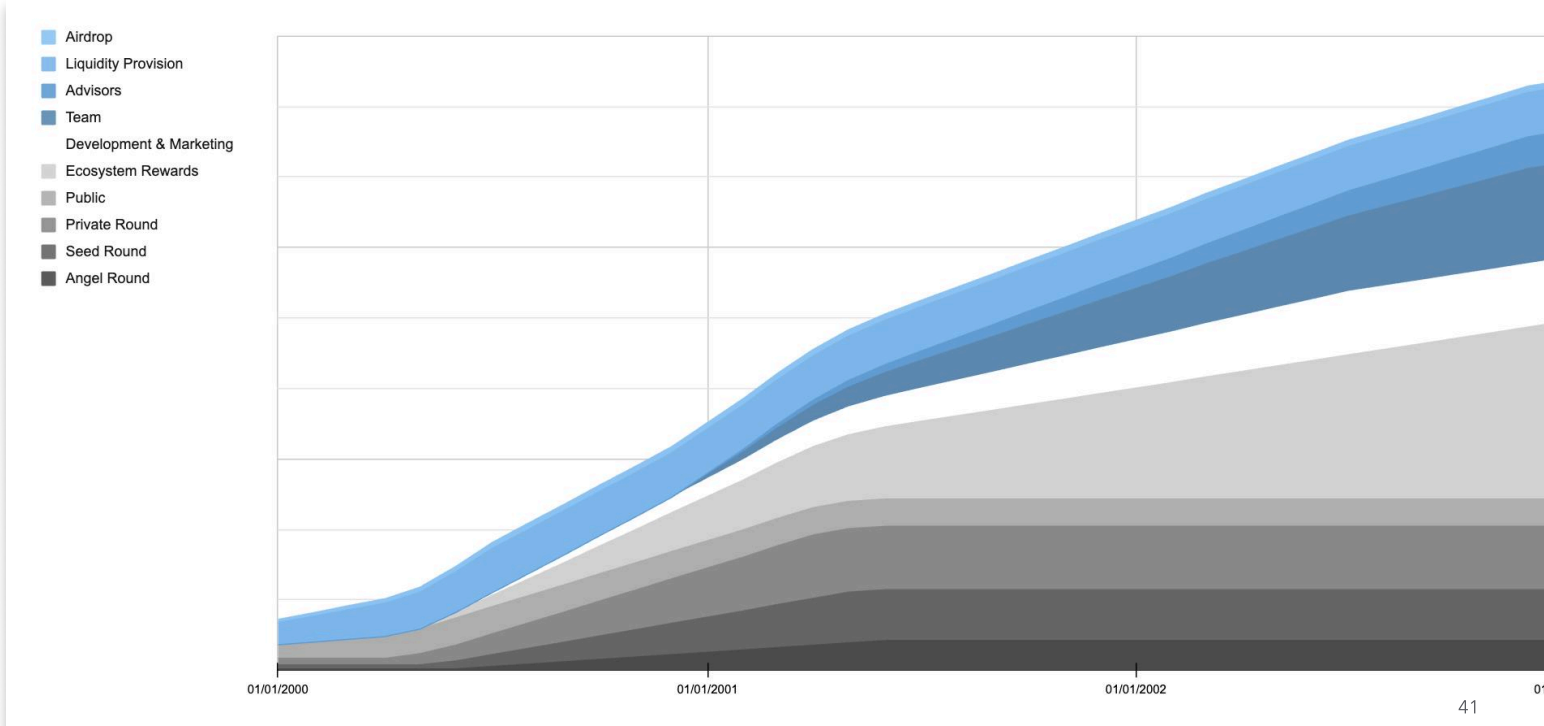
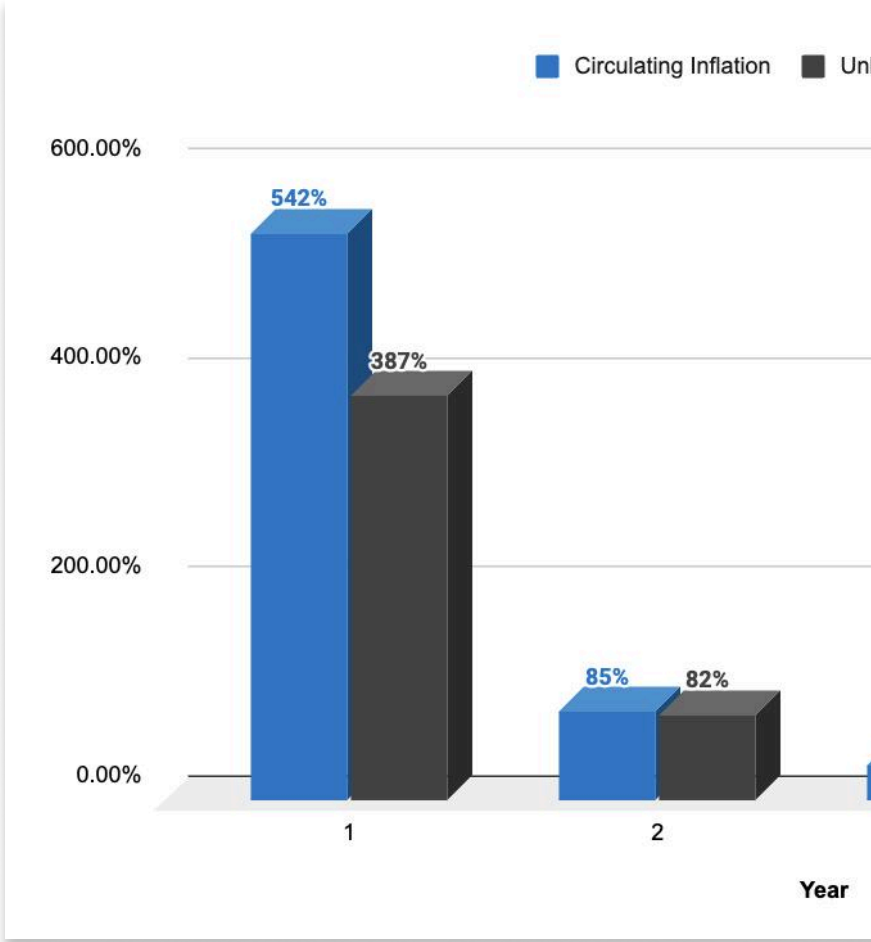
When designing tokenomics frameworks, we account for the pools that are most likely to enter circulation after unlocks. By stress testing and modeling these scenarios, we can better predict how unlocks will impact price dynamics, ensuring a balanced and sustainable approach.

Tightly linked to the differentiation between unlocks and circulating supply is the difference between a token's Fully Diluted Valuation (FDV) and its Market Capitalization (market cap). While market cap reflects the value of the current circulating supply, FDV takes into account the token's total potential supply. In simple terms, FDV is calculated by multiplying a token's maximum supply by its current market price.

For retail investors, when market cap and FDV are closely aligned, it's generally a positive sign. It suggests that while some dilution is expected, the inflationary pressure is moderate and predictable.

However, problems arise when there's a significant gap between market cap and FDV, indicating a large influx of unlocked tokens is on the horizon. This gap signals upcoming inflationary and selling pressure, which can lead to significant price drops.

This is why, when designing tokenomics frameworks, we strive to avoid models with low circulating supply and high FDV. Such models can result in unsustainable inflationary pressure and create challenges for long-term value retention.



# Tokenomics Design

## The problem of low floats and high FDVs

A “low float” refers to when only a small percentage of a project’s total token supply is circulating and available for trading at TGE, with most tokens still locked or not yet released.

This page of the report will bring light on the reality of low float models and why they offer only short-term happiness in exchange for long-term failure.

Imagine you’re eager to launch your token, and the market seems ripe for success.

You approach a launchpad, only to be met with demands for **low FDVs, low initial MCAP, and low floats**. At first, this sounds like a winning strategy– artificial scarcity that boosts your token’s price with just a little demand.

But the truth is, this isn’t about supporting your project; it’s about lining their pockets.

These launchpads are the first to receive tokens with high TGE unlocks and short vesting periods.

and once the 2x, 5x, or even 10x multipliers are orchestrated.

They’re poised to cash in quickly, dumping their tokens as soon as prices spike, while your project is left to deal with the aftermath– hyperinflation, plummeting prices, and a struggling community

The initial price surge might look impressive, with 2x, 5x, or even 10x gains. But as this report will clarify, this is only a brief moment of success before the inevitable downfall.

Low float models bring short-term happiness, in exchange of long-term failure.

An alarming 94% of projects that launch with a low float end up failing, with most trading below their launch price just a few months after listing, underscoring the risks of this short-term strategy.

The community, including early adopters and retail investors, ends up paying the price. They invest at inflated valuations due to the low float manipulation, and as tokens unlock, they face dilution and see their investments lose value, while others have already cashed out.

The team, lacking an economic background, was misled into believing that the low float model would benefit them. Now, they’re left dealing with a hyper-inflationary model as early investors and launchpads have cashed out, leaving the community and the project to face dilution and plummeting prices.

### Most Recent Low-Float Launches on Seedify

Project	Initial Float	% from ATH
RunesTerminal \$RUNI	5.55%	-77.50%
Orbital7 \$ORBI	3.15%	-97.10%
Artfi \$ARTFI	5.14%	-79.60%
Legion Ventures \$LEGION	4.13%	-94.50%
Skilliful AI \$SKAI	2.02%	-88.70%
Elixir Games \$ELIX	2.12%	-92.20%
Wisdomise AI \$WSDM	1.48%	-92.10%
BLASTOFF \$OFF	5.00%	-97%
Exverse \$EXVG	2.02%	-94.80%
SatoshiSync \$SSNC	0.75%	-99.10%
Ordify \$ORFY	4.25%	-92.60%
GAIMIN \$GMRX	2.50%	-98.40%

Our data analysis team at Blacktokenomics conducted an in-depth study of over 500 crypto launches in 2024 to understand how the initial token float impacts price performance over time.

### What did we find?

Low-float tokens initially surge in value due to scarcity, providing high returns in the first few months post-launch, as shown by the blue line on the chart. However, these returns come with significant volatility, as the limited float amplifies price swings.

High-float tokens (red line) are comparatively less volatile over the entire period measured. While these tokens may lack the rapid, high returns seen with low-float launches, their larger circulating supply provides a cushion against extreme price fluctuations.

Around day 200 (breaking point), as low-float tokens start experiencing dilution, high-float tokens begin to outperform. The larger initial supply of high-float tokens stabilizes their long-term price, overtaking the performance of low-float tokens.

Our analysis highlights that a high-float token model is crucial for projects focused on long-term growth. While low-float launches generate quick gains for early investors and launchpads, they come with high volatility and future dilution, leaving the community and project exposed to plummeting prices as more tokens are released.

In contrast, a high-float strategy provides stability by releasing a substantial supply upfront, reducing sharp price swings and creating steady, long-term growth, aligned with sustainable project development.

# Tokenomics Design

## Defina Finance (Bonus)

Defina Finance serves as a significant example of the risks associated with low-circulating supply (float) and high fully diluted valuation token launches in recent years.

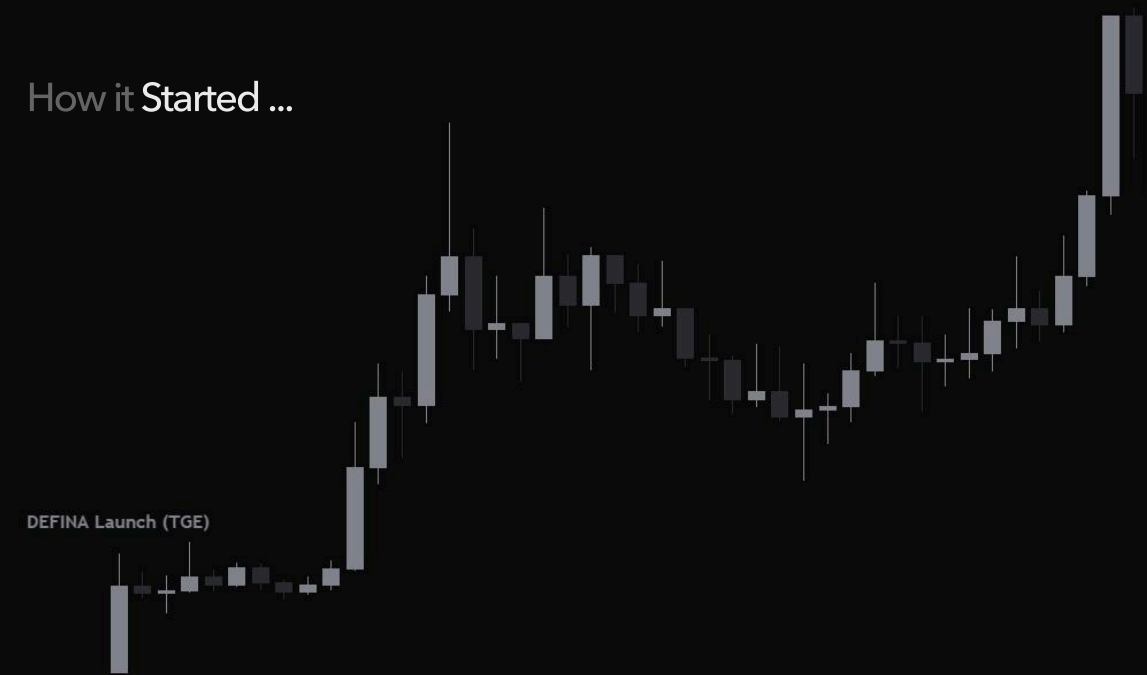
The project launched in late 2021, at the end of the last bull market cycle, with only 2.71% of its total token supply in circulation and an initial FDV of \$200 million. Due to this limited circulation, Defina’s FDV skyrocketed to over \$1 billion within a few months.

However, issues emerged approximately two months after listing. With a first-year inflation rate of 1,677%, early seed and private investors began receiving their initially locked tokens at this high FDV. This influx of tokens, combined with limited demand, led to an 85% price drop within a month from the peak, and prices continued to decline thereafter without recovering to previous highs.

The critical problem lays in the combination of low initial float (2.71%) and the timing at the tail end of a bull market. To maintain the initial token price one year after launch, demand would have needed to increase by 17 times the initial demand at the time of the TGE, an unrealistic expectation, especially as the bull market was ending.

This case study is a perfect example of how challenging it is to sustain high FDVs with minimal circulating supply, especially in volatile market conditions.

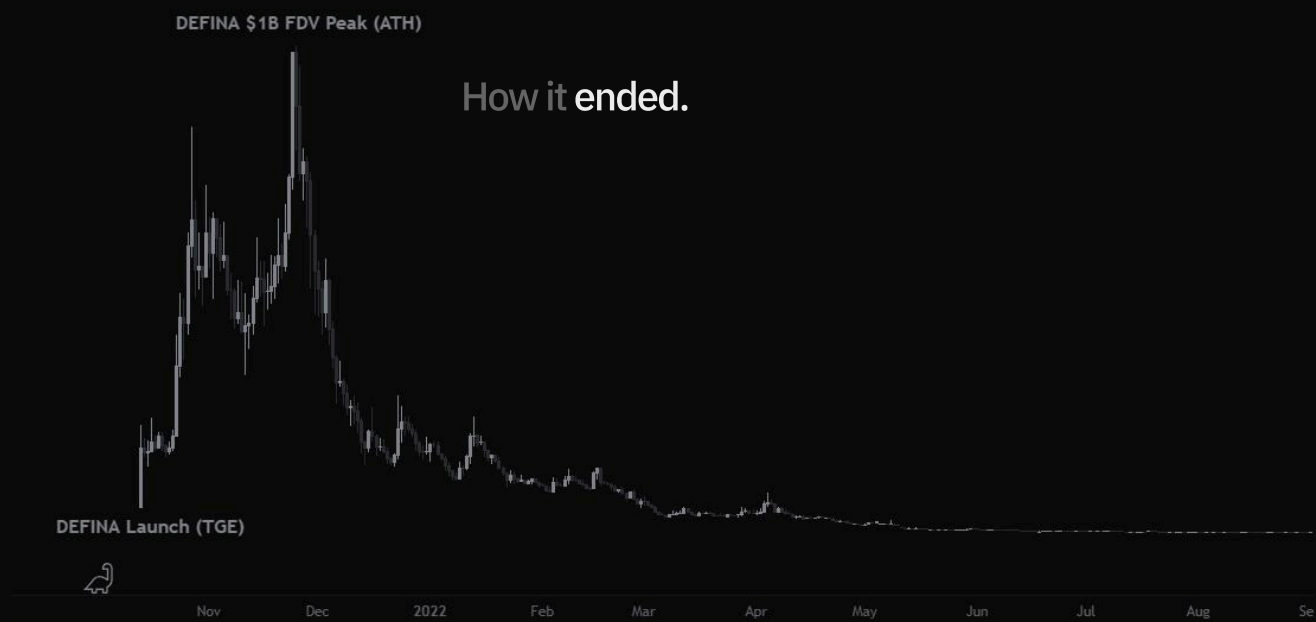
How it Started ...



How it continued..



How it ended.



# Tokenomics Design

## Key fundamentals and models we run

Managing token inflation and supply shocks is essential for maintaining a stable and healthy token economy. Token inflation refers to the gradual increase in the circulating supply of a token over time, which can reduce its value, especially when demand doesn’t grow at the same rate. Without careful management, inflation can result in an oversupply of tokens, leading to diminished value as there aren’t enough buyers or use cases to support the price. This can cause token prices to fall, weakening the project’s long-term viability.

To prevent this, controlled inflation is key. It ensures that the token supply grows in line with project adoption and demand. By managing token emissions and supply growth, projects can avoid sudden price drops, maintain long-term investor confidence, and ensure price stability within the ecosystem. Proper inflation control prevents hyperinflationary scenarios, where excessive supply leads to a significant devaluation of the token.

As part of this strategy, we implement controlled supply shocks, limiting increases to under 15%. These supply events are timed strategically to coincide with key moments such as liquidity generation events, marketing pushes, or major announcements. By planning supply increases in advance, we create liquidity opportunities and ensure market stability, preventing the negative impact of sudden, unexpected supply spikes.

This balanced approach allows for necessary supply expansions to fuel growth, while safeguarding against the risks of excessive inflation. By combining controlled inflation with carefully timed supply shocks, we help maintain a stable token economy, support long-term sustainability, and build trust with investors.

What are Monte Carlo simulations?  
Monte Carlo simulations are a mathematical technique used to understand the impact of risk and uncertainty in prediction and forecasting models. It works by defining a range of possible outcomes for a given scenario and then repeatedly sampling from this range, effectively simulating multiple iterations of the scenario.

The Quantity Theory of Money (QTM) is a model that relates the money supply in an economy with the general price levels. It's a classic framework for understanding the concept of inflation and how alterations in the money supply impact the overall pricing structure in an economy.  
The traditional QTM equation is:  $MV = PT$

When we adopt this model in the crypto space, it needs some modification due to the different nature of cryptocurrencies compared to fiat currency

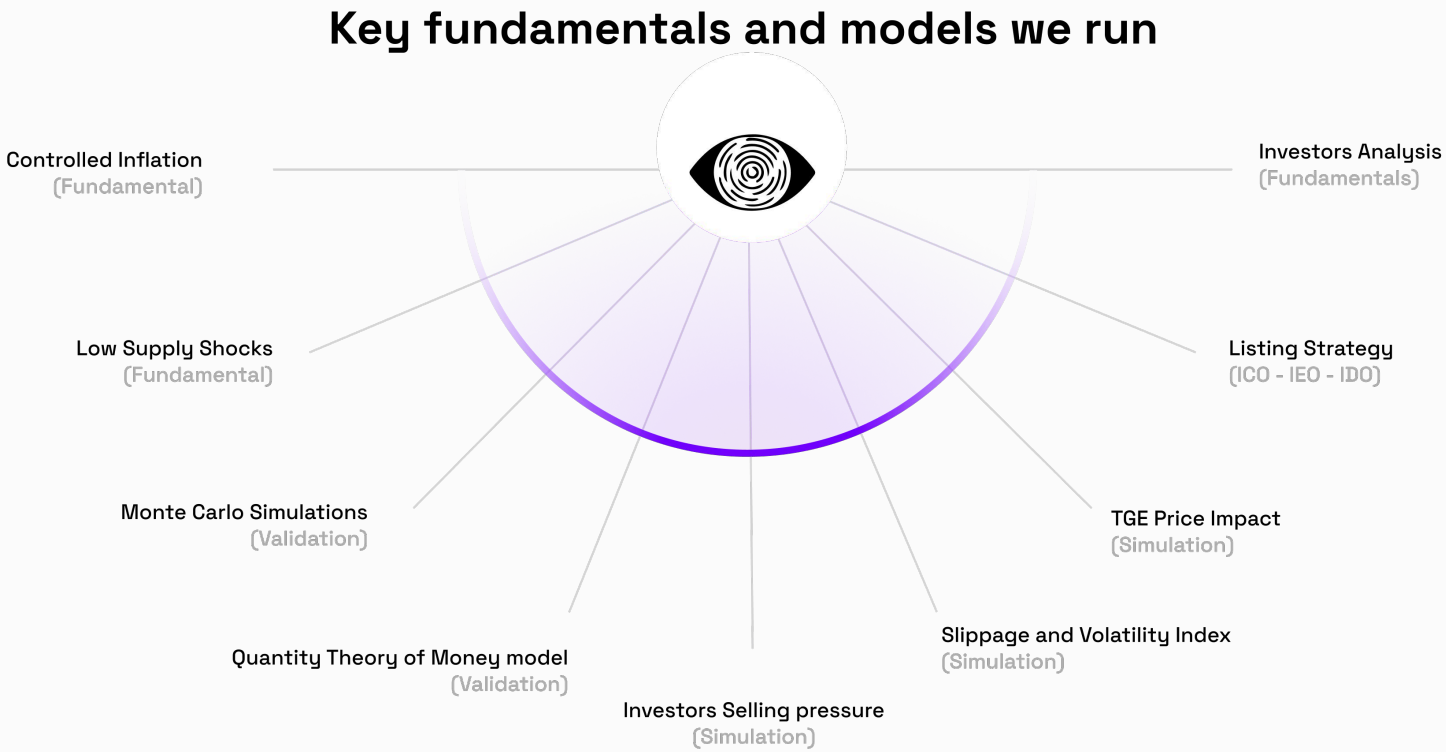
We analyze selling pressure on token sales to understand how prices react when stakeholders exit their positions.

Our simulation dashboard helps align your marketing team’s efforts with token unlock events, ensuring that marketing strategies and tokenomics are coordinated effectively.

The main goals of the simulation are:  
To help you use marketing funds in the most effective way and to avoid sudden price drops when larger token unlocks occur.

As an external firm, independent from the team and any stakeholders, it is crucial for us to uphold market standards of fair distribution while closely monitoring token control during unlock events.

We carefully consider potential implications for governance models, voting strategies, and ensure that no party is disproportionately advantaged over others.





# Tokenomics Design

## Token Unlocks

As token engineers, our goal is to understand how different elements of token unlock design – namely the size, frequency, length and distribution of unlock – impact a token’s price stability and long term health.

We collected and analyzed data on over 50.000 different unlock events and identified the following insights:

Small unlock events, those that increase circulating supply by 0% to 1%, had no meaningful relationship to price.

Larger unlocks, those that increase circulating supply by greater than1 5%, correlated to a HUGE noticeable, negative relationship: as unlock size increased, prices decreased.

Tokens that have vested most of their supply (more than 70%) had both substantially lower volatility and higher relative prices than tokens early in their vesting periods.

From these insights we derived three considerations for founders, which are briefly summarized below:

- **Consider sizing unlocks to be no larger than 1% of the circulating supply.** Bias towards daily or weekly unlocks instead of monthly, quarterly or annually.
- Rethink the inclusion of a large vest cliff. Such events can create significant and unnecessary price pressure.

U.S. companies must comply with a one-year cliff requirement and unfortunately, some projects mistakenly try to make up for this by unlocking a full year’s worth of tokens immediately after the cliff creating an extremely big supply shock.

Instead, it’s crucial to design a vesting schedule that gradually releases tokens over time rather than a large block at once.

- Be aware that token price may be substantially **more volatile in the first year of the vest schedule.**
- Start with as **highest initial float possible.**

When we analyze the projects of our top performing tokens, we consistently observe a common factor: **a high initial float .**

Another solid analysis that we did was deviding our dataset into two groups: **tokens that are mostly vested ( $\geq 70\%$  vested)** and those that are **mostly locked ( $< 40\%$  vested).**

We chose the 70% adn 40% threshold because it gave us a balanced sample of tokens.

Therefore, we looked at a recent four-month period– from January 15th to April 15th of this year–to measure their performance in their current vesting state. We focused on two key metrics:

**1. Average Variance.**  
Instead of using variance or standard deviation, we use the coefficient of variation, a measure that divides the standard deviation by the mean. This allows direct comparison of volatility between assets without the skewing effects of varying token prices. In essence, we measure how much spread and volatility occurred in token prices over the time period.

**2. Average price change.**  
Percent difference in price from the beginning of the time period to the end. We use this to understand how tokens performed when compared to the market.

we found the following:

	Mostly Vested Tokens	Mostly Locked Tokens	ETH	BTC
Average Variance	13.11	34.54	7.57	11.31
Average Price Change	+30.56%	-20.95%	+36%	+45.64%

**The two groups have strongly divergent behaviors.** The mostly vested tokens map much more closely to ETH & BTC, meaning that they essentially move according to the market. For mostly locked, however, we see that they have substantial price reduction over the same time period and also have 2.6x more variance than the mostly vested tokens. Clearly, tokens that have already vested most of their tokens are far more stable and appreciated more in value than tokens that are still vesting their tokens. This confirms our hypothesis that tokens become more stable in price once most of the tokens are unlocked. We believe this is because tokens have moved into communities & investors that have greater long-term belief in the protocol.

# Fundraising Setup

## Valuation

Valuing a Web3 project before its Token Generation Event is exceptionally challenging. Unlike traditional equity, where shares represent a stake in a company with established cash flows and financial statements, **tokens in decentralized networks do not directly reflect a company's intrinsic value.** Instead, a token's value depends on future network adoption, usage, and tokenomics rather than on current earnings.

Based on our analysis, we recommend a multi-faceted valuation approach that combines **three main fundamental models**. This strategy will provide you with a robust framework to assess your project's valuation.

### Scenario-Based Financial Modeling (Discounted Cash Flow Model)

In this approach, we project future protocol revenues based on anticipated network adoption, transaction volumes, and fee structures. Because the project has not yet launched, we develop best-case, base-case, and worst-case scenarios. We then discount these future cash flows at a high rate (**recommended for Web3 is 40%**) to account for the significant risks involved.

### Tokenomics and Value Capture Models

This model focuses on the economic design of your token. By applying the equation of exchange ( **$MV = PQ$** ), we connect projected transaction volumes with the token price. We also factor in token velocity, staking mechanisms, and fee or burn models to estimate how much of the network's economic activity will be captured by token holders.

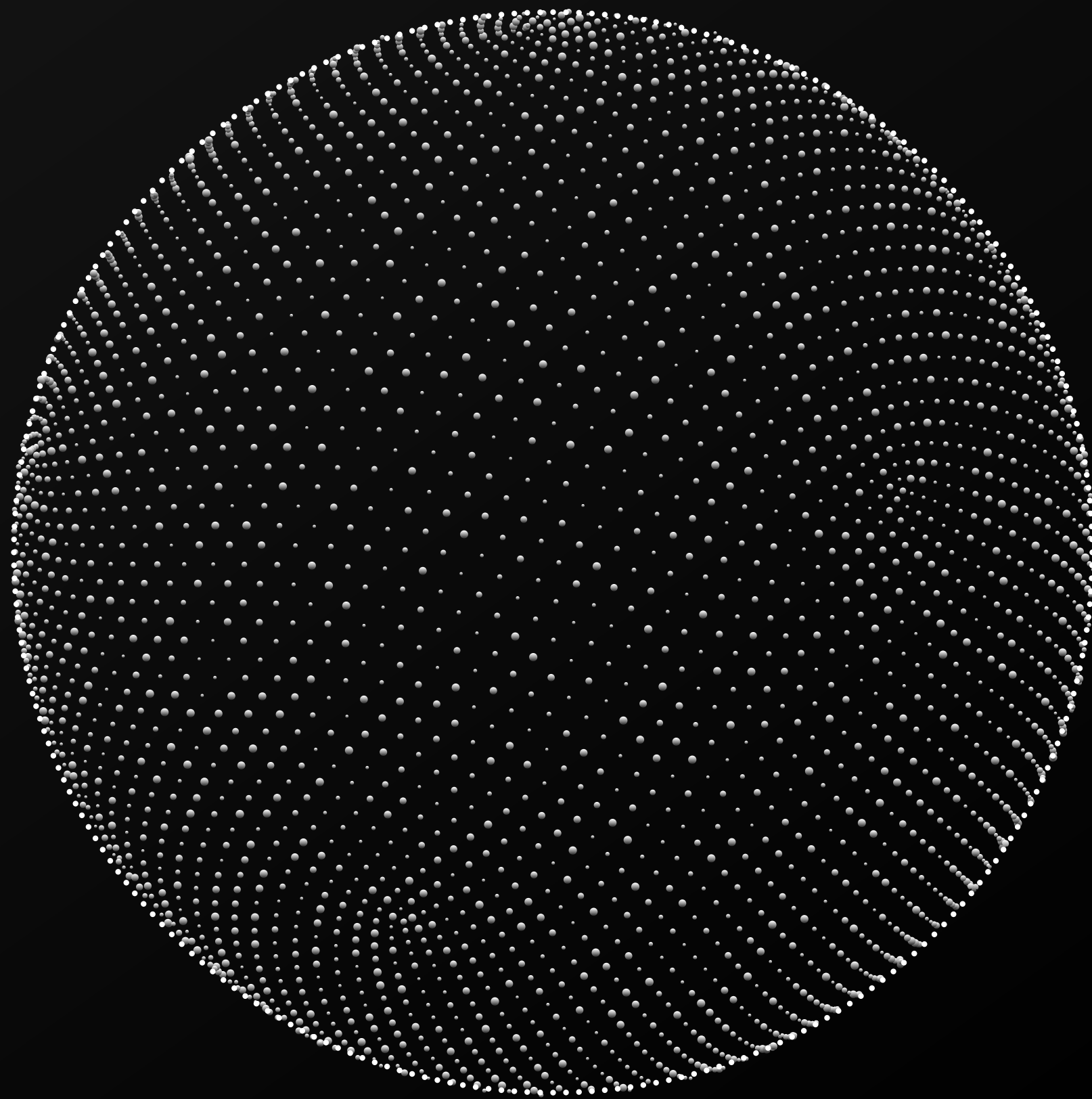
### Market Multiples and Comparables

Even in a pre-launch scenario, we can benchmark against similar projects within the same niche. This method uses multiples such as price-to-sales or the market capitalization relative to Total Value Locked derived from early funding rounds or peer projects.

By estimating future revenue or TVL multiples and discounting these figures to present value, we gain insight into how the market might value your token compared to its competitors. Firms such as Multicoon Capital use such comparisons while adjusting for differences in token supply and network utility.

### Our recommendation is to integrate all three models into your valuation process.

The Discounted Cash Flow model provides a forward-looking, risk-adjusted estimate of future cash flows. The Tokenomics model highlights how the design and economic incentives of your token create and capture value (**which we will cover in the next section**). And finally, the Market Multiples approach offers a reality check by comparing your project to similar competitors in the industry.



Phase 3

# Validation and Optimization

Our Validation process involves data-driven analysis, comparing the model against market standards, and competitors

On the Optimization layer we ensure that the design aligns with the project's goals and operates within the set parameters. Key areas like inflation, supply shocks, dilution risk, distribution fairness, investor balance, and other supply metrics.

# Validation and Optimization

## Validation and Optimization

Once the tokenomics model is designed, audited, we transition to the Validation and Optimization phase, which is crucial for refining and perfecting the framework before it is fully deployed.

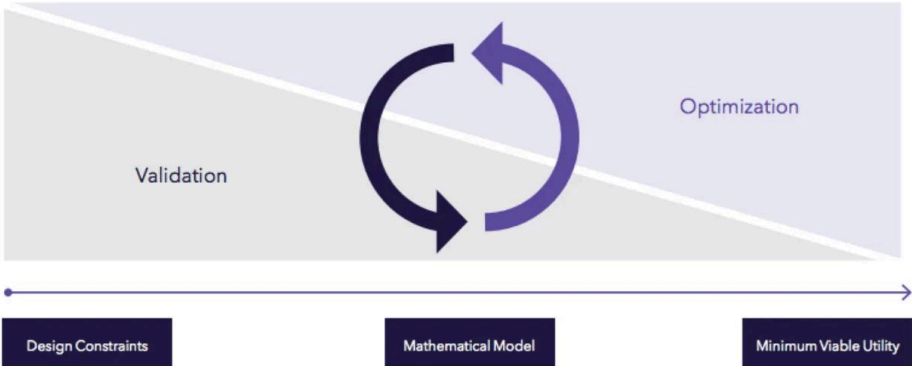
Validation is about comparing the model to market standards and competitor benchmarks using data-driven analysis. This step ensures that the model aligns with industry practices and is robust enough to withstand market dynamics. By simulating different scenarios, we validate how the model reacts to various market pressures like inflation, supply shocks, dilution risk, and distribution fairness. The objective is to identify any weaknesses in the design and adjust accordingly.

After validation, the process moves into Optimization, where we ensure that the tokenomics model operates within the set parameters and aligns with the project’s long-term goals. During optimization, we focus on areas such as investor balance, inflation control, and other critical supply metrics. The goal is to refine the design, ensuring that it supports sustainable growth, avoids excessive inflation, and maintains fair distribution among stakeholders.

The visual above demonstrates the flow from Validation to Optimization, emphasizing that these two phases are iterative and interconnected. The model is validated against constraints, then refined based on mathematical models, and optimized to reach a Minimum Viable Utility—the point where the tokenomics framework is robust, functional, and aligned with project objectives.

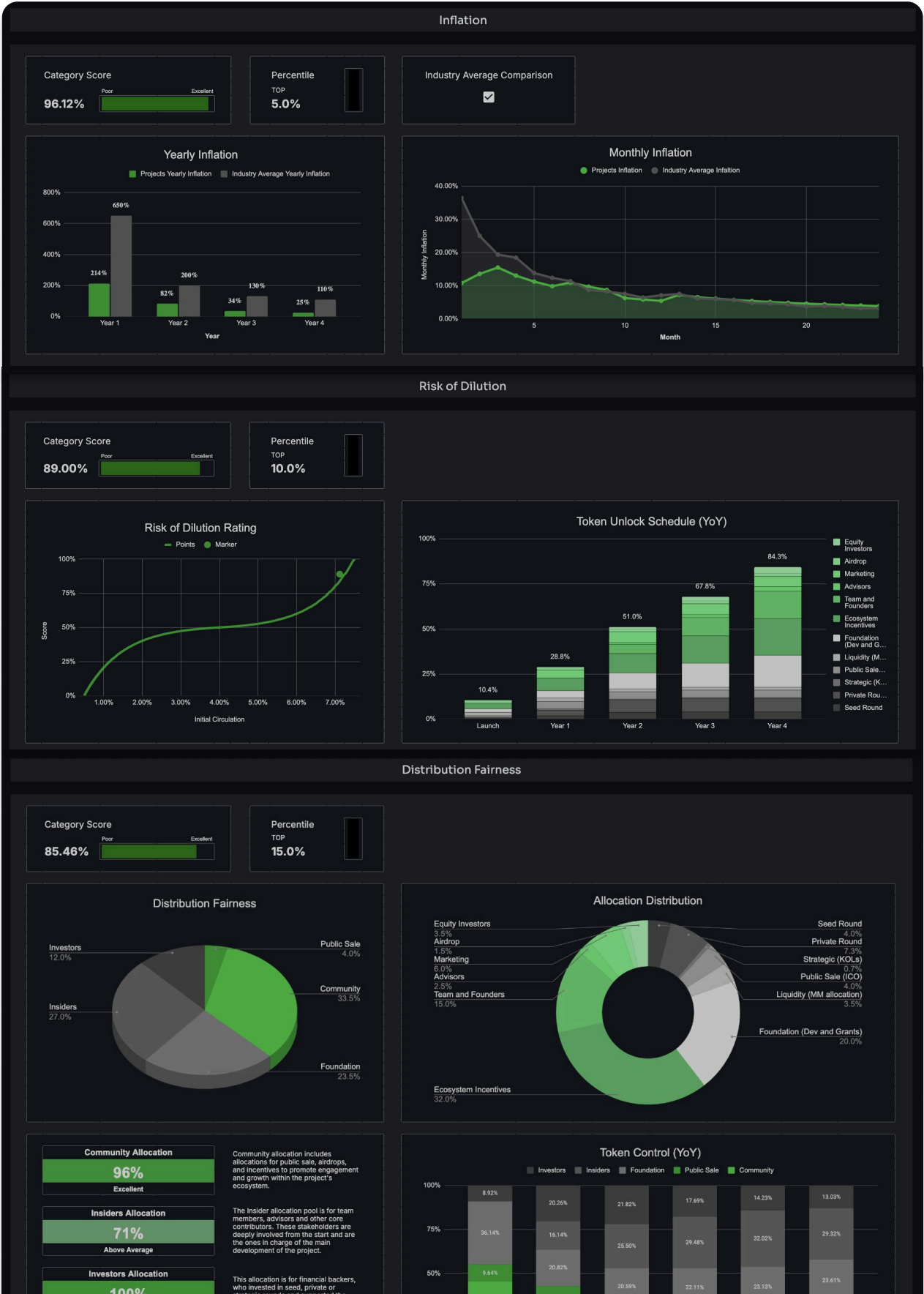
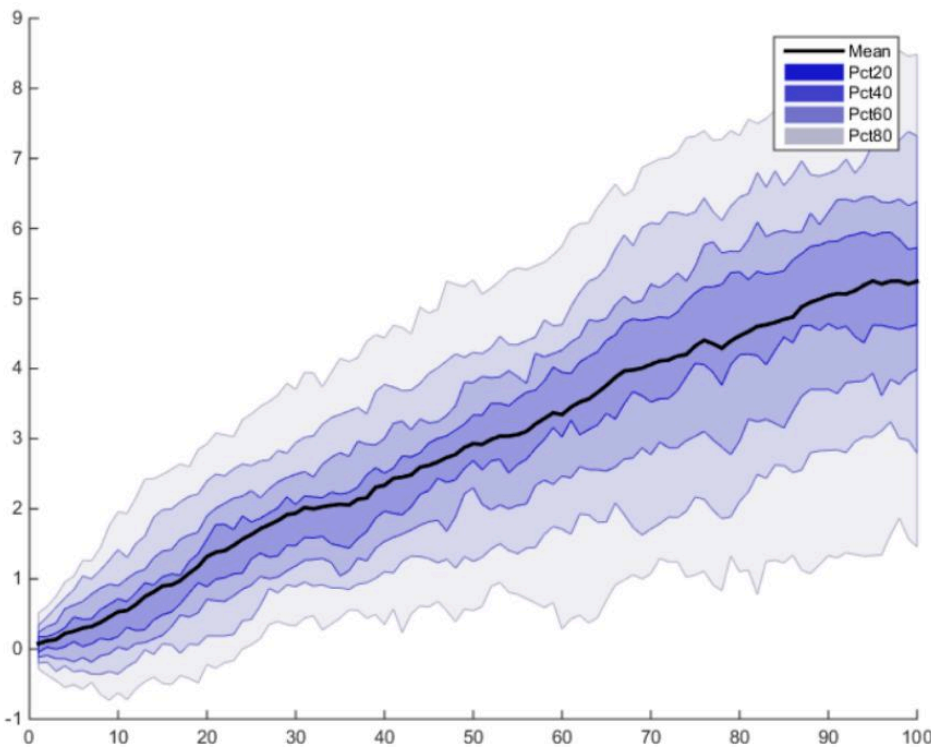
By cycling through validation and optimization, we ensure that the tokenomics model is not only technically sound but also practical and efficient for real-world deployment.

### Testing: Validation & Optimization



General flow moving from Validation to Optimization

Our validation and optimization phases follow an iterative feedback loop. After each round of validation, the model is adjusted based on performance and feedback, ensuring continuous refinement until the tokenomics framework reaches its most efficient and balanced state.





# Validation and Optimization

## Variations

Once we finalize the validation and optimization phase, we deploy three variations of the main tokenomics model, each tailored to a specific audience:

### 1. Community-Focused Model:

This version is communicated with a broad, community-centric approach. It's designed to explain the tokenomics in a clear, transparent way that engages the community, ensuring they understand the token's role, utility, and long-term vision. This approach helps build trust and engagement from key supporters, early adopters, and token holders.

### 2. Investor-Centric Model

This version is tailored specifically for investors. It focuses on the terms and conditions of the investment, highlighting the opportunities, expected returns, and the overall economic model of the token. It aims to provide a clear picture of the risks and rewards, ensuring that investors have a comprehensive understanding of how their interests are aligned with the project's goals.

### 3. Legal SAFT Agreement:

The third iteration is focused for the Simple Agreement for Future Tokens (SAFT). It outlines the specifics of the token allocation, vesting schedules, and other legal obligations related to the token sale, working as the source of truth.

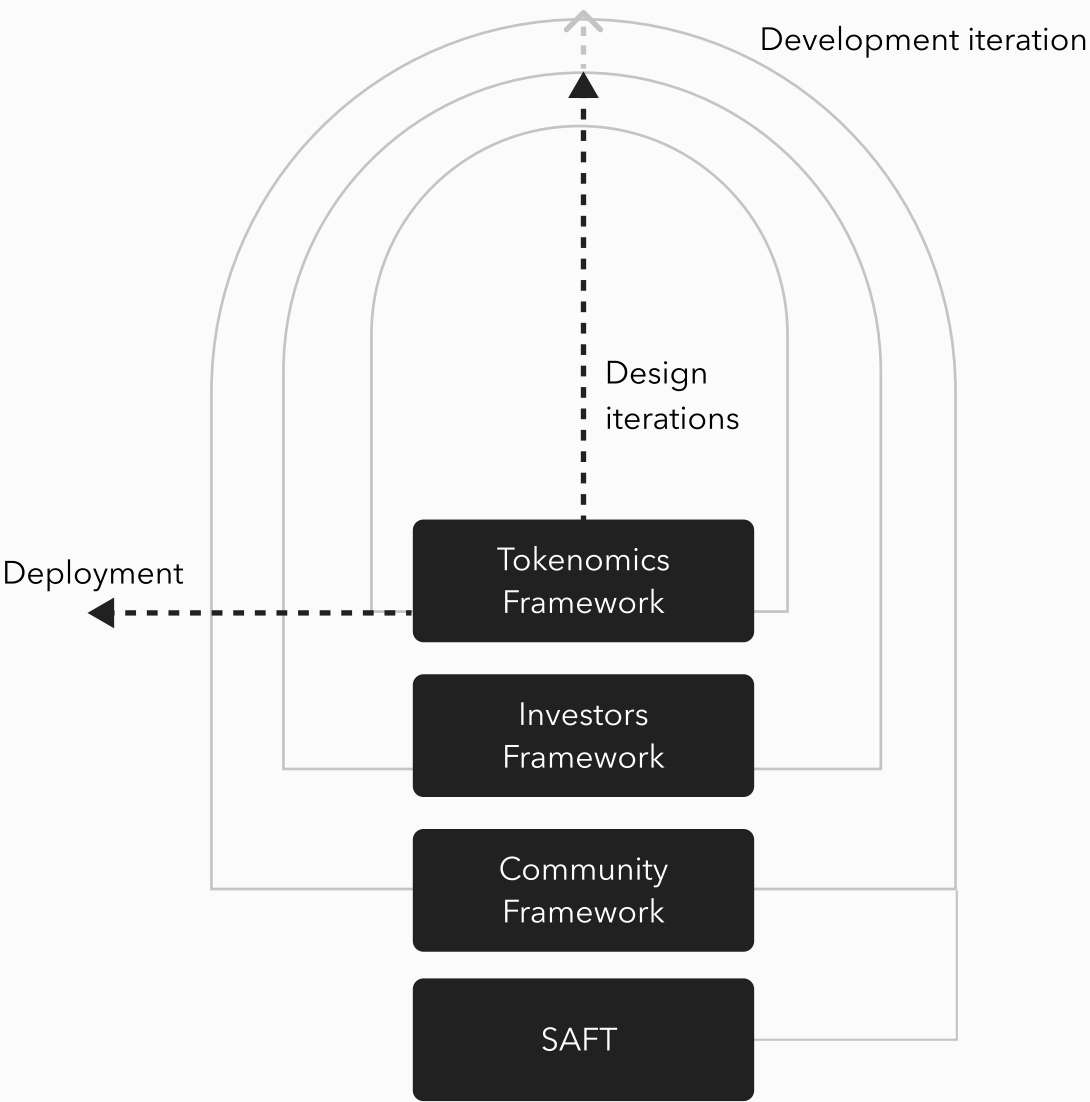
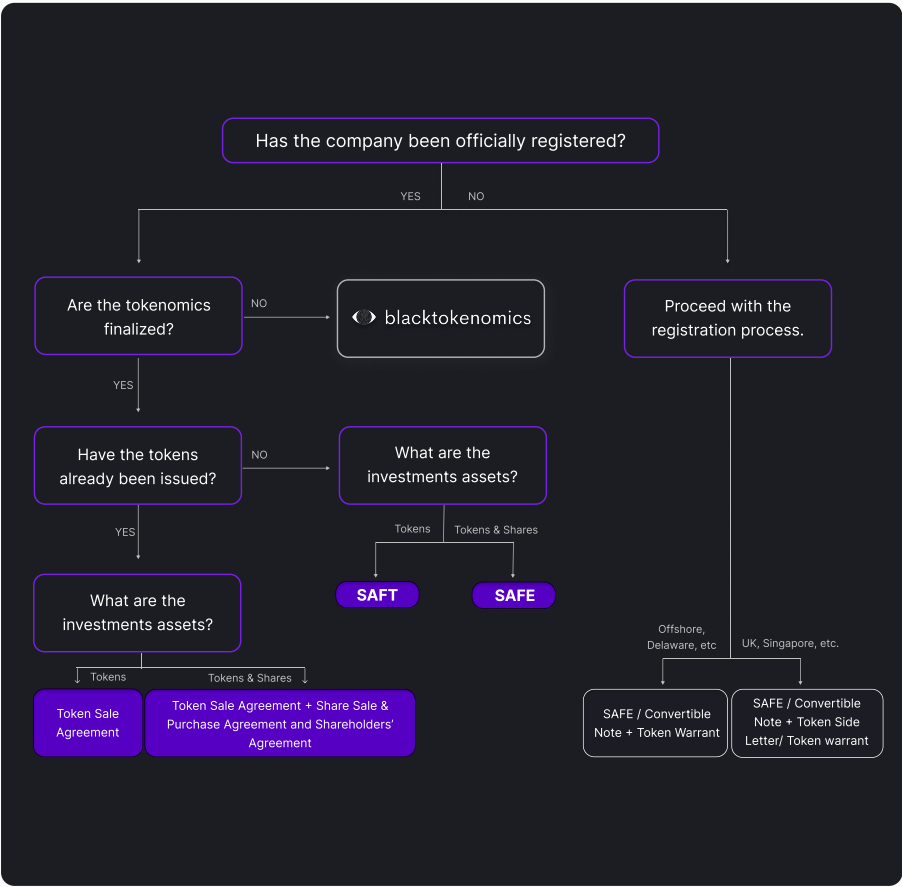
It's not only important to have the right numbers and conditions, but also present them in a compelling, easy to understand format for investors.

We ensure that investment rounds are balanced using our proprietary algorithm, designed to guarantee fairness across different rounds. These conditions are then clearly illustrated with charts, making them accessible and straightforward for investors.

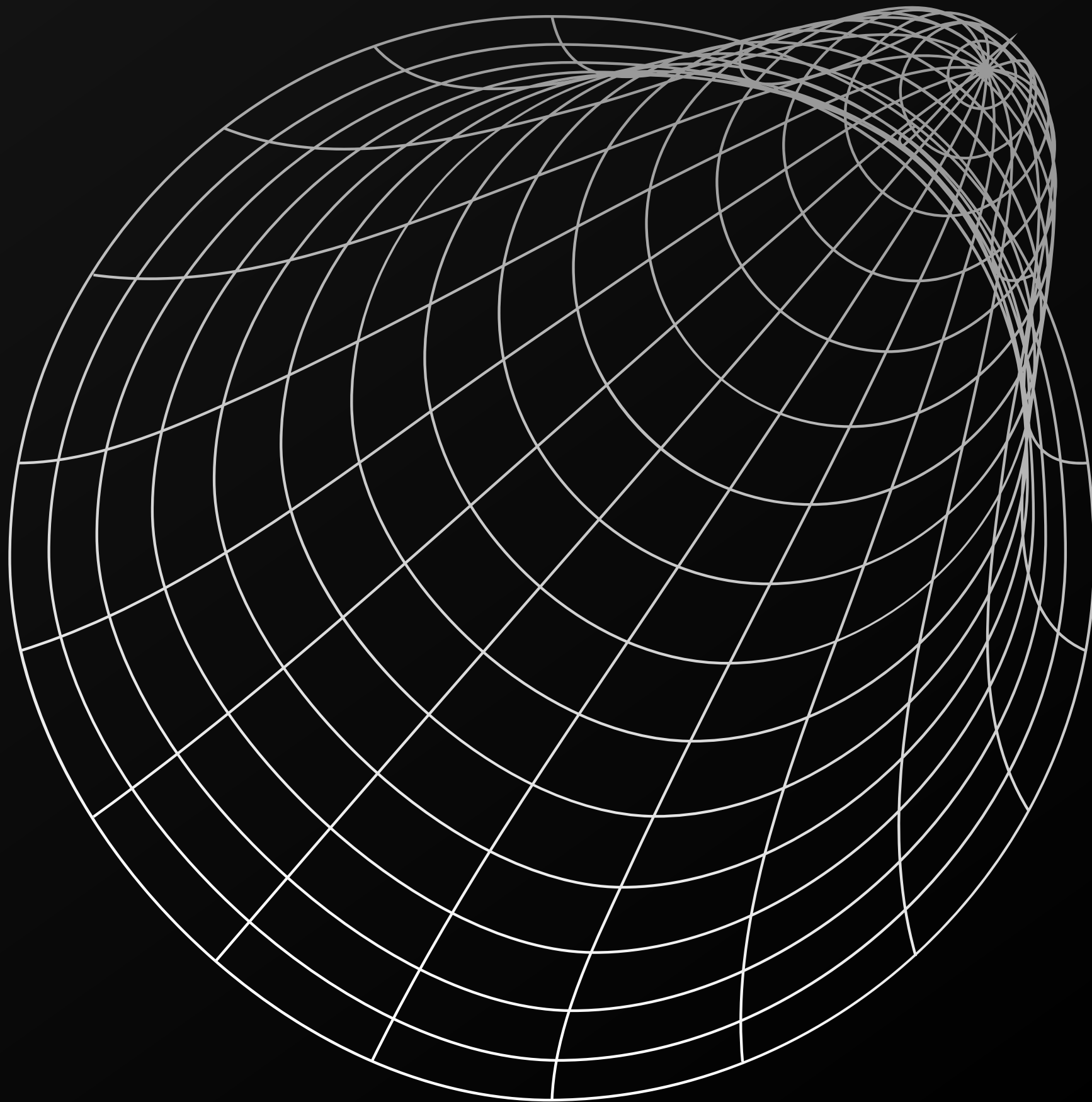
Additionally, we've developed a unique valuation model, which we call the "Vesting Diluted Valuation."

That unlike traditional FDV calculations, our model is centered around the specific vesting schedules, terms, and conditions of each round / investor.

This approach provides a more accurate valuation and helps incentivize investor participation.



Token design is a multidisciplinary process that pulls learnings from many fields.



Phase 3 .1

# Python Fundraising

In this phase, we elevate tokenomics by introducing an interactive model, transforming the token structure into a dynamic experience for potential investors.

This allows them to explore various scenarios, adjust parameters, and see how different factors influence potential returns.

By making the tokenomics model interactive, we not only present the data but also empower investors with a hands-on tool that highlights incentives and encourages informed investment.

# Python Fundraising

## Interactive tokenomics for investors

We use Python to simulate, model, and validate tokenomics frameworks with precision.

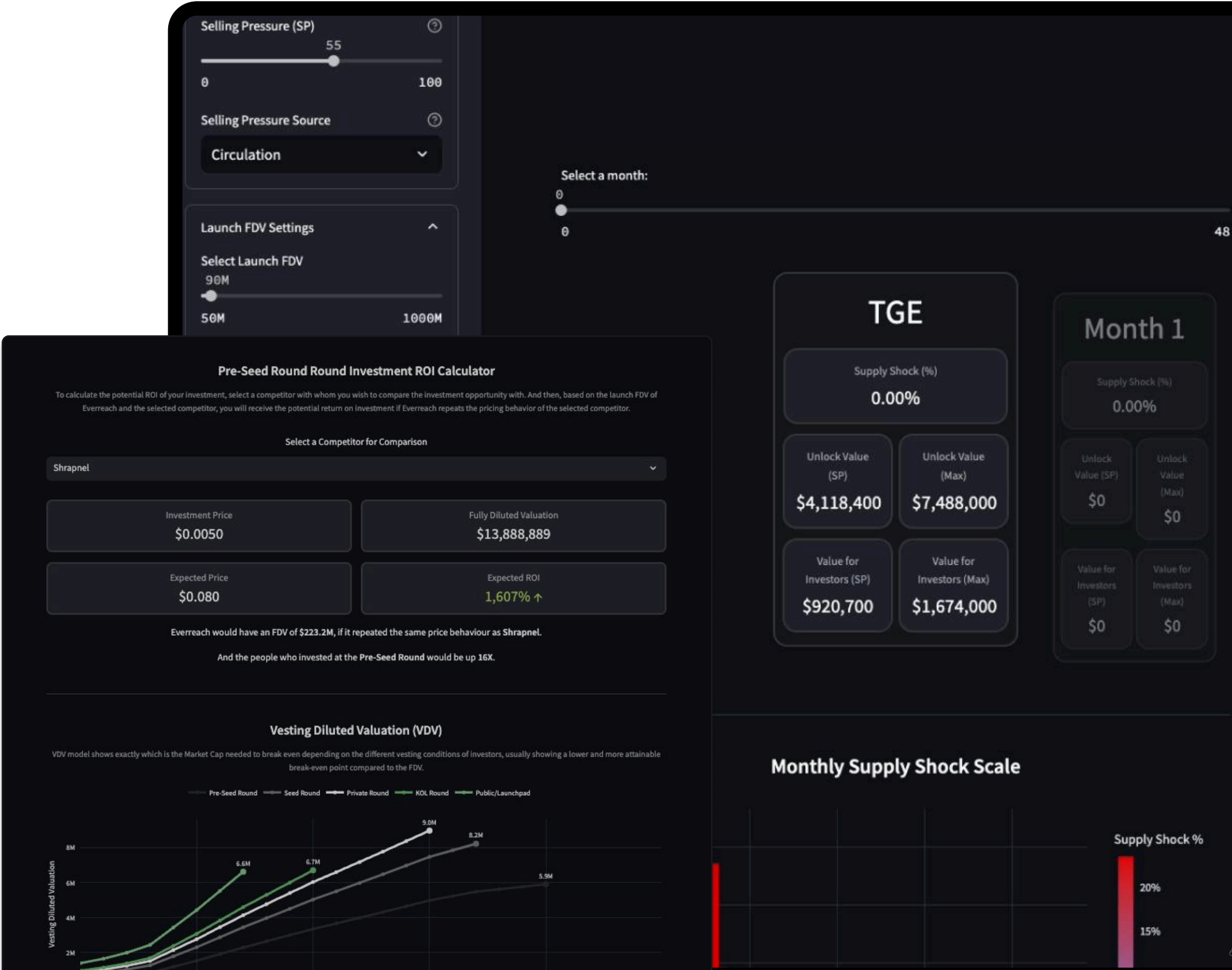
We have developed the Vesting Diluted Valuation (VDV) model on Python, designed to offer a realistic assessment of a project’s break-even valuation by focusing on vesting schedules for each funding round.

Unlike the Fully Diluted Valuation (FDV), which assumes all tokens are in circulation, the VDV model calculates the necessary market cap for investors to break even based on the actual circulating supply at each vesting stage, providing a more achievable and accurate target.

This model is presented to investors in an interactive format, transforming the token structure into a dynamic experience.

Investors can explore various scenarios, adjust parameters, and observe how different factors influence potential returns.

By making the tokenomics model interactive and providing a clear view of potential returns, we aim to incentivize investors through transparency and clarity, encouraging them to invest with confidence.





# Fundraising

## What fundraising instrument?

Since 2019, BlackTokenomics has worked with (plus sometimes also invested) over 150 Web3 startups. Andres, the founder, previously managed a Web3 venture capital firm, gaining deep insights into early-stage funding.

During our experiences, we’ve encountered numerous Web3 companies seeking to raise from venture capital using various fundraising instruments.

**This section of the bible aims to outline the three major fundraising instruments**, their key features, and provide a high-level guide to help you determine the most suitable investment contract for your Web3 startup.

### 1) SAFE (Simple Agreement for Future Equity)

A SAFE is a type of investment contract that is commonly used in early-stage startup fundraising. The SAFE fundraising contract was developed by Y Combinator in 2013 as an alternative to convertible debt and has become a very popular equity fundraising instrument.

Startups leveraging SAFEs provide investors with the right to convert their investment into equity at a future priced round or liquidity event.

Key characteristics include:

- **Simplicity**  
Typically concise and straightforward, making them quick and cost-effective to structure.
- **Future Equity**  
Investors don’t receive shares immediately but instead gain rights to convert their investment into equity upon specific future triggers, such as Series-A rounds or company acquisitions.
- **Valuation Caps and Discounts**  
These provide preferential terms for early investors, protecting their investment from dilution and ensuring fair equity pricing.

- **No Interest or Maturity Date**  
Unlike convertible notes, SAFEs do not accumulate interest or have repayment obligations if conversion events don't materialize.
- **Risk**  
They offer fewer investor protections compared to traditional equity investments, increasing investor exposure in case of startup failure.

### 2) SAFT (Simple Agreement for Future Tokens)

As a natural evolution of SAFEs, the SAFT adapts the equity-oriented instrument specifically for blockchain startups. Companies using SAFTs raise capital against the promise of delivering functional tokens upon the Token Generation Event (TGE). This instrument streamlines the funding process, ensuring capital is available early to facilitate the necessary development of blockchain technology.

Key features include:

- **Token-focused Funding:** Companies that inherently require tokens can raise capital in a straightforward manner similar to traditional startups raising via SAFEs.
- **Accredited Investors:** Usually, SAFTs are available only to accredited investors following strict KYC/AML compliance due to their security-like nature in many jurisdictions.
- **Token Generation Event (TGE) Trigger:** Conversion from investment to tokens occurs upon the token contract's deployment, typically followed by contractual lock-ups or vesting schedules.
- **Contractual Deadlines:** Important to manage carefully, as they can necessitate a premature TGE, impacting market success and token stability negatively.
- **Risk:** Investors only receive future tokens, without equity claims if the project pivots or abandons the token model altogether.

### SAFE+T (SAFE + Token Side Letter)

The SAFE+T blends traditional equity investment through a SAFE with a flexible side letter or warrant granting optional future token allocations.

Increasingly favored by Web3 startups, SAFE+T enables projects to raise capital without prematurely committing to a token launch, allowing agility in product pivots.

The three primary methods of structuring token allocations within SAFE+T:

**Company Allocation Method:** Investors receive tokens based on proportional ownership, taken from insider allocations (founders, treasury, etc.).

**Fully Diluted Supply Method:** Investors' token allocation directly reflects their equity percentage from the fully diluted token supply.

**Conversion Rate Method:** Investors obtain tokens via predefined equity-to-token conversion ratios (e.g., a 4:1 equity-to-token conversion rate).

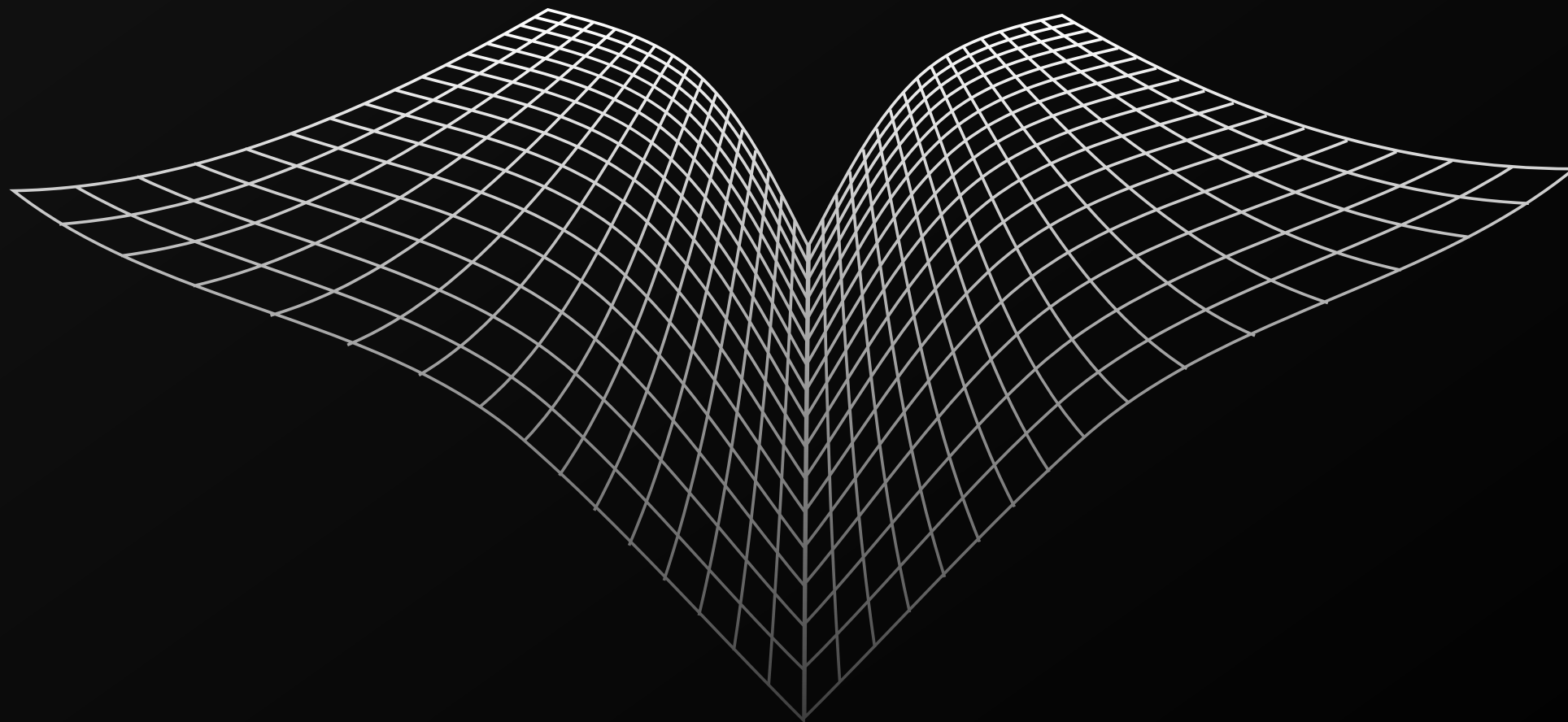
Each structure has distinct advantages, ranging from greater company control (Company Allocation Method), guaranteed fixed percentages for investors (Fully Diluted Method), or a balanced approach (Conversion Rate Method).

Methodology	Description	Example	Advantage
Company allocation or insider's supply method	Investors are allocated a proportional share of the company or insider's allocation of the tokens (inclusive of the founders, employees, and the corporate treasury).	If the investor owns 10% of the company equity, and the company gets 25% of the token supply, then the investor gets to purchase up to 2.5% (10% * 25%) of the fully diluted token supply.	<b>The company</b> has more control and discretion of how much the company should receive of the token supply, and therefore the proportional investor share.
Fully diluted supply method	Investors are allocated a percentage of the fully diluted supply of tokens.	If the investor owns 5% of the company equity, the investor gets to purchase 5% of the fully diluted token supply.	<b>The investors</b> are generally getting a larger share of the token supply and are guaranteed a fixed percentage.
Conversion rate method	Equity-to-token conversion rate depending on equity ownership percentage.  Investors get a guaranteed % of the supply at a conversion ratio of their equity ownership.	If the investor owns 10% of the company equity, there is some conversion rate (50%, 33%, or 25%) where you can purchase up to 5%, 3.3%, or 2.5% of the fully diluted token supply respectively.	<b>Advantage is split between company and investors.</b> The company gives less tokens to investors for the same amount of capital, but investors are guaranteed a fixed percentage of the tokens.

It is imperative that when you are structuring your fundraising documentation you understand some fundamental things such as:

Whether the value of your blockchain project is **accruing in the token, equity or both.**

*\*we cover this topic in page 79.*



Phase 4

# Tokenomics Documentation

We understand that it's not enough to have the right numbers; you also need to present them in a way that truly resonates with investors.

We craft the tokenomics community documentation, with a broad community centric approach, and the investors documentation with a technical incentive approach.



# Tokenomics Documentation

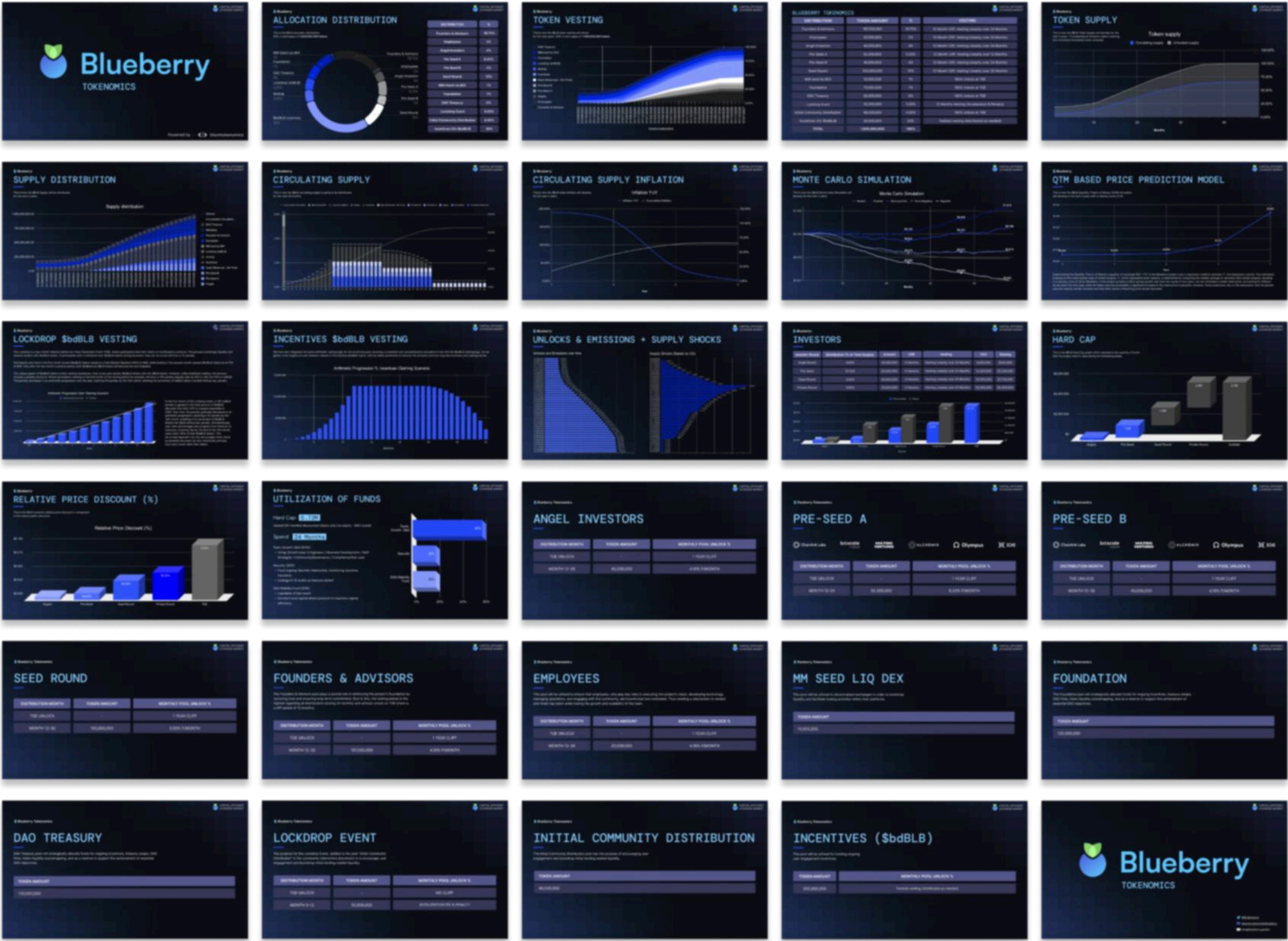
## Investors documentation

When it comes to private investor-focused documentation, our goal is to highlight the investment opportunity and the financial potential of the tokenomics model. Investors care about the bottom line: how their investment will grow, what risks are involved, and how the model safeguards their capital.

So, we don't just present raw data; we explain why it matters. We break down token allocation and vesting schedules not just as numbers on a page, but as part of a broader financial narrative. We make sure investors can clearly see how the model ensures growth while mitigating risks like dilution or inflation.

For investors, we position the project as a strategic investment, showing them the data but also ensuring they see the bigger picture: why this tokenomics model stands out, how it compares to competitors, why it's unique and designed for growth.

We also create the tokenomics slides for your deck, designed to effectively communicate the investment opportunity to potential investors. This slides highlights the key aspects of your tokenomics model that are most relevant to investors.





# Tokenomics Documentation

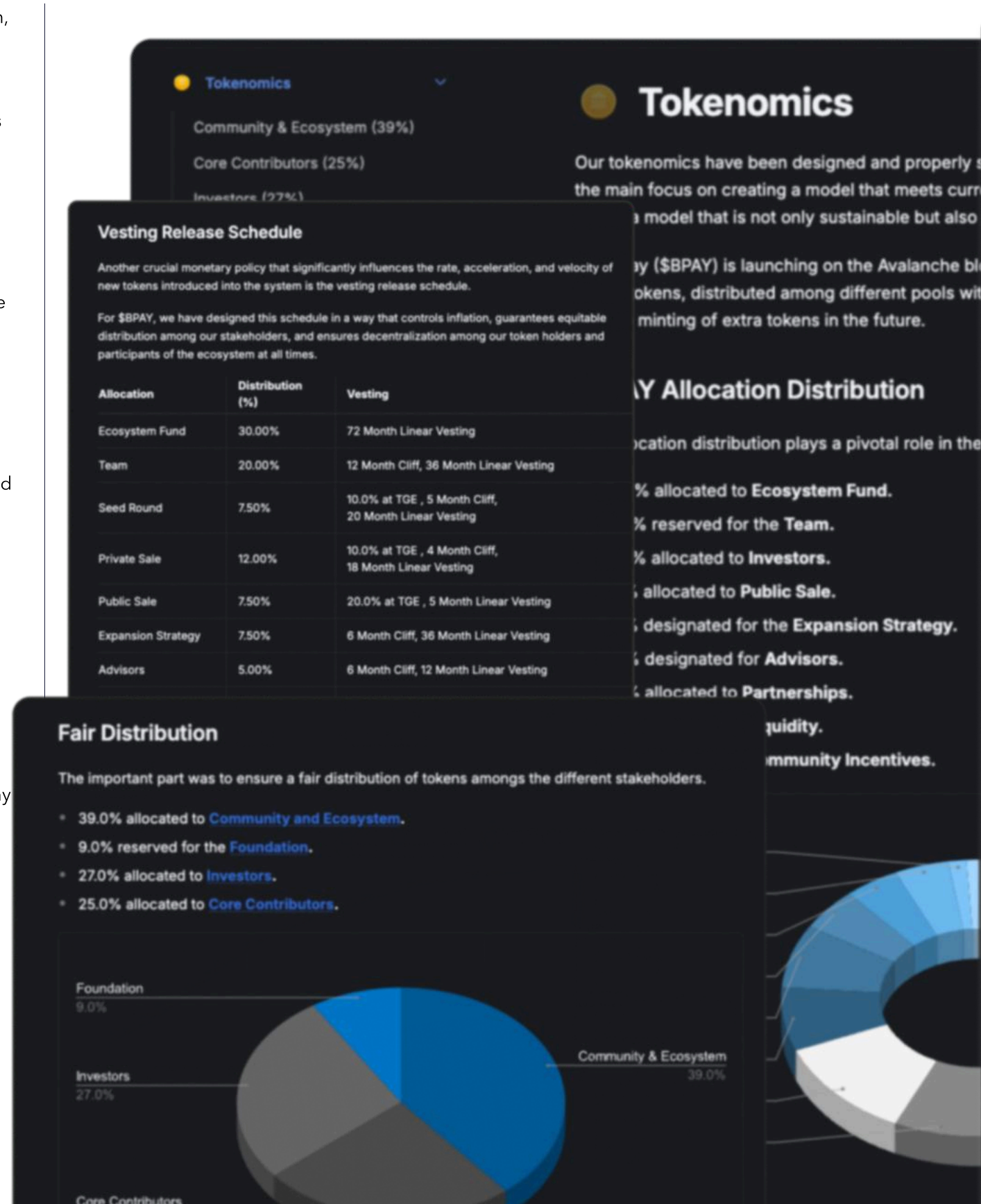
## Community documentation

On the other hand for the community documentation, the approach shifts to a broader, community-focused perspective. The community isn't necessarily looking for ROI metrics, they want to know how the token will work for them. So we put the spotlight on utility flows and incentives. We break down how the token operates within the ecosystem, whether it's for staking, governance, or rewards so that every participant, from the most experienced user to someone just getting involved, can clearly see where they fit in. The documentation here is less about the technical economics and supply mechanics and more about engaging the community, building trust, and showing how everyone benefits from long-term participation.

The aim is to show that the tokenomics is designed not just to create value but to align with the needs and behaviors of all ecosystem participants. It's about ensuring that the community understands how their participation fuels the project's success and, in turn, how they are rewarded for it.

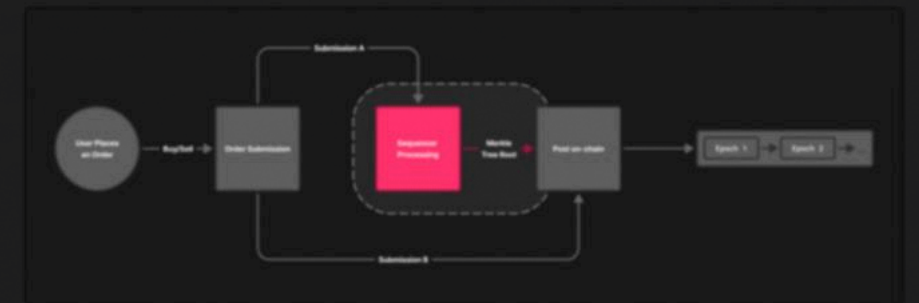
Ultimately, the difference in approach is clear: for investors, it's about presenting the investment opportunity ensuring that the tokenomics resonates by showing financial growth, minimizing risk, and providing clear return strategies. For the community, it's about focusing on utility, incentive alignment, and making sure the broader ecosystem works in harmony to drive long-term participation and value creation.

Each audience requires a tailored approach that not only presents the right numbers but also tells a story that truly resonates with their specific concerns and interests.



## Sequencer Processing

Once the order has been submitted, it moves to the **sequencer** stage. The sequencer's main job is to organize and arrange all the centralized transactions in a specific order, making sure everything is processed fairly and consistently.



## Challenge Results

The **60% of transaction fees** collected are locked in the Treasury for **14 days**, acting as a **prize pool** that both **Validating Nodes (VNs)** and the **Sequencer** "compete" for. The outcome of this competition depends on whether the **Sequencer** behaves correctly or whether a **challenge** raised by VNs is successful.



**The system is designed to align the incentives for both parties:**

Sequencer's Incentive	Validating Nodes (VNs) Incentive
The Sequencer's goal is to never make	The VNs' incentive is to monitor the

# Tokenomics Documentation

Tokenomics rationale report

## Investors Report for RWA Project

A report for private investors that explains the rationale behind the tokenomics model.



“We understand that is not enough to have the right numbers you also need to present them in a way that truly resonates with investors.”

Domas Golysenko, Co-Founder @ Blacktokenomics

A handwritten signature of Domas Golysenko in black ink. The signature is stylized and cursive, with a large 'D' and 'G'.





NOW AS YOU FUNDRAISE  
**WE MOVE INTO THE HEAVY SYSTEMS**



Phase 5.1

# The Value Triangle

The Tokenomics Value Flow is one of the core fundamentals of every tokenomics framework.

Web3 founders build great products but assume that having lots of users will automatically drive token value.

but without the right systems in place, they end up losing money as token value slips away.

we will explain this in detail while covering three main concepts:

- value creation
- value accrual
- value capture

# The Value Triangle

Key fundamentals and models we run

**The first concept is value creation.**

this refers to the mechanisms by which a token ecosystem generates utility or benefits for its participants.

Think of the ethereum’s platform, which enables developers to build decentralized applications (dApps), creating a wide array of services and tools that benefit users globally.

This capability has led to a rich ecosystem of DeFi projects, NFTs, and more, enhancing the overall value of the Ethereum network.

Value creation attracts users.

But just because your product creates value does not necessarily mean it captures any of that value - it depends on your business model and parameters.

We always emphasize that tokenization alone does not create value. A strong underlying application is essential, it must solve a real problem, engage users, and foster a community that is motivated to use and support the application.

Tokens, in this case, enhance the system’s efficiency and enable the creation and capture of value.

The token itself is typically used as an incentive layer, encouraging participation and interaction within the ecosystem.

While incentives are powerful, they are not unique to blockchain and have been used in various online platforms, like Reddit or even larger applications like Uber.

However, it’s crucial to recognize that a token is not a one-size-fits-all solution. In some cases, a traditional equity model may be more appropriate, depending on the project’s needs and objectives.

**Next is Value Capture.**

As we understand that creating value is only the first step in token design. To truly benefit a project, the token needs to effectively capture the value generated by the network.

Value capture mechanisms allow the token to benefit from the utility and demand within the ecosystem.

Value Capture (a business’s ability to create profit from it’s transactions) is one of the most interesting and under-studied areas of business.

A product can’t capture value if it hasn’t created any in the first place. But it’s also easy to create value and not capture any of it.

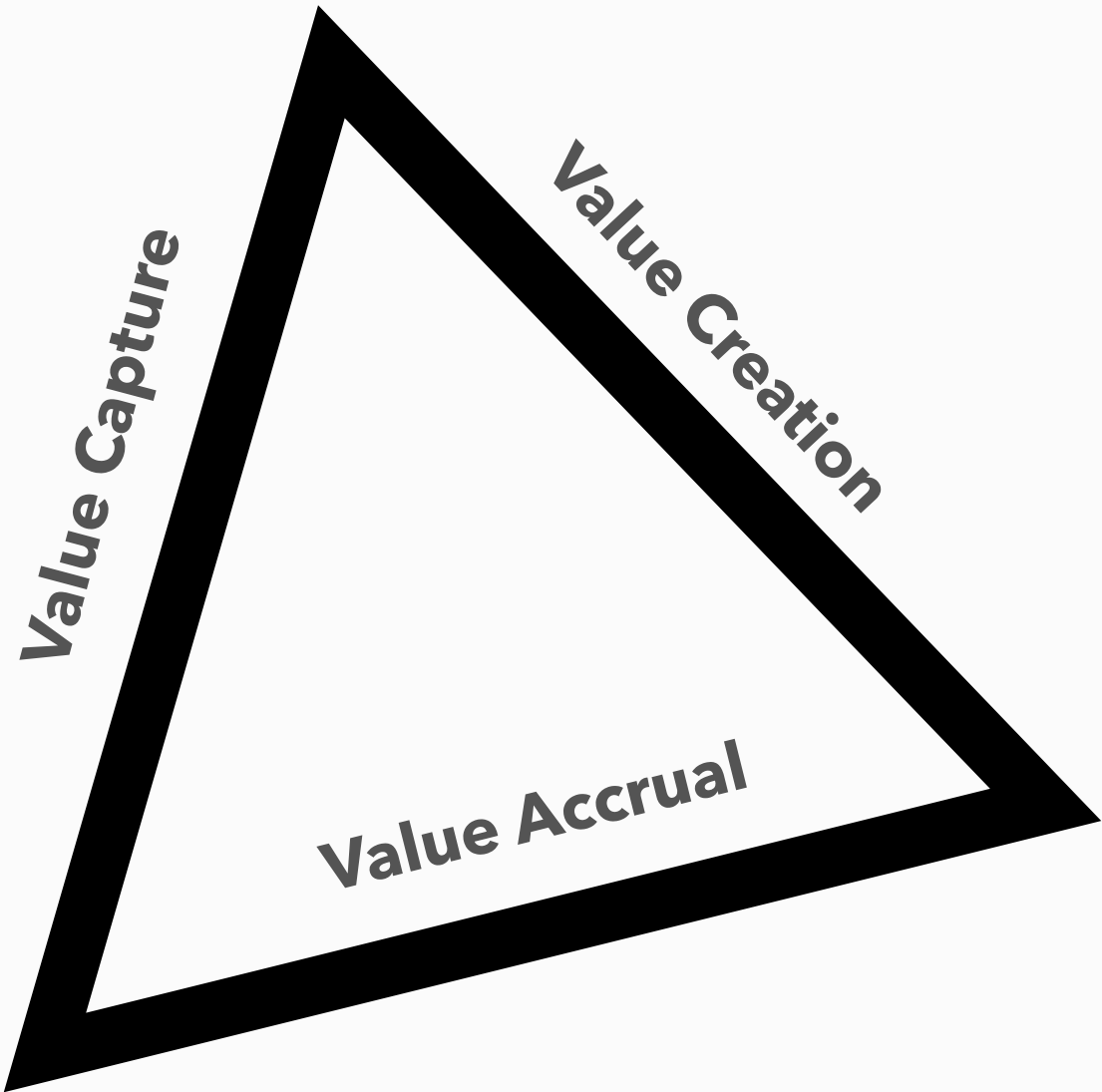
Just because a product captures value does not mean that value accrues to the token.

Which brings us to the next concept: **Value accrual.**

Value accrual relates to how desirable the token is to hold (holdability) and external demand for your token.

In other words, value accrual is how a token ecosystem creates and maintains demand over time, while transforming that demand into captured value.

Token value accrual can be an especially critical topic from a regulatory point of view. Always get a legal opinion from a registered professional before launching a token.





# The Value Triangle

## Value Accrual forms

Arguably the simplest and most direct form of value accrual **is a token with utility** (creating demand for the token) combined with scarce supply - as more users want to acquire the token to use it, value accrues to the token.

But only if the net growth in demand continues to exceed net growth in supply. In reality, in these terms are often heavily dominated by other elements than utility, such as overall market trends, token price speculation, and existing token supply moving.

Remember that scarcity alone does not make something value - rare collectibles that no one wants to buy are still worthless. Builders too often forget that utility and demand are required as well.

Furthermore, relying on this form of value accrual requires careful management of supply and supply sinks, which can tempt builders into adding in token sink mechanisms that simply add user friction add amplify the volatility of supply inflows/outflows without adding any value to the product (for instance staking APE tokens to simply earn more tokens)

### Buyback and Burn

Revenues earned by the product are used to repurchase tokens from the open market, and then some or all of these tokens are burned.

Modern AMMs allow for this process to be fully decentralized and non-custodial. To do so, the product's smart contract collects fees and has a publicly callable contract which will place a trade to buyback the native token from an existing AMM pool and burn them.

Since all token holders have an incentive to trigger the contract to buyback from the pool, and the contract can be called by any token holder, it's inevitable that the contract is called from time to time to buyback tokens and burn them.

In practice, certain limitations may be desirable to avoid abuse, such as a maximum cap on the number of tokens repurchased per day, or throttling how often the public contract can be called - but these too are part of the contract itself, removing the need for any centralized entity to take custody or oversee the process.

The benefit of buyback and burn is two-fold:

- The greater the revenues, the more buying pressure there is in the short term, accruing immediate value to the token
- The greater the revenues, the more tokens are burned, thus the more supply is reduced, making tokens increasingly sparse

The downsides are that buyback and burns reward dead wallets, and if done indiscriminately, can be buying back tokens at peak speculation prices.

A reasonable modification may be to buyback dips in the token price, essentially helping to establish a price floor - which makes a bigger impact on prices when it matters most (in downturns) and be a more efficient spend of the funds, especially if buybacks are telegraphed and can be front run, which would mean buying back tokens at short-term highs.

Either way, critics of buyback and burns are correct in that it consumes funds that could otherwise be reinvested into growth.

Once a product is mature, such that it generates large, stable revenues but not growing quickly, buybacks may be the optimal approach - but while revenue is growing at a faster rate than the rate of return earned by buybacks, it is value destructive to buyback and burn instead of reinvest in growth

### Buyback and LP

The immediate effect of buyback and LP is very similar to buyback and burn, as the buyback adds net demand pressure, and tokens are removed from “active” supply (removed from non-treasury owned supply) instead of being distributed to wallets that may sell them again (as is the case in buyback and build).

The tokens don’t cease to exist though, they can still be purchased from the liquidity pool, so the circulating supply does not change. This means that in the longer term, buyback and LP is not as deflationary as buyback and burn.

That said, by increasing liquidity, the price volatility of the token is dampened, as future buys or sells with have less market impact.

### Fee Distributions

With fee distributions, revenues are directly distributed on a pro-rata basis to token holders or to staked tokens in order to reward those with skin-in-the-game.

- CRV, GXM, LQTY, and MPL are each examples of tokens that do this in some form, and when done properly, fee distributions can be done in a decentralized, non-custodial, and gas-efficient manner.

For example, CRV distributes a portion of fees to veCRV holders (CRV stakers) once a week, every Sunday at 12:00 UTC, and uses batching in order to minimize gas fees.

While fee distributions do not directly impact the token price, they create a token that pays a real yield - i.e. not just more of the product's native token. This yield has knock-on effects on token demand, and thus its price. For instance, if investments with similar risks pay a 10% yield, and a token is currently distributing an 12% yield from fee distributions of recurring revenue (a sustainable source of yield), that implies that there may be more demand for the token in the future as people would prefer to earn a 12% yield vs a 10% yield for the same level of risk, and thus buy more of the token.

When using fee distributions builders must also make decisions about who is eligible to receive distributions:

- Hold the token to be eligible
- Lock/stake the token to be eligible
- Provide liquidity with the token to be eligible

# The Value Triangle

## Value Accrual

Similarly, distributions can also be gated or weighted based on a time requirement:

- Fixed time requirement (e.x. must have been staking at least 30 days to be eligible for distributions)
- Boosting per amount of time (e.x. a user who has been staking 30 days will earn more share of future distributions than an otherwise equivalent user who has been staking 10 days)
- Committed time with no early unlock (e.x. must lock up for next 30 days to earn distributions)
- Committed time with early unlock penalties (e.x. commit to remain locked for the next 30 days to earn distributions, and incur a slashing penalty if unlocking before 30 days have passed)

Tokens from the first wave of projects from 2017 such as BNB and MKR, tend to use buybacks, whereas more recent projects, such as those from the 2020 DeFi Summer, tend to more commonly favor revenue distributions.

In fact, one of the reasons buyback variants originally become popular was due to a perception that they involved less regulatory risk than more direct fee distributions, not necessarily that they were stronger value accrual mechanisms.

That said, fee distributions indeed involve more regulatory risk in certain situations. In addition, they can potentially be less desirable for tax reasons, since fee distributions may be considered taxable as ordinary income at the time they are paid out. Conversely, appreciation in token price would only be taxable when tokens are sold, and potentially at lower “long terms capital gains” tax rates. This is not legal advice, accounting advice, or tax advice, and you should speak to a registered professional for relevant advice.

## Work Tokens

Kyle Samani's explanation below sums up Work Tokens' mechanism very well. Value accrues to the token as product usage increases due to the specific mechanism - not just because of a general assumption that usage translates into token demand.

The advantage here is that increased usage of the product pretty directly fuels demand for the token, without the product itself even needing to charge a fee that would otherwise reduce profits available to service providers.

The disadvantage is that requiring service providers to first acquire and stake large amounts of your token becomes an upfront investment that creates friction to adoption and may be a centralizing force by introducing a barrier to entry.

## Fee Discounts

Discounts can come in two forms:

- One time discount
- Perpetual discount

For a one time discount, the most well known example is BNB. Traders using Binance can optionally pay the fee for the trade in BNB token. Those tokens are used in the process, meaning they're a one time discount.

If the same trader wants a discount on the next trade, they need to go acquire more BNB if they don't have enough left over.

A perpetual discount is different - instead of spending tokens once for a discount, token holders get a higher percentage discount the more tokens they hold or stake.

As tokenomics deals partly with human behavior, it's as much a soft science (psychology, sociology, economics) as it is a hard science (math, physics) or an applied science (systems engineering).

Unlike hard sciences, soft sciences rarely deal with absolute right or wrong answers. Instead, they focus on trade-offs that are better or worse at optimizing for a given objective within a specific set of constraints.

For this reason, while quantitative topics such as statistical analysis, Monte Carlo simulations, and other number-heavy models are highly relevant, it's impossible to establish precise mathematical formulas for the “correct” tokenomics design.

This is where incentives come into play, as a way to direct human behavior and ensure that the tokenomics design functions as intended.

Coordinating user behavior comes down to answering these questions:

- Who do you reward/punish?
- What do you reward/punish them for doing?
- How much do you reward/punish them to do it?
- Where does this reward/punishment conflict with other elements of the system?

CoinMarketCap and CoinGecko are littered with failed projects whose builders fell into the trap of only answering these questions at a surface level due to laziness or hubris.

In complex systems, conflicting or misaligned incentives, and the exploit vectors they create, are hard to identify at first glance. Without explicitly thinking through the incentives in your tokenomics (and modeling them in later steps), you are blindly assuming your design will just happen to work out with no unexpected, emergent, or unintended user behaviors.

# Tokenomics Value

## Value capture and defensibility

The hierarchy of value capture is the axis along which protocols and the tokenomics mechanisms they employ can be ordered.

Protocols face a challenge in navigating this hierarchy when designing their value capture: mechanisms in the hierarchy of value capture can be ordered simultaneously as ascending in value capture, and descending in defensibility.

In essence, the more value a protocol captures, the less defensible it is.

This phenomenon epitomizes the tradeoffs between the first two **principles of tokenomics**: value capture, and utility; it will be helpful to understand a bit about these concepts before reading further.

Utility and **value capture** have tradeoffs because of their interdependence – the maximum value you can capture is the total value you create. As more value is captured, less is left for consumers.

Value creation, or utility, and value capture in crypto protocols resemble those of traditional companies, but they are not perfect analogs.

In a traditional business, value creation is the total value ascribed by consumers to a product or service; value is most frequently captured through profit, a percentage of the value created.

In crypto, utility is the same – the value created by a protocol, for users, **but value capture is often different**.

Value can be captured in more ways than in traditional businesses because of the types of tokens that are able to be created, and the underlying utility and flexibility of the blockchain back end.

But for both crypto protocols and traditional companies, the ability to capture value long-term is proportional to two things: value creation and defensibility.

### Defensibility

Defensibility is the competitive advantage of a protocol. It’s what keeps consumers from going to your competitors.

In short, moats.

It describes how much value can be sustainably captured before comparable utility is offered by a competitor.

The more defensible a protocol, the more value it can capture, and the more overtly it can do so.

### Maximizing defensibility results in a monopoly.

In Peter Thiel’s [famous talk at Stanford](#), he describes why you want to have a monopoly in your industry – monopolies can capture nearly all of the value they create.

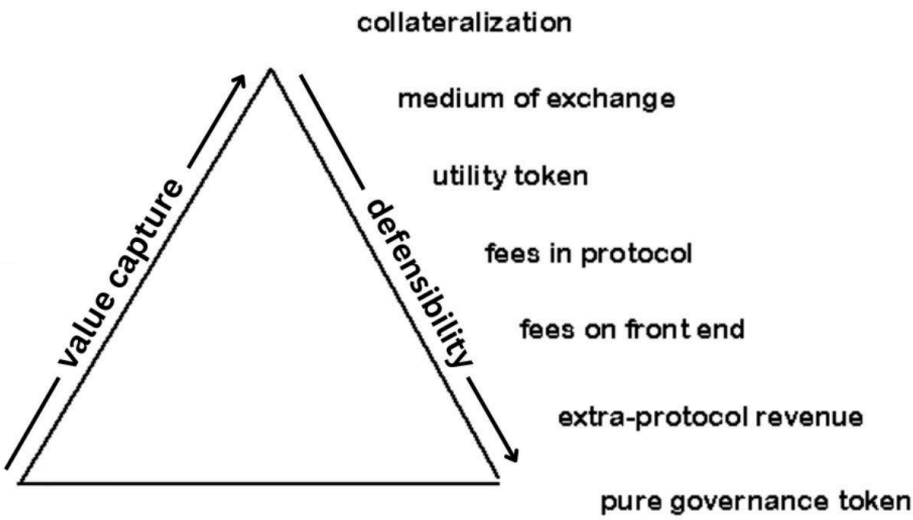
It’s difficult to have a monopoly in crypto, as it’s hard to build defensibility in open source

Still, there are various ways to build defensibility, and the more defensibility you have, the more value you can capture.

There are many reasons to build defensibility into your crypto protocol, and there are five moats – concrete ways of doing so.

These are:

- Network effect
- Lindy effect
- Documentation
- Brand
- Gas efficiency



### Network effect

Network effects build defensibility proportional to value created.

From Metcalfe’s Law, we know that networks become exponentially more useful to participants as the number of participants grows.

Metcalfe’s Law was originally used to describe fax and telephone networks.

Because crypto protocols share a network topology with these earlier telecommunications networks, Metcalfe’s Law also describes the utility of crypto protocols increasing exponentially with the number of users.

Protocols may use a first-mover advantage to generate strong network effects which increase utility, and therefore defensibility.

### Lindy effect

The Lindy effect is a theorized phenomenon whereby the longer something has been around, the more likely it is to remain.

Lindy is somewhat of a meme in crypto, where it’s perceived as a somewhat irrational phenomenon. Yet it makes an excellent moat for very rational reasons.

The length of time a given protocol has persisted without being hacked is a testament to that protocol’s security (especially in DeFi protocols, where black hat hackers are strongly incentivized to take advantage of a protocol).

The more unique the protocol, and the greater its TVL, the more Lindy “staying power” is ascribed to it.

Lindy effects become a strong moat for unique, high-TVL protocols over time as users prefer the security of battle-tested protocols to slight improvements in utility, or decreases in value capture.



# Tokenomics Value

## Moats and Defensibility

### Documentation

Good developer documentation is an under appreciated moat in crypto.

Good doc invites developers to build on top of a protocol.

In this way, documentation is important for primitives and other protocols that aspire to be money legos.

### Brand

Never underestimate the power of a good brand.

At a certain point, marketing takes care of itself for crypto protocols with good branding.

It can be difficult to displace incumbent protocols which have developed a good reputation, even becoming synonymous with their protocol’s function.

A good brand can be developed through organic or paid marketing activities, eventually causing the marketing activities to take on a life of their own.

### Gas efficiency

Gas efficiency is another moat, which, combined with the Lindy effect will give your protocol defensibility.

Gas efficiency is especially important for hyperstructures, or money legos. Because they are non-upgradeable contracts, hyperstructures must optimize everything possible before launching a version of the protocol.

Defensibility is one of the most important aspects of designing a protocol.

Building defensibly plays a part in the optimization between utility and value capture.

If you don’t design defensibly using these moats, your protocol will be copied by a competitor, who will capture less value.

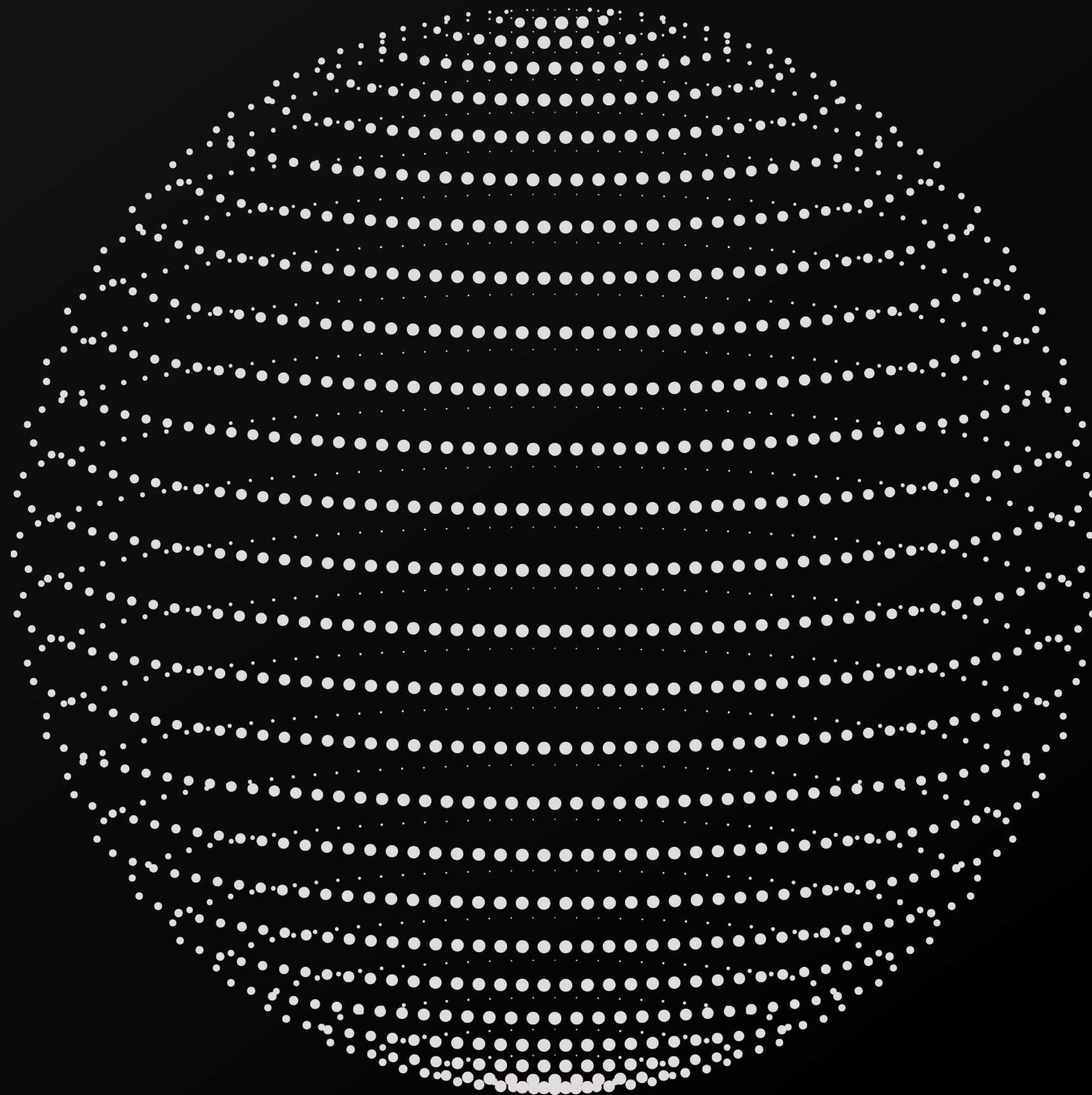
### Tokenomics leverage

The ratio of value captured to value created is called tokenomic leverage. Higher tokenomics leverage in a tokenomic mechanism or protocol overall is analogous to higher profit margins in a traditional business.

Tokenomics mechanisms further up the hierarchy have higher leverage. And it’s possible to have a tokenomic leverage greater than 1 - indicating more value is being captured than created.

When a protocol captures too much value, attempting to use their own token as a medium of exchange for example, they alienate users, enabling their competitors to copy their protocol without using a native token, capturing value through fees or another tokenomic mechanism with tokenomic leverage.

If a protocol captures too little, they lose out on the opportunity to capture value at all, and doom any competitors to the same fate.

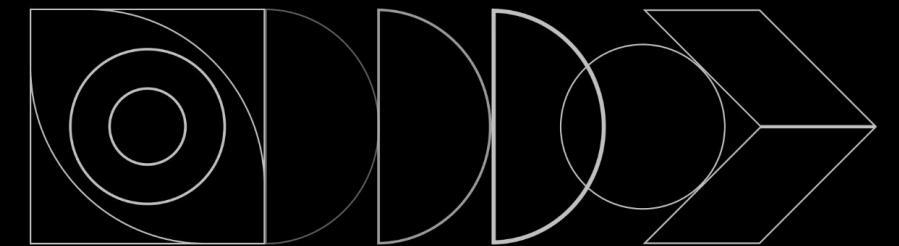


Phase 5

# Incentives System

Show me the incentive  
and I will show you the outcome.

Charlie Munger



# Incentives Systems

## Our circle model

At BlackTokenomics, we view incentives as the core mechanism that drives user behavior within an ecosystem.

By carefully designing and aligning incentives, we ensure that users are motivated to act in ways that create long-term value and support the health of the entire network.

**Our Circle Model** breaks down the fundamental layers of creating an effective incentive system.

We follow a structured, step-by-step approach focused on aligning incentives with desired behaviors within the ecosystem.

The first step is to identify who are the participants in your network and what tasks they perform.

Understanding these roles gives us a solid foundation for knowing how different types of users interact with the product.

Whether they are validators, liquidity providers, etc or regular users, each group has distinct tasks and contributions that need to be addressed in the incentive design.

Once we’ve understood the participants and their motivations, we move on to how users create value for the project.

Whether it’s through staking, providing liquidity, or contributing in other ways, each action should add value to the ecosystem.

The tokenomics incentive system must be designed to reward these actions appropriately. This ensures that value creation and distribution are balanced, and participants are properly incentivized to continue supporting the project.

From there, we focus on the actual incentive design. by identifying what behaviors we want to encourage and what actions we want to discourage.

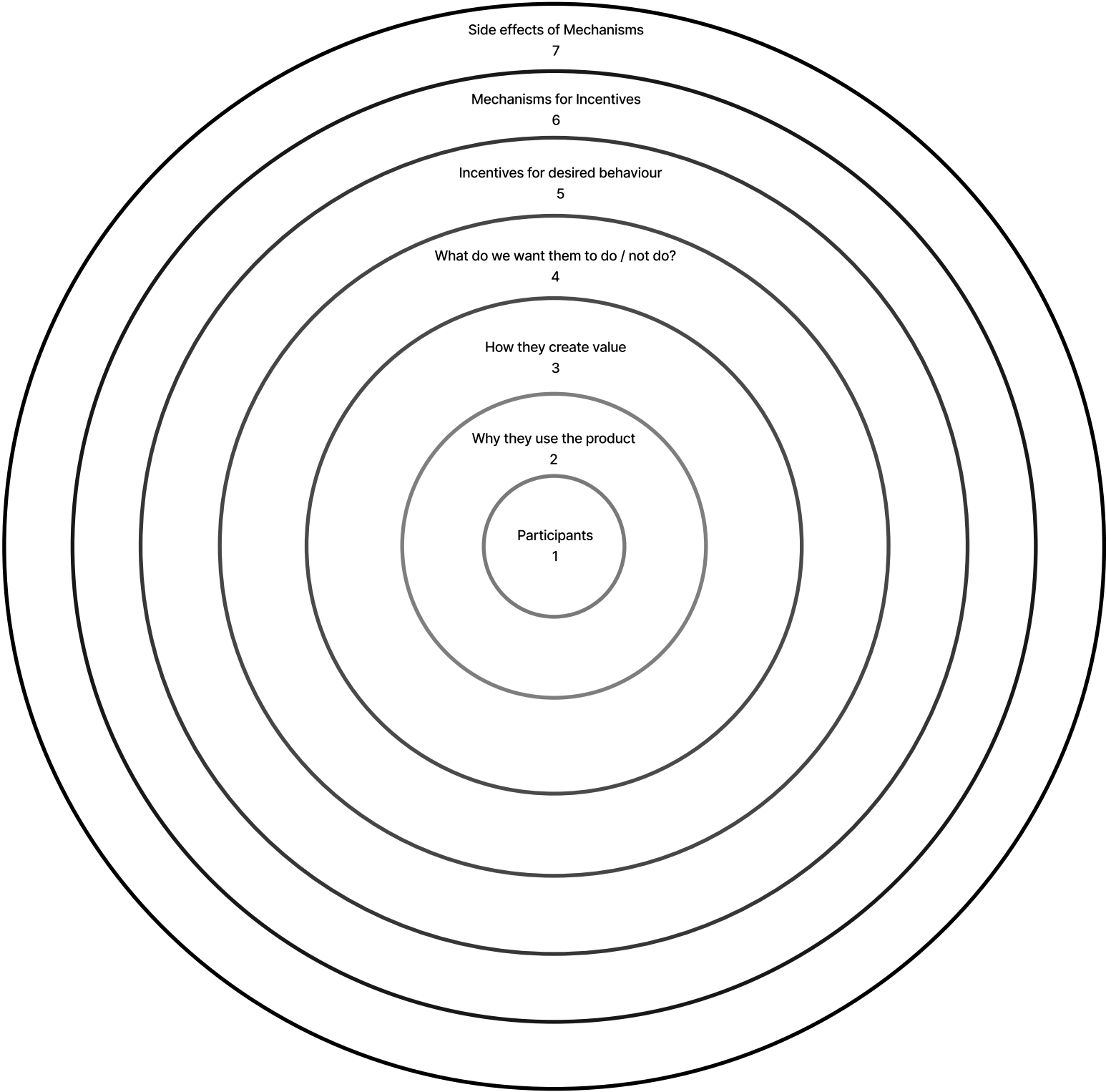
This includes setting up rewards (carrots) for desired actions and penalties (sticks) for behaviors that could harm the ecosystem.

After determining the incentives, the next step is translating them into mechanisms that can be coded into the system.

These mechanisms ensure that the incentives are consistently applied and that users are automatically rewarded or penalized based on their actions.

At this stage, we also consider the side effects of the mechanisms, running tests to ensure they don’t backfire or lead to unintended behaviors.

Finally, we map out the full incentive system, visualizing how all mechanisms interact with each other and ensuring that they align with the project’s overall goals.





# Step by Step Guide

## (Bonus)

In order to create an effective tokenomic system you need to understand who the different types of users are and what tasks they're performing. This may not seem important, but it is the foundation upon which your incentives will lie.

Create a circle map for each user in your project and the tasks they perform. You can copy/paste the map for all your users.

Participants

### 1. Participants (Who and What)

#### Ask yourself:

Who are the users of your project and what tasks do they do?

#### Resources:

- [Designing a sustainable system in equilibria](#)
- [Pay for performance systems](#)
- [What does a desirable action look like?](#)

Not everyone is motivated by the same thing, it is important to understand what motivates your users to use your product. Behavioural insights help us to get a better understanding of users motivations. Think about what the core motivator behind your users actions is.

### 3.3 Behavioural Insights

Think about what the core motivator behind your users actions is.

#### Resources:

- [Behavioural Insights Framework](#)

Bonus

## Incentives

Taking our defined users as an input, this section deals with the behaviours, incentives and mechanisms you want to put in place to get users to do what adds value to the project. Essentially, how do you get users to do you what you want?

The token is the tool to drive your users to certain behaviours. To get the incentives right, you need to define what you want them to do.

Add to your circle diagram what you want your users to be doing and things you don't want them to be doing.

What do we want them to do / not do?

### 4.1. Behaviour Framework

#### Ask yourself:

1. What do you want the user to do?
2. What do you not want the user to do?

#### Resources:

- [Tokenomics Evaluation Framework](#)

In 3.1 you looked at who will be using your product and what they will be doing. Now its time to think about why they use your product and what their underlying motivations for using your product are.

Why they use the product

### 2. Why and Motivation?

#### Ask yourself:

Why will they use your product?

Now that you know who will be using your product and why, it's time to think about how they create value for the product

How they create value

### 3.4 Value Created

#### Ask yourself:

- 1- How do they create value for the product?

Now that you know what you want your users to do and not do, you can expand upon this by thinking of carrots (reward) and sticks (punishment).

Incentive can be anything that could be used to get people to do what you want them to do.

For each user and their desired behaviour, you want to define the incentives that can ensure users are motivated to do what you'd like them to do.

Incentives for desired behaviour

### 4.2. Incentive Design

#### Ask yourself:

- 1- How do we incentive our desired behaviours?

# Step by Step Guide

## Core Mechanisms

So far, you have brainstormed on your mechanisms per user. It makes sense to now flesh them out in detail.

This should also give a clear understanding of which mechanisms introduce tokens into circulation (sources) and which take them out of circulation (sinks).

Mechanisms for Incentives

### 4.5. Core Mechanism

#### Ask yourself:

1 - Based on the mechanisms you determined in #4.4, explain each one in detail.

#### Resources:

- [Sources and sinks in games](#)
- [Token flow analysis](#)

User	Mechanism	Sink or Source?
<b>Description</b>		<b>Where do tokens come from?</b>
		<b>Who are tokens distributed to?</b>
<b>Distribution Quantity / Frequency?</b>		<b>Other / Additional</b>
<b>Impact on other users</b>		



User	Mechanism	Sink or Source?
Liquidity Provider	Reward early liquidity providers to reach critical mass	Source
<b>Description</b>		<b>Where do tokens come from?</b>
<ul style="list-style-type: none"><li>• A marketplace requires bootstrapping as without liquidity providers there won't be anyone swapping and without users swapping, no fees can be paid out.</li><li>• For a short period of time liquidity providers should be rewarded with project tokens for providing liquidity.</li></ul>		Genesis supply allocates a portion that is then distributed for a certain amount of time.
		<b>Who are tokens distributed to?</b>
		Liquidity providers proving initial liquidity
<b>Distribution Quantity / Frequency?</b>		<b>Other / Additional</b>
Weekly distribution based on total liquidity provided.		Import to wean off of this mechanism after a set timeframe.
<b>Impact on other users</b>		
<ul style="list-style-type: none"><li>• This mechanism is good to bootstrap but can backfire and work in reverse if not carefully scaled back after a short period of time.</li></ul>		

# Step by Step Guide Mapping

Take all mechanisms, users and components and create a diagram.

It will be a great representation of your ecosystem and will give you a fresh perspective.

Core Mechanisms

## 4.5. Core Mechanism

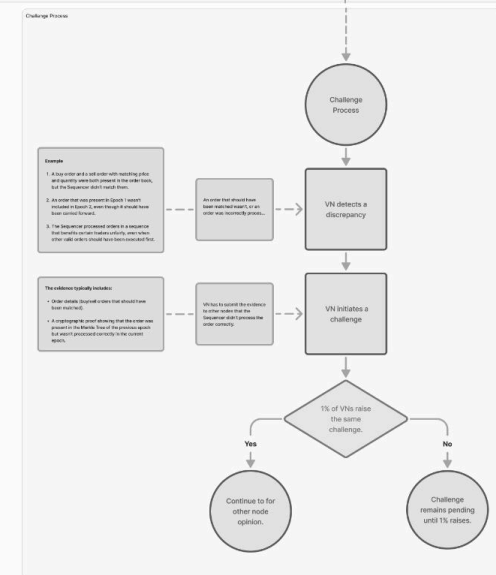
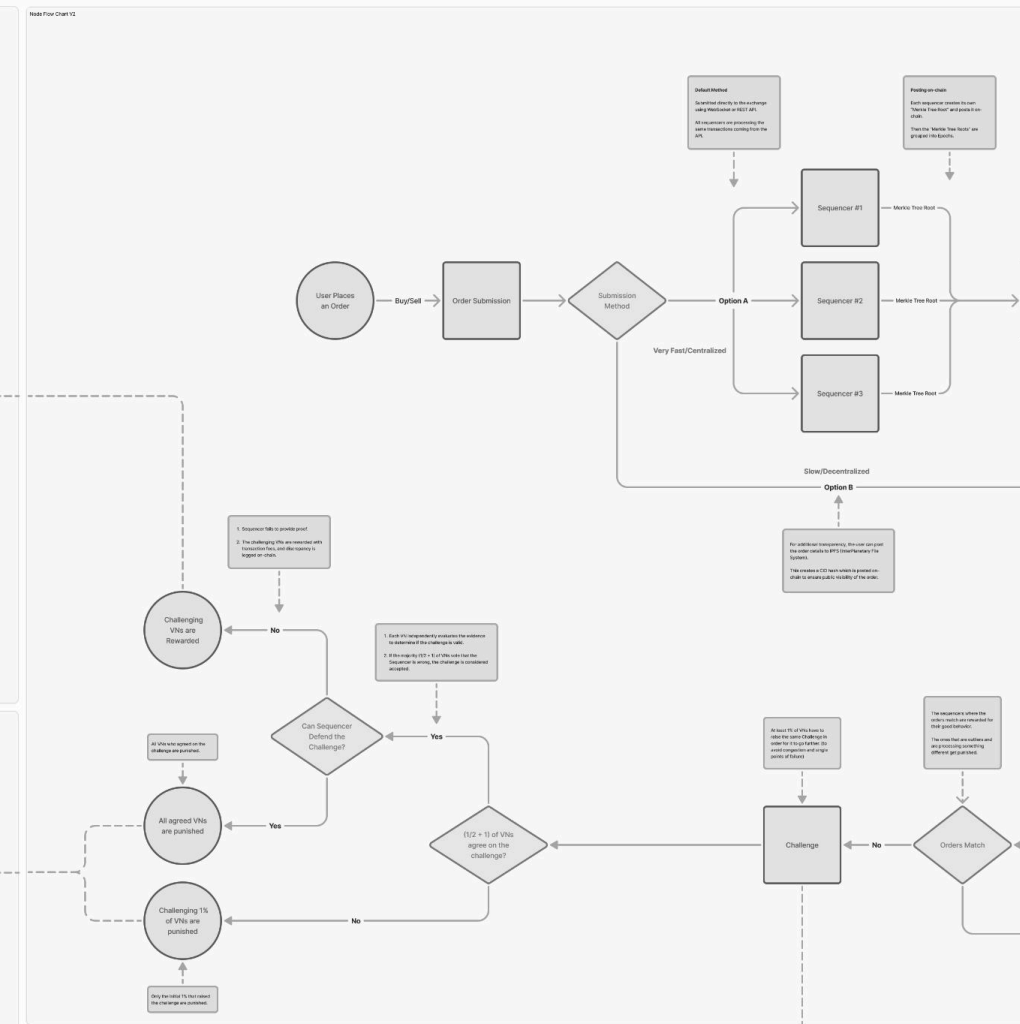
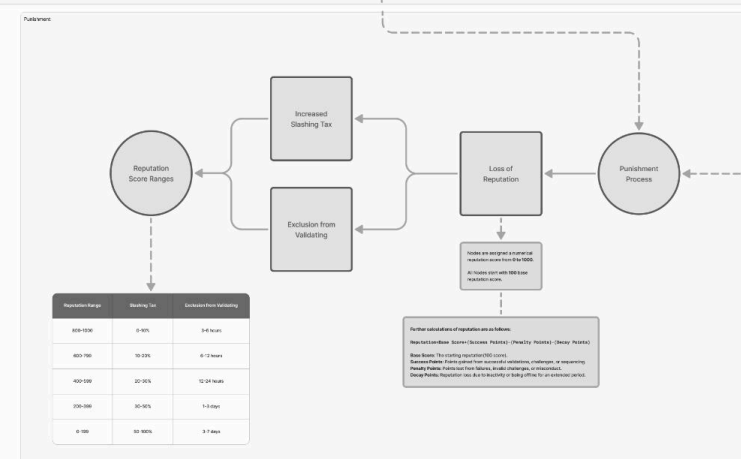
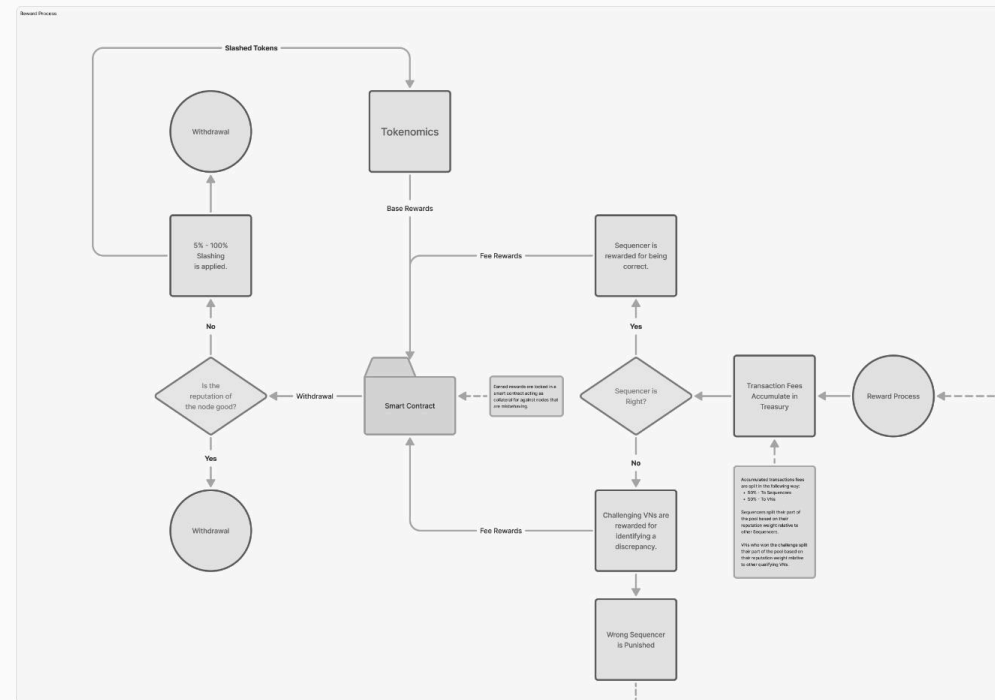
### Ask yourself:

1 -How does it all look when put together?

### Resources:

- How to create diagrams
- Use diagrams.net to clone and existing one.

blacktokenomics





# Blacktokenomics Circle Model

## Actions Sheet (Bonus)

### 1 - Users

Aligned incentives often lead to stronger communities.

Ask yourself:

- Who are the users of your project and what tasks do they perform?

#### 1.1 User Research - Who and What?

To create an effective tokenomics system, you need to understand who the different types of users are and what tasks they are performing.

Ask yourself:

- Who are the users of your project, and what tasks do they perform?

### 2 - Why and Motivation?

Now that you've looked at who will be using your product and what they will be doing, it's time to think about why they use your product and what motivates them.

#### Bonus Step - Behavioral Insights:

- What is the core motivator behind your users' actions?

### 3 - Value Created

Now that you know who will be using your product and why, think about how they create value for the product.

Ask yourself:

- How do your users create value for the project?

### 4. Incentives

This section deals with the behaviors, incentives, and mechanisms you want to put in place to get users to do what adds value to the project.

#### 5 - Behavior Framework

The token is the tool to drive your users to certain behaviors. To get the incentives right, you need to define what you want them to do and what you don't want them to do.

Ask yourself:

- What do you want the user to do?
- What do you not want the user to do?

### 5.1 - Incentive Design

Now that you know what you want your users to do (and not do), you can expand on this by thinking of rewards (carrots) and penalties (sticks).

Ask yourself:

- How do we incentivize our desired behaviors?

### 6 - Mechanism Design - Part I

Carrots and sticks (i.e., incentives) can be a bit abstract, but a mechanism is a concrete implementation of an incentive. Ideally, this can be coded into your system.

Ask yourself:

- How can a token help build mechanisms to implement incentives that drive desired behaviors?

### 7- Mechanism Design - Part II

Mechanisms often have flaws and side effects. At this stage, you should think about different mechanisms and their outcomes.

Ask yourself:

- What are the side effects of these mechanisms, and how could they backfire?

### 7 - Mechanism Mapping

You have brainstormed mechanisms for each user. Now it makes sense to flesh them out in detail.

Ask yourself:

- Based on the mechanisms you determined in step 4.4, explain each one in detail.

# Incentives Systems

## Tips for designing incentives

Every builders likes to think they know better. As the saying goes, pride comes before a fall.

- Steemit thought they were incentivizing high quality, not a high quantity of spam
- STPEN and Axie Infinity thought they were incentivizing sustainable growth, not about to hyperinflate their token supply
- Mango Markets thought they were incentivizing fee generating user activity, not creating a \$116mm economic vulnerability

Even brilliant business minds like Satoshi Nakamoto (Bitcoin) and Jeff Bezos (Amazon) have made missteps with incentives leading to unintended or emergent user behavior.

If you're wise enough to be reading this, I'm sure you're an extremely smart and talented individual - but please:

Do not underestimate the nuance and difficulty involved in designing properly balanced incentives. It's OK to need help. In fact it's outright foolish not to get help.

The first step in avoiding misaligned incentives is to clearly identify all relevant user behaviors and the corresponding incentives in your product, then systematically ensure those incentives are aligned.

Go to page:

### Tips for Designing Robust Incentives

#### Make Incentives Tangible

To be most effective, incentives should be as tangible as possible. The less directly users are affected, or the longer it takes to affect them, the weaker the incentive becomes.

Even when asking users to commit to long-term actions, such as locking up CRV for up to four years at a time, the benefits are still tangible and immediate - users get a higher weight of veCRV (vote escrow) tokens right away, as well as all the associated benefits such as a higher share of revenue distribution.

Conversely, tokens that solely exist as governance tokens offer relatively weak incentives. On its own, there's not much tangible benefit to being able to govern a protocol.

#### Make Incentives Simple to Understand

Incentive mechanisms are complex - but even if there's a lot of complexity involved behind the scenes, the key takeaways should be simply for users to understand.

You don't need to understand every in and out of Ethereum's consensus mechanism to know that it hurts to be penalized for going offline as a validator. The reality is that the vast majority of your users are not going to want to know every single detail of the inner mechanisms of your product. But they all want to be able to quickly know the key takeaways.

#### Abuse Your Incentives

Once you've got a first draft of your incentives, you must try to break, abuse, and exploit them before finalizing your design and launching.



When considering each incentive, ask yourself: "What could go wrong? How could I abuse this to make a profit, or to sabotage things if I wanted it to fail?"

It's important to remember that malicious actors or other individuals attempting to exploit your incentives may not always be profit-driven.

If your incentives allow for undesired actions, such as sending direct messages without any cost, it's only a matter of time before someone abuses this by repeatedly performing the action, not because it benefits them financially, but because there's no penalty for doing so.

This is yet another reason why designing incentives is so difficult - there's always someone smarter than you out there (whether human or AI), and the more complicated your incentives are, the easier it is for them to find an exploit you overlooked.

When designing and testing your incentives, there are two key points to consider:

#### 1. Keep it simple

Simpler systems are easier to test and harder to exploit. Bitcoin is a good example—though it's limited in functionality compared to fully programmable smart contracts, its simplicity is considered a security feature because it reduces potential vulnerabilities.

#### 2. Modeling and simulations are essential

Even if your incentives are straightforward, stress-testing through models and simulations is crucial to identify potential weaknesses. Teams that don't prioritize risk management and scenario modeling are more likely to face critical vulnerabilities and struggle to attract investors.

As discussed earlier in Page X, it's crucial for builders to consider not just who and what they reward, but also how much. Offering excessive rewards that are out of proportion to the value created can be wasteful and lead to short-term distortions in the ecosystem. This can result in increased price volatility, attract the wrong user base (such as bots or mercenary participants), and ultimately hinder the long-term adoption of the product.

A common example of this is protocols that aim to maximize the rate of return on their rewards to attract users at any cost. While this may increase short-term participation, the reward emissions often end up much higher than necessary to attract genuine users. The result is a surge in bots and mercenary capital—users who participate only to extract rewards, without contributing to the project's long-term value. This leads to higher inflation and little to no growth in organic user engagement.

# Incentives Systems

## Network effect tokenomics

Let's set blockchain products aside for a moment. Think of tradition web3 networks: Uber, Airbnb, YouTube.

What do they have in common?

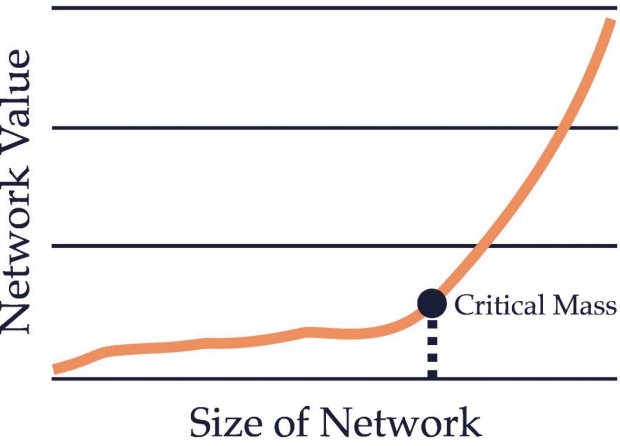
- They're all two-sided marketplaces:
- Uber pairs riders with drivers
  - Airbnb coordinates hosts and travelers
  - YouTube helps viewers find content creators

Like all two-sided marketplaces, when they first launched they each faced the "bootstrapping problem" or "cold start problem".

In simpler terms, a "chicken or egg" situation - which came first?  
Uber is only useful to riders if there are already lots of drivers providing rides  
But... Uber is only useful to drivers if there are lots of riders already requesting rides

The bootstrapping problem affects every marketplace business. And it's a big problem for any new product because it's difficult to compete with existing big players.

To see why, let's visualize how valuable Uber is to users in the aggregate (network value) compared to the total number of users in the network (size of the network):



Notice that network value drastically increases per unit of size beyond the point of critical mass.

Once Uber amasses enough drivers and riders, each new rider and driver not only inherits a high amount of existing value in the network but also adds significant marginal value.

New entrants trying to compete start at the very left of the chart. Uber's network already has (much) more value, and to make matters worse, Uber's value grows at a faster rate for each new user acquired.

This network effect makes it extremely difficult and expensive for new competitors to gain market share once a handful of large companies have already reached critical mass.

- As a result, tech industries tend to exhibit winner-take-all (or at least winner-take-most) dynamics:
- Amazon and Shopify dominate e-commerce
  - Facebook and TikTok dominate social media
  - Google dominates web search
  - Airbnb dominates hosting
  - Uber dominates ride sharing

None of these are blockchain products though, so why should we care? Because...

Network effects also apply to blockchain products. Nearly every blockchain product is an n-sided marketplace business - even centralized ones like Binance.

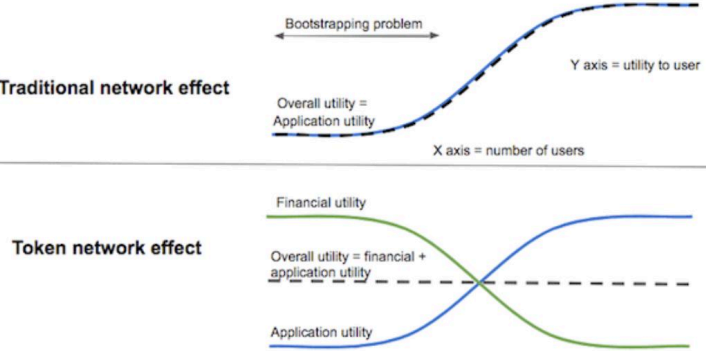
### What do you need to consider on network Tokenomics?

First you need to think of the token as a medium of incentives.

Lets analyze a real word example: FileCoin

When Filecoin was first launching, network utility was effectively zero - there was no reason for new supply-side users or new demand-side users to join.

This chart of Filecoin's network utility (above) is essentially the "traditional network effect" portion of the chart below. Tokens come in as the green line, smoothing out total network utility so that when Filecoin first launches, there is a draw for users to adopt the network even though the application itself has little utility.



The basic idea is: early on during the bootstrapping phase when network effects haven't kicked in, provide users with financial utility via token rewards to make up for the lack of native utility.

Then you need to think about your incentives system.

While the product is the driving force of token's demand, incentives play an important role in fulfilling the product's unique selling proposition (USP).

Well though Incentives attach a reward to a desired behavior that increases the product's value.

As we just mentioned, tokens are a way to incentivize early network participants and avoid the "cold start chicken and egg problem".

Tokens can be an effective way to bootstrap networks that need passive user participation, but they can be counterproductive for those that need active participation

This theory is tempting, but it is worth thinking through how widely applicable it actually is.



# Incentives Systems

## Pasive vs Active participation

### Passive Participation

(When Incentives Work)

Let me explain this with a few DePIN examples:

a) Helium, a decentralized network that provides cheap, easy internet access to IoT devices “in the wild” like e-scooters and sensors. Hosts can join the Helium network by buying its “hotspot” and connecting it to their WiFi. Once they do that, the hotspot provides internet access to end-users (or owners of the aforementioned IoT devices) – and rewards hosts tokens.

b) Arweave, which is described as a decentralized, censorship-resistant storage network. Miners hook up their unused hard drive space to the Arweave network, which can then be used by end-users to store any type of data. Miners are compensated with tokens as long as data is hosted on their hard drives.

Filecoin and Storj are other, somewhat similar examples.

c) Compound, a lending network. Lenders deposit their crypto assets into a lending pool for borrowers to access. Lenders then earn interest on their deposited assets and are rewarded with COMP tokens for providing liquidity to the network.

In each of these cases, the financial upside of the token was a strong incentive for early users to sign up and increase the utility of the network.

But have you noticed the one facet that these networks have in common? They all require passive participation from users.

Once users connect their assets or resources to the network – whether that is bandwidth (Helium), storage (Arweave), or crypto assets (Compound) – they continue to earn tokens.

### Active Participation

(Doomed for Failure)

One of the most important principles of bootstrapping a network is to start with the most underserved users.

Acquiring users is not enough to reach liquidity. You also need the right type of users, i.e. those who feel the problem most deeply and would put up with any amount of friction to engage with your network.

the type of user is what matters:  
An Uber driver who only provides rides when surge pricing hits 4x does not add as much value to Uber’s network as a driver who provides rides as their full-time job.

Play-to-earn game Axie Infinity’s highly inflationary tokenomics helped amass millions of daily active players. But unlike the value-add players of games like WoW, EVE Online, CS:GO, or Dota 2, most Axie Infinity players weren’t playing the game for enjoyment. Token rewards accelerated the adoption curve by amassing a high number of profit-motivated “value-extracting” players. The result? When token price momentum eventually stalled, daily active players fell by >50% from its peak, creating a feedback loop and crash of >95% in the price of AXS.

Maker DAO’s tokenomics aligned MKR holders with the success and adoption of DAI, which helped amass a small but dedicated audience committed to being vocal and loyal, value-add users of DAI years before DAI itself was even launched.

Despite building network capacity with FIL emissions, Filecoin only 5%-10% of the network storage capacity is currently used. Additional demand-side users are relatively much more valuable to the network than additional supply-side users - at least for the time being. These conditions are dynamic and change over the product life cycle.

Tokens can attract the wrong type of users – those drawn to financial incentives, and not the near-term utility of the network

Another well known example here is Looksrare – a decentralized NFT marketplace that launched in January 2022. It was meant to be a decentralized alternative to Opensea, which dominates the space

Looksrare executed a “vampire attack” on Opensea, by distributing (or “airdropped”) tokens for free to high volume Opensea users.

It also rewarded users with tokens for trading certain NFT collections on Looksrare. This go-to-market (GTM) approach should have been enough for Looksrare to beat the cold start problem and scale its network.

Unfortunately, financial incentives led to user behaviors that weren’t aligned with network utility.

After filtering out “wash trading”, i.e. the same NFTs traded back and forth between the same wallets to earn more token rewards.

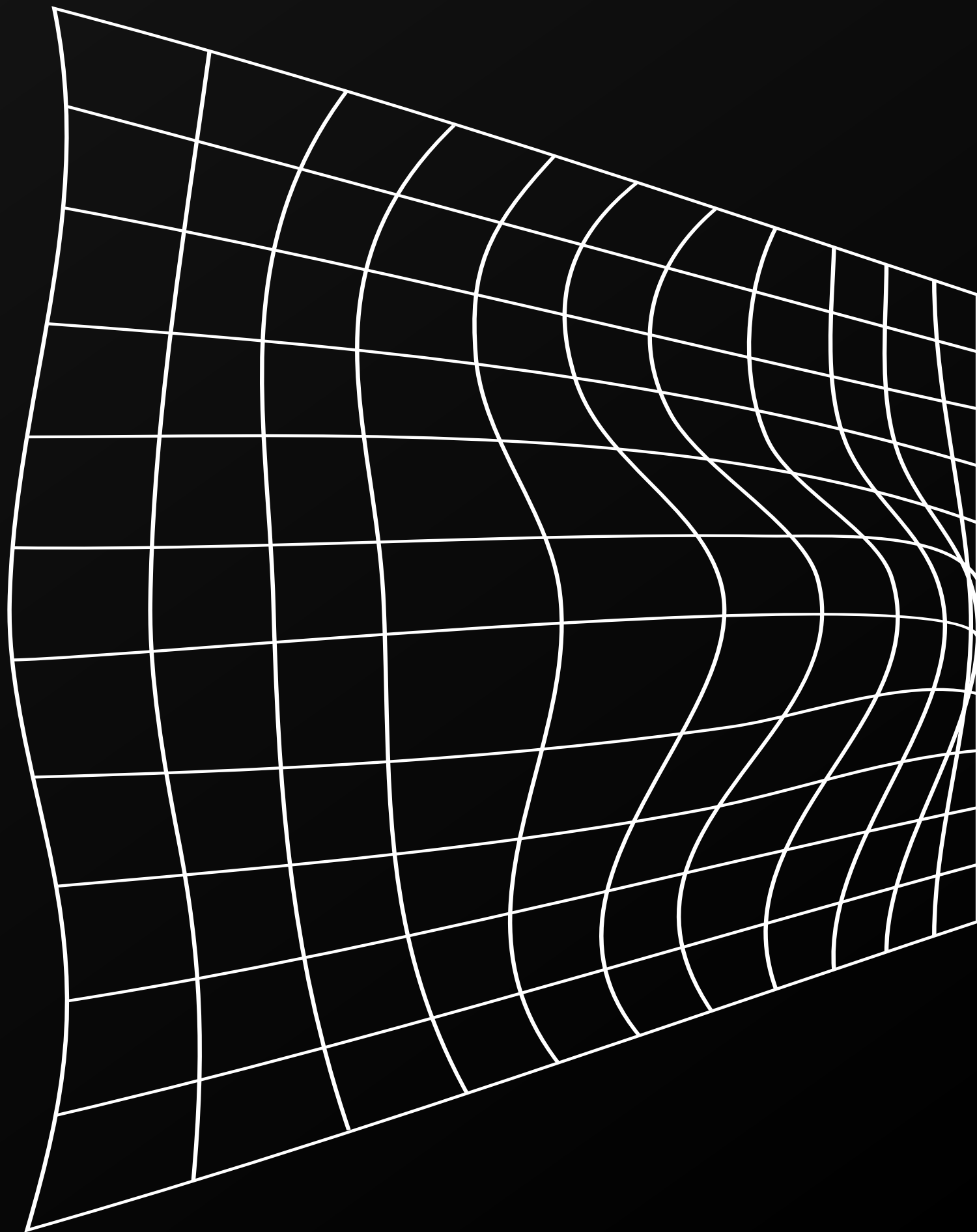
Interestingly, genuine trade volumes began to collapse as token payouts normalized.

In essence, users were there to earn and speculate on tokens, not to engage with the network.

### Conclusions

Tokenomics is vital to DePIN because:  
It’s one of the most powerful tools to direct user behaviors

- It can play a crucial role in overcoming the “cold start problem” to reaching critical mass
- The right tokenomics can help you reach critical mass. The wrong tokenomics can lead to collapse.
- Network effects are built by reaching a critical mass before competitors
- In incentives design → Passive > Active
- When going for passive participation, reward the actions that are critical for the project and increase the product value.
- Well-thought-out incentives attach a reward to a desired behavior that increases the product’s value.
- Tokens are a way to incentivize early network participants and avoid the “cold start chicken and egg problem.”
- Your opportunity for the positive spiral effect is at the beginning of the network, and you have in most cases only one chance.
- You need the right type of users, those who feel the problem most deeply.



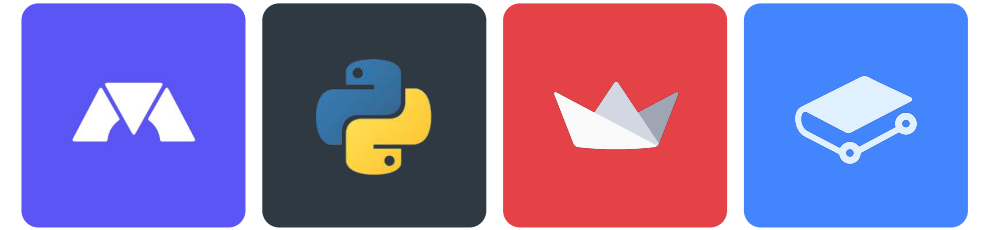
Phase 6

# Tokenomics Modeling

In this phase we go through our simulation systems including liquidity modeling, demand forecasting, and selling pressure scenarios, to prepare for different outcomes, while also validating the tokenomics design created (via cadCad + stochastic streamlit modeling).

# Tokenomics Modeling

## Python modeling



What beginners fail to understand, is that modeling is not useful for predicting outcomes, it's useful for analyzing risks. In other words, modeling is not about understanding what will happen, it's about understanding what can happen and the relative probabilities of various outcomes.

In other words, modeling is not about understanding what will happen, it's about understanding what can happen and the relative probabilities of different outcomes.

Modeling allows designers to quantify risks, identify key assumptions, and optimize system design to strike the best risk-to-reward balance for their use case and avoid catastrophic events before they happen.

When most people think of modeling, their first thought is spreadsheets.

Excel. Google Sheets. Rows. Cells. Formulas. That's modeling, right?

That's one kind of modeling, but that's not all there is to it.

This kind of modeling is very useful, especially for quick drafts, simple thought exercises, less complex systems, one subcomponent of a larger system, systems with less randomness or uncontrollable variables, less mission-critical use cases, and for creating interactive calculators that are more friendly for non-technical team members and users.

These kind of models are less useful when it requires analyzing systems with multiple moving pieces that recursively influence each other, or analyzing the relative probabilities of a large or open ended range of possibilities.

The more complex a system, the more important modeling becomes.

A simple spreadsheet with one field for each of these factors, for example a cell for "how much did collateral assets fall", clearly can not achieve this - it does not represent any randomness or path dependency over time.

In mathematics, computer science and physics, a **deterministic system** is a system in which no randomness is involved in the development of future states of the system. A deterministic model will thus always produce the same output from a given starting condition or initial state.

We can change the inputs to the cells, but each time we use the same inputs and "run" the model, we get the same output - it is a deterministic model.

Deterministic models are very powerful tools - but they are generally not the right tool for conducting robust risk analysis.

This brings us to **stochastic modeling**.

Stochastic" means being or having a random variable. A stochastic model is a tool for estimating probability distributions of potential outcomes by allowing for random variation in one or more inputs over time.

A common method used in stochastic modeling is Monte Carlo simulations.

Most models, both stochastic and deterministic, are conducted in an "aggregated" manner.

Agent based modeling can be either deterministic, stochastic, or a combination of both.

For example, imagine a simple two-agent simulation of "rock, paper, scissors". A deterministic approach would be to hardcode each agent's behavior such as "always play what your opponent played last round". No matter how many times the model is run, the exact same series of events will play out.

No matter which approaches to modeling you're taking, deterministic, stochastic, or agent based, all of them can benefit from basing your inputs and assumptions in real world data.

Your **deterministic** models' inputs should be realistic based on those of comparable projects.

Your **stochastic** models' degree of randomness and volatility should be realistic based on the fluctuations in data for comparable projects.

Your **agent based models'** agent behaviors and motivations should be realistic based on the behaviors of users of comparable projects, and the proportion of different user types such as speculative mercenary capital vs organic users vs bull market users vs bear market users, etc.

Your models will almost always be more useful when incorporating real world data wherever possible. But this doesn't mean you should run analysis that only considers "normal" real world situations, which brings us to...

While real world data is useful, certain risks, such as tail risks (black swan events), do not always show up in historical data because they happen so infrequently. You can and should incorporate real world data as much as possible - but you should always run analysis that is more conservative, and considers real world data from specific scenarios.

For example, you may run your stochastic model assuming a volatility rate observed during a bear market, compared to a flat market, compared to a bull market. You may even further exaggerate the parameters to be worse than the worst bear market even seen to date.

You should also feed in "artificial" boundary data - essentially asking: "What would happen if this parameter/input approached its highest or lowest possible value?"

This type of boundary analysis is simple but effective for detecting risks that have gone overlooked because the situations necessary for them to appear happen very rarely.

The results will describe situations that are very unlikely to occur, but which can occur (specially on crypto), which is the entire benefit of modeling in the first place.

You get a chance to fix and optimize things before they matter because once live, it's only a matter of time until a rare event inevitably occurs - you don't want the entire product to collapse when it does due to an oversight.

If you're making use of an oracle - how do you know that oracle is correct? Does your system assume the oracle is right 100% of the time?

At BlackTokenomics, we treat modeling as an optimization function. The goal is not to predict the future but to optimize specific variables—whether that's minimizing risk, maximizing adoption, or finding the "sweet spot" between various factors like adoption per unit of risk.

Too often, builders jump into modeling without a clear understanding of what they're trying to achieve. We take a more deliberate approach, focusing on what needs to be optimized to achieve the best outcome for the project, ensuring every model serves a specific purpose.

There is no such thing as "the best approach" or "the best tokenomics" for every situation. Every design decision is a tradeoff, and the right design for your context depends on what you are optimizing, maximizing, or minimizing.

"All models are wrong, but some are useful." - George E. P. Box



# Tokenomics Modeling

## cadCad modeling

cadCAD (Complex Adaptive Dynamics Computer-Aided Design) is a powerful open-source modeling framework that allows us to create, simulate, and analyze complex tokenomics systems. cadCAD is widely used for blockchain and decentralized finance token economy models, where systems are interconnected and evolve dynamically.

cadCAD flexibility allows us to build comprehensive simulations to test various scenarios and understand how specific changes might affect the whole system.

To model and stress test tokenomics in cadCAD, we start by breaking down the entire tokenomics flow into smaller, manageable components. This process involves detailed mapping of each interaction and dynamic within the token ecosystem.

By isolating each component, we can define specific parameters and behaviors in a modular way, making the model adaptable to changes and easier to understand.

### Step 1: Breaking Down the Model

First, we divide the entire token flow into smaller pieces, this disaggregation helps us focus on the individual factors that influence the token's behavior, such as user actions, economic incentives, and external market conditions.

These components are classified into two main categories:

**Exogenous Processes**  
These are external factors that influence the system but are not controlled within it. They are often stochastic, meaning they may involve randomness or uncertainty. In tokenomics, exogenous processes might include market volatility, macroeconomic trends, and regulatory changes. They act as forces that impact the system from outside, creating fluctuations or pressures on token value and user behavior.

**Agent Actions**  
These represent the choices and behaviors of participants within the system. For tokenomics, agent actions are activities like buying or selling tokens, staking, participating in governance, or voting on proposals. These actions directly impact the token's value and supply within the ecosystem.

### Step 2: Defining Behaviors, Mechanisms, and States

After identifying exogenous processes and agent actions, we structure the model into:

**Behaviors**  
These are the emergent patterns that result from exogenous processes and agent actions. For instance, users have an option to either buy or sell tokens at any given time, and the behavior is token holders choice.

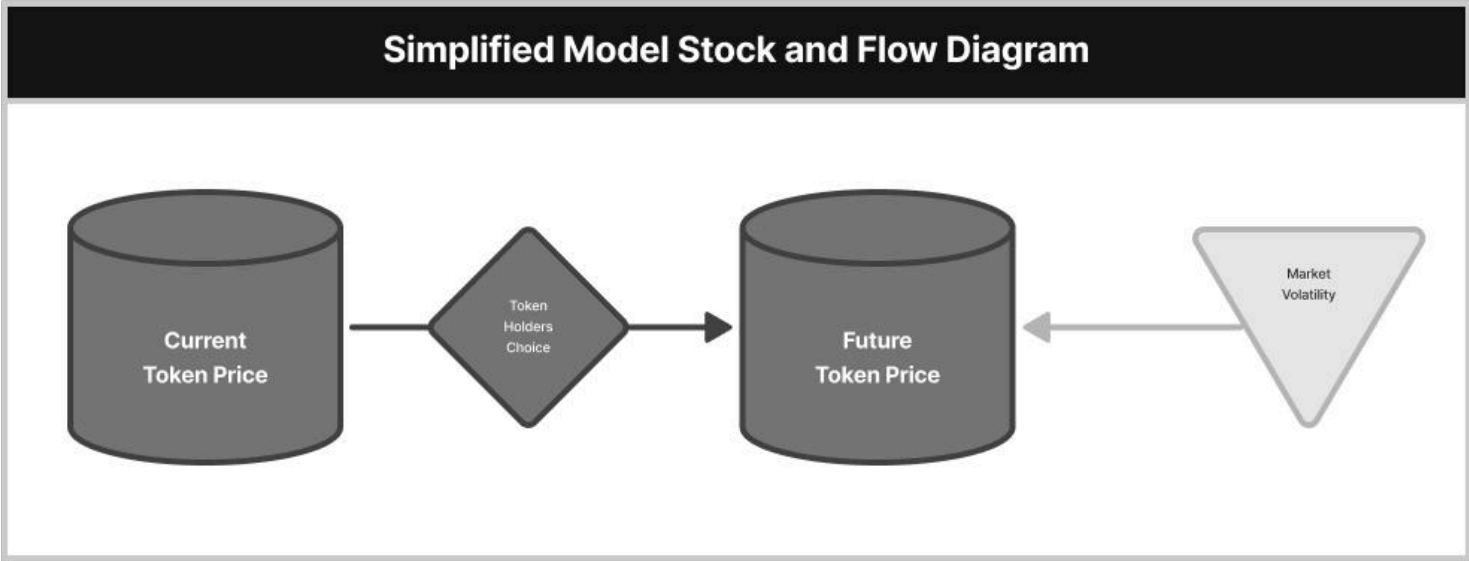
**Mechanisms**  
Think of mechanisms as rules or internal processes that define how user behaviors interact with each other to produce specific outcomes.

If "token holders choice" is a behavior, then the two mechanisms emerging from this are his decision to "buy on market" or "sell on market".

**States**  
Represent the current values or conditions of key variables within the system at any given time. They capture the immediate outcome of the mechanisms and provide a snapshot of the system's health.

If "token holders choice" is a behavior and "buy on market" or "sell on market" are the mechanisms the "future token price" would be the state.

States are continuously updated through interactions between behaviors and mechanisms, reflecting the system's response to user actions and external factors. States is the output we stress test and optimize.



### Step 3: Creating an "Model Mechanism Flow"

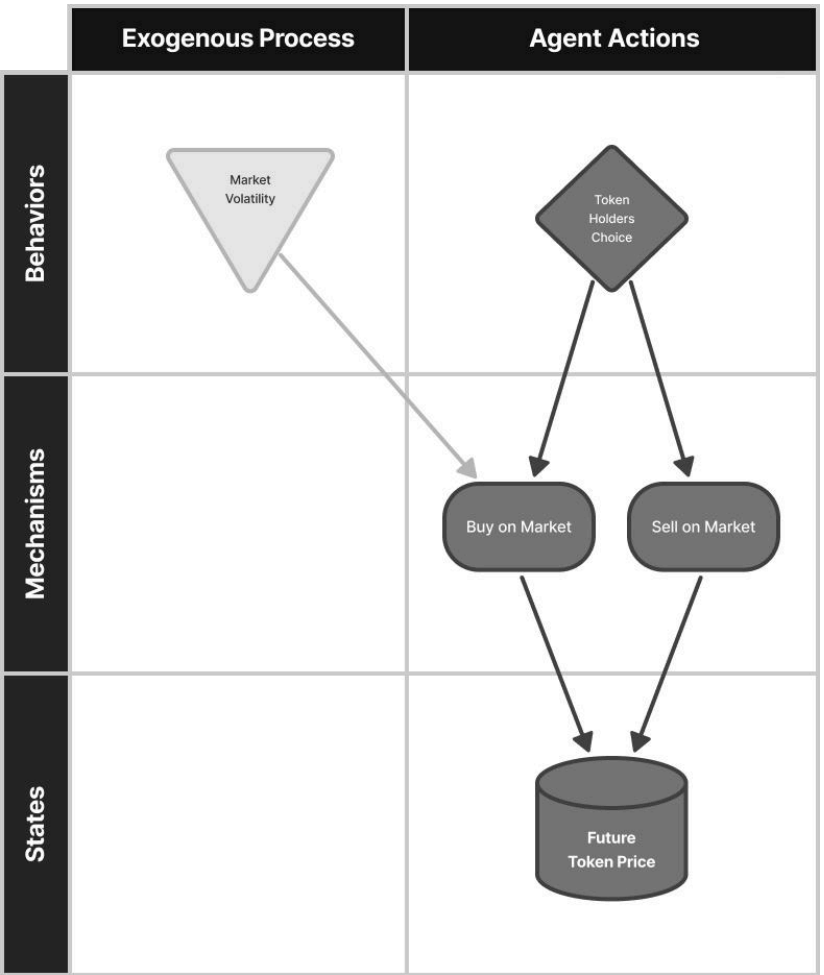
A mechanism flow helps to visualize the interdependencies between various states, agent actions, and exogenous processes. For instance:

**Behaviour's**  
Market Volatility, external influence that introduces randomness.  
Token Holder's Choice, who are influenced by market conditions.

**Mechanisms**  
Buy on Market: Action increasing demand based on holder's choice.  
Sell on Market: Action decreasing demand, potentially lowering token price.

**States**  
Future Token Price: Reflects current token value, updated by buy and sell actions in response to market conditions.

By mapping these flows, we can simulate how each part of the token system influences others, allowing us to observe feedback loops and dependencies within the tokenomics model.

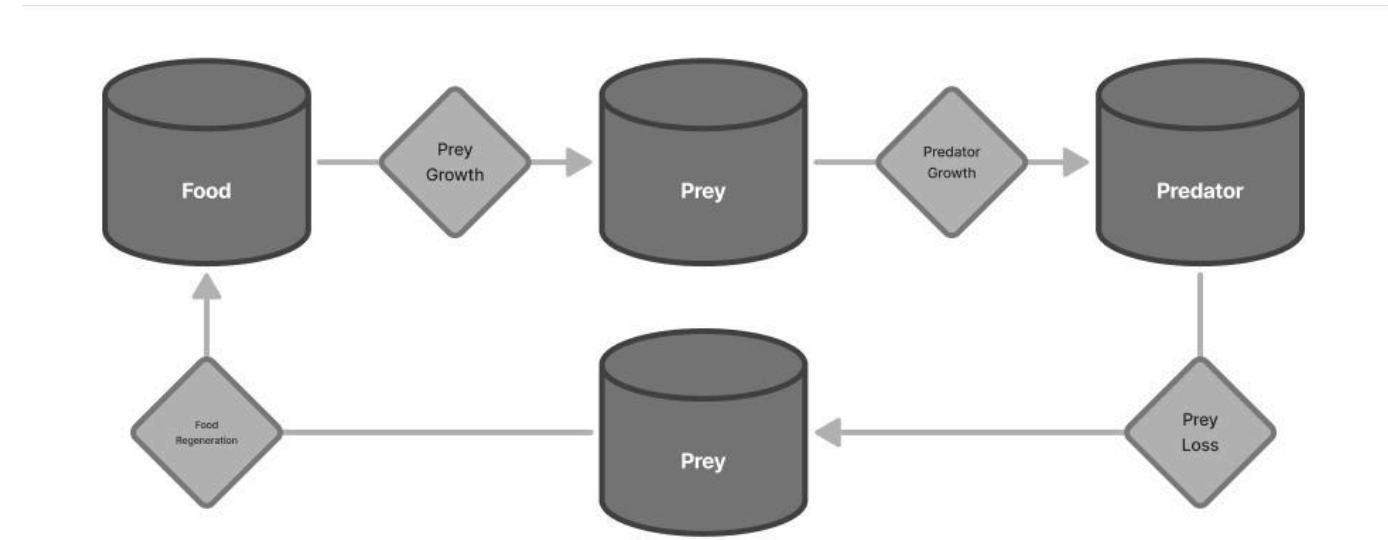


# Tokenomics Modeling

## cadCad model example

### Step 1: Breaking Down the Model

As a simplified example of cadCAD, let's visualize a classic **Food-Prey-Predator (FPP)** system, where we start by mapping the entire process into smaller, interconnected pieces. This dissection helps us define each population's interactions and dependencies in a modular way.



#### Exogenous Processes

External factors like Food Regeneration influence the system by replenishing food supplies without intervention from prey or predators.

#### Agent Actions

Key actions that each agent takes, like Prey Growth (eating food) and Predator Growth (hunting prey).

### Step 2: Defining Behaviors, Mechanisms, and States

#### Behaviors

1. Food Regeneration allows food supply to increase periodically.
2. Prey Growth behavior increases prey numbers based on available food.
3. Predator Growth behavior depends on prey availability for survival.

#### Mechanisms

1. Prey Growth Mechanism allows prey to increase when there's adequate food.
2. Predator Growth Mechanism reflects predator population increase based on prey consumption.
3. Prey Loss Mechanism reduction in prey numbers as predators consume them.

#### States

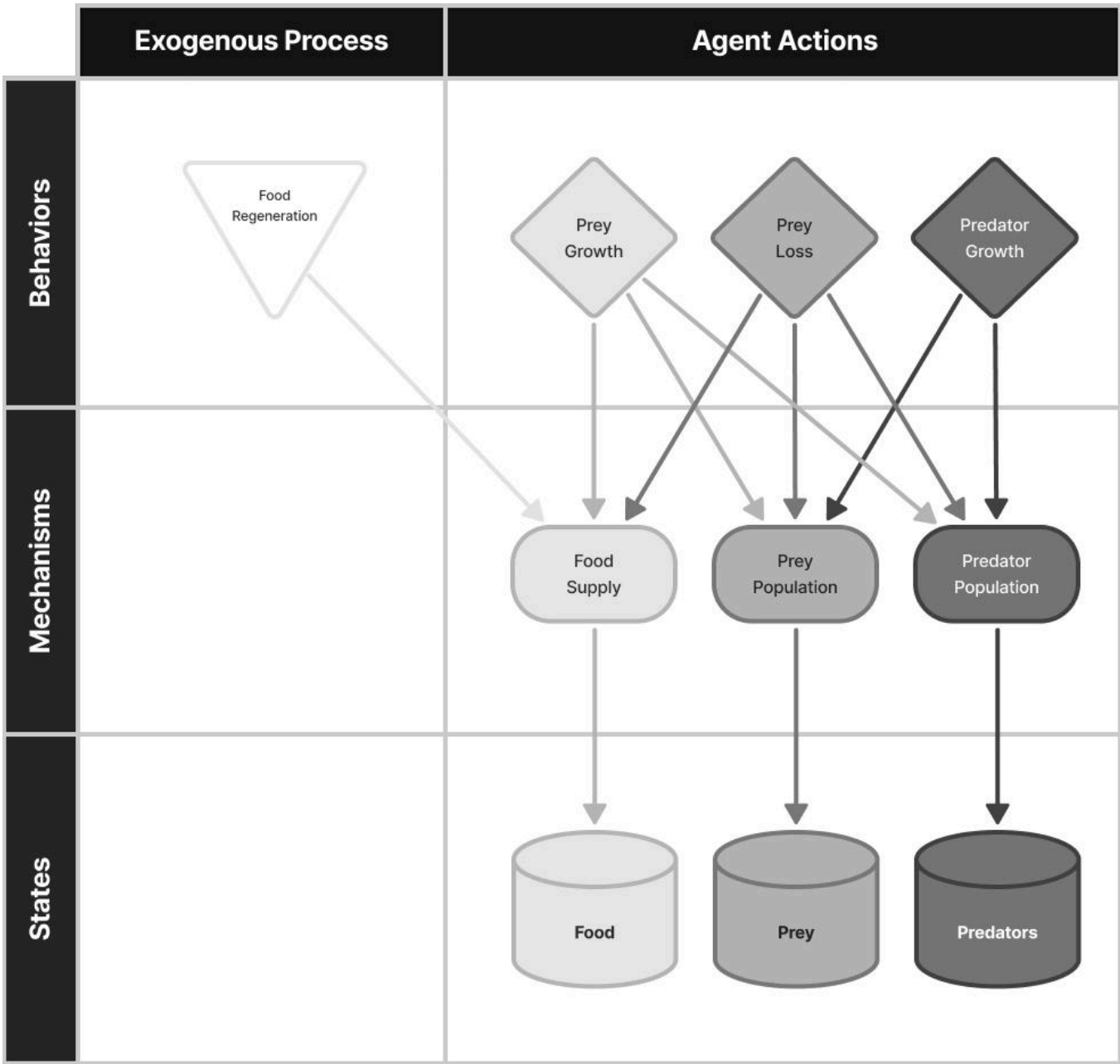
1. Food Supply the present level of food available for prey.
2. Prey Population, is the number of prey, reflecting the balance between prey growth and predation.
3. Predator Population is the number of predators, dependent on prey availability for sustenance.

### Step 3: Creating an "FPP Model Mechanism Flow"

The FPP Model Mechanism Flow maps out these dependencies and interactions.

When simulating this flow, we will observe feedback loops within the FPP system, such as how increased predation impacts prey,

which in turn affects predator growth and so on. This model will help us test the system's stability and outcomes under various conditions, providing insights into potential future scenarios and their probabilities.



# Tokenomics Modeling

cadCAD streamlit interface

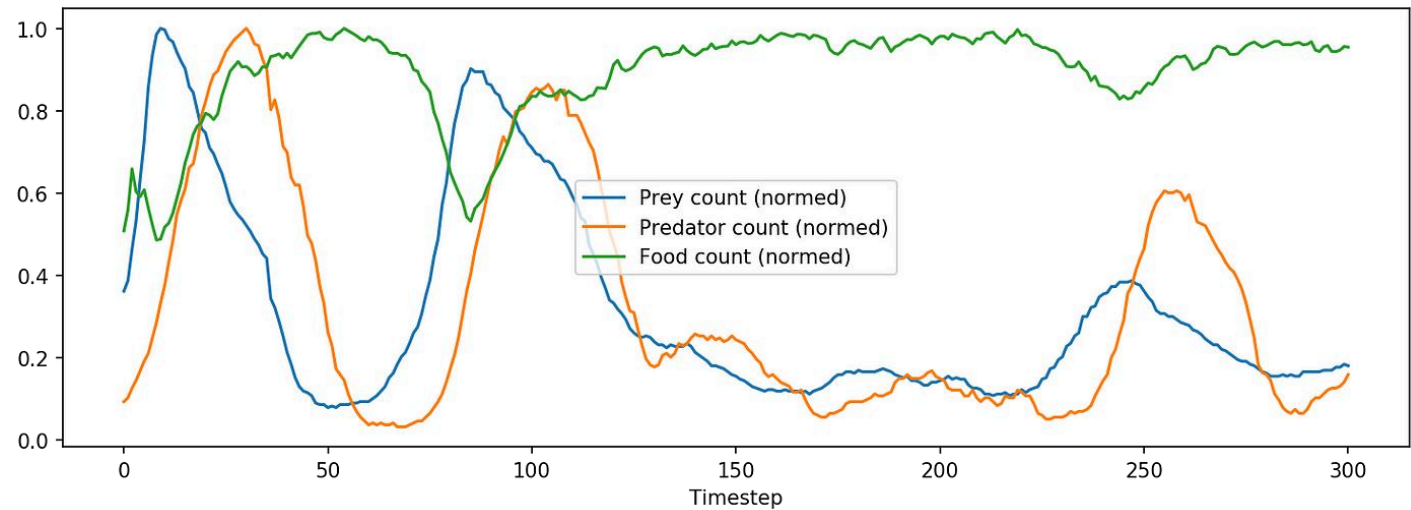
### Food-Prey-Predator (FPP) Model Outcome

The simulation results, as shown in the output graph below, illustrate the dynamic interactions between Food, Prey, and Predator populations over time. In this example, we observe cyclical patterns where fluctuations in food supply directly impact prey growth, which in turn affects the predator population.

Peaks and troughs in each population align with expected ecosystem behaviors: as prey increases due to food availability, predators grow, eventually reducing the prey population, which in turn leads to a decline in predators due to limited food (prey).

This simulation, conducted in cadCAD, provides valuable insights into the resilience and stability of the ecosystem model. The outcomes show how each component (food, prey, and predators) interact under varying conditions, such as changes in food regeneration rates or predator growth rates.

By simulating different configurations, we gain an understanding of what can happen within the ecosystem and the probabilities associated with each potential scenario. This modeling approach allows us to explore various dynamics, such as population booms and declines, and assess the likelihood of different outcomes.



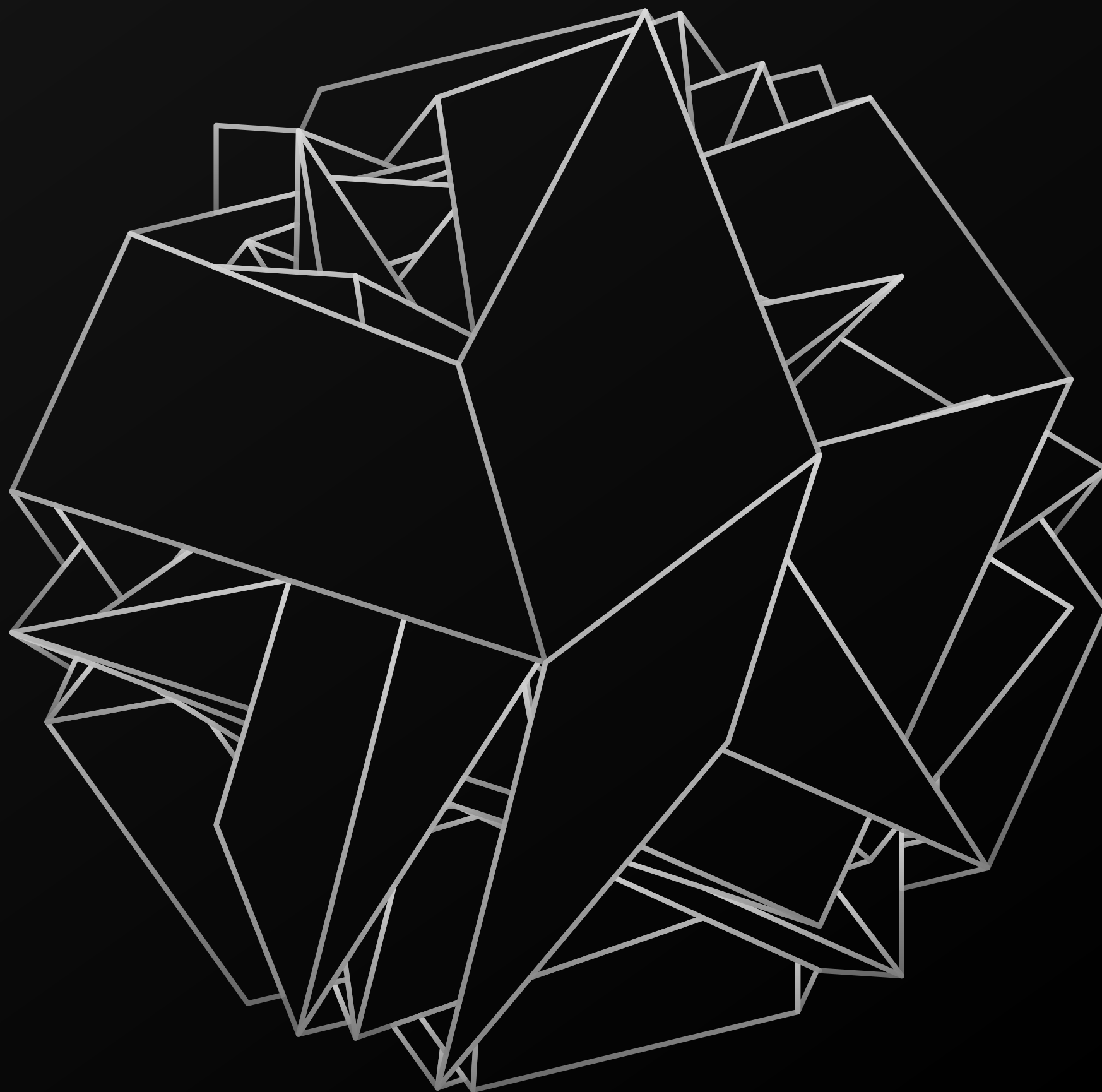
### cadCAD Streamlit Interface

We offer our clients comprehensive cadCAD simulations, providing not only the most optimized variables and models but also an interactive experience through Streamlit.

This interactive tool allows our clients to explore, adjust, and simulate various scenarios themselves, enabling a hands-on understanding of how different inputs affect outcomes.

With this setup, clients can see the exact probabilities of different potential outcomes, gaining valuable insights into what might happen if specific variables or agent behaviors in the ecosystem changed empowering them to adjust their model based on data-driven decisions when needed.





Phase 6.1

# Iterations

In the Iterations Phase, we build on the insights gained from the Modeling Phase to refine and enhance the tokenomics design.

This phase involves two key types of iterations: Design Iteration and Modeling-Based Iterations.



# Iterations

## Simulation-based iterations

In the Design Phase, while some individual parameters may have been validated independently to create the initial design, the entire system likely hasn't been tested together as a whole.

This is where **design iteration** and **modeling-based iterations** come into play.

Design Iteration focuses on refining the core elements of the model. After analyzing the results from modeling, we revisit key parameters, recalibrate inputs, and address any weaknesses revealed. This step ensures that each component aligns with the project's objectives and that the design stays adaptable to changing market conditions or user behaviors.

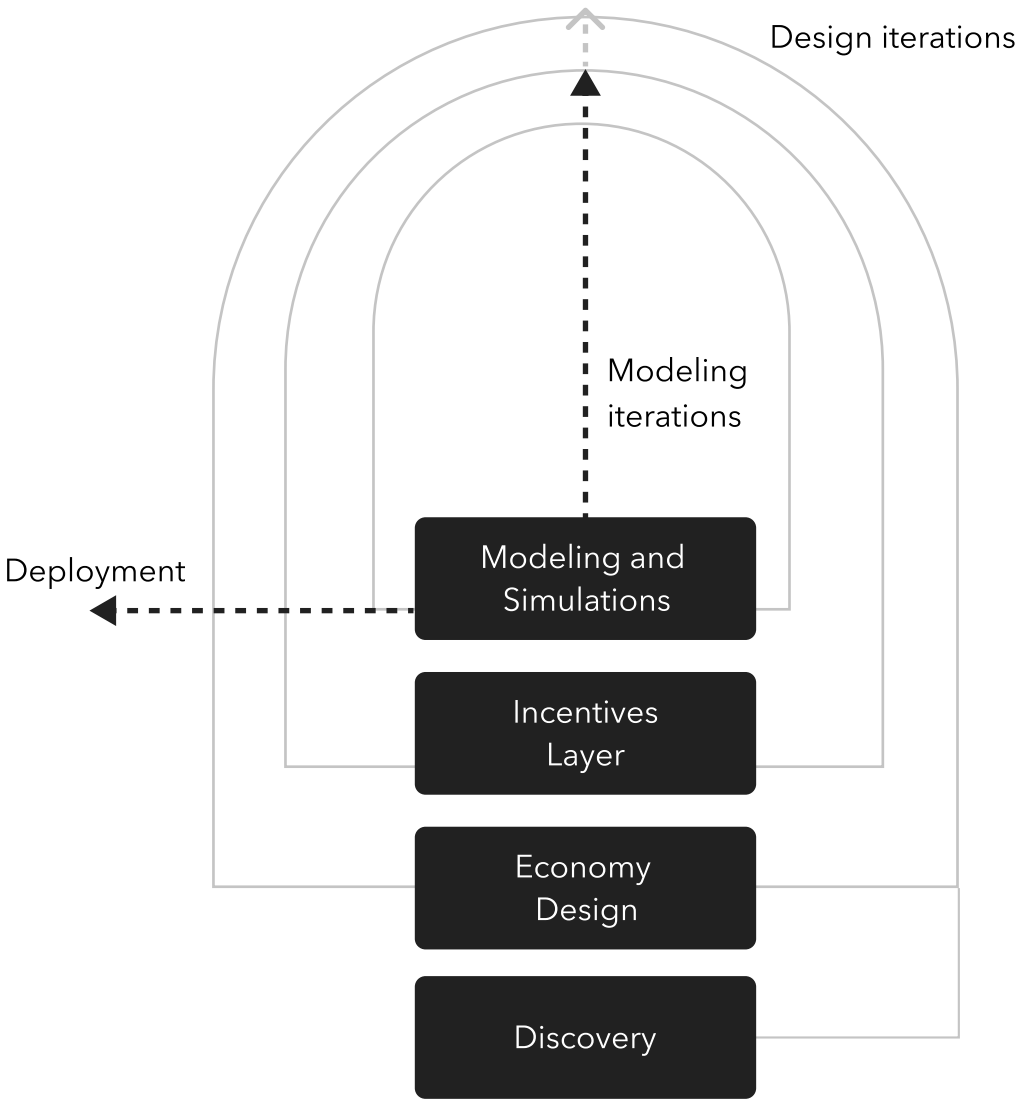
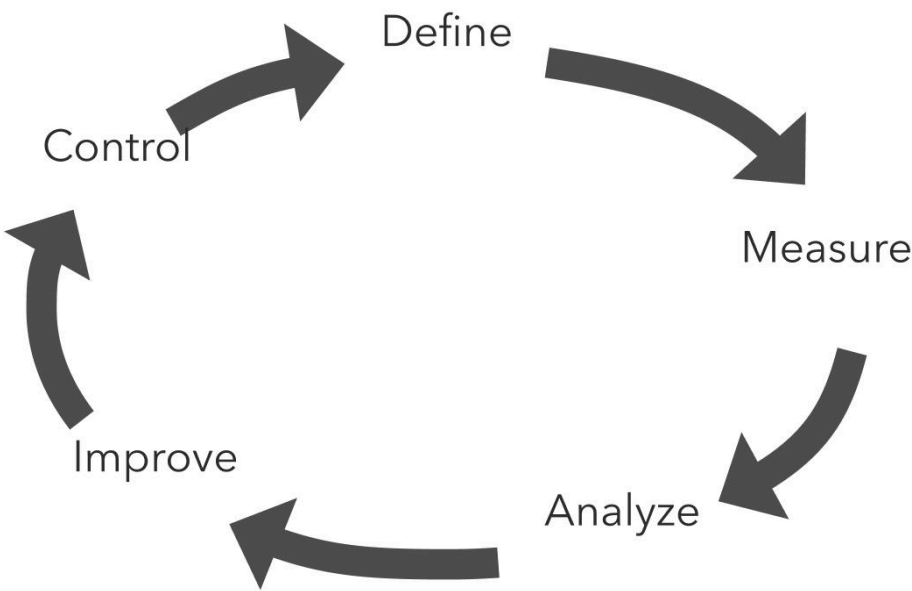
Modeling-Based Iterations allow us to put the refined design through a series of simulations, stress-testing it in various scenarios, including extreme conditions. These iterations are crucial for assessing the resilience of the tokenomics framework under different circumstances, helping us pinpoint any areas that may still require adjustments. By running these iterative cycles, we can preemptively address potential vulnerabilities and optimize for the best possible risk-reward balance.

Each iteration cycle enhances the tokenomics framework, transforming it from a theoretical model into a robust, data-informed system. This iterative approach ensures that when the tokenomics design goes live, it's prepared to handle real-world complexities with stability and resilience.

While the Modeling Phase provides a foundational understanding, it's the iterative process that refines the model for greater accuracy in predicting performance across various scenarios. Each iteration allows us to fine-tune key parameters, ensuring the framework can handle a broad range of potential outcomes and market behaviors.

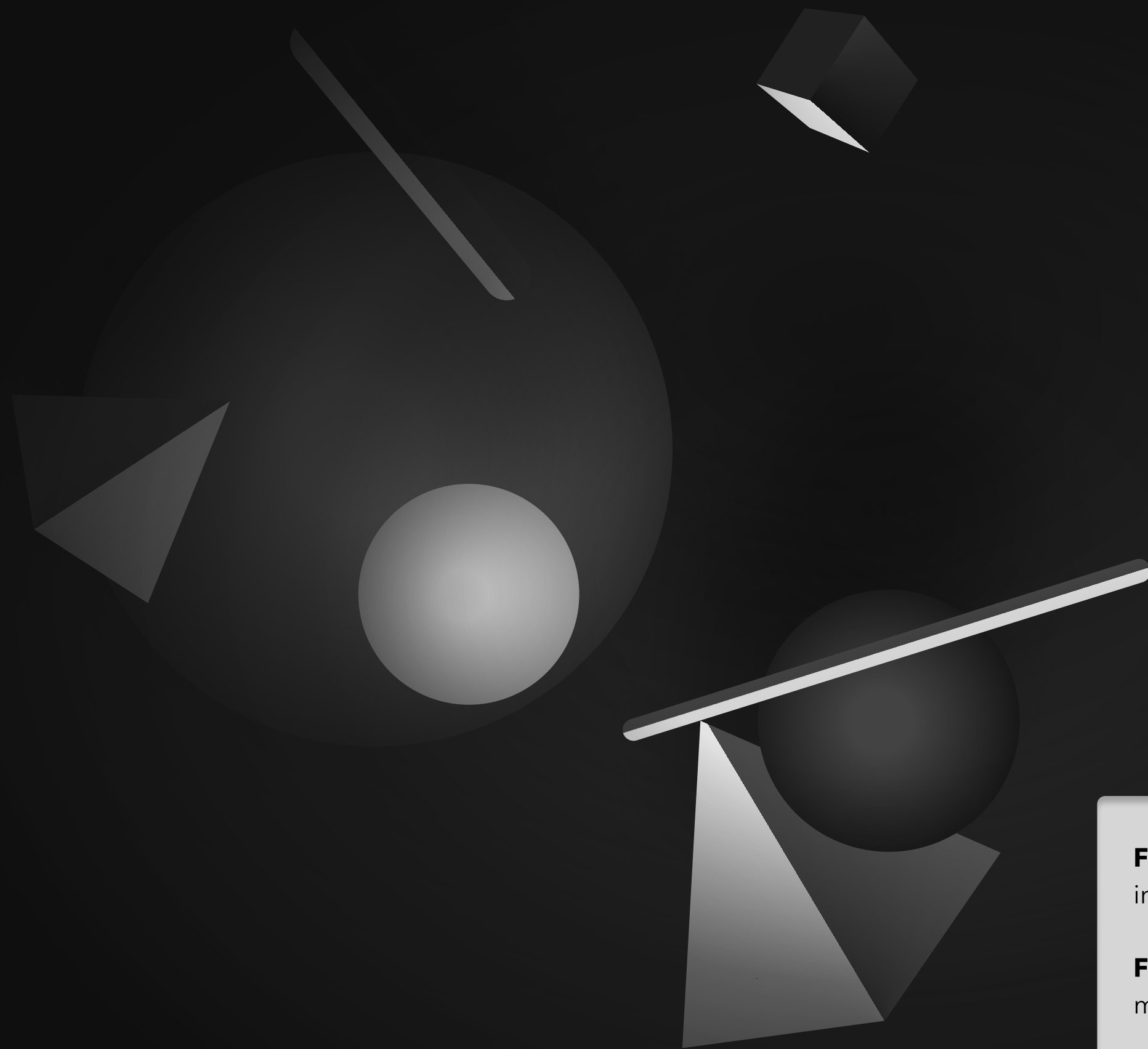
For example, incentive structures require careful balancing to promote positive behaviors while discouraging unwanted actions. Iterations offer an opportunity to review and adjust incentive alignment, ensuring that the system consistently rewards actions that drive ecosystem growth.

We also apply iterations to crucial economic variables such as token release schedules, supply shocks, and inflation rates, which can significantly impact a project's stability. These cycles allow us to test different configurations of these levers, finding the optimal balance that maximizes growth while minimizing risks like dilution and excessive volatility.



Token design is a multidisciplinary process that pulls learnings from many fields.

Figure 20: Iteration<sub>67</sub>



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