Discussion of "Identity-Compatible Auctions" by Haoyuan Zeng

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Model

Buyers

One object + random number of buyers:

$$\gamma_n = \Pr[\tilde{n} = n] > 0, \quad \text{for } n \geq 1.$$

Values $\theta_i \overset{\text{iid}}{\sim} F$ on $[0, 1]$.

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Auction design

Lit: total identity count is revealed.

Dark: total identity count is concealed.

Design Desiderata

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Attain the *unrestricted* BIC and interim-IR revenue benchmark.

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#4. Seller identity compatibility

No expected gain from shill bidding.

Lit: choose number of shills ex ante.

Dark: choose number of shills ex post.

(Shill bids can depend on realized bids.)

Overview

Main results

1. No lit auction is optimal + ex-post IR + seller ID-compatible.
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This discussion

#1. Geometric intuition underlying the dark FPA result.

#2. Understanding buyer beliefs about competition.

Geometric Intuition on the Dark FPA Result

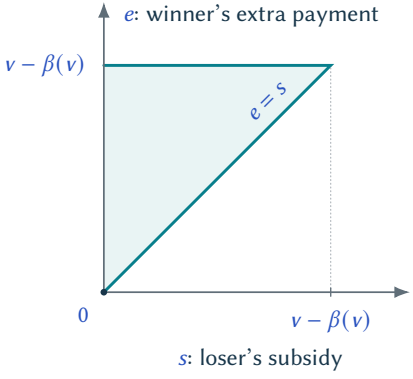
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Denote by $\beta(v)$ the equilibrium bid of value v in the optimal dark first-price auction.

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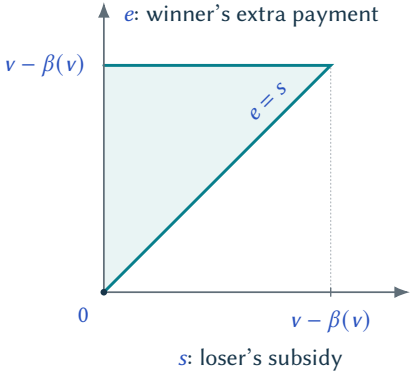
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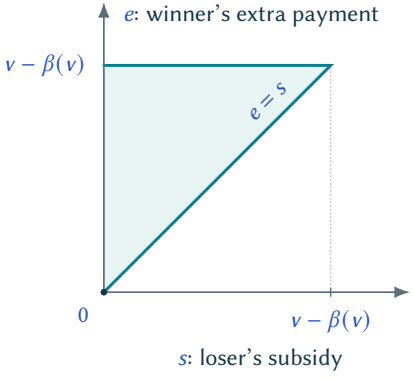


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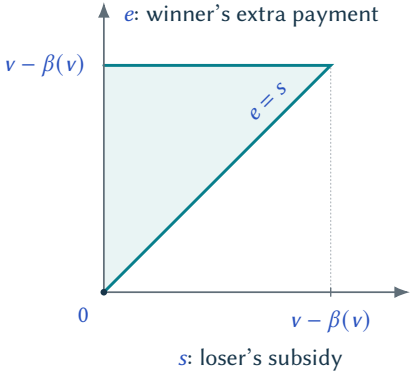
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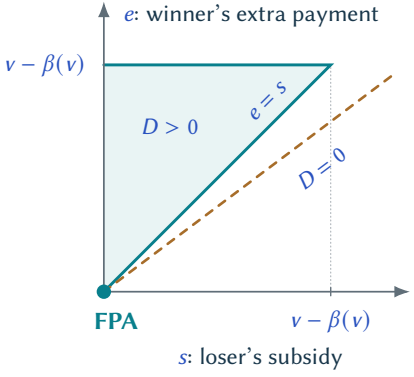


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Buyer + seller ID compatibility: $e \geq s$.

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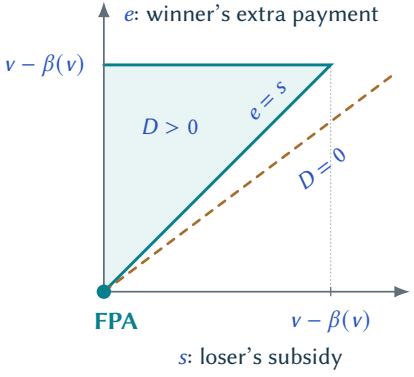


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$$D = v \cdot e + w \cdot (-s) \geq 0.$$

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As the paper shows, revenue equivalence gives

$$\mathbf{E}[D_{\tilde{n}}] = 0.$$

With $D_n \geq 0$, this implies that $D = 0$.

Buyer Beliefs About Competition

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But…this is also quite important to the main results (e.g., for revenue equivalence to hold).

Interdependent values and correlated signals extension is an effort in the right direction.

Are there other modeling approaches that are more realistic but are similarly tractable?