



Asymmetric Information

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Asymmetric Information

ASYMMETRIC INFORMATION

occurs when the available information is initially distributed in favor of one party relative to another in an exchange

-one party has more information than another

- There are two specific manifestations related to asymmetric information in markets:
 - Adverse selection
 - Moral hazard



Asymmetric Information

- There are two specific manifestations related to asymmetric information in markets:
 - Adverse selection
 - Moral hazard
 - The videos from Marginal Revolution University are a great overview of asymmetric information



Asymmetric Information: Adverse selection

- **Adverse selection** refers to situations where individuals have **hidden characteristics or ‘types’** where the selection process results in a pool of individuals with undesirable characteristics
 - In this context, a *hidden characteristic* is something that one party to a transaction knows about itself, but which are unknown by the other party

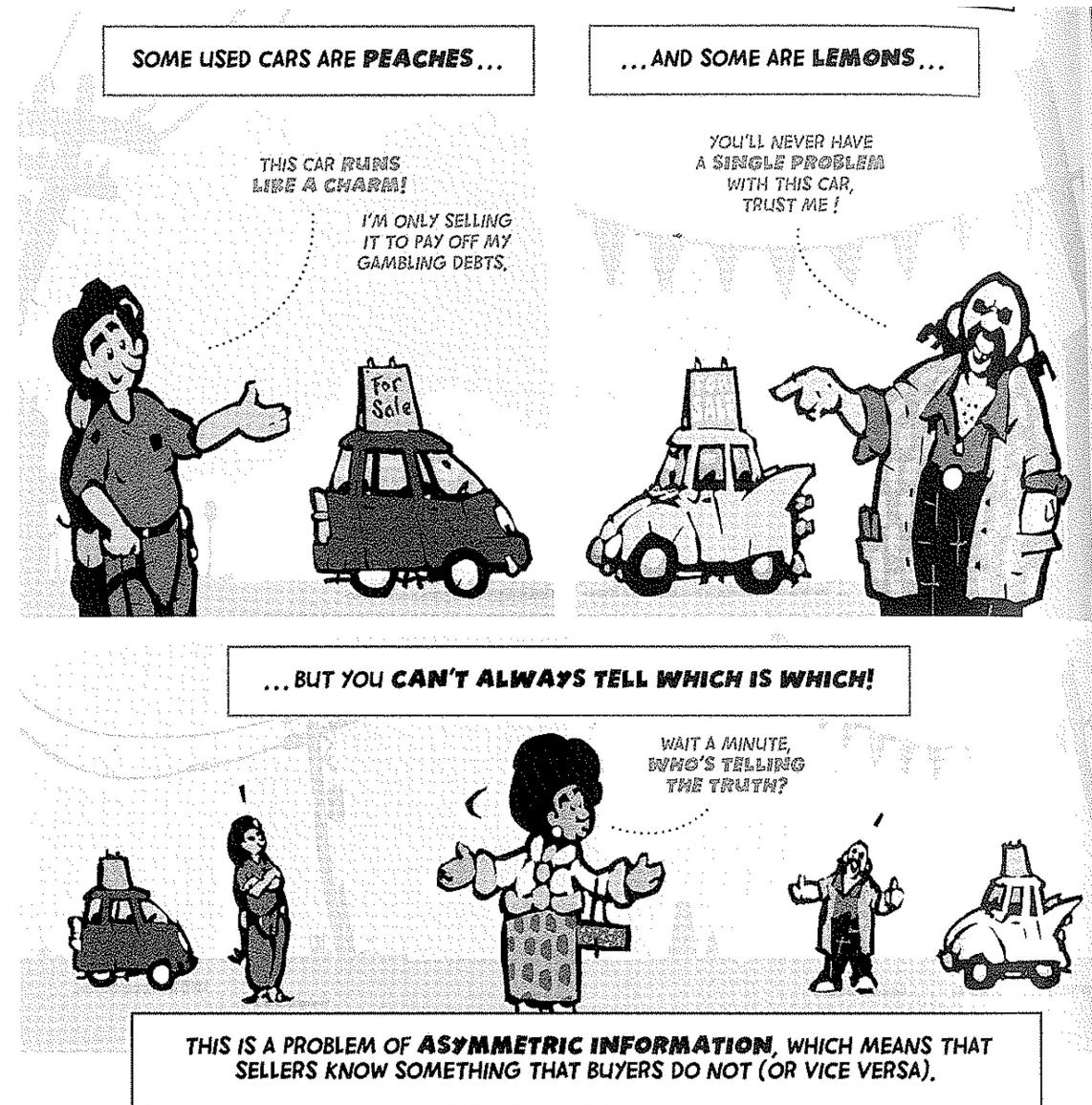


Asymmetric Information: Used cars

- Bought a new car for \$25,000
- About a month later you decide that you would be much happier with your old car and the money.
- Try to return the car to the dealership
 - perfect condition and less than 1,000 miles
 - salesman offers you about \$20,000
- The problem is that a potential buyer is going to be skeptical. Why is that new car being sold? **Is it a lemon?**



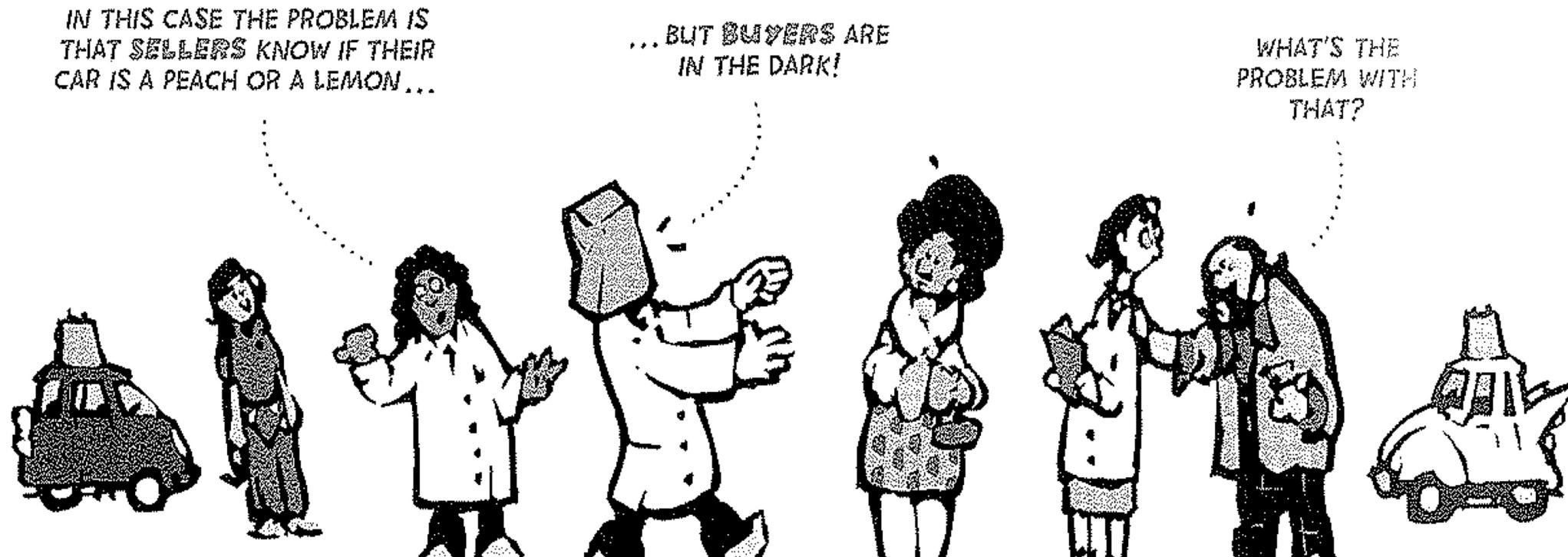
Asymmetric Information: Used cars





Asymmetric Information: Used cars

THIS IS A PROBLEM OF **ASYMMETRIC INFORMATION**, WHICH MEANS THAT SELLERS KNOW SOMETHING THAT BUYERS DO NOT (OR VICE VERSA).





Asymmetric Information: Lemons problem

- Sellers are at an information advantage over potential buyers when selling a car
 - Have more information about the quality of the car than does the potential buyer.
- Potential buyers know that sellers are more likely to sell a lemon.
 - As a result, potential buyers will offer a lower price than they would if they could be certain of the quality.
- This is known as the *lemon problem*.



Asymmetric Information: Lemons problem

- If the quality detection costs are sufficiently high, **a solution** is to price all used cars as if they are **average quality**
- That is, used cars of the same year, make, and model generally will be offered at the same price, regardless of their known conditions



Asymmetric Information: Lemons problem

- Buyer assumes average quality
 - Offers average price
- Seller knows quality, whether they have a lemon
 - Low quality cars -> benefit from ave. price
 - High quality cars -> harmed by ave. price
- Incentive for sellers
 - High quality cars rationally leave the market
 - Only low quality cars left

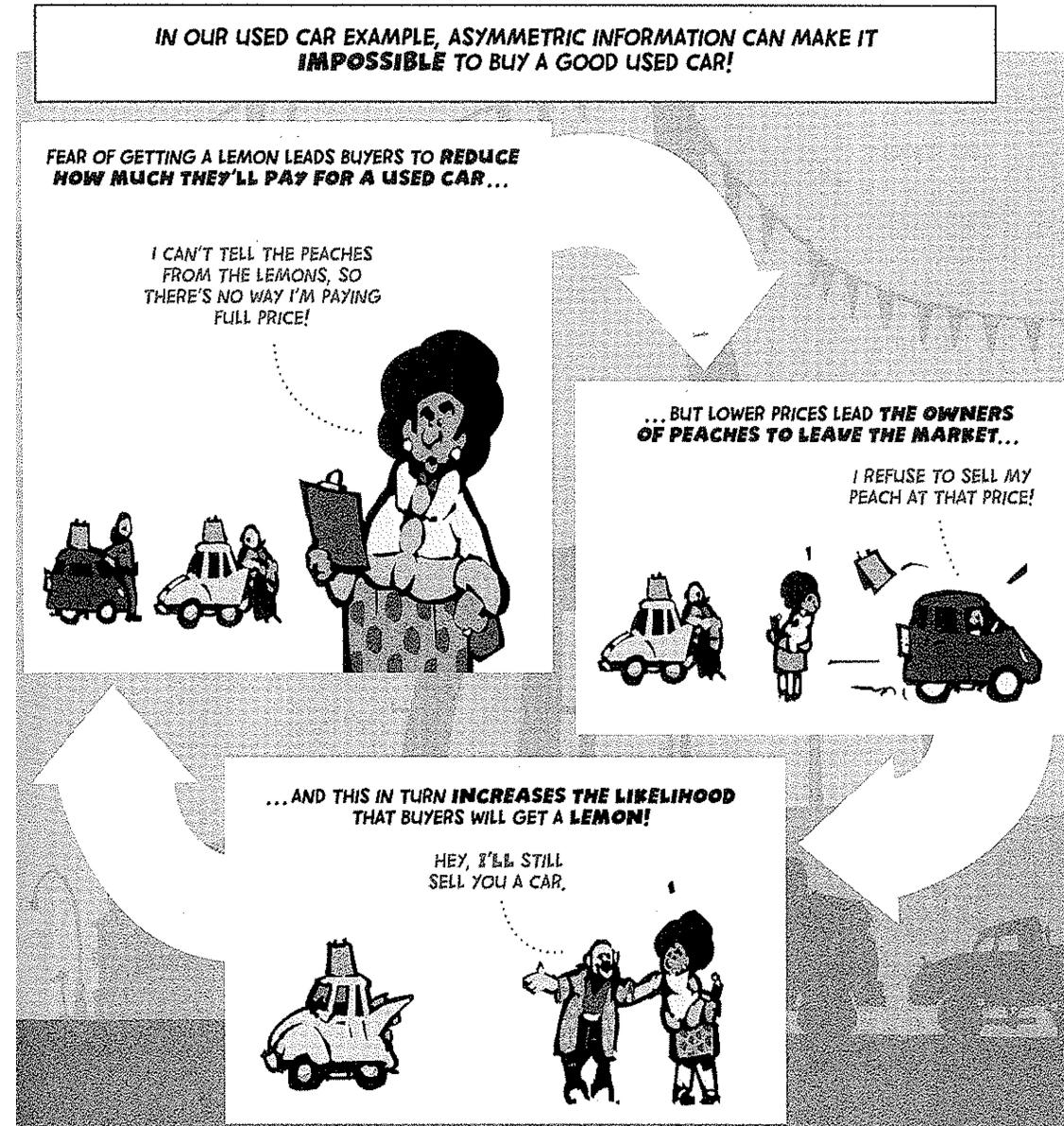


Asymmetric Information: Lemons problem

- Given the logical response of sellers of cars of higher-than-average quality
 - The average quality of used cars on the market will fall
 - The bad cars will “drive” the good cars out of the market

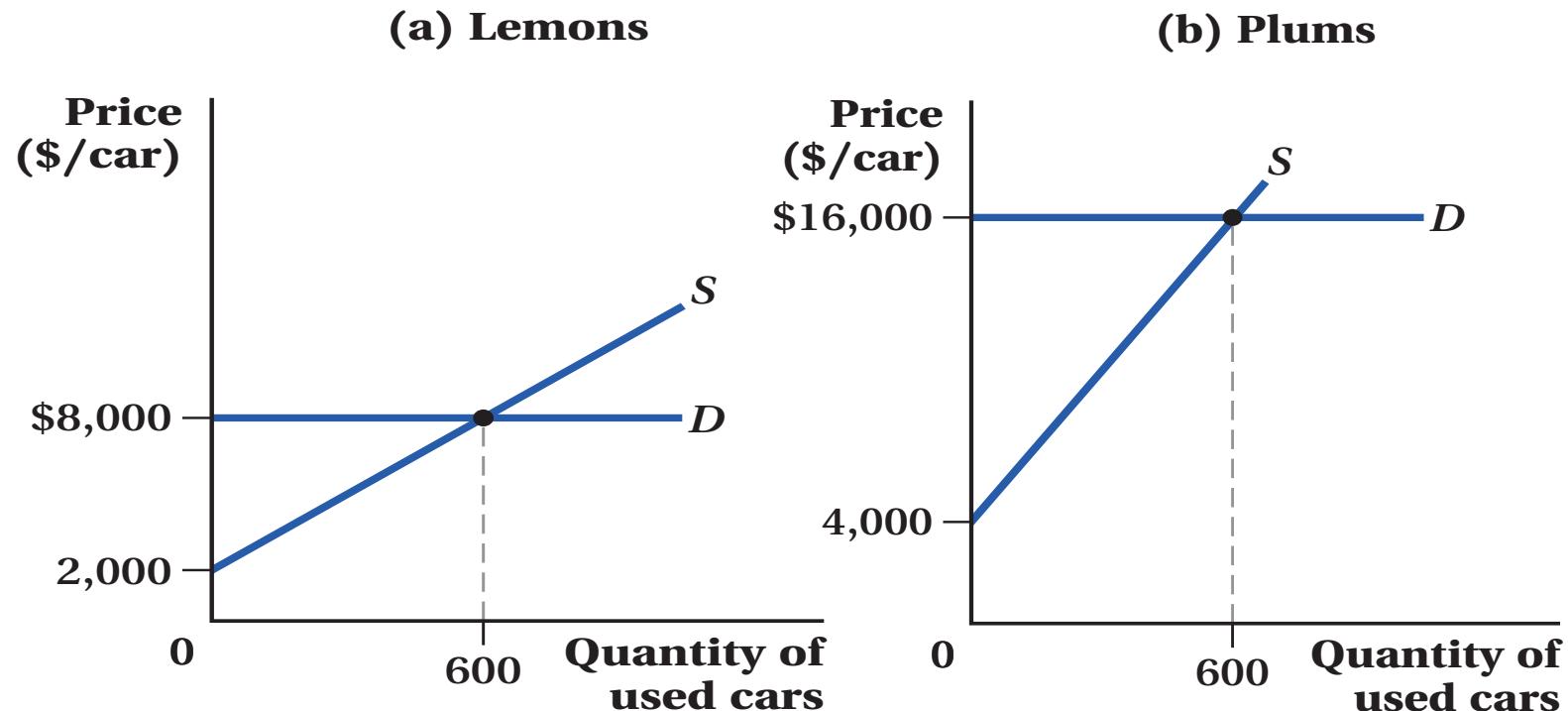


Asymmetric Information: Lemons problem



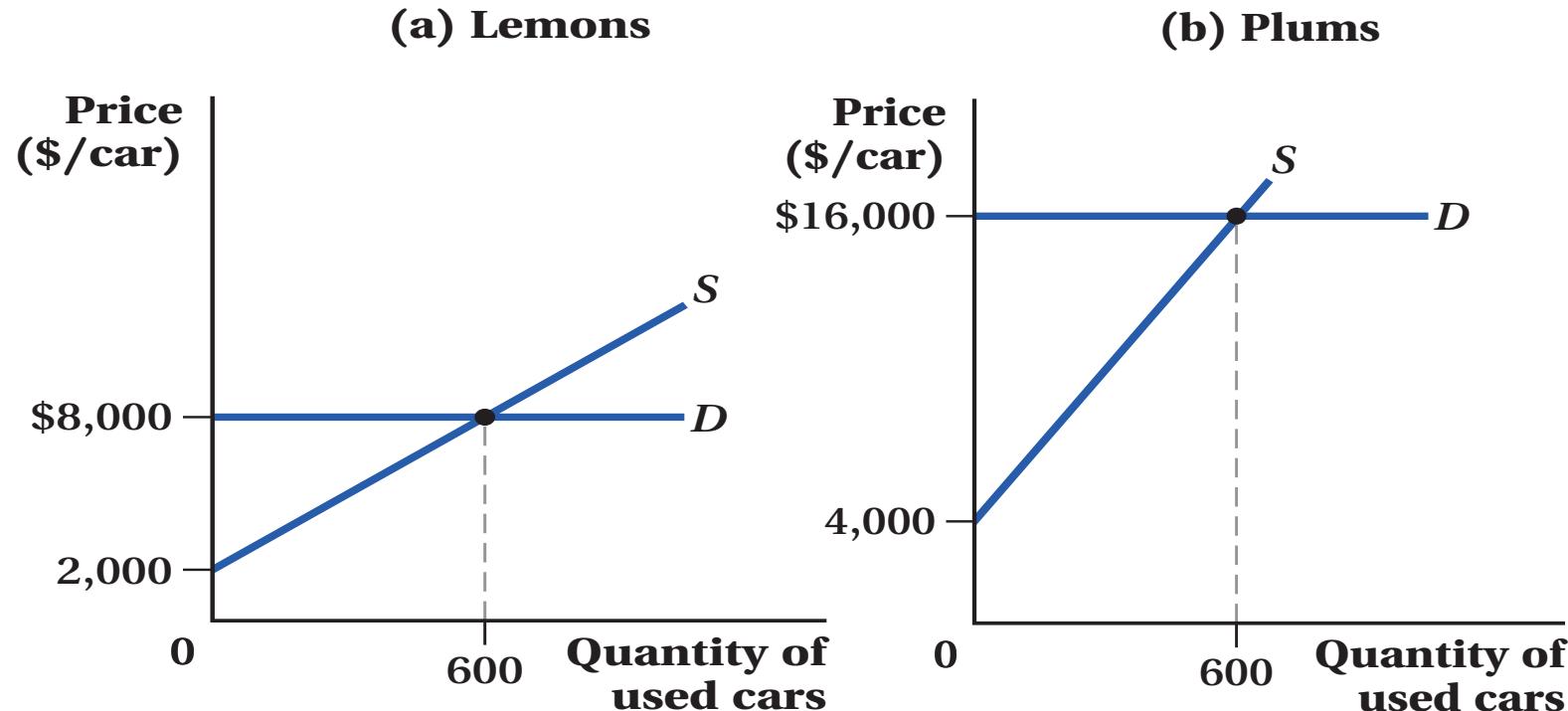


Asymmetric Information: Lemons problem





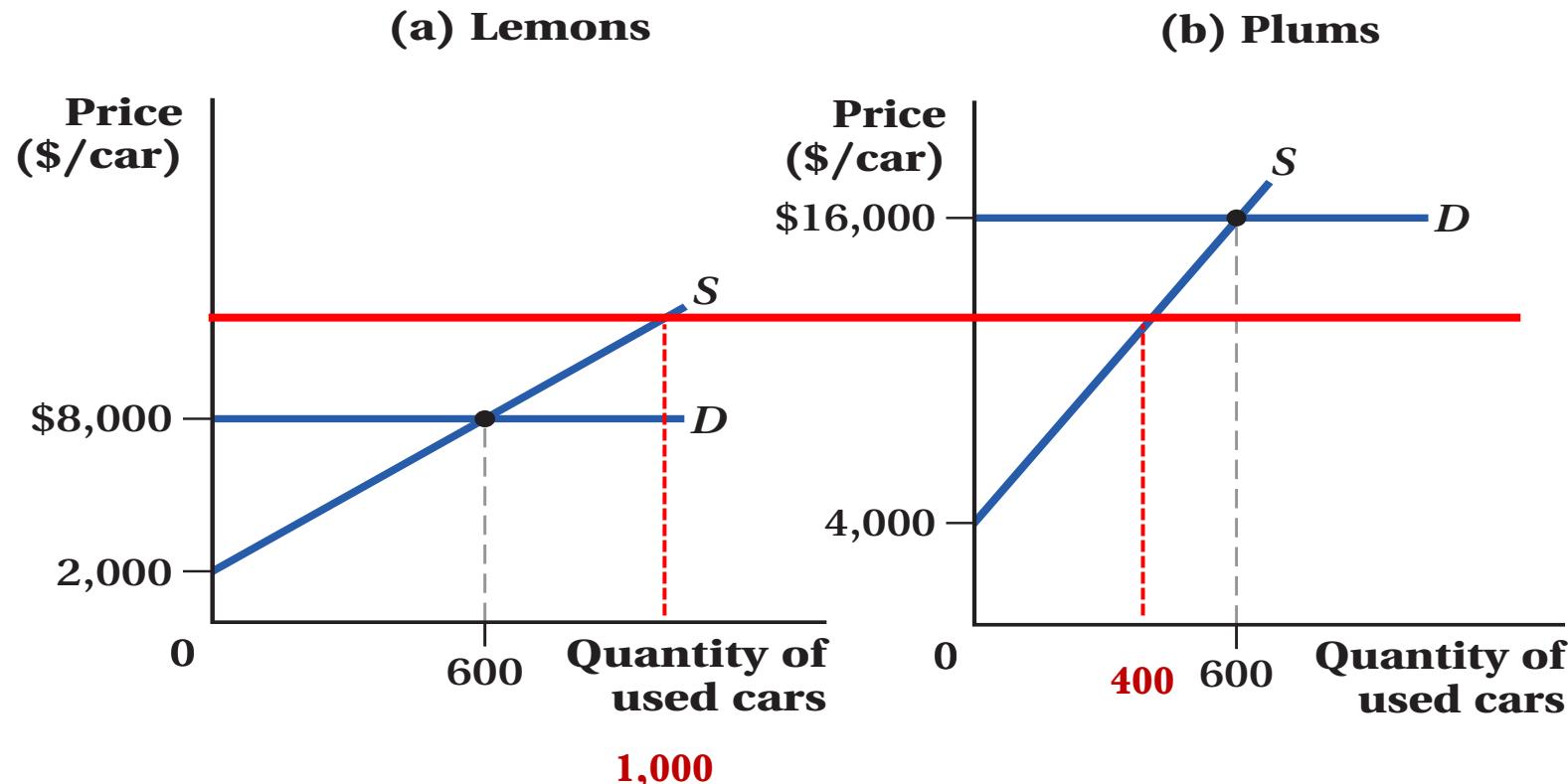
Asymmetric Information: Lemons problem



- Suppose that buyers thinks the chance of getting a lemon is 50%, but are unable to tell whether a car is a lemon or a plum. What is the expected value of a used car to a buyer? What is the quantity of each car available?



Asymmetric Information: Lemons problem



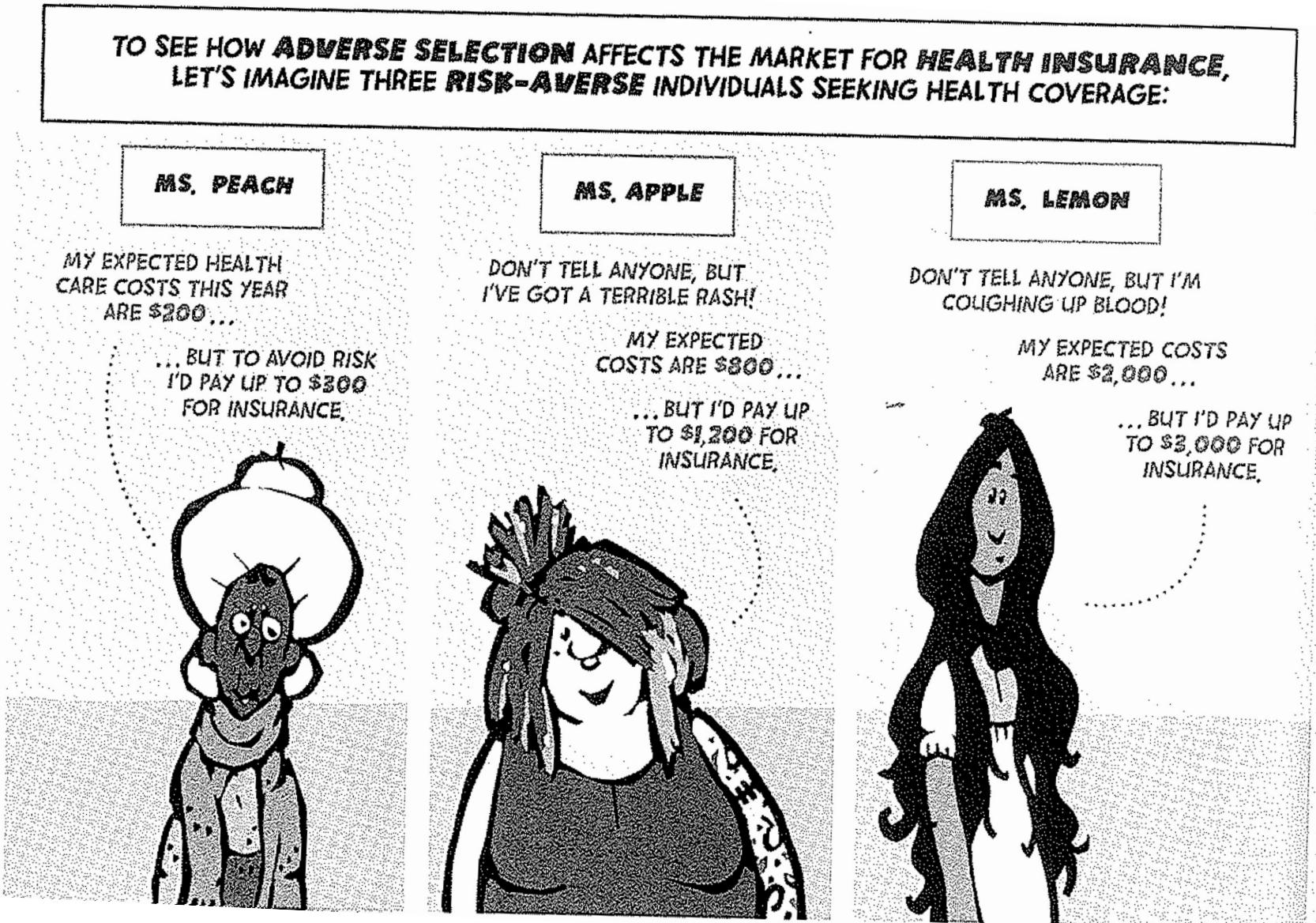


Asymmetric Information: Health Care

- Next, let's look at one aspect of health care
 - The individual mandate

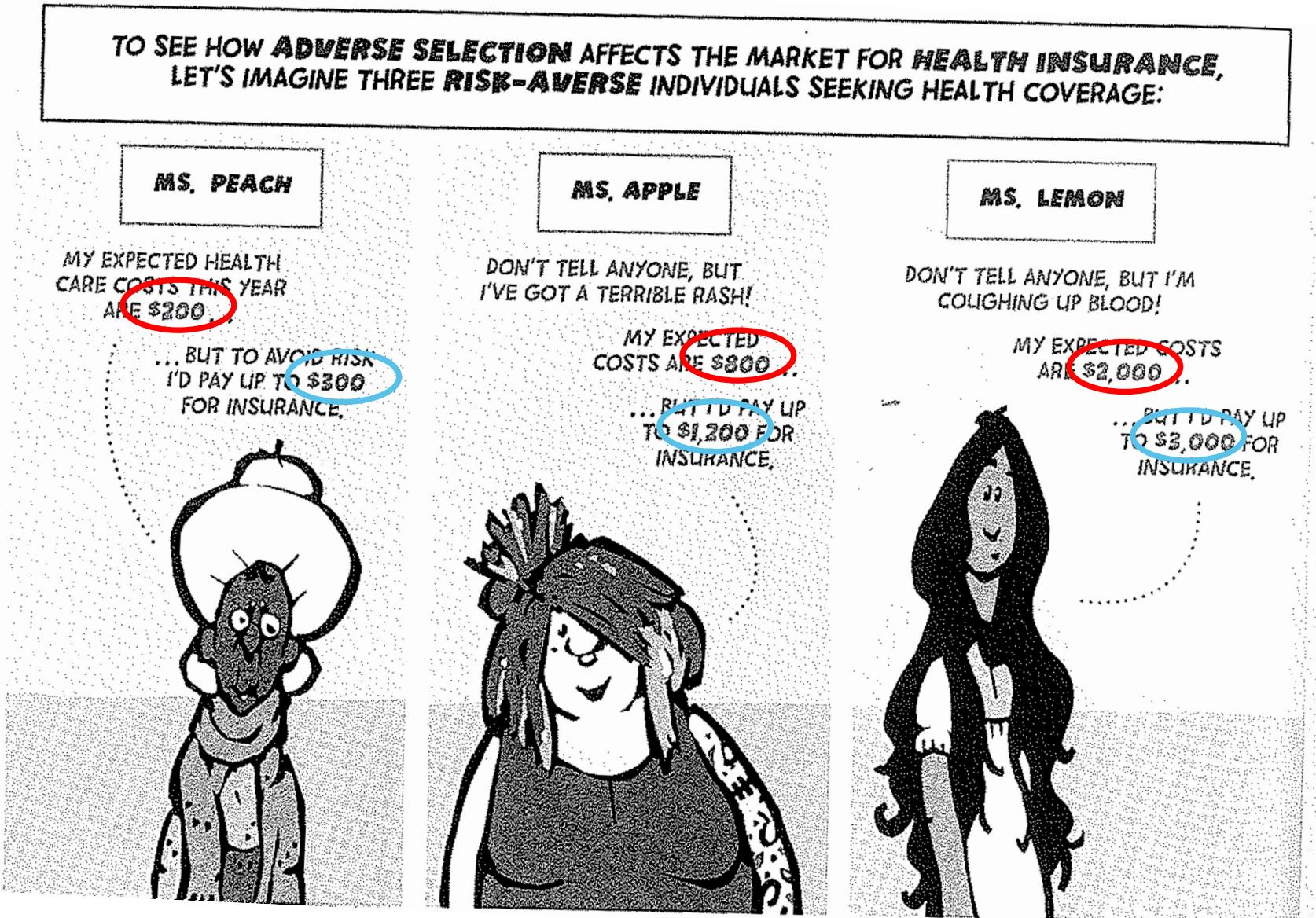


Asymmetric Information: Health Care



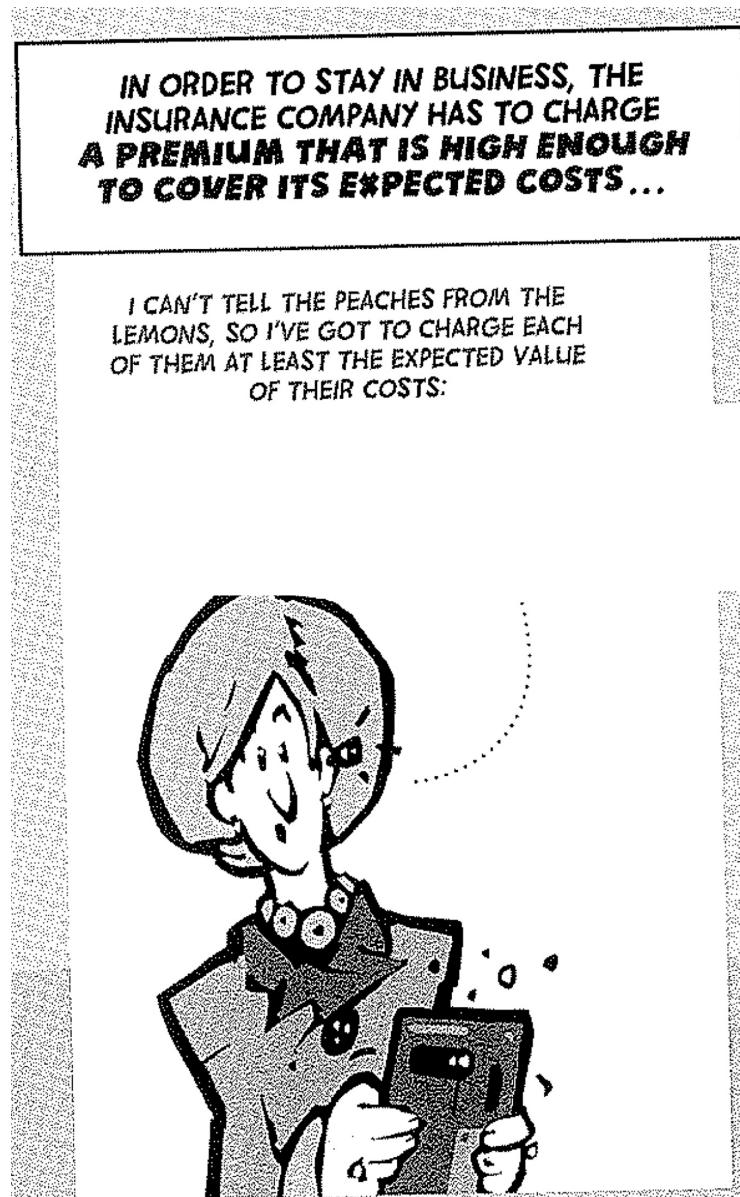


Asymmetric Information: Health Care



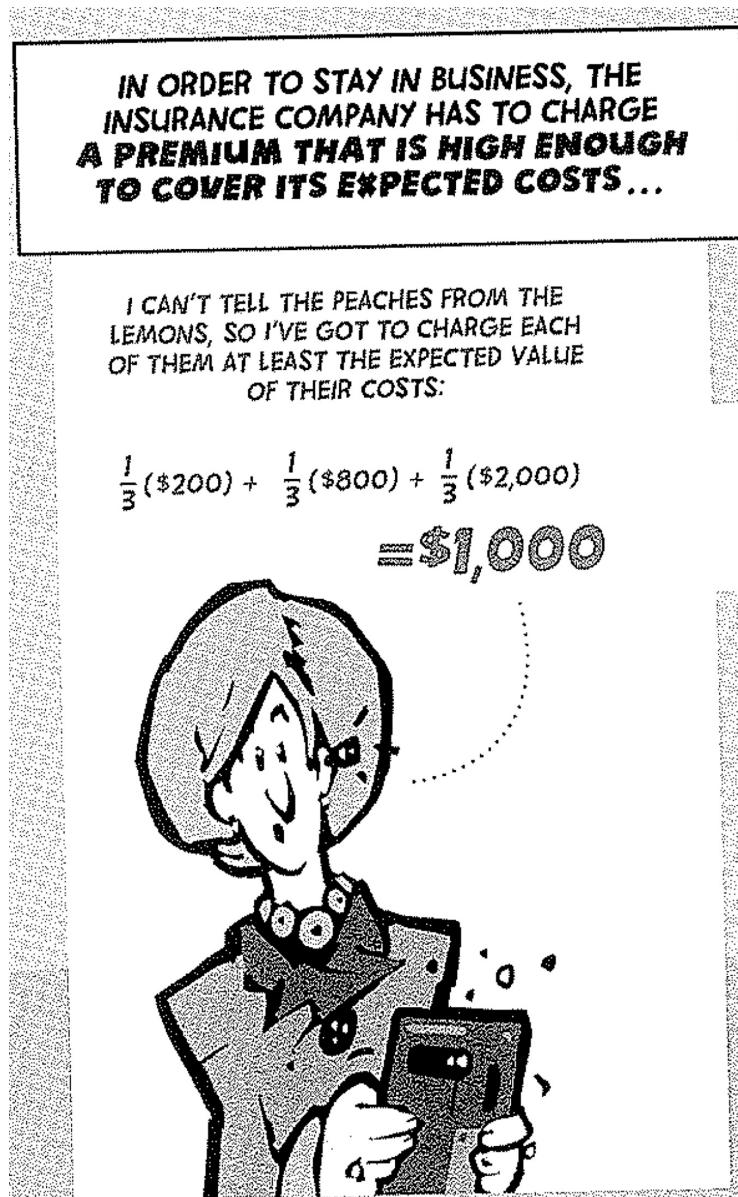


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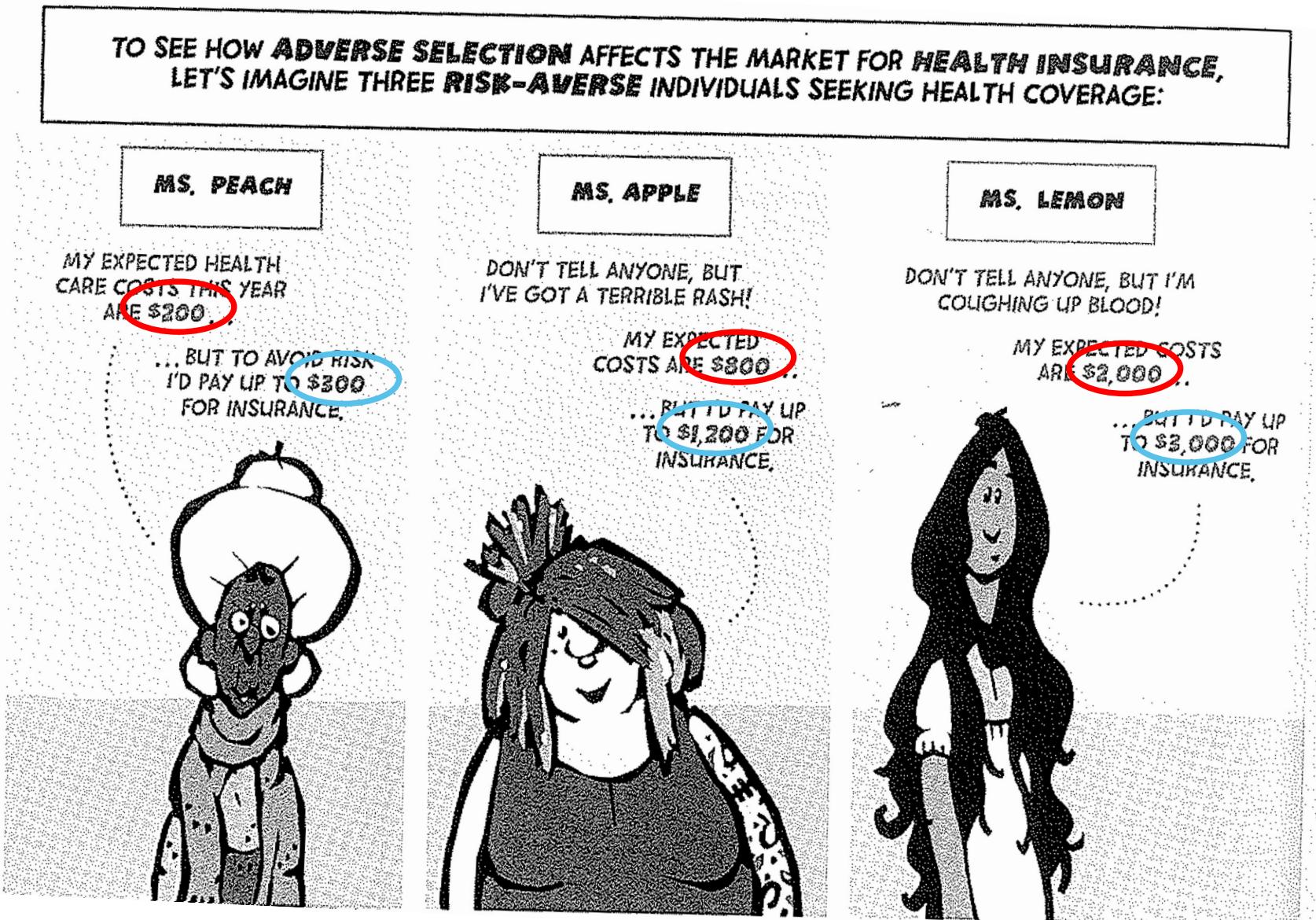


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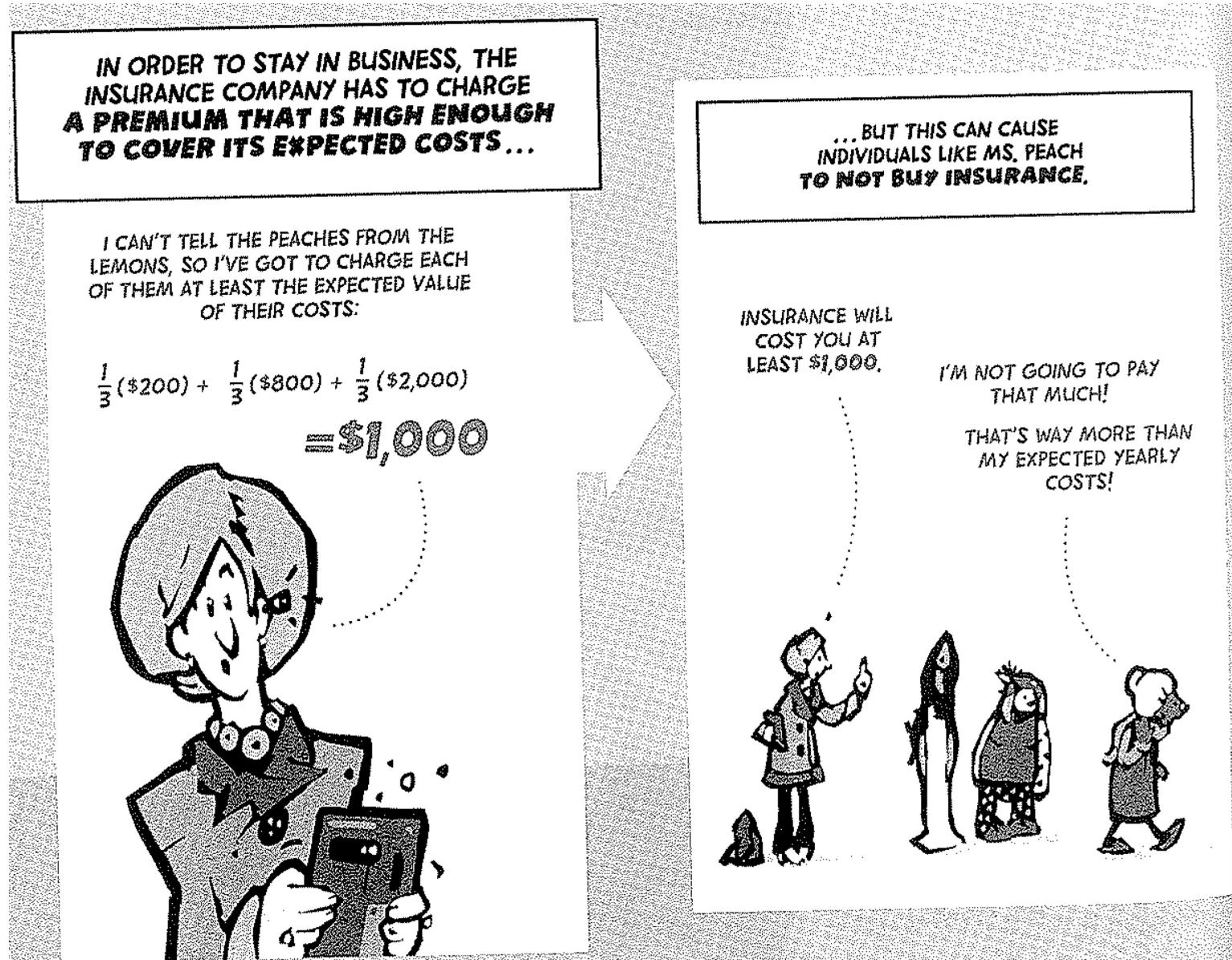


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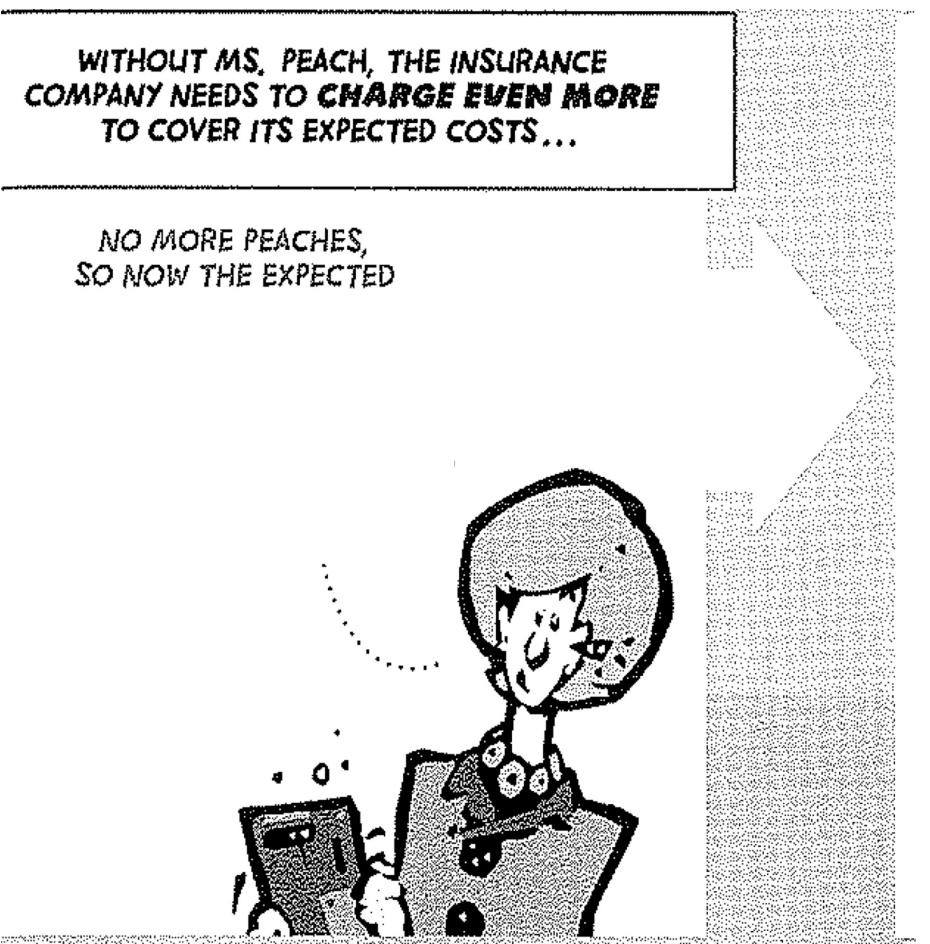


Asymmetric Information: Health Care





Asymmetric Information: Health Care





Asymmetric Information: Health Care

WITHOUT MS. PEACH, THE INSURANCE COMPANY NEEDS TO **CHARGE EVEN MORE** TO COVER ITS EXPECTED COSTS...

NO MORE PEACHES,
SO NOW THE EXPECTED
COST IS:

$$\frac{1}{2} (\$800) + \frac{1}{2} (\$2,000)$$

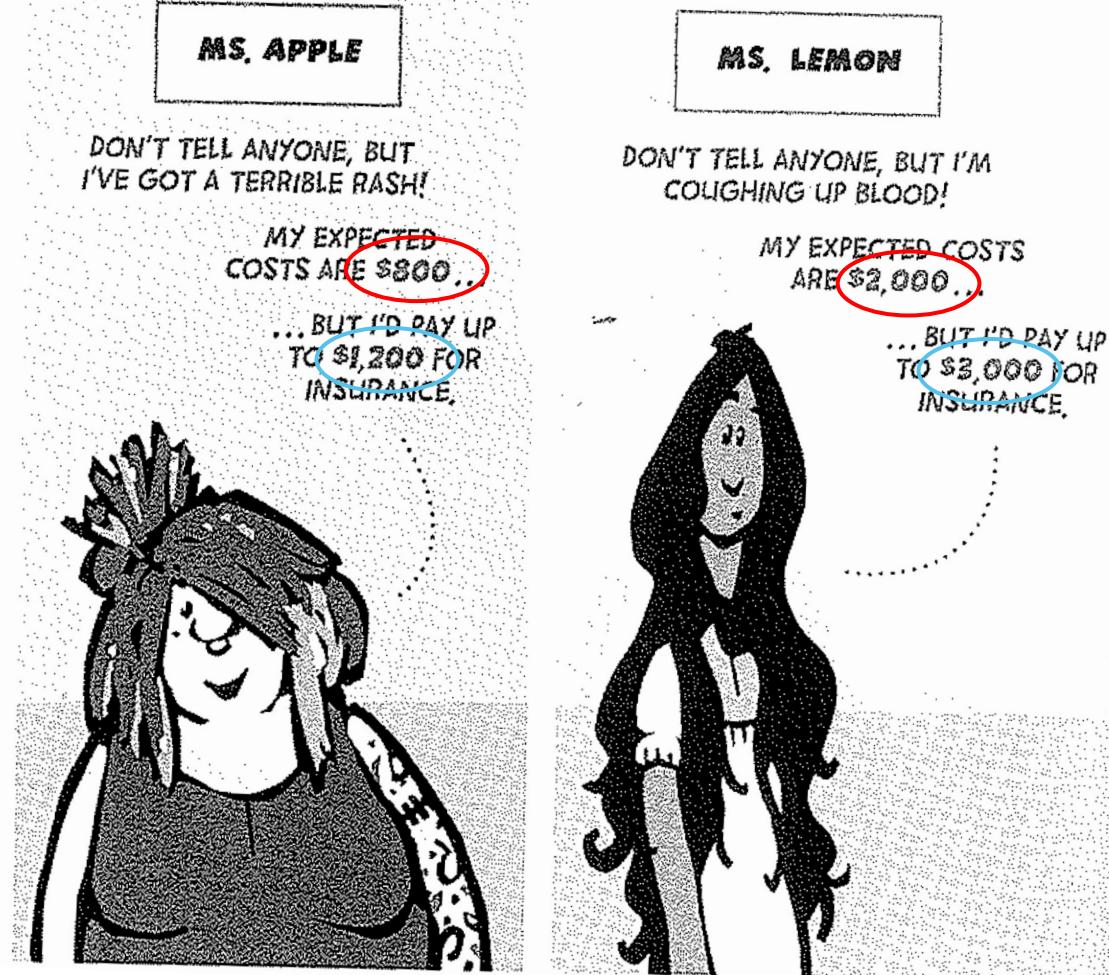
= \$1,400!





Asymmetric Information: Health Care

TO SEE HOW **ADVERSE SELECTION** AFFECTS THE MARKET FOR **HEALTH INSURANCE**,
LET'S IMAGINE THREE **RISK-AVERSE** INDIVIDUALS SEEKING HEALTH COVERAGE:





Asymmetric Information: Health Care

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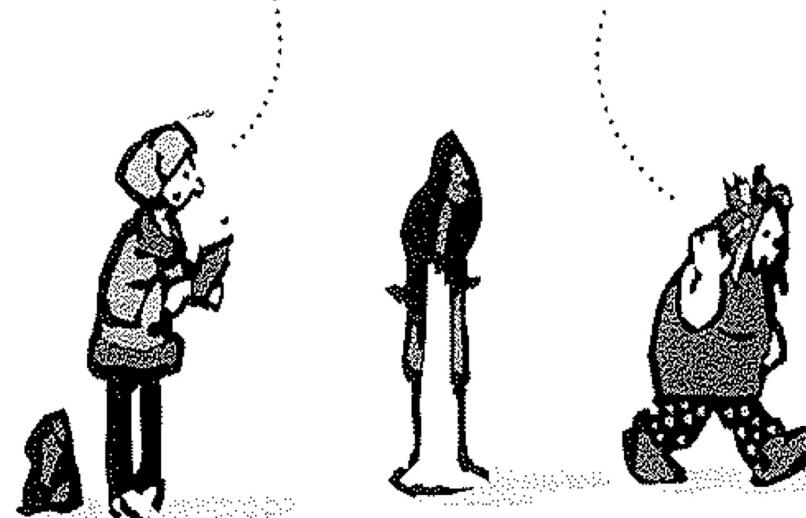
= \$1,400!



...BUT THIS CAN CAUSE THE MARKET TO UNRAVEL FURTHER.

INSURANCE WILL COST YOU AT LEAST \$1,400.

I'M WILLING TO PAY \$1,000, BUT \$1,400 IS TOO MUCH FOR ME!





Asymmetric Information: Health Care

THE END RESULT IS THAT EVEN **HEALTHY PEOPLE**
CAN'T GET INDIVIDUAL INSURANCE AT A REASONABLE PRICE!

THIS BRINGS US BACK TO
THE BIG QUESTION IN
MICROECONOMICS:

**UNDER WHAT
CIRCUMSTANCES
DOES INDIVIDUAL
OPTIMIZATION LEAD TO
OUTCOMES THAT ARE
GOOD FOR THE
GROUP AS A
WHOLE?**





Asymmetric Information: Health Care

- The individual mandate forces the ‘healthy’ population to stay in the market
- If they leave the market because the premium is too high, then the whole market starts to unravel
- Allows for insurance with pre-existing conditions, etc.



Asymmetric Information: Moral Hazard

- **Moral hazard** refers to a situation where one party to a contract takes a **hidden action** that benefits his or her at the expense of another party
- In this context, a *hidden action* is an action taken by one party in a relationship that cannot be observed by the other party



Asymmetric Information: Moral Hazard

- Moral hazard occurs after an exchange
 - Individuals who are insured against a cost have reduced incentives to take precautions against those costs



Moral Hazard Examples

- Banks (too big to fail)
 - Make risky decisions if believe the govt. will “bail you out”
- Health insurance
 - Use tobacco after you buy life insurance
- Buy full coverage car insurance
 - Lower incentive to drive carefully
 - Don’t install an alarm system



Moral Hazard Graph

- Nuisance flooding in Hampton Roads



- It's cheap to purchase sandbags, etc.
- More expensive to install concrete barriers and a flood gate to protect the whole property
- Benefits decline the more precautions you take i.e. diminishing marginal returns to precaution



Moral Hazard Graph

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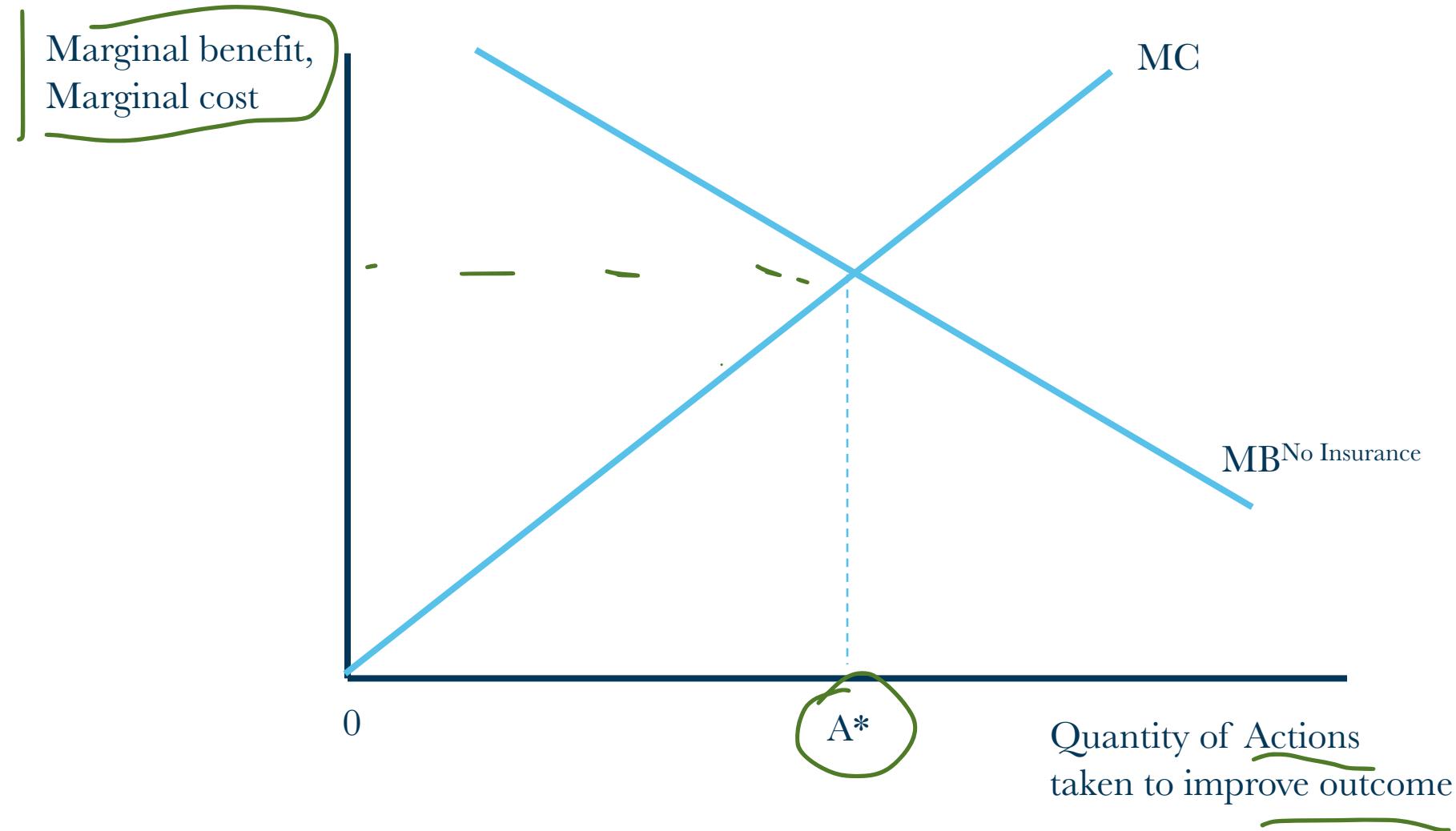


Moral Hazard Graph

- Nuisance flooding in Hampton Roads
 - It's cheap to purchase sandbags, etc.
 - More expensive to install concrete barriers and a flood gate to protect the whole property
 - Benefits decline the more precautions you take i.e. diminishing marginal returns to precaution
- What is the optimal quantity of precautions you should take if flood insurance were not available?
- Suppose you can obtain an insurance policy that covers half of the losses you might face What is your new optimal level of precaution?
- What is your level of precaution if you had full flood insurance for your house and belongings?

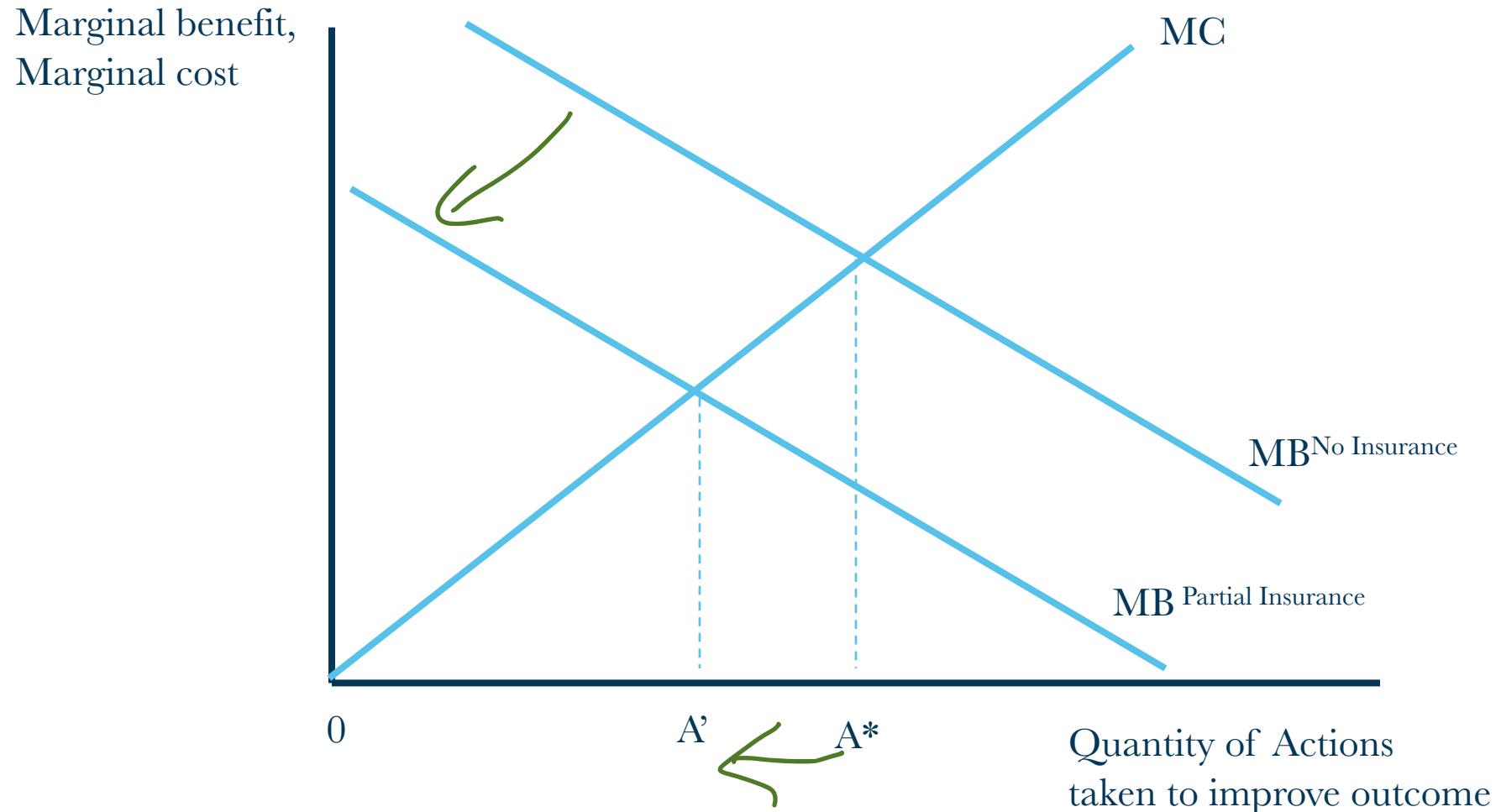


Moral Hazard Model / Graph



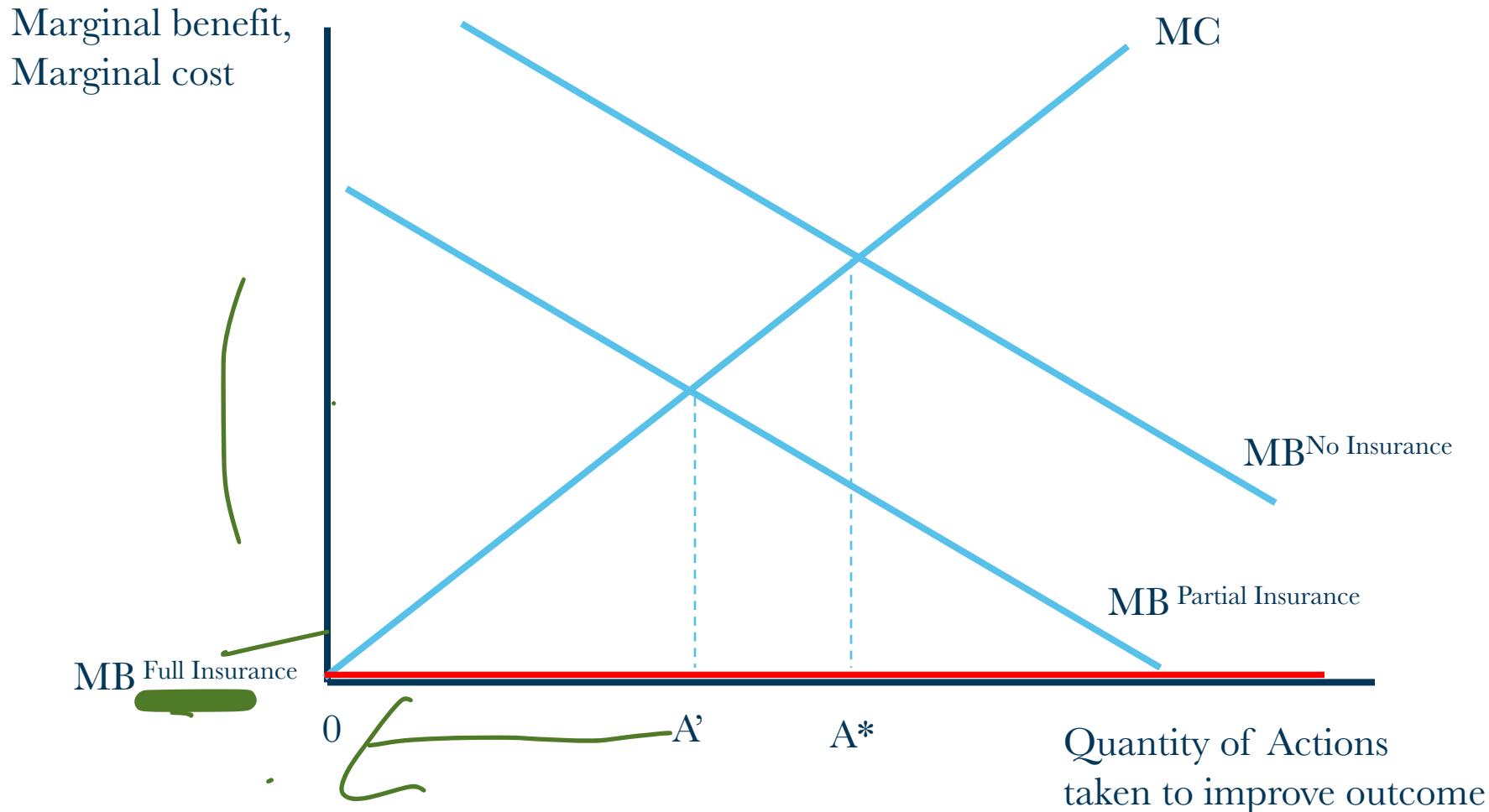


Moral Hazard Model / Graph





Moral Hazard Model / Graph





The Effects of Naloxone Access Laws on Opioid Abuse, Mortality, and Crime*

Jennifer L. Doleac

Anita Mukherjee

September 17, 2021

The U.S. is experiencing an epidemic of opioid abuse. In response, states have implemented a variety of policies including increased access to naloxone, a drug that can save lives when administered during an overdose. There is a concern that widespread naloxone access may unintentionally lead to increased or riskier opioid use by reducing the risk of death from overdose, however. In this paper, we use the staggered timing of state-level naloxone access laws as a natural experiment to measure the effects of broadening access to this lifesaving drug. We find that broadened access led to more opioid-related emergency room visits and more opioid-related theft, with no net measurable reduction in opioid-related mortality. We conclude that naloxone has a clear and important role in harm-reduction, yet its ability to combat the opioid epidemic's death toll may be limited without complementary efforts.

JEL Codes: I18, K42, D81

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**"The Moral Hazard of Lifesaving Innovations:
Naloxone Access, Opioid Abuse, and Crime."**

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Solutions

- Several mechanisms to overcome asymmetric information problems
 - Reputation and standards
 - Signaling
 - Screening
 - Mitigating moral hazard



Reputation and Standardization

- One method that sellers can use to convince potential buyers that their products are high quality is reputation.
 - E.g. a sellers reputation (stars) on Ebay
- Standardization
 - For example, a restaurant or a motel on a desolate highway. Customers have little idea of the quality of food, the probability of bedbugs, and so on. In this case, standardization is important. A national restaurant or a motel chain provides standardization.



Reputation and Standardization





Reputation and Standardization





Signaling

- *Signaling* is an attempt by an informed party to send an observable indicator of his or her hidden characteristics to an uninformed party
- For signaling to be effective it must be:
 - observable by the uninformed party.
 - a reliable indicator of the unobservable characteristic(s) and difficult for parties with other characteristics to easily mimic.



Signaling

- Sellers can sometimes signal their quality level to buyers
 - Signaling reduces the information costs associated with asymmetric information
- E.g. a car dealership might signal the quality of a used car by providing a Carfax report



Signaling

- Signaling and the job market
- The seller of labor (potential employee):
 - More information about her work ethic and reliability than the buyer of labor (potential employer).
- Weak signal: Suiting up

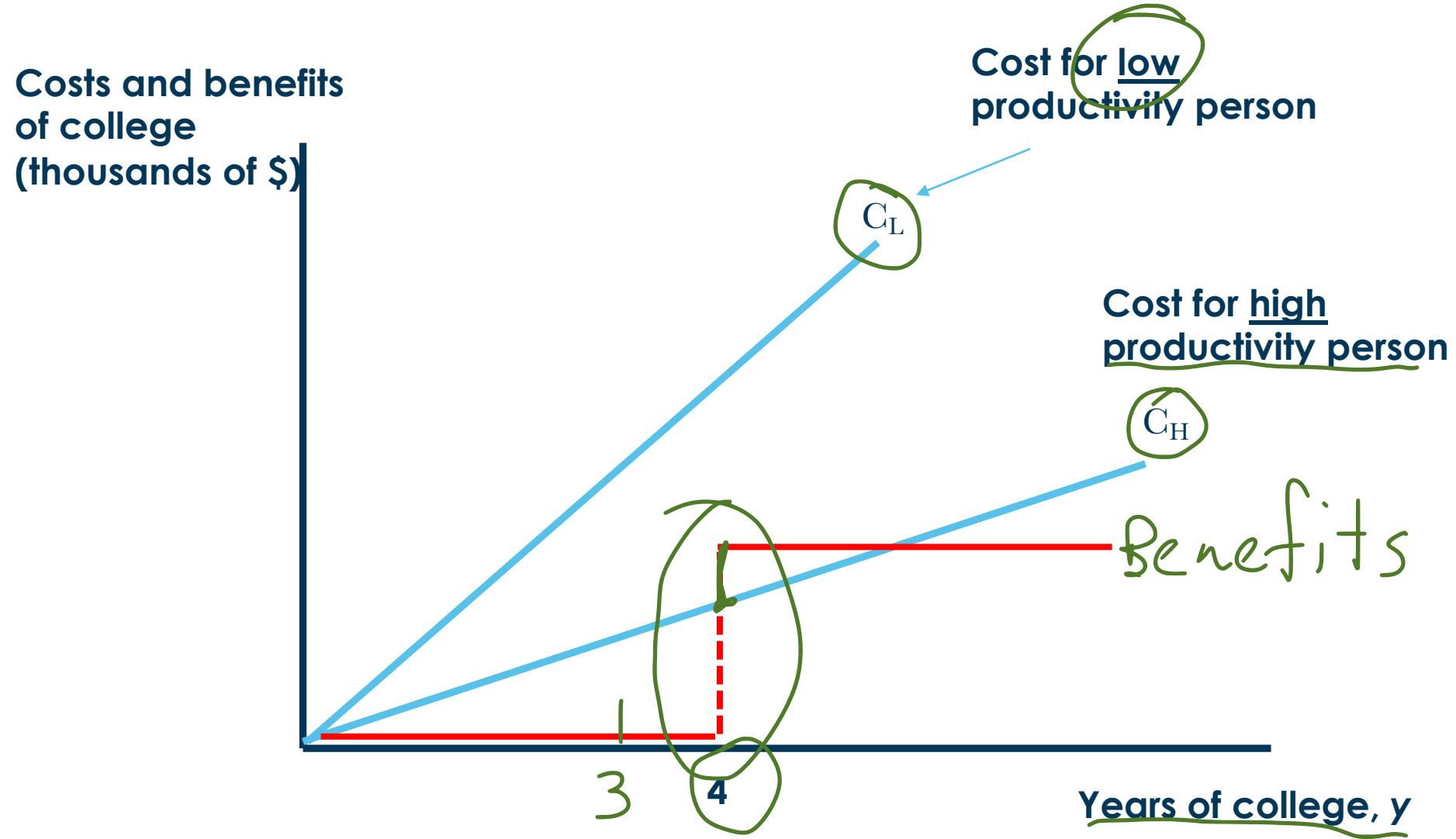


Signaling

- Strong signal: Education level
 - Grades, graduation, etc.
- Education is a strong signal in labor markets because it requires effort that many low-productivity workers may find too difficult to obtain.



Signaling





Signaling

- JJ Redick NBA podcast on The Ringer
 - The importance of toughness in the NBA
 - Miami Heat's Duncan Robinson
 - Historically great 3-point shooter





Signaling

- JJ Redick NBA podcast on The Ringer

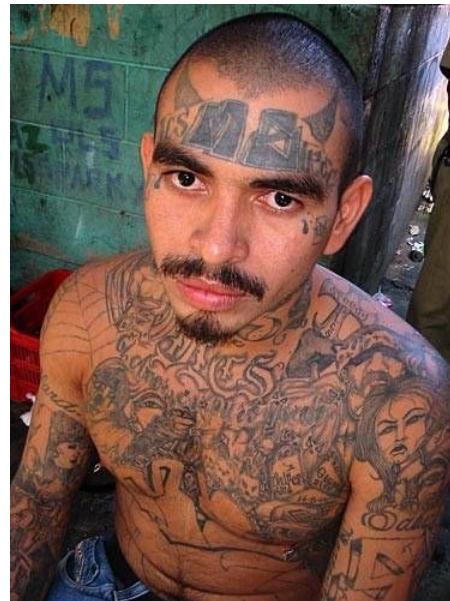
- The importance of toughness in the NBA
- Miami Heat's Duncan Robinson
- Historically great 3-point shooter
- Signaling toughness – has to be “costly”
- Ink





Signaling

- Tattoos in prison





Signaling



Blackbeard used the violent story as a “signals” to plunder with out violence



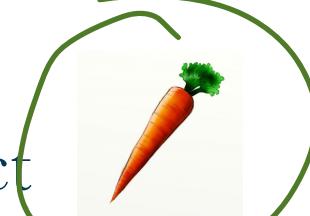
Screening

- Screening is an attempt by an uninformed party to sort individuals according to their characteristics
- Screening may be achieved through a *self-selection device*
 - A *self-selection device* is a mechanism in which informed parties are presented with a set of options, and the options they choose reveal their hidden characteristics to an uninformed party
 - E.g. Health insurance options
 - Incentive contract for a worker



Mitigating Moral Hazard

- Requirements as a part of an insurance policy
 - Specify and monitor
 - E.g. smoke detectors for commercial real estate
 - Either verify with an inspector
 - Or cancel policy if there is a fire and non-compliance
 - Incentivize in contract
 - Having a flood vent reduces flood insurance premium





Mitigating Moral Hazard

- Requirements as a part of an insurance policy

- Deductibles in a policy Imposes a cost(\$)
 - E.g. \$500 deductible on auto insurance
 - Accident causes \$2,000 in damage, insurance only pays \$1,500
- Co-payments in health care
 - E.g. insurance company covers 80%





Principal-Agent Relationship

- Principal-Agent Relationship
 - Economic transactions that feature information asymmetry between a **principal** and their hired **agent**, whose actions the principal cannot observe
 - Original problem: the separation of ownership and control

Owners / Board of Directors



Manager / CEO



- Poor performance: Bad luck or low effort?



Principal-Agent Relationship

- Manager's economic trade-off
 - Leisure
 - Labor
- Fixed salary
 - Receives wage independent of labor hours and effort
 - No strong incentive to monitor other employees labor hours and effort
 - Adversely impacts firm performance
- Incentive contract
 - Tie manager wage to firm performance (like profits)
 - Manager makes labor-leisure choice and is compensated accordingly



Principal-Agent Relationship

- Strategies to align owners' interests with that of the actions of its manager.
 - Stock option
 - Other bonuses directly related to profits.
 - Reputation, job mobility
 - Takeover threat.

External forces to incentives



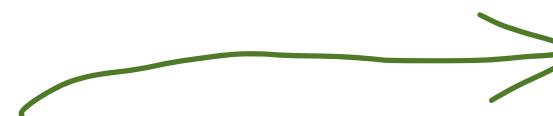
Principal-Agent Problem

- Primary obstacle is the separation of ownership and control.
 - General issue when there is asymmetric information

Principal



Agent





Principal-Agent Problem

- Primary obstacle is the separation of ownership and control.
 - General issue when there is asymmetric information

Principal / Owner



Agent / Workers





Principal-Agent Problem

- Primary obstacle is the separation of ownership and control.
 - General issue when there is asymmetric information

Car owner / Principal



Mechanic / Agent



Food truck owner / Principal



Workers / Agent





Principal-Agent Problem

Pirates



- Captains democratically elected
 - ⑥ Well defined set of rules
 - No drinking, gambling, etc.
 - Quartermaster allocate provisions
 - Clear system to share bounty
 - Peaceful
- ⑥ No principal-agent problems

Merchants

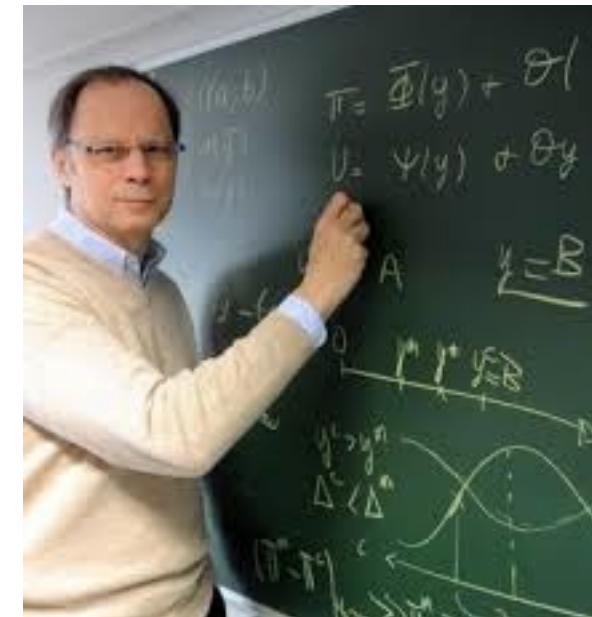


- Captain full autocratic control
 - Captains rewarded based on speed
 - Very unhappy sailors
 - Mutiny often in the air
- Lots of principal-agent problems



2014 Nobel Prize

- Jean Tirole
- Sveriges Riksbank Prize in Economic Sciences in Memory of Alfred Nobel
- Nobel citation reads:
- “for his analysis of market power and regulation”



Tirole's field is called industrial organization. He also worked on different aspects of the principal-agent problem



2014 Nobel Prize

Intrinsic and extrinsic motivation

Central tenet of economics is that individuals respond to incentives
Ideas in psychology suggest that incentive schemes can sometimes de-motivate

Tirole and Benabou (2003)

Argue that incentives provide motivation and information.

Sometimes that information may undermine motivation



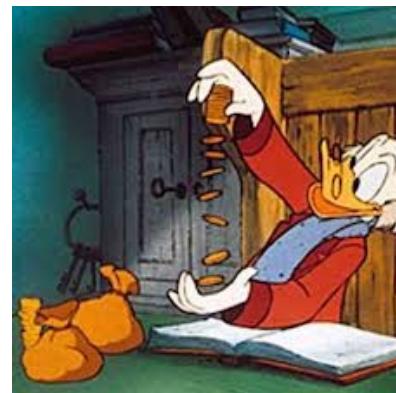
2014 Nobel Prize

Principal – Agent Problem

Let's say Uncle Scrooge is the Principal and you're the Agent

Goal: You to earn an A on the next test

Incentive: I'll give you \$1,000 if you earn an A



Messages you could take away from this:



2014 Nobel Prize

- 1) Scrooge thinks Econ is really important to offer \$1,000
He has several degrees (and is rich) and must know important things
You should work hard
- 2) Scrooge thinks you need \$1,000 to get an A.
Econ must be hard, or I'm not that smart
- 3) Scrooge offering you \$1,000 to do the right thing
Scrooge must not trust your judgment
- 4) Scrooge trying to 'control' you with incentives
You should rebel!!



2014 Nobel Prize

Intrinsic and extrinsic motivation

The incentive / reward has two effects:

- 1) A pure incentive effect (holding information constant)
- 2) An inference effect
 - depends on the context

Thus, an incentive isn't an objective fact, but subjective interpretation

Tough to know what the overall effect of the "incentive"