Is There Wisdom Among the DAO Crowd? Evidence from Vote Delegation*

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Abstract

Nearly half of decentralized autonomous organizations (DAOs) allow vote delegation to facilitate user participation in governance and decision making. However, how well this mechanism works is largely unknown. We evaluate the efficacy of the vote delegation scheme by examining token holders' vote delegation decisions and delegates' voting behavior in MakerDAO, a pioneering and foundational DAO protocol. We find that token holders are able to discern delegates' actions and reward delegates who act in their best interest with more delegated votes. Delegates vary in their incentives and expertise, which influence how they vote on proposals. Delegates whose interests are more aligned with token holders and who possess greater proposal-related expertise are more likely to vote correctly, whereas delegates with potential conflicts of interest tend to vote against token holders' interest. Finally, we find that the effectiveness of the vote delegation scheme is positively related to future performance of the governance tokens. Overall, our evidence suggests that vote delegation can contribute to DAO performance and growth, provided delegates have the requisite incentives and expertise.

Keywords: Decentralized Autonomous Organizations; Vote Delegation; Incentive Alignment; Conflicts of Interest; Voting Choices

JEL classification: G34, O3, G32

1.INTRODUCTION

Decentralized Autonomous Organization (DAO) is an innovative approach to exercising corporate governance on the blockchain. It allows stakeholders who hold governance tokens to directly participate in proposal voting, influencing the organization's operations. DAO differs from traditional centralized governance in two fundamental aspects. First, in centralized governance, shareholders elect board members who then appoint a CEO. In contrast, the term "Decentralized" indicates that nearly all decisions, from operational to financial, are made directly by active token holders. Second, "Autonomous" indicates that the governance process is enforced without external forces, such as regulations or third-party monitoring. Instead, this process is programmed into and executed via smart contracts, enhancing information transparency.[1] This setup ensures voting choices are immutable and publicly visible, eliminating vote manipulation and enhancing monitoring.

Despite its advantages, decentralized autonomous governance is often hindered by inefficiencies. Small and unsophisticated token holders may lack the time and knowledge to cast informed votes that enhance firm value (Ferreira and Li, 2025), while some token holders may engage in free riding by relying on others' decisions. To address these challenges, many DAOs have established vote delegation schemes that allow token holders to delegate their voting power to designated members, known as delegates. This mechanism enables token holders to participate in governance without voting on every proposal directly. Empirical evidence suggests that vote delegation is widespread in DAOs. For instance, Appel and Grennan (2024) find that 45% of the

[1] A smart contract is an automated, self-executing contract with terms directly written into code, executing, and enforcing the agreement upon pre-defined conditions on a blockchain network. The blockchain's decentralized ledger ensures transparency by allowing all participants to view contract and transaction details. Also, its cryptographic security renders the contract immutable, preventing alterations once deployed.

DAOs in their sample incorporate some form of vote delegation. However, the effectiveness of these schemes remains an open question, because there is no regulatory oversight for delegates in DAOs to safeguard against potential negligence or conflicts of interest. Therefore, the extent to which delegates serve the best interest of token holders is unknown.

The vote delegation scheme in DAOs bears some similarities to a recent development in the asset management industry. As highlighted in Malenko and Malenko's (2024) theoretical study, the rapid growth of "pass-through voting", a mechanism enabling mutual fund investors to choose between delegating their votes to fund managers or casting the votes themselves, could significantly reshape investor voting choices and corporate governance.[2] Currently, empirical research on mutual fund investors' delegation decisions is severely hampered by the lack of detailed investor- and delegate-level data. Thus, examining the behavior of token holders and delegates in DAOs provides a valuable avenue to gain insights into the working and optimal design of delegation mechanisms in general.

In this paper, we provide the first evidence on the efficacy of the vote delegation scheme by examining the delegation decisions of token holders and the voting behavior of delegates. Specifically, we focus on three important questions regarding vote delegation in decentralized governance. First, do token holders reward delegates who cast "correct votes" by increasing delegated shares, and conversely, penalize those who cast "wrong votes" by withdrawing shares? Second, how do incentives and expertise affect delegates' voting decisions? Third, does the efficacy of the vote delegation scheme impact the growth and performance of DAOs? Ex ante, the

[2] BlackRock announced the "Voting Choice" program in October 2021, which gives its investors the option to either delegate their votes to BlackRock or vote directly themselves. Other major asset management companies have also introduced similar programs, such as Vanguard's "Proxy Voting Choice" program and State Street's "Investor Choice" program. Fidelity has also indicated interest and conducted internal reviews for implementing pass-through voting programs.

answers to these questions are unclear, as the very reasons that prompt the introduction of vote delegation – namely, token holders' lack of sophistication and the absence of regulatory and monitoring forces – could also hinder the scheme's effectiveness.

We examine these questions using a sample of proposal voting in MakerDAO over a two-year period from October 25, 2021, to October 25, 2023.[3] MakerDAO is a foundational decentralized finance (DeFi) platform built on the Ethereum blockchain that operates as a crypto bank. It has introduced two cryptocurrencies: DAI, its stablecoin product pegged to the U.S. dollar, and MKR, which can be considered its governance token, analogous to a company's stock.[4] Like a traditional bank that lends out fiat currency, MakerDAO issues loans in DAI and generates revenue through the interest charged on these loans. MKR holders can vote on proposals covering topics such as new product design, budgeting, and staffing.

In our first analysis, we examine changes in the number of MKR tokens delegated to a delegate in the month after voting on a proposal (or proposals). We find that delegates who cast a higher percentage of correct votes experience higher growth of delegated shares, where a vote is defined as correct if it supports (opposes) a proposal that significantly increases (decreases) the value of MakerDAO. All else being equal, a one-standard-deviation increase in vote correctness is associated with a 1.5 percentage-point increase in delegated shares growth, or a 75% increase relative to the mean. Since the number of delegated MKR shares is a primary driver of delegate compensation, this improvement in vote correctness over a given month translates into an annual compensation increase of approximately $2,832 for the average delegate in our sample. These results indicate that token holders, through their delegation decisions, can incentivize delegates to

[3] We start the sample period from October 25, 2023, which is the beginning of the compensated delegation scheme.
[4] Stablecoins are a category of cryptocurrencies that aim to offer price stability and are typically pegged to a stable reserve asset, like the US Dollar. DAI is an algorithmic stablecoin, which relies on on-chain algorithms and smart contracts to manage its supply according to market conditions.

vote in the token holders' best interests.

Next, we explore the determinants of delegates' proposal voting decisions, focusing on delegates' incentive alignment (or misalignment) with MKR holders and their expertise regarding the underlying issues in each proposal. We find that delegates with larger MKR holdings in their own investment portfolios are more likely to cast correct votes on proposals. We also examine delegate holdings of other tokens and distinguish them based on whether their interests align or conflict with MKR. We find that delegates with larger holdings of MKR-conflicted tokens are more likely to cast incorrect votes. We note that our analysis likely underestimates the extent of conflicts of interest arising from delegate holdings of MKR-conflicted tokens, because delegates may conceal some of these positions by using unobserved addresses. These results highlight the role of incentive alignment in driving delegates' voting decisions and the importance of considering delegates' holdings in not only MKR but also other related tokens.

Regarding delegate expertise, our analysis shows that delegates are more likely to vote correctly on a proposal if they have previously invested in a greater proportion of tokens mentioned in the proposal's discussion forum, or have held larger positions in these tokens. We obtain similar results when measuring delegate expertise by the frequency of their past participation in proposals addressing similar topics. Additionally, we find that delegates with expertise are generally inclined to vote earlier, rather than free-riding on the choices of other voters.

We further assess whether the effectiveness of the vote delegation scheme affects MakerDAO's growth. We find that the aggregate percentage of correct votes cast by delegates each week is significantly and positively associated with the abnormal returns of MKR tokens in the following week. To the extent that higher abnormal returns of MKR tokens can attract more users to the MakerDAO protocol, our evidence suggests that a well-functioning vote delegation scheme, in which delegates make decisions aligned with on MKR holders' interests, can contribute positively to platform growth.

In our final analysis, we examine the relationship between token holders' heterogeneous preferences and their delegation decisions to illustrate the connection between the DAO setting and conventional corporate governance. Specifically, Malenko and Malenko (2024) theoretically demonstrate that, under pass-through voting, shareholders with heterogeneous preferences are more inclined to vote independently when their preferences differ significantly from those of available delegates. Consistent with this prediction, we find that token holders with larger holdings of conflicted tokens (i.e., stronger idiosyncratic preferences) are more likely to vote directly rather than delegate their votes. Conversely, token holders with larger MKR holdings (weaker idiosyncratic preferences) are more inclined to delegate. These findings underscore the critical role of preference heterogeneity in shaping investor voting choices.

Our paper makes several key contributions to the growing literature on DAO governance. To the best of our knowledge, we are the first to conduct a comprehensive empirical analysis of DAO delegation systems. While several papers provide descriptive analysis of DAO characteristics and classifications (Appel and Grennan, 2024; Ding et al., 2023; Puschmann and Huang-Sui, 2023), exactly how specific governance mechanisms – such as vote delegation – function and whether they affect DAO outcomes is not well understood. Appel and Grennan (2024) document a positive relationship between vote delegation and governance token returns during a proposal's voting period. They consider vote delegation as an inclusive governance feature that encourages token holder participation in DAO decision making. However, this interpretation hinges on a key assumption that delegates act in the best interest of token holders. We provide direct evidence on this assumption by demonstrating that even in a prominent decentralized organization like

MakerDAO, there are important variations across delegates in their expertise and incentive alignment with token holders and these variations influence the delegates' voting decisions. Furthermore, we find that the extent to which the delegates act in token holders' best interests is positively associated with the token's future performance. Overall, our study expands the understanding of a crucial design feature of decentralized governance.

A significant body of research examines ownership concentration in DAOs. For instance, Ferreira and Li (2025) develop a model highlighting the trilemma between efficiency, autonomy, and decentralization. Han, Lee and Li (2023) construct a theoretical framework analyzing conflicts of interest between large token holders and small participants, showing that ownership concentration can hinder platform growth. In contrast, our paper shifts the focus to the efficacy of decentralized delegation systems in DAOs. We empirically demonstrate that a well-functioning decentralized delegation system can substitute for centralized governance structures, positively impacting platform growth. Additionally, we provide evidence on conflicts of interest between voting delegates and token holders, informing the current discourse on DAO governance.

Our study also contributes to the literature on blockchain-based governance. Previous research has extensively discussed consensus algorithms in public blockchains (Cong, He, and Tang, 2022; Saleh, 2021) and has shown how blockchain reshapes collaboration and coordination between parties (Cong and He, 2019; Lee et al., 2024; Chen et al., 2023; Lumineau, Wang, and Schilke, 2021). Additionally, several theoretical studies explore how token-based governance impacts platform financing, data generation, and growth (Bena and Zhang, 2023; Cong, Li, and Wang, 2022; Jermann and Xiang, 2024; Cong, Li, and Wang, 2021). Our paper complements this literature by offering empirical insights into how the delegation system in DAO governance influences overall platform efficacy.

Last but not least, our findings also provide novel insight into the evolving landscape of voter choices driven by the recent trend of "pass-through voting", in which fund managers offer investors the option to reclaim their voting rights. While this practice aims to democratize voting, it presents challenges such as inefficient delegation and coordination failures (Malenko and Malenko, 2024). Our paper leverages the transparency of blockchain-based governance in DAOs, utilizing the granular data on both investors' and delegates' choices – data that is typically difficult to obtain in traditional mutual fund settings. Our findings suggest that vote delegation can serve as an effective governance mechanism when delegates have the right incentives and expertise to vote in the best interest of investors.

2.INSTITUTIONAL BACKGROUND

2.1 MakerDAO Business Model

MakerDAO is a DeFi company operating on the Ethereum blockchain that generates profits by issuing crypto loans. As one of the most promising DeFi project, its market capitalization reached USD 1 billion in July 2023. MakerDAO has introduced two cryptocurrencies: DAI, a stablecoin pegged to the U.S. dollar by a one-to-one ratio, and MKR, which serves as its governance token or 'stock'.

Similar to a traditional bank that lends out fiat currency, MakerDAO issues loans in DAI and generates revenue through the interest charged on these loans. To borrow DAI, borrowers are required to lock collateral, typically Ethereum (ETH), in a smart contract. To mitigate market volatility and potential depreciation of the collateral, MakerDAO often enforces overcollateralization. For instance, a loan of 1 DAI might be backed by ETH valued at 1.5 DAI. The interest charged on these loans, referred to as the "stability fee", is also paid using DAI.

Borrowers can either trade their DAI on public exchanges or keep it as savings. Investors who choose to save DAI can lock it into a smart contract to earn interest at a rate known as the DAI Savings Rate (DSR). The DSR plays a crucial role in maintaining DAI's price stability by balancing market demand and supply. For instance, if DAI's market price exceeds 1 USD, MKR holders can vote to lower the DSR, which reduces the demand for saving and increases market supply, thereby driving the price back to 1 USD. Secondary market trading also contributes to maintaining DAI's price stability. For example, if DAI's price rises above 1 USD, more investors are incentivized to borrow DAI from MakerDAO and sell it on the market, increasing the circulating supply and pushing the price back towards parity with the USD.

MKR functions similarly to corporate shares, serving three distinct roles within the MakerDAO ecosystem. First, MKR tokens provide voting rights, with each token equating to one vote. This allows holders to directly participate in MakerDAO's operational and policy decisions. Second, MKR tokens represents a claim on cash flow: holders share the profits generated from interest accrued on DAI loans. Lastly, MKR serves as a financial backstop. In the event of a sudden drop in collateral values that threatens solvency, additional MKR tokens can be minted and sold to cover outstanding debt. This action dilutes existing holdings but ensuring the integrity of the DAI peg.

2.2 MakerDAO Governance Scheme

Diverging from traditional corporate governance models that rely on a CEO and a board of directors, MakerDAO adopts a more democratic approach. All MKR holders are invited to participate in the governance process. As illustrated in Figure 1, the governance process begins with an open forum discussion, where any individual holding MKR tokens or having a vested interest in the MakerDAO ecosystem can submit and discuss proposals. These proposals cover a wide range of topics, from new collateral inclusion to budgetary considerations. By facilitating open discussions, MakerDAO decision-makers can incorporate insights from both internal and external stakeholders, leveraging the collective knowledge of a diverse user base.

After being thorough discussion and refinement in the forum, proposals that generate significant interest and debate proceed to the formal poll voting stage, which takes place weekly on the governance portal. Voting on new proposals begins every Monday at 4 PM UTC, with most polls concluding within three days. However, particularly important proposals could last for seven or fourteen days. All relevant materials and discussions about each proposal are carefully organized on the website, ensuring that voters can easily access and understand the information. The voting interface on the official website also includes a voting button for convenience. To help voters prioritize their attention and efforts, proposals are typically labeled as high, medium, or low impact, and each is tagged with relevant topic labels.[5] Participation in poll voting is exclusively restricted to MKR holders and delegates who have been entrusted with voting rights by ordinary holders. Once proposals passed the poll vote, they will proceed to an executive vote to determine their detailed implementation. Figure 2 illustrates an example of the MakerDAO governance process as displayed on the web interface.

2.3 The Delegation Framework

Acknowledging that not all MKR holder have the time or expertise to actively participate in every vote, MakerDAO has instituted a delegation system. As shown in Figure 3, the process begins with the prospective delegate establishing a delegation contract using a standardized smart contract format designed by MakerDAO. Upon successful execution of this contract, the delegate's

[5] Figure B1 in Appendix B shows voting participation across the major topic tags for our sample proposals, showing that proposals with the highest voter participation often involve risk parameters, such as changes to the stability fee.

agreement is displayed on the official MakerDAO voting website. Each delegation contract has a term of one year. When the delegation contracts expire, delegates wishing to continue must create new delegation contracts and attract token holders to delegate their voting rights under the new contracts.

MKR holders who wish to delegate their voting power can lock their MKR tokens with a chosen delegate, who then votes on their behalf in proposal polls. This arrangement offers flexibility: if MKR holders lose confidence in their delegate at any point during the contract period, they can terminate the delegation by unlocking their MKR tokens from the contract. The entire delegation process, including contract creation and interactions between delegates and MKR holders, is fully transparent and publicly recorded on the blockchain.[6] Any individual or institution can become a delegate within the DAO. Typically, MakerDAO has around 38 active delegates at any given time. This flexibility to switch delegation, combined with the competition among delegates to earn MKR holders' trust, incentivizes delegates to build expertise and dedicate significant effort to informed decision-making.

There are two types of delegates within MakerDAO: recognized delegates and shadow delegates. Recognized delegates are required to publicly disclose their identity, potential conflicts of interest, social media profiles, and introductory videos. Additionally, recognized delegates are eligible to receive compensation from MakerDAO's system reserves. The compensation amount is determined by two factors: the number of MKR shares they manage and their level of participation in voting and forum discussions. Equation (1) presents the formula used to calculate their monthly compensation.

[6] A delegate's history remains publicly accessible even after the delegation contract has expired.

$$Recognized\ Delegate\ Compensation = \left[C * \min\left(1, \frac{MKR^q}{T^q}\right)\right] * M \qquad (1)$$

where C represents the maximum monthly compensation of $12,000. MKR is the number of MKR tokens managed by the delegate at the end of the month; T is a threshold set at 10,000 MKR, and q is an exponential factor set at 0.5. Therefore, compensation increases with the number of MKR tokens managed by the delegate. The parameters T and q are specifically designed to skew compensation in favor of smaller delegates, thereby incentivizing the inclusion and recruitment of new participants into the governance system.

M is an adjustment factor determined by a performance modifier, P, which measures the delegate's voting participation and communication. Specifically, P = min (*participation, communication),* where *participation* is the percentage of polls in which the delegate participated in the previous 120 days, and *communication* measures the extent to which the delegate discloses voting decisions and provides reasoning for those decisions during the same 120-day period.[7] For example, a communication score of 100% would indicate the delegate disclosed all voting decisions *and* provided reasons for each decision over the previous 120 days. Conversely, a communication score of 50% would indicate the delegate disclosed all voting decisions but provided no reasoning for those decisions. If P is below 75%, then M equals zero, resulting in no compensation for the delegate. For value of P between 75% and 90%, M gradually increases from 40% to 100% as P reaches 90%. Once P reaches or exceeds 90%, M is set to 100%.

Unlike recognized delegates, shadow delegates remain anonymous and do not receive monetary compensation. Despite the absence of financial incentives, shadow delegates are motivated to attract MKR delegations to accumulate significant voting power and influence

[7] For a new delegate with less than 120 days of history, the evaluation period begins from the start of their delegation.

proposal outcomes in alignment with their interests. This delegation structure promotes diverse participation, accommodating various preferences and strategies from groups with differing priorities and objectives.

3. DATA AND VARIABLE CONSTRUCTIONS

3.1 Data and Sample

We collect proposal voting data from MakerDAO over a two-year period from October 25, 2021, which marks the introduction of the compensated delegation scheme, to October 25, 2023. The data are sourced from MakerDAO's official websites and include on-chain information on proposals, voting records, delegation history, and forum discussions. Proposal information includes titles, descriptions, voting durations, and outcomes. In this study, we focus exclusively on binary-choice proposals (i.e., 'Yes' or 'No'), excluding ranked-choice polls where voters rank multiple options rather than selecting a single one. Voting records contain voter addresses (either ordinary MKR voters' account addresses or delegates' delegation contract addresses), voting timestamps, poll identifiers, and vote choices. We focus on definitive votes, excluding 'Abstain' votes, which account for 7% of total votes. Additionally, we require proposals to be classifiable as either value-enhancing or value-destroying based on our classification approach described in Section 3.2, which drops about 20% of the proposals. Our final sample consists of 280 proposals, comprising 9,827 voting participation records, representing votes cast by 790 ordinary MKR holders and 179 delegates.[8]

The delegation history data includes delegation contract addresses, delegate account addresses (which deploy these contracts), MKR holder addresses granting voting power to the

[8] About 40% of these delegates are recognized delegates, and the remainder are shadow delegates.

delegates, and details of delegation record changes, such as timestamp and the number of delegated shares. Since the inception of the delegation scheme, 263 delegation contracts have been established: 188 by shadow delegates and 75 by recognized delegates (not all of whom participate in proposal voting). We exclude cases in which delegates grant their own MKR shares to themselves, which are identified if the deploying account address matches the delegating MKR holder's address. This leaves us with 1,153 records of delegation activities: 666 new delegations (i.e., MKR holders joining a delegate or adding more shares to an existing delegate) and 483 withdrawals (i.e., MKR holders leaving a delegate or transfer some of their shares away from an existing delegate). Recognized delegates account for 581 (87.2%) of the new share delegations, while shadow delegates account for 85 (12.8%).

The forum discussion data includes proposal titles, detailed descriptions, and discussants' posts within each thread. For each post, we record the discussant's nickname, the number of likes received, and any cited or referenced content. Since MakerDAO provides information about delegates' interactions within the forum, we can link forum discussants' nicknames to their corresponding delegates.

To examine delegates' expertise in specific tokens and identify potential conflicts of interest, we obtain data on MakerDAO delegates' token holdings from Etherscan. Etherscan is a blockchain explorer and analytics platform that provides detailed records of transactions, balances, and smart contract executions within the Ethereum network, covering activities and token holdings both within and outside the MakerDAO platform. We focus on token holdings associated with the account addresses delegates use to deploy their delegation contracts, as well as other public accounts linked to their ENS (Ethereum Name Service) names.[9] It is important to note that tracking token holdings in concealed accounts that delegates choose not to disclose, as well as their holdings on other blockchains such as Bitcoin, remains a significant challenge.

To assess market reactions for MKR and other tokens, we obtain daily token prices from CoinMarketCap, a leading platform for cryptocurrency price information. To calculate the abnormal returns of each token, we adopt the cryptocurrency factor model proposed by Liu and Tsyvinski (2021). The Crypto-CAPM model constructs a daily cryptocurrency market return index (CMKT) by value-weighting the returns of all tokens with market capitalizations exceeding USD 1 million. Using the CMKT factor, we calculate each token's daily abnormal return, enabling us to evaluate its price response to each proposal.

3.2 Classifications of 'Correct' Votes

For our analysis, it is crucial to determine whether a delegate votes correctly on a proposal, i.e., voting in favor of a value-enhancing proposal or against a value-destroying proposal. We take two steps to classify votes as correct. First, we categorize each proposal as either value-enhancing or value-destroying based on the market response of MKR on the pivotal voting date. Second, we examine whether the delegate's vote aligns with this classification.

To determine whether a proposal is value-enhancing or value-destroying, we examine the market response to the voting result on the *pivotal vote date*. The pivotal vote date for a proposal is defined as the day when: 1) The MKR shares voted for a decision ('Yes' or 'No') reach at least 50% of the expected total votes, where the expected total votes are calculated as the average MKR

[9] ENS is a decentralized naming system built on the Ethereum blockchain. It is designed to map human-readable names, like 'monetsupply.eth', to Ethereum addresses. This system allows us to identify other accounts linked to a delegate, as a single ENS name can be mapped to multiple Ethereum addresses, one of which is typically the delegate' address disclosed on MakerDAO.

shares involved in proposals from the previous month; 2) The MKR shares voted for that decision on the date exceed 10% of the expected total votes. These two conditions are designed to identify significant voting events that determine the outcome of a proposal.

We focus on market responses on the pivotal vote date rather than the voting's closing date for two reasons. First, the voting result is publicly visible and often determined before the final voting date, meaning the market reaction may occur prior to the conclusion of voting. Second, multiple proposals often conclude simultaneously within the same week, causing market reactions on the closing date to reflect aggregate outcomes rather than the impact of individual proposals. Note that a pivotal vote date may be unavailable for certain proposals if neither side exceeds 50% of expected total votes, or if incremental votes on that date fail to meet Condition (2).[10]

To illustrate the definition of pivotal vote date, consider Poll 665, which takes place from November 1 to November 4, 2021, with a total participation of 54,365 MKR shares. By the end of the poll, 34,315 MKR shares (63%) vote in favor, while 20,050 MKR shares (37%) oppose the proposal. The average participation in proposal voting during the previous one month is 67,043 MKR shares (expected votes). To meet the 50% threshold specified in Condition (1), one side must accumulate at least 33,521.5 MKR shares. Figure 4 plots the cumulative voting shares throughout the voting period and shows that the threshold is achieved by the "Yes" votes on November 3, 2021. Additionally, on the same day, the incremental MKR shares voted for the "Yes" decision amount to 15.5% of the expected votes, satisfying Condition (2), which requires that the MKR shares voted for that decision on the pivotal vote date exceed 10% of the expected total votes. Therefore, November 3, 2021 is identified as the pivotal vote date for Poll 665.

[10] Sixty-two proposals do not meet these two conditions and therefore are not included in our sample.

Next, we examine the abnormal return of MKR on the proposal's pivotal vote date. The daily abnormal return is estimated based on the Crypto-CAPM model:

$$r_{i,t} - r_{f,t} = \alpha_i + \beta_i CMKT_t + \epsilon_{i,t} \quad (2)$$

where *CMKT* is the value-weighted average return of cryptocurrencies listed on CoinMarketCap with market capital over $100 million (Liu, Tsyvinski, and Wu, 2021). We use the 180-day estimation window up to day -1 relative to the pivotal vote data. If the abnormal return aligns with the vote direction, i.e., a positive return when 'Yes' votes reach 50% of the expected votes, or a negative return when 'No' votes reach 50% of the expected votes, then we classify the proposal as value-enhancing. On the contrary, if the abnormal return contradicts the voting direction, i.e., a positive return when 'No' votes reach 50% of the expected votes, or a negative return when 'Yes' votes reach 50% of the expected votes, then we classify the proposal as value-destroying.

In the case of Poll 655, Figure 4 plots the cumulative abnormal returns of MKR during the voting period. On the pivotal vote date (November 3, 2021), the 'Yes' side prevails, and MKR experiences a positive abnormal return of 13.6%. Therefore, we classify the proposal as value-enhancing for MakerDAO.

Next, we define a delegate's vote on a proposal as *correct* if the delegate votes 'Yes' on a value-enhancing proposal or 'No' on a value-destroying proposal. Conversely, a vote is classified as *incorrect* if otherwise. Table 1 provides hypothetical examples illustrating this classification. Since delegates may vote on multiple proposals on the same voting date, we construct an aggregate measure, *Correct Vote*, for each delegate on each vote date.[11] This measure is defined as the proportion of correct votes cast by the delegate out of all the proposals they participate in on that vote date.

[11] On average, each delegate participates in 2.73 polls on days when they case a vote on a proposal.

Our approach for classifying proposals as value-enhancing or value-destroying is novel. To bolster the confidence in our approach, we conduct two validity checks: a case study and a text-based sentiment analysis. For the case study, we revisit Poll 665 and find that subsequent developments support our classification of this poll as value-enhancing. For the sentiment analysis, we use the Gemini-pro-latest API to label individual posts in the discussion forum for each proposal as positive, neutral, or negative (assigning sentiment scores of 1, 0.5, or 0, respectively), and then summarize at the proposal level. For example, the average sentiment score for Poll 665 is 0.64, indicating it is generally viewed favorably by the discussants as a value-enhancing proposal. We find a correlation of 30% between proposal-level sentiment scores and our classification (where value-enhancing proposals are coded as 1 and value-destroying proposals as 0). This result suggests that discussants' opinions broadly align with our classification approach. Details of these validity checks are provided in Appendix C.

3.3 Variable Constructions and Summary Statistics

Our analysis uses a vector of delegate characteristics, including an indicator variable distinguishing recognized from shadow delegates, as well as time-varying variables. Recognized delegates, whose identities are disclosed and prominently displayed on MakerDAO's official website, tend to attract more delegation shares than shadow delegates. Since recognized delegates are more closely monitored by MKR holders and face reputational costs, they are expected to align more closely with the interests of MakerDAO. Panel A of Table 2 summarizes the delegate-vote date level variables, restricting the sample to days on which a delegate cast a vote. The results reveal that 80% of the observations correspond to recognized delegates, while the remaining 20% correspond to shadow delegates.

Panel A of Table 2 provides additional insights into delegate behavior and characteristics.

During our sample period, the average delegate vote correctness (*Correct Vote*) is 44%.[12] The mean and median voting power held by delegates are 5% and 1.1% of the total votes cast in a poll, respectively, indicating significant variation in voting power, with certain delegates controlling a substantial proportion. The maximum voting power recorded for a single delegate is 48.9% of total votes cast, suggesting that even the largest delegate cannot unilaterally determine poll outcomes.[13] On average, delegates receive voting power from approximately four MKR holders. The average remaining duration of delegation contracts is 120 days. Delegates approaching the end of their delegation contracts may have lower incentives to vote correctly, as MKR holders are less likely to delegate voting power to contracts nearing expiration due to potential costs of switching delegates.

Panels B and C of Table 2 provide summary statistics for the delegate-poll-level and weekly-level variables, respectively. These variables are discussed in detail later in the paper, alongside their corresponding analyses. Additional details regarding variable construction are provided in Appendix A.

4.EMPIRICAL ANALYSIS

4.1 Do MKR Holders Reward (Punish) Delegates for Correct (Incorrect) Votes?

In this subsection, we investigate whether MKR holders reward delegates for casting 'correct' votes by increasing their delegated shares, and conversely, whether they penalize delegates for casting 'incorrect' votes by withdrawing those shares. We begin with a baseline regression analysis, followed by a series of robustness tests.

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[12] On average, delegates vote "Yes" 82% of the time. However, out of the 280 proposals in our sample, only 127 are classified as value-enhancing, while the remaining 153 are classified as value-destroying.

[13] Larger delegates may attract greater attention and trust from MKR holders. However, because the marginal increase in compensation diminishes as delegate size grows, larger delegates may have weaker incentives to vote correctly compared to smaller delegates.

4.1.1 Baseline Regression Analysis

We estimate the following delegate-vote date level regression of future delegation changes on delegates' vote correctness:

$$Delegation\ Change_{d,t+30} = \alpha + \beta\ Correct\ Vote_{d,t} + \gamma' X_{d,t} + \eta_d + \theta_t + \epsilon_{d,t} \quad (3)$$

where the sample includes observations where delegate *d* casts a vote on date *t*. The dependent variable, *Delegation Change*$_{d,\,t+30}$, captures the change in delegation to delegate *d* during the 30-day window following the vote on date *t*.[14] We construct three measures to capture the change in delegation. The first measure, *MKR Increase*, is a dummy variable that equals one if the net change in delegated MKR is positive over the 30-day period, and zero otherwise. [15] The second measure, *Delegator Increase*, is the net count of MKR holders delegating to the delegate over the 30-day period, calculated as the number of new delegators minus the number of delegators who withdraw delegation. The third measure, *Delegate Growth*, is the growth rate of delegated MKR shares over the 30-day period, calculated as the net gain in the number of MKR shares delegated, divided by the delegate's total MKR shares on the vote date.[16]

The main independent variable, *Correct Vote*, measures the correctness of delegate *d*'s vote on date *t*, defined as the proportion of correct votes cast by delegate *d* across all proposals voted on that date. $X_{d,t}$ represents a vector of control variables, including delegate and proposal characteristics discussed in the previous section, as well as delegation growth over the prior 30 days. To control for unobserved heterogeneity across delegates and time, we include delegate fixed effects (η_d) and year-month fixed effects (θ_t). Standard errors are clustered at the delegate level.

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[14] The 30-day window is selected based on the monthly evaluation cycle of delegates. Additionally, recognized delegates are required to disclose the rationale behind their votes within 7 days after each vote. MKR holders may require additional time to process and respond to their delegates' voting decisions.

[15] Our results remain similar when we estimate a multinomial logit model using three indicator variables: net increase in delegation shares, zero change in delegation shares, and net decrease in delegation shares.

[16] We winsorize Delegate *Growth* at the 90th percentile to mitigate the impact of outliers.

Table 3 presents the regression results. The coefficients on *Correct Vote* are significantly positive in five out of the six models, indicating that MKR holders reward delegates for making correct votes by increasing delegated shares, or conversely, punish delegates for making incorrect votes by withdrawing delegated shares. This effect is also economic significant. A one-standard-deviation increase in *Correct Vote* for a delegate is associated with a 1.4-percentage-point increase in the growth rate of delegation shares over the next 30 days, representing a 75% increase from the mean.[17] Given that the average number of MKR shares managed per delegate is 4,598, this increase translates to an additional delegation of approximately 66 MKR shares, resulting in roughly $58 in additional monthly compensation.[18] On average, a delegate participates in four votes per month. Thus, the increase in delegation shares observed in the current month would lead to an additional total compensation of approximately $241 in the following month.

4.1.2 Robustness Tests

We conduct several robustness tests to confirm the reliability of our baseline results. First, we measure vote correctness using an alternative approach: abnormal MKR returns derived from the cryptocurrency two-factor and three-factor models (Liu, Tsyvinski, and Wu, 2021), rather than the Crypto-CAPM model used in our baseline analysis.[19] Second, we expand the return window for measuring vote correctness to include both the pivotal vote date and the following day, rather than restricting it to only the pivotal vote date. As shown in Table B1 of Appendix B, the results

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[17] The 1.4 percentage-point increase is calculated as the standard-deviation of *Correct Vote* (45%) times the coefficient of 0.032 in Column (6) of Table 3.

[18] Compared to the average *Delegate Growth* of 2%, the additional increase of 1.44% corresponds to an incremental delegation of approximately $4{,}598 \times 1.44\% = 66$ MKR shares. According to Equation (1), without considering improvements in voting accuracy, the delegate's monthly payment is calculated as $12{,}000 \times (4598 \times (1 + 2\%)/10{,}000)^{0.5} = 8{,}218$. When accounting for the increased voting accuracy, the delegate can receive a higher monthly payment as $12{,}000 \times (4598 \times (1 + 2\%) + 66)/10{,}000)^{0.5} = 8{,}276$. Thus, the incremental delegation of 66 MKR shares translates into an additional monthly payment of approximately $8{,}276 - 8{,}218 = 58$ USD.

[19] The cryptocurrency two-factor model includes the crypto-market factor (CMKT) and the crypto-size factor (CSMB). The cryptocurrency three-factor model further incorporates an additional crypt-momentum factor (CMOM). When constructing the CMOM factor, we follow a three-day momentum strategy.

remain consistent with our baseline findings under both alternative specifications.

Third, we measure vote correctness using the delegate's number of correct votes on a given date, rather than the proportion of correct votes. As shown in Table B2 of Appendix B, our results remain consistent with this alternative specification. Fourth, in April 2023, MakerDAO implements significant governance changes as part of its "Endgame Plan", which aims to further decentralize governance, enhance efficiency, increase resilience, boost voter participation, and ensure long-term sustainability. This reform, discussed in detail in Appendix D, brings several key changes to delegate incentives, potentially affecting the effectiveness of MKR holders' monitoring of delegate voting. In Table B3 of Appendix B, we present a subperiod analysis covering the post-reform period from April 2023 to October 2023. These results reveal even stronger effects compared to the full sample period. For example, a one-standard-deviation increase in *Correct Vote* is associated with a 4.2-percentage-point increase in delegate growth, nearly three times the baseline effect.

4.2 Delegate Incentives and Voting Behavior

Our results in the previous subsection show that MKR holders can incentivize delegates to vote correctly on proposals through an ex-post settling-up mechanism of delegation adjustments. In this subsection, we examine delegates' ex-ante incentives, specifically those arising from their crypto holdings, and analyze how these incentives influence their voting decisions.

4.2.1 Incentive alignment from MKR token holdings

We begin by examining how delegates' MKR holdings influence their voting decisions. Delegates with larger MKR holdings in their investment portfolios are expected to have stronger interest alignment with their principals (MKR holders), thus increasing the likelihood they vote correctly. To test this hypothesis, we estimate the following delegate-poll level regression:

$$Correct_{d,p} = \alpha + \beta_1 \ln(1 + MKR\ holdings_{d,p}) + \gamma' X_{d,p} + \eta_d + \theta_t + \epsilon_{d,p} \quad (4)$$

where the dependent variable, $Correct_{d,p}$, is a dummy variable that equals one if delegate *d* casts a correct vote on proposal *p*, and zero otherwise. The key independent variable is the natural logarithm of one plus the dollar value of MKR holdings in delegate *d*'s accounts at the time of voting on proposal *p*. As shown in Panel B of Table 2, the majority of delegates hold no MKR in their public related accounts. Among those with positive MKR holdings, the average dollar value is $5,530. This regression also includes a vector of delegate and proposal characteristics, delegate fixed effects, and year-month fixed effects. Standard errors are clustered at the delegate level.

Table 4 presents the regression results. The coefficient for MKR holdings is positive and significant at the 0.01 level across both specifications. Economically, a one-standard-deviation increase in *ln(1+ MKR holdings)* is associated with a 2.4% increase in the likelihood of voting correctly on a proposal.[20] This finding suggests that, consistent with our prediction, delegates' MKR holdings help align their incentives with those of MKR holders.

4.2.2 Conflicts of interest from other token holdings

In addition to MKR, delegates often hold other tokens in their portfolios. While delegates' MKR holdings can strengthen the alignment of interest between delegates and MKR holders, their holdings of other tokens may create potential conflicts of interest, raising concerns among DAO participants. Figure 5 illustrates such a scenario, in which the delegate 'Monet-Supply' discloses holdings of tokens from Aave and COMP, competitors of MakerDAO. This disclosure prompts skepticism from an MKR holder, who voices concerns about conflicting incentives: "*We should need to trust you to act against your incentive. This is something I wouldn't trust anyone to do, as*

[20] The 2.4% increase is calculated as the standard-deviation of *ln(1+MKR Holdings)* (0.83) times the coefficient of 0.029 in Column (2) of Table 4.

I believe incentives always win."

We investigate the potential conflicts of interest arising from delegates' token holdings. For example, in the scenario depicted in Figure 5, suppose a proposal is introduced to lower the interest rate of DAI. Such as change could attract more users to MakerDAO but potentially divert users away from competitors like Aave. In this situation, could the delegate in question vote 'No' to protect the value of their Aave holdings, even if this proposal is value-enhancing for MakerDAO? To explore potential agency conflicts of this nature, we investigate whether delegates who hold tokens aligned with interests conflicting with MakerDAO are more likely to vote incorrectly.

We construct a poll-token level measure, *Conflicted*, to capture the contradicting effects of a proposal p on MKR and a token i.[21] The rationale is that if a proposal has divergent implications for MKR and token i, the voting outcome – whether approval or rejection – would cause opposite price reactions in MKR and token i. Specifically, we define *Conflicted* as a dummy variable equal to 1 if, on the pivotal vote date, the abnormal returns of token i and MKR are in opposite extreme deciles (either top or bottom deciles) of their respective distributions, and zero otherwise.

Similarly, we construct a dummy variable, *Aligned*, to capture scenarios in which the interests of MKR and token i align with respect to a proposal. Specifically, *Aligned* equals 1 if the abnormal returns of MKR and token i on the pivotal vote date are both in the top decile or both in the bottom decile of their respective distributions, and zero otherwise. Table B4 of Appendix B illustrates various scenarios, providing examples of how *Conflicted* and *Aligned* are constructed.

We examine how the incentives derived from delegates' related token holdings affect their voting behavior by estimating the following delegate-proposal level regression:

[21] We exclude tokens of Ethereum, DAI and MKR. Additionally, we exclude other stablecoins because stablecoins are known for its stable price around the peg.

$$Correct_{d,p} = \alpha + \beta_1 Conflict_{d,p} + \beta_2 Align_{d,p} + \gamma' X_{d,p} + \eta_d + \theta_t + \epsilon_{d,p} \quad (5)$$

where the dependent variable, *Correct*, is as defined in equation (4). The key independent variables include measures of conflicts or alignment of interests for delegate d with respect to proposal p. Specifically, we use three measures of conflicts of interest. *Conflicted Dummy* is a dummy variable that equals 1 if the delegate holds any tokens for which *Conflicted* equal to 1, and zero otherwise. *Conflicted Number* is the number of tokens in the delegate's holdings for which *Conflicted* equal to 1. *Conflicted Ratio* is calculated as the ratio of *Conflicted Number* to the total number of tokens held by the delegate on the vote date. Similarly, we construct three analogous measures of aligned interest based on *Aligned.* We include controls for delegate and proposal characteristics, as well as delegate and year-month fixed effects. Standard errors are clustered at the delegate level.

Table 5 presents the regression results. The coefficients for all three measures of conflict are significantly negative, indicating that delegates holding more tokens with interests misaligned with MKR are significantly less likely to cast a correct vote. These findings are also economically significant. For example, Model (6) shows that one-standard-deviation increase in *Conflicted Ratio* decreases the probability of voting correctly by about 2.8%.[22] It is worth noting that these results likely represent conservative estimates, as delegates may potentially conceal related token holdings in other accounts that are not publicly visible to the MakerDAO community, which could further exacerbate the agency problem.

For robustness, we also construct alternative measures of conflicts and aligned interests by using the logarithm of the dollar value of the conflicted (aligned) token holdings. In Table B5 of Appendix B, the results remain consistent with our baseline analysis. Overall, our analyses

[22] The 2.8% decrease is calculated as the standard deviation of *Conflicted Ratio* (0.08) times the coefficient of -0.354 in Column (6) of Table 5.

demonstrate that conflicts of interest arising from delegates' token holdings significantly impact their voting behavior.

4.3 Delegate Expertise

4.3.1 Delegate Expertise and Vote Correctness

In this subsection, we examine whether delegates are more likely to vote correctly on proposals when they have relevant expertise. We estimate a delegate-proposal level regression as below:

$$Correct_{d,p} = \alpha + \beta\ Expertise_{d,p} + \gamma' X_{d,p} + \eta_d + \theta_t + \epsilon_{d,t} \qquad (6)$$

where the dependent variable is a dummy variable equal to 1 if delegate d casts a correct vote on proposal p, and 0 otherwise. The key independent variable, $Expertise_{d,p}$, measures delegate d's level of expertise relevant to proposal p at the time of voting. As in Equations (4) and (5), we control for delegate and proposal characteristics as well as delegate and year-month fixed effects. Standard errors are clustered at the delegate level.

We measure a delegate's expertise on a proposal based on their experience holding tokens mentioned in forum discussions related to that proposal. This approach assumes that delegates who have previously held these tokens are more familiar with the proposal's subject matter and are therefore better equipped to make informed voting decisions. To construct this measure, we first identify tokens referenced in proposal discussions by searching for token names in the associated forum threads.[23] We exclude the three fundamental tokens of MKR, DAI, and ETH as they are relevant to virtually all proposals and thus do not provide additional insight into a delegate's

[23] If the name of a token is a single word such as Tether or two words, we require the entire token name to be present in the discussion. If a token's name contains three words such as Rocket Pool ETH, we require at least two words in the name to matched to the text of discussion (e.g., Rocket Pool).

specific topic expertise. Table B6 of Appendix B provides the list of tokens identified in proposal discussions.

Next, we classify a delegate as having experience with a particular token if they have previously held it. We focus on tokens that delegates previously owned but no longer hold at the time of voting, to avoid potential confounding effects from current token holdings. Delegates without any history of token ownership are excluded from our analysis. We construct an expertise measure, *Token Experience*, as the ratio of the number of unique tokens mentioned in the proposal discussion that the delegate previously held (henceforth "expertise token"), to the total number of unique tokens historically held by the delegate (excluding tokens currently held at the time of voting). As shown in Table 2, the average *Token Experience* across our sample is 3%.

We also construct two alternative measures of expertise that incorporate the dollar values of token holdings, as delegates who invest more heavily in a token may have greater expertise about the token. The first alternative measure is the natural logarithm of one plus the average dollar value of the expertise tokens. We calculate the dollar value for each expertise token as the average dollar holding value during the delegate's ownership period. The second measure, *Portfolio Weight*, represents the average daily portfolio weight allocated to expertise tokens throughout the delegate's ownership period. On average, delegates in our sample held expertise tokens valued at $1,458, which constituted about 5% of their total portfolios.

Table 6 presents the regression results. We find that the coefficient for *Token Experience* is positive and significant in both Models (1) and (2). This result is also economically significant, as a one-standard-deviation increase in *Token Experience* increases the likelihood of voting correctly by 3%. Similarly, the coefficients for the other two expertise measures are statistically and economically significant in Models (3) to (6). For example, the coefficient for *Portfolio Weight* indicates that a one-standard-deviation increase in *Portfolio Weight* is associated with a 2.2% higher likelihood of voting correctly.

For robustness, we adopt an alternative approach to measure delegate expertise based on the delegate's voting experience on proposals with similar topics. Delegates may accumulate knowledge from previous voting experience on related proposals, helping them make more informed voting decisions in subsequent votes. Specifically, we first measure a delegate's *Topic Experience* at the delegate-proposal-tag level as the number of times delegate *d* previously participated in proposals sharing an identical tag with proposal *p*, where each tag represents a key topic associated with the proposal. If proposal *p* has multiple tags, we then define *Topic Experience* at the delegate-proposal level as the average of these counts across the proposal's tags. On average, delegates in our sample have participated in 7.7 past proposals on the same topics, with a maximum value of 60.5.

Table 7 presents regression results of vote correctness on the natural logarithm of one plus *Topic Experience*. The coefficient for topic experience is positive and significant in both models, supporting our prediction that delegates with greater expertise on a proposal are more likely to cast correct votes. In terms of economic significance, a one-standard-deviation increase in *ln(1+Topic Experience)* leads to a 4.9% increase in the probability of voting correctly.[24] Overall, the results in this subsection demonstrate that delegates' expertise significantly increases the likelihood of casting correct votes.

4.3.2 Delegate Expertise and Timing of Votes

[24] Our results remain robust across various model specifications for calculating adjusted returns on the pivotal vote date, as well as using an expanded two-day window to capture market reactions. Tables B7 and B8 of Appendix B present the robustness tests.

In addition to correctness, the timing of delegates' votes is another variable of interest. Since votes are visible during the voting period, voters face a tradeoff: voting earlier allows them to influence subsequent voters and potentially affect the outcome, while voting later enables them to incorporate information from earlier votes, thus making more informed decisions. The latter aspect of this tradeoff is reflected in the significantly negative coefficient for *Vote Early* reported in Table 7, where *Vote Early* is defined as the duration between a delegate's vote and the end of the voting period, divided by the total duration of the voting period.

We predict that delegates with greater expertise are more likely to vote early because they rely less on information from other voters and have stronger incentives and greater ability to influence others. To test this prediction, we examine the relation between delegate expertise and vote timing. Specifically, we regress *Vote Early* on our measures of delegate expertise and present the results in Table 8. The coefficient on delegate expertise is positive across all regressions and statistically significant in half of them. For example, the coefficient for *Topic Experience* in Model (1) is positive and significant at the 0.01 level (t-statistic=4.72). Economically, this coefficient indicates that a one-standard-deviation increase in *Topic Experience* corresponds to a 20% increase in the standard deviation of *Vote Early*. Overall, these findings suggest that delegates with greater expertise are inclined to vote earlier.

4.4 The Efficacy of Vote Delegation and MakerDAO Performance

As a key component of the MakerDAO governance framework, the effectiveness of the delegation scheme can potentially have a significant impact on the performance and growth of the MakerDAO protocol. To shed light on this issue, we assess how delegates' voting correctness affects MKR prices. Given that most proposal voting on MakerDAO occurs within a week, we regress weekly abnormal returns of MKR on the lagged weekly weighted average of delegates' voting correctness. The regression model is specified as follows:

$$Abnormal\ Ret_{t+1} = \alpha + \beta Delegate\ Voting\ Correctness_t + \gamma' X_t + Year\ FE + \epsilon_t \qquad (7)$$

where the dependent variable is weekly abnormal returns of MKR. We follow Liu, Tsyvinski, and Wu (2021) and create weekly price factors CMKT, CSMB, and CMOM, allowing us to obtain residuals from the crypto-market model, the two-factor model, or the three-factor model. The key independent variable is *Delegate Vote Correctness$_t$*, which is the voting-power-weighted average of delegates' voting correctness over the past week. We control for several weekly measures related to proposal voting, including the number of proposals under voting, the total number of voting participations, and the number of proposals tagged as "High Impact" under voting. Additionally, we construct a measure of *Ordinary Voter Correctness*, defined as the voting-power-weighted average of non-delegate MKR holders' voting correctness, using the same methodology as *Delegate Vote Correctness*.

During our two-year sample period, there are 87 weeks in which both delegates and ordinary MKR voters participated. As shown in Panel C of Table 2, the average weekly crypto-market adjusted return for MKR during our sample period is 1%. Additionally, the average voting power-weighted correctness for delegates across weeks is 46%, which is higher than the 42% for ordinary MKR voters.

Table 9 presents the regression results. The coefficient for *Delegate Vote Correctness* is positive and significant across all models. Specifically, a one-standard-deviation increase in delegate vote correctness in a given week is associted with a 4.14% higher monthly returns. To assess how effectively the delegation system needs to function for it to be cost-effective for MKR holders, we perform a simple cost-benefit analysis. Taking December 2022 as an example, the total monthly compensation paid to delegates is $108,690, while the average number of MKR shares locked in delegation contracts is 129,183 shares. This implies a monthly delegation cost per MKR share of about $0.84 ($108,690/129,183). Given an MKR price of about $580 in December 2022, the monthly cost of delegation as a precentage of MKR price is roughly 0.14%, less than 1/25th of the 4.14% increase in MKR monthly returns associated with a one-standard-deviation increase in weekly delegate vote correctness. This comparison indicates that even a small improvement in delegate vote correnctness can increase value for MKR holders.

In addition to reducing the collective cost of governance and enhancing efficiency, the voting delegation system on MakerDAO is designed to increase MKR-holder participation and reduce the influence of large shareholders.[25] To assess whether the delegation scheme has achieved these objectives, we examine voter participation and concentration since 2019 (prior to the introduction of delegation). Figure 6 illustrates the weekly time series of the ratio of total MKR shares participating in voting relative to the circulating supply (blue line). Before the introduction of the delegation scheme in October 2021, the average voting participation rate is 4.5%. Following its launch, voting participation increases immediately, with the average rising to 10%. This finding suggests that the delegation scheme has effectively increased broader MKR-holder participation in governance.

The orange dotted line in Figure 6 tracks the voting power of the largest voter over time. Following the introduction of the delegation scheme, the voting power held by the largest voter decreases significantly, falling from an average of 48% to 26%. Similarly, the average voting power controlled by the top three voters declined from 80% before October 2021 to 57% afterward. These changes mark a meaningful step toward decentralization for MakerDAO without significantly compromising governance efficiency.

[25] See https://forum.sky.money/t/delegation-and-makerdao/9429.

4.5 Token-Holder Preferences and Delegation Decisions

Malenko and Malenko (2024) show theoretically that, in pass-through voting, shareholders with heterogeneous preferences are more inclined to vote independently when their preferences differ significantly from those of available delegates. Although our paper primarily focuses on the effectiveness of the delegation scheme, the unique data on token-holders' delegation choices allow us to empirically examine this important theoretical prediction. Investigating this prediction is especially relevant given the rapidly growing practice of pass-through voting, which has the potential to significantly reshape the landscape of shareholder voting decisions and corporate control.

Building on the prediction of Malenko and Malenko (2024), we hypothesize that MKR holders with more divergent preferences are more likely to vote directly rather than delegating their votes. To test this hypothesis, we estimate a MKR holder–poll level regression as follows:

$$Delegate_{i,p} = \alpha + \beta_1 Conflict_{i,p} + \beta_2 MKR\ Holdings_{i,p} + \gamma' X_{i,p} + \eta_i + \theta_p + \epsilon_{i,p} \quad (8)$$

where the dependent variable captures MKR holders' delegation choices. Specifically, we construct two dependent variables. First, *Delegate* is a dummy variable that takes the value of 1 if MKR holder *i* chooses to delegate their voting rights for proposal *p*, and 0 if they opt to vote directly.[26] As shown in Panel D of Table 2, on average, 75% of MKR holders choose to delegate their votes rather than voting directly. Second, recognizing that MKR holders may delegate only a portion of their voting power while using the remainder to vote directly, we define *Delegation Share Ratio* as the proportion of MKR shares delegated relative to the total MKR shares held by investor *i* for proposal *p*.

[26] If a delegate locks his MKR shares under his own delegation contract, we classify him as voting independently.

The key independent variable is $Conflict_{i,p}$, defined natural logarithm of one plus the dollar value of conflicted token holdings held by MKR holder *i* on the vote date of proposal *p*. To measure the alignment of interests between investors and MakerDAO, we construct the variable *MKR Holding Ratio*, defined as the amount of MKR holding shares the MKR holder *i* holds divided by the MKR supply amount in circulation on the vote date for proposal *p*. We also include several time-varying control variables capturing investor characteristics, specifically *Num of Other Token Holding* and *ln(1+Other Token Holding Value)*. The regression sample is conditional on MKR holders' voting participation, regardless of whether votes are cast directly or through a delegate. We incorporate proposal fixed effect (θ_p) but exclude MKR holder fixed effects.[27] All standard errors are clustered at the MKR holder level.

Table 10 reports the regression results. The coefficient on conflicted token holdings is negative and statistically significant in all models. Economically, a one-standard-deviation increase in *ln(1+Conflicted Holdings Value)* corresponds to a 1.5 percentage-point reduction in the likelihood of delegation. Conversely, the coefficient on MKR holdings is positive and significant, suggesting that MKR holders whose interests are more closely aligned with MakerDAO are more inclined to delegate their votes. Specifically, a one-standard-deviation increase in MKR holdings is associated with a 1.9 percentage-point increase in the likelihood of delegation. Therefore, these results are consistent with theoretical predictions of Malenko and Malenko (2024) that token holders with stronger idiosyncratic preferences are more likely to participate directly in voting rather than delegating their votes, underscoring the critical role of preference heterogeneity in shaping voting behavior in decentralized governance contexts.

[27] MKR holder fixed effects alone account for approximately 94% of the variation in delegation choices, as within-holder variation in the MKR Holding Ratio is small.

5.CONCLUSION

Governance on the blockchain has garnered significant attention in recent years, with Decentralized Autonomous Organizations (DAOs) emerging as a novel structure for managing decentralized communities. Unlike traditional governance models, DAOs operate without a central authority, allowing every token holder to participate directly in voting in decision-making processes that span from staffing to business strategy. However, this ideal of perfect decentralization can lead to inefficiencies, as not all token holders possess the time or expertise to make informed decisions that benefit the community's growth. To address this challenge, DAOs have introduced vote delegation schemes.

In this paper, we set out to investigate the efficacy of vote delegation in DAOs using data from MakerDAO. First, we demonstrate that token holders do reward delegates who cast "correct" votes, as evidenced by increased delegation of voting power to these delegates. Such increase in delegated shares can translate into tangible financial compensation for delegates.

Second, we find that delegates' incentives and expertise are crucial in shaping their voting behavior. Delegates with greater expertise - measured by their prior involvement in similar proposals or their holdings of tokens relevant to the proposals - are more likely to vote correctly. Moreover, delegates with higher MKR holdings are more likely to cast votes that are value-enhancing to the MakerDAO. However, our analysis also reveals that when delegates hold tokens that conflict with the interests of MakerDAO, they are more likely to vote incorrectly.

Finally, we show that the efficacy of the vote delegation scheme has a significant impact on MakerDAO's performance. Specifically, a higher percentage of correct votes by delegates correlates with higher future abnormal returns for MKR tokens, suggesting that well-functioning governance contributes to the platform's growth. Furthermore, we find that the delegation scheme increases voter participation and reduces centralization, fulfilling its foundational objective of facilitating relatively decentralized governance.

References

Appel, I. and Grennan, J., 2024. Decentralized governance and digital asset prices. Working Paper.

Bena, J. and Zhang, S., 2023. Token-based decentralized governance, data economy and platform business model. Working Paper.

Chen, M.A., Hu, S.S., Wang, J. and Wu, Q., 2023. Can blockchain technology help overcome contractual incompleteness? Evidence from state laws. Management Science, 69(11), pp.6540-6567.

Cong, L.W. and He, Z., 2019. Blockchain disruption and smart contracts. The Review of Financial Studies, 32(5), pp.1754-1797.

Cong, L.W., He, Z. and Tang, K., 2022. The tokenomics of staking. Working Paper.

Cong, L.W., Li, Y. and Wang, N., 2021. Tokenomics: Dynamic adoption and valuation. The Review of Financial Studies, 34(3), pp.1105-1155.

Cong, L.W., Li, Y. and Wang, N., 2022. Token-based platform finance. Journal of Financial Economics, 144(3), pp.972-991.

Ding, Q., Liebau, D., Wang, Z. and Xu, W., 2023. A survey on decentralized autonomous organizations (DAOs) and their governance. World Scientific Annual Review of Fintech, 1, p.2350001.

Edmans, A., Goldstein, I. and Jiang, W., 2015. Feedback effects, asymmetric trading, and the limits to arbitrage. American Economic Review, 105(12), pp.3766-3797.

Ferreira, D. and Li, J., 2025. Governance and Management of Autonomous Organizations. Working Paper.

Han, J., Lee, J. and Li, T., 2023. Dao governance. Working Paper.

He, J. and Huang, J., 2017. Product market competition in a world of cross-ownership: Evidence from institutional blockholdings. The Review of Financial Studies, 30(8), pp.2674-2718.

He, J.J., Huang, J. and Zhao, S., 2019. Internalizing governance externalities: The role of institutional cross-ownership. Journal of Financial Economics, 134(2), pp.400-418.

Jermann, U.J. and Xiang, H., 2024. Tokenomics: Optimal monetary and fee policies. Working Paper.

Lee, S., Pinto, J., Rabetti, D. and Sadka, G., 2024. Blockchain-Induced Supply Chain Transparency and Firm Performance: The Role of Capacity Utilization. Working Paper.

Li, T., 2018. Outsourcing corporate governance: Conflicts of interest within the proxy advisory industry. Management Science, 64(6), pp.2951-2971.

Liu, Y., Tsyvinski, A. and Wu, X., 2022. Common risk factors in cryptocurrency. The Journal of Finance, 77(2), pp.1133-1177.

Lumineau, F., Wang, W. and Schilke, O., 2021. Blockchain governance - A new way of organizing collaborations? Organization Science, 32(2), pp.500-521.

Malenko, A. and Malenko, N., 2024. Voting choice. Working Paper.

McCahery, J.A., Sautner, Z. and Starks, L.T., 2016. Behind the scenes: The corporate governance preferences of institutional investors. The Journal of Finance, 71(6), pp.2905-2932.

Saleh, F., 2021. Blockchain without waste: Proof-of-stake. The Review of financial studies, 34(3), pp.1156-1190.

Figure 1
MakerDAO governance process

This figure illustrates the governance process within MakerDAO. The process begins with stakeholders submitting proposals on the discussion forum, where community members—regardless of MKR holdings—can participate in open and transparent deliberation. Since the first two stages occur off-chain (i.e., not recorded on the blockchain), participation is unrestricted. Following discussions, designated facilitators consolidate viable proposals into polls, which are then presented on the governance portal each Monday. At this stage, MKR token holders and delegates cast votes to determine the proposals' viability. Successful proposals advance to the executive voting phase, where final assessments are conducted before approval and execution. The last two stages occur on-chain, ensuring immutability and enforceability within the MakerDAO system.

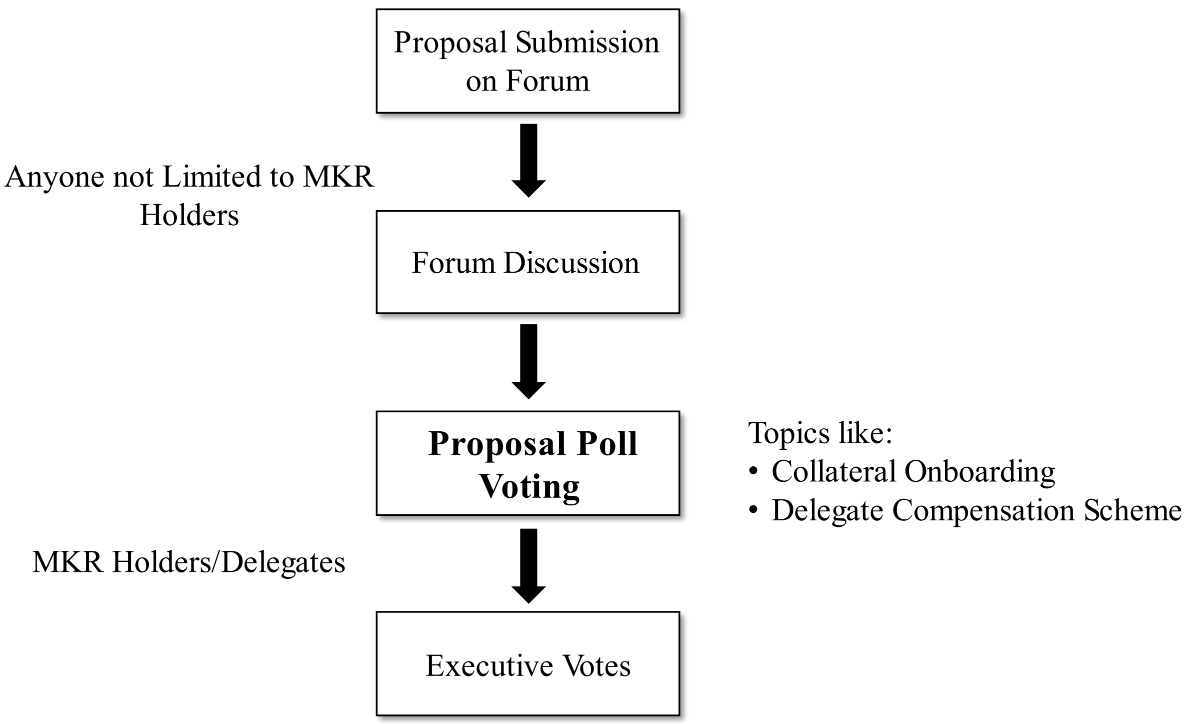
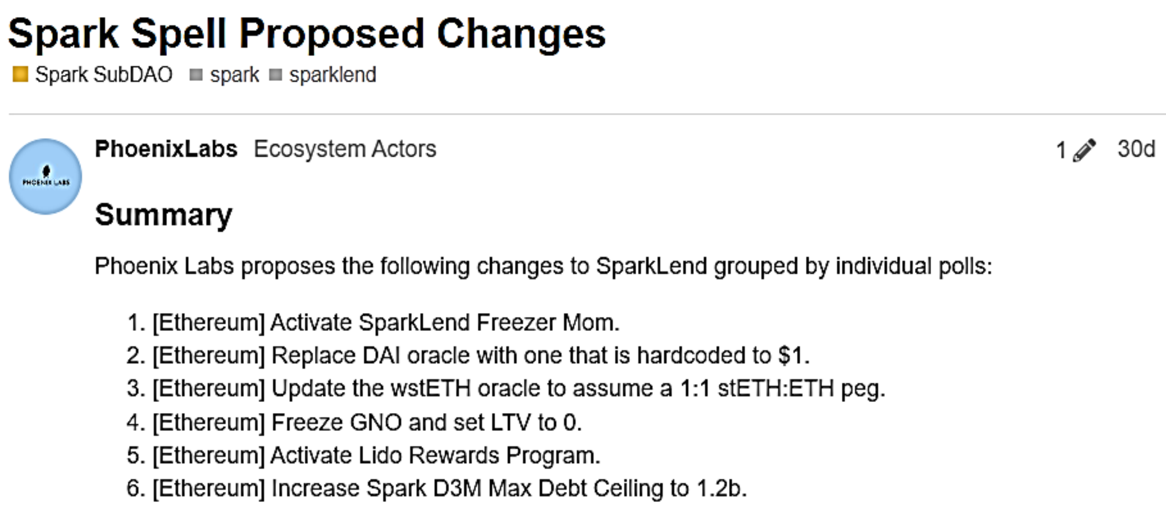


Figure 2

MakerDAO governance process: an example

This figure illustrates an example of the MakerDAO governance process as displayed on the web interface, outlining the sequential decision-making stages. Panel A depicts *Proposal Submission*, where PhoenixLabs submits a proposal to adjust parameters in a smart contract named SparkLend. Panel B represents *Forum Discussion*, during which community members provide questions, comments, and feedback. Panel C illustrates *Poll Voting*, where the proposal receives 100% support from 70 participants, with a total of 80,181.461 MKR votes cast. Panel D shows *Executive Voting*, in which the approved proposal undergoes a final governance vote that includes a detailed implementation plan. Finally, Panel E depicts *Implementation*, where the approved proposal is executed, enacting the proposed changes.

Panel A: Proposal Submission


Spark Spell Proposed Changes

Spark SubDAO spark sparklend

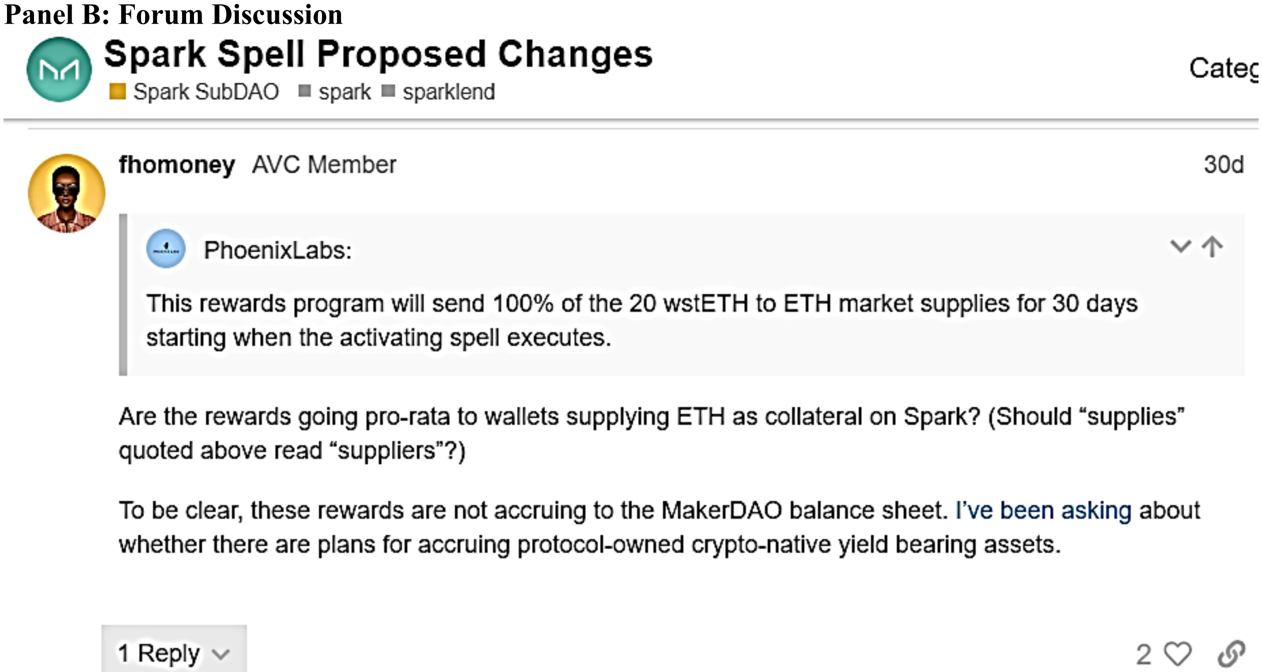
PhoenixLabs Ecosystem Actors 1 30d

Summary

Phoenix Labs proposes the following changes to SparkLend grouped by individual polls:

1. [Ethereum] Activate SparkLend Freezer Mom.
2. [Ethereum] Replace DAI oracle with one that is hardcoded to $1.
3. [Ethereum] Update the wstETH oracle to assume a 1:1 stETH:ETH peg.
4. [Ethereum] Freeze GNO and set LTV to 0.
5. [Ethereum] Activate Lido Rewards Program.
6. [Ethereum] Increase Spark D3M Max Debt Ceiling to 1.2b.

Panel B: Forum Discussion


Spark Spell Proposed Changes

Spark SubDAO spark sparklend

Categ

fhomoney AVC Member 30d

PhoenixLabs:

This rewards program will send 100% of the 20 wstETH to ETH market supplies for 30 days starting when the activating spell executes.

Are the rewards going pro-rata to wallets supplying ETH as collateral on Spark? (Should "supplies" quoted above read "suppliers"?)

To be clear, these rewards are not accruing to the MakerDAO balance sheet. I've been asking about whether there are plans for accruing protocol-owned crypto-native yield bearing assets.

1 Reply

2

Panel C: Poll Voting

POSTED JAN 08 2024 16:00 UTC | POLL ID 1063 — POLL ENDED

SparkLend Ethereum - Replace Dai oracle with one that is hardcoded to 1 USD - January 08, 2024

High Impact | Risk Parameter | Spark Protocol

Forum Discussion ↗
Review resources on GitHub ↗

Vote Breakdown | Poll Detail | Comments (0)

WINNING OPTION: YES WITH 80,181 MKR SUPPORTING.

Vote Breakdown — PLURALITY POLL

Yes	80,181 MKR Voting (100.0%)
No	0.0 MKR Voting (0.0%)
Abstain	0 MKR Voting (0%)

Voting Stats

Total Voting Power	80,181.461 MKR
Total Votes	70

Panel D: Executive Voting

SparkLend Changes, Compensation Distribution, Halting Legacy Streams, Offboarded Delegate Buffer Payments, and Update HVBank doc - January 12, 2024

Governing Proposal

0x54561...4DA0 ↗	80,213	38
Spell Address	MKR Support	Supporters

Proposal Detail | Spell Details | Comments (1)

PASSED ON JAN 12 2024 00:55 UTC. EXECUTED ON JAN 14 2024 00:55 UTC.

Panel E: Implementation

[Jan 11th, 2024] Expedited Inclusion of a Patch to Spark Pool Implementation

Spark SubDAO spark sparklend

PhoenixLabs Ecosystem Actors 15d

Jan 11

1 / 3
Jan 11

15d ago

Preamble

Impact on users: **None**
Severity: **Low**

Context Overview

After reviewing the patch applied to Aave V3 yesterday 13 , Phoenix Labs has determined that SparkLend is also susceptible to this problem in some edge-case circumstances. After thorough review and testing in cooperation with BGD Labs and Block Analitica, we have determined that this is unlikely to be acted on in practice, so the patch inclusion in the regularly scheduled spell is reasonable.

SparkLend is considered **low-risk** because the only assets listed are those with very high liquidity (or are unaffected in isolation mode). A more detailed post-mortem will be posted later as this is an ongoing problem with all Aave V3 forks.

Remediation

Phoenix Labs requests that a patched version of the Pool Implementation be included in the spell going out this week without a poll. This will patch both Mainnet and Gnosis Chain versions. The changes are very simple and mirror what the Aave team has done.

Figure 3

Delegation process within MakerDAO

This figure illustrates the delegation process within MakerDAO, detailing the steps through which MKR holders delegate their voting rights. The process begins with an institution or individual establishing a delegation contract, thereby assuming the role of a delegate (Step 1). Once the contract is successfully created, the delegate's profile and contract address are displayed on the official MakerDAO website. MKR holders seeking to delegate their voting rights can then select a trusted delegate and lock their MKR tokens into the contract (Step 2), granting the delegate the authority to vote on their behalf in poll voting (Step 3). If an MKR holder chooses to terminate the delegation arrangement, they can withdraw their MKR tokens from the delegate (Step 4), regaining full control over their voting rights and having the option to either select a new delegate or abstain from delegation entirely.

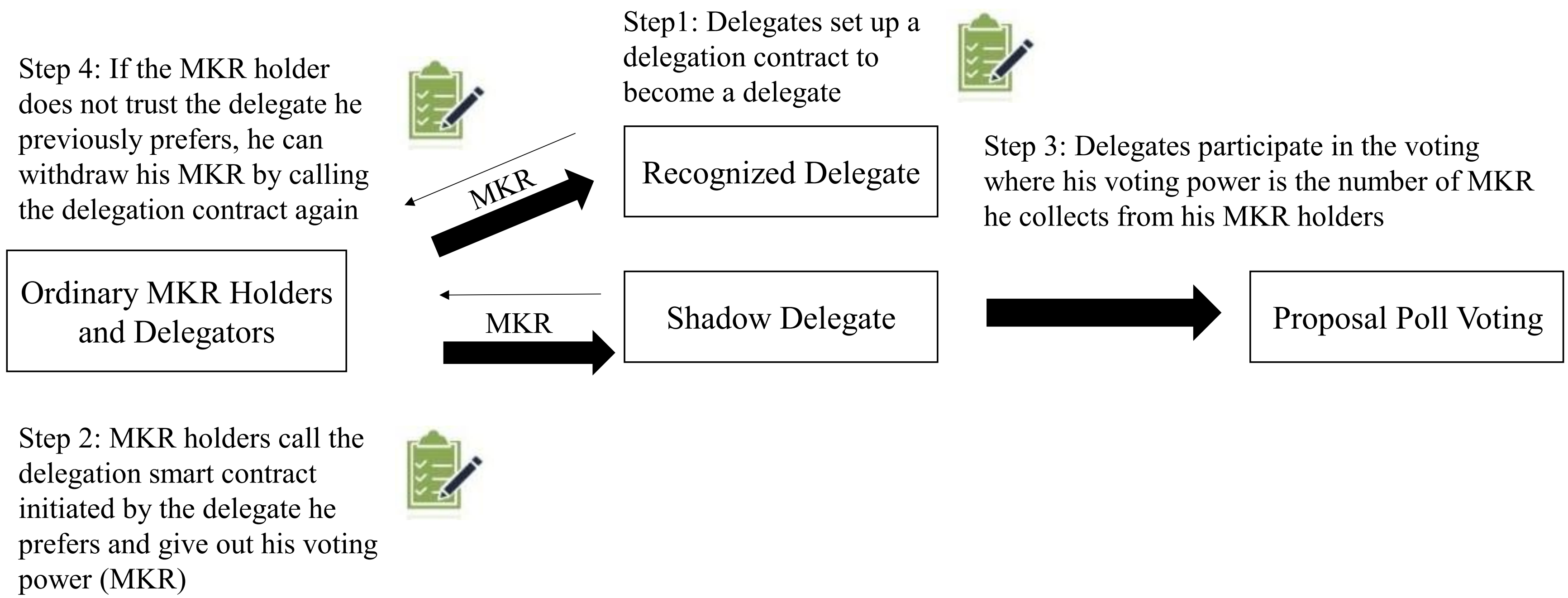


Figure 4

Classification of value-enhancing vs. value-destroying votes: an example

This figure illustrates the classification of value-enhancing versus value-destroying votes, using Poll 665 as an example. The poll concerns the removal of swap fees, and the figure presents the cumulative voting shares alongside MKR abnormal returns over the voting period. The average participation in proposal voting over the preceding month is 67,043 MKR shares (expected votes). To meet the 50% threshold, one side must accumulate at least 33,521.5 MKR shares, a level reached by the "Yes" votes on November 3, 2021. Additionally, on the same day, the incremental MKR shares cast in favor of the "Yes" decision amount to 15.5% of the expected votes, surpassing the second condition, which requires that votes cast on the pivotal vote date exceed 10% of the expected total votes. Therefore, November 3, 2021, is identified as the pivotal vote date for Poll 665. Next, we compute the daily abnormal return of MKR using the Crypto-CAPM model and plot the cumulative abnormal return over the voting period. On the pivotal vote date, the abnormal return for MKR is a positive 13.6%, coinciding with the victory of the "Yes" side. This outcome suggests that the market perceives the "Yes" decision as value-enhancing for MKR, validating it as the appropriate choice for this proposal.

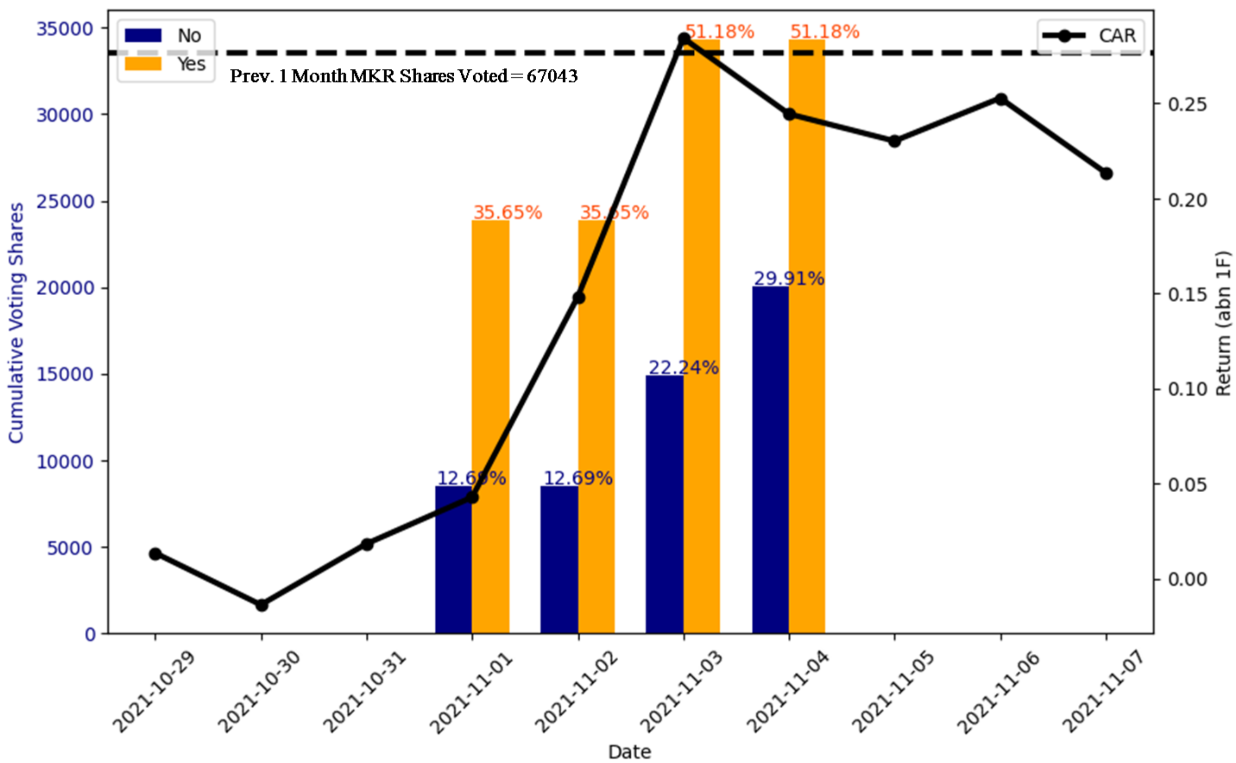


Figure 5

Conflicts of interest due to delegates' token holdings: an example

This figure presents a case illustrating potential conflicts of interest involving the delegate 'Monet-Supply' and MKR holders, as displayed on the delegate's forum homepage. Monet-Supply holds tokens from MakerDAO's competitors, including COMP and AAVE. Additionally, Monet-Supply serves as an employee within MakerDAO's Risk Core Unit. These overlapping roles create potential agency conflicts, particularly when a proposal benefits MakerDAO but negatively impacts competitors such as Aave. Following this disclosure, an MKR holder known as g_dip publicly raised concerns about a possible agency problem, highlighting the governance challenges associated with delegate incentives and conflicts of interest.

MonetSupply

Conflicts of Interest

I hold financial stakes in a broad range of tokens and crypto assets. Most holdings are in my public ENS account monetsupply.eth. I also hold small amounts of BTC plus assets from Cosmos, Polkadot, and Solana ecosystems. Holdings include Maker protocol competitors such as COMP and AAVE.

I have made investments in certain projects / companies on terms not available to the public. This includes:

- 10 ETH investment into LidoDAO LDO tokens (terms posted publicly here 10)
- Investment of less than $10,000 into Rabbithole 6 (private funding round)
- Employee stock package from Tally 5

I'm a core contributor to the Risk Core Unit, and receive income from MakerDAO in this capacity. I also receive employment income from Tally. In the future, I may take part time / contracting work with Aave as part of their proposed risk team.

I'm a reviewer on the Compound and Uniswap grant program committees. Uniswap is planning to begin compensating committee members for their time, so I may receive income from Uniswap Grants in the future.

I participate in several governance protocols beyond MakerDAO. Most of my protocol activity can be seen on Tally here 8 . My voting power currently exceeds the proposal thresholds for Uniswap and Compound governance.

I will make best efforts to update this disclosure statement when there are any material changes. Furthermore, I'll recuse myself from participation in any cases where I feel I'm unable to make an unbiased decision.

I have read and agree to the Delegate Code of Conduct 6 .

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g_dip Jul 2021

But abstention doesn't really solve the problem. Voting is politics and in any political system there's an implied or overt practice of vote trading. Basically if you were a delegate, we would need to trust you to act against your incentive. This is something I wouldn't trust anyone to do, as I believe incentives always win (subliminally or consciously).

Figure 6
Voting participation and concentration since 2019

This figure illustrates the impact of the delegation scheme implemented in October 2021 on MKR voting dynamics. Specifically, it shows that the proportion of MKR shares participating in the voting process (blue line) increased after the scheme's introduction, while voting concentration decreased, as indicated by the declining proportion of MKR shares cast by top voters (orange dotted line).

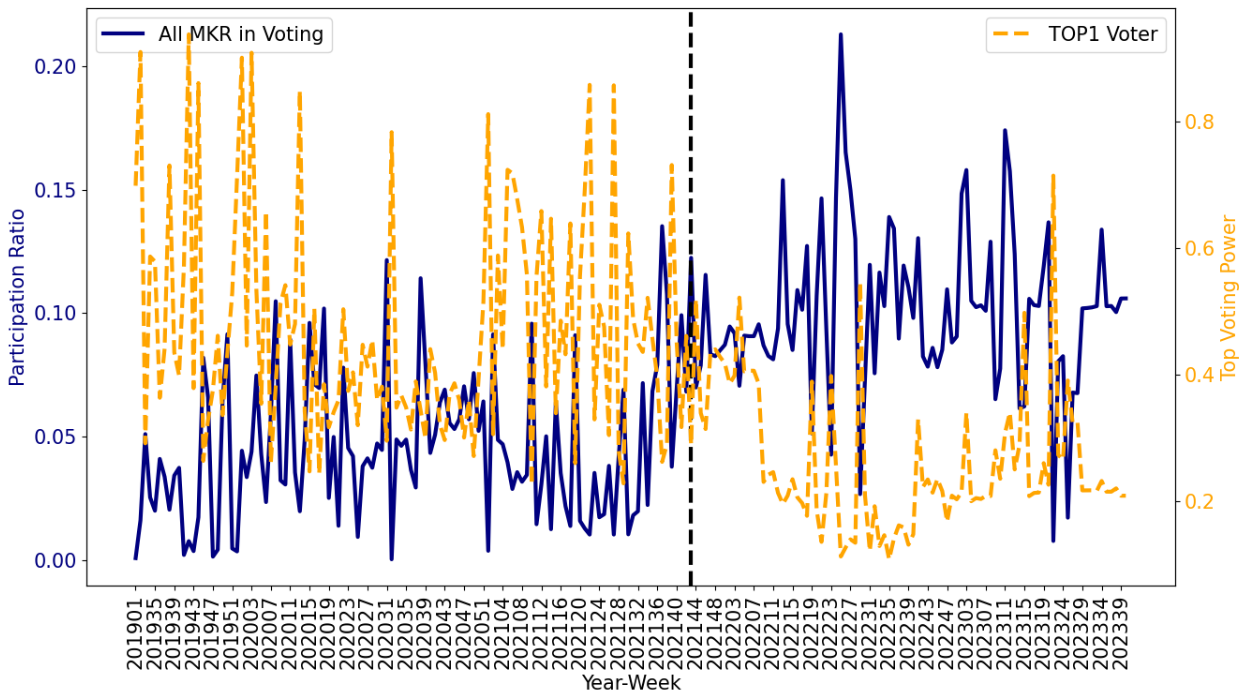

Table 1
Classifications of correct votes

The classification process begins by assessing the MKR market's reaction on the pivotal vote date (Positive or Negative). This is then considered in conjunction with whether the proposal received winning votes (Yes or No) to determine if the proposal was ultimately value-enhancing or value-destroying. For example, if the market reaction is positive and the proposal passed (Poll A), it's deemed value-enhancing. Conversely, if the market reaction is positive but the proposal failed (Poll B), it's considered value-destroying. Finally, a delegate's vote is compared to this value assessment. If the delegate voted "Yes" on a value-enhancing proposal (Poll A) or "No" on a value-destroying proposal (Poll B or C), their vote is classified as "Correct". Conversely, a "Yes" vote on a value-destroying proposal or a "No" vote on a value-enhancing proposal (Poll D) is classified as "Incorrect".

	Poll A	Poll B	Poll C	Poll D
MKR market reaction on the pivotal vote date	Positive	Positive	Negative	Negative
Winning votes	Yes	No	Yes	No
Decision 1: Value enhancing or destroying	*Enhancing*	*Destroying*	*Destroying*	*Enhancing*
Delegate's Vote	Yes	No	No	Yes
Decision 2: Vote Correctness	*Correct*	*Incorrect*	*Correct*	*Incorrect*

Table 2
Summary Statistics

Panel A presents measures at delegate-vote date level. *Delegate Growth* is the ratio of the net change in the MKR delegation amount within 30 days after the vote date to the delegate's existing MKR delegation amount on the vote date. To avoid outliers, we winsorize delegate growth at the 90th percentile. *Increase MKR* is a dummy that equals 1 if the delegation amount change in the 30 days after the delegate's vote is positive, and 0 otherwise. *Increase Delegators* is the number of delegators who give new delegation minus the number of delegators who withdraw their delegation. *Participation* is the number of proposals participated by the delegate on the vote date. *Correct Vote* is the ratio of the number of correct votes over *Participation* on the vote date. Panel B lists measures at delegate-poll level. *Topic Experience* is the historical count of voting participations in proposals with the same tags as the current proposal. *Token Experience* is the ratio of the number of unique tokens mentioned in the proposal discussion and had been held by the delegate ("expertise token"), to the total number of unique tokens in the delegate's portfolio prior to the time of voting (excluding those currently held by the delegate). *Holding Value ($)* is the average dollar value of tokens that have been held by the delegate and mentioned in discussion posts. *Portfolio Weight* is the average percentage of the dollar value of tokens held by the delegate and mentioned in discussion posts. *Conflicted (Aligned) Ratio* is the number of the delegate's tokens that are incentive-misaligned (aligned) with MKR under current poll divided by the number of tokens held by the delegate on the vote date. The baseline is interest uncorrelated. *Conflicted (Aligned) Dummy* is a dummy that equals 1 if the delegate holds any interest conflicted (aligned) tokens on the vote date. *Conflicted (Aligned) Number* is the number of conflicted (aligned) tokens held by the delegate on the vote date. *Conflicted (Aligned) Holding Value* is the dollar value of the interest-conflicted (aligned) token held by the delegate on the vote date. Panel C reports summary statistics on measures from October 2021 to October 2023 about MakerDAO at weekly level. *Abnormal Return* is the weekly adjusted return of MKR. *Delegates' Correctness* is the weekly weighted average of delegates' voting correctness. *Ordinary MKR Voters' Correctness* is the version for ordinary MKR voters. Panel D reports summary statistics at MKR holder-poll level. *Delegate* is a dummy measuring the delegation choices of the MKR investor. *Delegation Share Ratio* is the ratio of the MKR shares delegated to the total MKR shares held by the investor. *MKR Holding Ratio* is the ratio of the MKR shares held by the investor to the total circulation MKR supply. *Num of Other Token Holding* is the number of tokens excluding MKR, DAI and ETH held by the investor. *ln(1+Other Token Holding Value)* is the logarithm of one plus the dollar value of the tokens mentioned above. All the other variables are defined in Appendix A.

	#Obs	Mean	SD	Min	P25	P50	P75	Max
Panel A: Delegate-Vote Date Level Variables								
Delegate Growth	1,814	0.02	0.46	-1.00	0.00	0.00	0.00	1.00
MKR Increase	1,814	0.31	0.46	0.00	0.00	0.00	1.00	1.00
Delegator Increase	1,814	0.27	1.68	-10.00	0.00	0.00	1.00	15.00
Participation	1,814	2.73	2.28	1.00	1.00	2.00	4.00	19.00
Correct Vote	1,814	0.44	0.45	0.00	0.00	0.33	1.00	1.00
Shadow	1,814	0.20	0.40	0.00	0.00	0.00	0.00	1.00
Days to Expire	1,814	119.90	127.15	0.00	0.00	70.25	243.00	362.00
Num of Delegators	1,814	4.11	4.71	0.00	1.00	2.00	6.00	27.00
Num of High Impact	1,814	1.30	1.51	0.00	0.00	1.00	2.00	9.00
Voting Power (%)	1,814	5.05	7.39	0.00	0.01	1.10	8.55	48.93
ln (1+ MKR Holding)	1,814	0.09	0.86	0.00	0.00	0.00	0.00	2.86
Panel B: Delegate-Poll Level Variables								
ln (1+ Topic Experience)	4,959	1.59	1.12	0.00	0.00	1.61	2.51	4.12
Token Experience	1,713	0.03	0.12	0.00	0.00	0.00	0.00	1.00
ln (1+ MKR Holding)	4,959	0.09	0.83	0.00	0.00	0.00	0.00	10.29
ln (Holding Value)	1,674	0.90	2.45	0.00	0.00	0.00	0.00	12.04
Portfolio Weight	1,674	0.05	0.19	0.00	0.00	0.00	0.00	1.00
Conflicted Ratio	1,470	0.01	0.08	0.00	0.00	0.00	0.00	1.00
Aligned Ratio	1,470	0.05	0.19	0.00	0.00	0.00	0.00	1.00
Conflicted Dummy	1,470	0.04	0.18	0.00	0.00	0.00	0.00	1.00
Aligned Dummy	1,470	0.08	0.28	0.00	0.00	0.00	0.00	1.00
Conflicted Number	1,470	0.05	0.32	0.00	0.00	0.00	0.00	5.00
Aligned Number	1,470	0.21	0.95	0.00	0.00	0.00	0.00	11.00
ln (1+ Conflicted Holding Value)	1,470	0.19	1.14	0.00	0.00	0.00	0.00	11.78
ln (1+ Aligned Holding Value)	1,470	0.47	1.90	0.00	0.00	0.00	0.00	10.25
Vote Early	4,959	0.42	0.32	0.00	0.14	0.33	0.67	1.00
Panel C: Weekly Variables								
Return	87	0.00	0.11	-0.24	-0.08	0.00	0.06	0.31
Abnormal Return	87	0.01	0.11	-0.42	-0.05	-0.01	0.04	0.41
Delegates’ Correctness	87	0.46	0.38	0.00	0.06	0.52	0.84	1.00
Ordinary MKR Voters’ Correctness	87	0.42	0.40	0.00	0.00	0.36	0.89	1.00
Num of Votes	87	144.92	124.98	8.00	51.00	103.50	194.50	579.00

	#Obs	Mean	SD	Min	P25	P50	P75	Max
Panel D: MKR Holder-Poll Level Measures								
Delegate	22,707	0.75	0.43	0.00	1.00	1.00	1.00	1.00
Delegation Share Ratio	22,707	0.75	0.43	0.00	1.00	1.00	1.00	1.00
MKR Holding Ratio	116,649	0.00	0.01	0.00	0.00	0.00	0.00	0.14
Num of Other Token Holding	116,649	33.53	77.77	0.00	2.00	12.00	35.00	1,040.00
ln(1+Other Token Holding Value)	116,649	5.87	4.49	0.00	1.73	5.85	9.31	19.31

Table 3
Delegate vote correctness and future delegation changes

This table presents delegate-vote date level regressions that investigate whether delegates making correct (incorrect) vote choices are rewarded (punished) by MKR holders. The sample includes observations where a delegate casts a vote on a given day. The dependent variable in Model (1) and (2) is *MKR Increase*, a dummy variable equal to one if the delegation amount changes positively within 30 days after the delegate's vote, and zero otherwise. In Models (3) and (4), the dependent variable is *Delegator Increase*, defined as the net change in the number of delegators within 30 days after the delegate's vote. In Model (5) and (6), the dependent variable is *Delegate Growth*, defined as the growth rate of MKR delegation shares within 30 days after the delegate's vote. The main independent variable is *Correct Vote*, defined as proportion of correct votes cast by delegate *d* across all proposals voted on that date. We also control for a broad set of delegate and proposal characteristics. Definitions of the variables are provided in Appendix A. We also include year-month fixed effects and delegate fixed effects. T-statistics adjusted for heteroscedasticity and clustered at delegate level are reported in parentheses. *, ** and *** denote statistical significance at 10%, 5% and 1% level, respectively.

Dep. Var.	MKR Increase		Delegator Increase		Delegate Growth	
	(1)	(2)	(3)	(4)	(5)	(6)
Correct Vote	**0.040***	**0.046****	**0.213*****	**0.202****	**0.038***	**0.032**
	(1.94)	**(2.11)**	**(2.84)**	**(2.58)**	**(1.82)**	**(1.48)**
Shadow	-0.193***		-0.485***		-0.189***	
	(-5.14)		(-3.59)		(-3.51)	
Days to Expire	0.002***	0.003***	0.003***	0.002***	0.001***	0.001***
	(18.63)	(16.47)	(5.50)	(3.56)	(3.81)	(2.71)
Prev Delegate Growth	-0.060***	-0.064***	0.047	-0.123	0.010	-0.073**
	(-2.82)	(-2.91)	(0.49)	(-1.60)	(0.31)	(-2.42)
Num of Delegators	-0.008**	-0.027**	-0.063**	-0.401***	-0.014**	-0.037***
	(-2.22)	(-2.51)	(-2.17)	(-8.95)	(-2.33)	(-2.96)
Num of High Impact	0.005	0.006	0.040***	0.027*	0.009	0.009
	(1.12)	(1.42)	(2.84)	(1.92)	(1.45)	(1.58)
Voting Power	0.001	-0.002	0.025	0.049**	-0.009***	-0.025***
	(0.34)	(-0.38)	(1.54)	(2.06)	(-3.40)	(-4.91)
MKR Holdings	0.002	-0.003	0.021	0.006	0.010	-0.016
	(0.26)	(-0.20)	(0.55)	(0.10)	(0.57)	(-0.94)
Constant	0.106***	0.110*	-0.026	1.383***	0.049	0.225***
	(3.80)	(1.81)	(-0.22)	(6.12)	(1.24)	(3.47)
Month FE	Yes	Yes	Yes	Yes	Yes	Yes
Delegate FE	No	Yes	No	Yes	No	Yes
Observations	1814	1768	1814	1768	1814	1768
Adj. R^2	0.439	0.518	0.140	0.311	0.169	0.412
vce	Delegate	Delegate	Delegate	Delegate	Delegate	Delegate

Table 4

Delegates' MKR holdings and vote correctness

This table presents the delegate-poll level regressions of delegates' correct voting on their MKR holdings. The regression is at delegate-poll level. The dependent variable, *Correct*, is a dummy that equals one if the delegate vote correctly on the poll, and zero otherwise. The main independent variable is the natural logarithm of one plus the dollar value of MKR holdings by the delegate at the time of voting. We also control for delegate and poll characteristics Definitions of all the variables are in Appendix A. Some models include delegate individual fixed effect and year-month fixed effect. T-statistics adjusted for heteroscedasticity and clustered at delegate level are reported in parentheses. *, ** and *** denote statistical significance at 10%, 5% and 1% level, respectively.

Dep. Var.	Correct	
	(1)	(2)
ln (1+MKR Holdings)	**0.023***** **(5.65)**	**0.029***** **(6.64)**
High Impact	-0.025 (-1.26)	-0.030 (-1.58)
Days to Expire	0.000* (1.84)	-0.002 (-1.07)
Vote Early	-0.123*** (-3.11)	-0.087** (-2.15)
Num of Delegators	-0.006 (-1.35)	0.001 (0.34)
Voting Power	0.000 (0.16)	-0.000 (-0.12)
Constant	0.477*** (9.40)	0.867** (2.49)
Delegate FE	Yes	Yes
Month FE	No	Yes
Observations	4936	4936
Adj. R^2	0.040	0.124
vce	Delegate	Delegate

Table 5
Conflicts of interest and delegate vote correctness

This table presents delegate-poll level regressions of delegates' vote correctness and their holdings of tokens with misaligned interests. The dependent variable is *Correct,* which equals 1 if the delegate votes correctly on a proposal or 0 otherwise. The independent variables measure the potential incentives of delegates to cast votes. *Conflicted (Aligned) Dummy* is a dummy that equals 1 if the delegate holds any interest conflicted (aligned) tokens on the vote date. *Conflicted (Aligned) Number* is the number of conflicted (aligned) tokens held by the delegate on the vote date. *Conflicted (Aligned) Ratio* is *Conflicted Number* divided by the number of tokens held by the delegate on the vote date. Definitions of the variables are in Appendix A. Year-month fixed effect is included in Model (1), (3) and (5). Delegate fixed effects are included in Model (2), (4) and (6). T-statistics adjusted for heteroscedasticity and clustered at delegate level are reported in parentheses. *, ** and *** denote statistical significance at 10%, 5% and 1% level, respectively.

Dep. Var.	Correct					
	(1)	(2)	(3)	(4)	(5)	(6)
Conflicted Dummy	**-0.249***** **(-4.04)**	**-0.226***** **(-3.86)**				
Aligned Dummy	0.134* (1.77)	0.077 (1.00)				
Conflicted Number			**-0.124***** **(-3.53)**	**-0.120***** **(-3.84)**		
Aligned Number			0.007 (0.28)	-0.003 (-0.13)		
Conflicted Ratio					**-0.311*** **(-1.95)**	**-0.354**** **(-2.56)**
Aligned Ratio					0.051 (0.55)	-0.030 (-0.32)
High Impact	0.010 (0.26)	0.038 (0.98)	0.013 (0.34)	0.042 (1.04)	0.012 (0.32)	0.043 (1.07)
Days to Expire	0.000 (0.10)	0.002 (0.74)	0.000 (0.18)	0.002 (0.71)	0.000 (0.13)	0.002 (0.81)
Vote Early	-0.062 (-0.93)	-0.053 (-0.85)	-0.072 (-1.08)	-0.059 (-0.95)	-0.062 (-0.91)	-0.051 (-0.82)
Num of Delegators	-0.013* (-1.90)	-0.010 (-0.94)	-0.014** (-2.10)	-0.010 (-0.98)	-0.014** (-2.07)	-0.010 (-1.00)
Voting Power	-0.002 (-0.52)	-0.002 (-0.46)	-0.002 (-0.47)	-0.001 (-0.38)	-0.002 (-0.44)	-0.001 (-0.39)
MKR Holdings	0.016* (1.88)	0.029*** (2.80)	0.015* (1.92)	0.028*** (2.95)	0.016* (1.95)	0.029*** (3.01)
Constant	0.515*** (6.12)	0.112 (0.21)	0.522*** (6.45)	0.142 (0.28)	0.517*** (6.40)	0.094 (0.19)
Delegate FE	Yes	Yes	Yes	Yes	Yes	Yes
Month FE	No	Yes	No	Yes	No	Yes
Observations	1452	1451	1452	1451	1452	1451
Adj. R^2	0.060	0.135	0.055	0.134	0.054	0.133
vce	Delegate	Delegate	Delegate	Delegate	Delegate	Delegate

Table 6
Delegate expertise and vote correctness

This table presents delegate-poll regressions of delegates' vote correctness on their expertise with respect to the proposals. The dependent variable is, *Correct*, is a dummy variable which equals one if the delegate's vote in one poll is correct and zero otherwise. The main independent variable in Model (1) and (2) is *Token Experience,* which is the ratio of the number of unique tokens mentioned in the proposal discussion and had been held by the delegate ("expertise token") to the total number of unique tokens in the delegate's portfolio prior to the time of voting (excluding those currently held by the delegate). The independent variable in Model (3) and (4) is *Holding Value*, which is the average dollar value of tokens that have been held by the delegate and mentioned in discussion posts. In Model (5) and (6), the independent variable is *Portfolio Weight*, which is the average portfolio ratio of the dollar value of tokens held by the delegate and mentioned in discussion posts. Definitions of the variables are in Appendix A. Year-month fixed effect is included in Model (1), (3) and (5). Delegate individual fixed effect is added in Model (2), (4) and (6). T-statistics adjusted for heteroscedasticity and clustered at delegate level are reported in parentheses. *, ** and *** denote statistical significance at 10%, 5% and 1% level, respectively.

Dep. Var.	Correct					
	(1)	(2)	(3)	(4)	(5)	(6)
Token Experience	**0.202****	**0.259****				
	(2.19)	**(2.38)**				
ln(1+Holding Value)			**0.005**	**0.008***		
			(1.15)	**(1.84)**		
Portfolio Weight					**0.080****	**0.117*****
					(2.01)	**(2.66)**
Shadow	0.048	0.000	0.052	0.000	0.054	0.000
	(1.15)	(.)	(1.22)	(.)	(1.25)	(.)
High Impact	0.034	0.025	0.035	0.026	0.035	0.026
	(1.04)	(0.75)	(1.03)	(0.75)	(1.04)	(0.75)
Days to Expire	0.000	0.003	0.000	0.004	0.000	0.004*
	(1.65)	(1.57)	(1.61)	(1.66)	(1.61)	(1.70)
Vote Early	0.036	-0.018	0.040	-0.019	0.039	-0.019
	(0.57)	(-0.21)	(0.63)	(-0.24)	(0.63)	(-0.23)
Num of Delegators	0.001	0.012*	0.001	0.014**	0.001	0.014**
	(0.22)	(1.92)	(0.19)	(2.16)	(0.22)	(2.23)
Voting Power	0.002	-0.004	0.002	-0.004	0.002	-0.004
	(0.31)	(-0.53)	(0.39)	(-0.43)	(0.41)	(-0.43)
MKR Holdings	0.016*	0.029***	0.016	0.029***	0.016*	0.029***
	(1.69)	(3.26)	(1.66)	(3.22)	(1.69)	(3.22)
Constant	0.335***	-0.374	0.328***	-0.433	0.326***	-0.456
	(9.96)	(-0.79)	(8.61)	(-0.90)	(8.74)	(-0.94)
Delegate FE	No	Yes	No	Yes	No	Yes
Month FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1713	1703	1674	1664	1674	1664
Adj. R^2	0.104	0.117	0.104	0.119	0.105	0.120
vce	Delegate	Delegate	Delegate	Delegate	Delegate	Delegate

Table 7
Delegate topic experience and vote correctness

The table presents delegate-poll level regressions of delegates' vote correctness on their experience in the poll topics. The dependent variable, *Correct*, is a dummy variable which equals one if the delegate's vote in one poll is correct and zero otherwise. The main independent variable is *Topic Experience*, which is the historical count of participations in proposals with the same topic tags as the current proposal. For proposals with multiple tags, we calculate the average count. Definitions of the variables are in Appendix A. Delegate individual fixed effect is included in Model (1). Year-month fixed effect is added in Model (2). T-statistics adjusted for heteroscedasticity and clustered at delegate level are reported in parentheses. *, ** and *** denote statistical significance at 10%, 5% and 1% level, respectively.

Dep. Var.	Correct	
	(1)	(2)
ln(1+Topic Experience)	**0.053*****	**0.044****
	(2.77)	(2.13)
High Impact	-0.024	-0.031*
	(-1.27)	(-1.67)
Days to Expire	0.001***	-0.001
	(2.94)	(-0.49)
Vote Early	-0.141***	-0.101**
	(-3.62)	(-2.60)
Num of Delegators	-0.006	0.000
	(-1.21)	(0.11)
Voting Power	-0.000	-0.001
	(-0.02)	(-0.26)
MKR Holdings	0.022***	0.028***
	(5.52)	(6.24)
Constant	0.278***	0.614*
	(2.87)	(1.69)
Delegate FE	Yes	Yes
Month FE	No	Yes
Observations	4936	4936
Adj. R^2	0.045	0.127
vce	Delegate	Delegate

Table 8
Delegate's expertise and timing of votes

The table presents delegate-poll level regressions of delegates' vote time choice on their experience. The dependent variable, *Vote Early*, is the duration between a delegate's vote and the end of the poll, normalized by the total voting duration from the poll's start to its conclusion. In Model (1), *Topic Experience*, is the historical count of participations in proposals with the same topic tags as the current proposal. For proposals with multiple tags, we calculate the average count. In Model (2), *Token Experience* is the ratio of the number of unique tokens mentioned in the proposal discussion and had been held by the delegate ("expertise token") to the total number of unique tokens in the delegate's portfolio prior to the time of voting (excluding those currently held by the delegate). In Model (3), *Holding Value*, is the average dollar value of tokens that have been held by the delegate and mentioned in discussion posts. In Model (4), *Portfolio Weight*, is the average portfolio ratio of the dollar value of tokens held by the delegate and mentioned in discussion posts. Definitions of the variables are in Appendix A. Delegate individual fixed effect and Year-month fixed effect are added in all models. T-statistics adjusted for heteroscedasticity and clustered at delegate level are reported in parentheses. *, ** and *** denote statistical significance at 10%, 5% and 1% level, respectively.

Dep. Var.	Vote Early			
	(1)	(2)	(3)	(4)
ln(1+Topic Experience)	**0.058*****			
	(4.72)			
Token Experience		**0.019**		
		(0.40)		
ln(1+Holding Value)			**0.006***	
			(1.95)	
Portfolio Weight				**0.069**
				(1.62)
High Impact	0.012	0.021	0.019	0.019
	(1.24)	(1.27)	(1.13)	(1.13)
Days to Expire	0.007***	0.007***	0.007***	0.007***
	(8.87)	(3.59)	(3.50)	(3.50)
MKR Holdings	0.001	0.003	0.004	0.004
	(0.14)	(0.30)	(0.33)	(0.33)
Voting Power	-0.001	0.013	0.013	0.014*
	(-0.29)	(1.61)	(1.67)	(1.70)
Constant	-1.215***	-1.078**	-1.042**	-1.051**
	(-6.68)	(-2.58)	(-2.49)	(-2.49)
Delegate FE	Yes	Yes	Yes	Yes
Month FE	Yes	Yes	Yes	Yes
Observations	4936	1703	1664	1664
Adj. R^2	0.337	0.377	0.372	0.371
vce	Delegate	Delegate	Delegate	Delegate

Table 9

Delegate vote correctness and future MKR returns

The table presents the weekly regressions of MKR returns on the average delegate vote correctness in the previous week. The dependent variable is *Weekly Abnormal Returns* of MKR. The 1F indicates that the abnormal return (both the weekly and the daily used to define voting correctness) is the residual from Crypto-CAPM model. The 2F indicates that the abnormal return is the residual from a 2-factors (CMKT, CSMB) model. The 3F indicates that the abnormal return is from a 3-factors (CMKT, CSMB. CMOM) model. In Model (1) to (4), the voting correctness is defined on the daily abnormal return of MKR on the pivotal vote date, but Model (5) uses 2-day window CAR[0,+1] to define voting correctness. The main independent variable is last week's *Delegates' Correctness*, which is the voting power weighted average of delegates' voting correctness over last week. Definitions of the variables are in Appendix A. Year fixed effect is included. T-statistics adjusted for heteroscedasticity are reported in parentheses. *, ** and *** denote statistical significance at 10%, 5% and 1% level, respectively.

Dep. Var.	Weekly Abnormal Returns			
	1F	2F	3F	1F, 2Days
	(1)	(2)	(3)	(4)
Delegates' Correctness	**0.109****	**0.098****	**0.080****	**0.093*****
	(2.60)	(2.25)	(2.06)	(2.97)
Num of Polls	-0.002	-0.001	-0.001	-0.001
	(-1.02)	(-0.70)	(-0.58)	(-0.60)
Num of Votes	-0.000	-0.000	-0.000	0.000
	(-0.60)	(-0.63)	(-0.44)	(0.08)
Num of High Impact	-0.003	-0.003	-0.004	-0.003
	(-0.50)	(-0.54)	(-0.71)	(-0.46)
Ordinary Voters' Correctness	-0.015	-0.008	0.018	0.005
	(-0.41)	(-0.22)	(0.51)	(0.18)
Constant	-0.004	-0.004	-0.013	-0.026
	(-0.19)	(-0.19)	(-0.61)	(-0.91)
Year FE	Yes	Yes	Yes	Yes
Observations	87	87	87	87
Adj. R^2	0.091	0.069	0.073	0.084
vce	Robust	Robust	Robust	Robust

Table 10

Token holder preferences and delegation decisions

The table presents the MKR holder-poll level regression of MKR holders' decisions to delegate their votes or to vote by themselves. The dependent variable in Model (1)-(3) is *Delegate*, which is equal to 1 if MKR holder *i* chooses to delegate for proposal *p* and 0 if he chooses to vote by himself. In Model (4)-(6), the dependent variable is *Delegation Share Ratio*, which is the ratio of delegation MKR shares over the total number of MKR shares holder *i* has for proposal *p. ln(1+Confict Holding Value)* is the natural logarithm of one plus the dollar value of conflicted token holdings. *MKR Holding Ratio*, is the amount of MKR shares the holder has divided by the MKR supply amount in circulation. Definitions of the variables are in Appendix A. Poll fixed effect are included in all models. T-statistics adjusted for heteroscedasticity and clustered at the MKR holder level are reported in parentheses. *, ** and *** denote statistical significance at 10%, 5% and 1% level, respectively.

Dep. Var.	Delegate			Delegation Share Ratio		
	(1)	(2)	(3)	(4)	(5)	(6)
ln(1+Conflict Holding Value)	**-0.015****		**-0.016*****	**-0.015****		**-0.015****
	(-2.56)		**(-2.61)**	**(-2.51)**		**(-2.57)**
MKR Holding Ratio		**1.611*****	**1.627*****		**1.642*****	**1.658*****
		(4.64)	**(4.71)**		**(4.87)**	**(4.95)**
ln(1+Other Token Holding Value)	0.017***	0.016***	0.017***	0.017***	0.016***	0.017***
	(4.41)	(4.11)	(4.23)	(4.39)	(4.10)	(4.21)
Num of Other Token Holding	0.000	0.000	0.000	0.000	0.000	0.000
	(0.97)	(0.83)	(0.89)	(0.92)	(0.78)	(0.84)
Constant	0.641***	0.641***	0.640***	0.637***	0.637***	0.636***
	(20.46)	(20.42)	(20.41)	(20.23)	(20.19)	(20.19)
Poll FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	21368	21368	21368	21368	21368	21368
Adj. R^2	0.132	0.133	0.134	0.133	0.134	0.135
vce	Holder	Holder	Holder	Holder	Holder	Holder

Appendix A: Variable Definition

Variable	Definition
Delegate-Vote Date Level:	
Correct Vote	The proportion of a delegate's votes that align with the proposal's perceived value, calculated as the number of correct votes divided by the total number of proposals the delegate participates in on the vote date.
MKR Increase	A dummy variable that equals 1 if the delegate's MKR delegation amount increases within 30 days following the vote, and 0 otherwise.
Delegator Increase	The net count of MKR holders delegating to the delegate over the 30-day period, calculated as the number of new delegators minus the number of delegators who withdraw delegation.
Delegate Growth	The growth rate of delegated MKR shares over the 30-day period, calculated as the net gain in the number of MKR shares delegated, divided by the delegate's total MKR shares on the vote date. It is winsorized at the 90th percentiles.
Num of Delegators	The total count of MKR token holders who have delegated their voting rights to a specific delegate prior to the voting event.
Prev Delegate Growth	The ratio of the net change in a delegate's MKR delegation amount during the 30-day period preceding the vote date to their delegation amount 30 days prior to that period. It is winsorized at 90th percentiles.
Participation	The total number of proposals a delegate votes on during the vote date.
Days to Expire	The number of days remaining from the current vote date until the delegate's delegation contract expires.
Num of High Impact	The count of proposals tagged as "High Impact" that a delegate votes on during the specific vote date.
Vote Early	The proportion of the voting period remaining after the delegate casts votes. It is calculated as the ratio of the time between the delegate's vote and the end of the voting period to the total duration of the voting period.
ln(1+MKR Holdings)	The natural logarithm of one plus the dollar value of the delegate's MKR holdings on the vote date.
Delegate-Poll Level:	
Correct	A dummy variable that equals one if the delegate casts a correct vote.
ln(1+Topic Experience)	The natural logarithm of one plus a delegate's historical participation count in proposals sharing non-impact-related tags (excluding High/Medium/Low Impact classifications) with the current proposal. For multi-tag proposals, contributions are averaged across all relevant tags. This transformation normalizes the distribution, mitigates skewness, and ensures a value of zero when the delegate has no prior voting experience in proposals with matching thematic tags.
Token Experience	The ratio of "expertise tokens" to the delegate's total historical token portfolio, excluding current holdings. "Expertise tokens" are those tokens mentioned in the proposal discussion that the delegate previously holds. A token is considered mentioned if its full name (for single-word tokens) or at least two parts of its name (for multi-word tokens) appear in the discussion.

Variable	Definition
ln(1+Holding Value)	The natural logarithm of one plus the average value of tokens mentioned in the proposal that the delegate historically holds. This average is calculated as the mean daily dollar value of these tokens during the delegate's ownership period prior to the vote.
Portfolio Weight	The natural logarithm of one plus the average value of tokens mentioned in the proposal that the delegate historically holds. This average is calculated as the mean daily dollar value of these tokens during the delegate's ownership period prior to the vote.
Conflicted Dummy	A dummy variable that equals 1 if the delegate holds any interest-conflicted tokens on the vote date.
Aligned Dummy	A dummy variable that equals 1 if the delegate holds any interest-aligned tokens (exclude MKR) on the vote date.
Aligned Number	The count of tokens in the delegate's holdings on the vote date that are aligned with the interests of MakerDAO.
Conflicted Number	The count of tokens in the delegate's holdings on the vote date that are conflicted with the interests of MakerDAO.
Aligned Ratio	The proportion of interest-aligned tokens in the delegate's portfolio on the vote date, calculated by dividing the *Aligned Number* by the total number of tokens held by the delegate.
Conflicted Ratio	The proportion of interest-conflicted tokens in the delegate's portfolio on the vote date, calculated by dividing the *Conflicted Number* by the total number of tokens held by the delegate.
Weekly Level:	
Return	The weekly return of MKR.
Abnormal Return	The weekly risk-adjusted excess return of MKR, calculated as the residual from the Cryptocurrency Capital Asset Pricing Model (Crypto-CAPM), $r_{i,t} - r_{f,t} = \alpha_i + \beta_i CMKT_t + \epsilon_i$, following Liu, Tsyvinski, and Wu (2022).
Delegates' Correctness	A weekly measure of delegates governance accuracy. It is calculated by weighting delegates' *Correct Vote* by their delegated MKR holdings, then averaging across all delegates.
Ordinary MKR Voters' Correctness	A weekly measure of governance accuracy. It is calculated by weighting ordinary MKR voters' *Correct Vote* by their MKR holdings, then averaging across all ordinary MKR voters.
Num of Votes	The total count of votes cast by both delegates and ordinary MKR holders during a week.
Num of Polls	The total count of proposals that are actively under voting during a week.
Num of High Impact	The count of proposals tagged as "High Impact" that are under voting during a week.
Conflicted Number	The natural logarithm of the dollar value of the interest-conflicted tokens held by the delegate on the vote date.
Aligned Number	The natural logarithm of the dollar value of the interest-aligned tokens (exclude MKR) held by the delegate on the vote date.
Ln(1+Conflicted Holding Value)	The ratio of MKR shares voted by the delegate to the total number of MKR shares voted in the poll.

Variable	Definition
ln(1+Aligned Holding Value)	The natural logarithm of the dollar value of the interest-conflicted tokens held by the delegate on the vote date.
Voting Power (%)	The natural logarithm of the dollar value of the interest-aligned tokens (exclude MKR) held by the delegate on the vote date.
Delegate-Level:	
Shadow	A dummy variable that equals 1 if the delegate is shadow, otherwise, 0.
MKR Holder-Poll Level:	
Delegate	A dummy variable that equals 1 if the MKR holder chooses to delegate to vote under proposal p and 0 if he chooses to vote by himself.
Delegation Share Ratio	The ratio of MKR shares delegated to the total MKR shares held by the MKR investor.
MKR Holding Ratio	The ratio of the MKR shares held by the MKR investor to the total circulating supply of MKR at the end of the proposal voting.
Num of Other Token Holding	The number of tokens excluding MKR, DAI and ETH held by the MKR investor at the end of the proposal voting.
ln(1+Other Token Holding Value)	The natural logarithm of one plus the dollar value of token holdings excluding MKR, DAI and ETH

Appendix B: Additional Figures and Tables

Figure B1

Voting participation across proposal topics

This figure depicts voting participation among MKR holders from October 2021 to October 2023, categorized by proposal topic tags. Participation is measured by the number of voters engaging in each proposal type. Proposals tagged as "Risk Parameter" attract the highest voter turnout. Other popular tags include "MIP" (Maker Improvement Proposals), "Ratification Poll" (final approval of MIPs), "Real World Asset" (integration of real-world assets as collateral), and "Endgame" (a governance restructuring initiative aimed at decentralization and innovation).

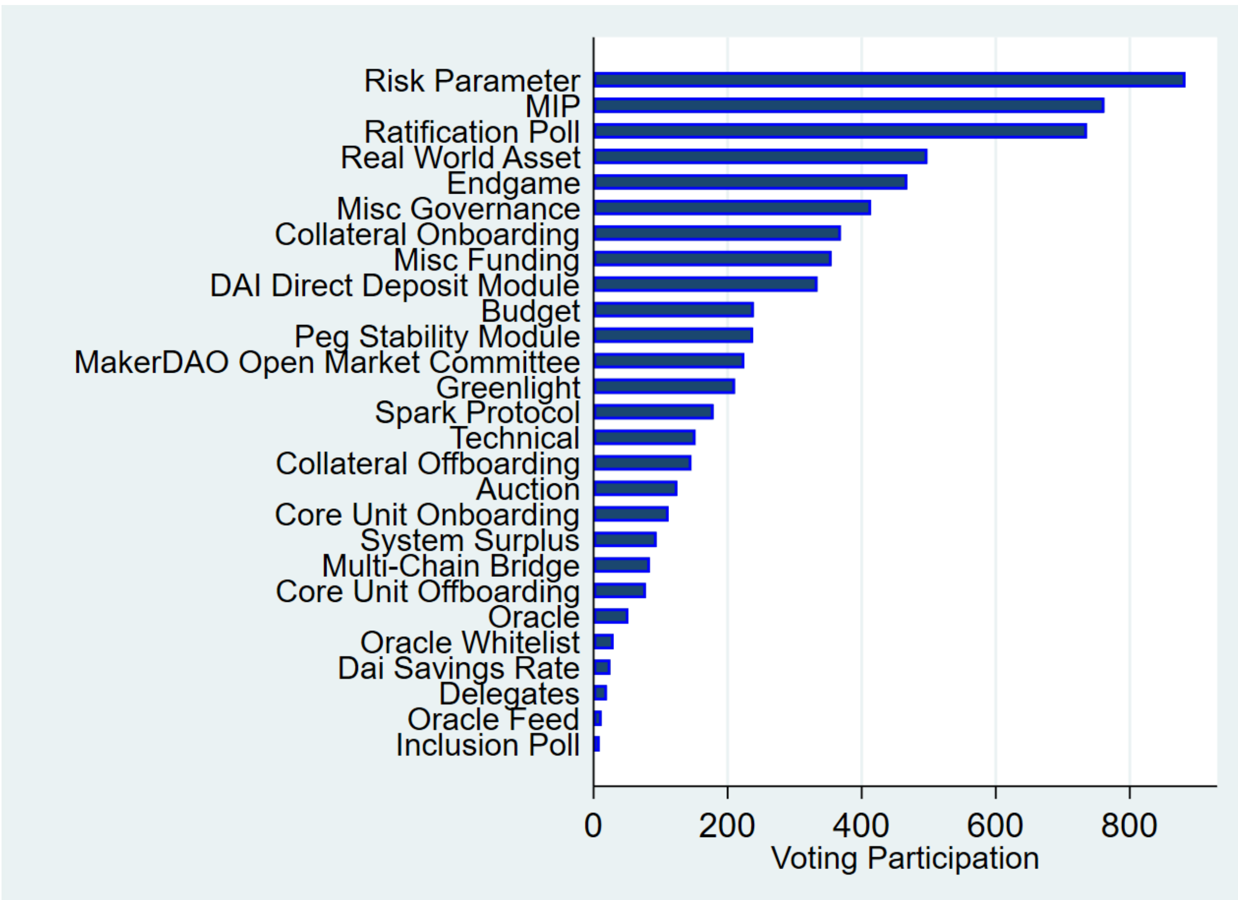

Table B1

Robustness test: using alternative cryptocurrency factor model or alternative event window to estimate abnormal returns

This table presents the robustness tests of Table 3 to test whether the delegate will be properly rewarded if he casts correct votes. In this table, following Liu, Tsyvinski, and Wu (2022), we construct 2 additional factors: CSMB (small minus big) and CMOM (3-day momentum) to get the abnormal returns adjusted by 2-factor (Model (1), (4) and (7)) or 3-factor model (Model (2), (5) and (8)). Additionally, in Model (3), (6) and (9), we focus on a 2-day window after the pivotal vote date. All models use delegate and year-month fixed effects. T-statistics adjusted for heteroscedasticity and clustered at delegate level are reported in parentheses. *, ** and *** denote statistical significance at 10%, 5% and 1% level, respectively.

Dep. Var.	MKR Increase			Delegator Increase			Delegate Growth		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Correct Vote (2F)	**0.046****			**0.197****			**0.027**		
	(2.12)			**(2.58)**			**(1.28)**		
Correct Vote (3F)		**0.045****			**0.168****			**0.024**	
		(2.14)			**(2.45)**			**(1.21)**	
Correct Vote (1F, 2Days)			**0.034***			**0.164***			**0.029**
			(1.78)			**(1.83)**			**(1.36)**
Days to Expiration	0.003***	0.003***	0.003***	0.002***	0.002***	0.002***	0.001***	0.001***	0.001***
	(16.48)	(16.48)	(16.55)	(3.55)	(3.55)	(3.53)	(2.70)	(2.70)	(2.71)
Prev Delegate Growth	-0.064***	-0.064***	-0.064***	-0.124	-0.125	-0.122	-0.073**	-0.073**	-0.072**
	(-2.93)	(-2.92)	(-2.97)	(-1.62)	(-1.63)	(-1.62)	(-2.43)	(-2.43)	(-2.42)
Num of Delegators	-0.027**	-0.027**	-0.027**	-0.401***	-0.400***	-0.401***	-0.038***	-0.037***	-0.037***
	(-2.51)	(-2.51)	(-2.49)	(-8.95)	(-8.96)	(-8.96)	(-2.96)	(-2.96)	(-2.94)
Num of High Impact	0.005	0.005	0.006	0.027*	0.025*	0.028*	0.009	0.009	0.009
	(1.40)	(1.33)	(1.47)	(1.89)	(1.81)	(1.96)	(1.56)	(1.54)	(1.61)
Voting Power	-0.002	-0.001	-0.002	0.049**	0.049**	0.049**	-0.025***	-0.025***	-0.025***
	(-0.37)	(-0.36)	(-0.38)	(2.07)	(2.06)	(2.05)	(-4.91)	(-4.91)	(-4.93)
MKR Holdings	-0.003	-0.003	-0.003	0.007	0.007	0.008	-0.016	-0.016	-0.016
	(-0.19)	(-0.20)	(-0.17)	(0.11)	(0.12)	(0.14)	(-0.93)	(-0.93)	(-0.92)
Constant	0.109*	0.109*	0.114*	1.382***	1.397***	1.398***	0.227***	0.228***	0.225***
	(1.79)	(1.81)	(1.94)	(6.09)	(6.18)	(6.00)	(3.48)	(3.50)	(3.57)
Month FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Delegate FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1768	1768	1768	1768	1768	1768	1768	1768	1768
Adj. R^2	0.518	0.518	0.517	0.311	0.310	0.310	0.412	0.412	0.412
vce	Delegate	Delegate	Delegate	Delegate	Delegate	Delegate	Delegate	Delegate	Delegate

Table B2

Robustness test: using alternative measure of vote correctness

This table presents the robustness tests of Table 3 to test whether the delegate will be properly rewarded if he casts correct votes. In Table 3, the key independent variable is *Correct Vote*, which is the ratio of correct choices in all poll participations on one vote date. While in this table, we use *Net Num of Correct*, which is the number of correct votes minus the number of wrong votes. All models use delegate and year-month fixed effects. T-statistics adjusted for heteroscedasticity and clustered at delegate level are reported in parentheses. *, ** and *** denote statistical significance at 10%, 5% and 1% level, respectively.

Dep. Var.	MKR Increase	Delegator Increase	Delegate Growth
	(1)	(2)	(3)
Net Num of Correct	**0.007****	**0.025****	**0.004**
	(2.23)	**(2.17)**	**(1.08)**
Days to Expiration	0.003***	0.002***	0.001***
	(16.49)	(3.56)	(2.72)
Prev Delegate Growth	-0.064***	-0.122	-0.073**
	(-2.90)	(-1.59)	(-2.41)
Num of Delegators	-0.027**	-0.400***	-0.037***
	(-2.50)	(-8.98)	(-2.96)
Num of High Impact	0.007*	0.032**	0.010
	(1.76)	(2.21)	(1.61)
Voting Power	-0.002	0.049**	-0.025***
	(-0.39)	(2.04)	(-4.93)
MKR Holdings	-0.003	0.008	-0.016
	(-0.19)	(0.12)	(-0.93)
Constant	0.129**	1.469***	0.238***
	(2.24)	(6.54)	(3.81)
Month FE	Yes	Yes	Yes
Delegate FE	Yes	Yes	Yes
Observations	1768	1768	1768
Adj. R^2	0.518	0.310	0.412
vce	Delegate	Delegate	Delegate

Table B3

Robustness test: subperiods after the implementation of new delegate scheme

This table presents the robustness tests of Table 3 to test whether the delegate will be properly rewarded if he casts correct votes. This table focuses on a subperiod which starts from April, 2023 when MakerDAO starts a new delegation scheme. All models use delegate individual and year-month fixed effects. T-statistics adjusted for heteroscedasticity and clustered at delegate level are reported in parentheses. *, ** and *** denote statistical significance at 10%, 5% and 1% level, respectively.

Dep. Var.	MKR Increase	Delegator Increase	Delegate Growth
	(1)	(2)	(3)
Correct Vote	**0.075*****	**0.300*****	**0.092****
	(2.74)	**(3.90)**	**(2.47)**
Days to Expiration	0.002***	0.001***	0.000
	(11.51)	(3.15)	(0.99)
Prev Delegate Growth	-0.075***	-0.159***	-0.075***
	(-2.90)	(-2.73)	(-2.91)
Num of Delegators	-0.132***	-0.476***	-0.139***
	(-4.43)	(-5.06)	(-4.12)
Num of High Impact	0.011	0.033	0.014
	(1.19)	(1.05)	(0.90)
Voting Power	-0.012**	0.024	-0.043***
	(-2.12)	(0.75)	(-4.04)
MKR Holdings	-0.023***	-0.017	-0.014**
	(-3.49)	(-1.09)	(-2.12)
Constant	0.204***	0.648***	0.320***
	(3.25)	(2.81)	(3.59)
Month FE	Yes	Yes	Yes
Delegate FE	Yes	Yes	Yes
Observations	485	485	485
Adj. R^2	0.534	0.476	0.472
vce	Delegate	Delegate	Delegate

Table B4

Constructions of conflicted and aligned indicator variables

This table presents seven examples of the *Conflicted Dummy* and *Alignment Dummy* between MKR and Token X. For Proposal Polls A, B, and C, the market reactions of either MKR or Token X on the pivotal vote date fall within 10% to 90% range of their corresponding distribution. This pattern suggests that MKR and Token X are uncorrelated in the context of Proposals A, B, and C. Conversely, in Proposals D and E, both MKR and Token X exhibit market reactions in either their respective lower or upper 10% ranges. This alignment in the market reactions implies that MKR and Token X share interest alignment under these proposals, in which the *Alignment Dummy* will take 1 but *Conflicted dummy* takes 0. Under Proposal F and G, if MKR (Token X) is in its own upper 10%, then Token X (MKR) is found in its own lower 10%, which indicates an interest Conflicted relationship between MKR and Token X under these proposals, in which case *Conflicted Dummy* takes 1 but *Alignment Dummy* takes 0.

	Poll A	Poll B	Poll C	Poll D	Poll E	Poll F	Poll G
MKR Market Reaction	>10% and <90%	<10%	>10% and <90%	<10%	>90%	>90%	<10%
Token X Market Reaction	>90%	>90% and <10%	>10% and <90%	<10%	>90%	<10%	>90%
Conflicted Dummy	0	0	0	0	0	1	1
Alignment Dummy	0	0	0	1	1	0	0

Table B5

Robustness test: using alternative measures for conflicted incentives

This table shows robustness test for Table 5 that to confirm the evidence of agency problem by considering the token holding value for a delegate on the vote date. The regression is conducted on delegate-poll level. The dependent variable is *Correct* Dummy. The independent variables *Conflicted (Align) Holding Value* is the logarithm of the dollar value of the interest-Conflicted (aligned) token (Excluding MKR itself) held by the delegate on the vote date. Model (1) includes year-month fixed effect and Model (2) adds delegate fixed effect. T-statistics adjusted for heteroscedasticity and clustered at delegate level are reported in parentheses. *, ** and *** denote statistical significance at 10%, 5% and 1% level, respectively.

Dep. Var.	Correct	
	(1)	(2)
Conflicted Holding Value	**-0.019***	**-0.018****
	(-1.85)	**(-2.39)**
Align Holding Value	0.016**	0.009
	(2.19)	(1.17)
High Impact	0.009	0.038
	(0.23)	(0.96)
Days to Expire	0.000	0.002
	(0.20)	(0.79)
Vote Early	-0.059	-0.050
	(-0.89)	(-0.80)
Num of Delegators	-0.013*	-0.010
	(-1.88)	(-0.94)
Voting Power	-0.002	-0.001
	(-0.37)	(-0.33)
MKR Holdings	0.017**	0.030***
	(2.19)	(3.03)
Constant	0.504***	0.092
	(5.86)	(0.18)
Delegate FE	Yes	Yes
Month FE	No	Yes
Observations	1452	1451
Adj. R^2	0.055	0.131
vce	Delegate	Delegate

Table B6
Tokens referenced in the discussion forum threads

This Table lists the names of tokens (excluding MKR, DAI, and ETH) that are mentioned in the MakerDAO proposal forum discussions, specifically those instances where the token's name are present. The mostly mentioned tokens include stablecoins like USDC and Gemini Dollar. Both of them also serve as collateral on MakerDAO. It also includes MakerDAO's competitors in DeFi lending platform like Aave, Compound and Nexo. It also includes collateral tokens like Rocket Pool ETH, WETH as well as some DeFi exchanges like Uniswap and Sushiswap.

Token Name	Type and Relationship with MakerDAO
USD Coin	Stablecoin, Collateral on MakerDAO
Tether	Stablecoin
Gemini Dollar	Stablecoin, Collateral on MakerDAO
Compound	MakerDAO's Competitor in DeFi Lending
Nexo	MakerDAO's Competitor in DeFi Lending
Uniswap	Decentralized Exchange Uniswap's Governance Token
Sushiswap	Decentralized Exchange Sushiswp's Governance Token
1inch	Decentralized Exchange 1inch's Governance Token
3Crv	Decentralized Exchange Curve's Liquidity Provider Token
Chainlink	Oracle. Update DAI and Collateral Market Price for MakerDAO
stETH	Wrapped Token. Collateral on MakerDAO
Rocket Pool ETH	Wrapped Token. Collateral on MakerDAO
WETH	Wrapped Token. Collateral on MakerDAO
HOP	Multi-Chain Bridge. MakerDAO's Collaborator on Layer-2
Stargate Token	Multi-Chain Bridge. MakerDAO's Collaborator on Layer-2
Lido DAO Token	Lido DAO's Governance Token. stETH is its product
Gitcoin	Gitcoin DAO's Governance Token
Gnosis	Gnosis DAO's Governance Token. Collateral on MakerDAO
Curve DAO Token	Curve DAO's Governance Token

Table B7

Robustness test for table 6: using two- or three-factor model to estimate abnormal returns

This table presents the robustness tests of Table 4. In this table, we define correct vote choice based on the abnormal returns adjusted by either 2-factor (Model (1) to (3)) or 3-factor model (Model (4) to (6)). Additionally, in Model (7), (8) and (9), we focus on a 2-day window after the pivotal vote date. All models use delegate and year-month fixed effects. T-statistics adjusted for heteroscedasticity and clustered at delegate level are reported in parentheses. *, ** and *** denote statistical significance at 10%, 5% and 1% level, respectively.

Dep. Var.	Correct								
	2F			3F			1F, 2 Days		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Token Experience	**0.289****			**0.292****			**0.152**		
	(2.52)			**(2.54)**			**(1.47)**		
Holding Value		**0.007***			**0.006**			**0.009*****	
		(1.74)			**(1.45)**			**(2.79)**	
Portfolio Weight			**0.114****			**0.108****			**0.105****
			(2.59)			**(2.49)**			**(2.03)**
High Impact	0.019	0.022	0.022	-0.007	-0.005	-0.005	0.058*	0.056*	0.056*
	(0.58)	(0.65)	(0.66)	(-0.26)	(-0.17)	(-0.17)	(1.93)	(1.79)	(1.78)
Days to Expire	0.003	0.003	0.003	0.003	0.004*	0.004*	0.002	0.002	0.002
	(1.45)	(1.55)	(1.58)	(1.60)	(1.68)	(1.72)	(0.83)	(0.89)	(0.91)
Vote Early	0.003	0.003	0.003	-0.003	-0.002	-0.003	0.038	0.034	0.036
	(0.03)	(0.04)	(0.04)	(-0.04)	(-0.03)	(-0.03)	(0.54)	(0.49)	(0.51)
Num of Delegators	0.013*	0.014**	0.014**	0.011*	0.012*	0.012**	0.014*	0.015*	0.015*
	(1.85)	(2.04)	(2.11)	(1.74)	(1.94)	(2.00)	(1.76)	(1.74)	(1.79)
Voting Power	-0.004	-0.004	-0.004	-0.007	-0.006	-0.006	-0.002	-0.000	-0.000
	(-0.54)	(-0.42)	(-0.42)	(-0.89)	(-0.74)	(-0.74)	(-0.37)	(-0.03)	(-0.03)
MKR Holdings	0.014	0.015	0.015	0.027***	0.027***	0.027***	-0.012	-0.011	-0.012
	(1.37)	(1.37)	(1.37)	(3.02)	(3.02)	(3.03)	(-0.79)	(-0.75)	(-0.75)
Constant	-0.290	-0.355	-0.379	-0.343	-0.399	-0.423	-0.092	-0.123	-0.136
	(-0.64)	(-0.77)	(-0.81)	(-0.75)	(-0.85)	(-0.90)	(-0.20)	(-0.28)	(-0.30)
Delegate FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Month FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1703	1664	1664	1703	1664	1664	1703	1664	1664
Adj. R^2	0.130	0.134	0.134	0.099	0.101	0.102	0.241	0.242	0.242
vce	Delegate	Delegate	Delegate	Delegate	Delegate	Delegate	Delegate	Delegate	Delegate

Table B8

Robustness test for table 7: using two- or three-factor model to estimates abnormal returns

This table presents the robustness tests of Table 7 to test whether delegates with expertise on related topics can improve voting performance. In this table, we define correct vote choice based on the abnormal returns estimated by either 2-factor (Model (1)) or 3-factor model (Model (2)). Additionally, in Model (3), we focus on a 2-day window after the pivotal vote date. All models control for delegate and year-month fixed effects. T-statistics adjusted for heteroscedasticity and clustered at the delegate level are reported in parentheses. *, ** and *** denote statistical significance at 10%, 5% and 1% level, respectively.

Dep. Var.	Correct		
	2F	3F	1F, 2Days
	(1)	(2)	(3)
Topic Experience	**0.037**	**0.048****	**0.008**
	(1.61)	**(2.20)**	**(0.91)**
High Impact	-0.060***	-0.069***	-0.043**
	(-3.29)	(-3.87)	(-2.27)
Days to Expire	0.001	0.001	0.001
	(0.38)	(0.52)	(0.63)
Vote Early	-0.091**	-0.106***	-0.029
	(-2.42)	(-2.88)	(-0.82)
Num of Delegators	0.002	0.000	0.008
	(0.45)	(0.08)	(1.50)
Voting Power	-0.002	-0.002	-0.003*
	(-0.82)	(-1.15)	(-1.67)
MKR Holdings	0.017**	0.025***	-0.001
	(2.53)	(5.43)	(-0.08)
Constant	0.374	0.321	0.276
	(1.16)	(0.96)	(1.02)
Delegate FE	Yes	Yes	Yes
Month FE	Yes	Yes	Yes
Observations	4936	4936	4936
Adj. R^2	0.156	0.140	0.274
vce	Delegate	Delegate	Delegate

Appendix C: Validation for the Classification of Value-Enhancing vs. Value-Destroying Proposals

Our approach for classifying proposals as value-enhancing or value-destroying is novel. To bolster the confidence in our approach, we conduct two validity checks: a case study and a text-based sentiment analysis.

For a case study, we revisit Poll 665, which proposes reducing swap transaction fees from DAI to USDC to zero.[28] The swap system in MakerDAO, known as the Peg Stability Module (PSM), is a mechanism designed to maintain the stability of DAI's value by enabling direct swaps between DAI and other stablecoins, such as USDC, at a fixed exchange rate. Poll 665 aims to enhance the stability of DAI's peg to the US dollar by enabling seamless and cost-free swaps between USDC and DAI. However, this approach carries certain risks, particularly increased exposure to USDC, which is subject to censorship risk due to its reliance on centralized reserves to maintain its peg. Additionally, the elimination of fees could result in a reduction of revenue generated from PSM transactions. Thus, this proposal represents a strategic trade-off between enhancing liquidity and peg stability, and managing the associated risks from heightened exposure to centralized assets. As discussed in the previous section, our approach classifies this proposal as *value-enhancing*, given the prevailing "Yes" vote and the positive abnormal return of MKR on the pivotal vote date.

To evaluate the consequences of this proposal, a crypto analyst examines the performance of the Peg Stability Module (PSM) following the implementation of the proposal. As shown in Figure C1, there is a substantial rise in PSM volume, with daily inflows and outflows reaching historically high levels. This increase enhances liquidity and contributes to greater stability of the DAI peg, thereby confirming the realization of the intended benefits. Additionally, Figure C1 shows that the PSM balance experiences only a temporary decrease before recovering to its previous levels, indicating that net exposure to USDC is not as significant as initially anticipated.

[28] The swap system in MakerDAO, known as the Peg Stability Module (PSM), is a mechanism designed to maintain the stability of DAI's value by enabling direct swaps between DAI and other stablecoins, such as USDC, at a fixed exchange rate. The PSM allows users to exchange USDC for DAI (and vice versa) with minimal slippage, thereby supporting DAI's peg to the US dollar.

Furthermore, Figure C2 shows that DAI's price peg remains stable, especially when compared to the fluctuations observed in October, thus successfully achieving the proposal's primary objective of maintaining a 1:1 peg with the U.S. dollar. The analyst emphasizes that "the reduction in fees facilitates smoother arbitrage opportunities," which helps stabilize DAI's price by aligning it more closely with its intended peg.[29] Therefore, these subsequent developments validate our classification of Poll 665 as value-enhancing.

To further systematically validate our classification approach, we analyze sentiment of forum discussions related to each proposal. If a proposal is genuinely value-enhancing for MakerDAO, we would expect to observe positive sentiment in the corresponding discussion thread. To assess the sentiment, we utilize the Gemini-pro-latest API, labeling each discussion post as positive, negative, or neutral.[30] The specific prompt used for sentiment labeling is detailed in Table C1. Additionally, we request Gemini to provide a rationale accompanying each classification. Table C2 presents three example posts from the discussion thread for Poll 665, showcasing positive, neutral, and negative sentiments, along with Gemini's assigned labels and corresponding rationales.

To aggregate post-level sentiment to the proposal level, we first require that each proposal's discussion thread contains at least 20 posts, resulting in a sample of 71 proposals. Since individual discussants may comment multiple times, we first aggregate sentiments at the proposal-discussant level by calculating a simple average, representing each discussant's overall opinion about the proposal. We then average these discussant-level sentiments to derive an overall sentiment score at the proposal level. The sentiment score for Poll 665 is 0.64, indicating that it is generally viewed favorably by discussants as a value-enhancing proposal. The overall correlation between the proposal-level discussion sentiment and our binary classification (equal 1 for value-enhancing proposals and 0 for value-destroying proposals) is 30%, indicating that discussants' opinions tend to align with our classification approach.

[29] For more details, see a crypto analyst report at https://cryptobanking.network/the-history-of-a-dai-at-par-value/.
[30] Gemini, developed by Google DeepMind, is a large language model (LLM) designed to compete with other advanced AI models like GPT-4.

Figure C1
PSM inflows and outflows after execution of Poll 665

This figure illustrates the dynamics of the PSM (Peg Stability Module) surrounding Poll 665, specifically focusing on DAI inflows, outflows, and the resulting net balance (outflows minus inflows). The period around Poll 665 is characterized by a marked increase in PSM activity, with both DAI inflows and outflows experiencing substantial growth. While the surge in activity leads to a temporary dip in the net balance, indicating a period where outflows exceeded inflows, the net balance subsequently recovers towards its pre-poll level, suggesting an overall stabilization of the PSM following the event.

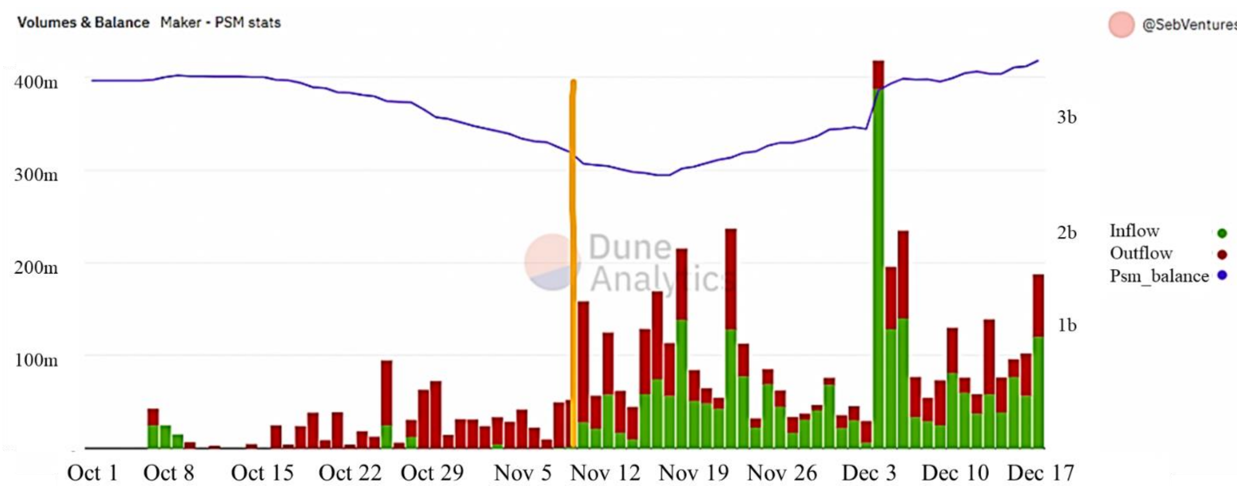

Figure C2
DAI's peg to US dollar around poll 665

This figure illustrates the stability of the DAI peg to the US dollar around the period of Poll 665. It highlights that, following the voting in November, the DAI peg exhibits a more stable behavior compared to the fluctuations observed in October. This suggests that Poll 665, and potentially its outcome, may have contributed to an increased confidence in the DAI peg's stability.

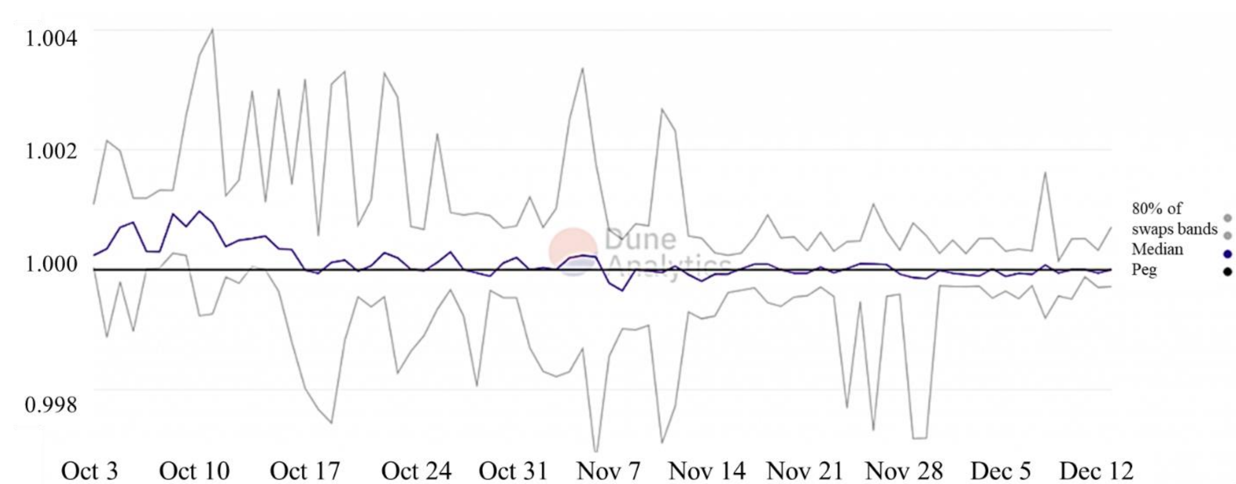

Table C1
Prompt used to obtain sentiment label from Gemini

This table displays the prompt used to instruct Gemini in assigning sentiment labels to each discussion post. The prompt specifies the task, details the elements to be returned, and provides guidelines for Gemini to consider during the classification process.

Prompt
* Task: Analyze the sentiment expressed in each discussion post from the MakerDAO forum, considering the context provided by the proposal content. * Guidelines: * Contextual Analysis: Consider the proposal content when interpreting the sentiment of each discussion post. The same phrase might convey different sentiments depending on the proposal's specific details. * Score: For each discussion post, provide a sentiment score in a range of 0 to 1: - 0: Extremely negative sentiment. - 0.5: Neutral sentiment. - 1: Extremely positive sentiment. * Explanation: Justify the assigned score using no more than 20 words. Do not include any quotation marks in explanation. * Pay attention to: - The relationship between the post's content and the proposal's details. - Distinguish between objective statements, questions, and subjective opinions. A post can be neutral if it primarily presents factual information, summaries or requests input without expressing strong personal opinions. - Citations: - Citations from other posts are marked by four newlines (\n) before and three newlines after the quoted text. - After the citation, the current discussant expresses their opinion. - Ensure your sentiment analysis is based on the discussant's own opinion, not the quoted content. Use this JSON schema: Sentiment = {'index':int, 'sentiment_score': int,'explanation':str} Return: list[Sentiment]

Table C2
Sentiment labeling of discussion posts: examples

The table presents three example posts labeled by Gemini for Poll 655, along with their assigned sentiment scores. The sentiment score takes the value of 0 (negative), 0.5 (neutral), or 1 (positive), where higher scores indicate more positive sentiment. The first example is a supportive post, labeled with a sentiment score of 1 given by Gemini. The second example suggests a compromise solution, resulting in a sentiment score as 0.5. The third example is an opposing post, assigned a sentiment score of 0.

Index	Discussion Post	Score	Explanation
1	**Strongly support this, obviously. I believe this is the biggest way** we are currently shooting ourselves in the foot on a daily basis when it comes to momentum and growth. 4 million in revenue, or whatever, is nothing compared to allowing Dai to be a viable alternative to USDC and other centralized stablecoins. There's also the context that a lot of large scale collateral solutions are finally seeing the light of day, like staked ETH, the direct deposit module for aave, and real world assets / backbone collateral such as corporate bonds, so the short term growth in USDC exposure should be seen as a positive rather than a negative, since it means more capital available at 0% cost that we can allocate to other assets and earn profits from. IMO we cannot afford to drop the ball on this so I will follow this up with a MIP that would allow MKR holders to have the final say on this, should the forum process block it. Again, this is the biggest way we are shooting ourselves in the foot on a daily basis - seeing Dai left out of solutions that include all other stablecoins, and also letting people think of Dai differently as simply a "not-quite-stable" coin rather than a real 1:1 USD stablecoin. **It is really a quantum leap in terms of Dais role in the market and we shouldn't let it be delayed longer than the quickest our governance processes will allow.** as an example I learned a while back that most OTC desks have special markets they call 1:1 markets for stablecoins like USDC and other things where there is a 1:1 arbitrage available somewhere. Since Dai doesn't have the 1:1 arb, it doesn't get this kind of treatment and most OTC desks instead consider it a volatile cryptocurrency, using different, more complicated and more expensive processes to price it and make it available to their users. This has forced me to use USDC over Dai in multiple transactions in the past because it creates a significant friction and inefficiency, especially at larger scale.	1	Strongly supports this proposal, seeing it as beneficial for Dai.
2	**I'm in favor of lowering the fees for PSM, but would prefer an intermediate option instead of going all the way to 0%.** Maybe starting with 0.05% fee in, 0% fee out, and then reassessing for further reductions (potentially all the way to 0%) after a month. Another option we could consider is "centering" the peg around 1% by reducing fee in but increasing fee out slightly above 0%. For example we could charge 0.025% for both fee in and fee out, which would result in a 0.05% spread / round trip fee from USD	0.5	Suggests a compromise: gradual fee reduction instead of complete removal.

	to DAI and back, but would create market conditions where the peg would trade right around 1:1 most of the time and never more than 2.5 bps away from peg (versus up to 10 bps off peg currently). This preserves our ability to earn some revenues from stablecoin swaps (maybe even growing revenues if we see a lot more volume), and also ensures we don't negatively impact Curve pools which serve as an important driver of DAI demand.		
3	The fees in the PSM serve several purposes that keep the system from going off of the rails. The PSM module was deployed to help take on as only as many 3rd-party stablecoins as necessary to get Dai's peg back down to an "acceptable" level after a market downturn. It's stated purpose was to be able to take the hit from a market crash and get enough Dai on the market at a reasonable price to let vaultholders cover their positions. **Moving the TIN to 0% means that we will take on to our books all of our competitors stablecoins until that market is completely saturated.** According to the market, Dai is objectively more valuable than the other stables. **I like to think it's subjectively because we're censorship resistant, but Dai's value will only equal other stablecoins when we've cut enough corners on issuance to counteract it's real benefits vs. other stables.** PE has been working for the last year and a half on various solutions to get USDC and other regulated stablecoins off of the books, and **this does the exact opposite of that.** Maker governors should be prepared to take on many multiples of the current portfolio regulated stablecoins if this is adopted. Having the PSM's full or at even greater percentages of Dai backing than what we're currently seeing is going to **limit the appetite to take on more stables in a market crisis** (when we need it the most). Without any spread, there's no limit to how much stable risk the protocol takes on, and zero friction for anyone looking to pass that risk to us. **We would be taking on blacklist, technical, and insider risks for 0 premium in an environment where we absolutely can and should expect to be rugged on these tokens. This is a short-term fix that exacerbates a long-term problem.** There are also **potential legal considerations** around this change, which is why the Foundation did not want to touch the PSM. I'd strongly recommend getting a legal core unit to weigh in on the implications here.	0	Argues against the proposal, highlighting risks and potential negative consequences.

Appendix D: MakerDAO Governance Changes in April 2023

In April 2023, MakerDAO implements significant governance changes as part of its "Endgame Plan", which aims to further decentralize governance, enhance efficiency, increase resilience, boost voter participation, and ensure long-term sustainability. The delegation scheme undergoes five major changes.

First, Aligned Voter Committees (AVCs) are established within MakerDAO. AVCs are groups of MKR holders that operate based on specific values and strategies. Recognized delegates, now referred to as Aligned Delegates (ADs), must join at least one AVC, while shadow delegates are not obligated to do so.

Second, ADs are divided into two groups: Prime Delegates (PDs) and Reserve Delegates (RDs). PDs are the delegates ranked highest by the number of MKR shares delegated to them, and consequently receive higher compensation than RDs. Once a delegate's status is determined, their monthly payment is based solely on their participation in voting and forum communication, following a structure similar to the previous system, where compensation gradually increases from 75% participation to a maximum at 95% participation.

Third, monthly compensation now consists of two components: MKR and DAI. The maximum monthly MKR payment is 13.75 MKR for PDs and 1.25 MKR for RDs, while the maximum monthly DAI payment is $54,167 for PDs and $8,333 for RDs. The DAI payments provide delegates a stable salary, while the volatile MKR component is designed to align delegates' incentives with MakerDAO's long-term value.

Fourth, instead of directly transferring payments to delegates, compensation accumulates as a budget within MakerDAO's treasury buffer accounts. Once a delegate has accrued at least one month's worth of income, they can request a withdrawal each month, up to the total amount of their accumulated savings.

Finally, all delegates, including ADs, are prohibited from disclosing their real-world identities. This measure aims to protect delegates from potential threats and reduce the bribery by making it harder for internal or external actors to identify them. Simultaneously, a "whistleblower bounty" is offered to anyone who can provide evidence that a delegate has revealed their identity.

These changes could affect delegates' incentives to vote correctly in several ways. First, being part of an AVC may constrain delegates' actions by binding them to the committee's shared missions and subjecting them to peer monitoring. Second, although the number of MKR shares delegated to each delegate no longer directly factors into the compensation calculation, it determines which delegates are designated as Prime Delegates each month. The substantially higher compensation for PDs compared to RDs creates powerful incentives for delegates to compete for these top positions by securing more delegated shares. This structure is akin to the tournament incentives common in other settings, such as sports, asset management industry, and the managerial labor market. Third, including MKR tokens delegates' monthly compensation can further align their interests with MakerDAO's long-term value. Finally, while the anonymity requirement can enhance delegates' independence and integrity, it may also weaken their incentives by reducing reputational costs.