The Potential to Use Reward as "Assurance Payments" to Attract Voluntary Payments for Ecosystem Services from Consumers

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Original title: The Potential to Use Subsidies as "Assurance Payments" to Attract Donations in Support of Ecosystem Services: The "Participation Challenge Fund" Approach

Motivation

- A market to sell (farm-provided) ecosystem services public goods
  - E.g., hayfield-based wildlife (grassland nesting bird) habitats
  - Supplied by farmers adjusting their haying practices

- Farmers need compensation to modify haying
  - Contingent contracts: farmers vs. local community
  - Multiple land parcels
  - Provision point: cost of contract for each parcel
  - A public good

The Assurance Payment Idea

- Dominant Assurance Contract for One Unit (Tabarrok, 1998)

- Assurance Payment for Multiple Units (*NEW*):

- Here is the **TRICK**
  - *Reward high offers in case of non-provision*

  - *Rewards paid after none provision would likely attract higher offers*
    - **since everyone wants to contribute enough to NOT to lose the reward**, the good will most likely be provided, and the reward will not actually need to be paid

Design

- An **A**ssurance **P**ayment (**AP**) is rewarded to whoever contributes ≥ a ***minimum offer*** (predetermined threshold) in case of non-provision.

  – For simplicity, let the minimum offer = AP

- For multiple units, we introduce two types of payment schemes:

  – **Partial** assurance payment: only covers the first several units.

  – **Conditional** (full) assurance payment: covers all units available.

Experiment Overview

- Parameters
  - 6 units of a discrete public good
  - v_i^1 and v_i^6 drawn from U[15, 25] and U[5, 15], interpolate v_i^2 to v_i^5 linearly
  - Cost per unit per capita=10, i.e., cost per unit=10*N (N is the group size)
  - Above info is common knowledge

- Treatments

  A0 (***NoAssur***): No assurance

  A1 (***ConstPartial10***): Constant assurance of **10** (= per capita cost share) for the 1st 3 units

  A2 (***ConstPartial14***): Constant assurance of **14** (medium) for the 1st 3 units

  A3 (***DecrPartial181410***): Decreasing assurance of **18** (high), **14**, and **10** for the 1st 3 units

  A4 (***ConstFull10***): Constant assurance of **10** for the 1st unit that cannot be provided

  A5 (***ConstFull14***): Constant assurance of **14** for the 1st unit that cannot be provided

Session	Treatment 1	Treatment 2	Treatment 3	Number of Subjects
1	A0	A1	A2	5*2
2	A1	A0	A3	6*2
3	A2	A3	A1	6*2
4	A3	A2	A0	7*2
5	A0	A4	A5	7*2
6	A0	A5	A4	6*2

Contribution stage:

Unit Cost: 20.00

Assurance Table: If you contribution reaches the minimum price, we will compensate you with this amount on the first unit is not provided.

Conditions	Unit	Minimum Contribution	Your Compensation
0 Units Provided	1	10	10
1 Unit Provided	2	10	10
2 Units Provided	3	10	10
3 Units Provided	4	10	10
4 Units Provided	5	10	10
5 Units Provided	6	10	10

Your Value for	Unit1	Unit2	Unit3	Unit4	Unit5	Unit6
Your Value	16.24	14.20	12.20	10.20	8.20	6.21
Your Contribution						

Earning display stage :

The Number of Projects Provided by Your Group:	2
You got an Assurance from Unit 3	10
Since your contribution on Unit 3 is	11
which is more than (equals) the minimum price	10
Your Total Benefit in This Period	33.30
Your Contribution on the Last Unit Provided	11.00
Your Total Contribution to the Project	22.00
Your Profit in this period	21.30
Your cash	171.30

Results

Did people contribute more?

Group Value Revelation (total offer / total value):

Assurance payment significantly increases value revelation

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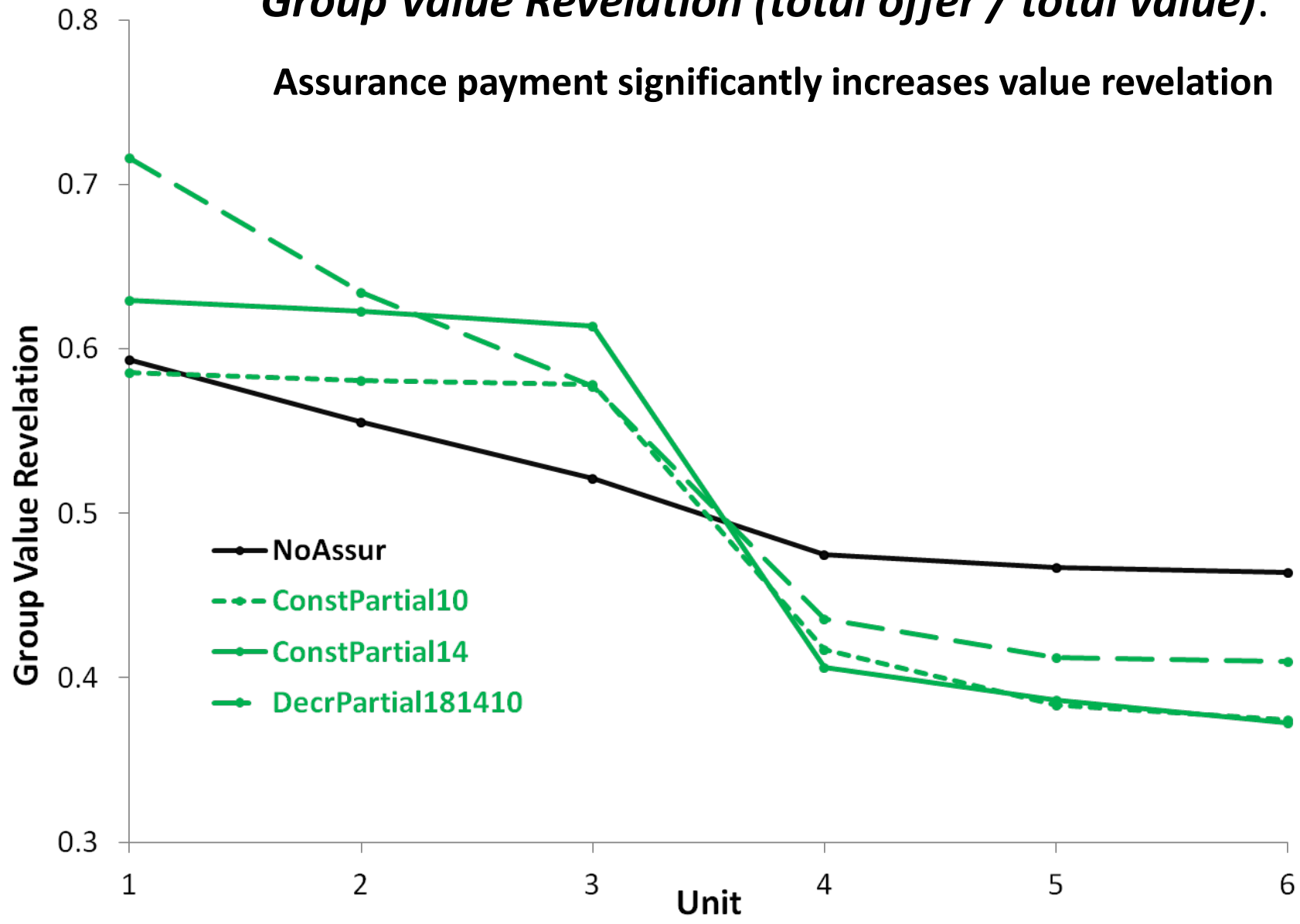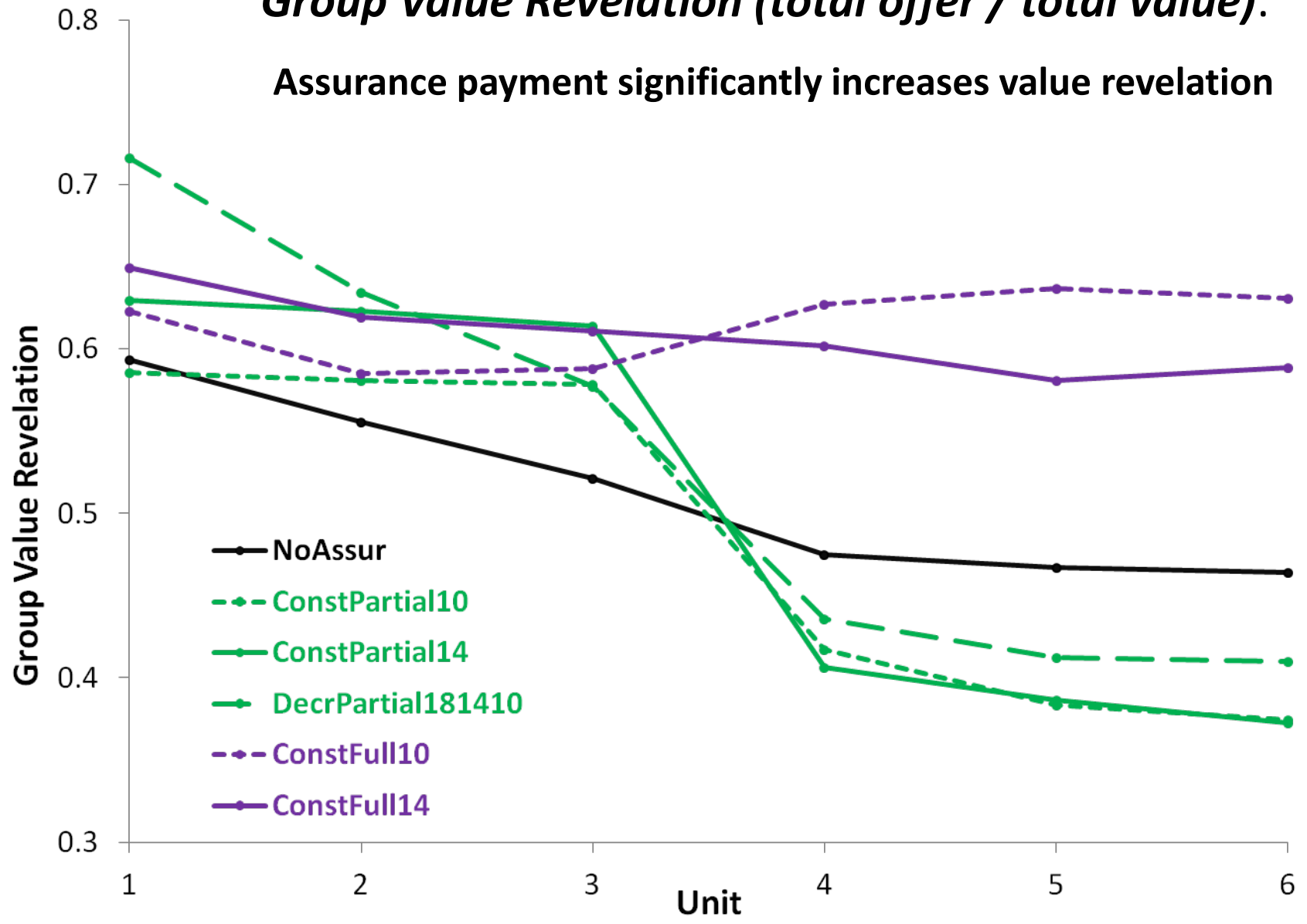
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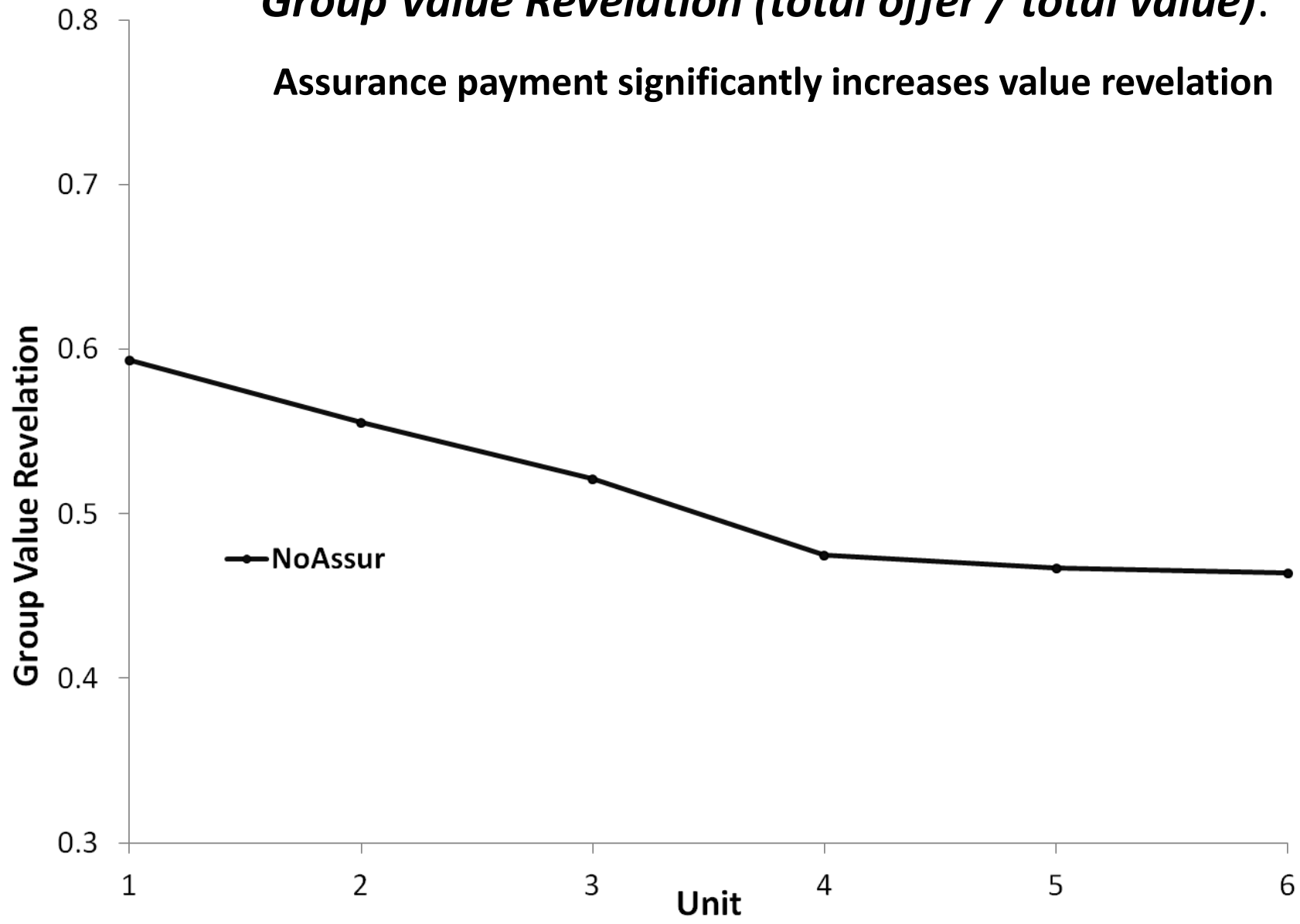
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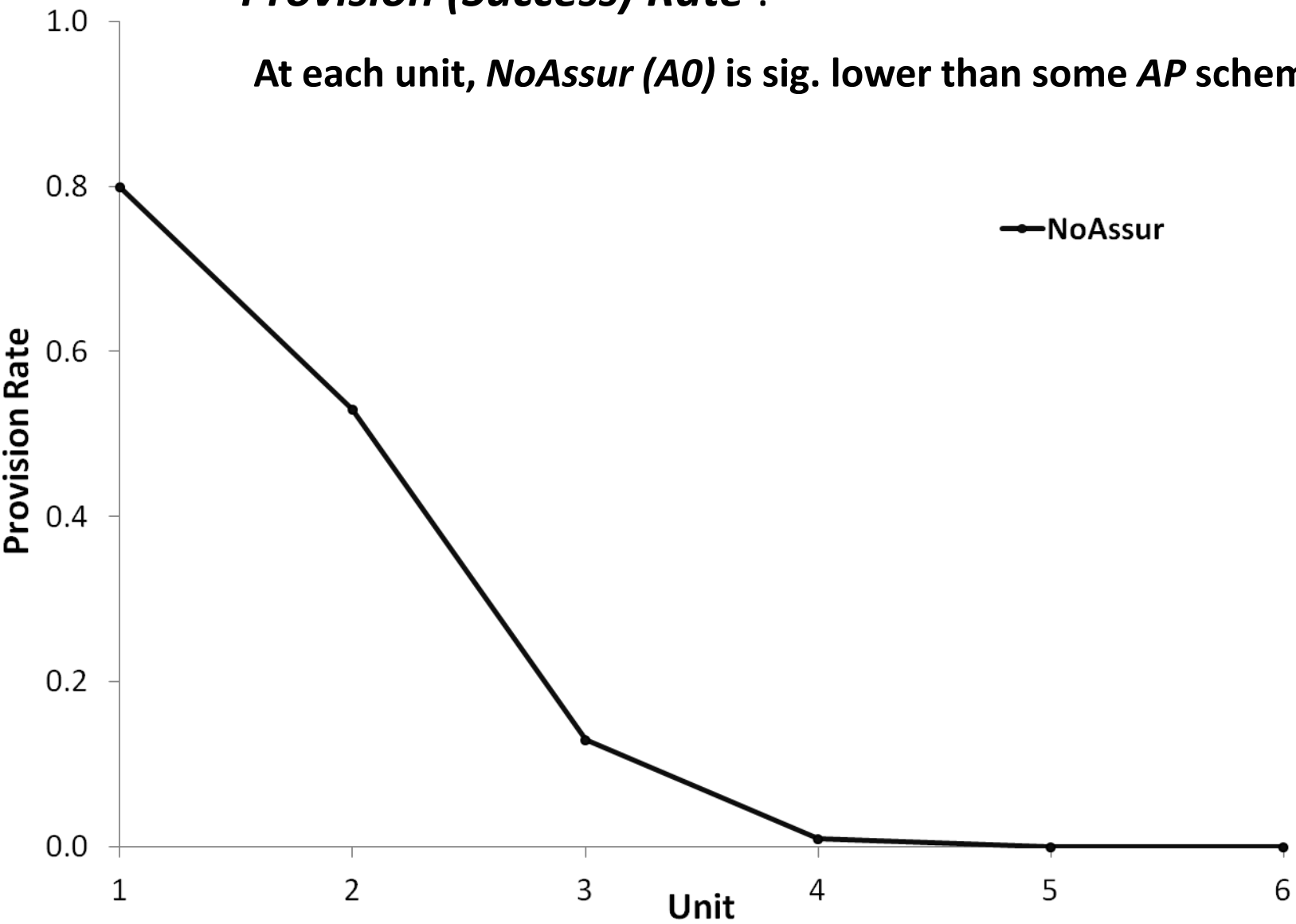
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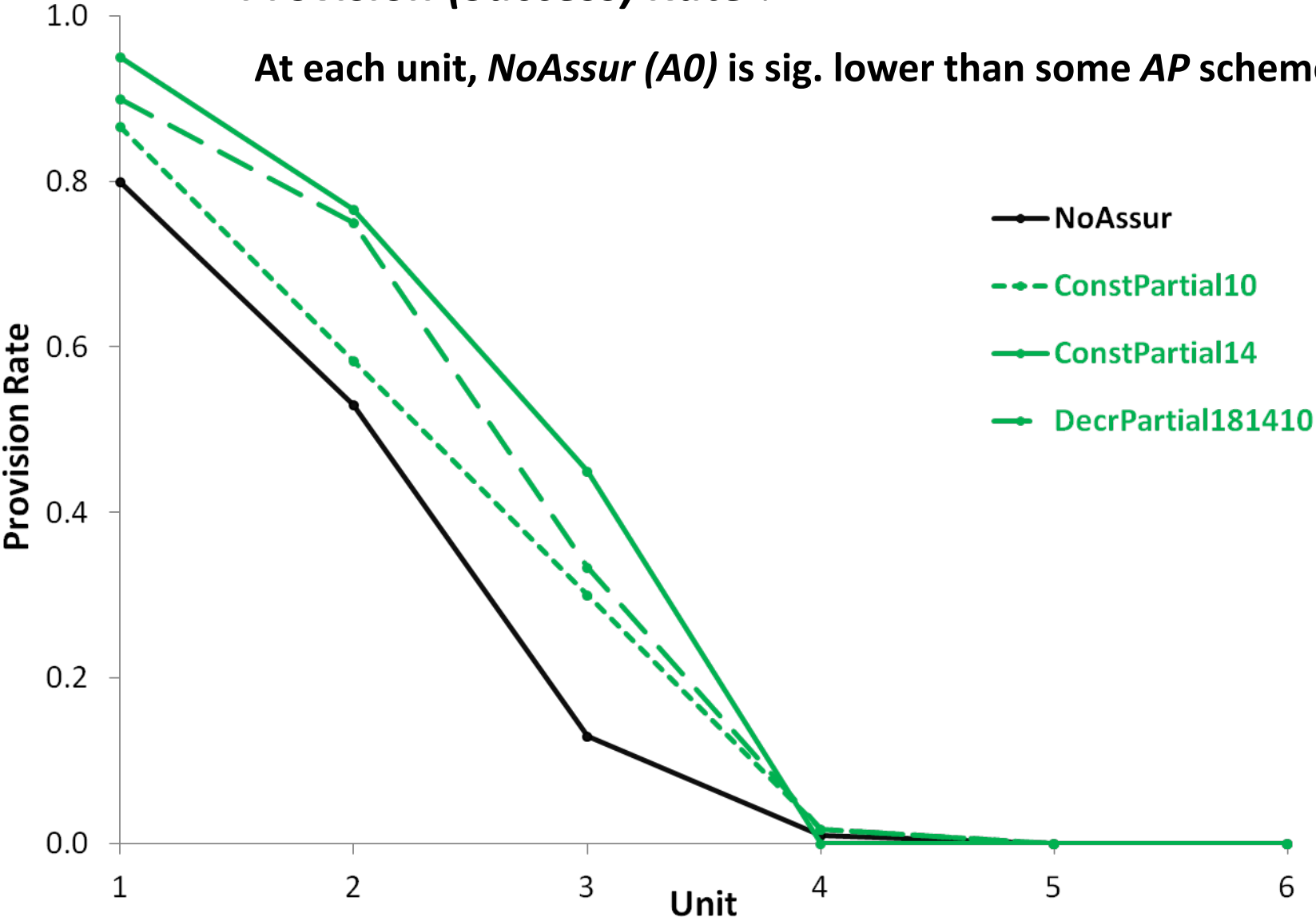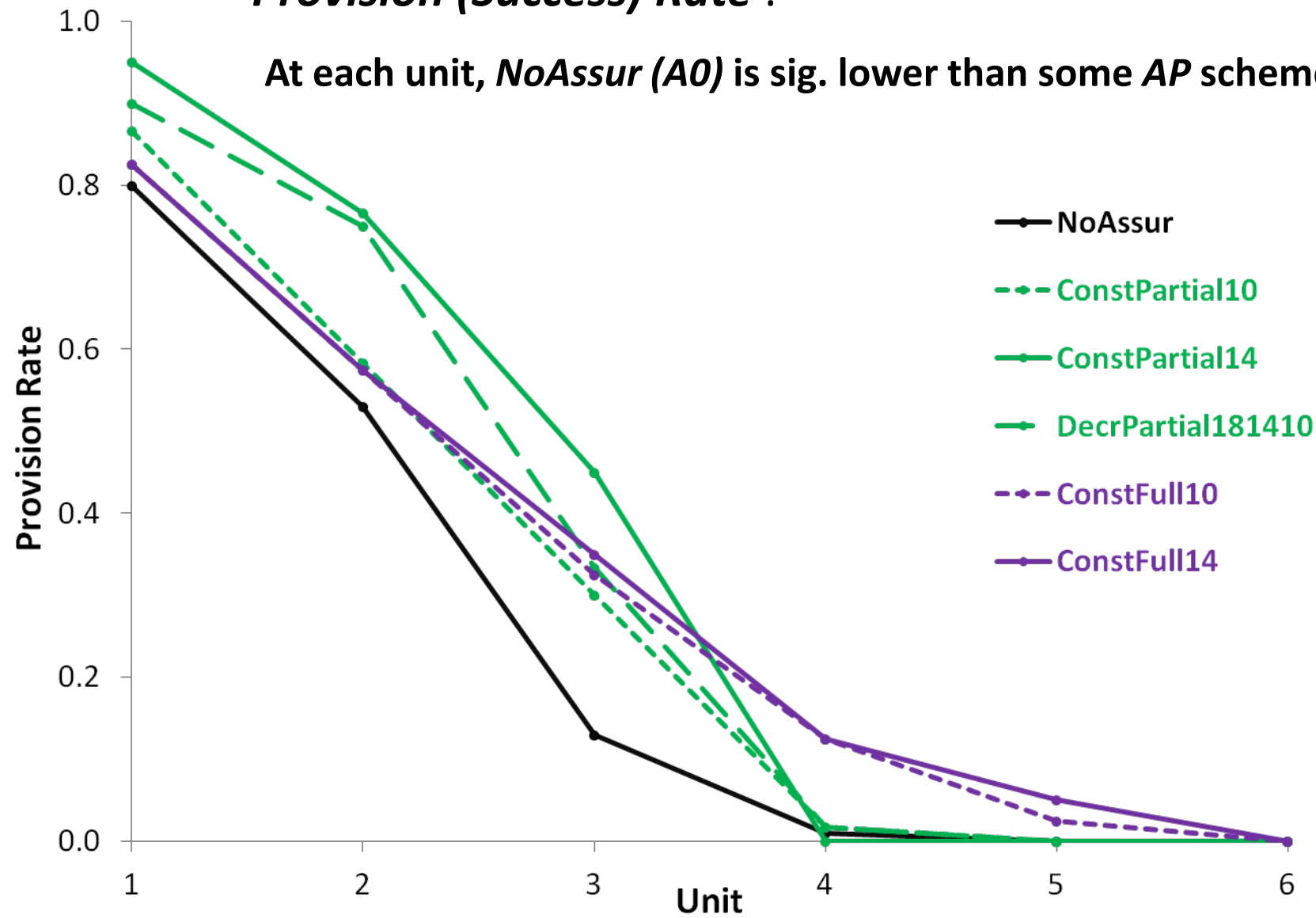
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Legend:
- NoAssur
- ConstPartial10
- ConstPartial14
- DecrPartial181410
- ConstFull10
- ConstFull14

Y-axis: Provision Rate (0.0 to 1.0)
X-axis: Unit (1 to 6)

Was the social welfare improved?

Realized Social Surplus (Net benefits provided)

A2 > **A3** > **A4** > **A5** > **A1** > **A0**

ConstPartial14 > *DecrPartial181410* > *ConstFull10* > *ConstFull14* > *ConstPartial10* > *NoAssur*

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Realized Average Social Surplus and Its Allocation

Treatment	Potential Maximum Social Surplus (from units *available*)	Realized Social Surplus (from units *provided*)	Realized Consumer Surplus	Realized Producer Surplus
NoAssur	100	44	39	5
ConstPartial10	100	50	61	-11
ConstPartial14	**100**	**63**	**62**	**1**
DecrPartial-181410	100	58	64	-6
ConstFull10	100	53	70	-17
ConstFull14	100	52	60	-8

Summary

- Assurance payment works, indeed
→ individuals increase their contribution
→ the public good is provided more frequently
→ the realized social efficiency is higher than the baseline

- Assurance payment level and scheme do matter
  - Optimal assurance payment level
  - Partial vs. Conditional: # of units covered *vs.* provision rate at each unit

- Next…
  - More efficient assurance payment level and the number of units covered
  - More efficient assurance payment schemes
  - Apply the assurance payment to actual markets.

Thank you!

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