Applicant Auctions for Top-Level Domains

Using auctions to efficiently resolve conflicts among applicants

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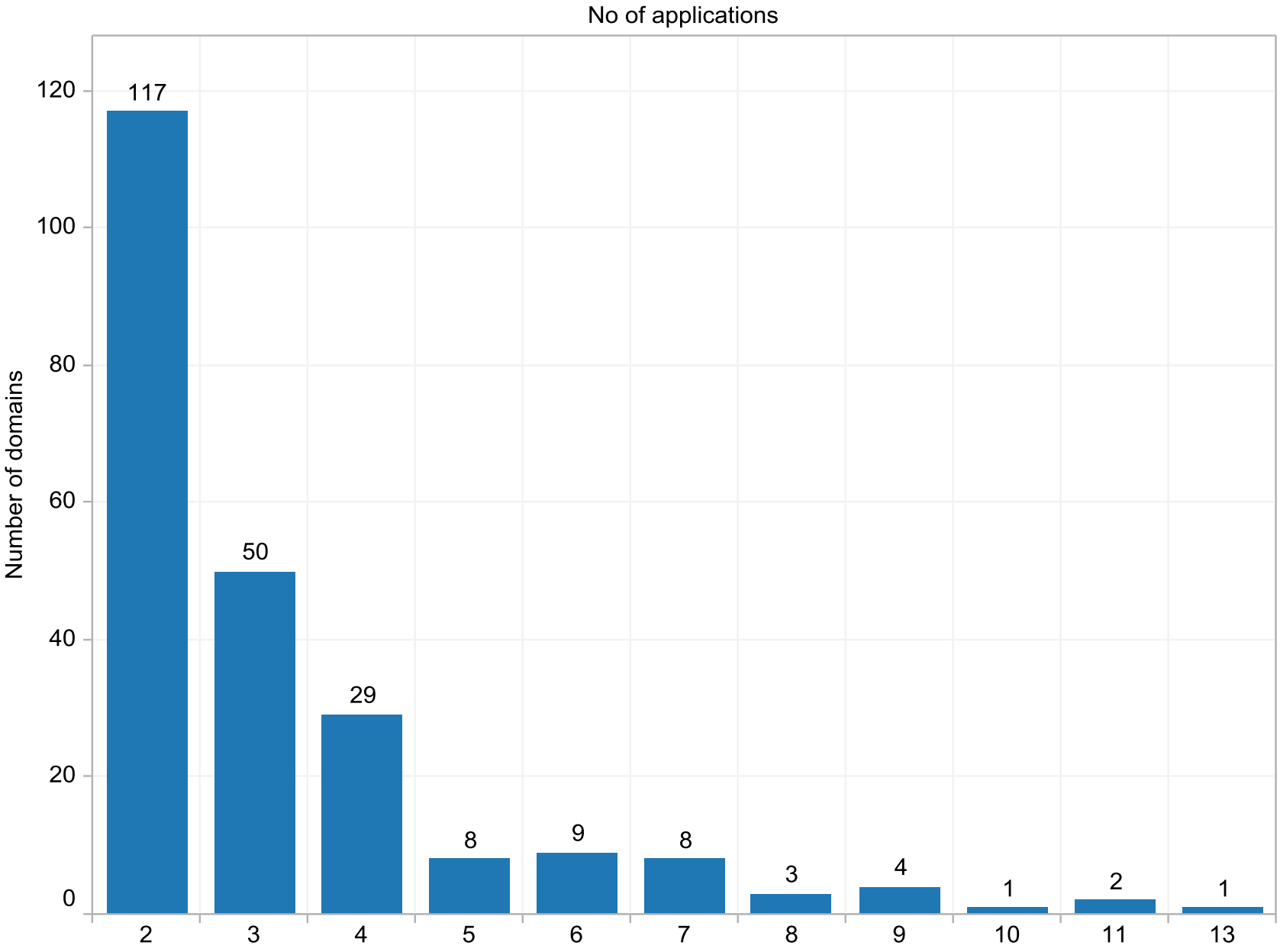
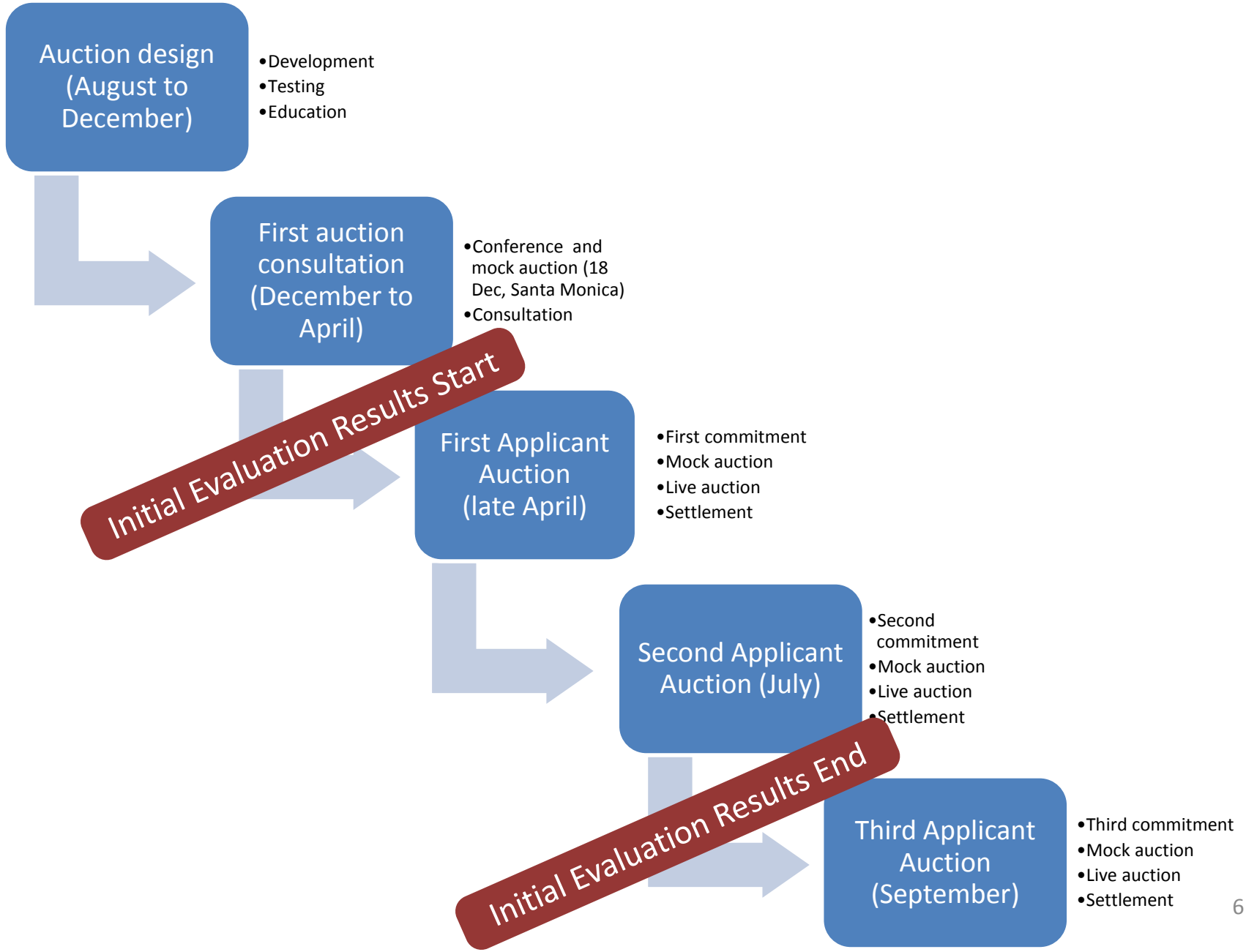
The top-level domains (items)

The applicants (bidders)

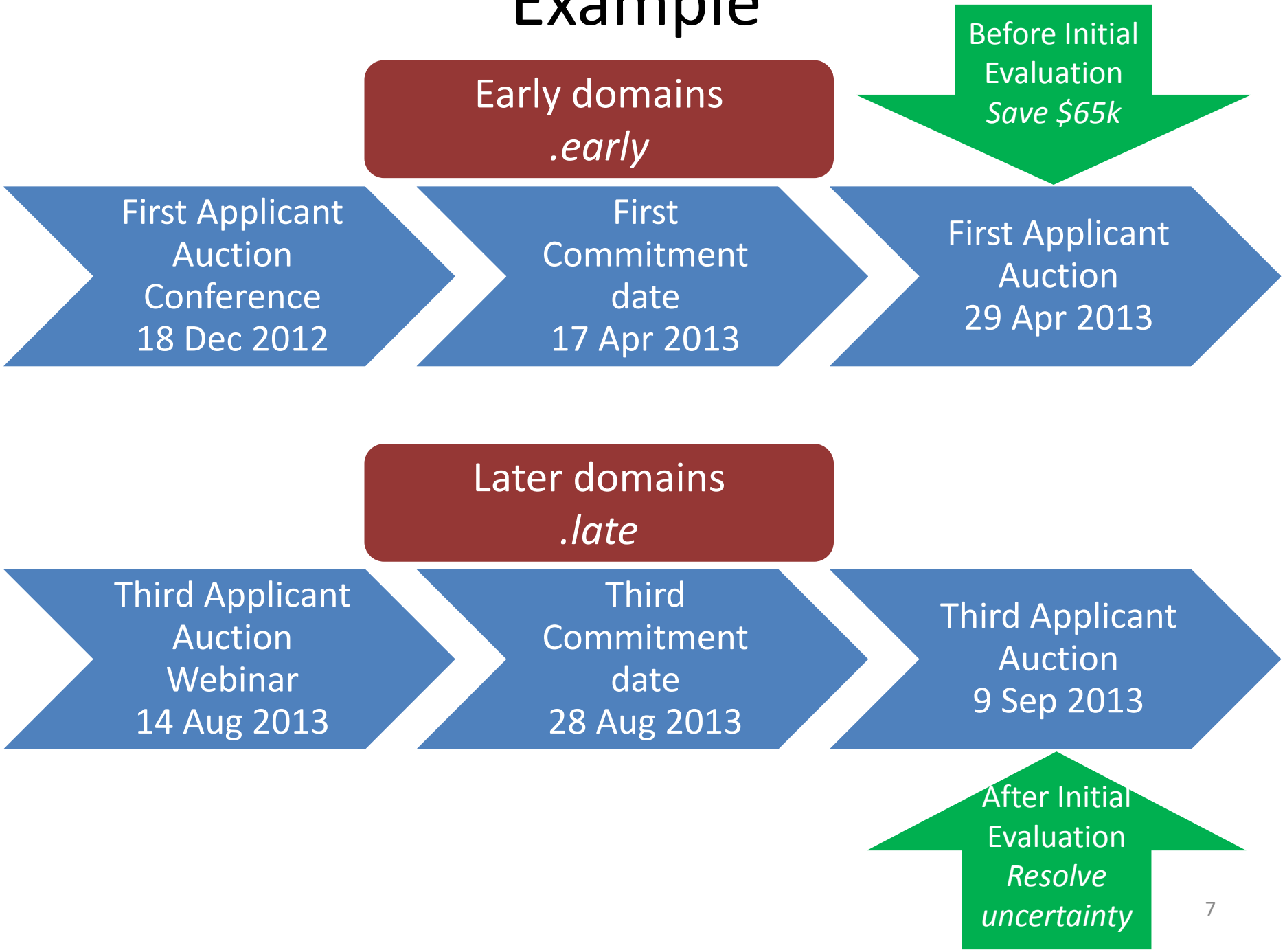
Summary numbers	
Total applications	1930
Contested applications	755
Contested domains	232
Applicants	444
Applicants holding a contested application	145


No of applications
Number of domains
120
100
80
60
40
20
0
117
50
29
8
9
8
3
4
1
2
1
2
3
4
5
6
7
8
9
10
11
13

Applicant Auction Plan



Example


Before Initial Evaluation
Save $65k
Early domains
.early
First Applicant Auction Conference
18 Dec 2012
First Commitment date
17 Apr 2013
First Applicant Auction
29 Apr 2013
Later domains
.late
Third Applicant Auction Webinar
14 Aug 2013
Third Commitment date
28 Aug 2013
Third Applicant Auction
9 Sep 2013
After Initial Evaluation
Resolve uncertainty

Key benefits of applicant auctions

- *Avoids delay and value loss from ICANN Last Resort Auction*
- Maximize value of domains
(puts them to their best use)
- Rapidly resolve contention leading to faster ICANN assignment
- Allow the applicants retain benefits of resolution, rather than sharing benefits with ICANN
- Lower price paid by buyer (applicant with highest bid)
- Compensate sellers (applicants with lower bids) with a share of buyer's payment

Auction objectives

- *Efficiency*. Auction maximizes applicant value
- *Fairness*. Auction is fair. Each applicant is treated same way; no applicant is favored in any way
- *Transparency*. Auction has clear and unambiguous rules that determine the allocation and associated payments in a unique way based on the bids received
- *Simplicity*. Auction is as simple as possible to encourage broad participation and understanding

The power of mechanism design:

Equal shares supports efficiency and fairness objectives

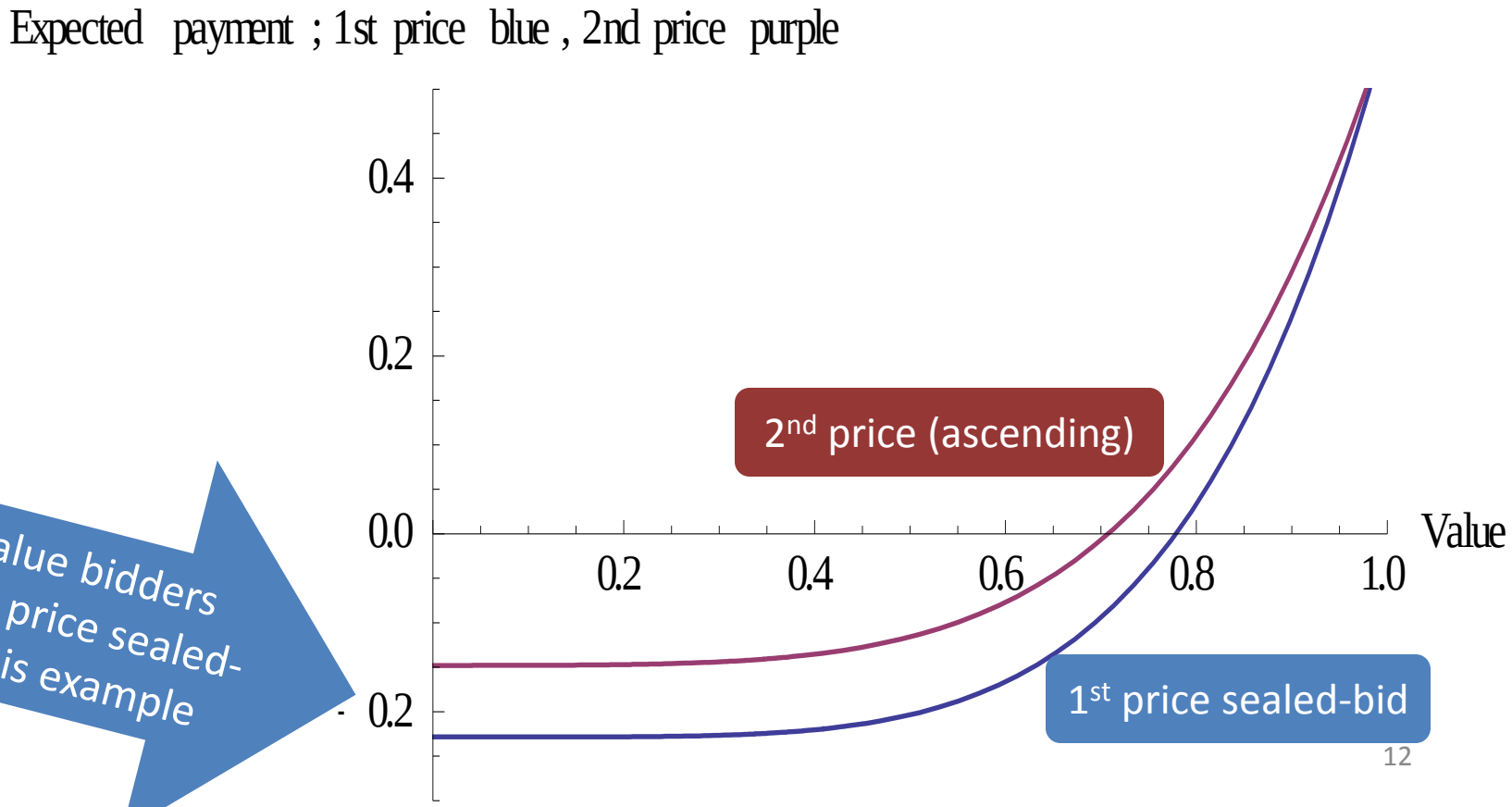
- Assume:
  - Each bidder's value is drawn independently from the uniform distribution on [0, v_{max}]
  - Each bidder seeks to maximize dollar profit
  - High bidder wins; non-high bidders share winner's payment equally
  - Consider *1st-price and 2nd-price pricing rules*
- **Proposition**. *There is a unique equilibrium, the outcome is ex post efficient, and each bidder's profit is invariant to the pricing rule (revenue equivalence).*
- **Proof.** Direct calculation results in a unique increasing equilibrium. Efficiency then is obvious. Revenue equivalence holds because the interim payment of the lowest-value bidder is invariant to the pricing rule.

But revenue equivalence does not hold for all distributions

- Assume:
  - Each bidder's value is drawn independently from the same distribution F with positive density f on $[0, v_{max}]$
  - Each bidder seeks to maximize dollar profit
  - High bidder wins; non-high bidders share winner's payment equally
  - Consider *any pricing rule (e.g. 1st price, 2nd price, …)* that results in an increasing equilibrium bid function
- **Theorem**. *The outcome is ex post efficient. However, a bidder's expected profit depends on the pricing rule (revenue equivalence fails).*
- **Proof.** Efficiency is obvious. Revenue equivalence does not hold because the interim payment of the lowest-value bidder is non-zero and depends on the pricing rule.

Counter example of revenue equivalence

- Consider an auction with three bidders whose values are distributed according to $F(x)=x^2$
- As shown, expected payments of a bidder with zero value differ in first- and second-price auctions



Prototype auction designs

- Sequential first-price sealed-bid auction
- Simultaneous ascending clock auction

Both approaches have proven successful when auctioning many related items

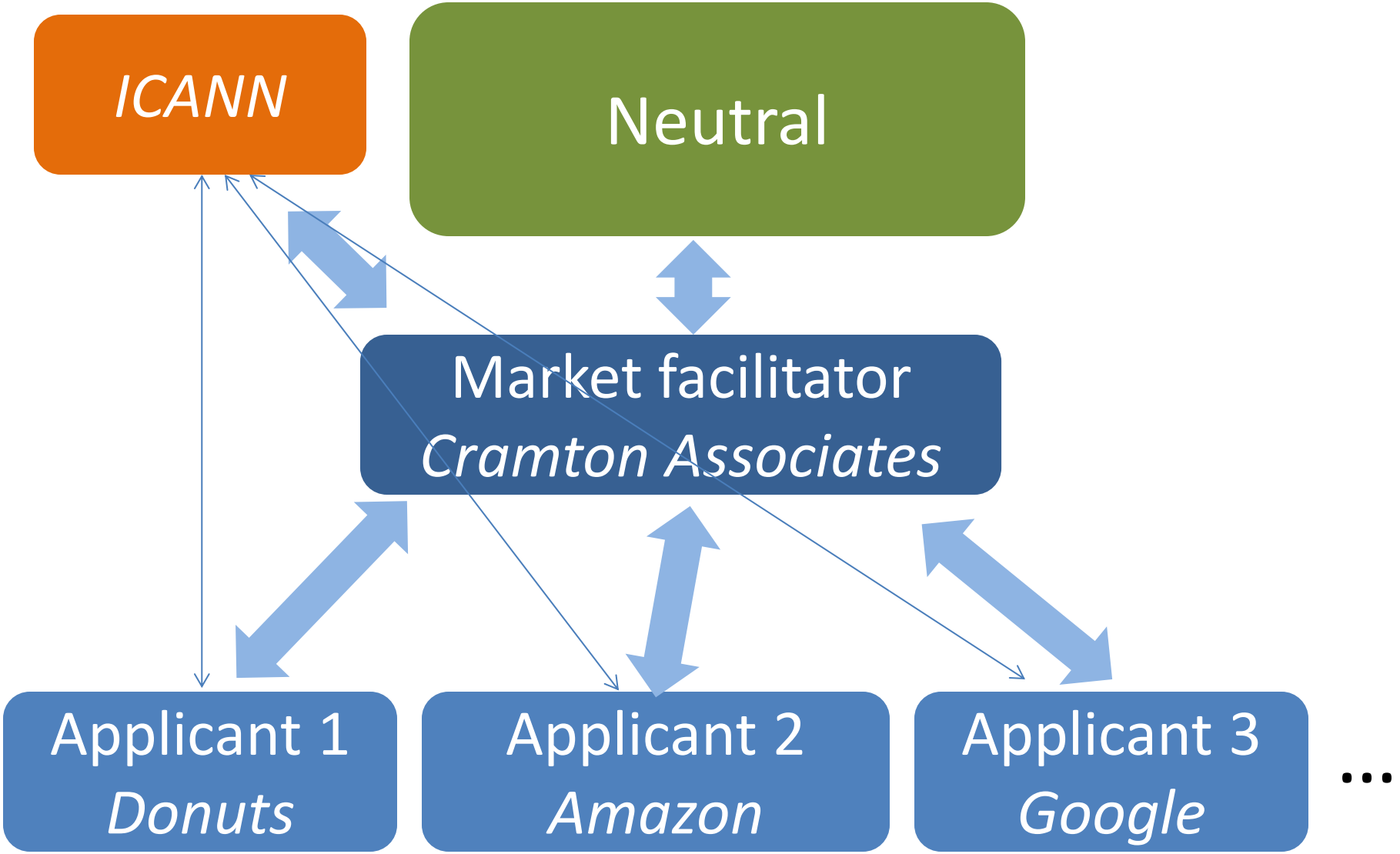
Addressing the holdout problem

- Applicant must make a binding commitment to participate in Applicant Auction by commitment date
  - Applicant agrees to participate in auction for all of the domains it has applied for
  - For domains lacking unanimous participation, applicant agrees to wait until the ICANN Last Resort Auction to resolve string contention
- This commitment removes “holding out and negotiating with other applicants” as a viable alternative
- All should participate since the Applicant Auction dominates the ICANN auction for all applicants

Big guys need small guys

Small guys need big guys

Contracts


ICANN
Neutral
Market facilitator
Cramton Associates
Applicant 1
Donuts
Applicant 2
Amazon
Applicant 3
Google
…

Deposit

- A 20% deposit is required to assure that bids are binding commitments
- Bids may not exceed five times current deposit
- Deposit may increase during auction
  - As a result of selling domain rights (real-time credits to escrow account)
  - As a result of deposit top-ups (credited at end of business day)
- Deposit is held in escrow account at major international bank (e.g. Citibank)

Settlement

- Within 8 business-days of auction end, settlement is executed by the settlement agent, a major international law firm working with the major international bank
- At no time does the market facilitator have access or take title to deposits, settlement amounts, or domain rights

Experimental testing

Experimental Economics Lab, University of Maryland

87 items (generic top-level domains)

size indicates number of applicants

16 bidders (Applicants)

size indicates number of applications

Treatments: 2 × 2 experimental design

- 2 auction formats
  - Sequential first-price sealed-bid
  - Simultaneous ascending clock (second price)
- 2 value distributions (independent private value)
  - Symmetric (uniform from 0 to $5000k)
    - 16 bidders, mean value = $2500k
  - Asymmetric (triangle distribution from 0 to $5000k)
    - 3 large strong bidders, mean = $3750k
    - 13 smaller weak bidders, mean = $1250k

Cramton Associates

Applicant Auction

Simultaneous Ascending Clock Auction - October 2012

Time Left in Round **27:48**

04 October 2012, 20:34:12 CEST

Round 2 started at 20:32:00 and will end at 21:02:00 CEST

Bidder Info | **Bidding** | Generate Bid Confirmation | My Results | Open Domains | Closed Domains | Auction Info | Auction Schedule | Messages | Downloads

Bidding for Amazon - Round 2

Your Bid must be at least the Minimum Price to Bid. In order to Continue, your Bid must be greater than or equal to the Minimum Price to Continue.

In the next Round, you will no longer be able to bid on those Domains that are marked "Exit".

Bid Status **Current Limit:** $42,250k **Total Commitment:** $8,220k

[Download Bids File]

You may submit a new Bids File Choose File No file chosen Upload

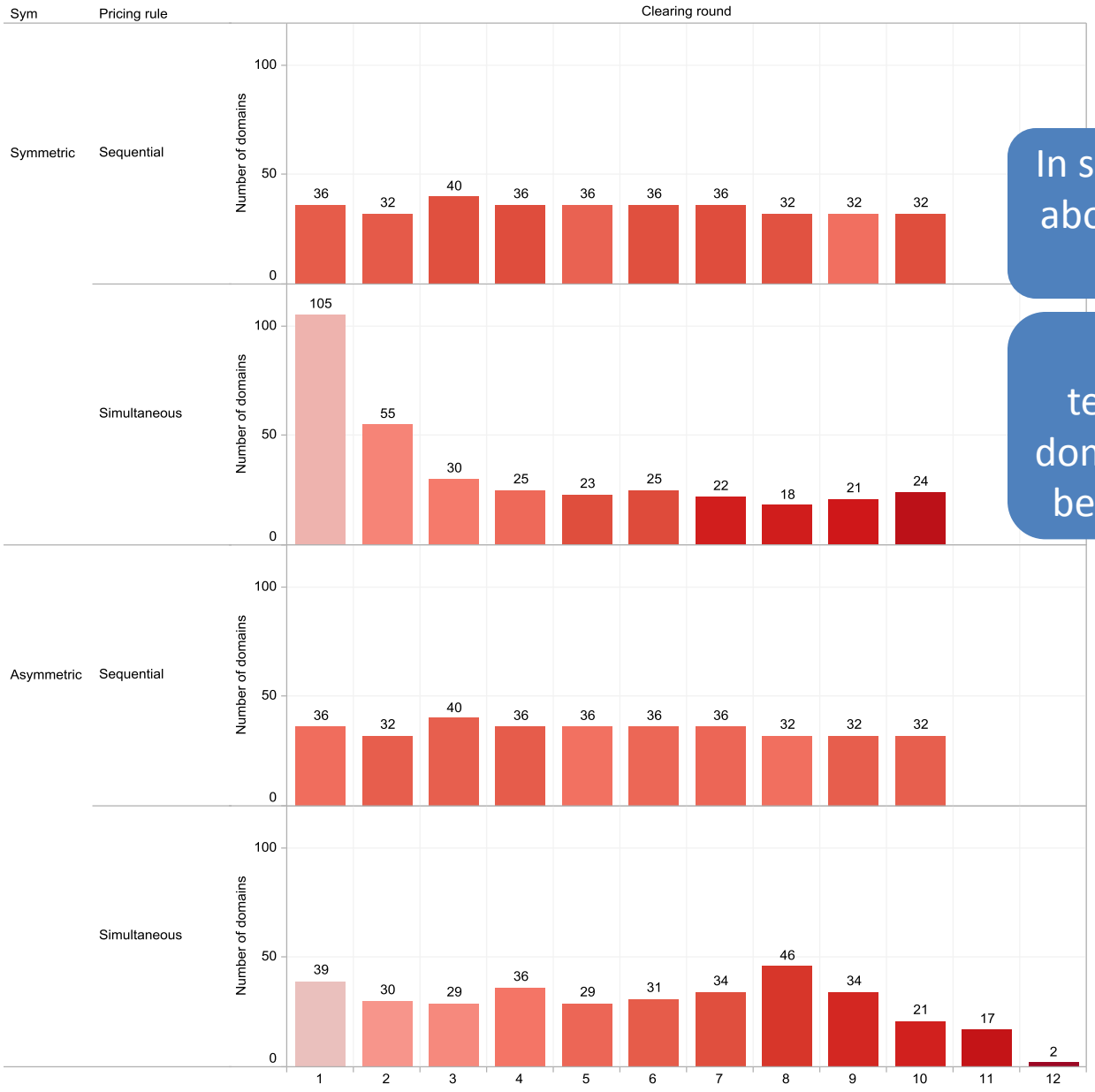
gTLD	Still Bidding	Minimum Price to		Bid		Your Private Value	Bid Status
		Bid	Continue				
.group	3	$1,820k	$2,584k	Edit Bid	$2,173k	$2,260k	Exit
.mobile	3	$1,470k	$2,087k	Edit Bid	$1,668k	$1,670k	Exit
.save	2	$1,020k	$1,448k	Edit Bid	$1,193k	$1,080k	Exit
.dev	2	$1,020k	$1,448k	Edit Bid	$1,126k	$880k	Exit
.you	2	$1,020k	$1,448k	Edit Bid	$2,060k	$3,680k	Continue

Note:

- 'Still Bidding' is the number of Bidders with Bids of at least the Minimum Price to Bid of this Round at its start time.
- Continue : You will be able to bid for this Domain next Round.
- Exit : You will not be able to bid for this Domain next Round.

Experimental results

Clearing round and prices

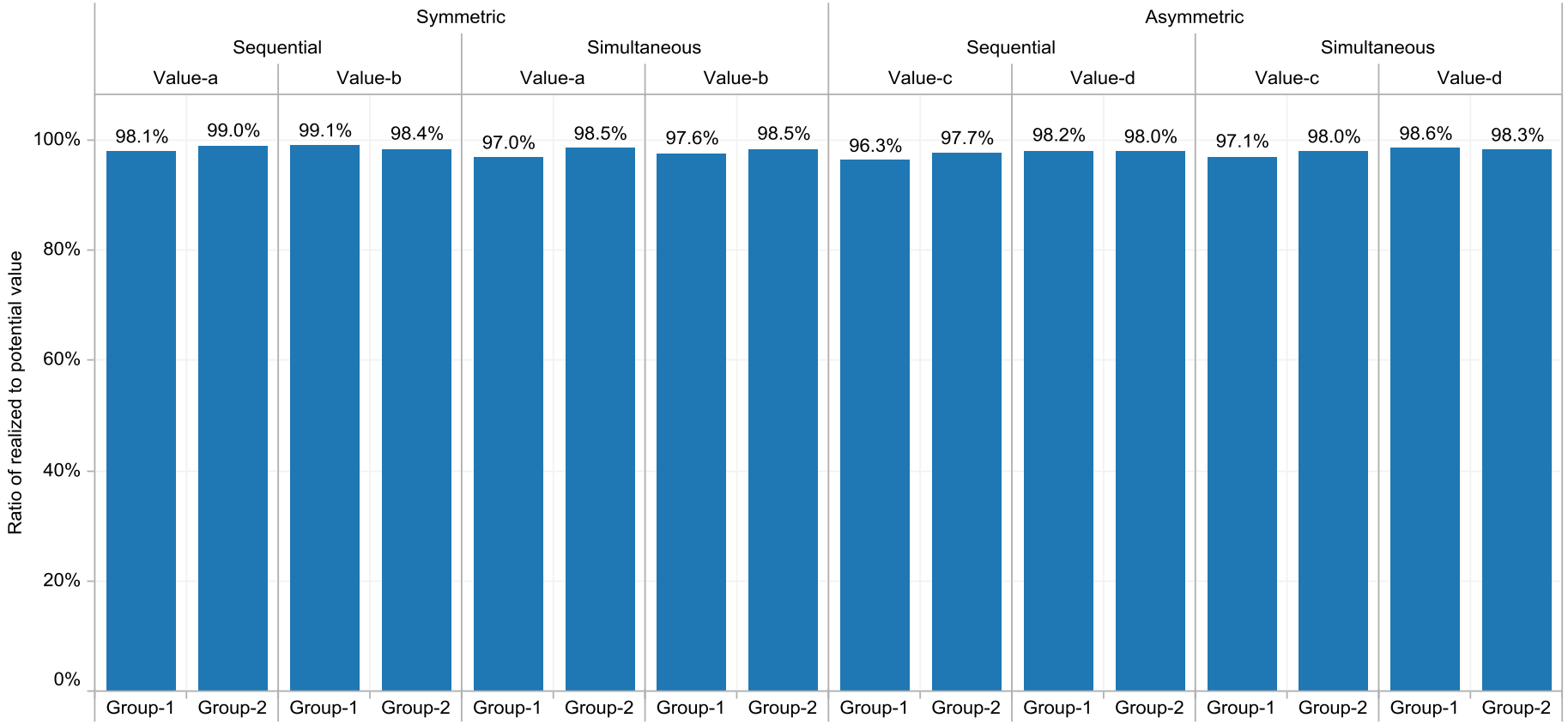


In sequential, by construction, about the same number clear in each round

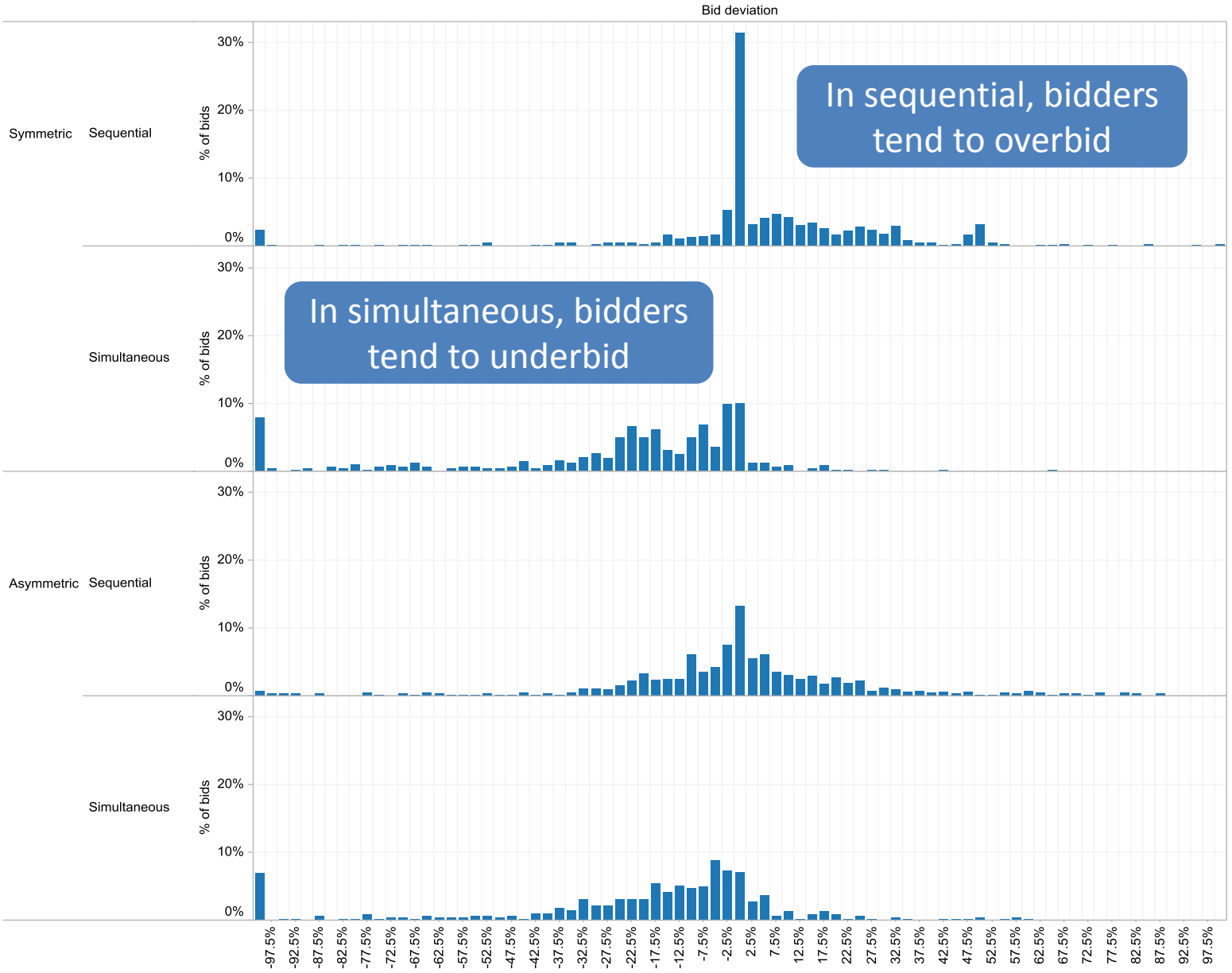
In simultaneous, strong tendency for highest value domains to clear last, allowing better budget management

Efficiency: ratio of realized to potential value

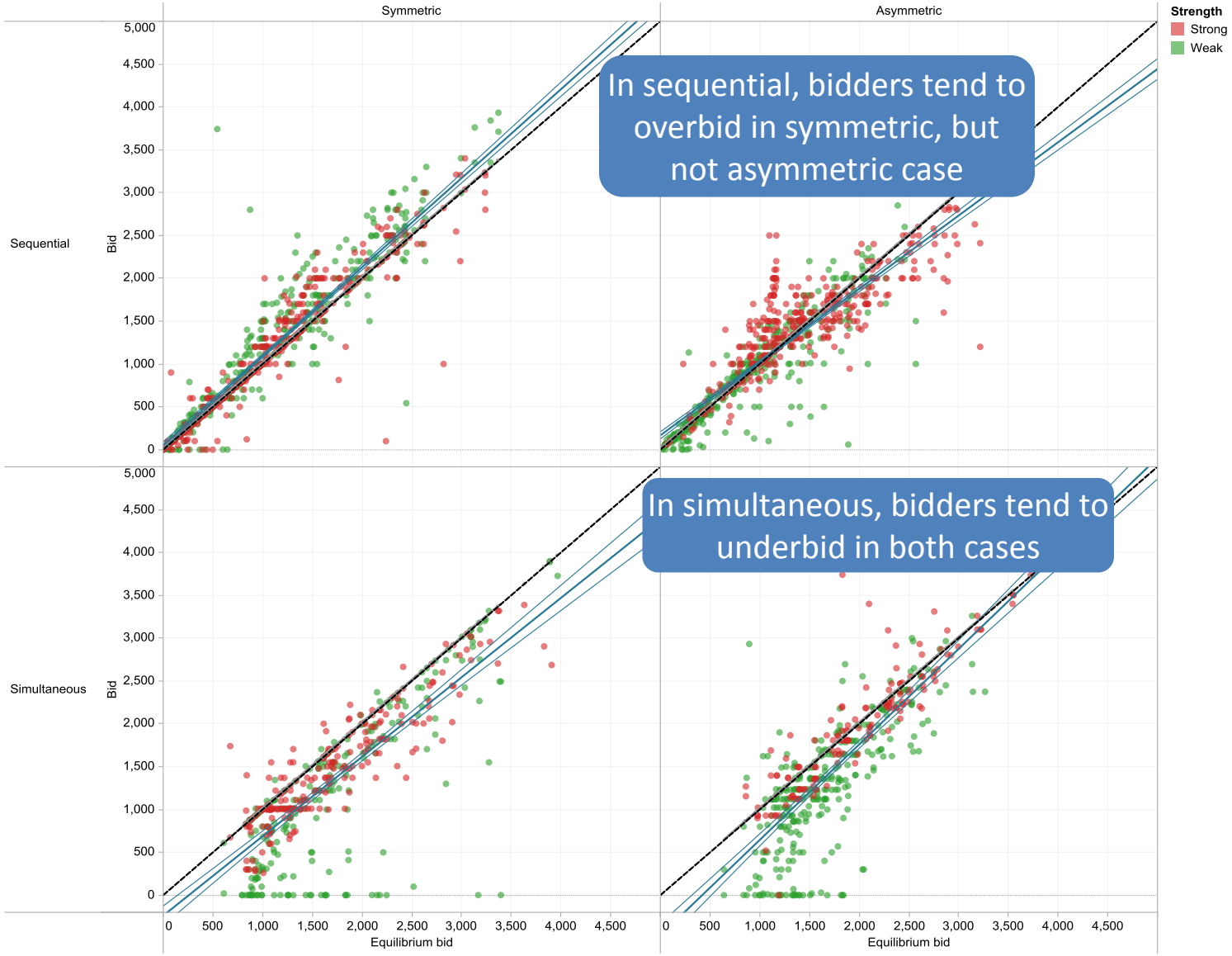
Both auction formats are highly efficient



Deviation in bids from theory

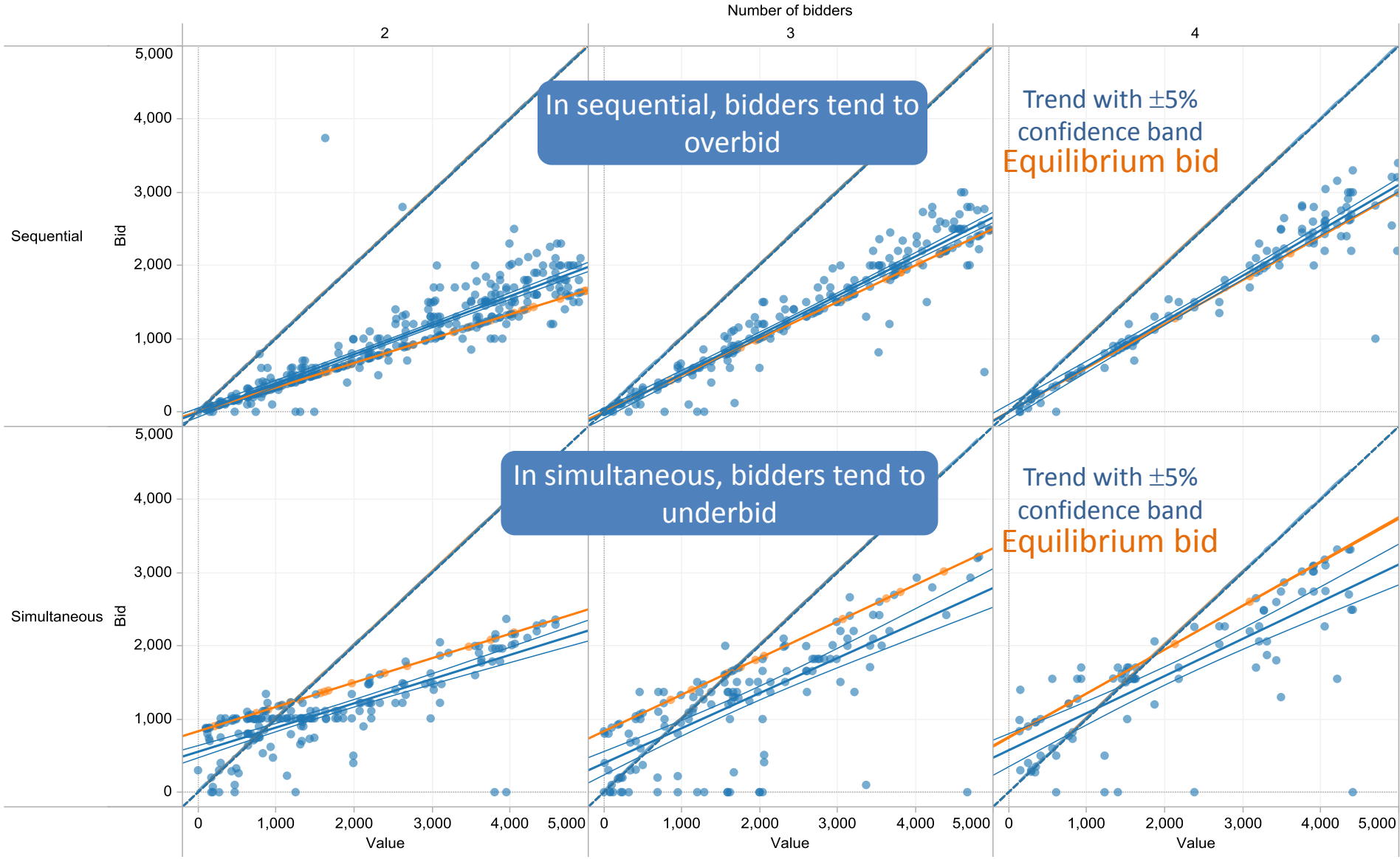


Actual and equilibrium bids



Black: Actual = Equilibrium

Blue: Trend of actual with ±5% confidence band



Human and equilibrium bid functions (symmetric)

Conclusion

- Both auction formats perform well
  - About 98% of potential value is realized
- Preference for simultaneous ascending clock
  - Better price discovery
  - Better deposit management
  - Reduced tendency to overbid
  - More consistent with ICANN Last Resort Auction

Limitations of analysis

- Actual auction setting will have more uncertainty than assumed here
  - Value distributions will not be commonly known
  - Values will be positively correlated, not independent
  - Some bidders may be less sophisticated than others
- Uncertainty will introduce guesswork, which likely will limit efficiency
- However, since ascending auctions outperform first-price sealed-bid auctions in settings with greater uncertainty and value correlation, these complications seem to reinforce our conclusion: *the simultaneous ascending format most likely is best*