

Fishery Buybacks: Efficiency and Participation

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Presentation Outline

- Fishery Context
- Lessons From Previous Buyback
- A Novel Buyback Design
- Theoretical Underpinnings
- Simulation Results
- Recommendations

Blue Crab Fishery

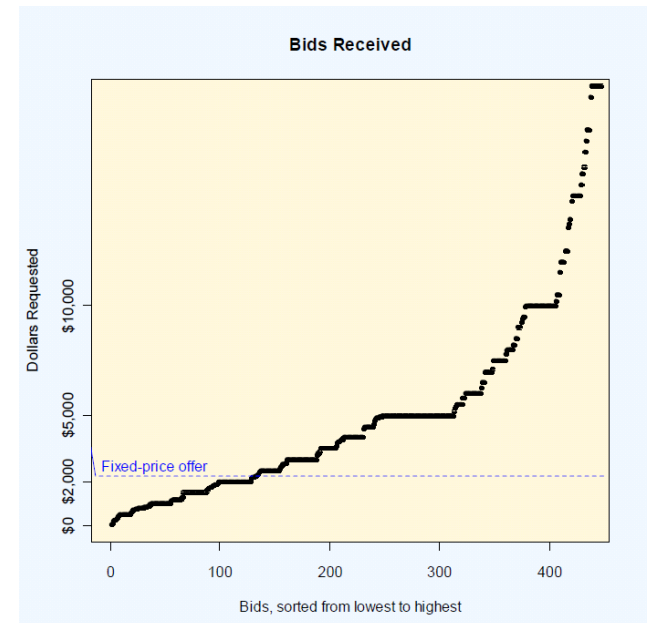
- Most valuable fishery in Chesapeake Bay
 - \$84 million in 2012
- Input control managed (not quota)
 - License cap
 - Gear restrictions
 - Seasonal closures/areas
 - Size limits
- Significant latent effort
 - In 2009, 1/3 of 6,000 licenses utilized

Buybacks

- Fishery disaster declaration in 2008
 - \$30 million allocated to Maryland and Virginia
 - Portion of funds used for buybacks to retire latent effort
- 2009 - Limited Crab Catcher (LCC) license buyback
 - LCC license authorizes fishing of up to 50 crab pots per day and use of unlimited trotline.
- 2011 - Unlimited Tidal Fish (TFL) license buyback
 - TFL allows fishing of up to 300 crab pots (or up to 900 if combined with other authorizations) and use of unlimited trotline. Also authorizes catch of finfish, clams and oysters.

2009 LCC Buyback

- Initially a reverse auction
 - Low participation (14% out of 3,676 licenses)
 - Higher bids than anticipated
- Cancelled and converted to a fixed price offer (\$2,260 per license)
 - 39% increase in participation
 - 19% increase for active fishermen
 - 54% increase for latent fishermen
 - 133 bids below fixed price
 - 683 accepted fixed price

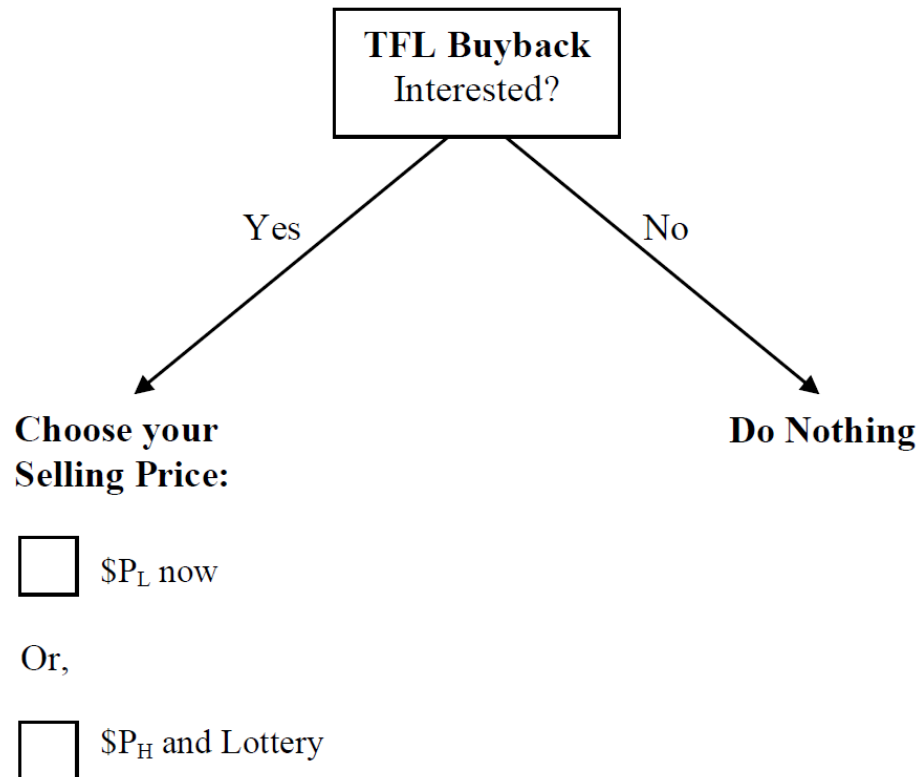


Lessons Learned

- Large heterogeneity in expected profits from auction
- Value uncertainty played significant role in bids and participation rates (DePiper 2012)
- Latent fishermen more impacted by value uncertainty than active fishermen
- Costs of participation can be affected by the buyback mechanism.

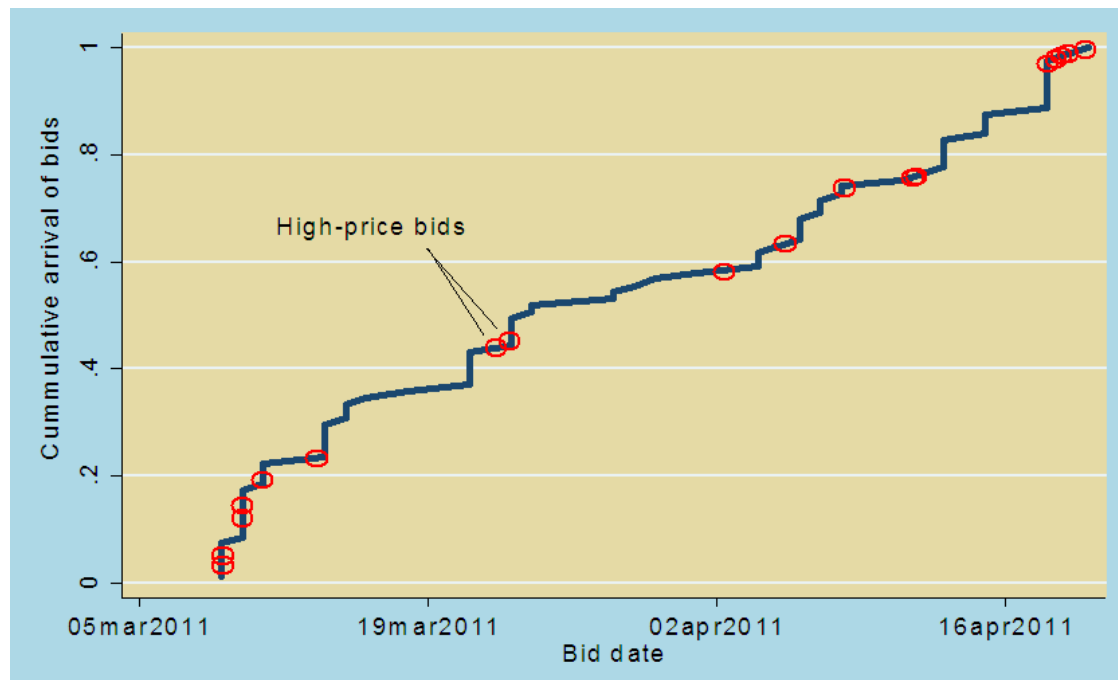
TFL License Buyback: “Sell it Now”

- Why? Increase participation keeping costs low
- What? A pair of fixed prices and a lottery:



TFL Results

- 98 licenses bought
 - 80% at P_L
 - No lottery required (budget not exhausted)



Compare Three Buyback Mechanisms

- Add participation cost:

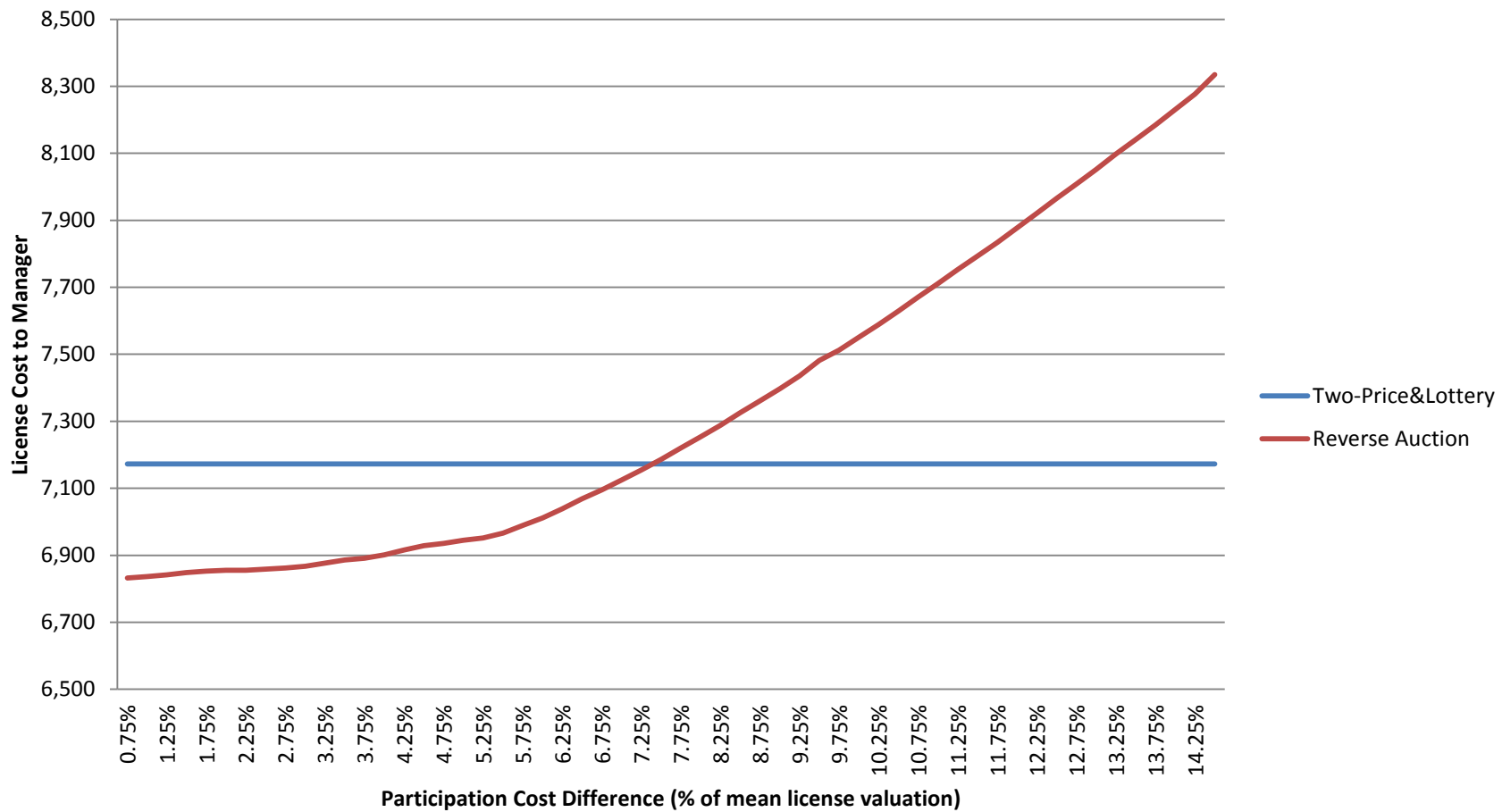
$$C_{\text{fixed}} < C_{\text{two-price}} < C_{\text{auction}}$$

- Derive optimal bid strategies
- Run simulations

Key Simulation Parameters

Number of simulations (m):	10,000
Number of license holders (n):	100
Budget (B):	130000
Target number of items to buy (q):	20
Posted price (p):	7,000
Lower posted price (pl):	6,000
Higher posted price (ph):	8,000
State reservation value (r):	8,000
Cost of participation (coo): posted price & two-price lottery schemes	50
Cost of participation (co): reverse auction	50 – 1,500

Reverse Auction vs. Two-Price With Lottery



Summary & Conclusions

- Higher participation costs, lowered participation in the reverse auction. This had the added effect of making the market less competitive and increasing bid shading.
- Participation is a key element of efficient market design.
- Theoretically efficient designs (e.g., reverse auction) may not perform as well as less efficient designs if there is a significant difference in participation costs.
- Therefore, simple buyback designs with low participation costs may be warranted, particularly in fisheries with significant latent effort or other factors that may make obtaining information costly.