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**Master of Business Administration**

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Course Location: Manhattan Campus

Submission Date: *03/05/2023*

Concept Proposal Title:

**MANAGERIAL ECONOMICS- WEEK 4 NOTES**

**CERTIFICATE OF AUTHORSHIP:**

I certify that I am the author of this paper and that any assistance I receive in its preparation is fully acknowledged and disclosed in this paper. I have also cited any sources from which I used data, ideas, or works, either quoted directly or paraphrased. I also certify that this paper was prepared by me specifically for this course/program.

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**X**

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Professor Comments:

## Managerial Economics

### Week IV-I

#### Chapter 17. Making Decisions with Uncertainty

**Objectives:** Knowing how to quantify uncertainty by replacing known quantities with *random variables*.

##### 17.1 Random variables and probability

The expected value of a random variable that can take on N values is:

$$E\{X\}=p_1 \times x_1 + p_2 \times x_2 + \dots + p_x \times x_n$$

*If a deal seems too good to be true, it probably is.*

##### 17.2. Uncertainty in pricing

If you don't know your demand, you face uncertainty in pricing. One of the easiest ways to model uncertainty is to classify the number and type of potential customers.

##### Price discrimination

Figuring out how to correctly identify low- and high-value customers is critical for any price discrimination scheme.

##### 17.3. Data-driven decision making

(In Amy's example: estimating the casual effect of a treatment X on outcome Y would require us to observe the same group with and without the treatment. Strictly, this is impossible. The same individual cannot be in both groups. Instead, a control group is constructed to be as close an approximation to the treated group as possible. Good analyses are those that are able to construct good controls).

The enemy of a good control is **selection bias**. It occurs when the treatment group differs systematically from the control group. When this occurs, some of measured effect is due to both the causal effect of the treatment (what we want to estimate) as well as "selection bias" (the underlying difference between the two groups). Unless the selection bias is negligible, our estimate could incorrectly suggest a bad decision.

$$\text{Observed effect} = \text{Treatment effect} + \text{Selection bias}$$

Whenever possible, run simple randomized experiments to get unbiased estimates of the treatment effect.

##### 17.4 Minimizing expected error costs

Rather than making decisions that maximize *expected* profits (i.e., those whose *expected* benefits are bigger than their *expected* costs), it is sometimes useful to think instead about minimizing expected "error costs."

$$P = \frac{c_2}{c_1 + c_2}$$

#### Chapter 18. Auctions

Auctions identify the high-value bidder but they also set a price for the item, thereby avoiding costly bargaining.

### 18.1. Oral Auctions

In an **oral auction or English auction**, bidders submit increasing bids until only one bidder remains. The item is awarded to this last remaining bidder.

In auctions, it is the losing bidders who determine the price; the stronger they are, the higher the price.

You get the second highest bid.

*Stronger losing bidders lead to higher winning bids.*

### 18.2. Second-price auctions

A **Vickrey auction or second-price** auction is a type of sealed-bid auction in which bidders submit their bids without knowing the bids of other participants. The item is awarded to the highest bidder, but the winner pays the second-highest bid.

A second-price auction induces bidders to bid more aggressively because their *bid determines only whether they win, not the price they pay*.

The optimal strategy in a second-price auction is to bid exactly your value.

The second-price auction is actually strategically equivalent to the English auction described earlier. In an English auction, everyone is willing to bid up to his or her value, and the highest valued bidder wins at a price equal to (or just above) the second-highest value.

### 18.3 First-price auctions

In a sealed-bid first price auction, the highest bidder wins the item at a price equal to the highest bid. In it, you have to pay the amount you bid. Since bidding exactly your value guarantees zero profit whether you win or lose, each bidder shades his bid; that is, he balances these two effects by bidding below his value. If the competition is stronger, *shade* your value less.

If you win, that is what you pay.

### 18.4. Bid rigging

Collusion happens with the two highest bidders.

- Collusion is more likely in small, frequent auctions than in big, infrequent ones.
- Collusion is more likely in oral auctions than in sealed-bid auctions.
- Collusion is more likely when winning bidders and winning bids are identified.

Collusion can be costly for the auctioneer.

**Backcasting**= The opposite of forecasting

### 18.5. Common-value auctions

In a common value auction, the value is the same for each bidder, but no one knows what it is for sure. Each bidder has only an estimate of the unknown value.

Winning in a common-value is bad news: it means that your estimate was the highest and most optimistic.

**Winner's curse:** when the highest and most optimistic estimate is likely to exceed the actual value, the winner will lose.

The winner's curse does not mean you lost money in an auction. It does mean that you bid incorrectly, and put yourself in a position to lose money, on average.

**To avoid the curse**, you must bid as if your estimate is the most optimistic in the first place. Basically, **you bid as if everyone else thinks the value is less than your estimate**.

The more competitors there are, the more winning is "bad news," and the lower you should bid.

**To avoid the winner's curse, you bid less aggressively as the number of bidders increases.**

The winner's curse is especially bad when rival bidders have better information about the value than you do.

*Oral auctions return higher prices in a common-value setting than sealed-bid auctions.*

One way to release information in a common-value auction is to hold an oral auction.

Oral auctions result in more aggressive bidding and higher prices in common-value auctions.

The source of profit in a common-value auction is the information that you have and that others do not.

## **Chapter 19: The Problem of Adverse Selection**

**Adverse selection:** when one party to a transaction is better informed than the other.

**Lottery:** random variable with a payment attached to each outcome.

A risk neutral consumer values a lottery at its expected value. A risk-averse consumer values a lottery at less than its expected value.

Anticipate adverse selection and protect yourself against it.

When you eliminate **information asymmetry** (when the company knows who is high risk and not), there is no adverse selection.

In financial markets, adverse selection arises when

The winner's curse of common values

### **19.3 screening**

The low risk consumers are not served because it is difficult to transact with them profitably. Adverse selection represents a potentially profitable, but unconsummated, wealth-creating transaction.

Two ways to overcome the obstacles to transacting with low-risk individuals: **screening** and **signaling**

**Screening:** The efforts of the less informed party (the insurance company) to gather information about the more informed party (consumers).

### **19.4 Signaling**

Signaling describes the efforts of the more informed parties (consumers) to reveal information about themselves to the less informed party (the insurance company). A successful signal is one that bad types will not mimic

## **Chapter 20.**

### **Chapter 20.2 Insurance**

Moral hazard means that insured customers exercise less care because they have less incentive to do so.

Anticipate moral hazard and protect yourself against it.

**Moral hazard** means that insured customers exercise less care because they have less incentive to do so. It represents an unconsummated wealth-creating transaction.

**Anticipate** moral hazard and protect yourself against it.

### **20.3 Moral hazard versus Adverse Selection**

What distinguishes adverse selection from moral hazard is the kind of knowledge that is hidden from the insurance company. It arises from hidden actions by the person purchasing insurance.

**Adverse selection** is the problem of separating you from someone else. **Moral hazard** is the problem of separating the good you from the bad you.

**Progressive Snapshot:** If the insurance company could observe whether the customer was exercising care, then it could lower the price of insurance to those taking care.

Information asymmetry is a form of market failure where one party in an economic transaction has more information than the other party. It creates two problems- moral hazard and adverse selection. A moral hazard is a phenomenon where an individual or agent in an economic transaction starts behaving differently after the transaction takes place. Such a change of behavior occurs because the individual or agent starts behaving carelessly as the agent knows that the damage is borne by the other party. Adverse selection is a phenomenon where one party who has more information uses that information to its advantage at the cost of the other party. So, there is more probability of getting bad risks than getting good risks.

A moral hazard occurs when one party participates in a risky activity while being aware that it is protected from the risk and the other party will bear the expense. It happens when the persons involved only have partial knowledge of one another. Revealing plentiful information to the credit-providing entity helps the institution have full information about the borrower. However, this does not ensure that the borrower is engaged in any risky activities. Thus, this situation does not resemble a moral hazard scenario.

