



# Collusion in Cloud Computing Auctions

Shunit Agmon, Orna Agmon Ben-Yehuda, Assaf Schuster

Computer Science Department

Technion—Israel Institute of Technology  
{shunita, ladypine, assaf}@cs.technion.ac.il



## The Problem

Cloud providers are moving towards auctions to allocate resources.

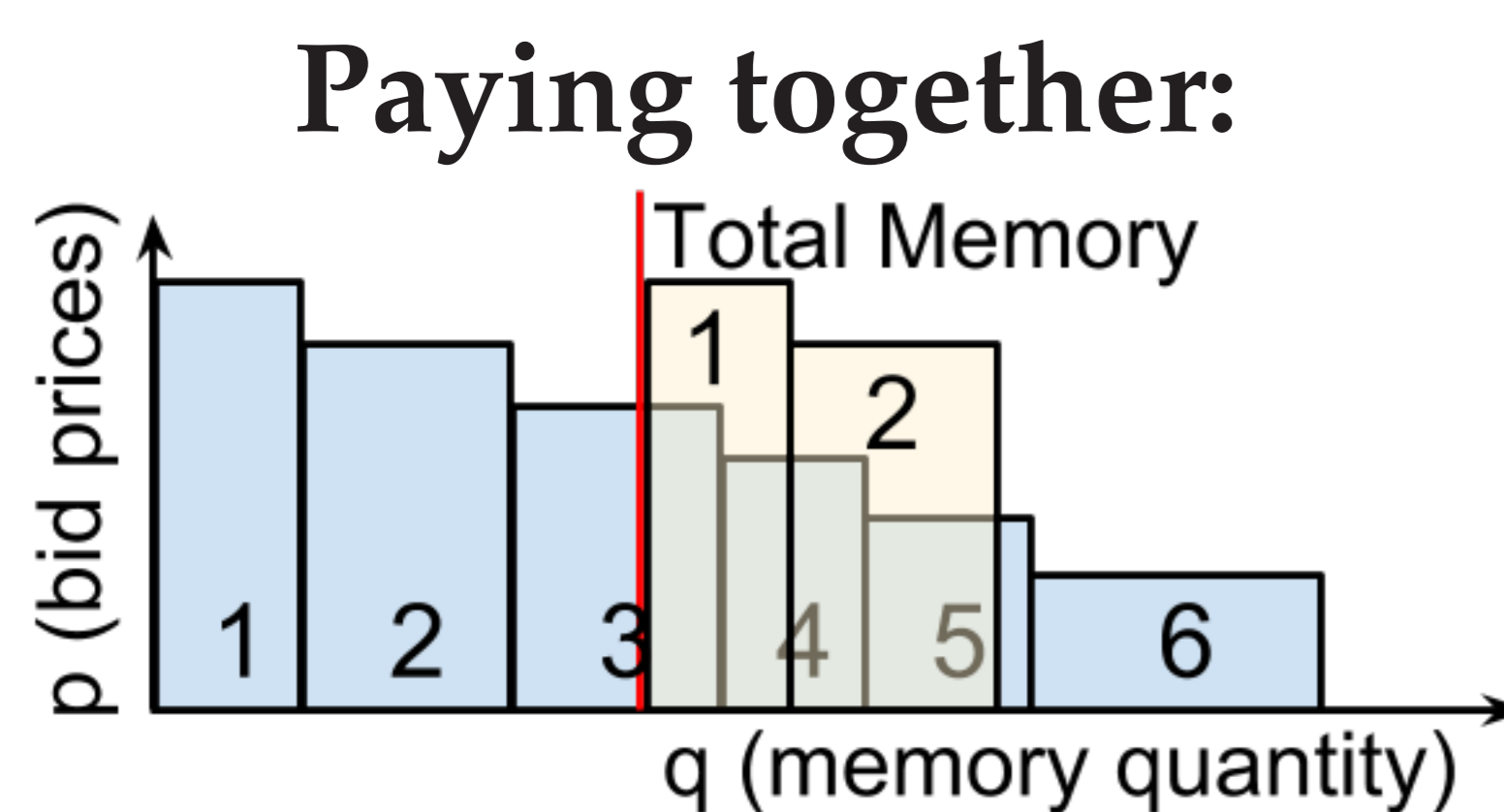
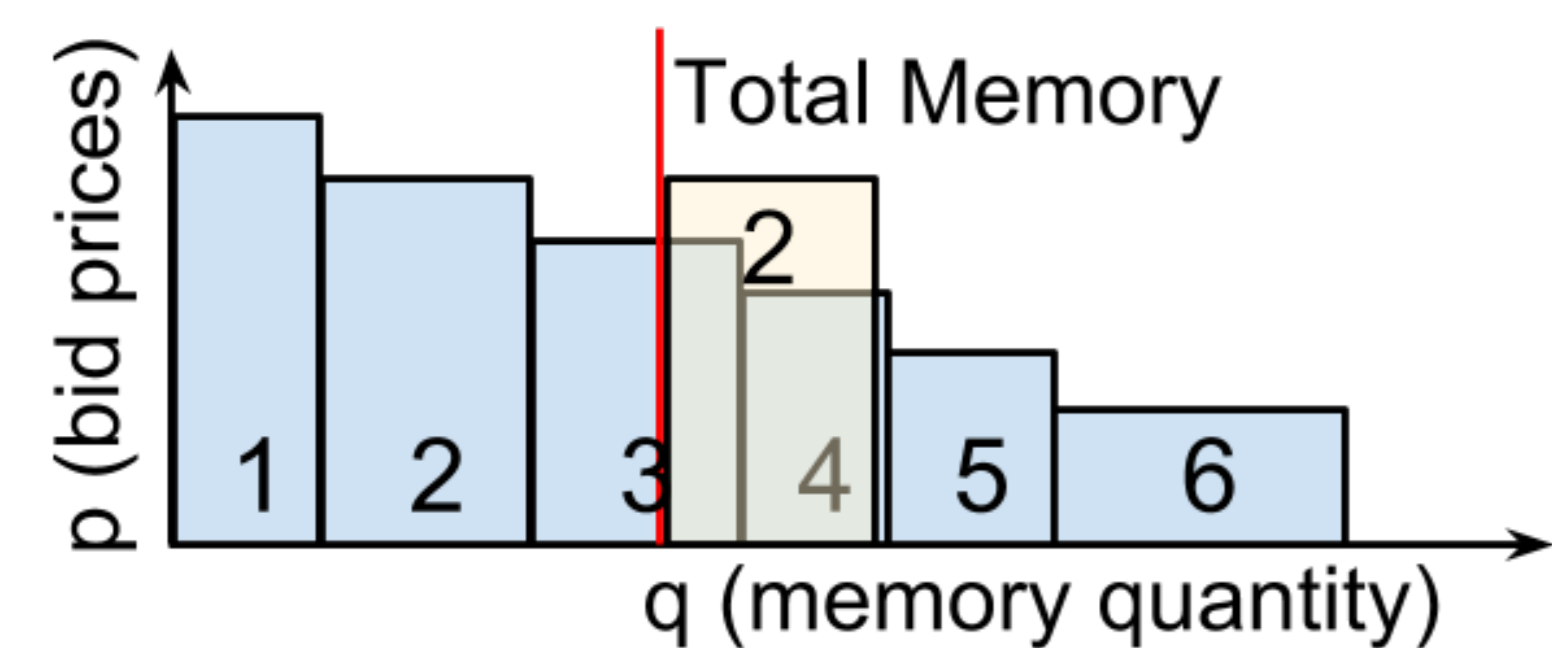
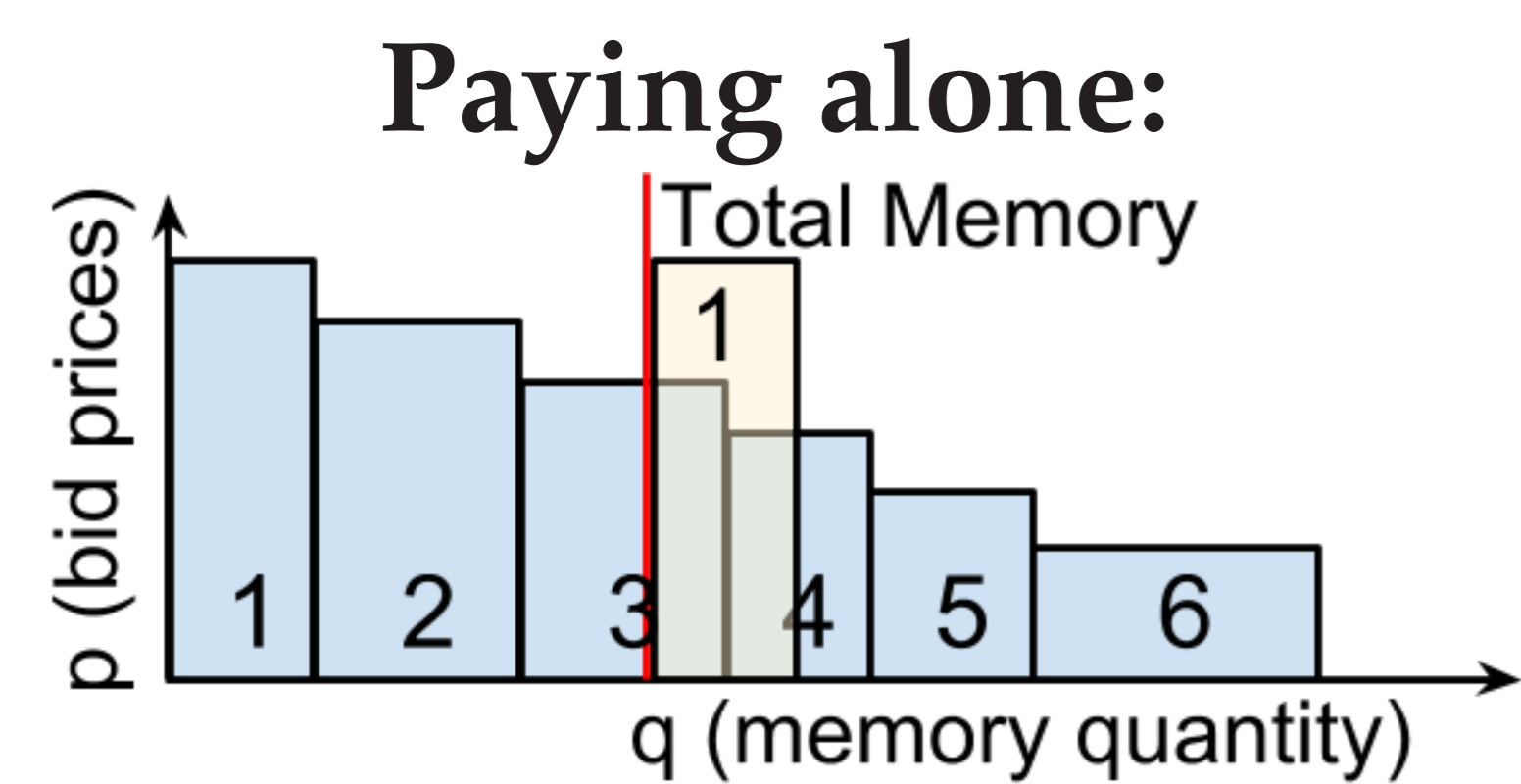
VCG auctions maximize Social Welfare and allocation efficiency but are prone to collusion by guests willing to sacrifice SW to increase their profits.

## The Solution

If the host supports guest collaborations, efficiency is maintained and guests have less incentive to collude.

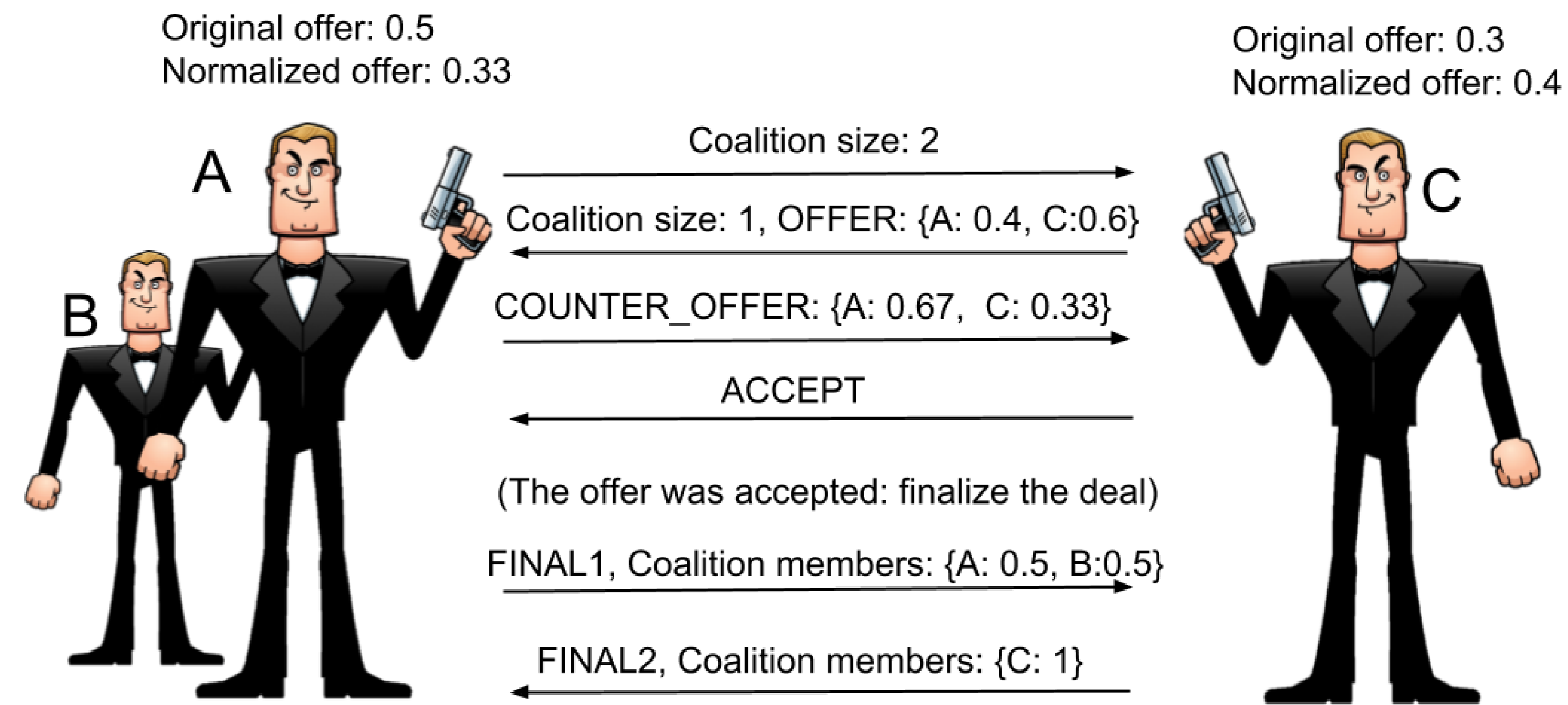
## The VCG-like Auction

Guests ask the host to be billed as one, which reduces their total bill.



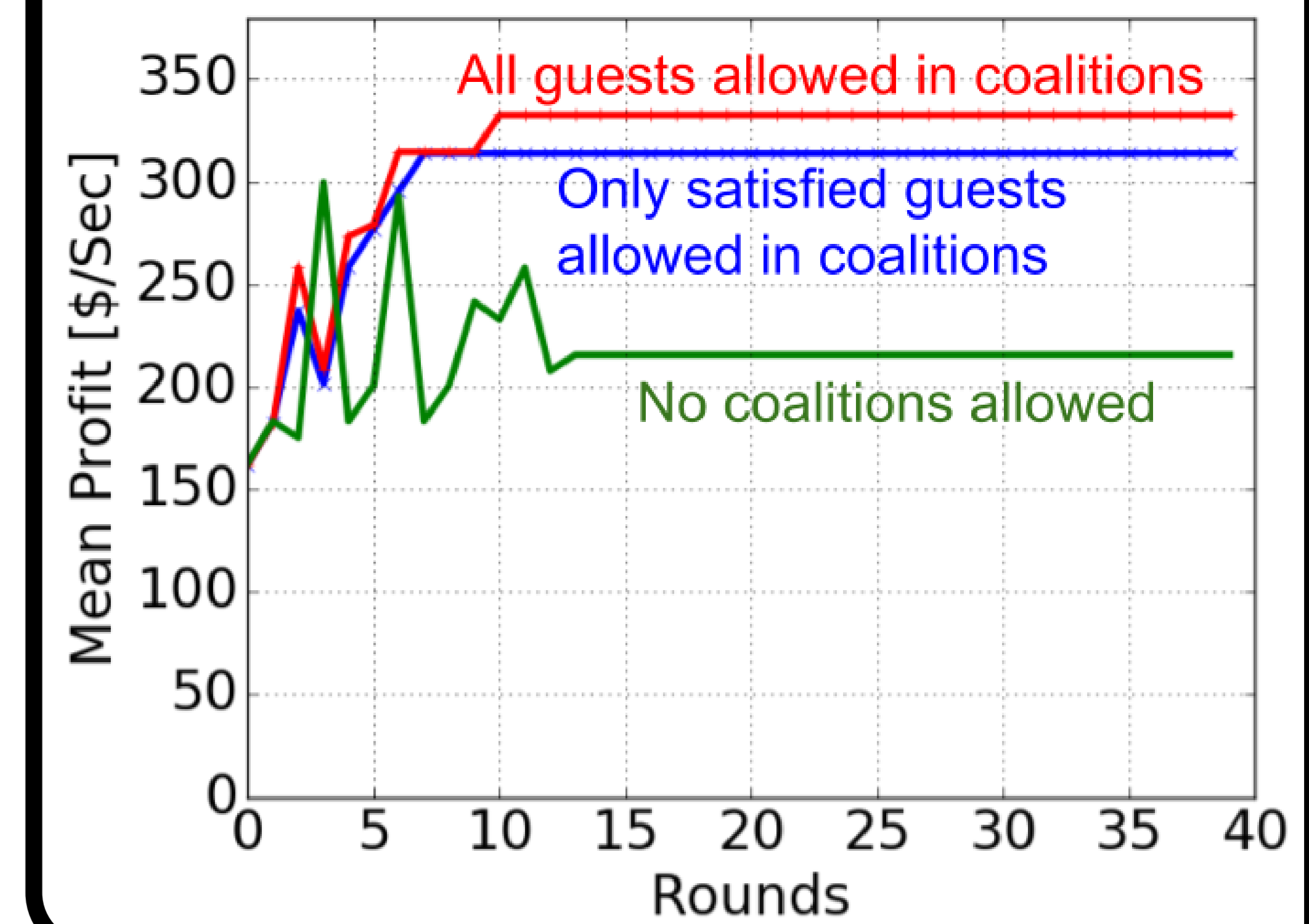
## The Negotiation Protocol

Economic agents decide how to split profits and inform the host.

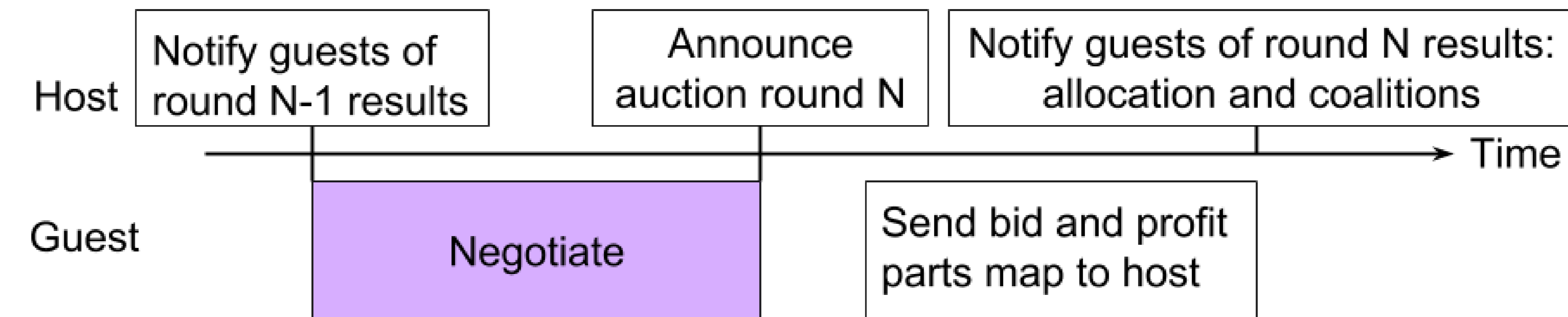


## Results

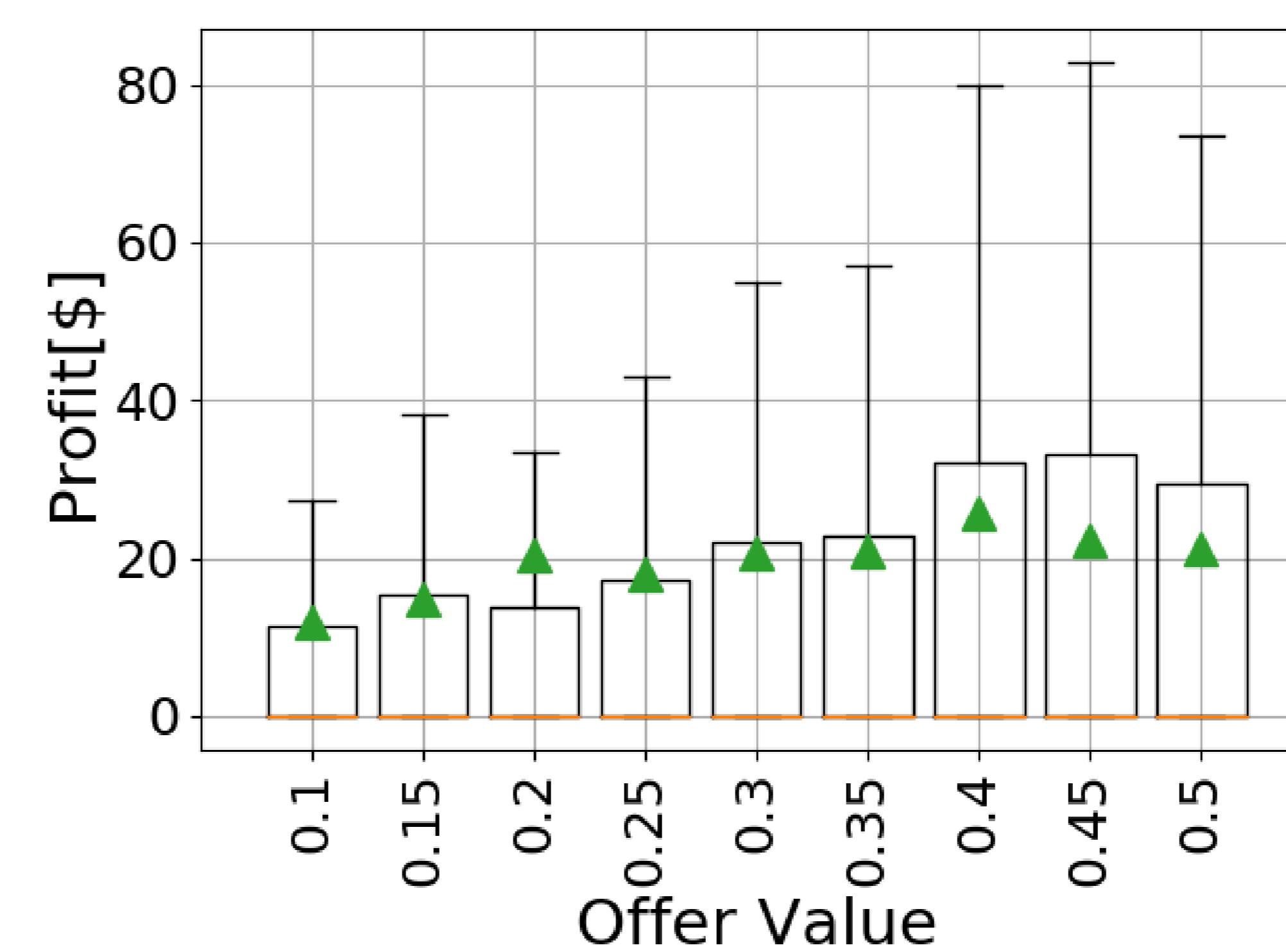
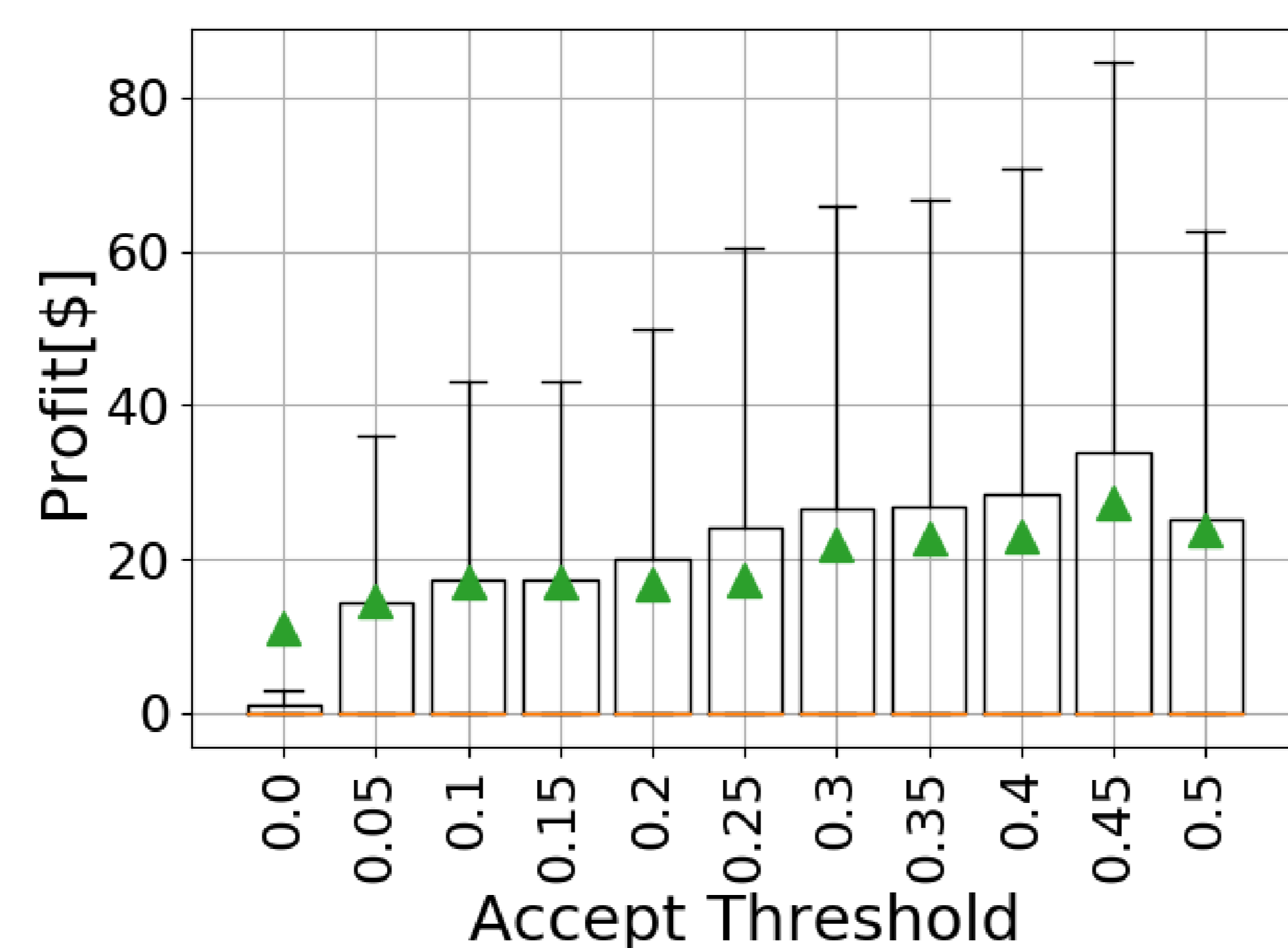
- Social Welfare is maintained.
- Profits are higher.



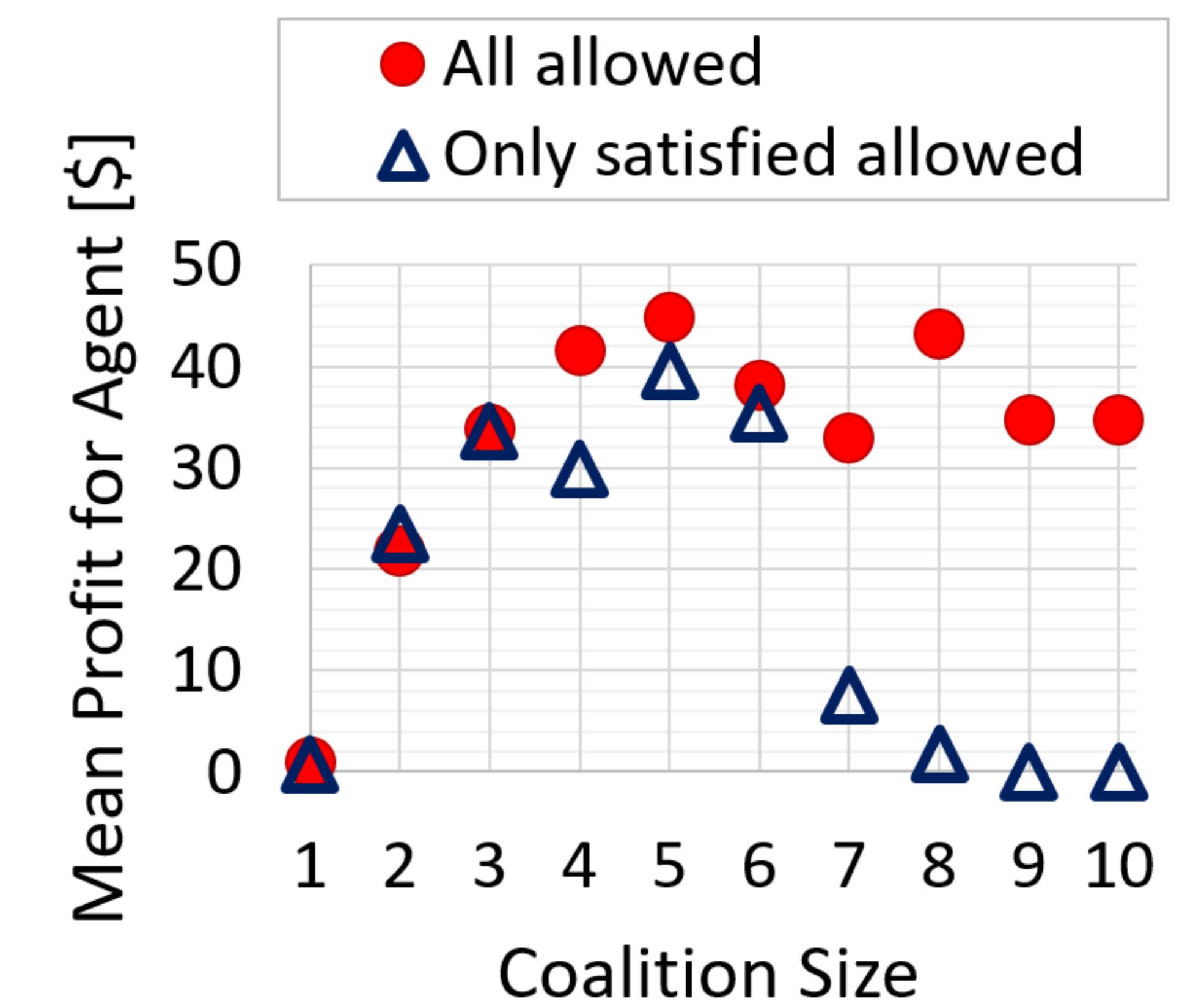
## Auction Timeline



## Guest Strategy



## Optimal Coalition Size



## Related Work

Agmon Ben-Yehuda, Posener, Ben-Yehuda, Schuster, Mu'alem  
**Ginseng: Market-Driven Memory Allocation, Virtual Execution Environments [VEE] '14**