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Trade and Investment Strategy
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ASSIGNMENT 1

You may submit a group assignment of up to 3 but no more than 3 in the group will be permitted. (Split groups of 4 into 2 groups of 2.) I have no problem with more than 3 people churning over ideas in the initial discussion of the assignment, but each group should submit one distinct assignment. Please submit a pdf or a word document. Scanned handwritten diagrams are also fine providing they are neat.

Question 1 (5 points)

Explaining the bidding behavior of the banks

The figures in the first class show that roughly speaking banks make bidding forays at different times. If they have not previously bid (or are OUT), when they (re)enter the bidding, they raise the interest rate offer by small increments until they either stop altogether or hit ONM; then they jump and end their foray. Later in the auction, they might reenter if they are pushed OUT because the ONM rate has risen in the meantime:

1. Why do they creep up to ONM from OUT?

   They do that to learn accurately where the ONM is, since they will get a notification when their bid is ONM. A very gradual creeping to ONM avoids overshooting it, and hence they can learn where it is accurately. This allows them to plan their next bids using the most accurate information. It also prevents them from bidding an amount far above the ONM and unnecessarily risking that they leave money on the table.

2. Why do they jump off the ONM to INM?

   Because monitoring an auction is costly, and placing an INM bid allows them to reduce the probability of being kicked OUT by other bidders while they are not looking, hence reducing the monitoring costs.

3. At the 15-minute mark suppose that after creeping upwards to the ONM rate, your value from winning a bid at the current ONM rate exceeds the current ONM rate. Should you bid now or wait for another possible bidding opportunity?

   Passing on a bidding opportunity while one's own current highest bid is ONM makes it more likely to be kicked OUT by other bidders before getting a new opportunity to bid than placing an INM bid. The bank will have to carefully consider how much time is left before the end of the auction. If very little time is left, the risk of being kicked OUT is lower, so the bank can place a lower INM bid or even, in extreme cases, even leave an ONM bid. You should not bid at the ONM rate unless you are willing to monitor every instant of the auction until the end. That's because bidding at the ONM rate gives you no degree of insurance against being kicked OUT by a bid before the end of the auction. If you can't monitor the auction constantly (e.g, you are monitoring a dozen auctions simultaneously) there's a risk of being kicked OUT and not getting to crawl back to the ONM and place a bid before the end. One could make an argument against bidding INM based on the consideration that one individual bid will trigger other bidders to bid, and will lead to a higher final ONM rate. Even considering that effect, in most circumstances, the optimum will be in the middle: do place an INM bid to insure yourself against being kicked out, but not too high to push the ONM rate too high at the end of the auction

4. Alternatively suppose that as you creep up towards the ONM rate, your creeping bid is about to exceed your valuation before you cross the ONM rate. What should you do now?

   The bank should never bid above their valuation, because if they end up losing it will have been for nothing, and if they win they will actually have a negative payoff. So all the bank can do is to keep creeping up until they reach exactly ONM, and then place a bid somewhere between ONM and their own valuation, trying to weigh the risk of being kicked OUT before receiving a further bidding opportunity and the incentive to bid a lower rate. If you placed a bid at the ONM which happens to be equal to your valuation, this should be your last bid.

Question 2 (5 points)

No time limit on the auction, and bankers give all their attention the how the auction proceeds.

Now let us consider a slightly different auction format and different conditions:

1. The auction ends when no further bids are received within a 5 second time elapse. In other words, if another bid is not received within 5 seconds of the most recent bid, the auction

ends, and the CDs are allocated in the same way. This implies the auction might end before or after 30 minutes.

2. All the banks (bidders) pay scrupulous attention to how the auction proceeds. (Perhaps they employ a person or a computer to specialize in this task.) However, this takes up their valuable time; they return to some other task once the auction is over.

As a way of thinking about this new format and discussing it within your own group, you might want to pretend to play such an auction amongst yourselves. Then answer the following questions. First suppose you are a bank.

1. Should you bid if your valuation is higher than the ONM?

   Yes, because if I win then I get a positive payoff, and if I lose, I get zero payoff.

2. How much higher than the ONM rate should you bid? Explain your reasoning.

   The auction might end any time soon, so there is no incentive to jump INM. ONM is defined as the smallest bid that wins a CD if the bidding stops. Therefore, if the bank finds out they are ONM or INM, their bid is enough to win. Given that the bank is paying full attention, they can stay at the ONM rate because they always have a chance bid again if they fall out. Bidding some increment that isn't infinitesimally above ONM leaves money on the table.

3. Should you bid if your valuation is lower than the ONM rate?

   No, because if I win then I get a negative payoff, and if I lose, I get zero payoff.

Compared with the current setup, and explaining your reasoning, do you think:

4. more money or less money be left on the table if this new modified setup is implemented?

   The new setup results in less money left on the table. Since the banks no longer face the risk of losing by bidding ONM, winning banks will end up bidding at or just above the ONM, closer to the highest losing bid.

5. bankers with the highest valuations are more likely to win the auction?

   Yes, because the banks don't have to jump INM, reducing the chances that banks with high valuations lose.

6. the modified auction would be more efficient at allocating the CDs the highest-values-in-use than the setup?

   Yes. All losing banks will have a lower valuation than the ONM, and winning banks will have higher valuation than the ONM, allocating the CDs to the ones with the highest valuation.

Question 3 (5 points)

A two-stage auction

Consider the following mechanism for a two-stage auction. There are initially twenty bidders competing for one object. In the first stage each bidder indicates a minimum amount they are willing to pay for the auctioned item by submitting a minimum bid that only the auctioneer sees. The auctioneer then selects the top three bidders and announces the minimum bid of the fourth highest bidder. The bidders never see the bids of their other rivals from the first stage. Each bidder knows how much they value the auction item. The three bidders are invited to submit a final bid in a sealed first price auction, in which they must bid an amount at least the minimum amount the auctioneer announced but do not have to bid higher than that. This means that each of the top three selected contenders can submit a lower amount final bid than his or her first bid providing the final bid meets the threshold the auctioneer has announced:

1. What should you bid in the first stage?

   Bid close your valuation

2. How should you calculate what to bid in the second stage if you are one of the top three bidders?

   Play the 3-bidder first-price equilibrium with reserve L; if values are uniform, bid $b(v) = L + \frac{2}{3}(v - L)$.