“A Walrasian Theory of Sovereign Debt Auctions with Asymmetric Information”

by Harold L. Cole, Guillermo Ordonez and Daniel Neuhann

Sergei Glebkin,
INSEAD

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Summary

A theory of divisible goods auctions, that allows for

- UP and DP auction formats
- Asymmetric info and info acquisition
- Short sale and borrowing constraints
- General utility function for bidders
- (Key simplification): bidders have no market power

Key result: info acquisition incentives are different with DP and UP auction formats

Setting

- Two assets: risk-free bond and risky sovereign bond
  - **Q:** real-life counterpart to the risk-free bond?
- Risky bond pays off $\{1,0\}$ w.p. $\{1-\kappa_\theta, \kappa_\theta\}$
- Quality shock $\kappa_\theta \in \{\kappa_g, \kappa_b > \kappa_g\}$ w.p. $\{f_g, f_b = 1 - f_g\}$
- Investors can acquire info: pay cost $K \Rightarrow$ know θ
  - **Q:** can the model handle more general distributions for bond's payoff and quality shock?

Setting

- Investors$\in [0,1]$: utility $U(x)$. Closed-form solutions with $U(x) = \log(x)$ with symmetric info.
  - Cannot short sell and/or borrow
  - **C:** contrast general $U(x)$ to commonly assumed specifications: CARA, mean-variance. Wealth effects? Contrast to the case of no financial constraints.
- Demand shock η: only fraction $1 - \eta$ of investors show up to the auction. Distribution of η is general.
  - η is a source of noise in the price
  - **C:** contrast to standard ways of introducing noise, e.g. random supply.

Comments

Why sovereign debt?

- Authors' response: assumptions are well justified:

  "Sovereign bonds are highly divisible, usually of uncertain quality, and auctioned … to a large number of investors."

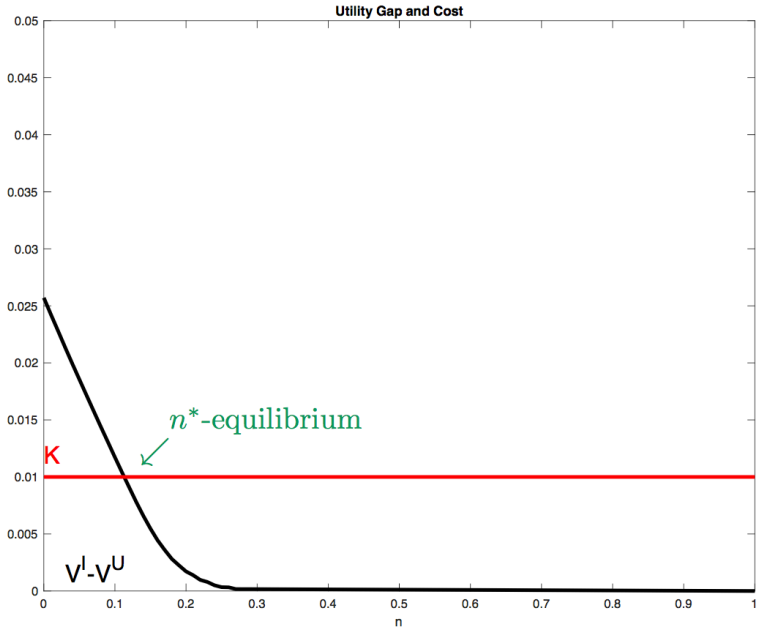
Insights can be applied to other markets!

- E.g., competitive REE models consider stocks as being divisible, of uncertain quality and assume traders have no market power
- REE models assume UPA, even though stocks are traded in (price-discriminating) limit-order books
- Are insights under DPA and UPA similar?

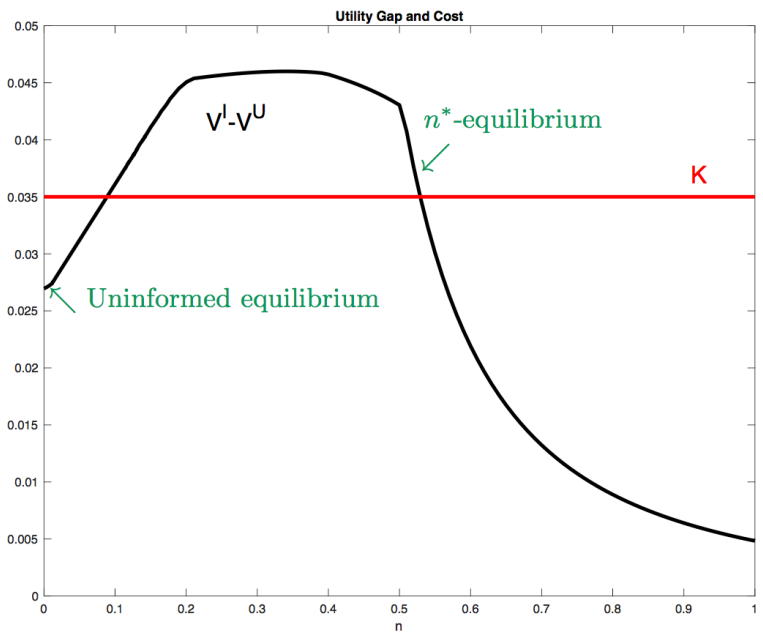
Info acquisition: DPA vs UPA

Figure 7: Equilibrium with Information Acquisition

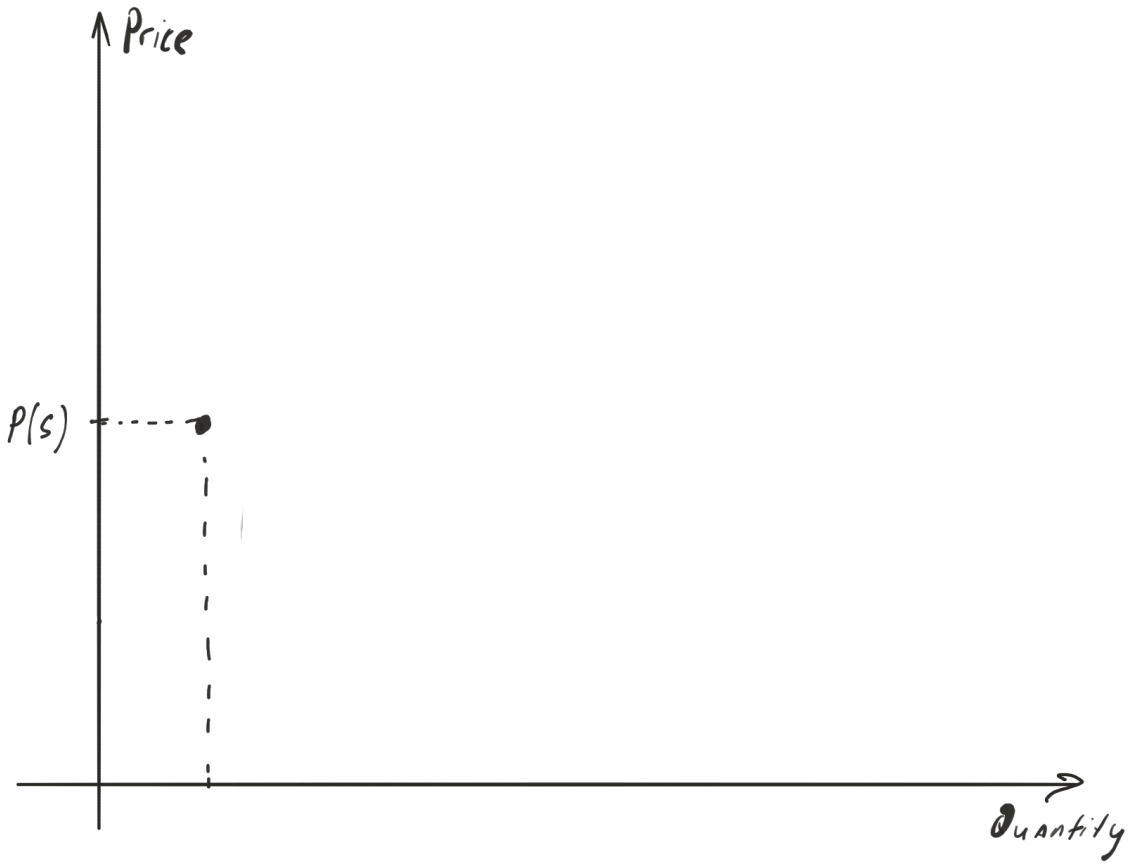
(a) UP Auction

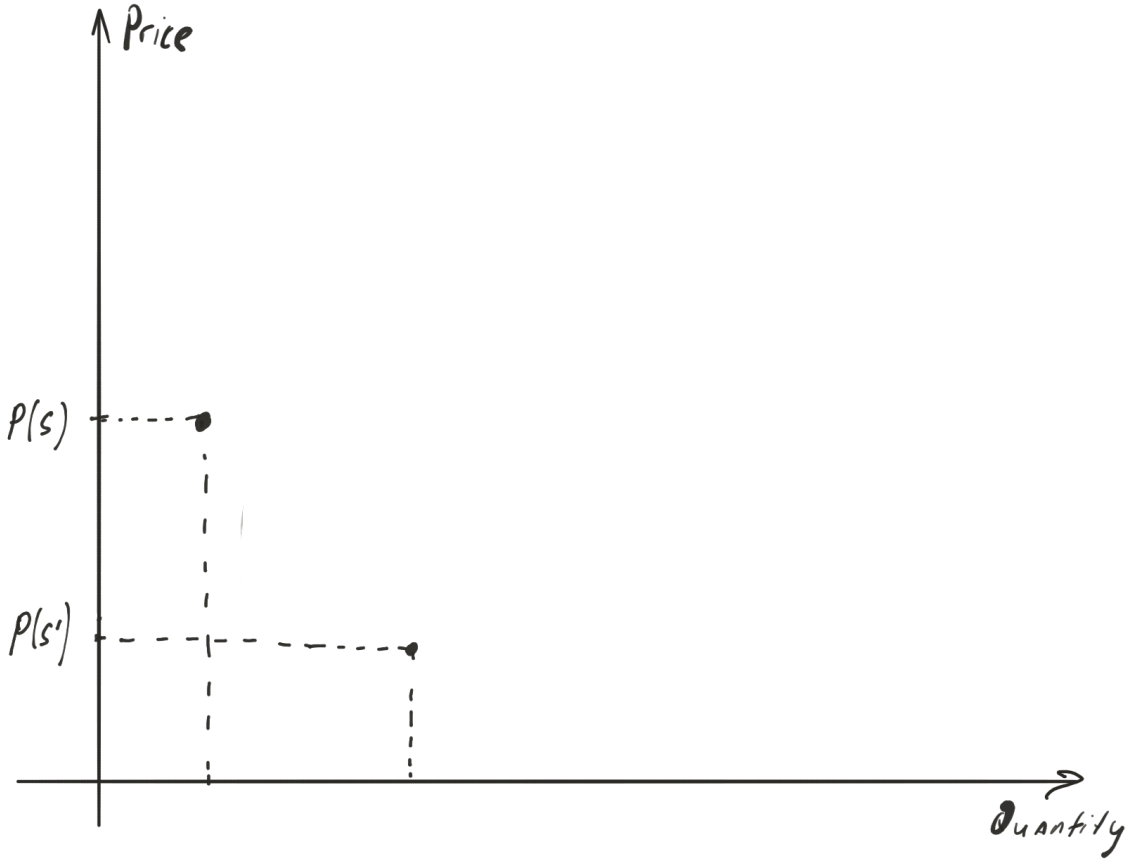


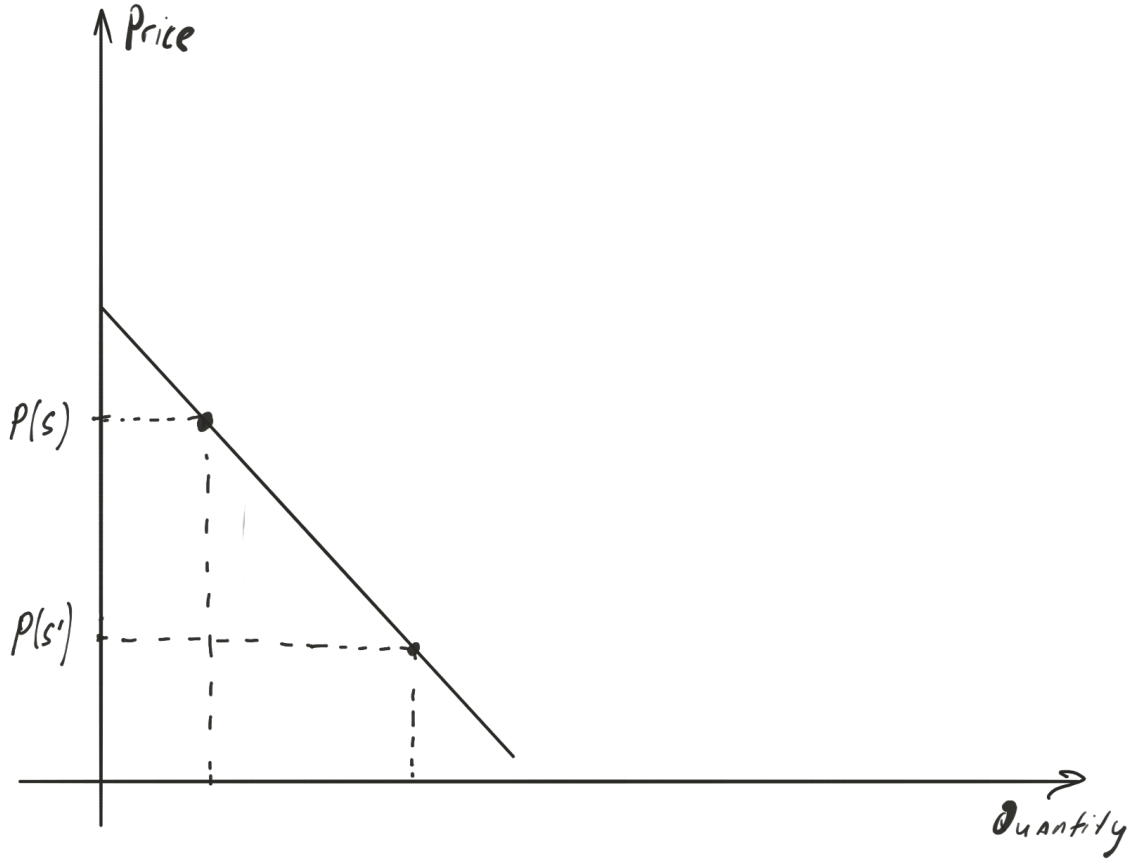
(b) DP Auction

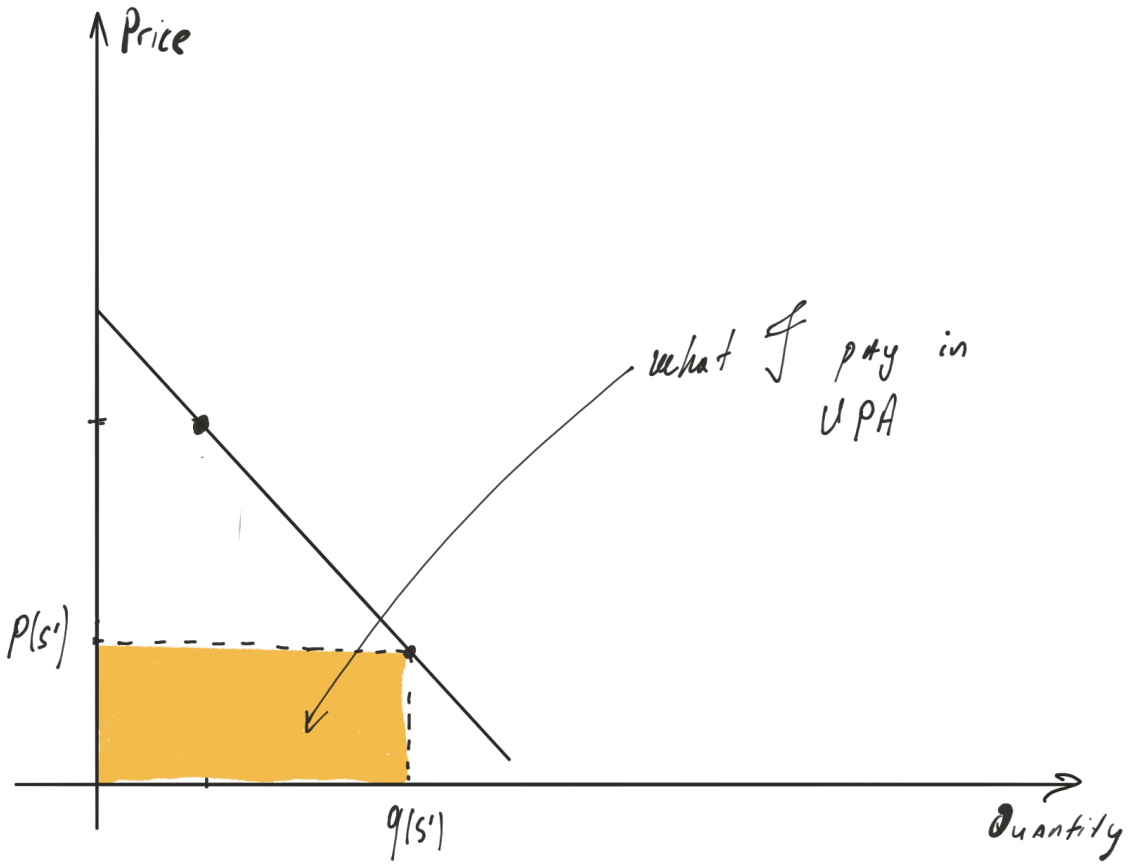


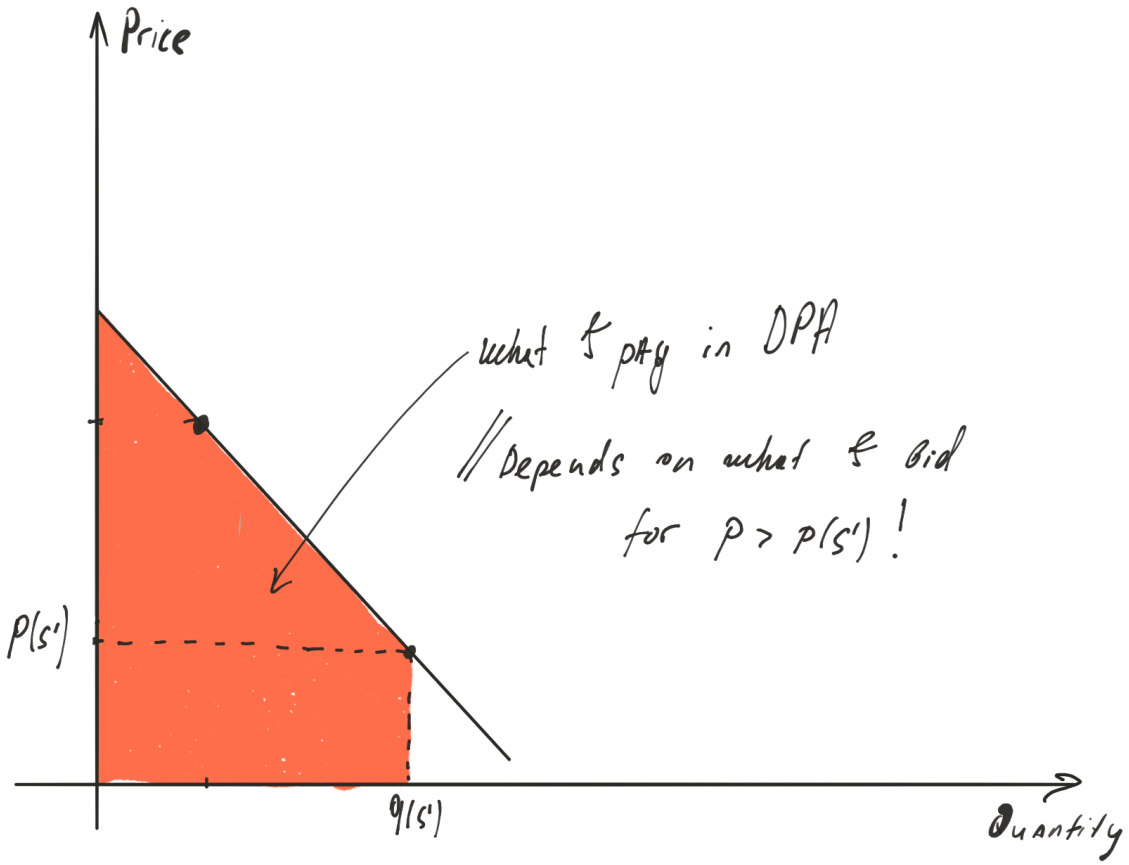
Complementarities in info acquisition with DPA but not UPA! Why?

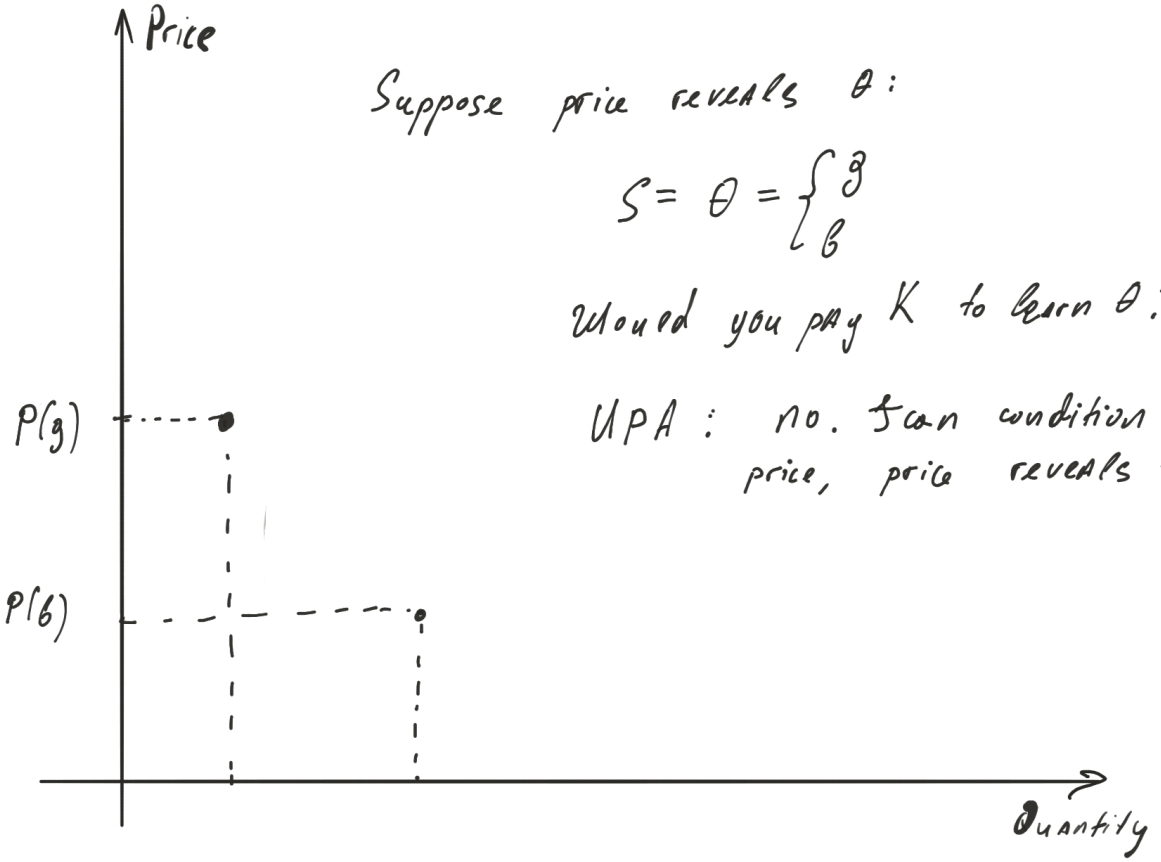

Price
P(s)
Quantity


Price
P(s)
P(s')
Quantity


Price
P(s)
P(s')
Quantity


Price
what I pay in UPA
p(s')
q(s')
Quantity


Price
what $ pay in DPA
// Depends on what $ bid
for p > p(s')!
p(s')
q(s')
Quantity

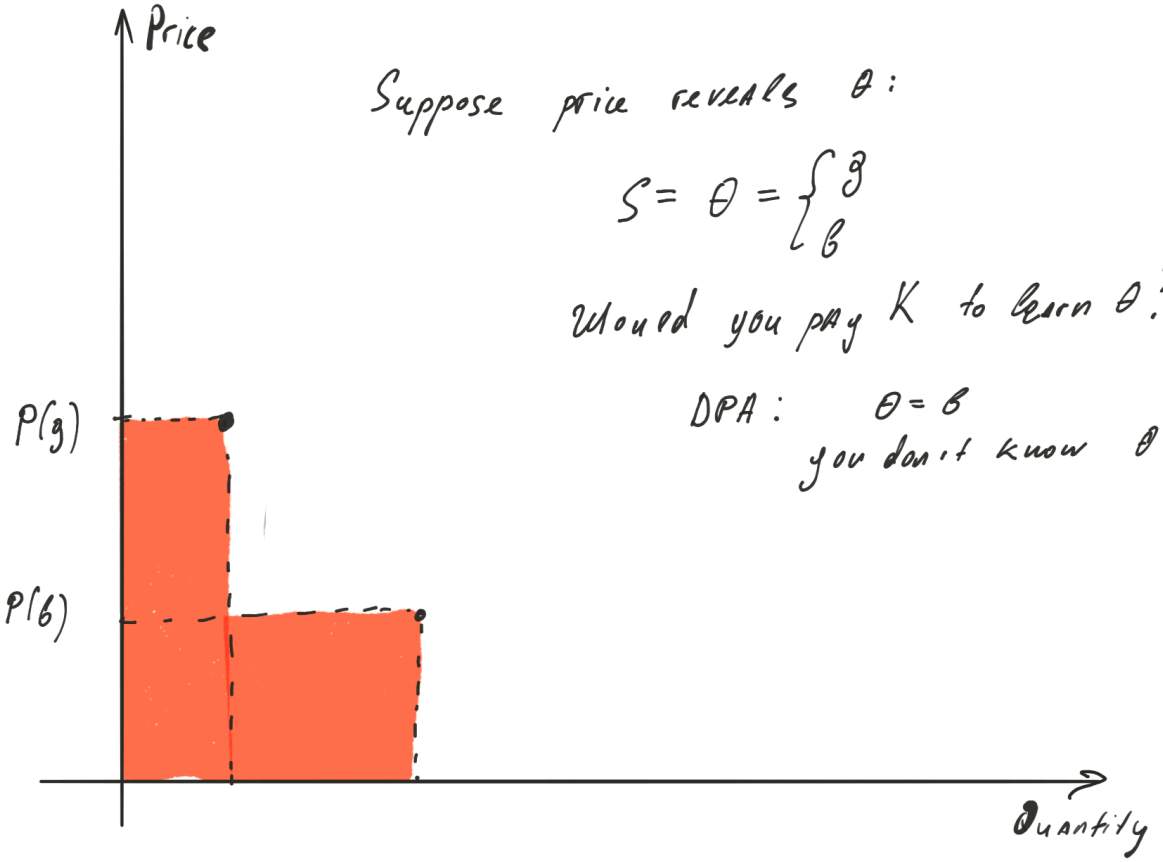


Suppose price reveals θ:

$$S = \theta = \begin{cases} g \\ b \end{cases}$$

Would you pay K to learn θ?

UPA: no. I can condition on price, price reveals θ.



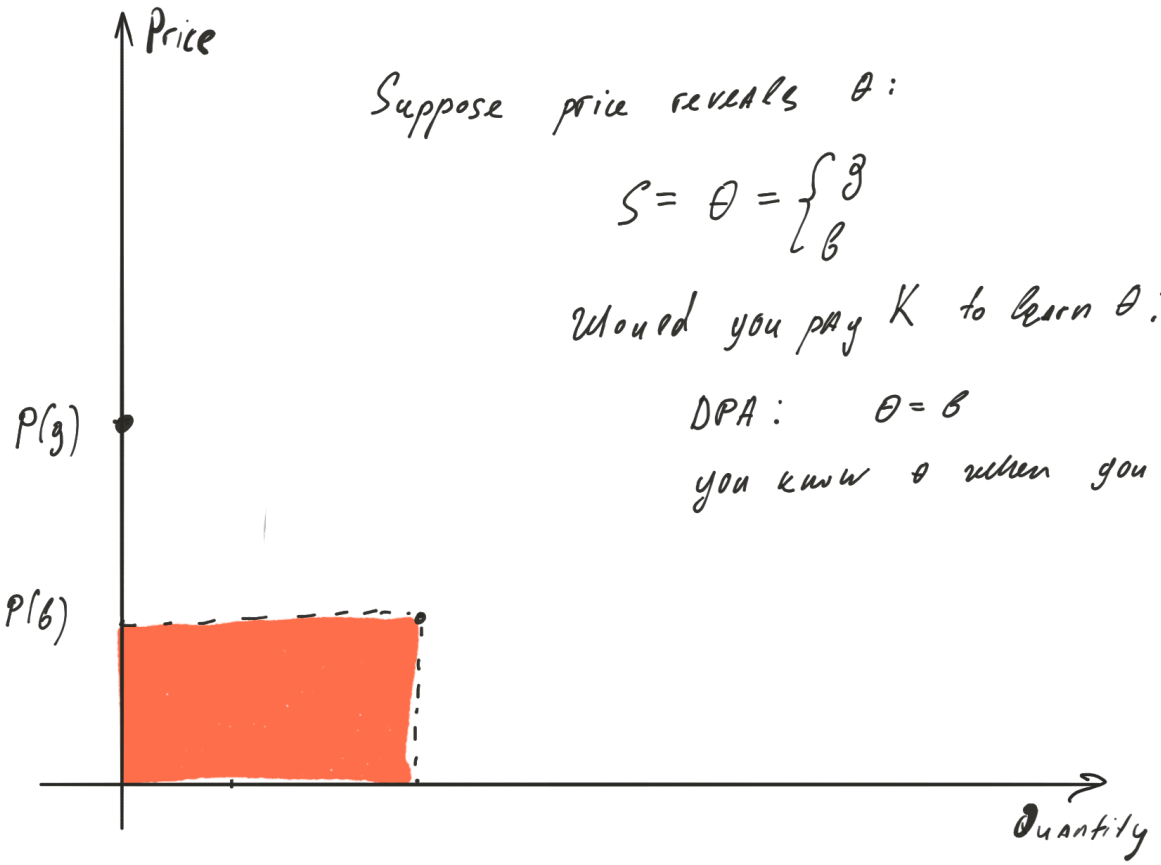
Suppose price reveals θ:

$$S = \theta = \begin{cases} g \\ b \end{cases}$$

Would you pay K to learn θ?

DPA: $\theta = b$

you don't know θ when you bid



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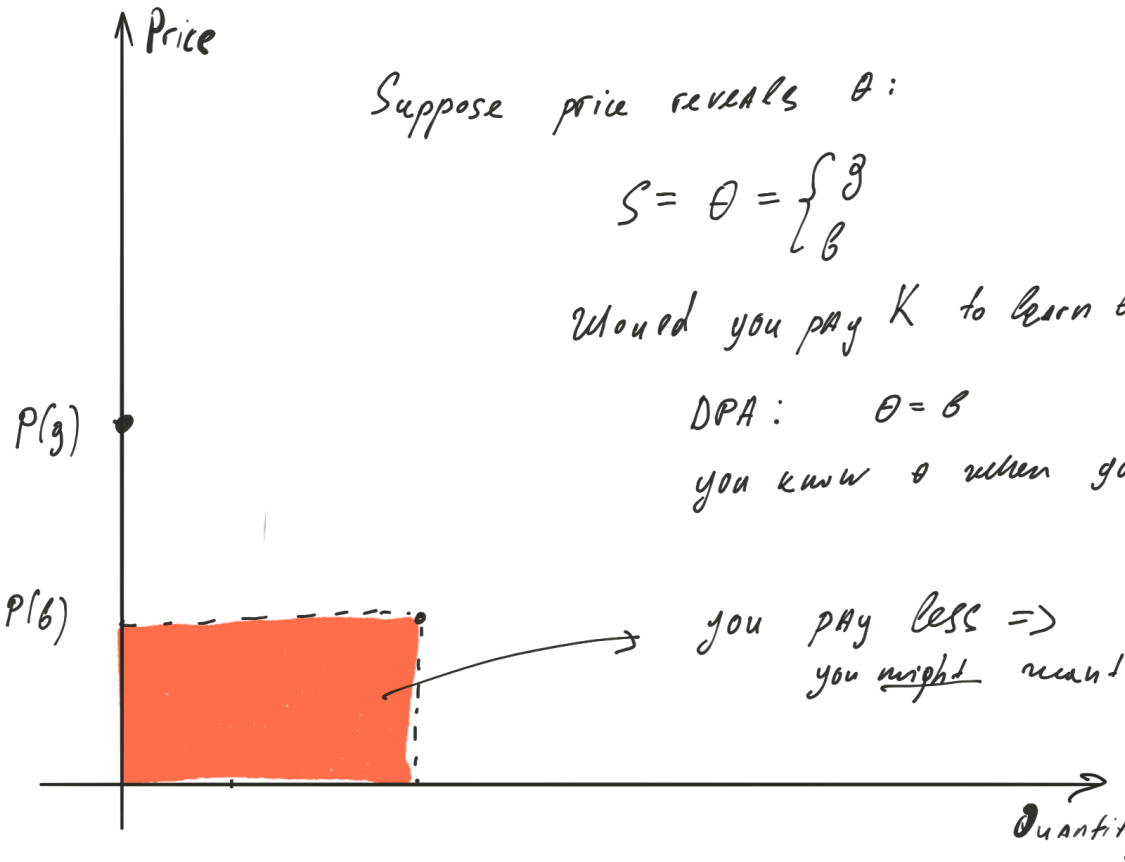

Suppose price reveals θ:

$$S = \theta = \begin{cases} g \\ b \end{cases}$$

Would you pay K to learn θ?

DPA: $\theta = b$

you know θ when you bid

you pay less =>
you <u>might</u> want to learn θ!

Comments

REE models assume UPA, even though stocks are traded in (price-discriminating) limit-order books

- It seems some of the insights from REE models are not robust to DPA vs UPA – interesting insight!
  - Info acquisition incentives are different

Minor comments

Clarify notation:
e.g., $\cdot$ vs $\times$ vs $*$

$$-U'\left(W-\mathbf{P}\times\vec{B}^{U}\right)\cdot\vec{P}\cdot\kappa^{U}+U'\left(W+[\mathbf{1}-\mathbf{P}]\times\vec{B}^{U}\right)\cdot\left[1-\vec{P}\right]*[1-\kappa^{U}]=0.$$

Conclusion

I enjoyed reading the paper!

- Potential for addressing more questions with the same machinery
    - DPA with asy info is particularly interesting
- Clarify modeling choices
- Compare your results to benchmarks

GOOD LUCK!