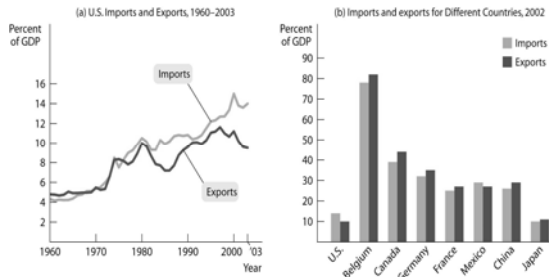




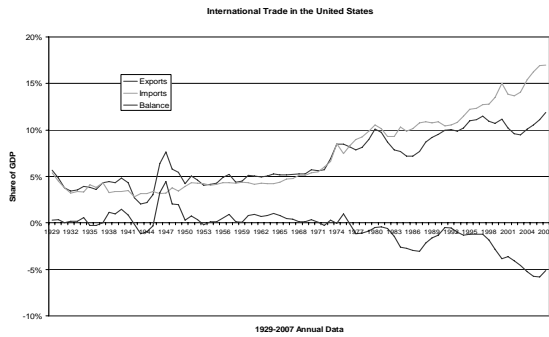
CHAPTER 17 International Trade

The Growing Importance of International Trade



2

Another Look: More U.S. Data



3

The Effect of International Trade

- From 1950-2003, world exports rose 117 times, after adjusting for inflation, an average annual growth rate of 9.4%.
- After 1950, economic growth rates doubled. From 1750-1950, world per-capita GDP grew at about 1% per year, and population also grew by 1%. From 1950-2003, world GDP rose by a factor of 7, an average annual rate of almost 4% (half was population growth).
- Many once-poor countries that adopted policies promoting international trade subsequently grew at much faster rates, especially in Asia: Japan, South Korea, Taipei (Taiwan), Singapore were first, then Malaysia and Thailand, and now China, Brazil, India, Poland, et cetera.

4

The Basic Idea

- Every nation has a **comparative advantage** in producing some goods, and a comparative disadvantage in producing other goods. It may be due to a relative abundance of capital, labor, or other natural resources; specific types of resources (e.g., skilled vs. unskilled); or differing productivities.
- Specialization allows for more efficiency, creating mutually-beneficial gains from trade. These gains from trade are a significant factor in improving world-wide growth, and countries which specialize and exchange with others tend to grow

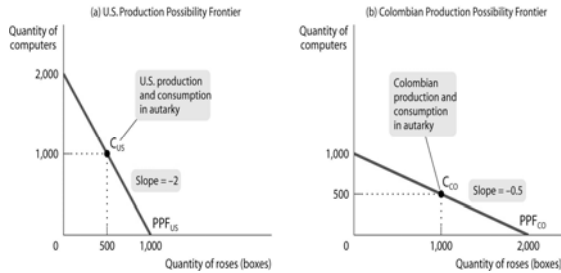
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Ricardian Theory of Trade

- The simplest model of trade, with one input (labor) and constant costs.
- Comparative advantage is determined by ratios in labor productivity.
- Trade increase real incomes in both countries.
- Suppose there are two countries, each of which produces two goods.

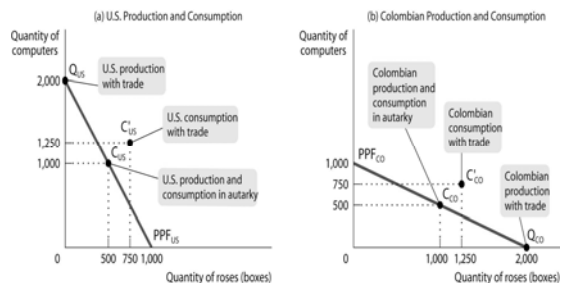
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Comparative Advantage and the Production Possibility Frontier



7

The Gains from International Trade



8

Heckscher-Ohlin model

- More than one type of input, with diminishing returns.
- Comparative advantage is determined by relative factor proportions, e.g., Home has 100 million workers and \$5 billion in capital, Foreign has 500 million workers and \$2 billion in capital, so Home is relatively capital-abundant and Foreign is relatively labor-abundant.
 - Home will have relatively cheap capital and expensive labor, Foreign vice-versa.
 - Home will have comparative advantage in capital-intensive goods and Foreign in labor-intensive goods.
 - Trade makes output prices and factor prices converge toward each other. Average incomes will rise in both countries, but at Home wages will fall and capital incomes rise. Vice versa in Foreign.
 - International trade improves efficiency and real incomes, but some people win and some people lose.

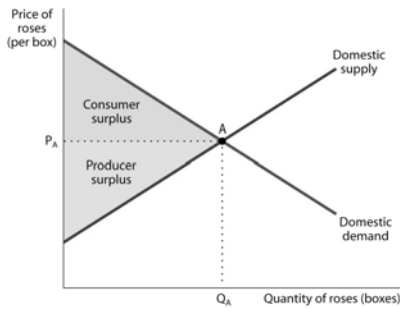
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Other Theories

- **Gravity Model:** Trade volume depends on distance and size of both exporting and importing economies.
- **Overlapping Incomes:** Consumers are more likely to buy goods of an appropriate quality produced by countries with similar consumers.
- **Monopolistic Competition:** In some sectors with economies of scale, international trade leads to more competition. Consumers have more choices, prices fall in both countries, driving some firms out of the market, and remaining firms (with economies of scale) get bigger.

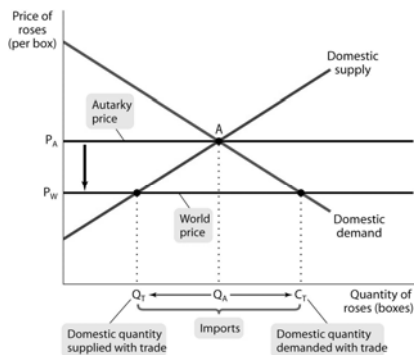
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Consumer and Producer Surplus in Autarky



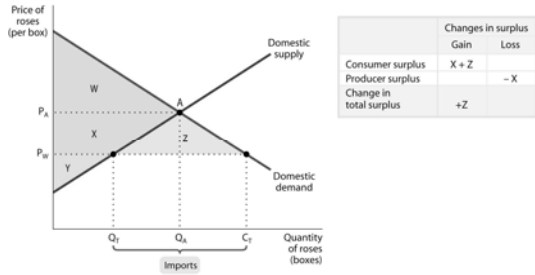
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The Domestic Market with Imports



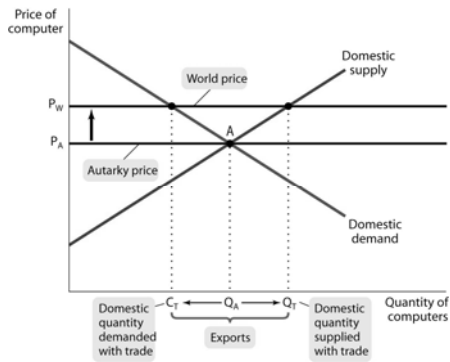
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The Effects of Imports on Surplus



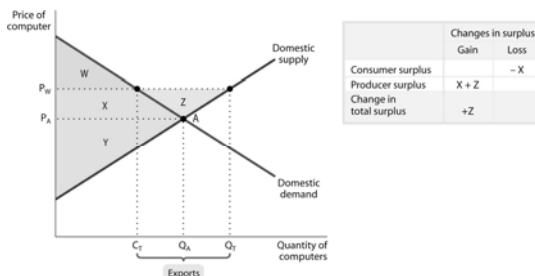
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The Domestic Market with Exports



14

The Effect of Exports on Surplus



15

The effect of low wages

- Why do wages differ between countries?

Average productivity differences.

- What if labor in two countries was equally productive, but wages were lower in one?

*Think about this... How would trade affect wages?
How would trade affect the exchange rate?*

16

Gains from Trade

- If countries specialize according to their comparative advantage and trade them for goods in their comparative disadvantage, both countries gain from trade.
- If both countries gain from trade, why is there any political opposition to trade?

Overall, countries gain, but some groups win and others lose. If we are relatively abundant in skilled labor and other countries are abundant in unskilled-labor, then we will likely specialize in and export skilled-labor products, and import goods which are produced with unskilled labor. This will lead to higher wages for skilled labor, higher prices for skilled-labor goods, lower wages for unskilled labor, and lower prices for unskilled-labor goods. Consumers of unskilled-labor goods benefit, but unskilled workers and even their employers may be worse off.

17

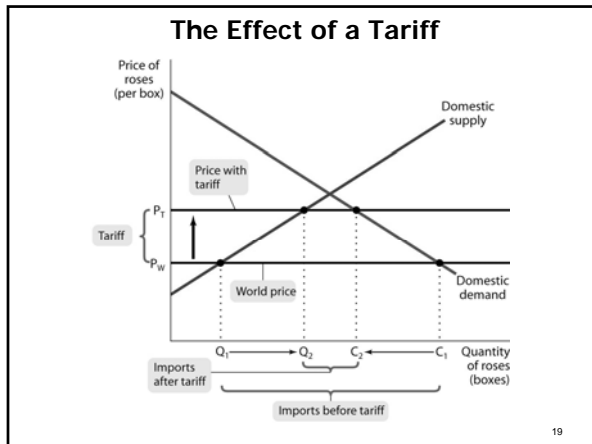
Effects of Trade Protection

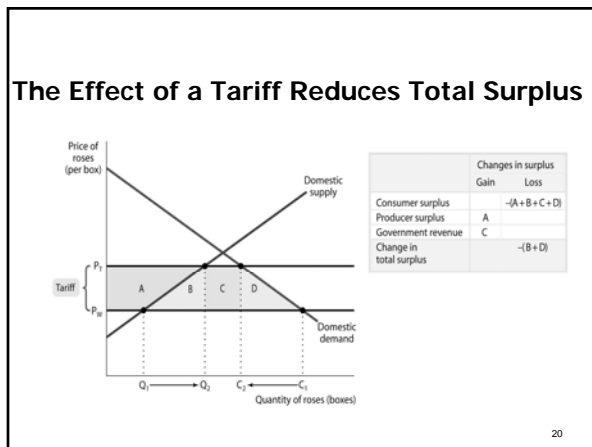
An economy has **free trade** when the government does not attempt either to reduce or to increase the levels of exports and imports that occur naturally as a result of supply and demand.

Policies that limit imports are known as **trade protection** or simply as **protection**.

The two most common protectionist policies are tariffs and import quotas. In rare instances, governments subsidize export industries.

18





Effects of an Import Quota

An *import quota* is a legal quantity limit on imports.

Its effect is like that of a tariff, except that revenues—the quota rents—accrue to the license-holder, not to the government.

It is more likely to lead to managerial slack and rent-seeking (see *monopoly inefficiency lecture*).

21

Foreign Exchange (Forex) Market

- **Foreign Exchange Rate (E):** Dollar price of foreign currency. For example, one Euro is about \$1.50, one Yuan is about 14 cents, one Yen is about 1 cent.
- Demand for Forex: imports, lending to foreigners.
- Supply of Forex: exports, borrowing from foreigners.
- Equilibrium exchange rate:

22

Balance of Payments

- Countries trade goods and services, but they also trade their savings and investment - through savings in foreign banks, buying foreign stocks or bonds, or direct foreign investment in plant and equipment.
 - S_f = net borrowing - lending (or repayment)
- If we are buying more imports, how should this affect E? How does that affect the value of the Dollar?
- If foreigners are putting their savings into the U.S., how does that affect E? The value of the Dollar?
- If we put a tariff on a quota on all our imports, how will this affect E and our exports?

23

If foreign workers are paid less than American workers because their exchange rate is cheap, will a giant sucking sound be heard as jobs move overseas?

No. Suppose foreign workers started producing everything. Then we would be importing, but not exporting. Falling supply of Forex (who wants our currency if we don't have anything to sell??) would make foreign currency more expensive, and when E rises, suddenly foreign wages would be high.

Foreign wage in dollars = foreign wage \times exchange rate.

24

Can protectionism alone cause a current account (trade) surplus?

No. Decreased demand for imports would decrease demand for foreign currency, lowering E (and thus making the domestic currency more expensive). Exports would fall too.

25

What causes Bilateral Trade Deficits?

- Between two countries, trade surpluses or deficits may result from multilateral trade. Suppose the U.S. exported food to Saudi Arabia, which exported oil to Japan, which exported cars to the U.S. The U.S. would have a surplus with Saudi Arabia and a deficit with Japan. Japan would have a surplus with the U.S. and a deficit with Saudi Arabia.

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What causes Multilateral Trade Deficits?

- Overall, the primary cause is simply foreign savings inflows or outflows. This results when domestic savings is not equal to domestic investment:
 - $NX + S_f = 0$ ($S_f = \text{inflows} - \text{outflows}$) and $I = S_d + S_f$.
 - If $I > S_d$, then $S_f > 0$ AND $nx < 0$.
 - Higher interest rates will attract foreign savings. More saving inflows will make foreign currency cheaper (and the dollar more expensive), causing exports to fall. Countries that save more than they invest have trade surpluses. Countries that save less have trade deficits.
 - In essence, every Dollar that a country saves in our country (i.e., lending it to us) is a Dollar they do not spend on our exports.

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Why has the Dollar been Falling?

- In the past, E was low because foreign savings were flowing into the U.S., because our financial markets were seen as safer, with higher returns. Our government gave tax cuts, increased spending, and borrowed the difference. Consumers also spent more than they earned, borrowing from their equity. This is not sustainable forever.
- In the future, we will have to repay what we borrowed. E will have to rise.
- Forex is a forward-looking market. If we all expect E to fall, it will fall.
- We may be in the transition between the past and the future, what Krugman called the “Wile E. Coyote” moment when investors realize there is no ground under their feet.

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What causes balance of payments surpluses/deficits?

Fixed exchange rates: Central banks offer to buy or sell foreign exchange with their domestic currency at a fixed price. This then affects their money supply and prices.

- An excess supply of forex will force our central bank to buy foreign exchange reserves and increase our money supply, or it will force the foreign central bank to sell its dollar reserves and decrease the foreign money supply.
- An excess demand for forex will force our central bank to sell its foreign exchange reserves and reduce our money supply, or it will force the foreign central bank to buy dollar reserves and increase the foreign money supply.
- The U.S. stopped doing this in 1971, but some countries (like China) still do it. China now hold \$1.2 trillion in dollar reserves, and they are getting worried.

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What causes international monetary crises?

There are often four separate but related crises that happen:

- A **balance of payments crisis**, resulting from a fixed, overvalued exchange rate, and a central bank that runs out of foreign exchange because of poor monetary policy. It may be made worse by speculators who bet that the exchange rate is unsustainable, and by domestic and foreign savers who are worried about the real value of their assets.
- A **debt crisis** brought about by foreign borrowing denominated in other currencies like the dollar. When the currency is devalued, this increases the domestic cost of foreign debt, puts further downward pressure on the exchange rate, and may make borrowers less solvent.
- A **speculative bubble** in stocks, real estate, and other assets resulting from excessive optimism for continued rapid growth. If this bubble bursts, this affects consumption, makes some firms default on their bank loans, and by reducing lending also decreases investment.
- A **banking crisis** from careless bank lending that results in an excessive default rate, making it harder for banks to lend and undermines confidence in the financial system.

30

The Political Economy of Trade Protection

Arguments for Trade Protection

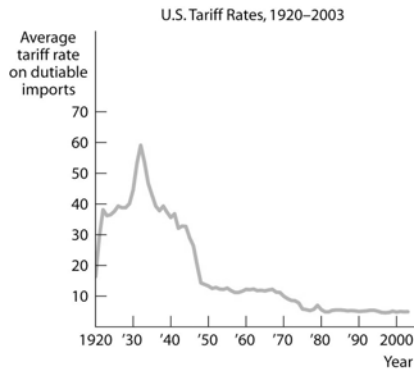
Advocates of tariffs and import quotas offer a variety of arguments. Three common arguments are:

- *national security*
- *job creation*
- *the infant industry argument*

For Trade liberalization countries engage in *international trade agreements*.

31

Declining Tariff Rates



32

Trade Policy can be a Prisoner's Dilemma

Outcomes for Countries X, Y	<i>Y has high tariffs</i>	<i>Y has low tariffs</i>
<i>X has high tariffs</i>	X and Y each gain \$1B from trade	X gains \$7B Y loses \$1B
<i>X has low tariffs</i>	X loses \$1B Y gains \$7B	X and Y each gain \$5B from trade

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Solving the Prisoner's Dilemma

- The “Nash equilibrium” is that each country has high tariffs, and they all lose.
- The General Agreement on Tariffs and Trade (GATT) was created after WWII, and negotiated lower tariffs using principle of reciprocity and nondiscrimination.
- Countries (including the U.S.) still found ways to cheat, using quotas, subsidies, regulations, and loopholes. GATT also had many exceptions, like agriculture, multifibres, services, intellectual property, et cetera.
- In 1995, GATT became part of the World Trade Organization (WTO) to better enforce trade agreements and close loopholes.

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CHAPTER 18 Uncertainty, Risk, and Private Information

35

What you will learn in this chapter:

- **Risk**—uncertainty about future outcomes—is an important feature of the economy, and most people are **risk-averse**: they would like to avoid risk
- Diminishing marginal utility makes people risk-averse and determines how much they are willing to pay to reduce risk
- Risk can be traded, with risk-averse people paying others to assume part of their risk
- **Diversification**
- **Private information**—situations in which some people know things that other people do not: “**Adverse Selection**” and “**Moral Hazard**”

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Expectations, Uncertainty and Risk

The **expected value** of a random variable is the *weighted average of all possible values*, where the weights on each possible value correspond to the probability of that value occurring.

$$EV = (P_1 \times S_1) + (P_2 \times S_2) + \dots + (P_N \times S_N)$$

Risk is uncertainty about future outcomes. Most people prefer, other things equal, to reduce **risk**.

We covered this already, but now let's use it.

37

The Expected Loss

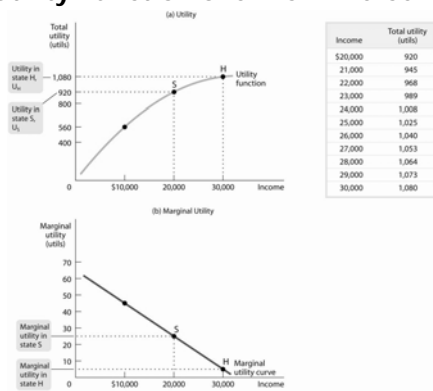
Assume in a typical year that you have a 5% chance of having a \$1000 loss, a 1% chance of a \$10,000 loss, and a 0.1% chance of a \$500,000 loss.

$$\begin{aligned} \text{Expected loss} &= \$650 \\ &= 5.0\% \times \$1,000 \\ &+ 1.0\% \times \$10,000 \\ &+ 0.1\% \times \$500,000 \\ &+ 93.9\% \times \$0 \\ &= \$50 + \$100 + \$500 + \$0 \end{aligned}$$

A risk-neutral person would be willing to pay \$650 per year to avoid this risk, but most people would be willing to pay even more. Why?

38

The Utility Function of a Risk-Averse Family



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The Logic of Risk Aversion

Most people in real life, are **risk-averse**: they will choose to reduce the risk they face when the cost of that reduction leaves the expected value of their income or wealth unchanged.

They would be willing to purchase a **fair insurance** policy for which the premium is equal to the expected value of the claims.

The purchase of a fair insurance policy increases expected utility and this is due to the concept of diminishing marginal utility. The reason is that *a dollar gained when income is low adds more to utility than a dollar lost when income is high* (alternatively, *at any income the utility of gaining a dollar is less than the utility of losing a dollar*).

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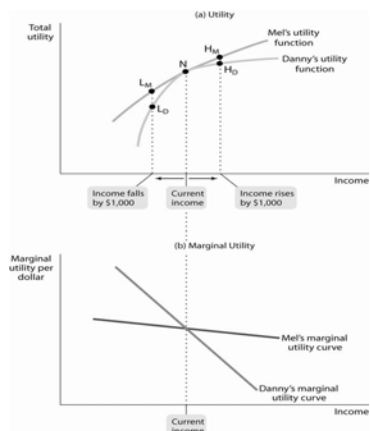
An Example:

The Effect of Fair Insurance on the Lee Family's Expected Income and Expected Utility

	Income in different states of the world		Expected income	Expected utility
	\$0 in medical expenses (0.5 probability)	\$10,000 in medical expenses (0.5 probability)		
Without insurance	\$30,000	\$20,000	$(0.5 \times \$30,000) + (0.5 \times \$20,000) = \$25,000$	$(0.5 \times 1,080 \text{ utils}) + (0.5 \times 920 \text{ utils}) = 1,000 \text{ utils}$
With fair insurance	\$25,000	\$25,000	$(0.5 \times \$25,000) + (0.5 \times \$25,000) = \$25,000$	$(0.5 \times 1,025 \text{ utils}) + (0.5 \times 1,025 \text{ utils}) = 1,025 \text{ utils}$

41

Differences in Risk Aversion



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Risk, Insurance, and Gambling

- How does an insurance company make money? They charge more than the expected loss, and reduce their risk by selling policies to lots of people.
- The chance of everybody having a loss simultaneously is very small. If the chance of flipping a coin and getting heads is 50%, the chance of doing it 1,000 times is roughly 10^{-300} .
- Insurance companies don't like hurricanes.
- Gambling is different, in that people pay to take risk (on average, gamblers always lose) rather than to avoid it. Some people may be risk-lovers, but in general we think they do it for entertainment.
- Differences in preferences and wealth lead to differences in risk aversion. Those who are more averse to risk will buy insurance from those who are not quite as averse to it.

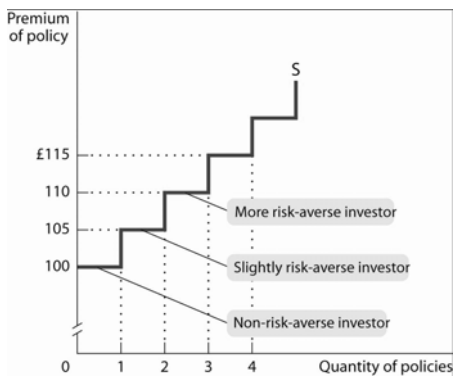
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What can be done in the presence of risk?

- Paying to Avoid Risk: buying insurance (or a farmer selling a futures contract, or an importer buying a forward contract for foreign exchange, or buying an options contract, et cetera).
- Trading Risk – as long as both parties are well-informed, trading risk should be mutually beneficial (with private information, of course, one party may be made worse off, e.g., if I buy an insurance policy that I don't need or can't ever use).

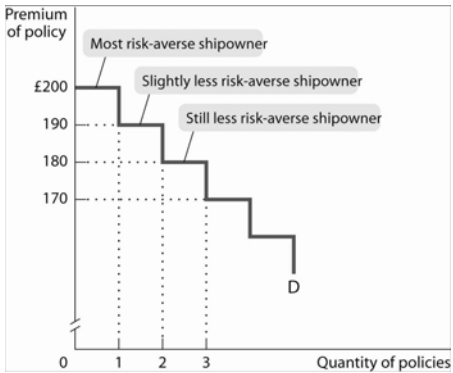
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The Supply of Insurance



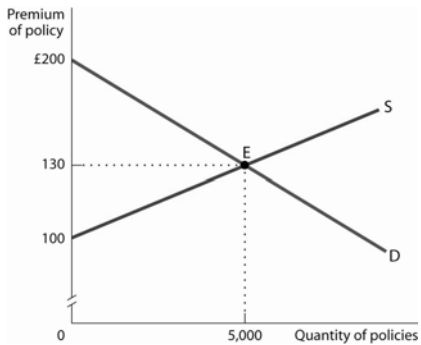
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The Demand for Insurance



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The Insurance Market



The equilibrium is at a premium of £130 with 5,000 policies bought and sold. In the absence of private information, the market generates an efficient allocation of risk.

Why would risk-averse investors take on risk?

- Because most people are averse to risk, risk is traded at price called the risk premium.
- Imagine two bonds, A and B, each paying \$10,000 in three years. A is safe, but there is a 50% chance that Company B will default.
- If the market interest rate is 6%, then the present discounted value of Bond A is $10,000 / (1.06^3) = \$8,396$.
 - That is, $\$8,396 \times (1.06) \times (1.06) \times (1.06) = \$10,000$

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What about the risky bond?

- The expected value of Bond B is \$5000 in three years, so at 6% the PDV = \$4198.
- Would you prefer one of Bond A or two of Bond B?
- Price is the same ($2 \times \$4198 = \8396), but risk is different.
 - One of Bond A - certain \$10,000 in three years.
 - Two of Bond B - 50% chance of paying \$20,000, 50% of nothing.
- Most investors are risk-averse, and would buy Bond A, not Bond B. Not an equilibrium.
- How do you find the market equilibrium?
- Demand would rise for Bond A, and falls for Bond B.

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Getting to Equilibrium

- Assume P_A rises from \$8396 to \$8638, and P_B falls from \$4198 to \$3861. Now which would you prefer?
- Bond A is now only earning a 5% annual yield $[(10000/8638)^{(1/3)} - 1 = 0.05]$.
- Bond B is now earning an annual yield of 37% if you are fortunate $[10000/3861)^{(1/3)} - 1 = 0.37]$. But you might lose all your money!
- Bond B's expected annual yield is 9% $[(50\% * 10000/3861)^{(1/3)} - 1 = 0.09]$.
- The risk premium for Bond B is 4% [9%-5%]. If it is an equilibrium price, then there will be enough people willing to buy Bond B at this higher return, even though it is risky.

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Reducing Risk

If financial markets are efficient, then the only way to get a higher return on average is to take more risk. You could win big, but you could lose big.

One important way of reducing risk is by not putting all your eggs in one basket: reduce the probability that all your eggs would be lost in case of an accident. A strategy of investing in such a way as to reduce the probability of severe losses is known as *diversification*.

> For example, putting your retirement into your own company's stock may *not* be a good idea. Buying stock in two large companies that compete with each other may be a good idea. Putting your savings in mutual fund may be an even better idea, especially with different managers.

> Some risks are hard to reduce with diversification. If the global economy collapses, for example, there is not much you can do.

> Mutual funds have reduced the risk premium for stocks by making them more desirable (and higher priced) for savers.

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Imperfect Information is a Market Failure

- *Asymmetric (Private) Information* — one side of a transaction (either buyer or seller) knows key information unknown to other party. What you don't know can hurt you.
- *Adverse Selection* — buyers or sellers may self-select due to asymmetric information, to the detriment of the other party.
- *Moral Hazard* — the failure of a person who is insured against risk to exercise proper caution and avoid that risk. The term comes from someone who is overinsured (e.g., against fire) and then decides to create the loss (e.g., arson).
- *Principal-Agent Problem* — an incentive problem. When a less-informed principal hires a better-informed agent to act in her interest, the agent may instead act in his own interest. Doctors, dentists, car repairmen, business managers.

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Insurance and Incentive

Insurance Markets are rife with imperfect information.

- *Basic idea* — individuals pay a premium to avoid risk, firm reduces its risk by pooling and diversification.
- *Adverse selection* — example of optional student health care, possibility that rate increases reduce profits, solution of actuarial rating into risk categories. The more you need insurance, the less the insurance company wants to sell you an insurance policy. Individual policies are expensive.
- *Moral hazard* — car theft insurance and where you park, solution of deductibles.

Incentive problems — e.g., principal-agent problem (doctor, car mechanic, lawnmowing)

Solutions? contracts, ownership, reputation, self-regulation

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Akerlof's *Lemons Market*

Adverse Selection in the market for used cars (as an example).

- Imagine some new cars are *lemons*, and these buyers want to get rid of them so bad they are price inelastic. Other new cars are not lemons, and these resellers are more price elastic.
- The lower the price, the more likely the car is a lemon.
- Consumers rely on signaling — price and quality.
- Demand curve can actually curve backwards.
- Market is inefficient — market quantity is much lower than optimal amount.
- Market may not clear — excess supply can be chronic.

Solutions: government regulation, warranty, self-regulation, reputation & signaling by firms

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Imperfect Information in the Capital Market

Consider the market for new start-up firms:

- Entrepreneurs know more than the bank about their risk, and bankruptcy laws can shield a borrower from repayment.
- The higher the interest rate banks charge, the less likely that safe firms will borrow. At higher interest rates, more of the willing borrowers will be risky. Banks may be less willing to lend, and could even have a backward-bending supply curve (*lemon loans*).
- Banks are really risk averse, but there is a **venture capital market** for people willing to take higher risks. They will want as much assurance that you will work hard, and will also want more control and more of the potential profits.
- The entrepreneur may signal how much she believes in her idea by putting her own assets at. While this may increase the risk of bankruptcy, it also signals that she is willing to put her money where her mouth is.

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Imperfect Information in the Labor Market

Motivation affects the marginal product of labor:

- Wages, nonpecuniary & fringe benefits.
- Promotion contests in lieu of higher wages.
- Piece rates & commissions – when monitoring is easy.
- When worker performance is subject to things outside the worker's control, the worker may want to insure against risk by accepting a lower average wage.
- Sometimes productivity is hard (or too expensive) to monitor well.

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Efficiency Wages

- The harder it is to monitor worker productivity, the more likely firms will pay wages above the market-clearing wage. Workers then have something to lose.
- If one firm does this, workers who lose their jobs can move to other, lower-paid jobs.
- If all firms do this, then this creates excess supply (unemployment), and workers who lose their jobs may not be able to get another job in their field.
- This may be efficient for the firm, but the information problem is inefficient for the market.
- *Wages of trust* are a similar idea.

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College Education Hiring & Job Search Issues

A college education may serve several purposes:

(1) **Investment in human capital:**

- o General skills like writing & critical thinking, seeing the big picture.
- o Specific skills like programming, accounting, engineering, , understanding the economy, using statistics for forecasting.
- o Basic skills like knowing how to show up on time, being willing to work, getting your work done, being able to learn, et cetera.

College is costly (tuition, books, and foregone wages), but for most people the net present value of higher future earnings is significantly higher than the cost.

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But imperfect information leads to more functions for college...

Because employers cannot accurately identify which workers will be more productive, a college education serves additional functions as well:

- (2) **Screening:** only people who have demonstrated they have basic skills and some general skills can graduate, so the university has done some of the work for the employer.
- (3) **Self-selection:** students know themselves better than the employer can, and only students who believe that they have potential will find college to be a worthwhile investment.
- (4) **Signaling:** employers cannot read your mind, and will judge you by what they can observe. For example, students signal to employers how hard they are willing to work by the trouble they are willing to put into the interview. A college education with a tough major signals you are willing to work hard. *Good grades help, but not with easy majors.*

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In conclusion

- Imperfect information is one of the more interesting research areas in economics, and the theory is increasingly able to explain a variety of sub-optimal behaviors.
- Like imperfect competition, imperfect information can create significant market failures that can lead a free market economy to be less efficient than it could be.
- Some types of government intervention may “fix” some of these market failures, like laws against insider information in stock trading, consumer fraud, lemon laws, et cetera.
- However, government is itself subject to the same failures of information and incentive. What needs fixing? How do we fix it, and exactly how much should we fix it? Is everybody motivated to fix it?

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