Analysis: ICON POS Token Economics

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Preface: Blockchain for Enterprises

As the industry for blockchain solutions continues to grow, we will begin to see more cost-saving applications for blockchain technology. The focus of this report will be on one of such projects – ICON (ICX). ICON aims to connect blockchain solutions (DApps) with private chain systems through a public chain protocol. Many of the ICON network's proposed solutions center around cost savings for enterprise and institutional clients. Although blockchain enterprise solutions are still early, there are plenty of reports demonstrating significant cost saving potential.

> *According to a Santander FinTech study, distributed ledger technology could reduce financial services infrastructure cost between US$15 billion and $20 billion per annum by 2022, providing the possibility to decommission legacy systems and infrastructure and significantly reduce IT costs.*[1]
>
> *Blockchain-based database systems could reduce costs and cut 70% on central finance reporting, 50% on business and central operations, 50% on compliance.*[2]
>
> *Besides its security advantages, [User authentication blockchain platform] Chain ID is anticipated to cut costs by about 90%, reducing them to 1/10th of what they are right now.*[3]

ICX Benefits Summarized

- A secure investment that can be moved or sold at any time on a liquid market
- Access to ICON Public DApps that may provide valuable solutions for enterprises
- ICONloop private DApps such as ChainID or ChainSign
- Access to Ethereum DApps through the decentralized exchange
- Ability to communicate with other consortiums or enterprises on the ICON network
- Ability to interact privately with other members within a private chain network
- The ability to start or stop using the network instantaneously by buying or selling ICX stake
- Bonus end of year reward for activity through newly minted ICX
- ICON developer support for implementation

How Enterprises might use the ICON Network

From our analysis of the ICON whitepaper and publications, we theorize two potential ways that ICON active network participants might use the network.

"Renting the network": One possible way for an enterprise to use the network would be by having enough ICX in a wallet to cover transaction fees, replenishing their ICX balance periodically. This can be thought of as renting the network.

“Buying the network”: The second way an enterprise may use the network is through staking and earning staking rewards. This would allow for the enterprise to tap into the ICON Incentives Scoring System (IISS) and benefit from its network activity. An enterprise would want to purchase and stake enough ICX so that the monthly transaction fees in ICX are replenished through rewards from staking. There are multiple benefits to this, including cheaper costs of using the network.

Narrowing down the blockchain network costs of an enterprise to only a lump investment, enterprises can value the tradeoffs of using this network through a simple ROI (return on investment) calculation. As long as the blockchain network can provide them an acceptable level of return (through cost savings or other synergies), enterprise adoption is likely.

The following analysis of ICX token economics will assume that network users are “buying the network”, to maximize on staking rewards. Enterprises will buy enough ICX so that when they stake it, they will earn enough staking revenues to cover their transaction fees for the use period.

The following report examines the relationship between staking rewards and enterprise investment.

Thesis

> *Activity rewarding PoS systems have better-aligned token-economic incentive structures than fixed rewards systems for everyone within the network. Further, if the price of transactions in USD remains static, the price appreciation of tokens does not affect enterprise incentives.*

Simplified for the purposes of this report, the ICON network works as such:

ICONloop, a for-profit consultancy, onboards enterprises onto private chains with technology similar to IBM’s Hyperledger called Loopchain. The benefits of Loopchain over Hyperledger are that it has the ability to connect to a public channel using the ICON Nexus, allowing for cross-private chain interaction. If an enterprise within a consortium were to want to initiate a blockchain — based communication with another enterprise, Loopchain has a pre-built gateway for doing so.

The ICON nexus is a Delegated Proof of Stake (DPoS) system where elected enterprises within individual consortiums are chosen as C-Reps to govern the economics of the public network (node addition & removal, voting rights, transaction fees and more). Because the ICON public network uses DPoS, a transaction fee must be paid in order to incentivize verification of network transactions — as of now, each ICON transaction costs 0.01 ICX ($0.013).

Enterprises that choose to use the ICON Nexus for communication between private chains would issue a bond to the reserve channel — a channel created to pass-down the rewards of staking ICX. After issuing this bond (staking ICX), the enterprise will receive ICX from the public treasury for its verification of network transactions, & it may use this ICX to pay for its own transaction fees.

Assumption for this model:

ICX earned through staking needs to equal ICX transaction fees for an enterprise so the enterprise can transact “freely”.

Active & Passive Rewards

The reason why the ICON token-economic model was chosen for this report is because ICON has a variable staking rewards system. Nodes are categorized as either active on the network, or passive using the ICON Incentives Scoring System (IISS). This system uses a few variables to determine these categories;

1. DEX usage
2. Number of transactions
3. ICX staked in the treasury

With the IISS, active network users earn significantly higher staking revenues for active contribution to the public network. Generally, enterprises will be considered active users through IISS.

Category	Allocated ICX	I_score ranking	ICX_{calc}	ICX_{actual}	
Active group	970,000	1	95,000	95,000	
		2	72,000	72,000	
		3	47,000	47,000	
		⋮	⋮	⋮	
		100,000	51**(B)**	51	
Inactive group	30,000**(A)**	100,001	49	50.93	30000/51=588.235 **(A)/(B) = (C)** → 589 participants will receive ICX incentives. 30000/589=50.93 ICX **(A)/(C)** = 50.93 ICX
		100,002	48	50.93	
		⋮	⋮	⋮	
		100,588	38	50.93	
		100,589	**37**	**50.93**	
		100,590	**35**	**0**	
		100,591	33	0	
		⋮	⋮	⋮	

On the other hand, network hoarders that essentially remove currency from total supply are rewarded far less in staking incentives than their transacting counterparts — these hoarders are often speculators, so they do not specifically seek staking returns as an incentives — they simply seek investment returns, which can also be represented in price. While the exact staking revenue figures are yet to be witnessed, one thing is very likely:

Active network users earn higher staking revenues on the variable PoS ICON network than on other, non-variable rewards systems.

Example:

Some back-of-the-envelope estimates & calculations can be made which illustrate various implications for the incentives of this network. Again, as the exact figures for incentives are unknown until the network has truly been put to use, only examples & estimates can be used for now.

User Type	% Population	Staking Rewards
Active Users	40%	8%
Passive Users	60%	3%
Standard PoS	100%	5%

* Standard PoS = Weighted Average of Active & Passive

Assumption: Active Users in a Variable PoS system will earn more staking rewards and Passive Users will earn less staking rewards than an average user in a Non-Variable PoS System. Values for this example are arbitrary.

Let's examine this token economic incentive system from the example of Enterprise ABC. Enterprise ABC is a player who will transact through the ICON Nexus 1,000,000 times in a given year (roughly 2700 per day). Transaction fees are assumed to be $0.02. Therefore, in order to transact for the year, Enterprise ABC would need to pay $20,000 in annual transaction costs.

Enterprise ABC	
Transactions / yr	1,000,000
Transaction Fees	$0.02
Total Annual Costs	$20,000
Status	Active

Assuming that active users earn 8% staking revenues within this system, and if Enterprise ABC requires $20,000 to transact in a given year, the investment into ICX can be calculated through a simple formula:

Investment Requirement = Annual Fees / Staking Rewards

Therefore, in an active system:

Investment Requirement = $20,000 / 8%

And in a non-variable PoS system, assuming 5% :

Investment Requirement = $20,000 / 5%

Putting this all together, Enterprise ABC would have to invest $250,000 to freely transact on the network, whereas in a standard, non-variable PoS rewards system, Enterprise ABC would have to invest $400,000. Clearly, there is a strong cost saving incentive for using a Variable PoS system that greatly rewards active users.

System	Investment
Variable	$250,000
Standard	$400,000

Active User

The active user is an enterprise that would like to earn enough revenues to transact freely on the network. The main goal for this user would be maintaining the initial ICX quantity of the bond within the reserve, while covering transaction fees. Price appreciation is insignificant to this user — only a sweetener. The value this user wants is the value of the public blockchain network & its DApps. This is calculated through return on investment in the network.

Active users want ICX rewards for transactions

Passive User

The passive user, one with non-significant network usage, is categorized as a network hoarder (e.g.,typical investor). These users care only for the appreciation of their investment — and in the case of staking, appreciation can happen in two ways:

1. PoS rewards from staking
2. Token value appreciation

Passive users want value appreciation for their investment

As active users earn more rewards within the variable incentive system, the investment for value is always relatively lower than standard PoS systems.

Price appreciation of the ICON currency becomes insignificant for the next joining active user as long as the transaction costs in USD stay the same. Within the ICON ecosystem, transaction fees are controlled indefinitely by the elected C-reps, making this possible. While ICON prices appreciate, network users would have to invest the same amount of $USD, and while receiving a lower amount if $ICX, they would reap the same benefits. ICX price would appreciate with lump sum purchases, while network-joining incentives wouldn't change for the next firm in line.

Enterprise ABC	
Transactions / yr	1,000,000
Transaction Fees	$0.02
Total Annual Costs	$20,000
Status	Active

(Notice how in the example graphic, none of the variables are ICX price dependent — as long as USD remains constant, meaning transaction fees in ICX go down as ICX appreciates, incoming firms will not need to pay more to use this network)

Incentives:

For passive users, the network growing in terms of enterprise user adoption would increase the price of the ICX token, through large enterprise purchases of ICX. This is a great incentive for early passive investors.

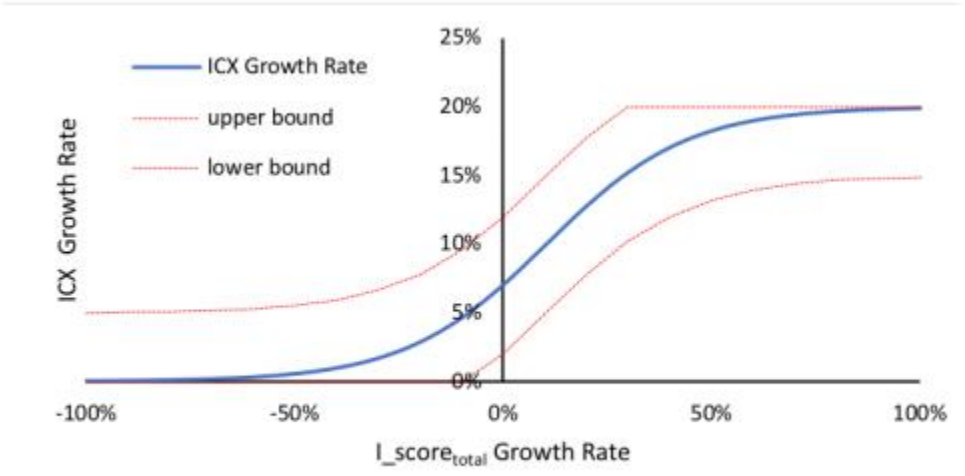
At the same time, new enterprises would have the same incentives to join as the firms that joined prior due to static USD transaction fees.

More circulating supply would be locked up from staking as more active users buy large amounts of ICX on the market to stake in bonds. With simple supply & demand, the value of the token would increase.

Therefore, the active user receives non-changing positive incentives for staking in an active network, while the passive user receives non-changing positive incentives for being a network investor through investment price appreciation.

Additionally, as the ICON variable DPoS system provides better terms for active users (enterprises) than traditional PoS systems, the lower investment cost for a joining firm would incentivize network growth through adoption. This appreciates the $ICX token, also benefiting the passive user as well.

In addition to earning monthly transaction fees during distribution, participants who stake ICX also receive newly issued ICX every year. Currently, the amount of ICX distributed is capped at 20% of total supply per year, but this amount is subject to change. The amount of ICX received at issuance also depends on network activity, DEX & DApp usage, and staked amount because it is also calculated based off of IISS score. Therefore, active users are not only earning more money from transaction fee revenues, but also earning a large portion of future issuance yearly.



Conclusion

As more valuable DApps and platforms enter the market, enterprises will have more cost-saving technologies available to them. Specifically with PoS projects, electing for a variable DPoS system will make projects like ICON more valuable in the eyes of enterprises. Additionally, active users will have to invest even less after taking into account annual issuance revenues which could increase the amount of circulating supply by up to 20% per year. While active investors thrive by earning more tokens, passive investors also benefit due to increasing adoption and passive staking/issuance revenues.

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Note: This report was put together with the current available information on staking. As more information is released, the content within this article may need significant change.

This report was put together for HX57 ICON Research Week.

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[1] https://www.pwc.com/m1/en/media-centre/articles/blockchain-new-tool-to-cut-costs.html
[2] https://www.accenture.com/ca-en/insight-banking-on-blockchain
[3] https://cryptovest.com/news/south-korean-consortium-launches-blockchain-based-authentication-service/