Economics of Dijets Native Coin $DJT

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Abstract. This paper discusses the key implementation details, in particular the token economics (tokenomics), of the native token of Dijets platform, called $DJT. The native token secures the network, pays for fees, and provides the basic unit of account between the multiple blockchains deployed on the larger Dijets network. For additional details on Dijets, we guide the reader to the accompanying architectural paper [1].

1 Introduction

The economic model of any new digital currency/asset is one of the most critical components of the platform that the asset resides on [2]. This is especially true for the native token of a selfsovereign, permission-less platform, like Dijets. In this paper, we discuss the economic design of the native token, called $DJT. The discussion is broken down into the governance properties of the token, its supply, minting (rewards) function of stakers, and other pertinent economics details, such as its transactional economy & dynamics.

1.1 $DJT: Key Properties

Following are the key properties of $DJT's economics design model:

- The resources spent by a validator for staking are proportional to that validator's total stake.
- The rewards accumulated by a validator for validating are proportional to that validator's total stake.

– Dijets is Egalitarian & Leaderless, therefore the ecosystem has no “rich-get-richer” compounding effects.
– Validators that lock their stake for longer are rewarded more.
– Validators are incentivised to stay online and operate correctly as their rewards are based on proof-of-uptime and proof-of-correctness.
– $DJT has a capped-supply, with a maximum cap of 100 million coins.
– While capped, $DJT is still governable. The rate at which the maximum cap is reached is subject to governance.
– Fees are not paid to any specific validator. Instead, they are burned, thus increasing the overall scarcity of the $DJT coin.

2 Governance

Governance is a central element in Dijets economic framework and is integral to the evolution of future components. To ensure that the system can respond flexibly to shifting economic landscapes, Dijets platform allows for dynamic adjustment of key system parameters based on user feedback. Establishing a process for reaching consensus on globally acceptable parameter values is essential in decentralised systems where no single authority has control. Leveraging its consensus mechanism, Dijets enables any user to propose special transactions that act as system-wide polls, effectively allowing all participating nodes to issue governance proposals.

One of the most impactful parameters in any currency—digital or fiat—is the reward rate, which influences both economic stability and growth. Cryptocurrencies that lock this rate permanently risk experiencing challenges such as deflation or hyperinflation over time. Therefore, in Dijets, the reward rate is governed by participants within predefined limits, enabling token holders to collectively decide the rate at which the token supply approaches its cap.

Transaction fees, represented as set F, will also be governed over time. F is structured as a tuple that defines fees associated with various transaction types and instructions that will be available in future releases. List of these governable parameters is defined in [1]. Governance will also extend to setting parameters for staking, including staking durations and minimum amounts required for participation. This approach ensures that

01.	Δ :	Staking amount, denominated in $DJT. Defines the min stake to be placed as bond.
02.	δ_{min} :	The minimum amount of time required for a node to stake into the system.
03.	δ_{max} :	The maximum amount of time a node can stake.
04.	γ, λ :	The two key parameters in governing the minting rate function.
05.	$\mathcal{F}$:	The governable fees parameters that specify costs to various transactions.

Fig. 1. The governable parameters listed above afford Dijets the flexibility to ensure that the system can adapt the emission rate according to evolving economic conditions.

critical economic parameters within Dijets are adaptable and reflective of the community's needs, supporting a flexible, user-driven evolution of the platform.

3 Token Economics

The $DJT has a total capped supply of 100,000,000 (100 million) coins. At the launch, or in the genesis block, 44 million $DJT coins will be initially available. The remaining 54 million coins will be gradually minted following the emissions model described by Equation 1. For a visual illustration, Figure 2 provides a comparison between the token emissions curve of $DJT and that of Bitcoin (BTC).

The emissions model adopted for Dijets is straightforward: it aims to reach a capped token supply in a manner similar to Bitcoin's emissions schedule. However, unlike Bitcoin [3], Dijets design includes a governance mechanism that allows for adjustment of the rate at which the capped supply is reached. This flexibility ensures that the system can adapt the emission rate according to evolving economic conditions and community decisions, balancing fixed supply objectives with adaptable growth dynamics.

3.1 Governable Parameters for Minting

Dijets (DJT) uses a unique minting function in its tokenomics that includes a capped supply and an adjustable emissions curve, designed to allow its community to influence inflation dynamics. This design is structured around the idea of predictable inflation but includes governance flexibility for key parameters in its minting and staking mechanisms. Here's an in-depth look at how Dijets minting function operates and the governable parameters involved:

3.1.1 Key Aspects of the DJT Minting Function

3.1.1.1 Capped Supply Dijets has a maximum supply of 100 million DJT tokens. This cap is an essential feature of its tokenomics, as it limits the total amount of tokens that can ever be in circulation.

3.1.1.2 Initial Supply and Genesis Distribution Dijets launched, with 44 million DJT tokens being created in the genesis block. These tokens have been allocated to a range of people/organisations including early investors, the team, and other strategic partners, while the remaining 56 million tokens are scheduled for minting over time.

3.1.1.3 Emission Curve and Minting Rate The remaining 56 million tokens will be gradually minted following a controlled emissions curve. Dijets emissions curve is designed to gradually release tokens into circulation over time, resembling a model similar to Bitcoin's, where emissions decrease over time but never quite reach zero until the cap is hit. The rate of emissions is not fixed but can be influenced through governance, providing flexibility to adjust inflation as necessary.

3.2 Minting Function

D_j is total number of tokens at year j, with $D_1 = 44M$, and D_l representing the last year that the values of γ,$\lambda \in \mathbb{R}$ were changed; cj is the yet un-minted supply of coins to reach $100M$ at year j such that $cj \leq 44M$; u represents a staker, with $u.s_{amount}$ representing the total amount of stake that u possesses, and $u.s_{time}$ the length of staking for u.

$$D_j = D_l + \sum_{\forall u} \rho(u.s_{amount}, u.s_{time}) \times (c_j/L) \times \left(\sum_{i=0}^{j} \frac{1}{(\gamma + \frac{1}{1+i^{\lambda}})^i} \right) \tag{1}$$

where,

$$L = \left(\sum_{i=0}^{\infty} \frac{1}{(\gamma + \frac{1}{1+i^{\lambda}})^i} \right) \tag{2}$$

At Genesis, c_i=$44M$. The values of γ and λ are governable, and if changed, the function is recomputed with the new value of $c*$. We determine that $\sum_{*} \rho(*) \leq 1.\rho(*)$ is a linear function that can be computed as follows and wherein ($u.s_{time}$ is measured in weeks, and $u.s_{amount}$ is measured in \$DJT tokens):

$$\rho(u.s_{amount}, u.s_{time}) = (0.002 \times u.s_{time} + 0.896) \times \frac{u.s_{amount}}{D_j} \tag{3}$$

If the entire supply of tokens at year j is staked for the maximum amount of staking time (one year, or 52 weeks), then $\sum_{\forall u} \rho(u.s_{amount}, u.s_{time}) = 1$. If, instead, every token is staked continously for the minimal stake duration of two weeks, then $\sum_{\forall u} \rho(u.s_{amount}, u.s_{time}) = 0.9$. Therefore, staking for the maximum amount of time incurs an additional 11.11% of tokens minted, incentivising stakers to stake for longer periods. Due to the capped-supply, the function above guarantees that regardless of the number of governance changes, we will never exceed a total of 100M tokens. Therefore,

$$\lim_{j=\infty} D_j = 100M \tag{4}$$

Dijets minting and staking mechanisms are designed to support a robust yet flexible approach to token issuance and reward distribution. By enabling governance over key parameters, Dijets ensures that its tokenomics can adapt to meet the needs of the community, economic changes, and network security requirements, while ultimately working within a capped supply model that limits long-term inflation.

4 Minting Mechanism

The minting mechanism of $DJT is specifically structured to motivate nodes to contribute to the network in ways that enhance its global performance and stability. This incentive structure is achieved through special minting transactions that reward positive node behavior. In Dijets, a node earns the ability to mint tokens by first putting up a stake as collateral and then actively engaging in the consensus process. Rewards for each node are not arbitrary but are tied to measurable indicators of network participation, particularly uptime and response latency.

Each node in Dijets tracks and records its interactions with other nodes, accumulating local data on the activity and responsiveness of its peers. When node u interacts with node v, u keeps a record in the form of a tuple: (response bit, timestamp). The response bit is a binary indicator of whether node v responded within the designated timeout window, while the timestamp records the precise time of the response. This dual-layered tracking allows the network to validate each node's reliability and efficiency, as nodes with high uptime and low latency are rewarded.

Dijets minting model operates through a combination of proof-of-uptime and proof-of-responsiveness, ensuring that minting rewards are earned by nodes that consistently contribute to network health and responsiveness. This decentralized approach has several significant advantages:

- **No Leader Dependency** Unlike many consensus systems that rely on a single leader or a select few to manage rewards distribution, Dijets avoids centralized reward accumulation. This means there is no single "leader" node responsible for collecting rewards, which helps prevent any one node from disproportionately benefiting or becoming a point of failure.
- **Egalitarian Dynamics** Since rewards are based on real-time performance rather than stake size alone, nodes cannot simply rely on large holdings to amass rewards. This approach limits the "rich-get-richer" effect common in other systems, where a few large stakeholders can compound their wealth over time.
- **Enhanced Network Health** By rewarding nodes based on uptime and latency, Dijets's model promotes a network environment where reliability and speed are continually optimized. Nodes are incentivized to maintain high uptime and low latency, which directly benefits the overall performance and stability of the network.
- **Improved Security and Decentralization** The combination of performance-based rewards and a lack of a leader structure supports Dijets's goals of both security and decentralization. Since nodes must maintain performance standards to earn rewards, there is an inherent incentive for nodes to remain active and vigilant. Additionally, with no single node or group monopolizing rewards, power and responsibility are more evenly distributed.

5 Transaction Economics

5.1 Fees Structure

The fee structure on Dijets platform is designed with unique features that set it apart from other existing and upcoming blockchain platforms, aiming to support a sustainable ecosystem while promoting fair incentives and network stability.

Staker Fees In contrast to many protocols where all transaction fees go directly to an elected leader node—such as Bitcoin, where miners collect the fees — Dijets takes a different approach by **burning all transaction fees**. This process permanently removes fees from circulation, which in turn enhances token scarcity, benefiting the entire ecosystem. Instead of enriching specific nodes, this method supports all participants indirectly by increasing the scarcity and, potentially, the value of $DJT tokens. To ensure that this fee-burning approach does not gradually deplete the token supply over time, the minting process is carefully calibrated to offset the burned tokens. This way, the system avoids the risk of a "supply freeze" and ensures that there will always be tokens available for circulation and transactions.

Transaction Costs In Dijets, transaction fees are structured to reflect the type and complexity of the transaction. For instance, instantiating new subnetworks or ECCs incurs the highest fees, reflecting the greater resources and validation efforts required for these transactions. In contrast, more straightforward transactions, such as standard transfers of $DJT, incur minimal costs, encouraging frequent, simple transactions without burdening users. Additionally, within Dijets subnetwork ecosystem, transactions pay fees in both the subnetwork's native token and a fraction in $DJT. For subnetworks that are permissionless and open, creators have the flexibility to design fee structures that motivate validators, ensuring that validation is incentivized appropriately based on the nature and scope of each subnetwork.

Sliding Cost Function Dijets employs a dynamic sliding-cost function for its transaction fees, that adapts to network conditions and congestion. Rather than being set by individual users, transaction fees are calculated through a globally verifiable formula that adjusts based on network congestion. As network activity rises and congestion increases, transaction fees also rise in response, which helps to manage demand on network resources. This adjustment mechanism is recalibrated at specific intervals, allowing it to account for organic increases in transaction volume over time. By recalculating fees periodically, the function ensures that transaction costs reflect current network load, balancing accessibility with resource allocation efficiently.

Dijets's fee structure fosters a balanced economic model with a number of key benefits including:

– **Network-Wide Benefits through Fee Burning:** The fee-burning mechanism aligns incentives by removing fees from circulation entirely, indirectly benefiting all token holders through scarcity-driven value support.

- **Transaction-Specific Costs:** By differentiating fees based on transaction type, Dijets provides a cost-effective structure for everyday transactions while fairly allocating higher fees to resource-intensive operations, like creating new subnetworks.
- **Incentivization for Subnetwork Validation:** Subnetworks in Dijets have customizable fee structures, allowing creators to design fee mechanisms that can attract and retain validators for specific applications or requirements, ensuring an adaptable and resilient ecosystem.
- **Adaptive Congestion Management with the Sliding Cost Function:** The globally verifiable sliding-cost function manages network load by adjusting fees based on congestion, promoting consistent accessibility. This adaptive model encourages efficient network use, discouraging spam, and optimizing network resource allocation.

Dijets token dynamics & its economic model fosters a balanced and adaptive approach to long-term sustainability and efficient resource allocation across different types of transactions and subnetworks. Through its novel minting mechanism with governable parameters, fee-burning, transaction-specific costs, flexible subnetwork and ECC incentives, and dynamic fee adjustments, Dijets promotes an ecosystem that benefits all participants while remaining responsive to network demands.

References

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