

Did OP Airdrop 2 Increase Governance Engagement? An Academic Analysis by [@andyhall](#) & [@elizaoak](#)

→ Link to full draft of the academic paper [here](#)

Summary

One of the most important questions for projects exploring decentralized governance is: How do we broaden participation to include more community members?

One idea is to offer token rewards to encourage people to engage in governance. To study whether this mechanism works in-practice, we took advantage of airdrop #2

's clever design and looked at the data for ~1.2 million OP users.

We find that:

(1) revealing airdrop 2's reward scheme caused a large increase

in token delegation, including first-time delegations

(2) receiving a larger reward for past participation increases the rate at which addresses subsequently delegate their tokens and vote.

This raises some interesting questions for the future:

- Is this cost effective?
- Do you need to change the activities rewarded in future airdrops?
- How would you decentralize this process in the future while maintaining its efficacy?

Open Debates about the Effectiveness of Airdrop Incentives for Community Engagement

Airdrops are one way to distribute token rewards to potentially incentivize participation, though there are ongoing debates about the success of airdrops. Some key challenges include the fact that addresses may cash out the rewards and exit; airdrops may incentivize mindless harvesting of rewards which is not helpful for long-term civic engagement; and people may not value token rewards to begin with. Dune Analytics co-founder, for instance, says that airdrops create rich quick "communities," are an absurd spending of capital to farmers, and create no long term value for anyone. An [analysis of Uniswap's airdrop](#) suggests that most awardees immediately dumped and exited, leading the author to conclude that "the airdrop model seems to be broken."

But Optimism's airdrop 2 (and 3, for that matter) is unique in that it specifically rewarded active governance participation. More generally, Optimism has been pioneering novel governance and public goods initiatives over the past few years – so there's reason to think this setting might be a particularly interesting case to study incentives for prosocial behavior.

We Exploit the Natural Experiment in Optimism's Airdrop 2 to Study Causal Effects of Rewards on Participation

On Feb 9, 2023 Optimism distributed 11.7 million OP tokens to over 300,000 unique addresses. Unlike airdrop 1, rewards were sent directly to addresses so there was no need to claim. Airdrop 2's reward function consisted of

1. A governance delegation reward (6.8 million OP sent to 57, 204 qualifying addresses)
2. A gas usage reward (2.5 million OP sent to 280,057 eligible addresses)
3. Four bonus attributes (161,759 eligible addresses).

Importantly, OP users knew an airdrop was eventually coming but they didn't know when and they didn't know how rewards would be allocated and what behaviors would be rewarded. This is an important detail as it means we could exploit the quasi-randomness in our statistical analysis to examine causal effects. The quasi-randomness refers to the previously

unknown, and somewhat arbitrary nature of the exact reward criteria cutoff (e.g. spent at least \$6.10 in gas, or had delegated at least 2,000 delegate-days).

One concern with teasing out the causal effects from mere correlation is that there might be some potential confounding, where higher rewards simply go to addresses already more inclined to participate. To address this we exploit another important detail in how the airdrop was designed, namely the fact that two of the three reward function components are non-governance related. This means that we can control for a wallet's prior delegation behavior and examine the residual variation in rewards that mainly comes from gas usage and bonus categories.

We Find Positive Effects of Airdrop 2 Rewards on Subsequent Voting and Delegation

The tl;dr is that airdrop 2 did seem to increase subsequent governance engagement (both delegation and voting).

Finding 1: Noticeable Increase in Delegation After Announcement of Rewards Scheme on Feb 9, 2023

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op_img1

936×360 74.1 KB

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First, we see an increase in new wallets that got rewarded but didn't previously delegate – but who began to delegate post-airdrop. In the figures above, the left plot shows the total amount of new OP tokens (logged) that were delegated each day. The vertical red dashed line represents the day of the Airdrop 2 announcement (Feb 9, 2023), and indeed we see a noticeable spike in delegation activity in the immediate aftermath of the announcement. Because the daily data is inherently bouncy, we also present binned averages that pool across days in the right-hand plot. We estimate lines of best fit to either side of the announcement date.

Finding 2: Receiving Larger Rewards Leads to More Delegation, On Average – Especially Delegation to Other Addresses

In addition to documenting the overall informational effects of the announcement on delegations, we also looked into whether addresses who received airdropped tokens due to past behavior subsequently committed these new tokens to governance, as opposed to “dumping” and exiting. We find a strong positive conditional relationship between the size of the rewards and the amount of delegation (in terms of delegating a higher amount for more days) after receiving the reward. Our analysis accounts for pre-treatment delegation, as discussed above in the section on overcoming potential confounding.

Of course in Optimism, users have the choice of delegating their tokens to themselves and directly vote on proposals or to delegate to a representative delegate on their behalf. Delegation to others is arguably an important part of scalable online democracy as it allows users to participate without requiring the time and skills necessary to study upcoming proposals. We find that delegations to others increase more than delegations to self – and specifically, as reward size increases, addresses delegate to others much more often than to themselves. We also find that the effect of rewards on delegation is larger for addresses with smaller OP token balances prior to the airdrop, which suggests that the rewards scheme is broadening democracy to an extent, bringing in smaller token holders into the governance process.

Finding 3: Larger Rewards Lead to More Voting

Finally, we explored the effects of airdrop 2 rewards on the act of voting. Airdrop 2 only explicitly rewarded delegation, not voting, so one concern at this point might be that we've merely documented delegation farming so far. However, we also see an increase in voting as well as delegations, suggesting there is a strong relationship between reward size and governance participation more broadly.

What's Unique About The OP Case?

There are some unique features of OP's airdrop 2 that might help explain these strong, positive effects. First, there's a promise of future rewards that is likely driving these anticipatory effects – people believe Optimism will do similar airdrops in the future (and indeed, airdrop 3 rewarded delegation as well). This is a clever approach to offer rewards retroactively and promise future rewards, though this raises the question of whether discontinuing airdrops at some point in the future will

reduce the effectiveness of the reward scheme, and in turn how to sustain sequential airdrop rewards over time. Second, it's worth noting the low value of the OP token at the time of airdrop 2, meaning the incentive to sell and exit was lower.

The first point raises an interesting question for Optimism: How long can the sequence of rewards go on, and how many different behaviors can be rewarded productively over time? If, for example, delegation continues to be rewarded, this may incentivize adversarial rewards harvesters to delegate mindlessly and crowd out the prosocial behavior across the ecosystem. Optimism can seek to change what kinds of prosocial behaviors are rewarded, but there are only so many observable components to governance participation. We look forward to further discussion on these considerations in the comments section!

Fortunately, there's an open design space for addressing some of these potential concerns and continually iterating and experimenting with new ideas. In fact, in the time since we began analyzing airdrop 2, airdrop 3 has already been implemented and improves on some of the critiques of airdrop 2 (eg., providing on average higher reward amounts). In future airdrops, it might be interesting to experiment with Incorporating non-transferable reputation, or social rewards (e.g., an "I Voted" ERC-5114 token) to overcome concerns about mindless reward harvesting, or dumping and exiting.

Conclusion

To summarize, there are two big takeaways from our analysis:

1. Announcing an airdrop that explicitly rewards a certain type of governance participation (i.e., delegation) causes many addresses to delegate further in anticipation of future rewards.
2. The particular addresses that received bigger rewards for past delegation reacted by delegating more – this could be some combination of anticipating future rewards as well as some deeper sense of ownership of the project.

We think a large part of what is driving these positive findings is the fact that there is 1) a promise of future rewards

(this is not a one-off instance), 2) the tokens give people a larger stake in the project

(via governance power), 3) there's a broader ecosystem emphasis and culture of promoting public goods and prosocial behavior

, 4) the quasi-random, retroactive reward criteria

which made this harder to game, and 5) focusing specifically on rewarding past governance behavior

in hopes of incentivizing future governance behavior. These characteristics might serve as a model for other projects seeking to successfully design airdrop incentives for community engagement.

Finally, this raises some interesting questions for the future:

- Is this cost effective?

We know that giving out token rewards in airdrop 2 led to more delegation, but only time will tell if the amount of rewards distributed maps to meaningful, sustained governance participation.

- Do you need to change the activities rewarded in future airdrops?

We know that airdrop 2 successfully created incentives for people to delegate more tokens looking ahead to the future, but if all future airdrops continue to reward the same action, will it encourage mindless delegating that doesn't translate into meaningful governance participation?

- How would you decentralize this process in the future while maintaining its efficacy?

We know that the retrospective, surprising aspect of the airdrop 2 announcement was able to change behavior and encourage delegation, but in the future, we will want to be able to create similar incentives without having to rely on a central actor to design the airdrop and announce it.