

**George Akerlof**

**Michael Spence**

**Joseph Stiglitz**

Presented by: Kohei Yamamoto

# George A. Akerlof

- He was born on June 17, 1940 in New Haven, Connecticut.
- In 1950, his family moved to Princeton, because Princeton University hired his father for the Forrestal Research Laboratories.
- He went to the Princeton County Day School.
- He went to the Lawrenceville School.



# George A. Akerlof

- In 1958-62, he went to Yale University.
  - ▶ was working on The Yale Daily News
  - ▶ received B.A. in Economics
- In 1962-66, he went to MIT.
  - ▶ met **Joseph Stiglitz** at the time
  - ▶ received PhD in Economics
- In 1966, he became an assistant Professor at UC Berkeley.
  - ▶ wrote “**Market for 'Lemons'**” in his first year at UCB
  - ▶ met Kay Leong, and married
- In 1967-68, spent a year at the Indian Statistical Institute in New Delhi, India<sup>3</sup>



# George A. Akerlof

- In 1969, he was voted tenure by the department of economics at UC Berkeley.
- In 1973-74, he served as Senior Economist at the Council of Economic Advisers.
  - ▶suffered from colitis, and divorced from Kay
- In 1977-78, worked at Federal Reserve Bank in Washington
  - ▶met **Janet Yellen**, and married with her.
- In 1978-80, he worked at London School of Economics.
  - ▶Janet was also given a tenure-track lectureship at the LSE, so they could stay together in London

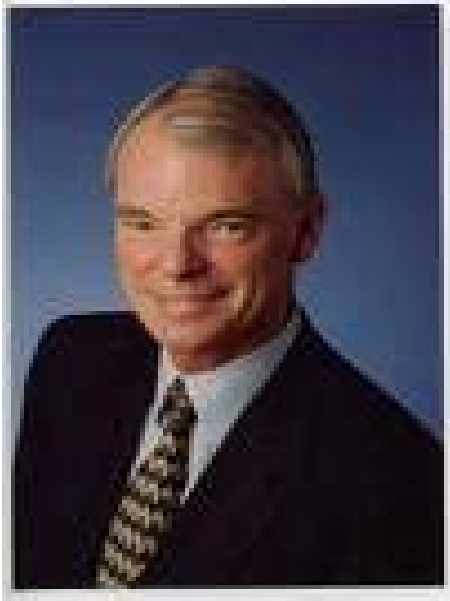
# George A. Akerlof

- In 1994-97, Janet was named to the Board of Governors of the Federal Reserve System
  - ▶ his family moved to Washington
  - ▶ he was named as a Senior Fellow by the Brookings Institution
  - ▶ **Joseph Stiglitz** was the Chairman of the Council of Economic Adviser



- After Janet left the Council, both returned to Berkeley
  - ▶ He won the **Nobel Prize** in Economics in 2001
  - ▶ is a Koshland Professor at UCB

# A. Michael Spence



- He was born Nov. 7, 1943 in Montclair, New Jersey.
- He started attending to high school, which is the University of Toronto School at age 12.
- In 1962-66, he went to Princeton University.
  - ▶ met Ann Bennett, later they married
  - ▶ received B.A. in **Philosophy**
- In 1966, he received the Canadian Rhodes Scholarship. Then, decided to try an academic career at Oxford U.<sup>6</sup>

# A. Michael Spence

- In 1966-68, he went to University of Oxford.
  - ▶ received B.A. in **Mathematics**
- In 1968, he entered PhD program in economics at Harvard University.
  - ▶ supported by Danforth Fellowship
- In 1971, he began teaching analytic methods at the Kennedy of Government at Harvard.
- In 1972, received PhD in Economics from Harvard University
  - ▶ wrote thesis call “**Market Signaling**,” and he was awarded the David A Wells prize for doctoral thesis



# A. Michael Spence

- In 1973,  
He became an Associate Professor at Stanford University
- In 1975, he returned to Harvard University as a professor.
  - ▶ had **Bill Gates & Steve Ballmer** in his graduate theory course, and both of them got A's in the course.
- In 1979, he became a joint appointment in Economics and the Harvard Business School at Harvard.
  - ▶ received Galbraith prize for teaching at Harvard
- In 1982, he received the John Bate's Clark medal from American Economic Association.

# A. Michael Spence

- In 1983, he became chairman of the Department of Economics at Harvard University.
- In 1986, he joined board of directors of Polaroid Corporation.
- In 1990, he became Dean of the Graduate School of Business at Stanford University.
  - ▶ served the Dean's job for 9 years
- In 2001, he received the **Nobel Prize** in Economics.
- Recently, he is a chair of the Commission on Growth and Development.



# Joseph E. Stiglitz

- He was born on Feb. 9, 1943 in Gary, Indiana.
- In 1960-63, he studied at Amherst College.
  - ▶with full scholarship
  - ▶majored in **Physics**
  - ▶President of the Student Government
- In 1963, he went to MIT for his senior year as an undergraduate, and later pursued graduate work.
  - ▶was offered to edit **Paul Samuelson's** collected papers
  - ▶his first academic paper was co-authored by **Akerlof**



# Joseph E. Stiglitz

- In 1965-66, he went to Chicago University to do research under Hirofumi Uzawa\*.
  - \*who had received NSF grant to bring around a dozen of graduate students to work on theory
  - ▶ **Akerlof** was also selected for the project
- In 1966-67, he returned to MIT, and studied for PhD.
  - ▶ was supported by the National Science Foundation
  - ▶ worked as a assistant professor at the same time
  - ▶ also worked as **Bob Solow**'s research assistant
- In 1969-70, he was a Fulbright research fellow at Oxford.
  - ▶ did some researches with **Akerlof**.

# Joseph E. Stiglitz

- He held professorship at Yale U, Stanford U, Oxford U and Princeton University until he worked for the **Clinton Administration**.
  - ▶ In 1979, he received the John Bate's Clark medal
- In 1992-97, he worked for the **Clinton Administration**. Later, became the Chairman of the Council of Economic Advisors.
  - ▶ Actually, the President asked him to continue the job, but he had been already offered by the World Bank.
- In 1997-2000, he served Senior Vice President and Chief Economist at the World Bank.



# Joseph E. Stiglitz

- In 2000, he went to Columbia University.
  - ▶ helped to find the Initiative for Policy Dialogue with support of Ford, Rockefeller, McArthur, etc.
- In 2001, he receive the **Nobel Prize** in Economics.
- Since 2001, he has been a member of the Columbia Faculty, and chairs the University of Manchester's Brooks World Poverty Institute. Also, he is a member of the Pontifical Academy of Social Sciences and an editor of “The Economists' Voice Journal.”



# Influences

# George A. Akerlof

## Family

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- **Great-grandfather & Grandfather:**

Both are UC Berkeley alumnus, and a pharmacologist and cardiologist.

- **Mother studied chemistry at Yale University.**

- **Father was a chemist**

- **Brother, Carl became physicist**

➤➤ **Akerlof said, “Being a chemist or, at least some form of physical scientist, was thus a family ideal,”**

▲ **However, he became economist because he failed to understand the mystery of science, and he was more interested in social things.**

# George A. Akerlof



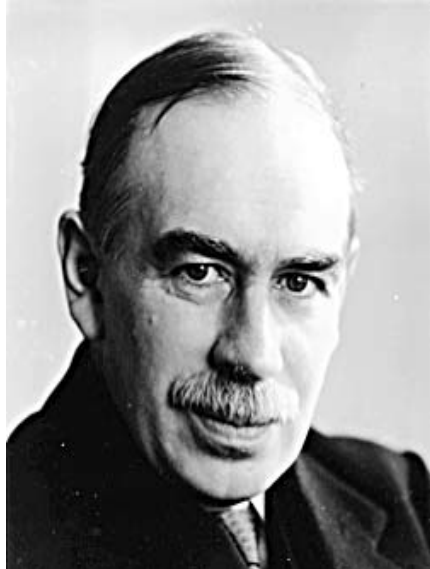
## **Janet Yellen:**

is economist, Akerlof's wife.

is Professor Emeritus at UC Berkeley.

is a president of the **Federal Reserve Bank** of San Francisco.

►Akerlof worked with his wife Janet on many papers for years in the 80's and 90's.



## **John Maynard Keynes:**

is a british economist, whose idea had a major impact on modern economist, is called

**Keynesian economics.**

►Akerlof said that the defense of Keynesian macro is one of his main work as an economist.

# Joseph E. Stiglitz



**Paul Samuelson:**  
Nobel prize in 1970

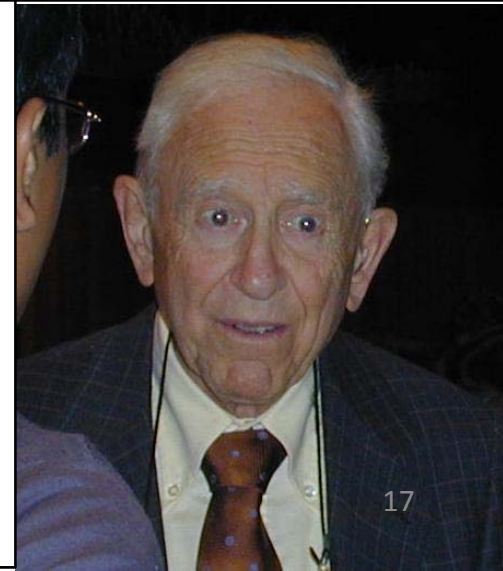


**Kenneth Arrow:**  
Nobel Prize in 1972

**Robert Solow:**  
Nobel Prize in 1987



**Franco Modigliani:**  
Nobel Prize in 1985



# A. Michael Spence

His doctoral advisors

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- **Kenneth Arrow:**

He is an economist and winner of **Nobel Prize in 1972**.

He is considered as one of the founders of modern neo-classical economic theory.

- **Thomas Schelling:**

He is an economist and winner of **Nobel Prize in 2005**.

➤ “He had an extraordinarily original mind,” said **Spence**.

“A great deal of that interest and motivation came from hours spent with **Tom Schelling**.”

- **Richard Zeckhauser:** american economist

He had a professorship at Harvard.

# Joseph E. Stiglitz

## Amherst College

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### - Arnold Collery

“was s thoughtful and erudite scholar,” Stiglitz said.

### - James Nelson

“conveyed the sense of excitement that came from trying to shape economic policies,” he said.

⇒“**Amherst was pivotal in my broad intellectual development,**” he said.

## MIT

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⇒When Stiglitz was at MIT, “**it was the hey-day of MIT with first rate professors,**” he said.

# Joseph E. Stiglitz



**Paul Samuelson:**  
Nobel prize in 1970

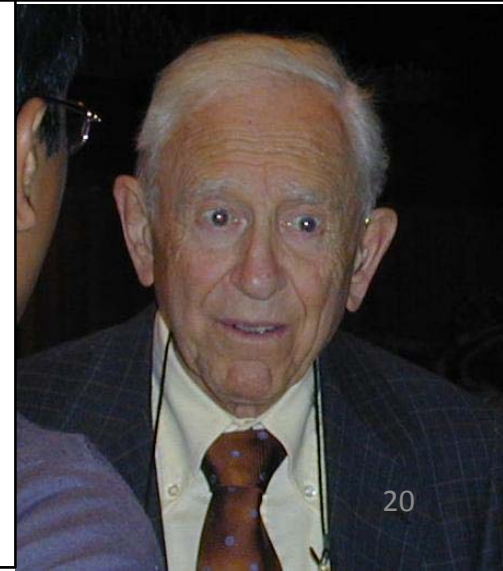


**Kenneth Arrow:**  
Nobel Prize in 1972

**Robert Solow:**  
Nobel Prize in 1987



**Franco Modigliani:**  
Nobel Prize in 1985



# Contributions

# Asymmetric Information

- **Akerlof, Spence and Stiglitz** received the **Bank of Sweden Prize in Economic Science in Memory of Alfred Nobel** (Nobel Prize), 2001, “for their analysis of markets with **asymmetric information.**”



- ▶ **Asymmetric information:** is a common feature of market interactions, agents on one side of the market have much better information than those on the other side.
- Their researches explain the emergence of many social institutions that counteract the negative effects of **informational asymmetries.**

# Asymmetric Information

- ▶ **Akerlof** showed that informational asymmetries can give rise to *adverse selection* on markets, in his paper “**The Market for Lemons.**”
- ▶ **Spence** showed that under certain conditions, well-informed agents can improve their market outcome by **signaling** their private information to poorly informed agents.
- ▶ **Stiglitz** showed that an uninformed agent can sometimes capture the information of a better-informed agent through **screening.**

# Market for Lemons (Akerlof)

- It is an analysis of how **information asymmetries** lead to inefficiency market(**adverse selection**).
  - ▶ **Adverse selection** refers to a market process in which “bad” results occurs when buyers and sellers have asymmetric information: the “bad” products or customers are more likely to be selected.
- **Akerlof** in his paper analyzes a market for a product where sellers are better informed than buyers about the quality of the good: his example used is the market for used cars.



# Market for Lemons

- Let's say, there are 50% of GOOD(quality) used car, and 50% of BAD(quality) used car.

	Seller's Value	Buyer's Value
GOOD cars	\$2,500	\$3,000
BAD car(lemons)	\$1,000	\$1,500

► **Scenario I** ~perfect information~

If the quality of goods are known to both parties,

GOOD cars are sold at price:

$$\$2,500 \leq P_G \leq \$3,000$$

BAD cars are sold at price:

$$\$1,000 \leq P_B \leq \$1,500$$

# Market for lemons

► **Scenario II** ~asymmetric information~

If only sellers know the quality of the goods,

the buyers can't define the quality, so their willingness to pay for a unknown quality used car will be the average of their valuation:

$$E(P) = .5 \times \$3,000 + .5 \times \$1,500 = \$2,250$$

However, **the sellers will sell only BAD cars** because:

$$\text{GOOD: } P_{\text{SWR}} = \$2,500 \geq \$2,250 = P_{\text{BWP}}$$

$$\text{BAD: } P_{\text{SWR}} = \$1,000 \leq \$2,250 = P_{\text{BWP}}$$

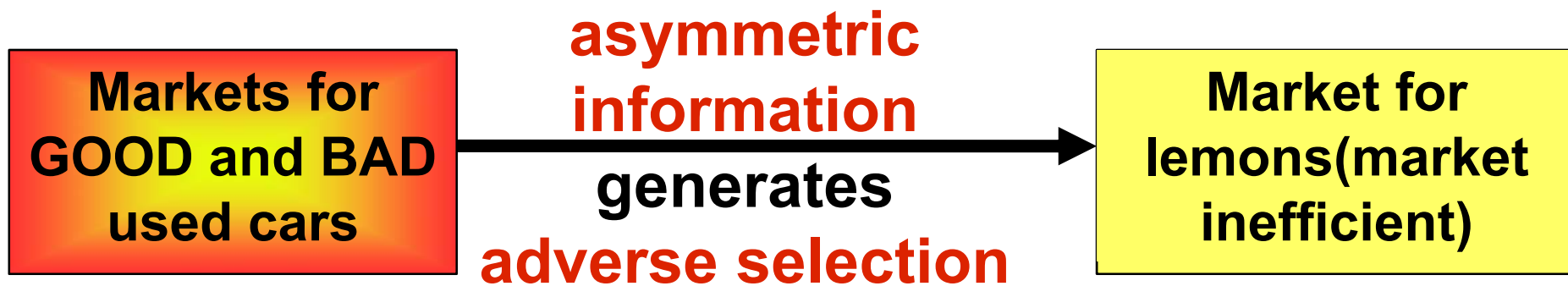
\* Now, the market for the GOOD cars is collapsed, caused by the information asymmetries. Only bad cars are sold.

# Market for lemons

## Summary

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- Under market with asymmetric information, the market will be inefficient that sellers will sell only the BAD cars because the buyer's best guess for a given car's quality is the average of it and the valuation gives benefits to sellers only if they sell the BAD cars.



# Market for lemons

## Summary(cont'd)

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- A key insight is that economic agents may have strong incentives to offset the adverse effects of information problems on market efficiency. Akerlof argues that **many institutions may be regarded as emerging from attempts to resolve problems due to asymmetric information.**  
e.g. guarantees from car dealers



# Signaling (Spence)

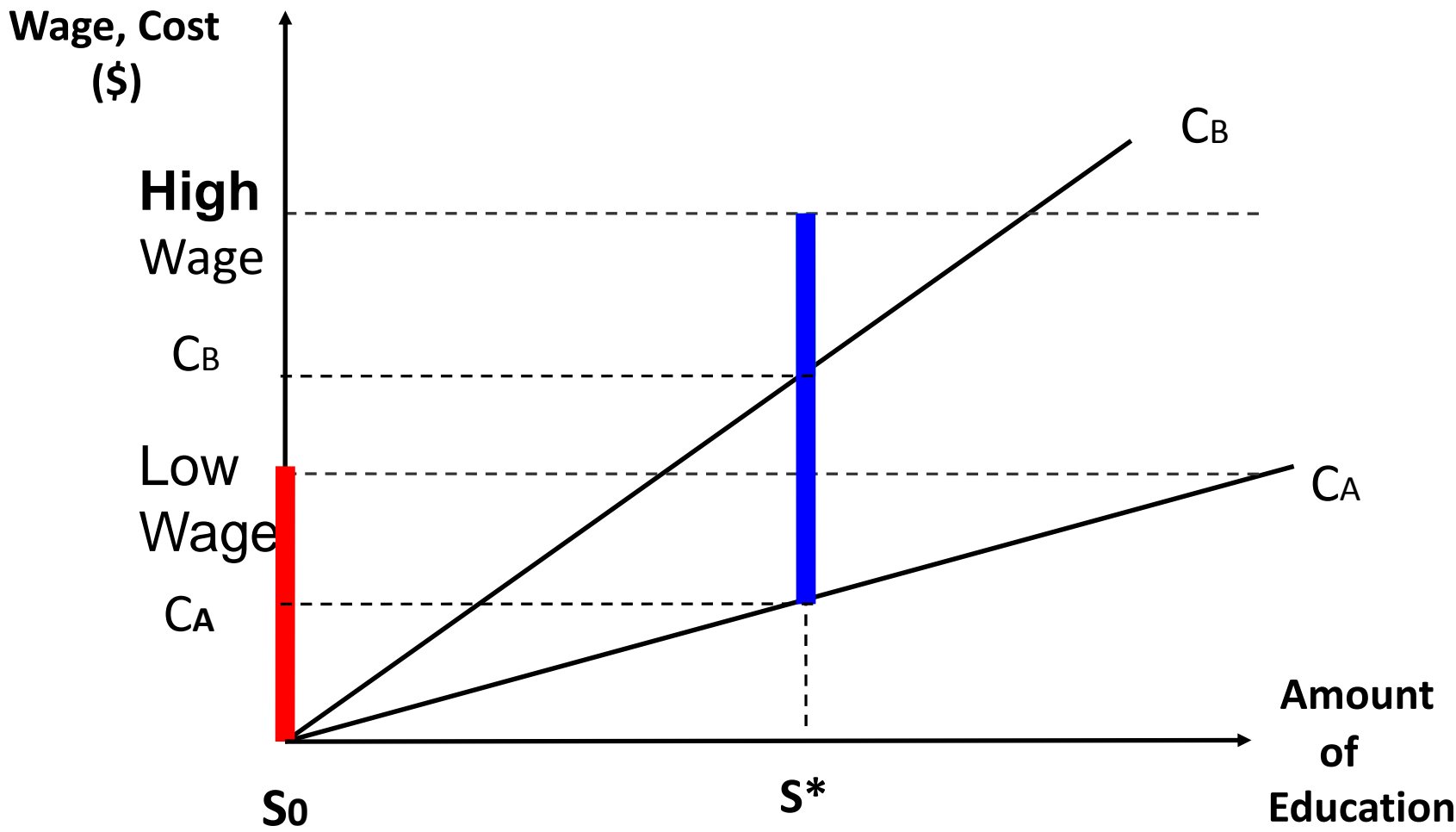
- **Signaling** is a strategy to avoid some of the problems associated with **adverse selection**.
  - ▶ refers to observable actions taken by a party to convince the opposite party of the quality of their product
- **Signaling** can succeed only if the signaling cost (opportunity cost of signaling) differs sufficiently among the “senders”.
- **Spence** proposed that two parties could get around the problem of asymmetric information by having one party send a signal to the other party. That party would then interpret the signal and adjust her/his purchasing behavior.
  - ▶ Spence used education as an example of signaling

# **What is the purpose of education?**

## **Education as a Signal**

- **There are two different productivity workers A and B. A is the high productivity worker who has been accepted by university with scholarship. And, B is the low productivity worker who somehow graduates from his high school. Then, a company is willing to hire workers at the factory for low wage and workers at the office for high wage. Since the employer cannot distinguish the productivity of workers, the company decided to pay high wage for graduates. What should A and B do?**

# Education Signaling



# Education Signaling

## Results

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- If both doesn't go to university, there will be only the job with low wage – this is analogous of the **adverse selection** outcome in **Akerlof's** market where only lemons remain.
- The worker A will be better off if she/he goes to university. On the other hand, B will be worse off if she/he does so.

## Summary

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**Even if** education doesn't improve the productivity of the worker, signaling is important to avoid the market inefficiency associated with adverse selection. However, **signaling cannot succeed unless the signaling cost differs sufficiently among the “senders”**, i.e., job applicants.

# Examples of Signaling

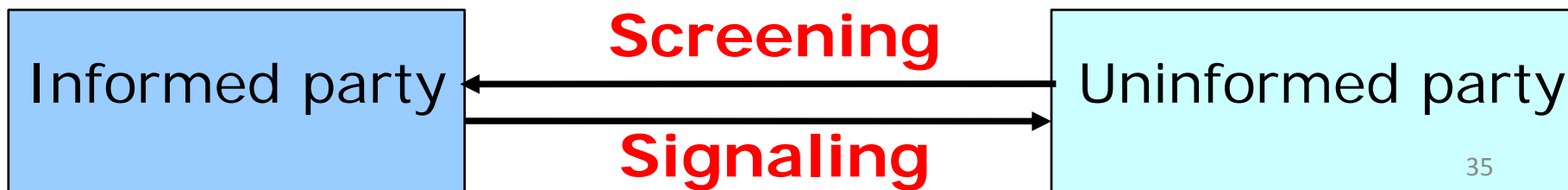


# Examples of Signaling



# Screening (Stiglitz)

- **Stiglitz** developed the concept of **screening** is another way to eliminate the effects of **informational asymmetries**, and the idea is that uninformed agents can offer a menu of contracts to well-informed agents and the choice of the well-informed agents reveals the information in the particular transaction. For example, an insurance company offers their customers different combinations of premium and deductibles.
- **Screening** should be distinguished from **signaling** in which the agent who has information acts first.



# Example of Screening

- Visitors Medical Protection Plan Monthly Rates (\$25,000 policy limit)

Deductible	\$100	\$250	\$500	\$1,000	\$2,500
Under 18	\$23	\$21	\$19	\$17	\$14
18 - 29	\$36	\$33	\$30	\$26	\$23
30 - 39	\$46	\$42	\$38	\$34	\$30
40 - 49	\$71	\$65	\$57	\$52	\$46
50 - 59	\$101	\$92	\$84	\$73	\$65
60 - 64	\$118	\$107	\$97	\$86	\$75
65 - 69	\$135	\$123	\$111	\$99	\$86
70 - 79	\$181	\$165	\$147	\$132	\$115
80+ *	\$343	\$312	\$282	\$249	\$219

\*\$15,000 Policy Maximum

# Impact

# Impact

- They basically explained:
  - what happens to prices and trade quantities if agents on one side of the market are better informed than those on the other?
  - What can better-informed agents do to improve their individual market outcome?
  - What can less informed agents do to improve their individual market outcome?
- Their analyses of markets with information asymmetries are fundamental to modern microeconomic theory.
  - ▶ Asymmetric Information is a common feature of market interactions, and their analyses increase our understanding of how markets work

# Impact

- The research has furthered understanding of phenomena in real markets which could not be fully captured by traditional neoclassical theory.
  - ▶ Theories of **market failure** have been based on the problem of free-rider and **externalities**. Analysis of **asymmetric information** explained some phenomena which the old theories couldn't explain, like the “**market for lemons**”.
- Applications explained many phenomena abound from traditional agricultural markets to modern financial markets.
  - e.g. labor, financial and credit market

# Critiques

# Critiques

- **These are new contributions, and too early to critique them.**

# Questions

# Questions

- Adam Smith mentioned 3 types of market failures:
  1. Public goods
  2. Externalities
  3. Monopolies

What other market failure was added to this list by Akerlof?

Asymmetric information

# Questions

- How would you change our higher education system so that education can better separate the high productivity workers from those with low productivity? (would you increase or decrease tuition?)
  - If the tuition has been decreased, many people will pursue higher education. Then, classes will be too crowded to enroll. Also, labor market will be full of graduates applicants, so **the education signaling wouldn't be sufficient to the employers, any more.**
  - If the tuition has been increased, simply poor people can't afford to pursue higher education. And, **it will stretch the social gap between rich and poor.**