Bond and Bill Auctions: Policy Choices and International Practice

Based on client presentations
in 2015 and 2019

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Outline

- Transparency and predictability
- Auction types
- Some practical and policy issues
- Post-auction analysis

Objectives for Auctions

- Debt managers
  - Minimising government borrowing costs
  - Developing investor base; and intermediaries
- Central bankers
  - Manage liquidity
  - Set (or signal) interest rates
    - May prefer to fix price and vary volume
    - Not relevant in dollarized economies

- Central bank auction procedures typically simpler and more flexible than those for non-monetary treasury bills or bonds
  - Auctions of monetary bills open only to intermediaries with accounts at central bank (guaranteeing settlement within a short period)

Predictability and Transparency

- "Predictability and transparency" are aimed at removing a major source of market uncertainty
  - Help minimize the cost of financing
  - Allow investors to project future commitments of funds with greater confidence
- Practices and procedures fall into three broad categories:
  - Pre-announced auction calendars & annual financing plans
  - Auction announcements
  - Announcement of auction results
- Out of 38 countries [2015 data]:
  - 24 announce their annual borrowing plans for the following year
  - 20 publish an indicative annual issuance calendar
  - 27 publish quarterly, half yearly and/or monthly issuance calendars

Auction Announcements

- Timing relative to auction date:
  - Varies by sovereign borrower and instrument type
  - Ranges from 1 day to 1 week
  - In most countries, final details of upcoming auctions are announced one week prior to the auction
- Information disclosed:
  - Most sovereigns value transparency and predictability over flexibility
  - The degree of information disclosure varies, but should ideally include:
    - amount of the security being offered
    - auction date
    - issue (and settlement) date
    - maturity date
    - non-competitive, and competitive bidding close times
    - (where there is a short or long first coupon) accrued interest at issue date
    - terms and conditions of offering – minimum bids, how to make bids etc (unless they are published in a standing memorandum)

Announcement of Results

- Timing of release relative to auction:
  - Ranges from a few minutes to 1 day
  - Bidders need to know if they have been successful – especially important as secondary market develops
- Disclosure varies but in most cases, announcement details:
  - auction date, issue date, maturity date
  - terms and conditions of the offering, ISIN code
  - competitive and non-competitive bids
  - allotment amount, and any pro-rating
  - lowest accepted [cut-off] price/highest accepted yield
  - weighted average price/yield [hence tail]
  - bid-to-cover ratio
- Important that everyone in market (not only successful bidders) has result at same time

Types of Auctions - 1

Closed or Open

Closed Auction	Open Auction
▪ Only primary dealers (PDs) directly participate in auctions ▪ Others through PDs ▪ Helps stimulate secondary market	▪ Investors directly participate in primary market ▪ Puts more pressure on banks ▪ But at cost of less active secondary market?

Yield or Price Based

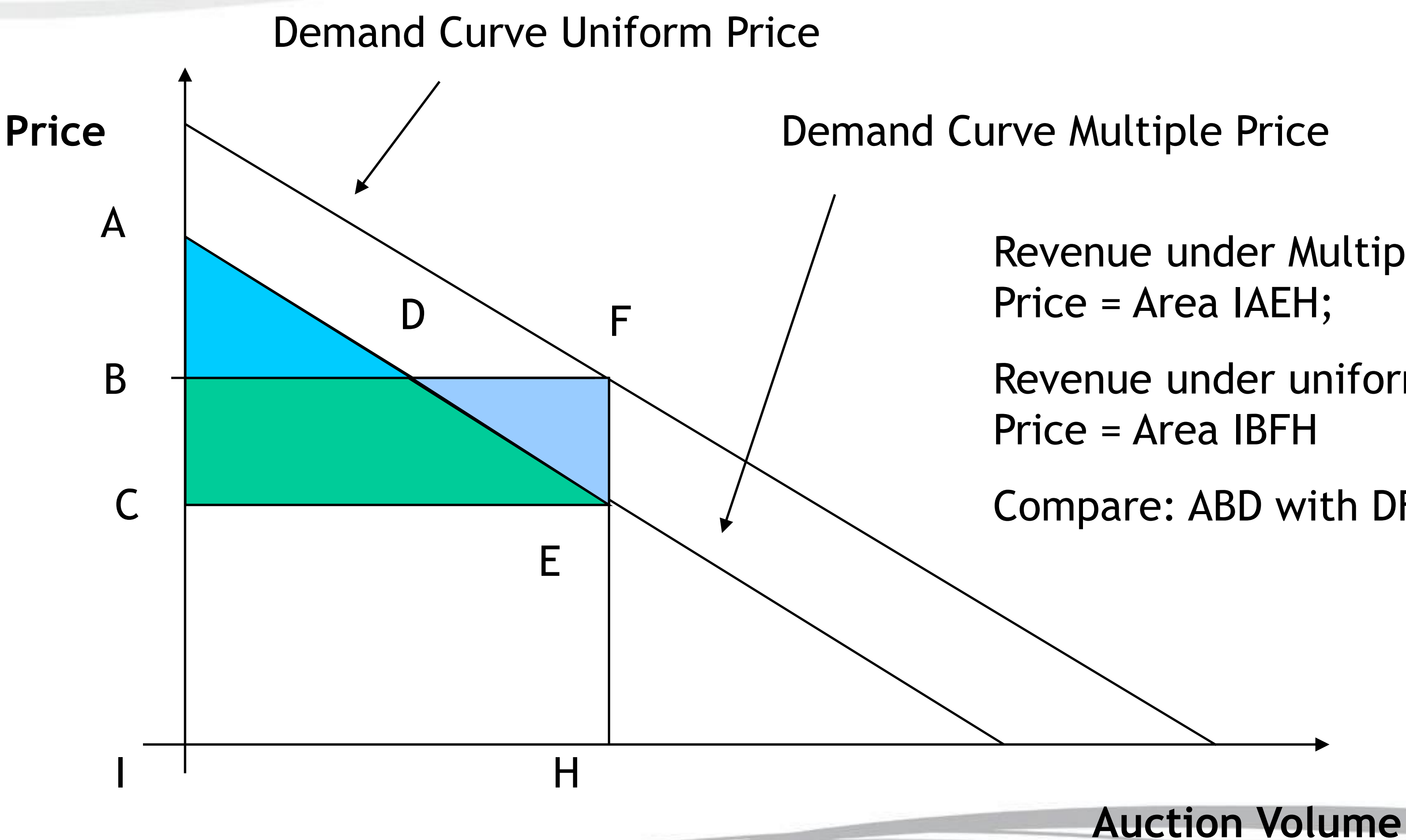
Yield Based Auction	Price Based Auction
▪ Bids arranged in ascending order ▪ Cut-off yield = yield corresponding to the notified amount of the auction ▪ Cut-off yield determines coupon rate	▪ Bids arranged in descending order ▪ Successful bidders are those who have bid at or above the cut-off price

Types of Auction - 2

Uniform or Multiple Price

- Uniform price (or single price or Dutch) – securities allocated to highest bidders but at lowest price of a successful bidder
- Multiple price (or bid price or American) each successful bidder pays the price it bids
- Hybrid
  - Spain: bids between minimum price and weighted average price (WAP) of accepted bids pay the price as bid; bids above the WAP pay the WAP
  - More unusual: Open outcry (Mongolia); in Eastern Caribbean Currency Union: bids (not name of bidder) transparent to all bidders – allows bidder to improve offer to ensure purchases
- Choice depends on:
  - implications for participation and bidding
    - Information asymmetries, concern about winner's curse
    - Market development objectives
    - Risks of collusion

Uniform or Multiple Price Auction

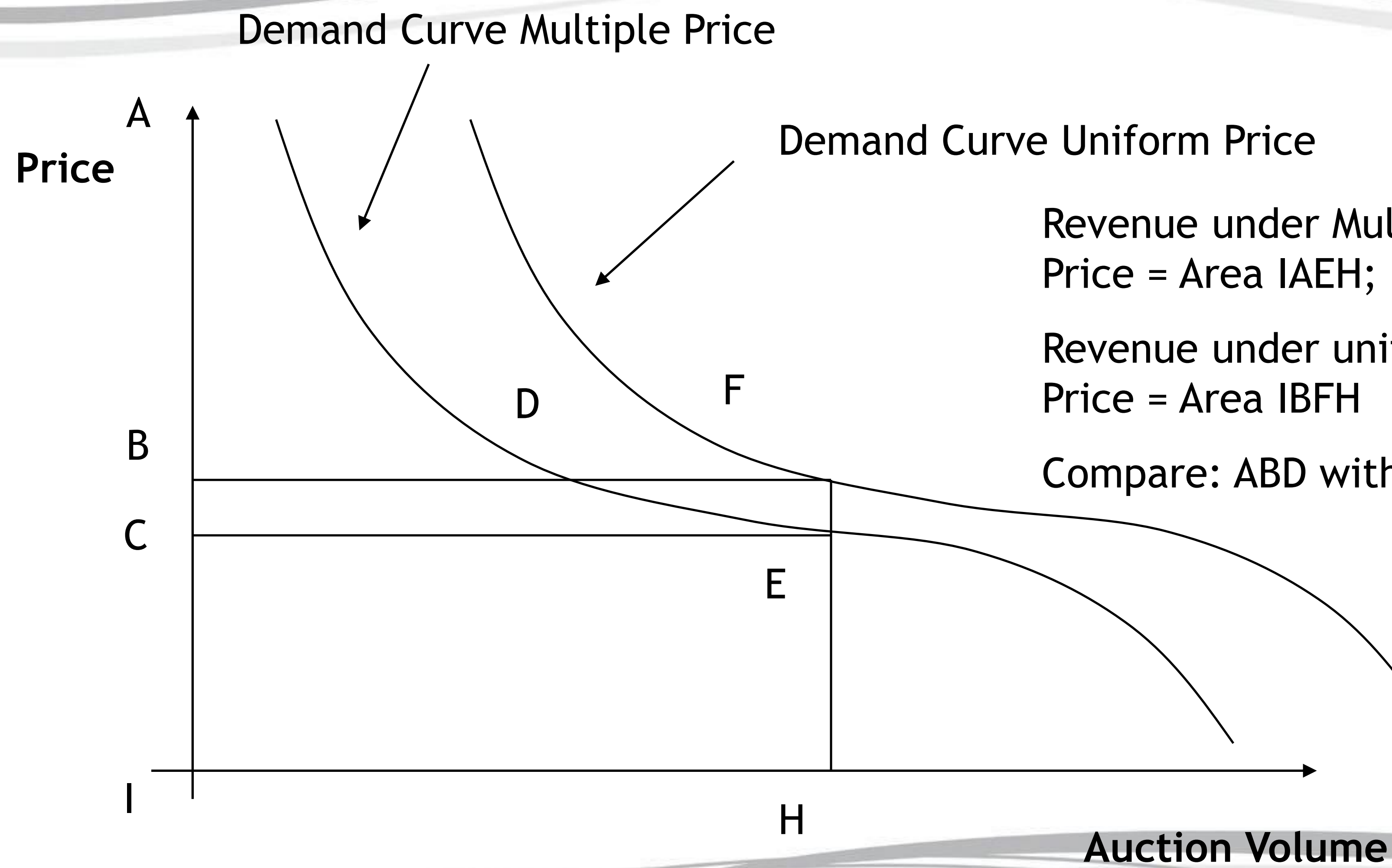


Revenue under Multiple Price = Area IAEH;

Revenue under uniform Price = Area IBFH

Compare: ABD with DFE

Uniform or Multiple Price Auction
…in practice demand curves are not straight!



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Compare: ABD with DFE

Making the Choice

- In a uniform price auction
  - The purchaser can bid its actual reservation price for a new security (i.e. the minimum yield at which it is willing to buy the security).
  - The bidder has no reason to bid a higher price, but if the auction stops at a lower price it will get the full benefit of buying at that lower price.
- Under the multiple price format
  - The purchaser is encouraged to bid above its reservation price in hope of getting the security on more favourable terms
  - Information costs are greater
- Issues for the authorities
  - Revenue maximization
  - Impact on monetary conditions
  - Impact on market development

Some Advantages and Disadvantages of Uniform Price

Advantages

- Avoids "winner's curse"
  - Successful bidders in bid price auction pay above market clearing price; immediately have a mark to market loss
- Encourages a broader market
  - Less concern about inside information; reduces information costs
  - US Treasury move to uniform price to encourage wider participation
- Consistent with price signalling (e.g. central bank fixes auction price; and takes volume bids to drain)

Disadvantages

- Risk of greater volatility from auction to auction
  - particularly in thin markets or uncertainty about yield curve shape
  - clearing price may be set by single marginal bid with a strong random component
  - problematic when policy signalling
- Encourages gaming
  - large participants bid high to ensure purchases, even though know they will not pay that
  - "bottom fishing"
- Risks of Collusion
  - cartel of intermediaries all benefit from low price

Secondary Market Implications

- Uniform price or multiple price interacts with market development strategy
  - Multiple-price auctions give an incentive for secondary market trading
  - Helps to develop secondary market
- Uniform price may facilitate wider participation (as in US); but multiple price consistent with development of market-makers
  - Flow visibility encourages aggressive bidding
  - Information costs discourage bidding from uninformed bidders
  - When-issued trading helps price determination
  - Has to be linked with constraints on bid size or volume takedown
- Uniform price auctions may encourage speculation about interest rates changes – create a one-way bet?

The Evidence

- "The debate on which auction format maximizes government revenues has so far been inconclusive. At the theoretical level, there is a presumption that uniform-price auctions are superior because …. they reduce the cost of the winner's curse. However, this conclusion has been reached only under restrictive hypotheses – including absence of risk-aversion, homogeneity among bidders, sale of single objects, absence of collusion – which cannot easily be extended to treasury bill auctions"   . *IMF Internal Paper 1995*
- "US evidence on impact of switch to uniform price: 'not unambiguous'." *Kenneth D. Garbade and Jeffrey F. Ingber, Current Issues, FRBNY, Feb 2005*
  – Price close to when-issued price; but results more volatile

Revealed Preference!

- WB study [early 2000s?] of placement mechanisms in the 67 countries using auctions indicated that multiple-price auctions are by far the most common
- Of 67 countries:
  - 9 use a uniform-price auction (UPA)
  - 36 use a multiple-price auction (MPA)
  - 21 use both auction mechanisms depending on the security being auctioned
  - 1 uses a mixture of two mechanisms, Spanish auction (since adopted by Peru and China)
- Out of 21 countries using both mechanisms:
  - 6 use UPA for bonds, and MPA for bills
  - 2 use UPA for bills, and MPA for bonds

Country Examples

UPA	MPA		Both	Spanish
Argentina	Australia	Lithuania	Brazil[1]	Spain
Colombia	Austria	Macedonia, FYR	Canada[2]	Peru
Denmark	Bangladesh	Malaysia	Czech Republic[3]	China
Greece	Belgium	Malta	Finland[4]	
Italy	Botswana	Mauritius	Ghana[4]	
Norway	Cyprus	Mongolia	Iceland[4]	
Peru	Ecuador	Morocco	Indonesia	
Singapore	Egypt, Arab Rep.	Panama	Japan[5]	
United States	France	Portugal	Mexico	
	Germany	Solomon Islands	Netherlands[6]	
	Hungary	Sri Lanka	New Zealand	
	India	Sweden	Nigeria[4]	
	Ireland	Switzerland	Philippines[4]	
	Israel	Tanzania	Poland[7]	
	Jordan	Thailand	Romania	
	Kenya	Tunisia	Sierra Leone	
	Latvia	Uganda	Slovak Republic	
	Lebanon	Venezuela, RB	Slovenia[3]	
			Trinidad and Tobago[4]	
			Turkey[2]	
			United Kingdom[8]	

- [1] UPA-floating rates & MPA-fixed rate instruments, [2] UPA-only inflation linked bonds, [3] UPA-bills & MPA-bonds, [4] UPA-bonds & MPA-bills, [5] UPA-only 40Y & inflation-indexed bonds, [6] UPA-bills & 5-10-30Y bonds; MPA-3Y bonds & reopening of all bonds, [7] UPA-only supplementary auctions, [8] UPA-only indexed linked bonds

Non-competitive (NC) Allocation

1. NC bids can be submitted at the time of the auction:
   - Makes it easier for retain sector to access the bonds
   - Restricted to small quantities – not to distort auction result
   - Sometimes available to PDs as a sweetener (size may depend on performance)
2. Second round:
   - Most countries grant PDs the option to buy more in a NC allocation after the auction – may sometimes be available also to their clients
   - Intended to reward/incentivize PDs for their market making role
   - Investors are effectively given an option: they can exercise it if SM prices are higher than the auction price when the option expires
   - The longer the exercise period, the more valuable is the option
   - With a few exceptions, usually
     - Exercise (access) period ranges between a few hours to 1 day
     - NC allocation usually between 15-40%
     - Strike price is the weighted average CA price

Auction Overrides - 1

- Several countries impose a minimum price (or maximum yield)
  - Provides protection against lack of competition
  - Central banks can use as a way of signalling interest rates (ministries of finance should not!)
- To publish or not to publish the override?
  - Risks that bids automatically cluster near a published rate
  - Publish a maximum spread or tail
  - Some complicated formulae
    - [Macedonia: rejects bids more than [x] points away from weighted average price of the lowest half of the bids by value; [x] is published in each prospectus.]

Auction Overrides - 2

- Avoid:
  - Changing allocated amounts from those announced
  - Cancelling auctions
  - Variability in timing or volumes sold (except short-term bills for cash management reasons)
- Must retain possibility of not accepting bids
  - Non-compliance with rules or regulations
  - Anti-money laundering
  - On revenue protection grounds (esp. in an undersubscribed uniform price auction)

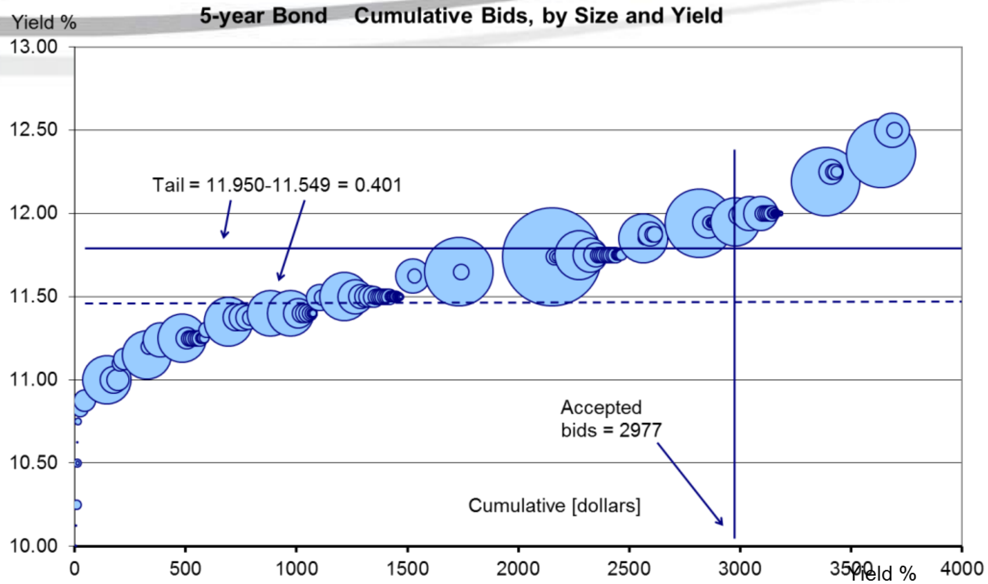
Some Practical Decisions

- Number of bids per bidder
  - Should be as high as practical (may be difficult with phone auctions – if bids made at last minute)
- Minimum bid
  - Trade-off between admin and attractiveness – and who participates
- Maximum award per bidder
  - Aimed at preventing dominant purchaser squeezing market
  - Widely used; but debate about effectiveness
  - Depends on transparency of market; secondary market development; size of issue; etc
  - Less relevant to re-openings; less important for bills than bonds
- Settlement arrangements
  - Ideally DvP in central bank money; but depends on local CSD
  - May link settlement date with cash outflow dates; and especially redemption dates

Receiving and Processing Bids

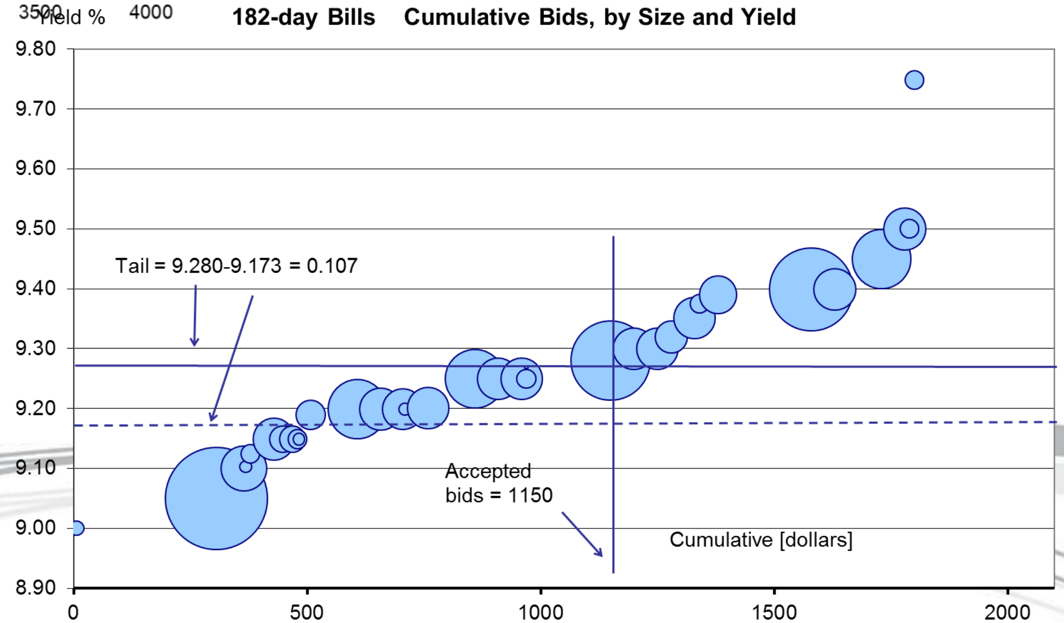
- Traditionally
  - Bids made by phone [retail bids maybe by paper]
  - Entered by DMO into spreadsheet or auction system for calculating result - presented for decision
  - Agreed decision entered into market data system for publication
- Increasingly…
  - Electronic system used that provides both a means of collecting bids (through terminals at bidders' premises) and calculating result (through embedded algorithm)
  - Once decision made, system publishes result to market
- Electronic system carries less risk of error or fraud
  - Offered by Bloomberg Reuters, etc (also ICAP)

Post-auction Analysis: Demand Curves



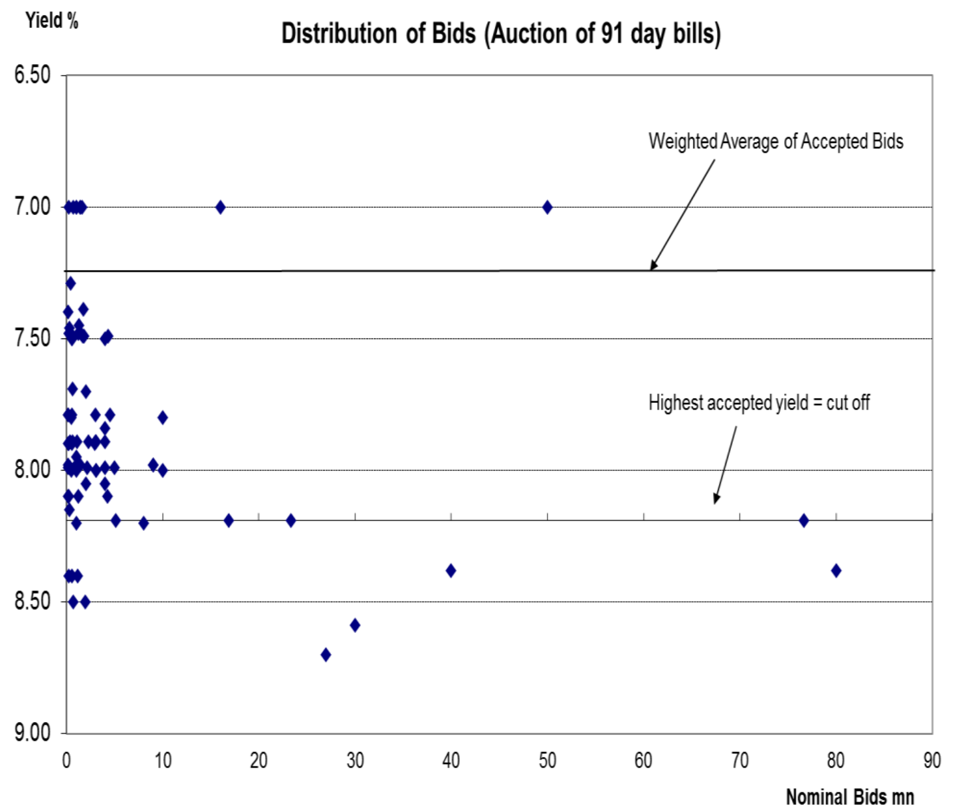
Multiple price auction
Size of bubble indicates
size of bids

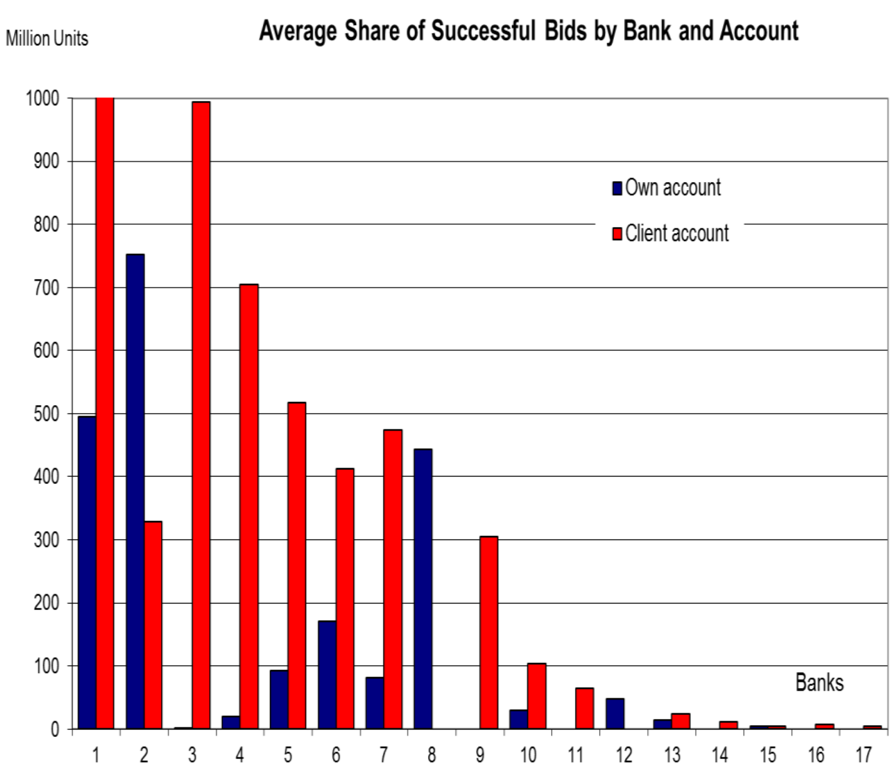
More concentrated bids might indicate collusion?



Further Analysis

Explore clustering and distribution of bids





Recording Spreads

- Data from 7 bill auctions of a small transitional country using multiple price

- Tail = difference between lowest accepted bid and bid at weighted average of accepted bids
- Spread = difference between lowest and highest bid