

# Foundations of Economic Analysis & Explanation

## Lecture 20: Market Efficiency and the Coase Theorem

Biwei Chen

*Lux Mantis Scientia*

Colby College  
Department of Economics

# Overview

- General Equilibrium
- Market Efficiency
- Market "Failures"
- Coase Theorem



This lecture formalizes the concept of economic efficiency in production, exchange, and public policy; introduces four notorious cases which result in market "failure"; and clarifies the confusion and misunderstanding on the nature of the market from the insight of the Coase Theorem.

<https://www.proximgroup.com.au/process-improvement-consulting/>

## Questions for Discussion

Think-pair-share: discuss with your peers and write down summary answers.

- ① What is partial equilibrium? What is general equilibrium (GE)? Why is it important to consider it in economic analysis?
- ② What is Pareto efficiency? Is market production and exchange Pareto efficient? How do economists measure efficiency in general equilibrium?
- ③ What are the two fundamental theorems in Welfare Economics?
- ④ What are the market "failures"? In each of the cases, why can the market "fail" or render "inefficient" outcomes?
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- ⑤ What is the Coase theorem? What are his two most influential papers? What does Coase think of market "failures"?

# OUTLINE

① Market Efficiency

② Market "Failures"

③ Coase Theorem

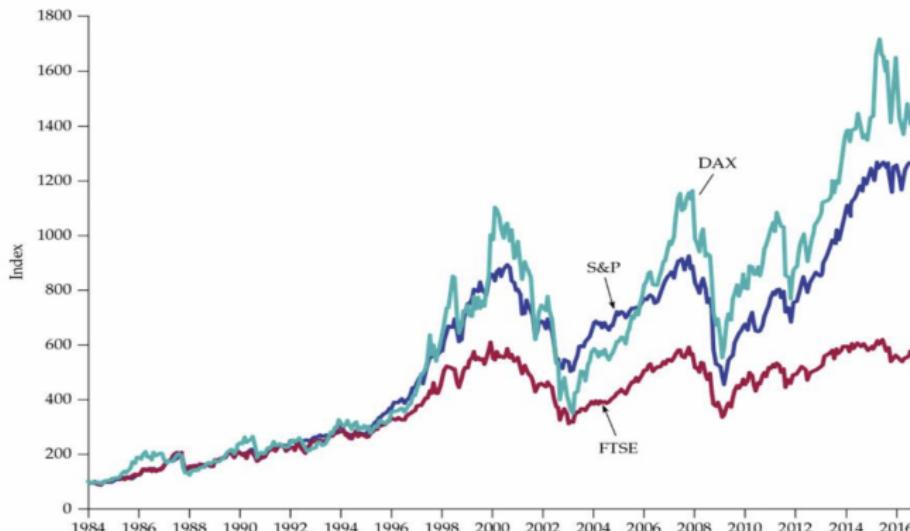
④ Appendix

# Market Equilibrium Analysis

- Demand, supply, and market equilibrium analysis is a gift from Alfred Marshall since his 1890 publication of the Principles of Economics .
  - Partial equilibrium analysis: Determination of equilibrium prices and quantities in a market independent of effects from other markets.
  - General equilibrium analysis: Simultaneous determination of the prices and quantities in all relevant markets, taking feedback effects into account. A feedback effect is a price or quantity adjustment in one market caused by adjustments in related markets.
  - In practice, a complete general equilibrium analysis, which evaluates the effects of a change in one market on all other markets, is not feasible. Instead, we confine ourselves to two or three markets that are closely related. For example, when looking at a tax on oil, we might also look at markets for natural gas, coal, and electricity.

Pindyck & Rubinfeld, CH16, Microeconomics, 9th edition. Pearson.

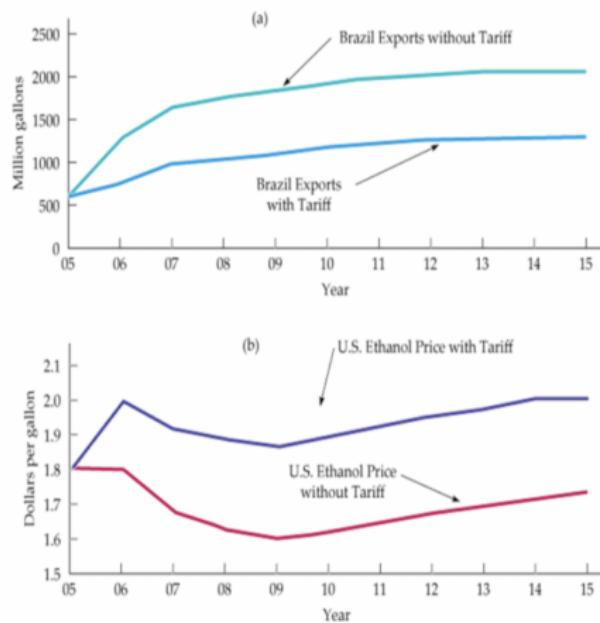
## Stock Market Co-movements



Three stock market indices—the S&P 500 in the United States, the FTSE in the United Kingdom, and the DAX in Germany—are plotted together, scaled so that each starts at 100 in 1984. The indices tend to move together, increasing and decreasing at about the same time.

## Global Market for Ethanol

- The world ethanol market is dominated by Brazil and the United States, which accounted for over 90 percent of world production in 2005.
  - If U.S. tariffs on ethanol produced abroad were to be removed, Brazil would export much more ethanol to the U.S., displacing much of the more expensive corn-based ethanol produced domestically.
  - As a result, the price of ethanol in the U.S. would fall, benefiting U.S. consumers.



## Social Competition & Efficiency

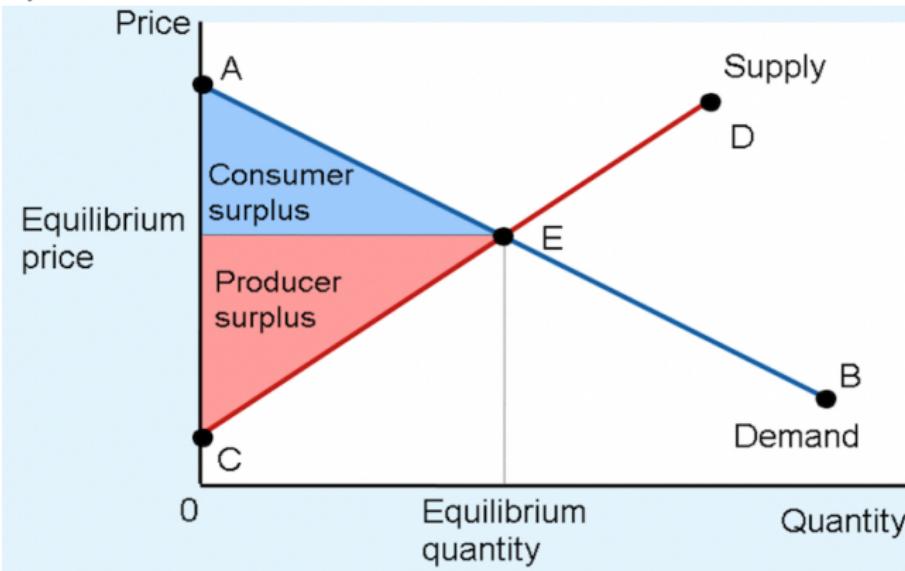
- In the lecture on Scarcity and Competition, we study the nature of resource allocation via various forms of social competition.
  - Competitive criterion determines winners and losers. Rules of the game ensures equity and efficiency.
  - Which type of competition can lead to highest level of economic prosperity and public welfare, benefiting all in the society? What are the corresponding rules of the game?
  - Economic Efficiency is a relationship between ends and means. Implied by rationality, it means maximizing benefit at a minimum cost. When applied to a competitive market, the term economic efficiency refers to a market that maximizes aggregate consumer and producer surplus. Any deadweight loss indicates inefficiency.

[https://undsci.berkeley.edu/article/intro\\_01](https://undsci.berkeley.edu/article/intro_01)

## Pareto Efficiency and Social Welfare

- Welfare Economics: normative evaluation of markets & public policies.
- Pareto Efficiency/Optimality: an allocation of resources in which the goods cannot be reallocated without making any individual worse off.
- In a Pareto efficient allocation of goods, no one can be made better off without making someone else worse off (no Pareto improvement exists).
- Note that there is an equity implication of Pareto efficiency. It may be possible to reallocate the goods in a way that increases the total well-being of the society, but leaves one individual worse off. In this case, the society improves efficiency but lacks equity. Public policy plays its role in striking a balance between efficiency and equity. A bigger pie or equal shares.
- Redistributive public policy has the potential to ensure a bigger pie and then compensate for the "losers" to improve their welfare.

# Market Equilibrium and Welfare



- In equilibrium, social surplus = consumer surplus + producer surplus
- In equilibrium, market welfare is maximized for a combination of P & Q.

## Economic Efficiency: Exchange

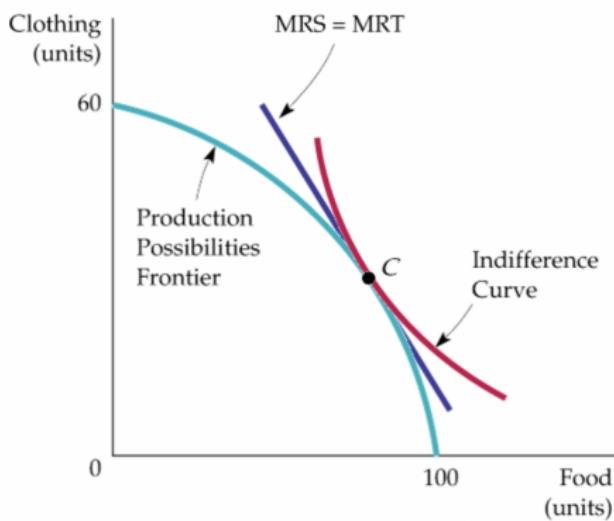
- Exchange economy: Market in which two or more consumers trade two goods among themselves.
- In a competitive market, the prices of the two goods determine the terms of exchange among consumers.
- Exchange Efficiency: a Pareto efficient allocation of a set of goods ( $i$  and  $j$ ) across all individuals (A and B).
- Mathematically,  $MRS_{ij}^A = MRS_{ij}^B = P_i/P_j$ .
- A equilibrium is a set of prices at which the quantity demanded equals the quantity supplied in every market. This is also a competitive equilibrium because all suppliers and demanders are price takers. The market is in disequilibrium when the quantities of food and clothing demanded are not equal to the quantities supplied. This disequilibrium should be only temporary.

## Economic Efficiency: Production

- Input efficiency: a Pareto efficient allocation of input factors ( $i$  and  $j$ ) across all producers (A and B).
- The production possibilities frontier PPF shows all efficient combinations of outputs. Marginal rate of transformation (MRT): Amount of one good that must be given up to produce one additional unit of a second good. The opportunity cost of producing a good in term of the other.
- The PPF is concave because its slope (the MRT) increases as the level of production of food increases.
- Production efficiency: a combination of outputs that simultaneously supports exchange and input efficiency.
- Mathematically,  $MRT = MP_i/MP_j = MRS = P_i/P_j$ .

# Production & Exchange Efficiency

The efficient combination of outputs is produced when the marginal rate of transformation between the two goods (which measures the cost of producing one good relative to the other) is equal to the consumer's marginal rate of substitution (which measures the marginal benefit of consuming one good relative to the other).



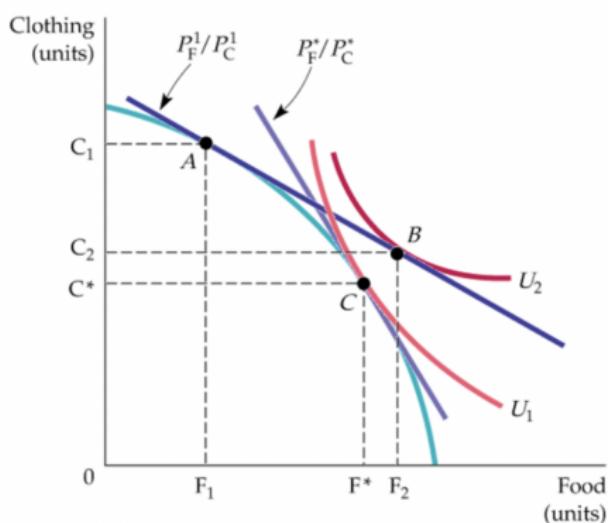
Pindyck & Rubinfeld, CH16, Microeconomics, 9th edition. Pearson.

# Production & Exchange Efficiency

In a competitive output market, people consume to the point where their marginal rate of substitution is equal to the price ratio.

Producers choose outputs so that the marginal rate of transformation is equal to the price ratio.

Because the  $MRS = MRT$ , the competitive output market is efficient. Any other price ratio will lead to an excess demand for one good and an excess supply of the other.



Pindyck & Rubinfeld, CH16, Microeconomics, 9th edition. Pearson.

## Economic Efficiency: Taxation

- The principle of marginal equalization results from optimizing objective function. In theory, social welfare function guides the trade-off between equity and efficiency in optimal policy design.
- In practice, the governments may face certain constraints in achieving its optimal taxation policy (e.g., the budget limit).
- Optimal income tax: choose the tax rates across income groups to maximize social welfare subject to a level of government revenue.
- Optimal consumption tax: choose the tax rates across goods to minimize DWL for a given government revenue constraint.
- Ramsey Rule: To minimize the DWL while raising a fixed amount of revenue, taxes should be set so that the ratio of the marginal deadweight loss to marginal tax revenue is equal across all commodities i and j:  
$$\text{MDWL}_i / \text{MR}_i = \text{MDWL}_j / \text{MR}_j$$

# Nobel Prize for Welfare Economics

- 1970 Paul A. Samuelson "for the scientific work through which he has developed static and dynamic economic theory and actively contributed to raising the level of analysis in economic science"
- 1972 John R. Hicks and Kenneth J. Arrow "for their pioneering contributions to general economic equilibrium theory and welfare theory"
- 1975 Leonid Vitaliyevich Kantorovich and Tjalling C. Koopmans "for their contributions to the theory of optimum allocation of resources"
- 1983 Gerard Debreu "for having incorporated new analytical methods into economic theory and for his rigorous reformulation of the theory of general equilibrium"
- 1988 Maurice Allais "for his pioneering contributions to the theory of markets and efficient utilization of resources"
- 1998 Amartya Sen "for his contributions to welfare economics"
- 2015 Angus Deaton "for his analysis of consumption, poverty, and welfare"

<https://www.nobelprize.org/prizes/lists/all-prizes-in-economic-sciences/>

# First and Second Welfare Theorem

- There are two fundamental theorems of welfare economics.
- First fundamental theorem: any competitive equilibrium leads to a Pareto efficient allocation of resources. It is also known as the "Invisible Hand Theorem." The main idea here is that markets lead to social optimum. Thus, no intervention of the government is required, and it should adopt only "laissez faire" policies.
- Second fundamental theorem: any efficient allocation can be attained by a competitive equilibrium, given the market mechanisms leading to redistribution. This theorem is important because it allows for a separation of efficiency and distribution matters. Those supporting government intervention will ask for wealth redistribution policies.

<https://policonomics.com/fundamental-theorems-of-welfare-economics/>

# OUTLINE

① Market Efficiency

② Market "Failures"

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④ Appendix

# Market Inefficiency and Failure

- One of the major functions of the market economy is to allocate resources and distribute income in a way that consumers and producers value most highly based on cost-benefit optimization.
- However, market economy and price system is not the only way to achieve such desirable outcome. Transaction costs in the market economy are costly, and sometimes prohibitive, including legal/administration/contracting cost/enforcement/information cost.
- On the other hand, according to mainstream views, markets are sometimes said to produce too much or too little of certain products and thus fail to make the most efficient use of society's limited resources, hence Market Failure. The misunderstanding is prevalent in the evolution of economic thought and public policy designs.

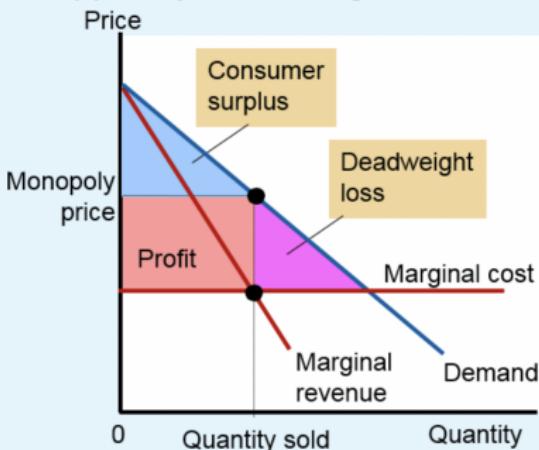
# The Big Four "Market Failures"

In almost all economic textbooks, there are four types of market failures:

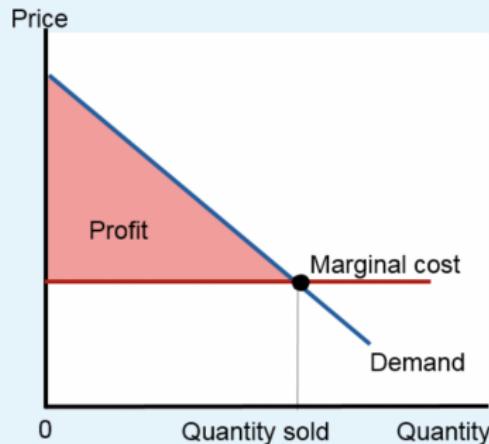
- ① Market Power: monopoly (single seller), monopsony (single buyer), and natural monopoly (when the cost structure of the industry makes it more efficient for a single firm to produce the entire market's output)
- ② Externalities: uncompensated costs or benefits that spill over onto people who are not party in a transaction.
- ③ Public Goods: non-rival in consumption and for which it is prohibitively costly to exclude non-payers or free-riders.
- ④ Asymmetric Information: over-protective risk adverse decisions under incomplete information. For example, overpriced insurance policies and lemon problems (used cars). Adverse selection and moral hazard are two negative consequences of asymmetric information.

# Monopoly Inefficiency: Deadweight Loss (under single pricing)

(a) Monopolist with Single Price



(b) Monopolist with Perfect Price Discrimination



Panel (a) shows a monopoly that charges the same price to all customers. Total surplus in this market equals the sum of profit (producer surplus) and consumer surplus.

Panel (b) shows a monopoly that can perfectly price discriminate. Consumer surplus equals zero and total surplus now equals the firm's profit. "What a sin against the public!"

Source: Mankiw (2018) CH14

# Classification of Goods and Resources

- Goods can be classified according to two attributes:
  - whether they are excludable
  - whether they are rival in consumption
- A good or service is excludable if the suppliers of that good can prevent people who do not pay from consuming it.
- A good or service is rival in consumption if the same unit of the good cannot be consumed by more than one person at the same time.
- Most goods can be produced efficiently and consumed in a competitive market. But some goods cannot.

# Private vs Public Goods

	Rival in consumption	Nonrival in consumption
Excludable	<p><b>Private goods</b></p> <ul style="list-style-type: none"><li>• Wheat</li><li>• Bathroom fixtures</li></ul>	<p><b>Artificially scarce goods</b></p> <ul style="list-style-type: none"><li>• On-demand movies</li><li>• Computer software</li></ul>
Non-excludable	<p><b>Common resources</b></p> <ul style="list-style-type: none"><li>• Clean water</li><li>• Biodiversity</li></ul>	<p><b>Public goods</b></p> <ul style="list-style-type: none"><li>• Public sanitation</li><li>• National defense</li></ul>

# Public Goods: Examples

Public goods are also known as collective consumption goods



Sanitation infrastructure



Flood defence / tidal barrage



Crime control for a community

Why healthcare is NOT a public good  
Healthcare has the characteristics of a private good because is rival and excludable in consumption



Reduced risk of disease from vaccinations



Freely available knowledge e.g. online learning



Public service broadcasting

<https://www.tutor2u.net/economics/reference/public-goods>

## Public Goods: Free Rider Problem

- Goods that are nonexcludable suffer from the free-rider problem: individuals have no incentive to pay for their consumption and instead will take a "free ride" on anyone who does pay.
- Public goods are also nonrival in consumption, more than one person can consume the same unit of the good at the same time.
- A rationale for the existence of government is that no individual has an incentive to pay for providing the efficient quantity of a public good because each individual's marginal benefit is less than the marginal social benefit. The most important public goods are paid for with taxes.
- The marginal social benefit of an additional unit of a public good is equal to the sum of each consumer's individual marginal benefit from that unit. At the efficient quantity, marginal social benefit equals the marginal cost. However, consumers avoid to reveal their true preference and pay.

# Tragedy of the Commons

- A common resource isn't a public pure good due to non-excludability.
- In modern economic context, "commons" is taken to mean any shared and unregulated resource such as atmosphere, oceans, rivers, ocean fish stocks, or even an office refrigerator.
- Although common resource systems have been known to collapse due to overuse (such as in over-fishing), many examples have existed and still do exist where members of a community with access to a common resource co-operate or regulate to exploit those resources prudently without collapse.
- Elinor Ostrom was awarded the 2009 Nobel Prize in Economics for demonstrating exactly this concept in her book *Governing the Commons*, which included examples of how local communities were able to do this without top-down regulations or privatization.
- Ten Real-Life Examples of the Tragedy of the Commons: [Article Link]

[https://en.wikipedia.org/wiki/Tragedy\\_of\\_the\\_commons](https://en.wikipedia.org/wiki/Tragedy_of_the_commons)

# Individual Choice & Social Effects

- Individuals will incur external effects on the society in their decision making processes, regardless of their intentions.
- Externality refers to the net social effects of private decisions.
- "Good effects" examples: education makes the consumer a more productive worker who earns higher wages. A well educated population leads to more informed voters, tends to result in lower crime rates, and may encourage the development and dissemination of technological advances, leading to higher productivity and wages for everyone.
- "Bad effects" example: though production of goods and services is beneficial to the producers and consumers, firms can cause pollution to the environment (air, water, noise, etc...).

# Positive Externalities

Examples of external benefits:

- Internet
- Education
- Sanitation
- Lighthouse
- Preserved farmland
- Public infrastructure
- Shopping center/mall
- Beehives next to almond orchards/pollination
- Industrial clusters/networks



# Negative Externalities

Examples of external costs:

- Traffic congestion
- Rumors and gossips
- Endemic and pandemic
- Air and water pollution
- Texting while driving
- Construction/airport noises
- Bank runs and financial market panics
- Chemical runoff that affects fish stocks
- CO<sub>2</sub> emission and global warming



## Externality Inefficiency

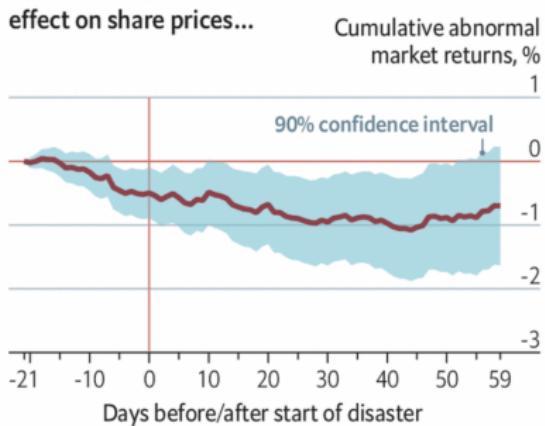
- Negative externality: when social cost is greater than private cost of private action. Social cost = private cost + external cost.
- Positive externality: when social benefit exceeds private benefit of the private action. Or, external benefit of a private action is positive. Social benefit = private benefit + external benefit.
- When negative externality exists, the action is considered as "overdosed" and should be reduced; when positive externality occurs, the action is considered as insufficient and should be encouraged. What can be done to solve externality problems?
- Market is said to fail in handling externality problem due to divergence between reality and myth. Conventional wisdom suggests government intervention.

# Climate Risk & Stock Market Valuation

## Calm before the storm

Climatic disasters and share prices

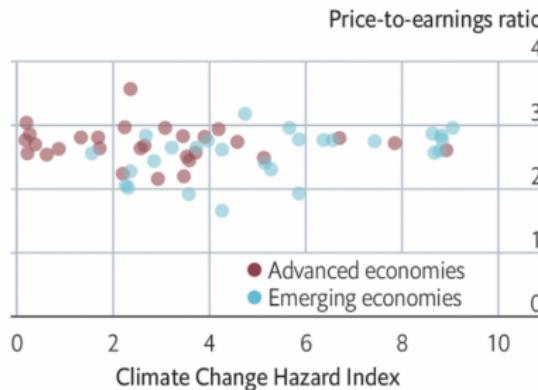
Climatic disasters\* have a modest effect on share prices...



Source: IMF

The Economist

...and there is no relationship between climate risk and equity valuations



\*In 68 countries, 1980–2018

[//www.economist.com/graphic-detail/2020/06/02/why-are-investors-not-pricing-in-climate-change-risk](https://www.economist.com/graphic-detail/2020/06/02/why-are-investors-not-pricing-in-climate-change-risk)

# Asymmetric Information Failure

- Asymmetric information, also known as "information failure," occurs when one party to an economic transaction possesses greater material knowledge/information than the other party.
- Many markets are characterized by asymmetric information: actors on one side of the market have much better information than those on the other. Borrowers know more than lenders about their repayment prospects, managers and boards know more than shareholders about the firm's profitability, and prospective clients know more than insurance companies about their accident risk.
- Asymmetric information can result in two problems in the markets.
- Adverse selection (*ex ante*): quality decline or lack of transaction.
- Moral hazard (*ex post*): excessive risk-taking or "immoral" behavior.

<https://www.nobelprize.org/prizes/economic-sciences/2001/press-release/>

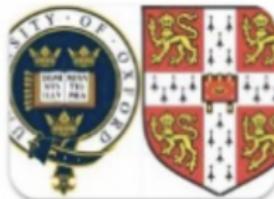
# Asymmetric Information: Examples



Risks from using tanning salons



Addiction to painkillers & other drugs



Gaining entry to elite degree courses



Complexity of pension schemes



Uncertain quality of second hand products



Knowledge of the nutritional content of foods



Cowboy builders or other "rip-off merchants"



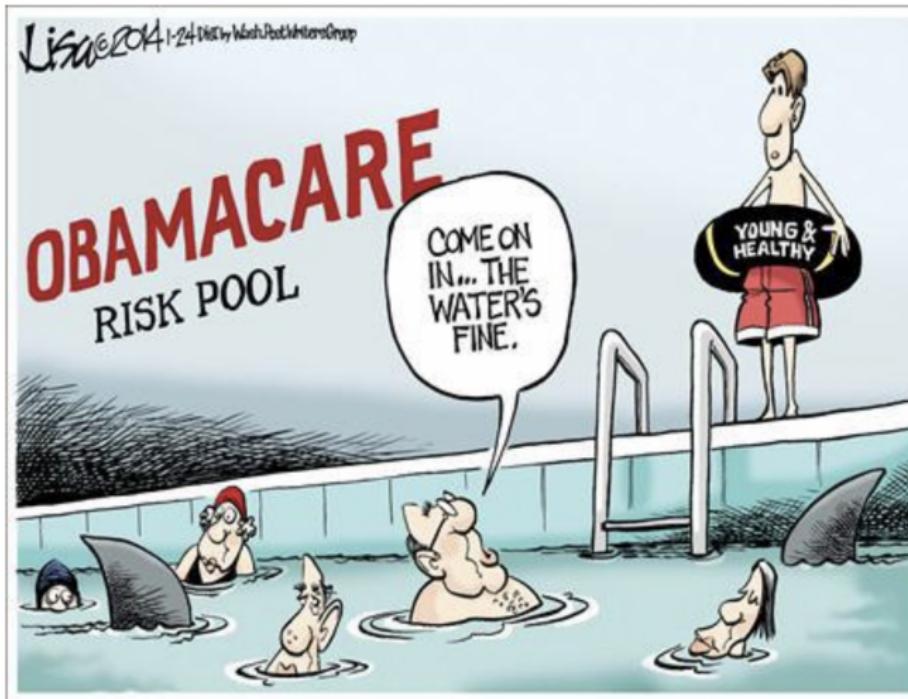
Tourist Bazaars or buying and selling antiques

# Moral Hazard & Adverse Selection

- Moral hazards are conditions that may lead a person to intentionally cause or exaggerate a loss. The threat from moral hazard is the possibility that the insured may intentionally cause a loss or file a false claim.
- For example, an insured may intentionally cause a fire or an auto accident to collect a claim payment on a building or car and unjustly enrich himself or herself.
- Moral hazard easily occurs when information asymmetry exists or when incentive systems that make stakeholders observe laws or agreement are not well established.
- The concept of adverse selection was first used predominantly in the insurance industry.
- The fact that insured individuals know more about their risk level than does the insurer might cause those most likely to have the adverse outcome to select insurance, leading insurers to lose money if they offer insurance, which as a consequence drives up insurance premiums.
- Under information asymmetry, adverse selection leads to market failure since healthy people may not be willing to buy insurance due to rising costs of insurance policy.

<https://financialservicescommission.wordpress.com/2010/03/03/1239/>

## Health Insurance: Adverse Selection



<https://sacredcowchips.net/tag/adverse-selection/>

# Health Care and Insurance Design

David Powell and Dana Goldman (2016) Disentangling Moral Hazard and Adverse Selection in Private Health Insurance, NBER Working Paper.

- A central challenge in designing health insurance plans is providing coverage that will provide for participants' unexpected health care needs without encouraging unnecessary spending.
- Moral hazard: When insured individuals bear a smaller share of their medical care costs, they are likely to consume more care. Adverse selection: When individuals who have a choice among insurance plans select their plan, those who are more likely to require care tend to choose more generous plans.
- The researchers calculate that adverse selection added \$773 in per-person costs to the most generous plan. Enrollees had to pay an additional \$60 a month in premiums in order for this plan to break even. Overall, the study concludes that moral hazard accounted for \$2,117, or 53 percent, of the \$3,969 difference in spending between the most and least generous plans. It attributes the remaining 47 percent to adverse selection.

<https://www.nber.org/digest/apr16/moral-hazard-and-adverse-selection-health-insurance>

# Health Care and Insurance Policy

## Healthcare Debate

Case for Public	Case for Private
<b>Equality</b> - ensures everyone has access to basic service, essential for living standards.	<b>Efficiency of private sector</b> - Private sector have incentives to be efficient.
<b>Positive externalities</b> - Good health for whole population increases labour productivity.	<b>Alternative</b> - Gives those who can afford it greater choice for choosing how they use healthcare
<b>Adverse selection</b> - In free market, the unhealthy will be most willing to buy insurance - pushing up premiums and making expensive.	<b>Demand keeps rising</b> - Public sector struggling to keep up with rising demand due to ageing population, and increased expectations.
<b>Merit good</b> - people may underestimate benefits of getting check up or getting treatment.	<b>Not limited</b> - With limited budget, public healthcare may have to ration services.
<b>Public service</b> - Healthcare is not like most private goods. Profit incentive isn't needed, and consumers struggle to choose between different doctors.	<b>Bureaucracy of government</b> . Public healthcare bodies may suffer from high bureaucracy costs.

[www.economicshelp.org](http://www.economicshelp.org)

<https://picshealth.blogspot.com/2017/02/adverse-selection-health-insurance.html>

# Moral Hazard: Too Big to Fail



- During the 2008 subprime crisis, the U.S. government's bailout of Fannie and Freddie (the two mortgage giant companies) has cost \$191 billion.
- Since the housing market returned to profitability, they've repaid that amount and almost \$100 billion more – and the housing market is more dependent on them than ever.
- The Wall Street banks and financial institutions were also on the government's bailout list because of the 2008 financial crisis, while their CEOs were still receiving hefty amount of compensation at that time.

<https://www.bloomberg.com/quicktake/fannie-mae-and-freddie-mac-irbtzdkhttps://mobile.twitter.com/truthsearch1957/status/1039138759382642688>

<https://financialservicescommission.wordpress.com/2010/03/03/1239/>

# Moral Hazard: Welfare Programs

"As it is certain, on the one hand, that we are all making some similar request to the Government; and as, on the other, it is proved that Government cannot satisfy one party without adding to the labor of the others, until I can obtain another definition of the word Government I feel authorized to give it my own. Who knows but it may obtain the prize? Here it is:

Government is the great fiction through which everybody endeavors to live at the expense of everybody else."

—Frederic Bastiat (1848)



<https://alphaideas.in/2017/06/20/moral-hazard/>

<https://therionorteline.com/2014/01/22/creating-moral-hazards-for-fun-and-profit/>

# OUTLINE

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# Ronald H. Coase (1910-2013)

Ronald Coase received the Nobel Prize in 1991 "for his discovery and clarification of the significance of transaction costs and property rights for the institutional structure and functioning of the economy." Coase is an unusual economist for the twentieth century, and a highly unusual Nobel Prize winner. First, his writings are sparse. In a sixty-year career he wrote only about a dozen significant papers and very few insignificant ones. Second, he uses little or no mathematics, disdaining what he calls "blackboard economics." Yet his impact on economics has been profound. That impact stems almost entirely from two of his articles, one published when he was twenty-seven and the other published twenty-three years later.

<https://www.coase.org/aboutronaldcoase.htm>



# The Coase Theorem

- In an influential 1960 article, "The Problem of Social Cost," the economist Ronald Coase pointed out that in an ideal world when transaction cost is low enough/negligible, the market exchange and private sector could indeed deal with all externalities.
- According to the Coase theorem, even in the presence of externalities and in the provision of public goods, individual market participants are aiming to and can reach an efficient outcome provided that the transaction costs are sufficiently low.
- Coase theorem is also called the invariance theorem due to the equivalent outcome of resource allocation under different assignments of private property rights (how to "divide the pie" does not matter).
- More insightfully, Coase pointed out that the delineation of rights is a prelude to market transactions, rendering it a more efficient approach to closing the divergence between private and social costs.

# Coase (1974) The Lighthouse in Economics

- Since the 19th century economists have routinely posed the lighthouse as an example of a public good. Ships coming in to port benefit from lighthouse services. Ships cannot individually be excluded from using the lighthouse if they have not paid for it, so the public good argument suggests that ships will free-ride on the payments of others for the provision of the lighthouse.
- If the free-rider problem is extreme, then there won't be enough lighthouses, or any at all. For that reason, economists starting with John Stuart Mill in 1848 and most notably Paul Samuelson, who formalized public good theory in 1954, concluded that public goods should be supplied by governments and paid for through taxation.
- Coase was dissatisfied with this treatment of public goods, and in "The Lighthouse in Economics" (1974) he laid out his critique and an alternative analysis. Coase went back into the history of lighthouses in Britain and showed that they mostly had been built and operated by private adventurers and later it was decided to nationalize them all through an institution called Trinity House.

<https://www.essentialscholars.org/coase>

## Coase (1960) The Problem of Social Costs

- Coase's classic example: a railroad emits sparks on a farmer's crops. Suppose that it costs one thousand dollars to control the sparks and the lost crops are worth two thousand dollars. Even if the law sides with the railroad, the farmer will pay the railroad to control the sparks.
- Alternately, suppose that it costs two thousand dollars to control the sparks, the lost crops are worth only one thousand, and the law sides with the farmer. Then the railroad pays the farmer for permission to continue sparking. Coase was particularly clever to emphasize that, in terms of economic efficiency, it does not matter whether the law sides with the railroad or the farmer.
- How can people resolve conflicts over resource use when that use creates costs for people who are not party to the transaction? Coase used his approach of examining how people resolve such conflicts in reality to look at the history of how disputes were resolved in English common law, from grazing cattle eating a neighbouring farmer's crops to industrial smoke harming nearby residents.

Ronald Coase, 1959, The Federal Communications Commission, Journal of Law and Economics, Vol. 2, pp. 1-40

*It is not easy to understand the feeling of hostility to the idea that people should pay for the facilities they use. It is true that this attitude has been supported by the argument that it was technologically impossible to charge for the use of frequencies, but this is clearly wrong. It is difficult to avoid the conclusion that the widespread opposition to the use of the pricing system for the allocation of frequencies can be explained only by the fact that the possibility of using it has never been seriously faced.*

#### V. PRIVATE PROPERTY AND THE ALLOCATION OF FREQUENCIES

*If the right to use a frequency is to be sold, the nature of that right have to be precisely defined. A simple answer would be to leave the situation essentially as it is now: the broadcaster would buy the right to use, for a certain period, an assigned frequency to transmit signals at a given power for certain hours from a transmitter located in a particular place. This would simply superimpose a payment on to the present system. It would make it possible for the person or firm who is to use a frequency to be determined in the market. But the enforcement of such detailed regulations for the operation of stations as are now imposed by the Federal Communications Commission would severely limit the extent to which the way the frequency was used could be determined by the forces of the market.*

## Cheung (1973) The Fable of the Bees

- In the early 1950s, J. E. Meade advocated subsidizing apple orchards to correct for the positive externalities they provide to beekeepers. Inspired by Coase, however, Steven Cheung (1973) wrote a careful case study of the bee-apple nexus.
- In the real world, beekeepers and apple orchard owners do not wait for government to solve their problem. They can and do negotiate detailed contracts to deal with externalities.
- It turns out, however, that pollination is a \$15 billion industry in the United States and beekeepers regularly truck their colonies around the country to sell pollination services to farmers.
- Watch this video on how markets figure out pricing bee services and positive externalities.

# How Bees Practice Social Distancing

Amy C. Geffre et al., Honey bee virus causes context-dependent changes in host social behavior. Proceedings of the National Academy of Sciences, May 12, 2020, 117(19), 10406-10413

- Honeybees live in large communities that contain tens of thousands of related individuals in close quarters. Scientists got to wondering, how can bees keep infections from spreading like wildfire?
- In the case of one particular virus, called Israeli acute paralysis virus, a study shows that honeybees actually use a form of social distancing to prevent transmitting the infection within their own colony.
- Of course, not to be outdone, the virus manipulates the bees in a way that spreads the infection to the colony next door.
- Bees infected with a virus cut back on interactions within their hive but find it easier to get past sentries at neighboring hives.

<https://www.scientificamerican.com/podcast/episode/virus-infected-bees-practice-social-distancing/>



Who Was Ronald Coase?



What Are Transaction Costs?



Transaction Costs &amp; Institutions



Why Do Firms Exist?



The Lighthouse in Economics



The Problem of Social Cost

Ronald Coase (1910-2013) was one of the most influential economists of the 20th century. His influence is due largely to two publications, the only two cited in the announcement of his Nobel Prize: *The Nature of the Firm* (1937) and *The Problem of Social Cost* (1960). These two articles are among the most-cited works in economics. The ideas Coase developed in these two works led to entirely new fields of inquiry in economics, law, management, and political science, and in conjunction with his article on using markets to allocate radio spectrum (Coase 1959), spawned new market design theory and practice that helped to transform our society and enable innovation and digitization.

The Essential Ronald Coase: Book and Videos <https://www.essentialscholars.org/coase>

# Noble Prize for "Market Failure"

- Market Power
  - 1982 George J. Stigler "for his seminal studies of industrial structures, functioning of markets and causes and effects of public regulation"
  - 2014 Jean Tirole for "his analysis of market power and regulation"
- Externalities and Public Goods
  - 1991 Ronald H. Coase "for his discovery and clarification of the significance of transaction costs and property rights for the institutional structure and functioning of the economy"
  - 2009 Elinor Ostrom "for her analysis of economic governance, especially the commons"

<https://www.nobelprize.org/prizes/lists/all-prizes-in-economic-sciences/>

# Noble Prize for "Market Failure"

- Asymmetric Information

- 1996 James A. Mirrlees and William Vickrey "for their fundamental contributions to the economic theory of incentives under asymmetric information"
- 2001 George A. Akerlof, A. Michael Spence and Joseph E. Stiglitz "for their analyses of markets with asymmetric information"
- 2007 Leonid Hurwicz, Eric S. Maskin and Roger B. Myerson "for having laid the foundations of mechanism design theory"
- 2010 Peter A. Diamond, Dale T. Mortensen and Christopher A. Pissarides "for their analysis of markets with search frictions"
- 2016 Oliver Hart and Bengt Holmstrom "for their contributions to contract theory"

<https://www.nobelprize.org/prizes/lists/all-prizes-in-economic-sciences/>

## Government Failures: Examples



## Political self interest / lobbying



## Policy myopia – search for “quick fixes”



## Regulatory Capture



### Information failures



### Disincentive effects



## High Enforcement / Compliance Costs



## Conflicting Policy Objectives



### Damaging effects of red tape

<https://www.tutor2u.net/economics/reference/government-failure>

# OUTLINE

① Market Efficiency

② Market "Failures"

③ Coase Theorem

④ Appendix

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