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

by Harold L. Cole, Guillermo Ordonez and Daniel Neuhann

Discussed by
Sergei Glebkin,
INSEAD

FIRS 2018

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?

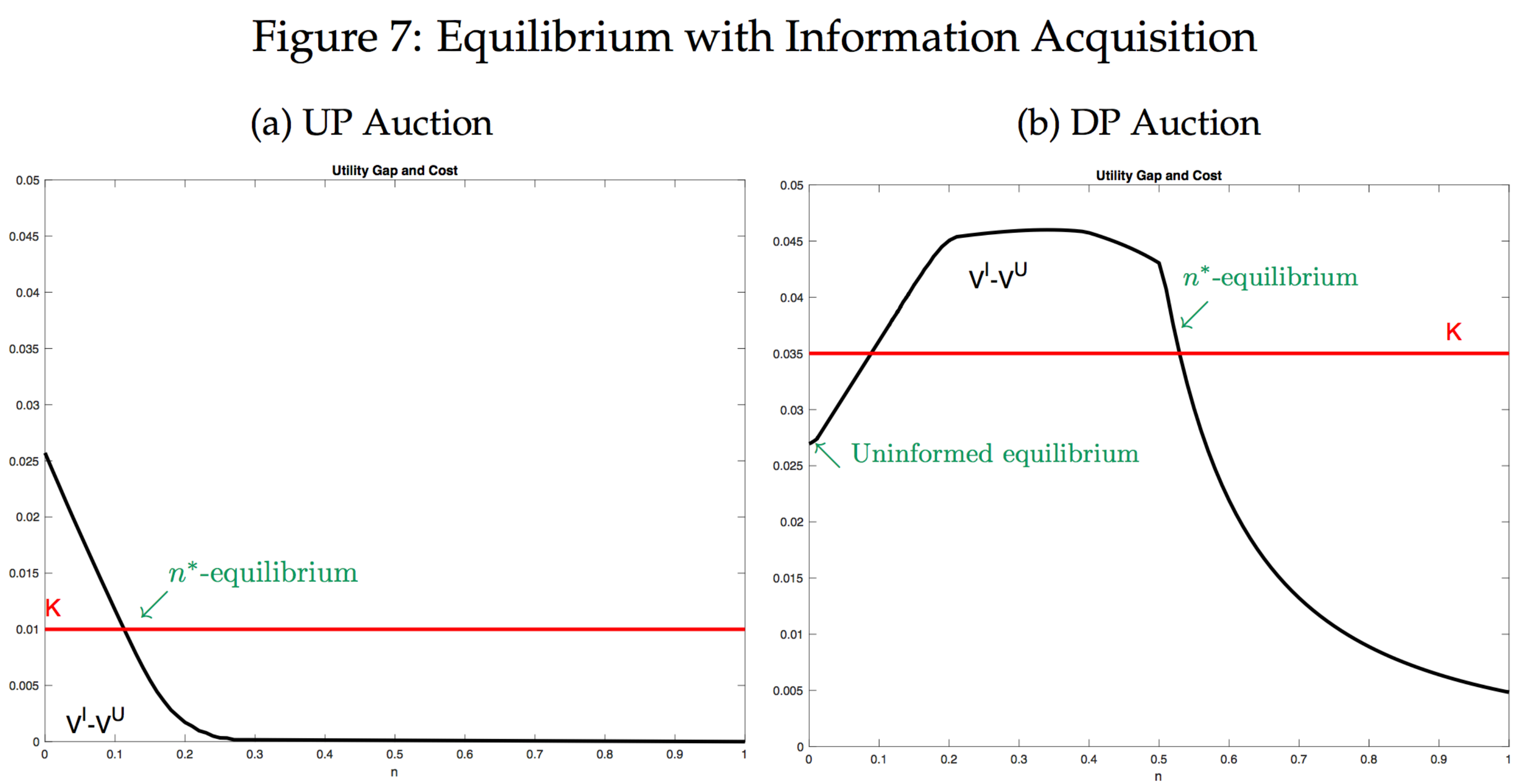
- Authors' response: assumptions are well justified:

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

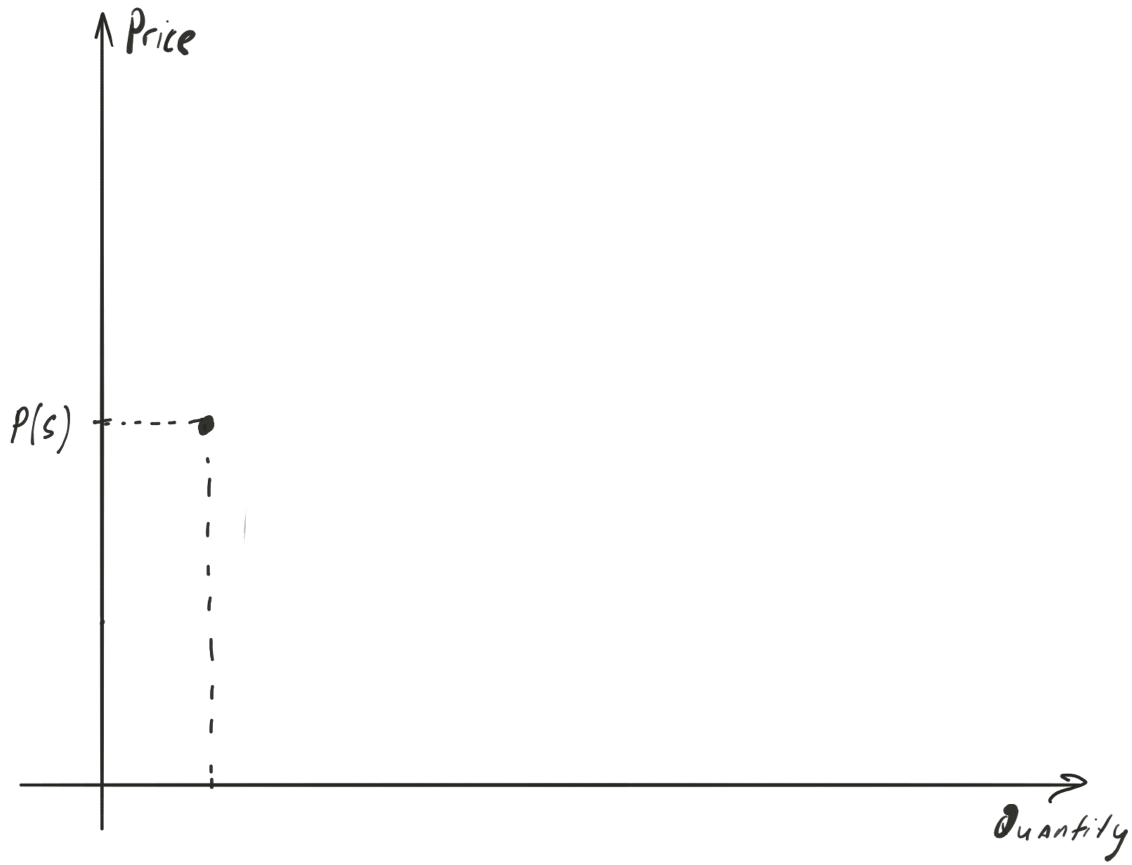
Insights can be applied to other markets!

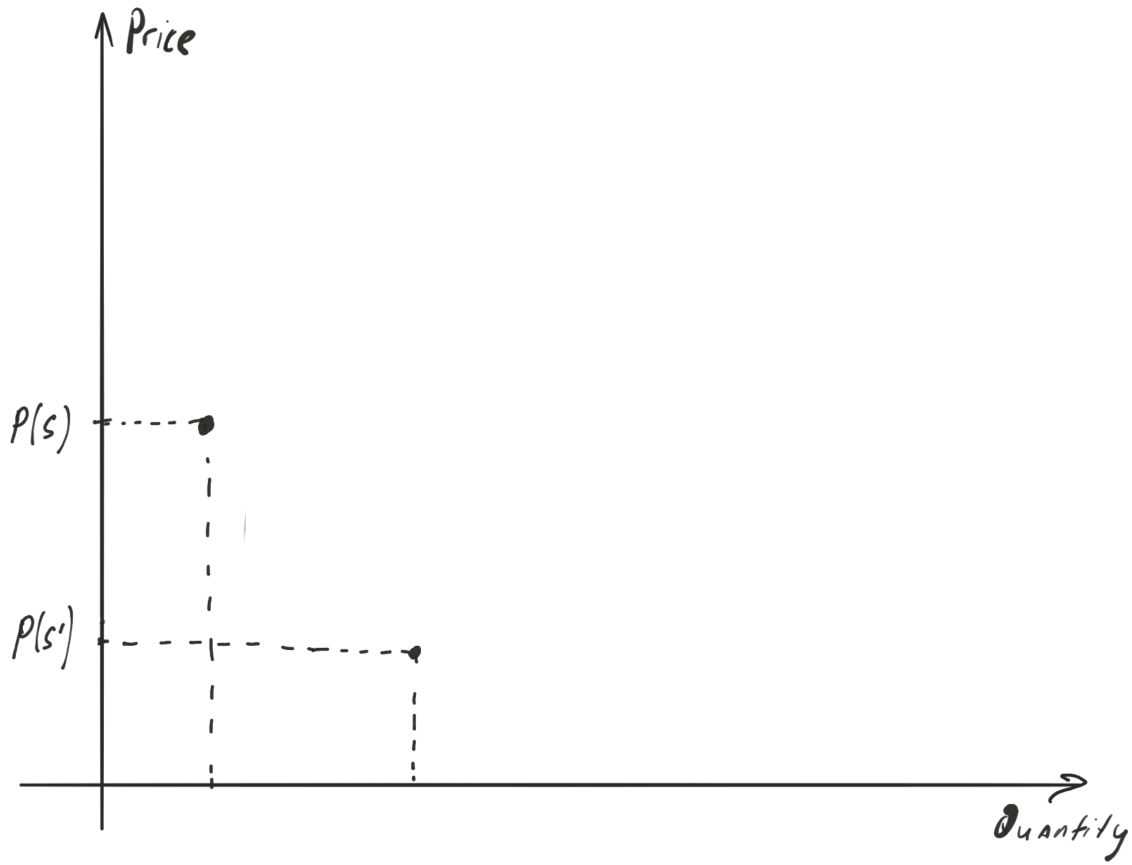
- E.g., competitive REE models consider stocks as being divisible, of uncertain quality and assume traders have no market power
- REE models assume UPA, even though stocks are traded in (price-discriminating) limit-order books
- Are insights under DPA and UPA similar?

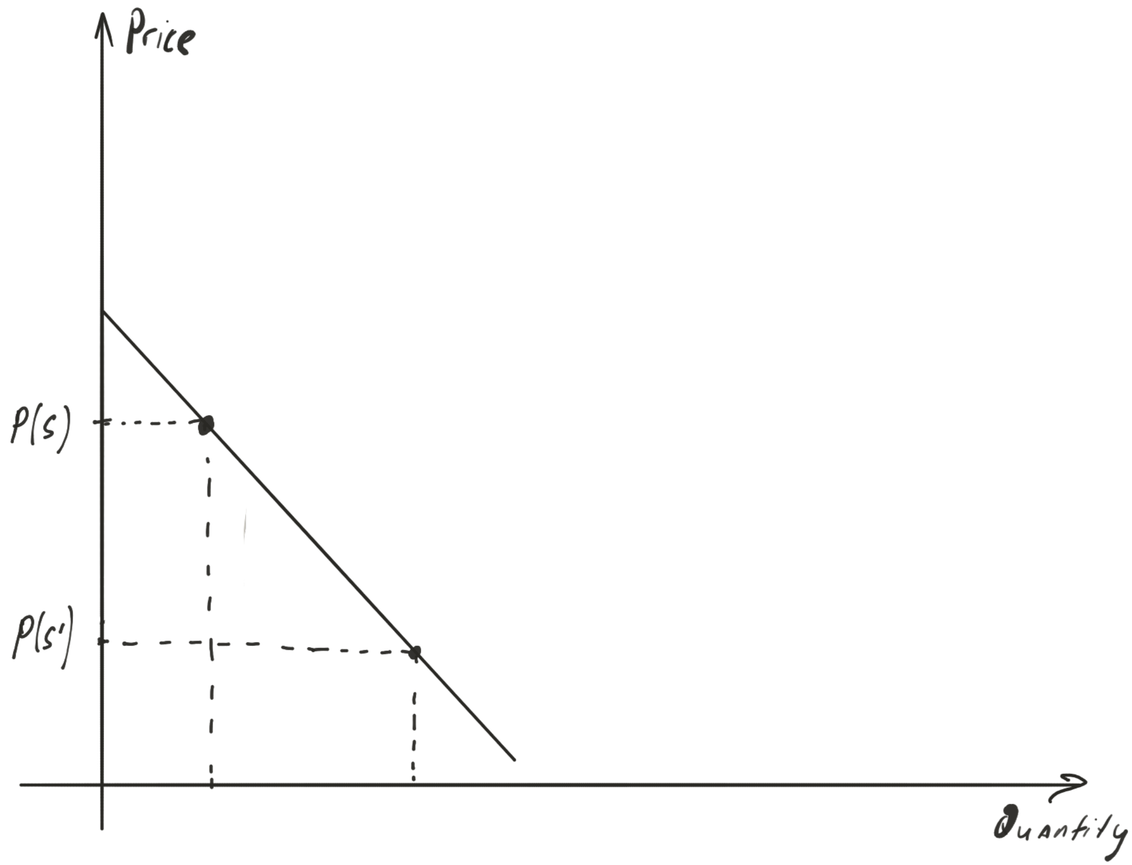
Info acquisition: DPA vs UPA

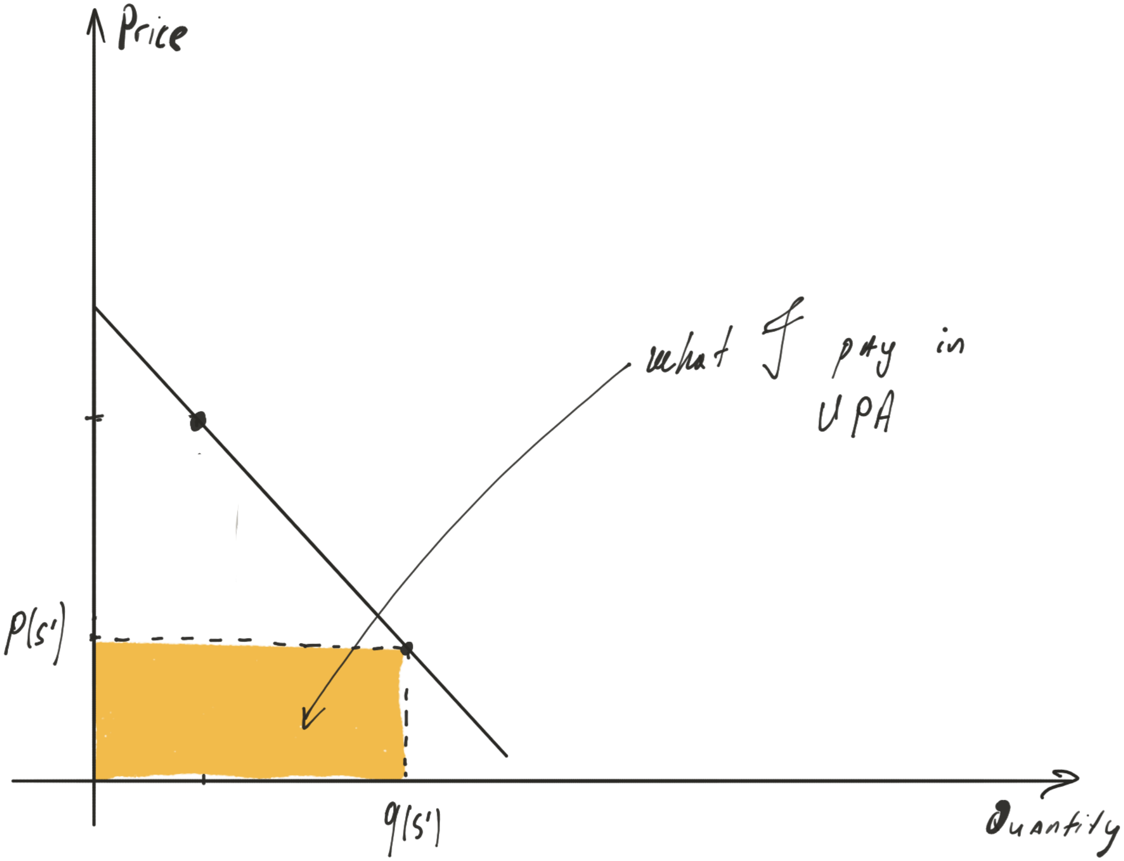


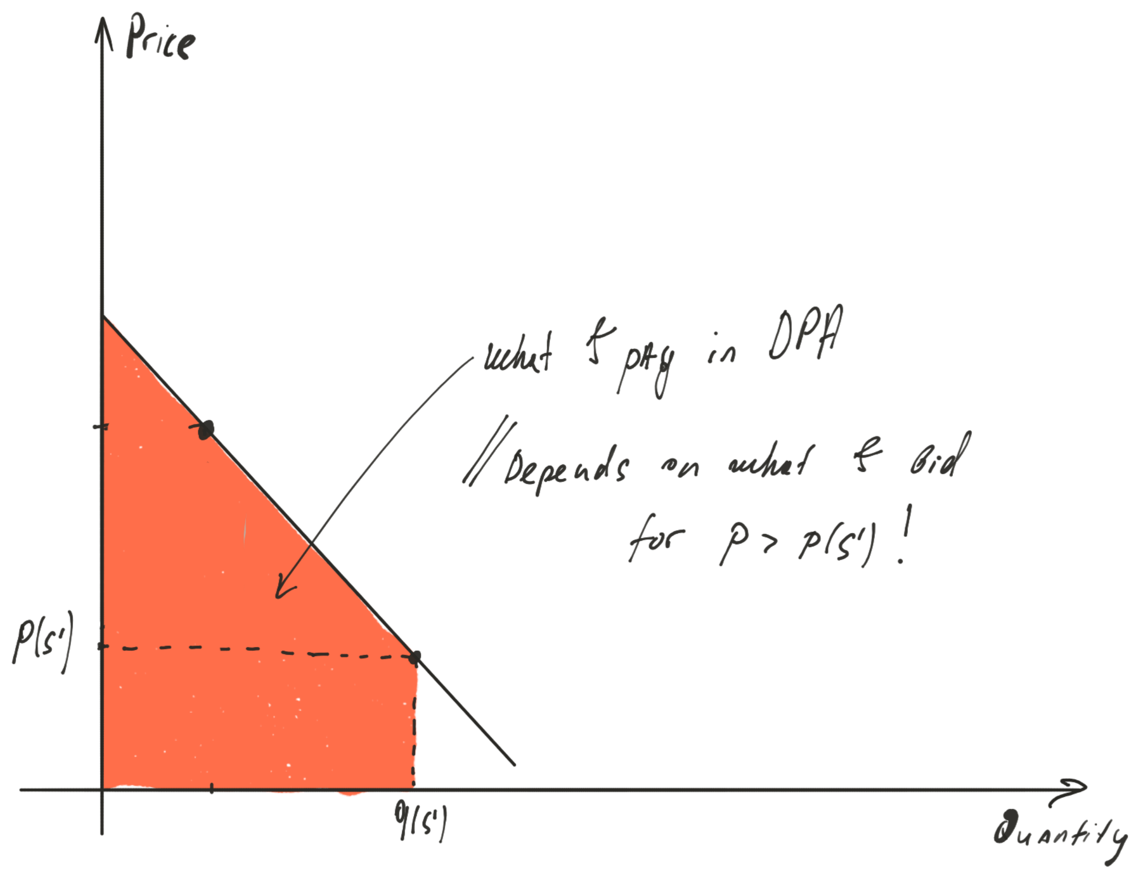
Complementarities in info acquisition with DPA but not UPA! Why?


Price
P(s)
Quantity

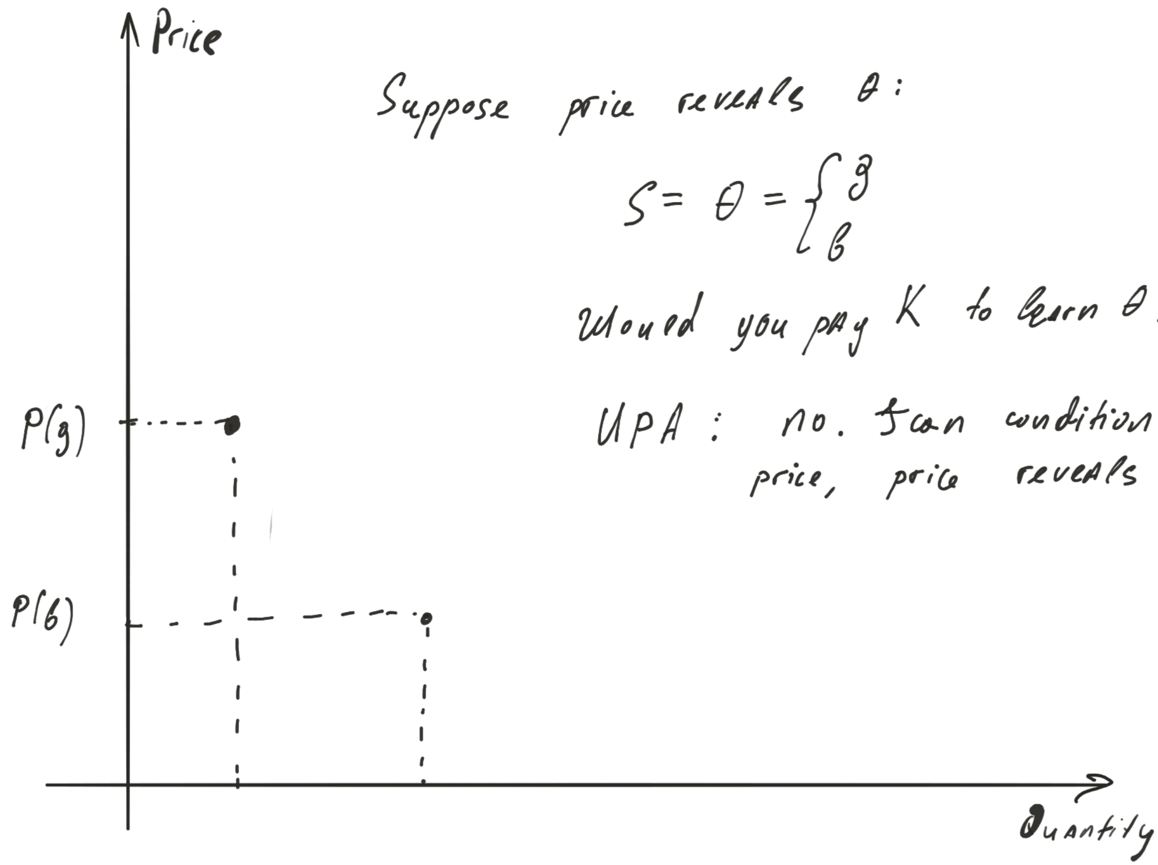

Price
P(s)
P(s')
Quantity


Price
P(s)
P(s')
Quantity


Price
what $ 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

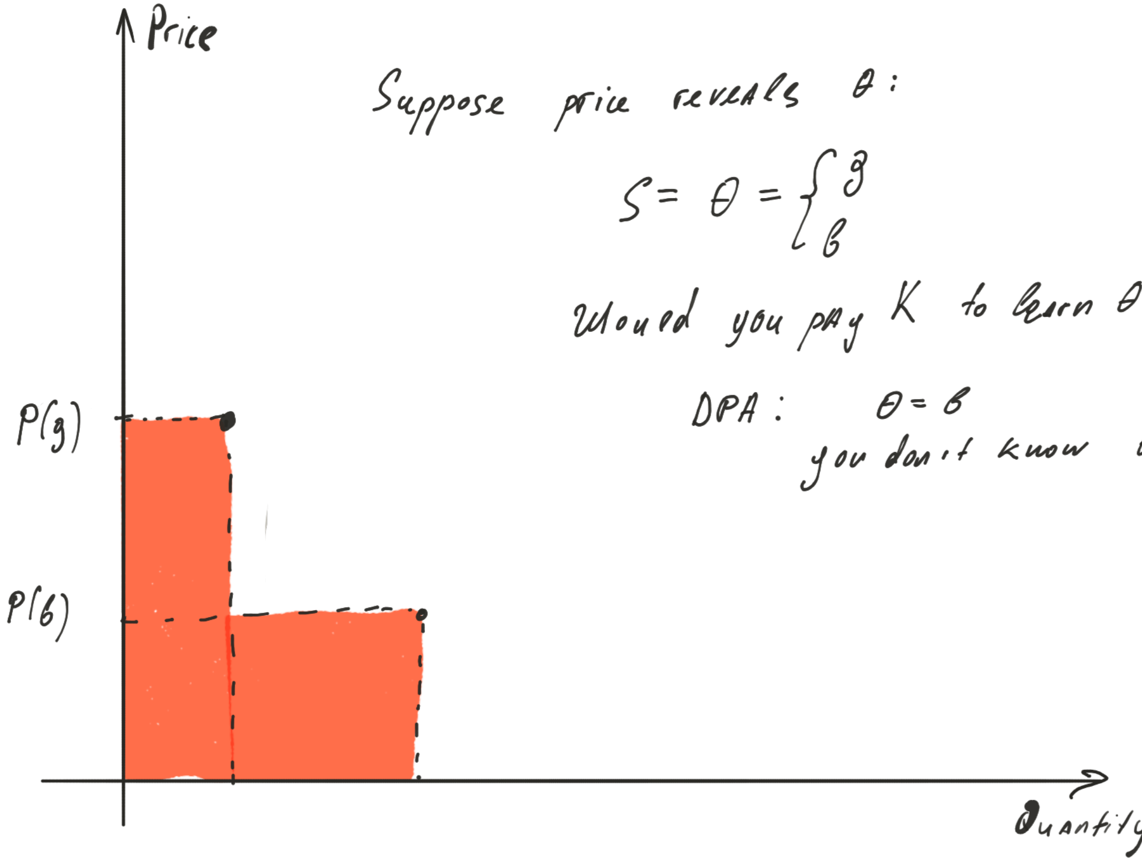


Suppose price reveals θ:

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

Would you pay K to learn θ?

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



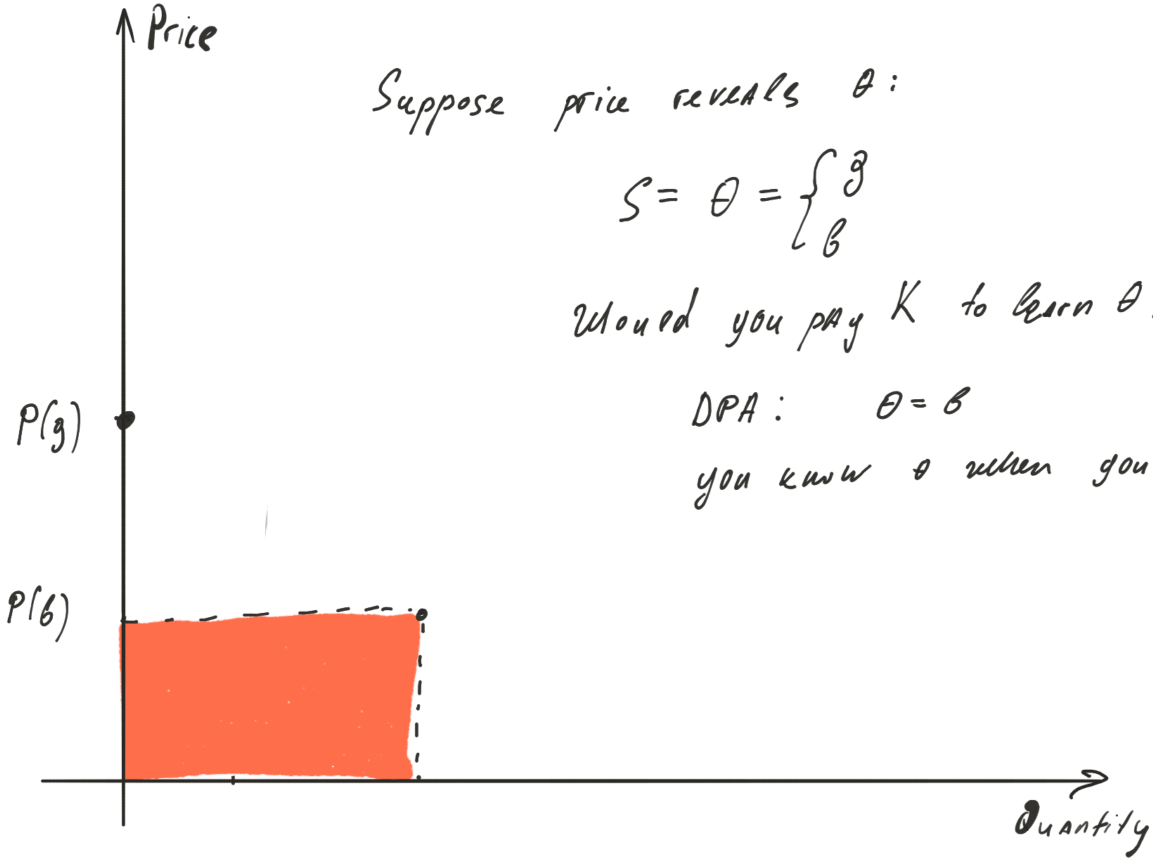
Suppose price reveals θ:

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

Would you pay K to learn θ?

DPA: $\theta = b$

you don't know θ when you bid



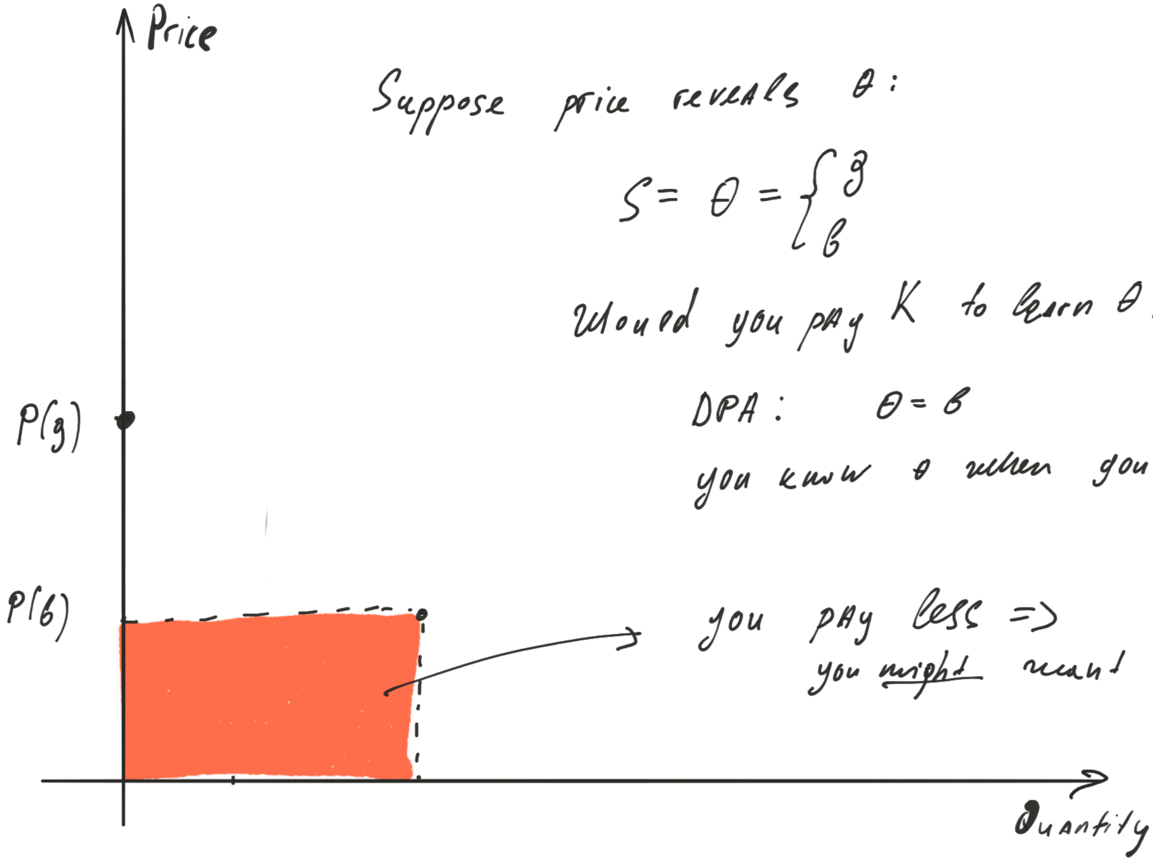
Suppose price reveals θ:

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

Would you pay K to learn θ?

DPA: $\theta = b$

you know θ when you bid



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 $\Rightarrow$
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!