

An Empirical Analysis about Japanese 'Dango'

Yuji Kimura
Toshiko Suzuki
and Noriyuki Yanagawa

1

Facts

- In 2002 fiscal year,
 - The number of legal action by JFTC is 37.
 - In that, 30 are related to bid-rigging.
- Recently, it becomes difficult for JFTC to obtain the evidence of bid-rigging, as the firms take more effort to hide their illegal actions.

2

Motivation

- To get useful information for detecting Collusive behaviors.
- To derive more information about Japanese 'Dango', collusive bidding and bid rigging in Japan.

3

Theoretical Literature

- McAfee and McMillan (1992)
 - Static Situation, First Price Auction
 - With Side-payment; Preauction Knockout
 - Without Side-payment; Target Price Bid
- Aoyagi (2003)
 - Repeated Auction
 - Bid Rotation Scheme

4

Empirical Literature

- Porter and Zona(1993)
 - State highway construction contracts
 - Check the difference of cartel firms and non-cartel firms.
- Porter and Zona(1999)
 - School Milk Contracts
- Bajari and Ye (2003)
 - Highway Paving Contracts

5

Our Study

- Comparison of Collusive Data and Competitive Data
 - Collusive Data: before the JFTC inspection
 - Competitive Data: after the inspection
- 3 Cases of Procurement Auction offered by Local Government

6

Data

- Bid submitted by firms (BID_{ij})
- Target Price set by Local Government (EST_j)
- Distance (DIS_{ij})
 - Distance between the firm and the work place
- Capital (CAP_i)

7

Data

- Utilization rate ($UTIL_{ij}$)
 - Here, first computing the 3-month sum of winning price before each job
 - Regarding Maximum of this sum as the firm's Capacity
 - For each job date, regarding the rate of 3-month sum divided by the capacity as Utilization Rate

8

Data

- Dummy Variable for Winning Bidder ($DUMBIDDER_{ij}$)
 - If the firm is winner, $DUMBIDDER_{ij} = 0$
 - If the firm is not winner, $DUMBIDDER_{ij} = 1$

9

Case 1 (Outline)

- Construction Work offered by Local Government A
- Mostly, just Designated Firms can Submit their Bid
- Target Price:
 - Ex post revelation before November 2000
 - Ex ante revelation after November 2000

10

Case 1 (Outline)

- Inspection date: 14 months before the last data
- Reported collusion period: 4 years
- The number of Sample Firms: 37
- The number of auctions: 58
 - Collusive: 51
 - Competitive: 7

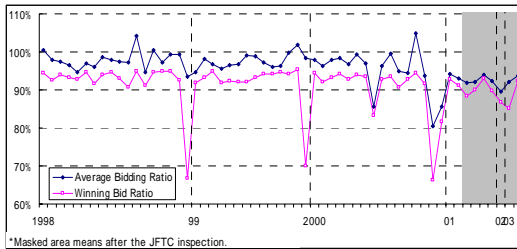
11

Case 1

- Summary Statistics
 - Bidding Ratio: Bid divided by target price
 - Winning Bid Ratio: the Lowest Bidding Ratio for each job
 - Average Bidding Ratio: Average of Bidding Ratio for each job
 - Variance of Bidding Ratio

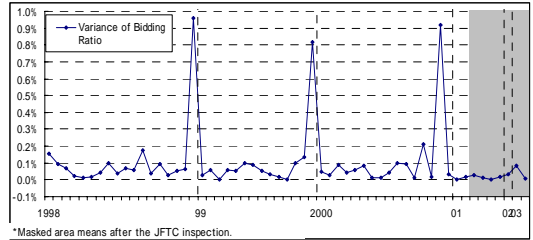
12

Case 1



13

Case 1



14

Case 1 (Empirical Model)

- Dependent Variable
 - Bidding Ratio: BID_{ij}/EST_j
- Independent Variable
 - Distance
 - Utilization Rate
 - Capital
 - Dummy Variable for Winning Bidder

15

Case 1

- Result (Table 1)

16

Case 2 (Outline)

- Construction Work offered by Local Government C
- Just Designated Firms can Submit their Bid
- Target Price is not Disclosed in all sample period

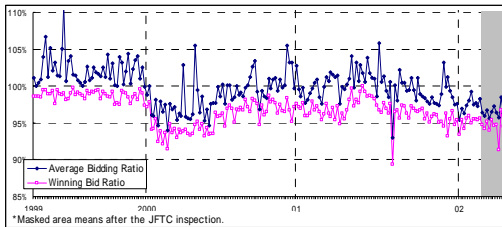
17

Case 2 (Outline)

- Inspection date: 1 month before the last data
- Reported collusion period: 3 years
- The number of Sample Firms: 24
- The number of auctions: 206
 - Collusive: 195
 - Competitive: 11

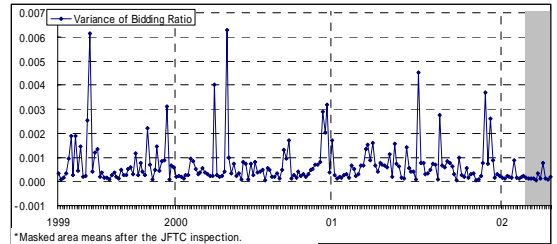
18

Case 2



19

Case 2



20

Case 2 (Empirical Model)

- Dependent Variable
 - Bidding Ratio: BID_{ij}/EST_j
- Independent Variable
 - Distance
 - Utilization Rate
 - Square of Utilization Rate
 - Dummy Variable for Winning Bidder

21

Case 2

- Result (Table 2)

22

Case 3(Outline)

- Construction Work offered by Local Government D
- The firm who announce desire to submit tends to be Designated as a Bidder.
- Target Price is not Disclosed in all sample period

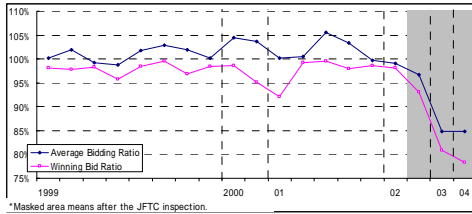
23

Case 3 (Outline)

- Inspection date: 20 months before the last data
- Reported collusion period: 3 years and half
- The number of Sample Firms: 33
- The number of auctions: 19
 - Collusive: 16
 - Competitive: 3

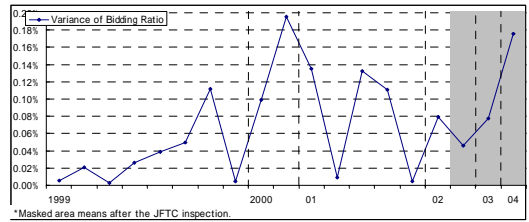
24

Case 3



25

Case 3



26

Case 3 (Empirical Model)

- Dependent Variable
 - Bidding Ratio: BID_{ij}/EST_j
- Independent Variable
 - Distance
 - Utilization Rate
 - Square of Utilization Rate
 - Dummy Variable for Winning Bidder

27

Case 3

- Result (Table 3)

28

Conclusion

- Competitive Data
 - Bidding Ratio tends to depend on the cost measure, utilization rate.
- Collusive Data
 - Bidding Ratio does not depend such cost measure.

29

Further Research Direction

- Analyzing Collusive data more closely
 - How different is collusive bid with different construction work specifics?
 - Why the seeming bid regularity are observed in collusive data?
 - Checking consistency of collusive data with theoretical predictions

30