

Market Provisioning Better Public Goods: What Experimental Economics Can Tell Us About Addressing The Public Goods Problem.

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What Are Public Goods?

Definition: Goods that are Non-excludable and Nonrivalrous

Examples include: Lighthouses, dams, and national defense

Challenges: Despite their high collective value individual incentives often lead to their underprovisioning and developers rarely know how much people value these goods.



Methods and The FSU Experimental Economics Lab

- Laboratory complete with 26 terminals and specialized monitoring equipment.
- Participants are given tokens as a stand in for currency and are directed to allocate their funds to a shared public good. Simulates real-world social dilemmas.
- Rules like refund bonuses or matching funds are manipulated by researchers.



Dominant Assurance Contracts, Funding Public Goods, and Experimental Results

Coordination Problem: How do we pay for public goods?
 Mechanism: An evolution of the standard assurance contract (like Kickstarter). It adds a refund bonus paid to contributors by the entrepreneur if the funding threshold is not met.
 function: This removes the "Assurance Problem." Contributors are no longer worse off if the project fails; they either get the public good or a financial bonus.
 Experimental Testing: In lab settings, adding the refund bonus (the "Dominant" element) increased the success rate of funding public goods from 30% to 67%.

Table 7: Robustness Treatments – Performance Summary

| Treatment | Funding Frequency | Shortfall | Funding Efficiency | Net Returns | Ave. Total Bonuses | Average Returns: $k = 273$ | $k = 250$ |
|-----------|-------------------|------------|--------------------|----------------|--------------------|----------------------------|--------------|
| F3 | 45/90 = 50% | 34.5 (4.1) | 0.481 (0.051) | 152.47 (18.89) | -9.57 (1.03) | 10.00 (3.26) | 21.50 (4.43) |
| F6 | 57/90 = 63% | 36.6 (4.2) | 0.599 (0.049) | 175.02 (18.20) | -15.20 (2.15) | 12.08 (4.56) | 26.65 (5.69) |
| FE30 | 43/90 = 48% | 41.2 (3.7) | 0.458 (0.051) | 140.02 (19.35) | -15.53 (1.58) | 4.23 (4.19) | 15.22 (5.31) |
| FE50 | 50/90 = 56% | 35.7 (4.4) | 0.518 (0.051) | 151.42 (17.39) | -9.47 (1.17) | 17.35 (5.54) | 30.13 (6.40) |
| PE10 | 44/90 = 49% | 58.0 (4.6) | 0.473 (0.052) | 149.17 (18.83) | -8.79 (0.93) | 9.37 (3.33) | 20.62 (4.42) |
| Baseline | 74/170 = 43.5% | 86.2 (6.2) | 0.424 (0.037) | 139.74 (12.60) | - | 15.41 (1.51) | 25.43 (2.33) |
| P20 | 133/220 = 60.5% | 29.0 (2.9) | 0.575 (0.032) | 158.27 (12.17) | -21.43 (1.81) | 3.09 (3.29) | 17.00 (4.03) |
| PE20 | 154/230 = 67.0% | 49.8 (3.8) | 0.632 (0.030) | 189.73 (11.31) | -12.79 (1.23) | 16.39 (3.20) | 31.79 (3.80) |

Note: Standard errors are reported in parentheses.

funding frequency, efficiency, and net returns across various experimental treatments, including the baseline and several refund bonus schemes

(Cason, Timothy N., Alex Tabarrok, and Robertas Zubrickas. 2021. "Early Refund Bonuses Increase Successful Crowdfunding." Purdue University Economics Department Working Paper No. 1326.)

Quadratic Funding, Identifying Public Goods and Field Results

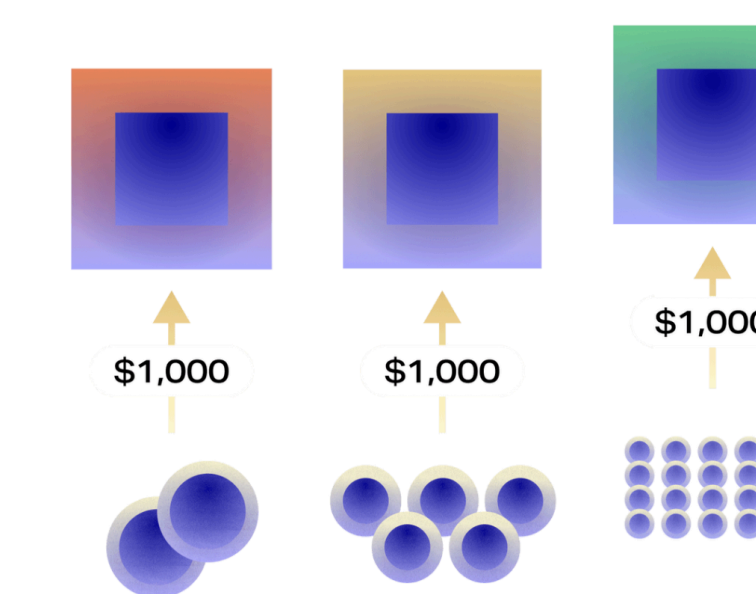
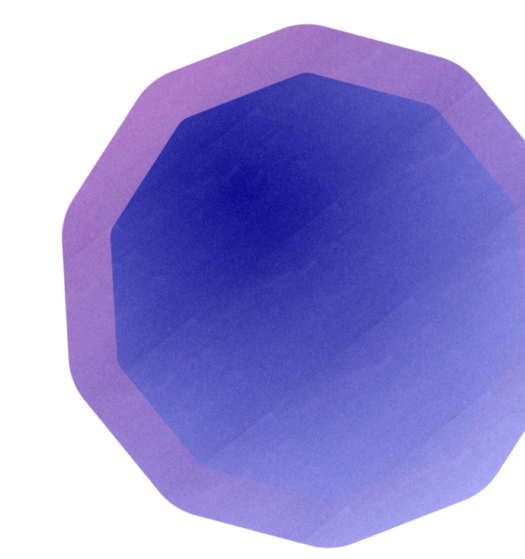
Information Problem: How do we decide which public goods are worth funding at all?

Mechanism: Uses a mathematical formula where the amount of matching funds a project receives is the square of the sum of the square roots of individual contributions.

Function: This prioritizes the number of unique contributors over the total dollar amount, effectively signaling which projects have the broadest community support rather than just the wealthiest backers.

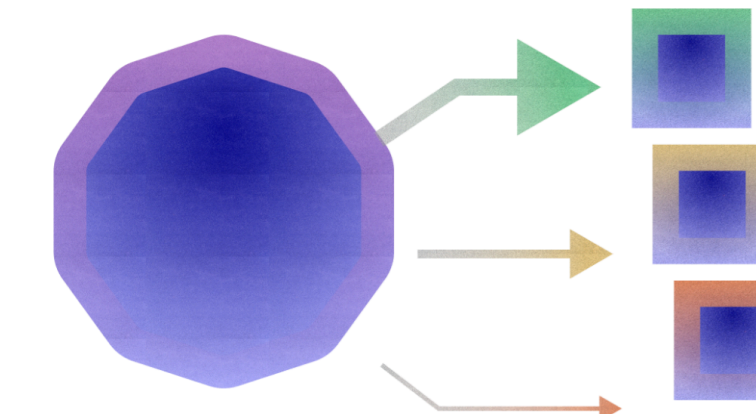
Field Testing: Extensively applied in the field via Bitcoin Grants, successfully identifying and amplifying community-wide preferences in decentralized ecosystems.

Imagine that we have \$10,000 we want to distribute, and we want a community to determine who should receive the funding



Let's say three projects participate in a funding round...

- Project A received \$1,000 in total from 2 contributors (\$500 each).
- Project B received \$1,000 in total from 5 contributors (\$200 each).
- Project C received \$1,000 in total from 20 contributors (\$50 each).



- Project A receives \$740.74, +74% on top of the contributed amount
- Project B receives \$1851.85, +185% on top of the contributed amount
- Project C receives \$7407.41 of matched funding, +740% on top of the contributed amount

(Gitcoin. 2023. "WTF is Quadratic Funding?" Accessed February 5, 2026. <https://www.wtfisqf.com/>.)

Conclusions

Market Viability: Experimental and field evidence suggests that coordination and information problems can be addressed through market-based incentive structures rather than just coercive taxation.

Incentive Alignment: By manipulating variables like refund bonuses (DAC) and matching pools (QF), we can align individual self-interest with the collective provisioning of public goods.

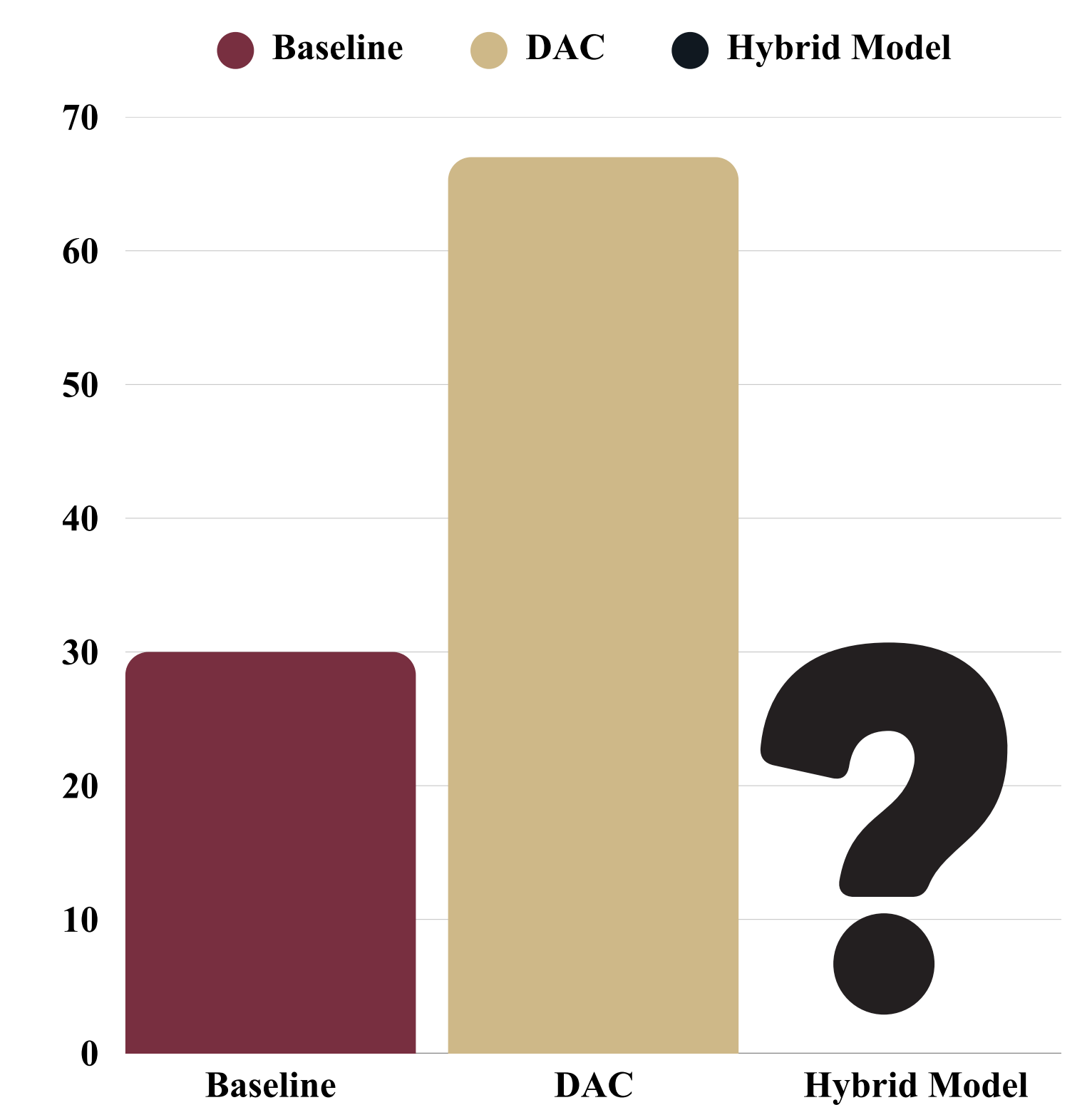
Efficacy: These mechanisms significantly increase the success rates and democratic accuracy of voluntary public good funding.

Further Research

Proposed Lab Study: A four-stage experimental game to observe evolving participant behavior:

1. Baseline crowdfunding
2. Dominant Assurance
3. Quadratic Funding
4. Hybrid Model: A two-stage game combining QF (to identify the good) and DAC (to fund it).

Goal: To determine if a hybrid system can optimize voluntary provisioning for goods historically funded through taxation.



References

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