



# Asymmetric Information Problems

BECO-3310 Fall 2025

# 3 important things to know from this class today

- 1. Adverse Selection (before the deal is made)
- 2. Principal-Agent (Agency) Problems
- 3. Signaling Theory

# Asymmetric Information Problems

- In some markets asymmetric information leads to high transaction costs.
- **Asymmetric Information:** when one party to an exchange has different (often more complete) information than the other party involved.

# Asymmetric Information Problems

- Asymmetric information problems can be especially important when...
  - the quality of goods exchanged is difficult to ascertain;
  - the delivery of goods takes place over time;
  - the payment for goods takes place over time.

# Ex: Financial Markets

- **Financial Markets:** markets in which funds are exchanged between lenders and borrowers.
- Asymmetric information is particularly problematic here!
- Why?
  - Information is costly to obtain.

# Ex: Financial Markets

- Lenders have incomplete information about...
  - the expected profitability of a borrower's stated project;
  - what project a borrower actually pursues;
  - whether or not the project actually proves profitable.
- Add onto this the fact financial transactions take place over time, we see that problems of asymmetric information can persist or go undetected (potentially).

# Asymmetric Information Problems

- Asymmetric information can create two broad categories of problems:
  - **1. Adverse Selection (before the deal is made)**
  - **2. Principal-Agent (Agency) Problems (after the deal is made)**

# Adverse Selection

# Asymmetric Information Problems

- Adverse Selection
  - When market mechanisms select individuals who are not beneficial to trade with.
  - When an offer conveys negative information about the good being offered.
- Ex: Financial Markets
  - When bad credit risks are the ones that most actively seek out loans.



STUDENT  
LOANS

# Student Loans

- Students know more about their own abilities, motivation, and career plans than the lender.
- A student who picks a low-paying major, isn't sure about finishing school, or isn't confident in their success is more likely to borrow a lot.

# Student Loans

- Meanwhile, students who are confident, well-prepared, or headed to **high-income careers** may borrow less or avoid loans altogether.
- The lender can't tell who's who before giving out the loan.
- 🙌 **Result:** Riskier students borrow more = lender ends up with a **pool of high-risk** borrowers = adverse selection.



# The “Lemons Problem”



George Akerlof



# The Process: Seller

- Quality is distinguishable beforehand by the seller.

# The Process: Seller

- Quality is NOT distinguishable beforehand by the buyer.

# Numerical Example

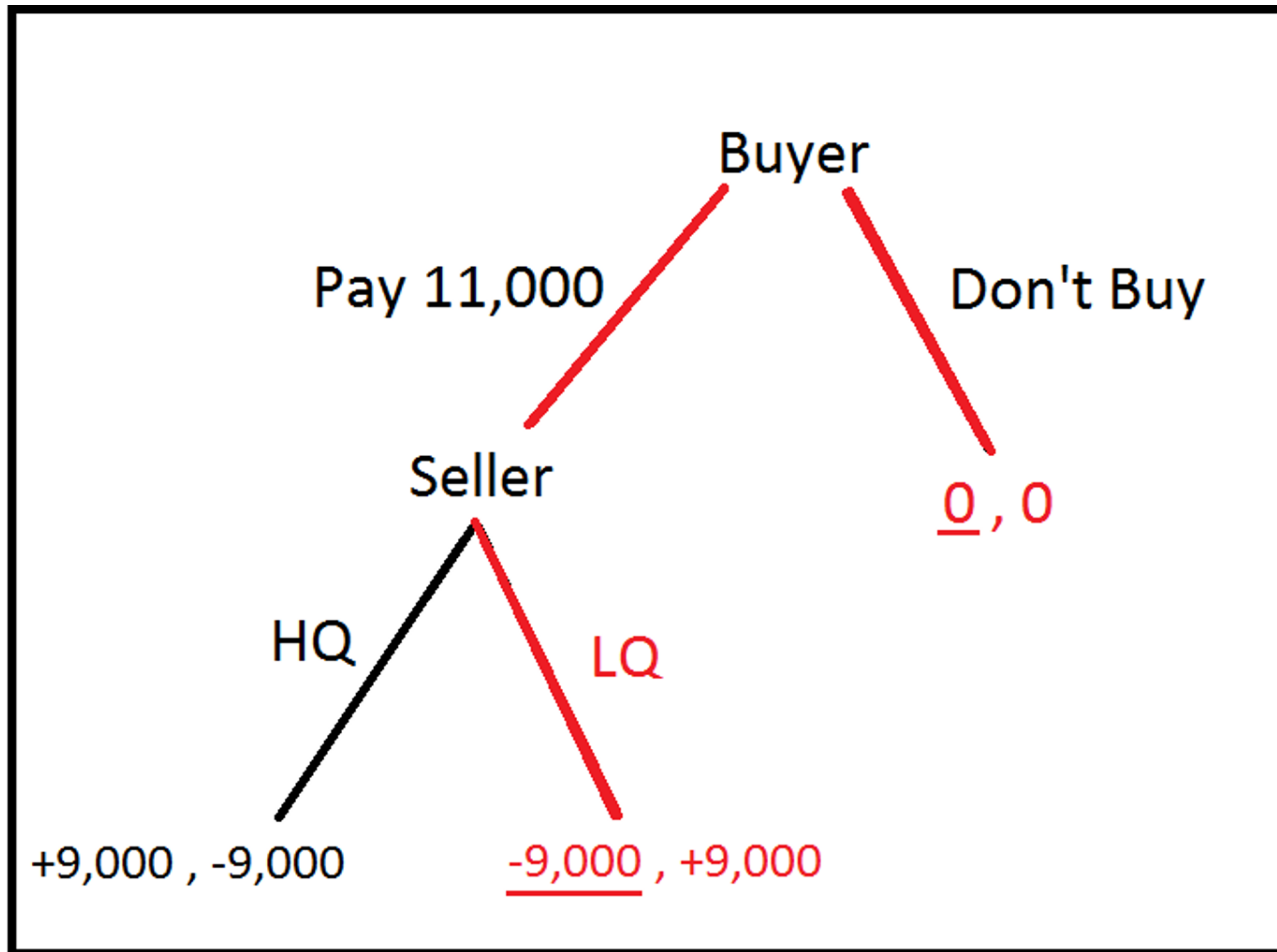
- Two Types of Cars: High (plums) and Low Quality (lemons)
  - Sellers value at slightly less than this and buyers value it at slightly more than this.
- High Quality Worth = 20,000
- Low Quality Worth = 2,000

# Numerical Example

- Buyers: Known that  $\frac{1}{2}$  of cars are high quality.
- Buyers: Known that  $\frac{1}{2}$  of cars are low quality.

# Numerical Example

- How much are buyers willing to pay if they can't know the quality?
- $(\frac{1}{2} * 2,000) + (\frac{1}{2} * 20,000) = 11,000$



# Numerical Example

- Who is willing to sell at a price of 11,000?
- Only LQ cars sold at dealership.



# The Process

- The efficiency problems stem from the exchanges that don't happen because buyers can't distinguish good cars from bad.

# Take Away: Lemons Example

- In the real world, everyone is not equally in the dark.
- In every situation, some people usually know more than others.
- Economists refer to this as asymmetric information.
- If information is not only imperfect but also asymmetric, inefficient outcomes may be the consequence.

# Adverse Selection Solutions?!

- Are we really doomed to “inefficient” outcomes?
- Or have institutions emerged to help mitigate adverse selection?

**CARFAX**

# Vehicle History Report™



Accident Reported



28,200 Reported Miles



6 Service Records



3 Previous Owners



\$160 Above Retail Value





**Angie's list**



**More examples?**

A hand holding a health insurance card against a yellow background. The card has a teal header with a white cross icon and the text 'HEALTH INSURANCE'. The main body of the card is white and contains the name 'JOHN DOE' and the ID number 'AB 51025929502'.

**+** **HEALTH**  
**INSURANCE**

**JOHN DOE**  
ID NUMBER: AB 51025929502

# More examples:

- Health Insurance
  - Sick people are more likely to buy insurance.
  - Healthy people might skip it if the price is too high.
  - The insurance company can't tell who's healthy or sick. 🙅 Result: They set higher prices, and mostly sick people buy it = bad mix of customers.

# More examples:

- Online Dating Profiles
  - People who exaggerate or lie about themselves might use dating apps more.
  - The person on the other side can't tell who's genuine. 🙅 Result: People may avoid online dating or waste time with bad matches = bad pool of choices.

# More examples:

- **Job Market for Used Workers:** A company wants to hire a worker.
  - Some good workers got laid off unfairly. Some got fired for being terrible.
  - The employer can't tell who's who.
    - 🙅 Result: Might avoid hiring anyone laid off = **misses good workers.**

# Principal-Agent Problems

# Asymmetric Information Problems

- **Principal-Agent Problem**

- When an individual (agent) contracts to act in the interests of another (principal) but lacks the incentives to do so.
- Hint: The agent is always the one “acting.”

- **Ex: Financial Markets**

- When borrowers' incentives are not aligned with those of lenders.

# Principal-Agent Problems

- Particularly important when transactions that are carried out over time.
  - Hence their importance in financial markets.
  - The incentives of a principal and an agent can be misaligned.
  - Monitoring an agent over time is costly.
  - In financial markets, this creates moral hazard.

# Principal-Agent Problems

- **Moral hazard:** when an agent takes on more risk than the principal desires because the latter bears the costs of that risk.
- Agency problems arise, for example, between ...
  - borrowers and lenders;
  - stockbrokers and their clients;
  - investment bankers and firms whose IPOs they underwrite;
  - corporate executives and the corporation's stockholders.

# Moral Hazard Solutions?

- Are we really doomed to the risk of ambitious agents?
- Or have institutions emerged to help mitigate moral hazard?



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**Angie's list**





**College  
Board**



# Incentives Matter!

- Overcoming moral hazard by creating better incentives:
  - Incentivize sellers not to exploit (e.g., splitting selling services, requiring an inspector).
  - Seek second opinions (e.g., doctor's visits).
  - Better align buyer/seller incentives (e.g., lawyers & contingency fees).

# More examples:

- **Babysitter Example:**
  - You hire a babysitter to watch your kid.
  - You go out.
  - The babysitter watches TV and lets the kid stay up all night. 🙅 You're the **principal**, the sitter is the **agent** — they didn't act in your best interest.

# More examples:

- **Mechanic Fixing Your Car**
  - You don't know much about cars.
  - The mechanic says: "You need a new transmission" (expensive!).
  - You can't really check, so you just pay. 🙏 You trusted them, but they may overcharge = classic **agency problem**.

# More examples:

- **Employee at Work**
  - You pay your worker a salary.
  - You expect 8 hours of work.
  - But they scroll social media when you're not around. 🙅 You can't monitor them all the time = **agency problem.**



Pay by hour,  
or by lawn?


# Signaling Theory



# Signaling Theory:

- It's all about sending a message to reduce asymmetric information.
- When one side of a deal **knows more** than the other (asymmetric info), they can **send a signal** to show they're high quality or trustworthy.
- BUT — for the signal to **work**, it must be **costly or hard to fake**, so **only the good types** will bother sending it.

# Classic Example: Job Market

- You're a smart and hardworking person.
- Employers don't know that — they see a bunch of resumes.
-  You get a college degree. That's your signal.

# Classic Example: Job Market

- Why? It's hard and expensive, so only motivated people usually do it.
- Now employers think: "Ah, this person must be capable."
- 🙌 Even if the job doesn't use what you studied, the degree signals ability.

**What would be a good signaling  
for someone selling a car?**

- Let's go back to the adverse selection lemon market:
  - Sellers of good cars want to signal that their car is NOT a lemon.
- They might offer:
  - A warranty
  - A car history report
  - Let you take it to a mechanic
- 🙌 These are signals of a good car — costly for lemon sellers to fake.

**Is signaling good?**

# 3 important things to know from this class today

- 1. Adverse Selection (before the deal is made)
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**End of class.  
Thank you for your attention.**