

Discussion of Benchmarks in Search Markets

by Darrell Duffie, Piotr Dworczak, and Haoxiang Zhu

Ali Shourideh
Wharton

Philadelphia Fed Search and Matching Conference
September 2015

Introduction

- Benchmarks are commonly used in frictional markets:
 - LIBOR, Kelly Blue Book, West Texas Intermediate, ...

Introduction

- Benchmarks are commonly used in frictional markets:
 - LIBOR, Kelly Blue Book, West Texas Intermediate, ...
- Key Idea of the paper: benchmarks reduce monopoly power/hold-up problem in search markets

Introduction

- Benchmarks are commonly used in frictional markets:
 - LIBOR, Kelly Blue Book, West Texas Intermediate, ...
- Key Idea of the paper: benchmarks reduce monopoly power/hold-up problem in search markets
- My discussion:
 - Simpler model to understand and disentangle the effects
 - Some more thoughts on the model

Simple Model

- Difference: order-dependent search costs
- 2 sellers: sell at cost c ; $c \sim F(c)$, $Supp(F) = [c_1, c_2]$
- continuum of buyers of two types:
 - fraction μ are fast buyers:
 - cost of search for a seller is 0
 - fraction $1 - \mu$ are slow buyers:
 - cost of obtaining first offer: 0
 - cost of obtaining the second offer: ∞
 - Buyers' valuation is v ; $c_1 < v < c_2$

Benchmark Policy

- With Benchmark:

- Trade occurs if and only if $v > c$
- When $v > c$, equilibrium distribution of prices, $G(p)$:

$$[1 - \mu + \mu G(p)](p - c) = (1 - \mu)(v - c)$$

- When $v < c$, equilibrium distribution of prices with support a subset of (v, ∞)

- Without Benchmarks:

- identical equilibrium outcome

- Benchmark has no effect

Entry cost

- Change: the first offer for the slower traders has cost ϕ
- With benchmark:

$$[1 - \mu + \mu G(p; c)](p - c) = (1 - \mu)(v - c)$$
$$v - \int pdG(p; c) > \phi \Leftrightarrow \text{Search}$$

- Without benchmark:

$$[1 - \mu + \mu G(p; c)](p - c) = (1 - \mu)(v - c)$$
$$\int^v \left(v - \int pdG(p; c) \right) dF(c) > \phi \Leftrightarrow \text{Search}$$

Entry Cost

- For intermediate values of ϕ , entry occurs under benchmark and not without benchmark
 - Burdett-Judd/Varian can be replaced with bargaining, etc.
- Benchmarks improve welfare
- “Inefficiency”: due to entry cost + hold up problem

Efficiency

- Planner's problem, i.e., 'First Best':
 - Without full information

$$\int^v (v - c) dF(c) > \phi \Leftrightarrow \text{Search}$$

- With full information

$$v - c > \phi \Leftrightarrow \text{Search}$$

- Planner likes benchmarks as well
- Are we comparing apples and oranges?

Search Cost

- Change:
 - cost of first offer for slow traders: 0
 - cost of a second offer for slow traders: κ
 - cost of third offer: ∞

Search Cost

- Change:
 - cost of first offer for slow traders: 0
 - cost of a second offer for slow traders: κ
 - cost of third offer: ∞
- With Benchmark:

$$[1 - \mu + \mu G(p; c)] (p - c) = (1 - \mu)(r - c)$$

r : given by

$$v - r = v - \kappa - \int p dG(p; c)$$

for κ small enough

- dealers cannot extract all the surplus from slow traders

Search Cost

- Without Benchmark:
 - slow trader can learn about true c by searching
 - reservation value = v if κ is not small enough
 - even without that there will be some extra costs to learning through searching

- Benchmarks allocate surplus to traders

- In the presence of entry cost + search cost, additional efficiency gains from benchmarks

Further Thoughts

- Benchmarks have no effect without entry cost
- Trade is happening efficiently conditional on entry
- The only margin that can be distorted is entry by traders
- This hides the novel channel for the effect of benchmarks: benchmarks affect the search decision

Further Thoughts

- Two ways around this:
 - Entry by dealers:
 - Matching is not so obvious any more
 - Creates a cost for benchmarks: trade-off
 - Symmetry

Further Thoughts

- Two ways around this:
 - Entry by dealers:
 - Matching is not so obvious any more
 - Creates a cost for benchmarks: trade-off
 - Symmetry
 - Endogenous size of trade without entry cost
 - only the search channel is present and it affects the surplus
 - Static Model: does not have the complications in DGP

Further Thoughts

- Benchmark: one statistic for distribution of prices
- Show them everything: put the market on an exchange (e.g., continuous limit order book)
- Presumably there is some fundamental reasoning for why the market is OTC
 - This is not in the model - need a better understanding of this

Conclusion

- Identifying potential benefits of benchmarks
- Novel effect of benchmarks: they prevent costly search for learning