

Principles of Microeconomics

Chapter 3:

Interdependence and the Gains from Trade



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Gains From Trade

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In This Chapter

- ▶ Why do people—and nations—choose to be economically interdependent?
- ▶ How can trade make everyone better off?
- ▶ What is **absolute advantage**?
- ▶ What is **comparative advantage**?
- ▶ How are these concepts similar?
- ▶ How are they different?

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Ask The Experts

Trade Between China and the United States

▶ “Trade with China makes most Americans better off because, among other advantages, they can buy goods that are made or assembled more cheaply in China.”

▶ Do you Agree or Disagree?

▶ Do you think Economists Agree or Disagree?

Source: IGM Economic Experts Panel, June 19, 2012.

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Do you "Agree" or "Disagree"?

“Trade with China makes most Americans better off because, among other advantages, they can buy goods that are made or assembled more cheaply in China.”

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Do Economists "Agree" or "Disagree"?
 "Trade with China makes most Americans better off because, among other advantages, they can buy goods that are made or assembled more cheaply in China."

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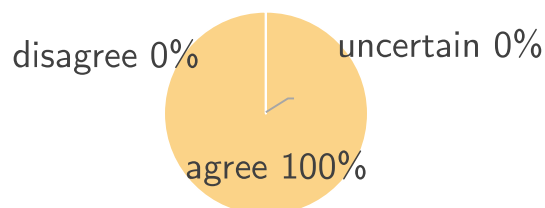
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Ask The Experts

Trade Between China and the United States

- ▶ "Trade with China makes most Americans better off because, among other advantages, they can buy goods that are made or assembled more cheaply in China."

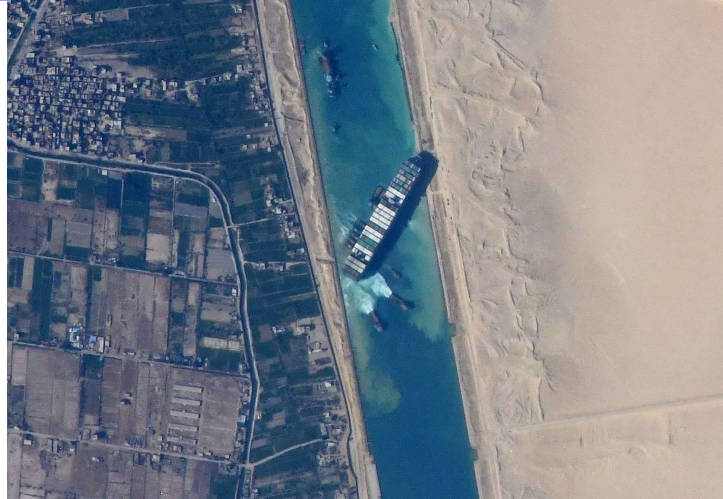
What do economists say?



Source: IGM Economic Experts Panel, June 19, 2012.

Interdependence

- ▶ Interdependence
 - ▶ Rely on many people from around the world, most of whom you've never met
 - ▶ To provide you with the goods and services you enjoy



NASA JSC ISS image library:

The container ship Ever Given stuck in the Suez Canal in Egypt, viewed from the International Space Station

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Interdependence

- ▶ “Trade can make everyone better off ”
- ▶ One of the Ten Principles from Chapter 1
- ▶ We now learn why people – and nations – choose to be interdependent
- ▶ And how they can gain from trade

印度 船長開一艘
 台灣 公司從
 日本 船東租來由
 英國 負責保險掛著
 巴拿馬 國旗的貨輪載
 中國 貨往
 德國 在
 埃及 蘇伊士運河堵住
 世界 的船

取自王業立教授臉書

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Interdependence

- ▶ “Trade can make everyone better off”



當你工作壓力很大的時候



想想這台小挖土機

現在全歐亞航線的船隻
都在等他把河岸挖開

Our example

- ▶ Assumptions:
 - ▶ Two countries: Dailiok and Daiwan
 - ▶ Two goods: chipsets and tea
 - ▶ One resource: labor, measured in hours
- ▶ We want to determine how much of both goods each country produces and consumes:
 - ▶ If the country chooses to be self-sufficient
 - ▶ If it trades with the other country

EXAMPLE 1: Dailiok

- ▶ **The Dailiok economy** has 50,000 labor hours per month available for production
- ▶ Produces only two goods: chipsets and tea
- ▶ To produce 1 chipset requires 500 labor hours
- ▶ To produce 1 ton of tea requires 10 labor hours

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EXAMPLE 1: Dailiok

	Employment of Labor Hours		Production	
	Chipsets	Tea	Chipsets	Tea
A	50,000	0	100	0
B	40,000	10,000	80	1,000
C	25,000	25,000	50	2,500
D	10,000	40,000	20	4,000
E	0	50,000	0	5,000

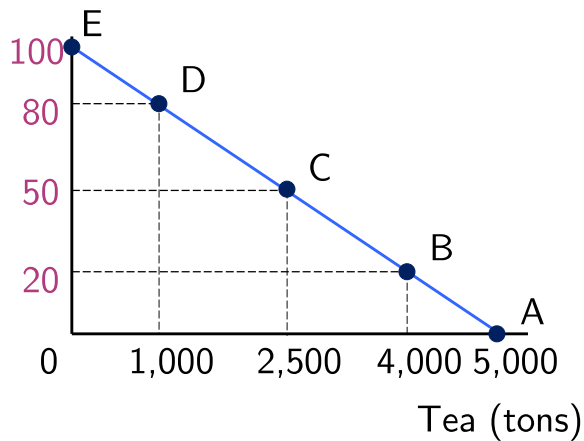
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EXAMPLE 1: The Dailiok PPF

Chipsets



Dailiok has enough labor to produce :

- ▶ 100 chipsets,
- ▶ OR 5,000 tons of tea,
- ▶ OR any combination along the PPF.

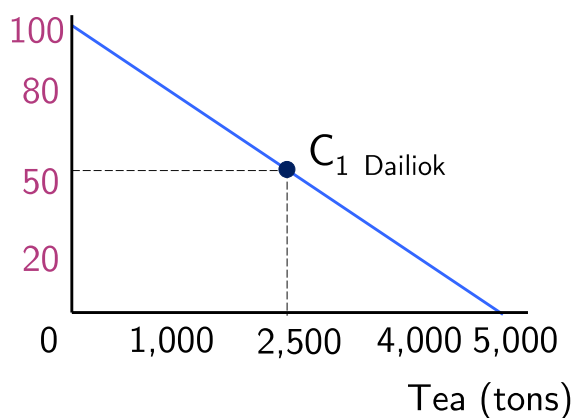
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EXAMPLE 1: Dailiok Without Trade

Chipsets



Suppose Dailiok uses **half its labor** to produce **each of the two goods**.

- Dailiok's **production and consumption** would be: 50 chipsets and 2,500 tons of tea

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Active Learning 1: Derive Daiwan's PPF

- ▶ Use the following information to draw Daiwan's PPF:
 - ▶ Daiwan has 30,000 labor hours per month available for production
 - ▶ Produces only two goods: chipsets and tea
 - ▶ To produce 1 chipset requires 625 labor hours
 - ▶ To produce 1 ton of tea requires 25 labor hours
 - ▶ Your graph should measure tea (tons) on the horizontal axis.
- ▶ Hint: How many chipsets (tons of tea) can Daiwan produce if all resources are used to produce it?

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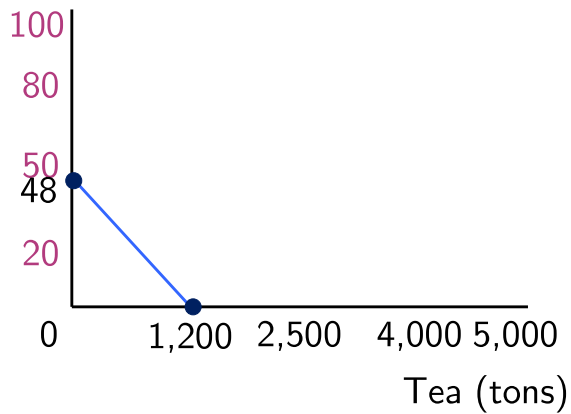
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Daiwan has 30,000 labor hours.
To produce 1 chipset requires 625 labor hours.
To produce 1 ton of tea requires 25 labor hours.
How many tons of tea can Daiwan produce if all resources are used to produce tea?

Active Learning 1: Answers

Chipsets



Daiwan has enough labor to produce:

- ▶ 48 chipsets,
- ▶ OR 1,200 tons of tea,
- ▶ OR any combination along the PPF.

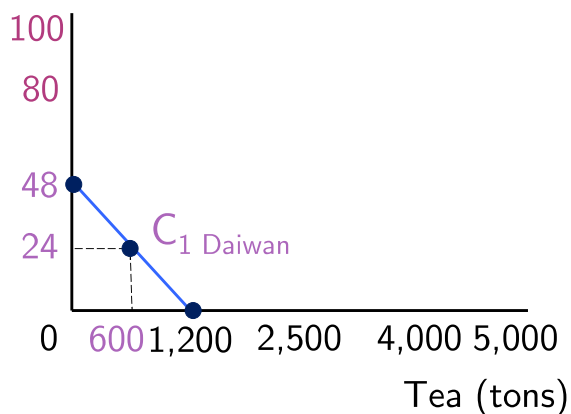
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Active Learning 1: Daiwan Without Trade

Chipsets



Suppose Daiwan uses **half its labor** to produce **each of the two goods**.

- Daiwan's **production and consumption** would be: 24 chipsets and 600 tons of tea

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Consumption With and Without Trade

- ▶ Without trade:
 - ▶ Dailiok consumers get 50 chipsets and 2,500 tons of tea
 - ▶ Daiwanese consumers get 24 chipsets and 600 tons tea
- ▶ Comparison:
 - ▶ Consumption without trade vs. Consumption with trade
 - ▶ We need to see how much of each good is produced and traded by the two countries

Active Learning 2: Production Under Trade

- ▶ We continue Example 1 and Active Learning 1, but this time the two countries will choose different production points.
 - A. Dailiok produces 3,500 tons of tea.
 - ▶ How many chipsets can Dailiok produce with the remaining resources? Draw this point on the PPF.
 - B. Daiwan produces 48 chipsets.
 - ▶ How many tons of tea can Daiwan produce with the remaining resources? Draw this point on the PPF.

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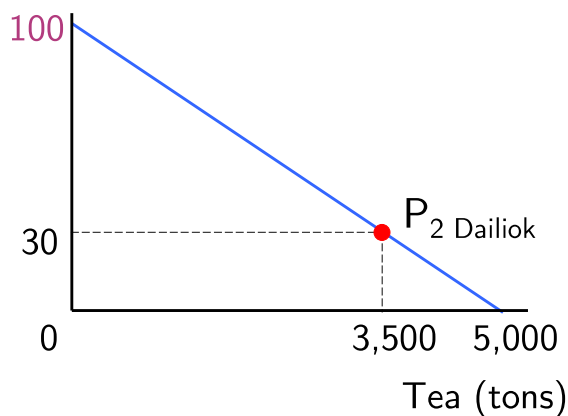
The Dailiok economy has 50,000 labor hours.
 To produce 1 chipset requires 500 labor hours.
 To produce 1 ton of tea requires 10 labor hours.
 If Dailiok produces 3,500 tons of tea, how many
 chipsets can it produce with the remaining resources?

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Active Learning 2A: Dailiok Production With Trade

Chipsets



Producing 3,500 tons of
 tea requires $35,000 = 3,500 \times 10$ labor hours.

► The remaining
 $(50,000 - 35,000) = 15,000$ labor hours
 are used to produce
 $30 = 15,000 / 500$
 chipsets.

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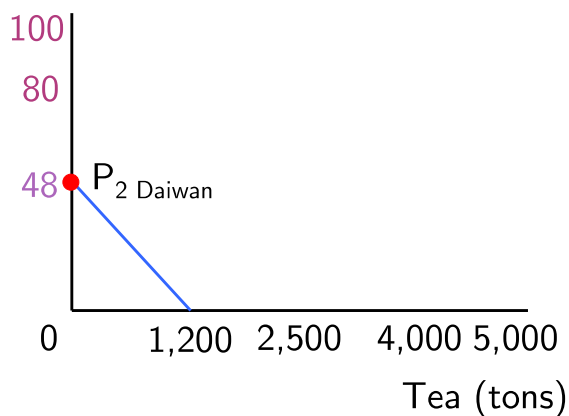
Daiwan has 30,000 labor hours.
 To produce 1 chipset requires 625 labor hours.
 To produce 1 ton of tea requires 25 labor hours.
 If Daiwan produces 48 chipsets, how many tons of tea can Daiwan produce with the remaining resources?

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Active Learning 2B: Daiwan's Production With Trade

Chipsets



Producing 48 chipsets requires all of Daiwan's resources:
 $48 \times 625 = 30,000$ labor hours.

► So, Daiwan would produce 0 tons of tea.

Exports and Imports

▶ Imports

- Goods produced abroad and sold domestically
- Foreign producer and domestic buyers

▶ Exports

- Goods produced domestically and sold abroad
- Domestic producer and foreign buyers

Active Learning 3: Consumption Under Trade

- ▶ We continue Active Learning 2, but this time the two countries will trade: 22 chipsets for 880 tons of tea.
- A. Dailiok exports 880 tons of tea/imports 22 chipsets
 - ▶ How much of each good is consumed in Dailiok?
 - ▶ Plot this combination on the Dailiok PPF.
- B. Daiwan exports 22 chipsets/imports 880 tons of tea
 - ▶ How much of each good is consumed in Daiwan?
 - ▶ Plot this combination on Daiwan's PPF.

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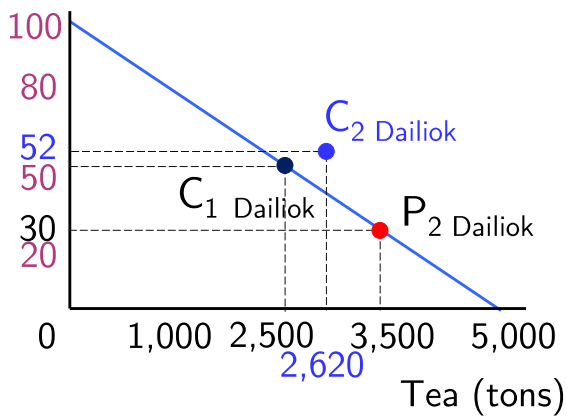
Dailiok produces 3,500 tons of tea and 30 chipsets.
 Dailiok exports 880 tons of tea and imports 22 chipsets.
 How much of each good is consumed in Dailiok?

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Active Learning 3A: Dailiok Consumption With Trade

Chipsets



	chipsets	tea
produced	30	3,500
+ imported	22	0
- exported	0	880
= amount consumed	52	2,620

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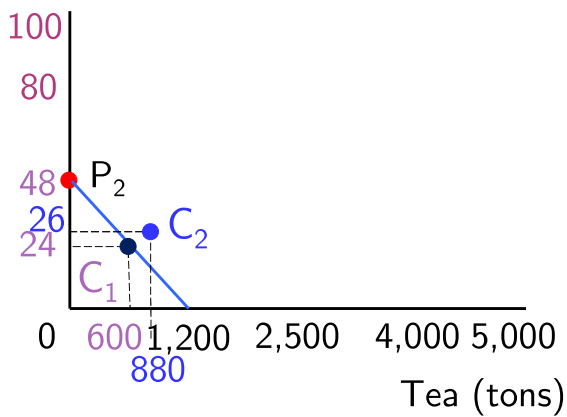
Daiwan produces 0 tons of tea and 48 chipsets.
 Daiwan exports 22 chipsets and imports 880 tons of tea.
 How much of each good is consumed in Daiwan?

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Active Learning 3B: Daiwan's Consumption With Trade

Chipsets



	chipsets	tea
produced	48	0
+ imported	0	880
- exported	22	0
= amount consumed	26	880

Trade Makes Both Countries Better Off

Dailiok			
	consumption w/o trade	consumption with trade	gains from trade
chipsets	50	52	2
tea	2,500	2,620	120
Daiwan			
	consumption w/o trade	consumption with trade	gains from trade
chipsets	24	26	2
tea	600	880	280

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Where Do These Gains Come From?

- ▶ Absolute Advantage:
 - ▶ The ability to produce a good using fewer inputs than another producer
- ▶ In our example:
 - ▶ Absolute advantage in tea: Dailiok
 - ▶ Producing 1 ton of tea uses 10 labor hours in Dailiok vs. 25 in Daiwan

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Where Do These Gains Come From?

- ▶ Absolute advantage in chipsets: Dailiok
 - ▶ Producing one chipset requires 625 labor hours in Daiwan, but only 500 in Dailiok
- ▶ Dailiok has an absolute advantage in both goods!
 - ▶ So why does Daiwan specialize in chipsets?
 - ▶ Why do both countries gain from trade?
- ▶ Two countries can gain from trade
 - ▶ When each specializes in the good it produces at lowest cost

Two Measures of the Cost of a Good

- ▶ Absolute Advantage
 - ▶ Measures the cost of a good in terms of the inputs required to produce it
- ▶ Another Measure of Cost: Opportunity Cost
 - ▶ The opportunity cost of a chipset
 - = amount of tea that could be produced using the labor needed to produce one chipset

Comparative Advantage

- ▶ **Comparative Advantage**
 - ▶ The ability to produce a good at a **lower opportunity cost** than another producer
- ▶ **Principle of Comparative Advantage**
 - ▶ Each good should be produced by the individual that has the smaller opportunity cost of producing that good
- ▶ **Specialize according to comparative advantage**

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EXAMPLE 2: Comparative Advantage

- ▶ **Dailiok**: produce 1 chipset using 500 labor hours; produce 1 ton of tea using 10 labor hours
- ▶ **Daiwan**: produce 1 chipset using 625 labor hours; produce 1 ton of tea using 25 labor hours
 - A. For each country, calculate the opportunity cost of producing each good.
 - B. Which country has comparative advantage in the production of tea?
 - C. Which has comparative advantage in producing chipsets?

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Dailiok can produce 1 chipset in 500 hours or 1 ton of tea in 10 hours.

Daiwan can produce 1 chipset in 625 hours or 1 ton of tea in 25 hours.

Which country has comparative advantage in the production of tea?

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Dailiok can produce 1 chipset in 500 hours or 1 ton of tea in 10 hours.

Daiwan can produce 1 chipset in 625 hours or 1 ton of tea in 25 hours.

Which country has comparative advantage in producing chipsets?

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EXAMPLE 2A: Calculating Opportunity Costs

▶ Dailiok:

- ▶ Produce 1 chipset using 500 labor hours, but using the 500 labor hours to produce tea would have produced $500/10 = 50$ tons of tea (TT)
- ▶ Opportunity cost of 1 chipset = 50 TT
- ▶ Opportunity cost of 1 TT = 0.02 chipsets

▶ Daiwan:

- ▶ Opportunity cost of 1 chipset = 25 TT
- ▶ Opportunity cost of 1 TT = 0.04 chipsets

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EXAMPLE 2B, C: Comparative Advantage

Opportunity cost of producing:

	1 Chipset	1 Ton of Tea
Dailiok	50 tons of tea	0.02 chipsets
Daiwan	25 tons of tea	0.04 chipsets

- ▶ Comparative advantage in chipsets: **Daiwan**
 - ▶ Because Daiwan only has to give up 25 tons of tea (less than 50 for Dailiok)
- ▶ Comparative advantage in tea: **Dailiok**
 - ▶ Since Dailiok has the lowest opportunity cost of producing it

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Comparative Advantage and Trade

- ▶ Gains From Trade
 - ▶ Arise from comparative advantage (differences in opportunity costs)
- ▶ When each country specializes in the good(s) in which it has a comparative advantage
 - ▶ Total production in all countries is higher
 - ▶ The world's "economic pie" is bigger
 - ▶ All countries can gain from trade

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The Price of the Trade

- ▶ The Price of Trade
 - ▶ Must lie between their opportunity costs
- ▶ In our example: 22 chipsets traded for 880 tons of tea
 - ▶ So, the price of trade is 1 chipset for 40 tons of tea
 - ▶ This is:
 - ▶ Greater than Daiwan's opportunity cost of 1 chipset (25 tons of tea)
 - ▶ Lower than Dailiok's opportunity cost of 1 chipset (50 tons of tea)

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Active Learning 4: California and Mexico

- ▶ California, 10,000 hours of labor/month:
 - ▶ producing 1 lb. coffee requires 2 hours;
 - ▶ producing 1 bottle wine requires 4 hours
 - ▶ Mexico, 10,000 hours of labor/month:
 - ▶ producing 1 lb. coffee requires 1 hour
 - ▶ producing 1 bottle wine requires 5 hours
- A. Which country has an absolute advantage in the production of coffee?
- B. Which has comparative advantage in producing wine?

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California produces 1 lb. coffee in 2 hours and 1 bottle wine in 4 hours.

Mexico produces 1 lb. coffee requires 1 hour and 1 bottle wine in 5 hours.

Which country has an absolute advantage in the production of coffee?

Which has comparative advantage in producing wine?

Active Learning 4: Answers

- A. Absolute advantage in the production of coffee?
- ▶ Fewer resources to produce 1 lb. of coffee
 - ▶ Mexico: (1 labor-hour in Mexico, but 2 in California)
- B. Which country has a comparative advantage in the production of wine?
- ▶ Producing wine at the lowest opportunity cost
 - ▶ California's opportunity cost of wine = 2 lb. coffee
 - ▶ Mexico's opportunity cost of wine = 5 lb. coffee

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Ask The Experts

Trade Between China and the United States

- ▶ "Some Americans who work in the production of competing goods, such as clothing and furniture, are made worse off by trade with China."
 - ▶ Do you Agree or Disagree?
- ▶ Do you think Economists Agree or Disagree?

Source: IGM Economic Experts Panel, June 19, 2012.

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Do you "Agree" or "Disagree"?
"Some Americans who work in the production of competing goods, such as clothing and furniture, are made worse off by trade with China."

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Do Economists "Agree" or "Disagree"?
"Some Americans who work in the production of competing goods, such as clothing and furniture, are made worse off by trade with China."

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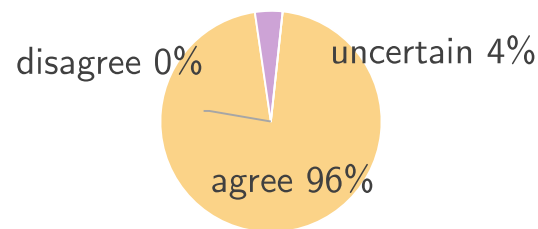
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Ask The Experts

Trade Between China and the United States

- ▶ “Some Americans who work in the production of competing goods, such as clothing and furniture, are made worse off by trade with China.”

What do economists say?



Source: IGM Economic Experts Panel, June 19, 2012

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Think-Pair-Share

You Are Watching an Election Debate on Television...

- ▶ A candidate says, “We need to stop the flow of foreign vehicles into our country. If we place a tariff on foreign vehicles, our domestic vehicle production will rise and Taiwan will be better off.”
 - Will Taiwan be better off if we limit car imports? Explain.
 - Will anyone in Taiwan be better off if we limit car imports? Explain.
 - In the real world, does every person in the country gain when restrictions on imports are reduced? Explain.

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Will Taiwan be better off if we limit car imports? Explain.

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Who in Taiwan will be better off if we limit car imports?

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In the real world, does every person in the country gain when restrictions on imports are reduced?

Name a person who will NOT gain if we reduce import restrictions. If you cannot think of one, simply state, "None."

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Chapter in a Nutshell

- ▶ **Interdependence and trade are desirable**
 - ▶ Allow everyone to enjoy a greater quantity and variety of goods and services
- ▶ **Comparative advantage:** being able to produce a good at a lower opportunity cost
- ▶ **Absolute advantage:** being able to produce a good with fewer inputs
- ▶ The gains from trade are based on comparative advantage, not absolute advantage

Chapter in a Nutshell

- ▶ Trade makes everyone better off:
 - ▶ It allows people to specialize in those activities in which they have a comparative advantage
- ▶ The principle of comparative advantage applies to countries as well as to people
- ▶ Economists use the principle of comparative advantage to advocate free trade among countries

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Chapter 3: Gains From Trade

- ▶ Trade can make people better off
- ▶ Key Idea: Comparative Advantage

- ▶ Suggested Homework:
 - ▶ Read Mankiw Chap. 3
 - ▶ Mankiw, Chap.3, Problem 3, 8, 9

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Principles of Microeconomics

Ch.3: Interdependence and the Gains from Trade

Questions about chapter 3?

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Audience Q&A Session

Principles of Microeconomics

Ch.3

The End

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