EC1101E:
Introduction to Economic Analysis

Lecture 1	**Introduction** ▪ Scarcity and Opportunity Cost ▪ Five Core Principles ▪ Production Possibilities Frontier ▪ Gains from Trade

Scarcity

- **Scarce:**
  - Deficient in quantity compared with the demand.
  - Insufficient to satisfy *needs* or *wants.*
- Individuals face a scarcity of resources, *e.g.*, *money, time.*
- Society faces a scarcity of resources.
  - **Labor**
  - **Capital: physical capital** and **human capital**
  - **Land** and **natural resources**
  - **Entrepreneurship**

What is Economics?

What is Economics?

- **Economics:** the study of choice under *scarcity*.
  - How people decide how much to work, what to buy, how much to save, how to invest, *etc.*
  - How firms decide how much to produce, how many workers to hire, *etc.*
  - How society decides how to allocate its resources among national defense, health care, education, scientific research, social safety nets, *etc.*

Opportunity Cost

- Making decisions requires comparing the *costs* and *benefits* of alternative choices.
- The **opportunity cost** of any choice is *whatever must be given up when we make that choice.*
  - **Explicit cost:** monetary sacrifice.
  - **Implicit cost:** non-monetary sacrifice, *e.g.*, time.
- When the alternatives to a choice are mutually exclusive, the **implicit cost** of the choice is *the value of the next best alternative.*

Example 1

The opportunity cost of attending university is

A. the cost of tuition, fees, and books.
B. the foregone wages.
C. the cost of tuition, fees, and books as well as the foregone wages.

Example 2

Suppose your choices, in order of preference, are as follows:

- Playing football
- Studying
- Watching TV

The opportunity cost of playing football is

A. the benefit derived from studying.
B. the enjoyment derived from watching TV.
C. the benefit derived from studying as well as the enjoyment derived from watching TV.

ACTIVE LEARNING *1.1*

What to Have for Lunch

You are deciding what to have for lunch. You have two options: *yong tau foo* and chicken rice. Each option costs $4. What is the opportunity cost of *yong tau foo*?

A. Chicken rice.

B. $4.

C. Chicken rice and $4.

D. None of the above.

ACTIVE LEARNING *1.2*

Opportunity Cost of a Concert

You have won a free ticket to an Ariana Grande concert. The ticket has no resale value. Billie Eilish is performing on the same night, and is your next best alternative. Tickets to the Billie Eilish concert cost $150, but you are willing to pay up to $250. Assume there are no other costs to attending either concert. What is the opportunity cost of attending the Ariana Grande concert?

A. $0.

B. $50.

C. $100.

D. $150.

E. $250.

Five Core Principles

Scarcity Implies Trade-Offs

- We have *unlimited* wants and *limited* resources.
  Hence having more of one good thing usually means having *less* of another.
- *Examples:*
  - Having more money to buy stuff requires working more hours, which leaves less time for leisure.
  - Going to a party the night before an exam leaves you less time for studying.

Bargaining Strength Comes Through Scarcity

- Scarce resources command *high* prices.
- *Examples:*
  - Why is the monthly wage of a cleaner in Denmark (SGD 5,500) so much higher than that of a cleaner in Singapore (SGD 1,000)?
  - Why are diamonds so much more expensive than water?
  - Read Harford (TUE) Chapter 1: *Who Pays for Your Coffee?*

Compare Costs and Benefits

- An action should be taken if, and only if,
  the *benefit* is at least as great as the *cost.*
- *Examples:*
  - When a tutor considers whether to work an extra hour, she compares the opportunity cost of her time to the extra income she could earn.
  - When a student considers whether to attend university, he compares the fees and foregone wages to the extra income he could earn with a university degree.

People Respond to Changes in Costs and Benefits

- The likelihood of taking an action
  rises as the benefit rises,
  and *falls* as the cost rises.
- *Examples:*
  - Sales of coconut oil increased as the health benefits were emphasized; but when questions emerged about the health benefits, sales of coconut oil decreased.
  - When cigarette taxes rise, teen smoking falls.

Focus on Your Comparative Advantage

- Everyone gains when each individual (or each country) concentrates on the activities in which her opportunity cost is *lowest.*
- *Examples:*
  - The plucking of tea leaves is usually done by women.
  - The U.S. produces strawberries, India produces mangoes, and Egypt produces figs.

Microeconomics

- **Microeconomics**
  - *Mikros*, or *"small"*
  - The study of how households and firms make decisions and how they interact in markets
  - *E.g.*, the effects of rent control on housing in Mumbai, the impact of foreign competition on the U.S. auto industry, the effects of compulsory school attendance on workers' earnings

Macroeconomics

- **Macroeconomics**
  - *Makros*, or *"large"*
  - The study of economy-wide phenomena, *e.g.*, inflation, unemployment, and economic growth
  - *E.g.*, the effects of borrowing by the federal government, the changes over time in the economy's rate of unemployment, alternative policies to promote growth in national living standards

Positive Economics

- As scientists, economists make **positive statements,** which attempt to *describe* the world as it is.
- **Positive** economics addresses the relatively narrow "What is?" question, *e.g.*, "What is the impact of immigration on the earnings of native-born workers?".
- **Positive** questions can be answered with the *tools of economics*, without interjecting any value judgment as to whether the particular outcome is desirable or harmful.

Normative Economics

- As policy advisors, economists make **normative statements,** which attempt to *prescribe* how the world should be.
- **Normative** economics addresses the much broader "What should be?" question, *e.g.*, "Should Singapore accept more immigrants?".
- Answers to **normative** questions require *value judgements.* Because each of us probably has different values, our answers may differ regardless of what the theory or the facts tell us about the impact of immigration on the economic well-being of native workers.

Positive & Normative Economics

- Every **normative** analysis is based on an underlying **positive** analysis.
- **Positive statements** *can* be confirmed or refuted by examining evidence.
- **Normative statements** *cannot* be confirmed or refuted. Deciding what is good or bad policy is not just a matter of science; it also involves our view on ethics, religion, and political philosophy.

Positive & Normative Economics

- Calvin: Minimum wage causes unemployment.
- Hobbes: The government should raise the minimum wage.
- Which is a **positive statement?** Which is a **normative statement?**

Positive & Normative Economics

- Calvin is making a **positive statement.**
  - He is speaking like a scientist; he is making a claim about how the world works.
  - We can evaluate Calvin's statement by analyzing data on changes in minimum wages and changes in unemployment over time.

- Hobbes is making a **normative statement.**
  - Hobbes is speaking like a policy advisor; he is making a claim about how he would like to change the world.
  - We cannot evaluate Hobbes' statement using data alone.

Why Economists Disagree

- Economists often give conflicting policy advice.
  - **Positive** disagreements — differences in scientific judgments, *e.g.*, response to taxation.
  - **Normative** disagreements — differences in values, *e.g.*, equity.
- Yet, there are many propositions about which most economists agree.

Propositions on which Most Economists Agree (percent who agree)

- A ceiling on rents reduces the quantity and quality of housing available. (93%)
- Tariffs and import quotas usually reduce general economic welfare. (93%)
- The U.S. should not restrict employers from outsourcing work to foreign countries. (90%)
- Cash payments increase the welfare of recipients to a greater degree than do transfers-in-kind of equal cash value. (84%)

Test Yourself

- Scarcity implies _____.

  We have _____ wants and _____ resources. Hence having more of one good thing usually means having _____ of another.

- Bargaining strength comes through _____.

  Scarce resources command _____ prices.

Test Yourself

- Compare _____ and _____.

  An action should be taken if, and only if, the _____ is at least as great as the _____.

- People respond to _____ in costs and benefits.

  The likelihood of taking an action _____ as the benefit rises, and _____ as the cost rises.

Test Yourself

- Focus on your _____ advantage.

  Everyone gains when each individual (or each country) concentrates on the activities in which her _____ _____ is lowest.

The Scientific Method

- Observe, theorize, test.
- **Model:**
  - A simplification of a more complicated reality.
  - Makes two types of assumptions:
    - *Simplifying assumptions:* do not affect the important conclusions
    - *Critical assumptions:* affect the important conclusions
  - *Example*: **Production Possibilities Frontier**

Production Possibilities Frontier

Production Possibilities Frontier

- **Production Possibilities Frontier (PPF):**
  a graph that shows
  all combinations of two goods that can be produced
  given the available *resources* and *technology*.

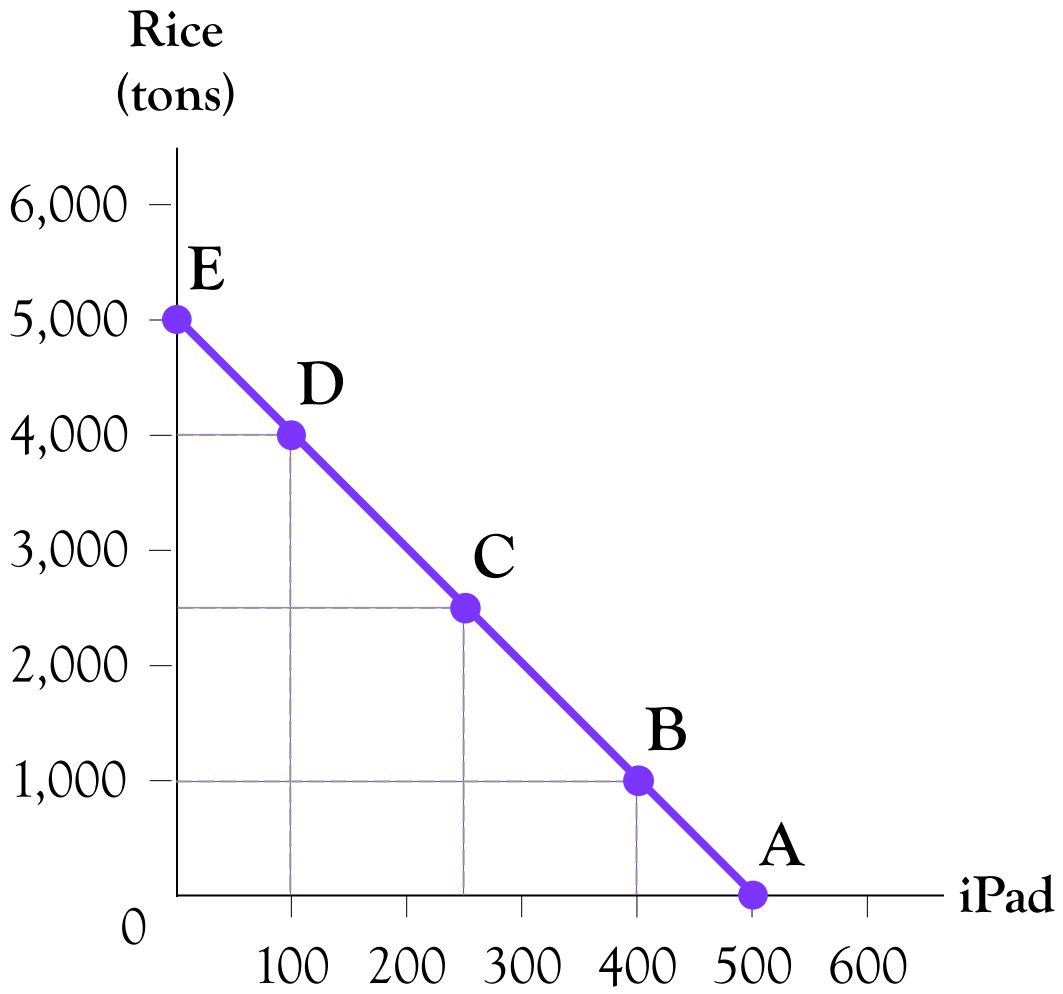
- *Example*:
  - Two goods: iPads and rice
  - One resource: labor (measured in hours)

- The economy has 50,000 hours of labor per month.
- Producing one iPad requires 100 hours of labor.
- Producing one ton of rice requires 10 hours of labor.

	Employment of labor hours		Production	
	iPad	*Rice*	*iPad*	*Rice*
A	50,000	0	500	0
B	40,000	10,000	400	1,000
C	25,000	25,000	250	2,500
D	10,000	40,000	100	4,000
E	0	50,000	0	5,000

EXAMPLE: Production Possibilities Frontier

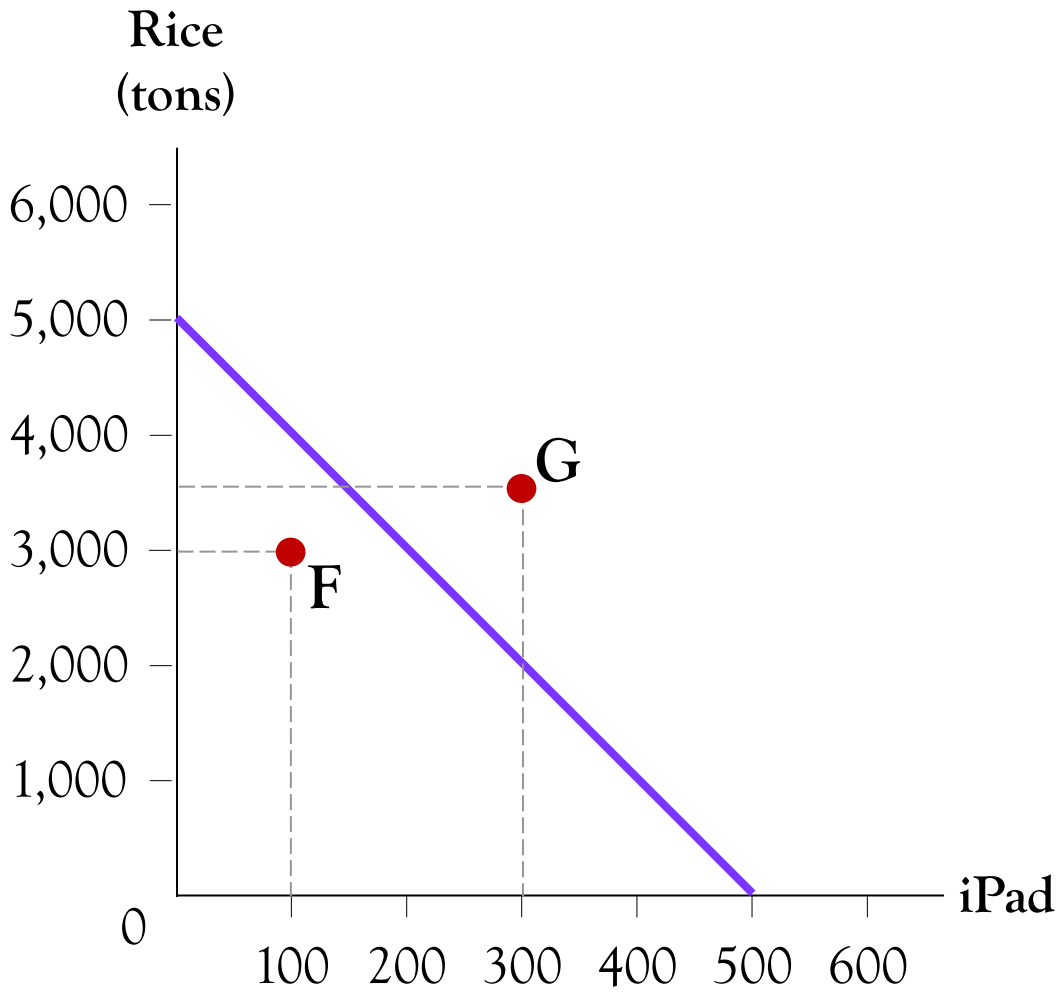
Point on graph	Production	
	iPad	*Rice*
A	500	0
B	400	1,000
C	250	2,500
D	100	4,000
E	0	5,000



EXAMPLE: Production Possibilities Frontier

Point **F**:
100 iPads,
3,000 tons of rice

Point **G**:
300 iPads,
3,500 tons of rice



Example: Production Possibilities Frontier

- Points on the PPF (*e.g.*, **A–E**):
  - *Possible*
  - *Efficient*
- Points under the PPF (*e.g.*, **F**):
  - *Possible*
  - *Not efficient*
- Points above the PPF (*e.g.*, **G**):
  - *Not possible*

The PPF and Opportunity Cost

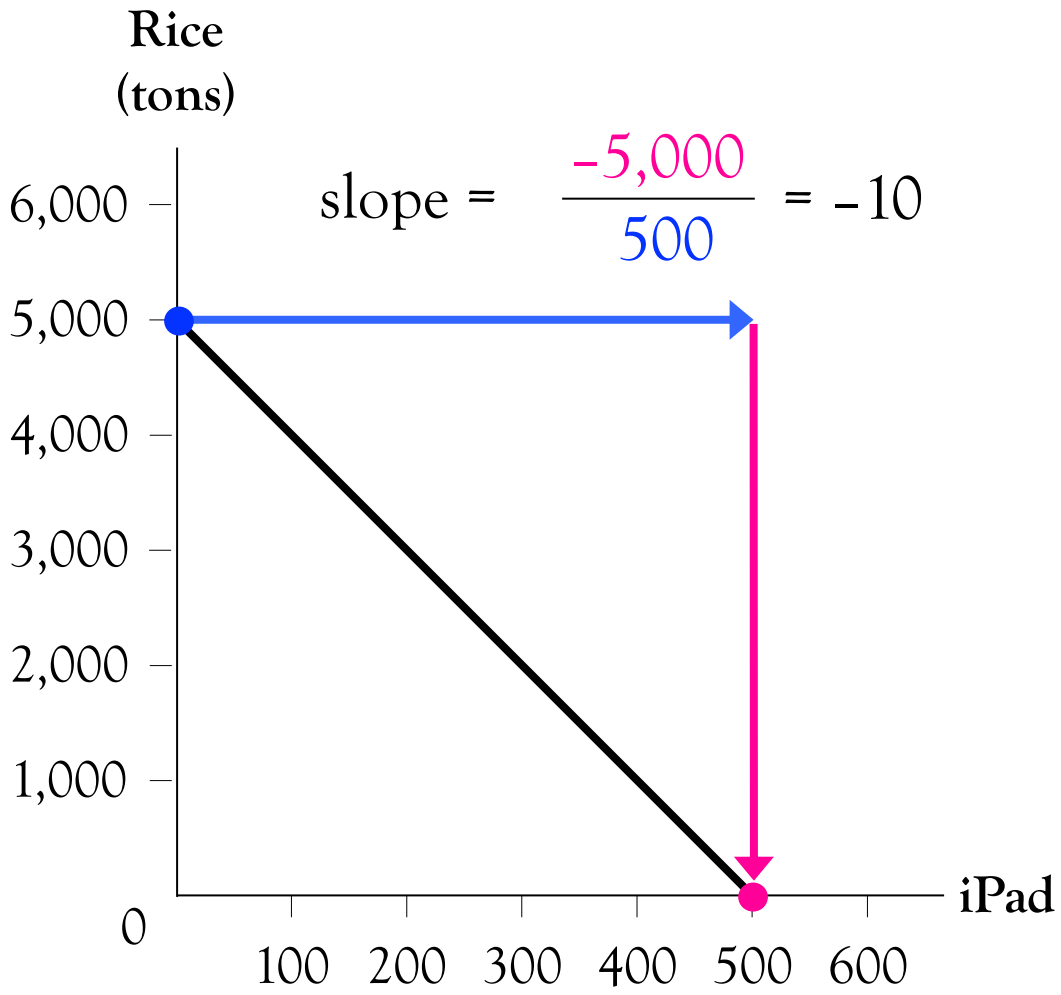
- Moving along a PPF involves shifting resources (*e.g.*, labor) from the production of one good to the production of the other good.

Scarcity Implies Trade-Offs

- Because resources are limited, getting more of one good requires sacrificing some of the other.

- The slope of the PPF indicates the *opportunity cost* of good x in terms of good y.

The PPF and Opportunity Cost



In order to gain
500 iPads,
we have to give up
5,000 tons of rice.

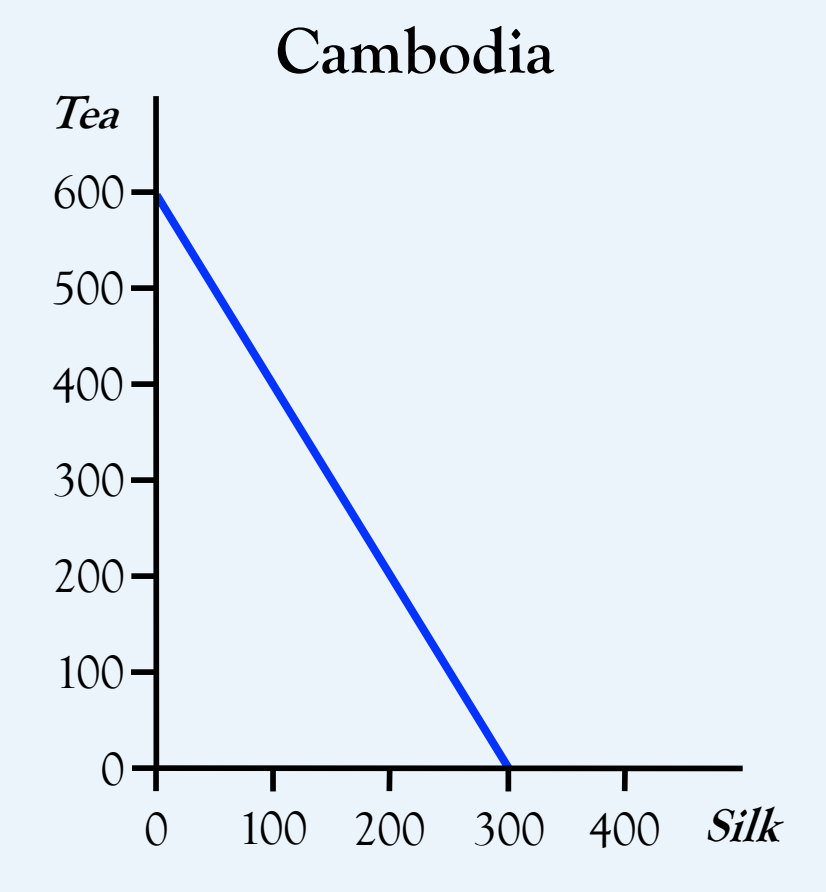
Hence, the
opportunity cost of
1 iPad is
10 tons of rice.

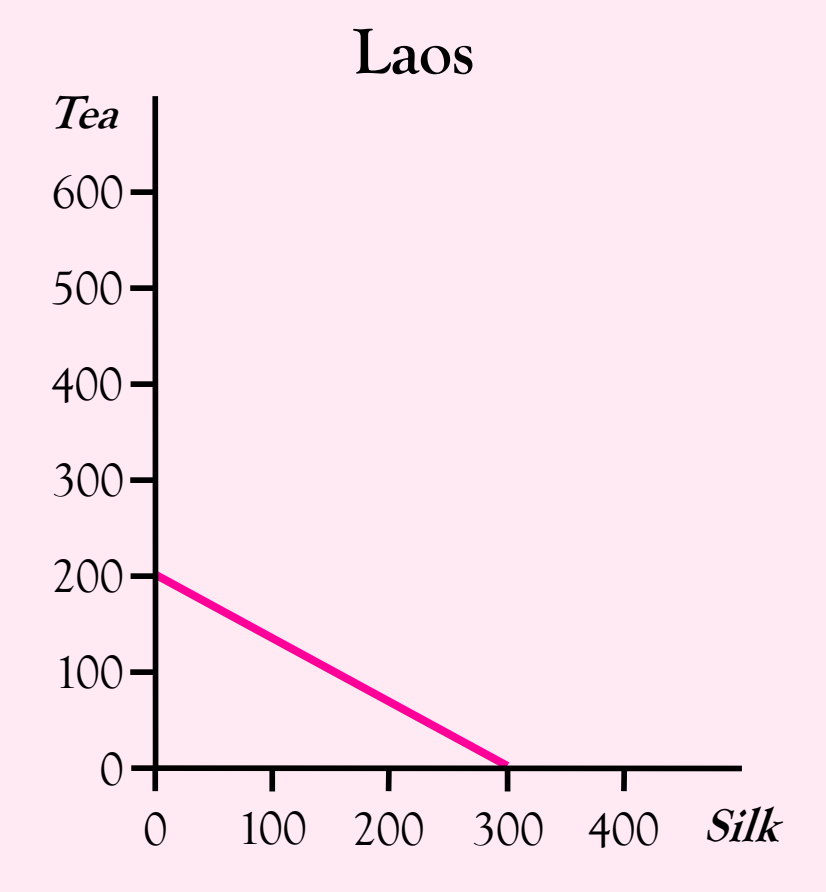
ACTIVE LEARNING *1.3*

The PPF and Opportunity Cost

A. In which country is the opportunity cost of silk lower?

B. In which country is the opportunity cost of tea lower?



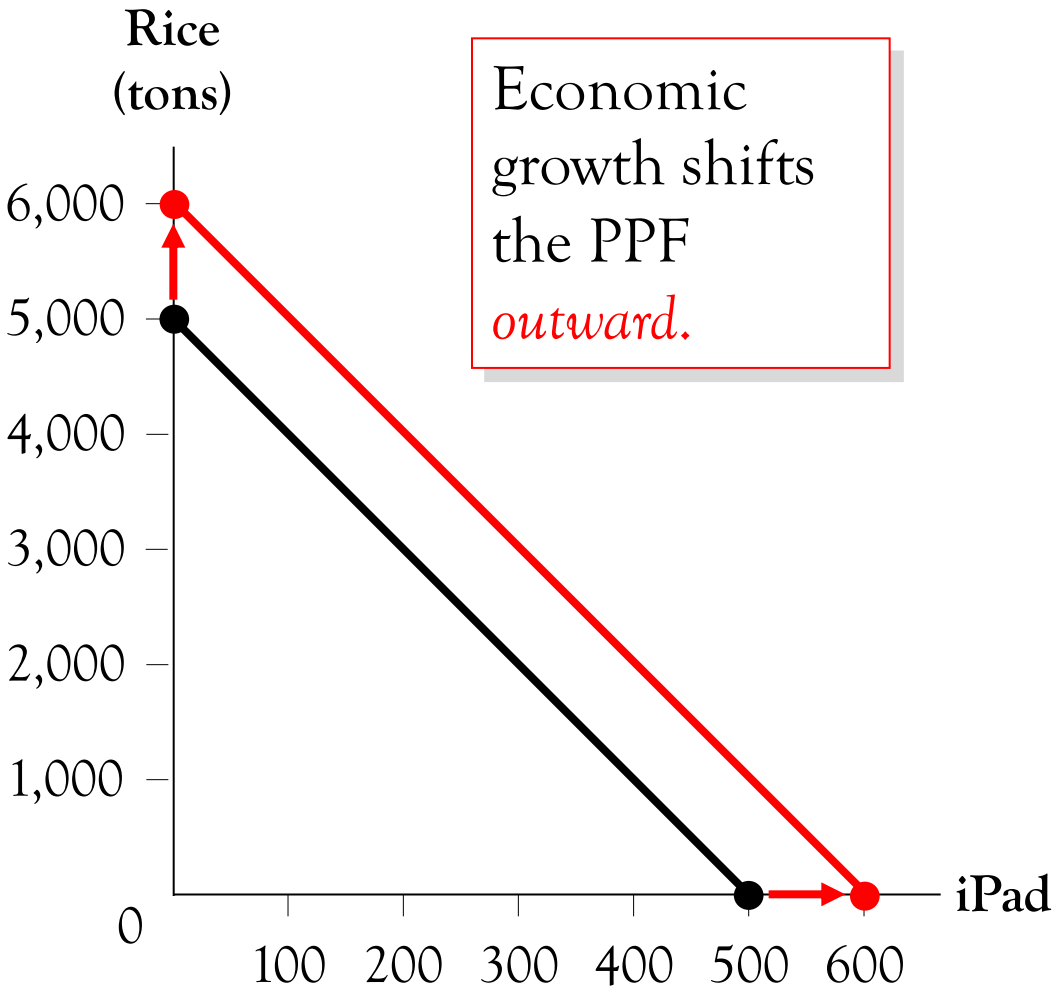


ACTIVE LEARNING *1.3*

The PPF and Opportunity Cost

Economic Growth and the PPF

With additional *resources* or an improvement in *technology*, the economy can produce more iPads, more rice, or any combination in between.



The Shape of the PPF

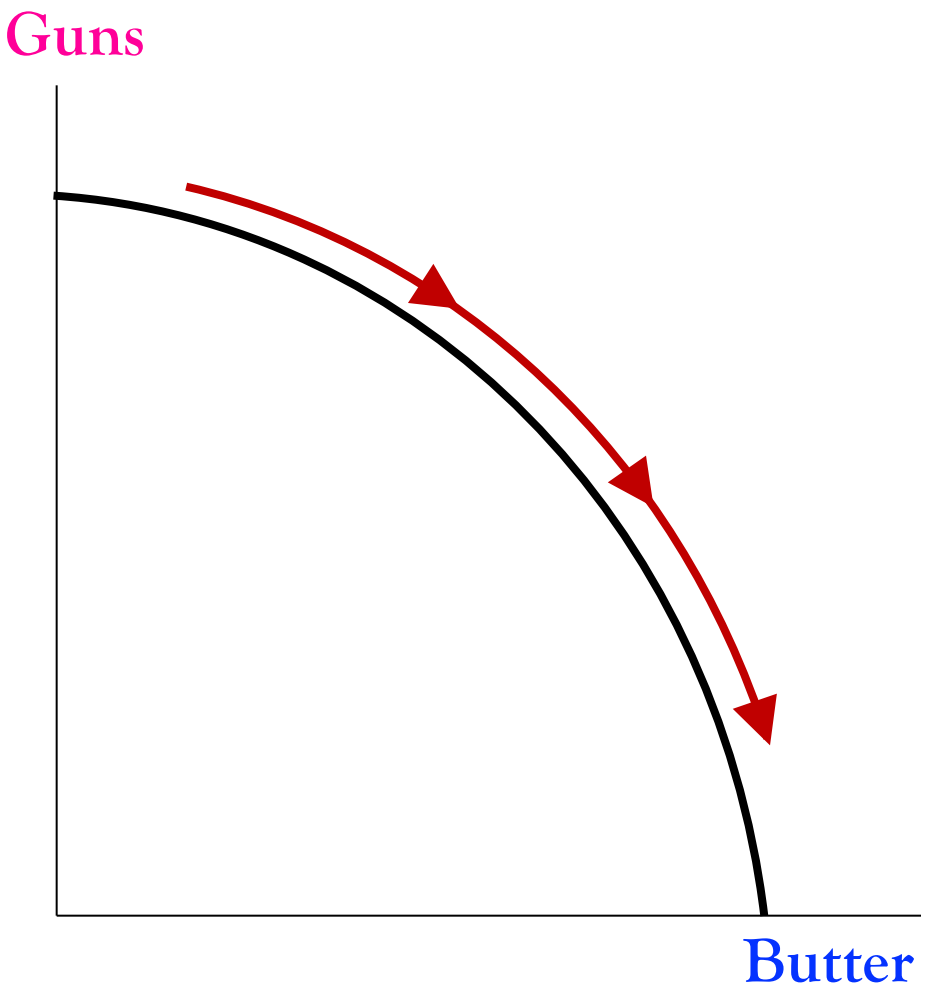
- The PPF could be *a straight line* or *concave.*

- It depends on what happens to opportunity cost as the economy shifts resources from one industry to the other.
  - If the opportunity cost of a good is *constant,* the PPF is *a straight line.*
  - If the opportunity cost of a good *rises* as the economy produces more of the good, the PPF is *concave.*

Why the PPF Might Be Concave

As the economy shifts resources from guns to butter:

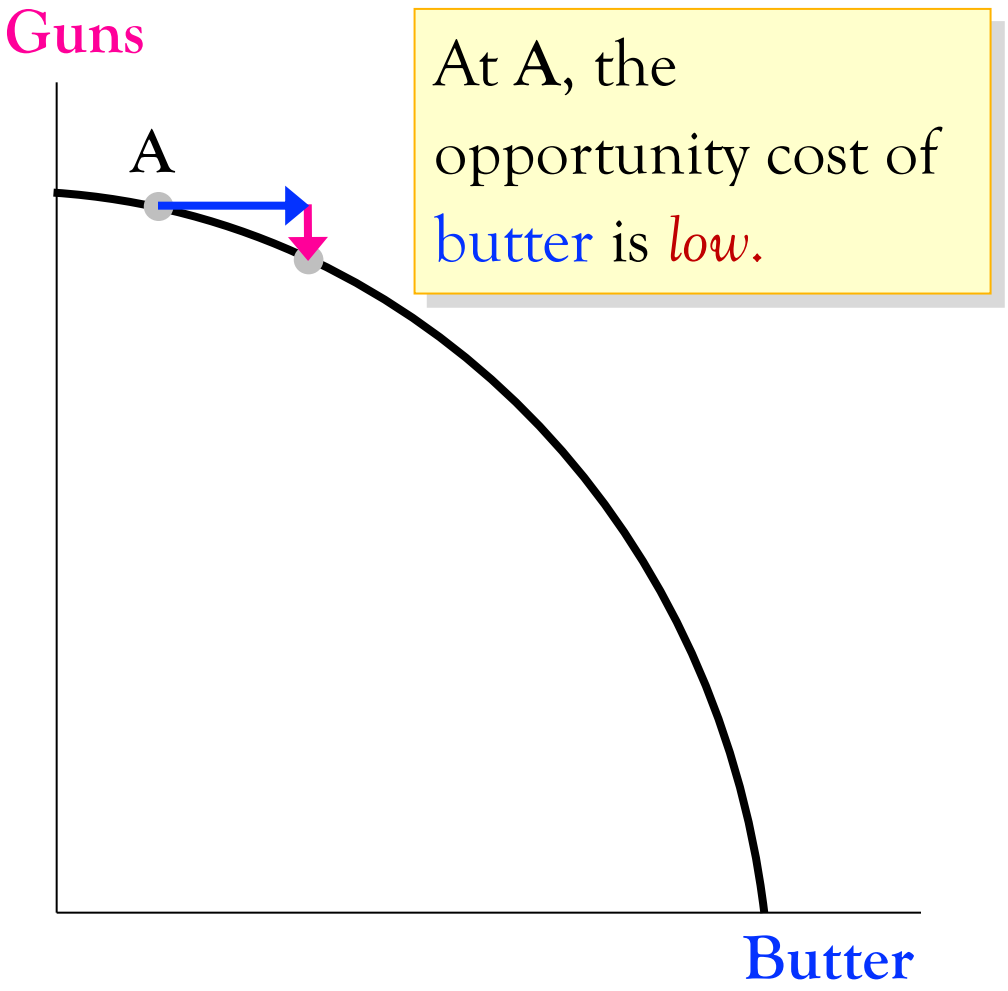
- the PPF becomes *steeper*
- the opportunity cost of butter *increases*



Why the PPF Might Be Concave

At point **A**,
most workers are
producing guns,
even those who are
better suited
to producing butter.

To get more butter,
we do not have to give
up many guns.

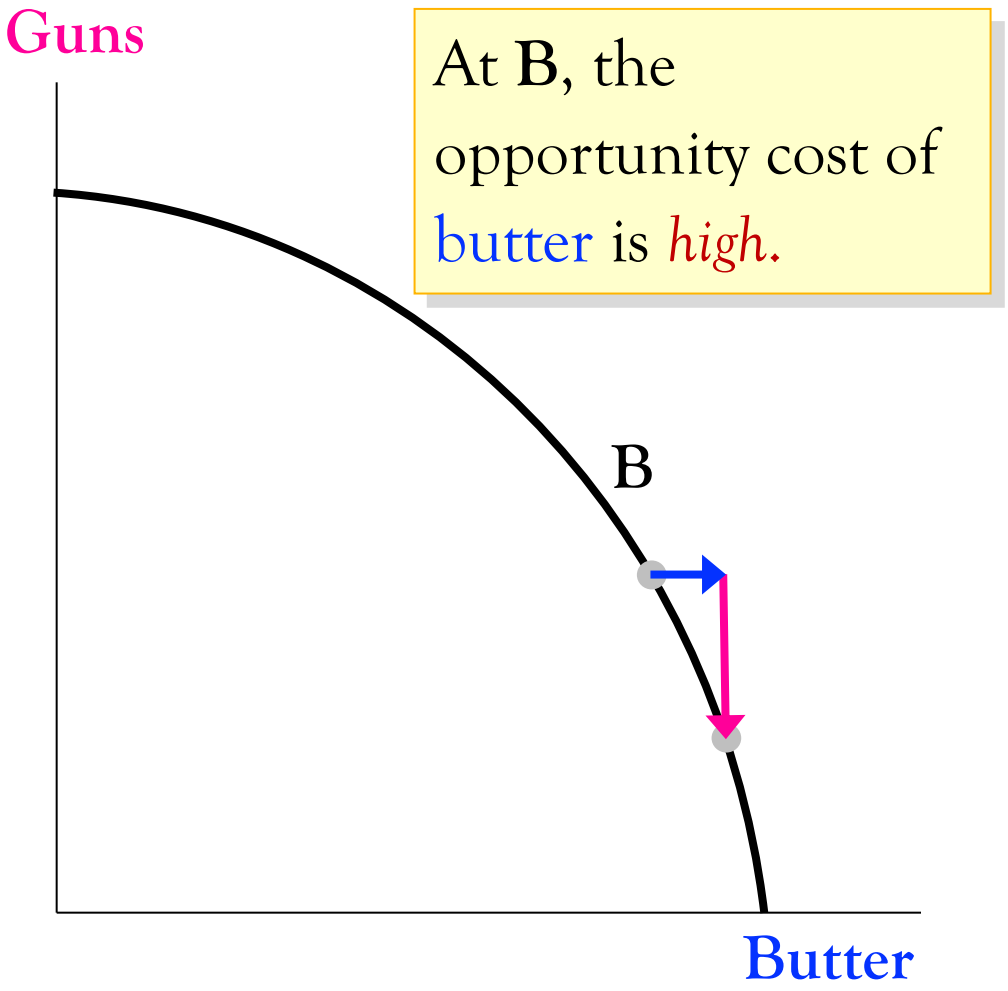


At **A**, the opportunity cost of butter is *low*.

Why the PPF Might Be Concave

At point **B**, most workers are producing butter. The few left in guns are the best gun makers.

Producing more butter would require shifting some of the best gun makers away from guns, and would cause a big drop in the output of guns.



Why the PPF Might Be Concave

- The PPF is *concave* when
  different resources are suited for different uses, *i.e.*,
  different resources have different **opportunity costs** of producing one good in terms of the other good.
  - *E.g.*, different workers have different skills.

ACTIVE LEARNING *1.4*
Production Possibilities Frontier

The shift of the PPF from PPF_1 to PPF_2 illustrates

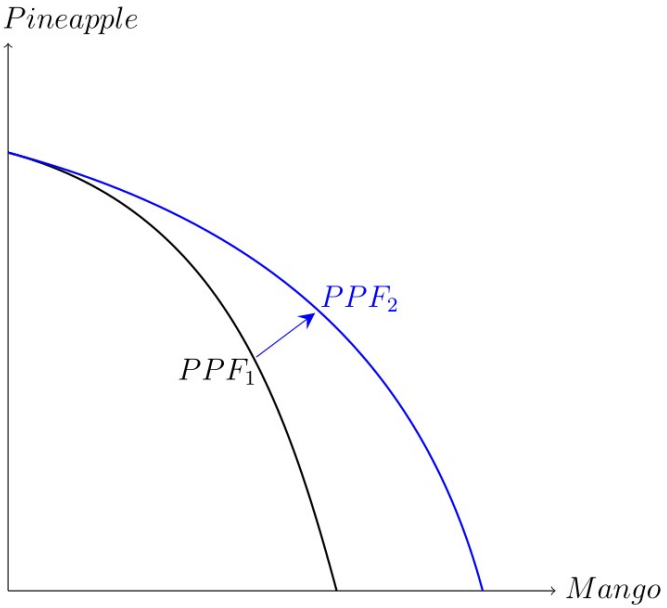
A. simultaneous technological advances in the mango and pineapple industries.

B. an increase in preferences for mango over pineapple.

C. a reallocation of resources away from the production of pineapple and toward the production of mango.

D. a reduction in unemployment.

E. economic growth.



Test Yourself

- The PPF shows the combinations of output that an economy can possibly produce, given its _____ and _____.
- A straight-line PPF depicts _____ opportunity cost.
  A concave PPF depicts _____ opportunity cost.
- Points on the PPF are _____.
  Points under the PPF are _____.
  Points above the PPF are _____.

Gains from Trade

Interdependence

- Every day
  we rely on many people from around the world
  — most of whom we have never met —
  to provide us with the goods and services that we enjoy.

Specialization and Exchange

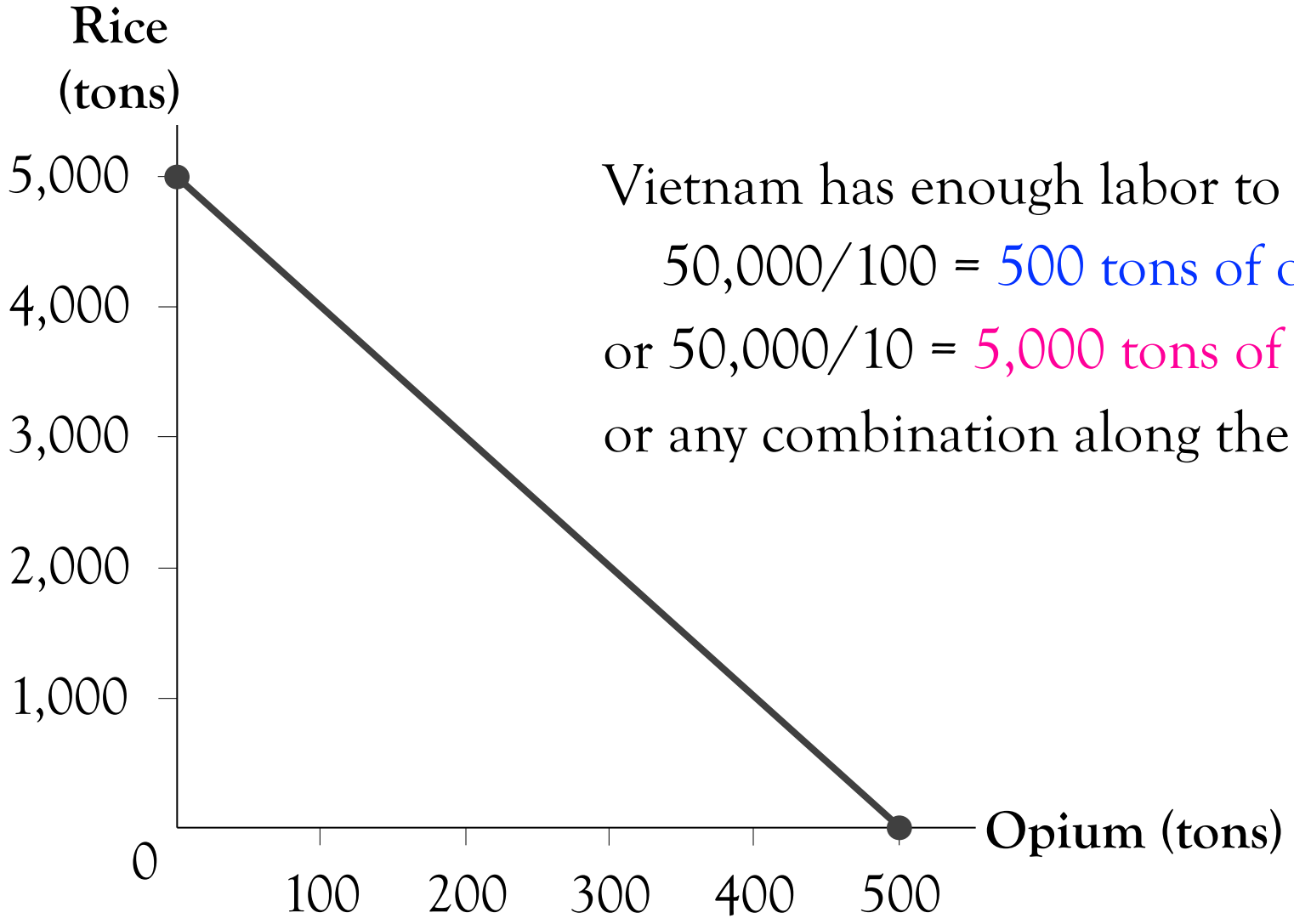
- *Example*:
  - Two countries: Vietnam and Myanmar.
  - Two goods: opium and rice.
  - One resource: labor, measured in hours.

- We will look at 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

Production Possibilities in Vietnam

- Vietnam has 50,000 hours of labor per month.
- Producing one ton of opium requires
  100 hours of labor.
- Producing one ton of rice requires
  10 hours of labor.

Vietnam's PPF



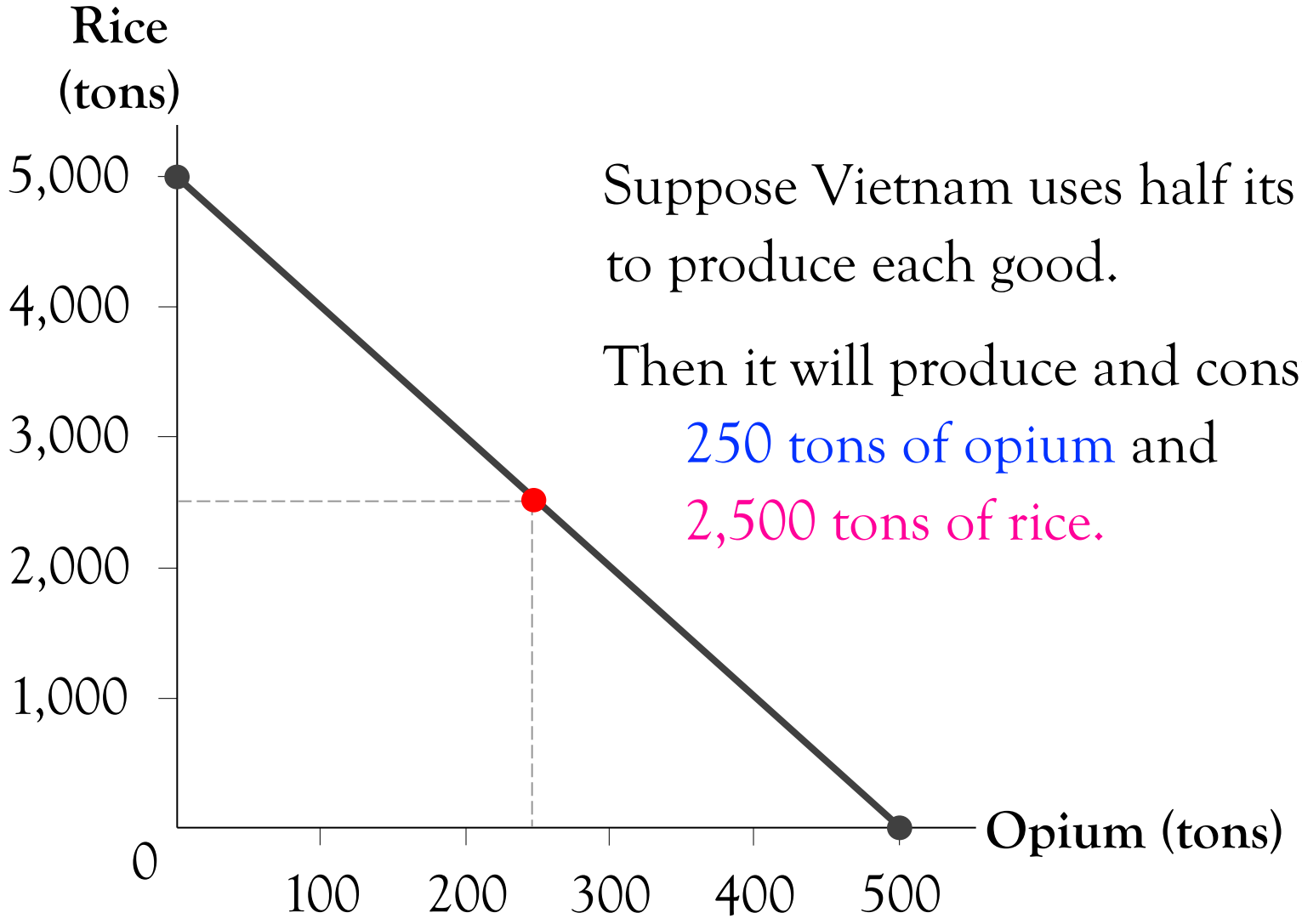
Vietnam has enough labor to produce

50,000/100 = 500 tons of opium,

or 50,000/10 = 5,000 tons of rice,

or any combination along the PPF.

Vietnam Without Trade



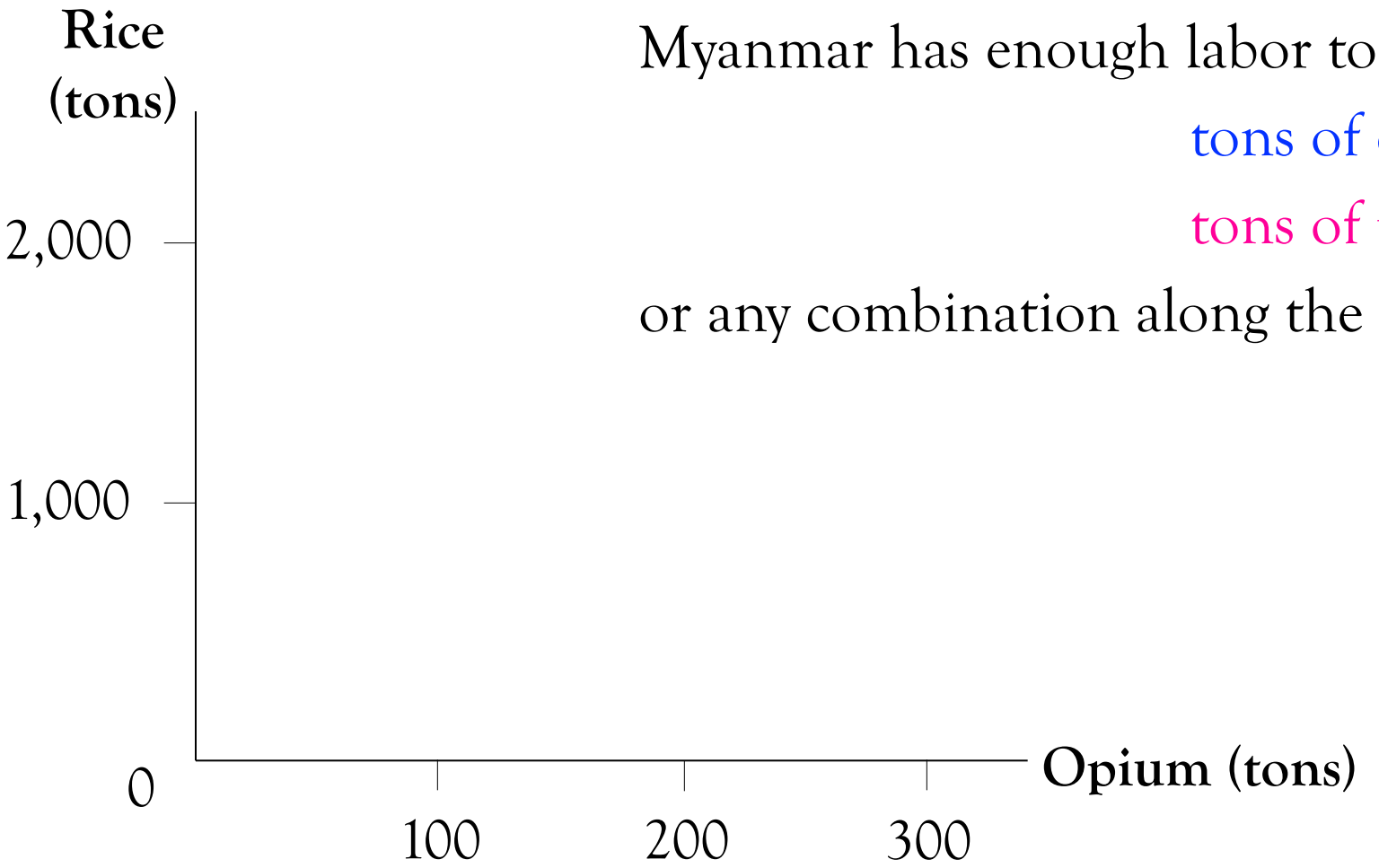
Suppose Vietnam uses half its labor to produce each good.

Then it will produce and consume
250 tons of opium and
2,500 tons of rice.

ACTIVE LEARNING *1.5*
Graph Myanmar's PPF

- Myanmar has 30,000 hours of labor per month.
- Producing one ton of opium requires
  125 hours of labor.
- Producing one ton of rice requires
  25 hours of labor.
- Suppose Myanmar uses half its labor to produce each good. How much of each good will it produce and consume?

Myanmar's PPF



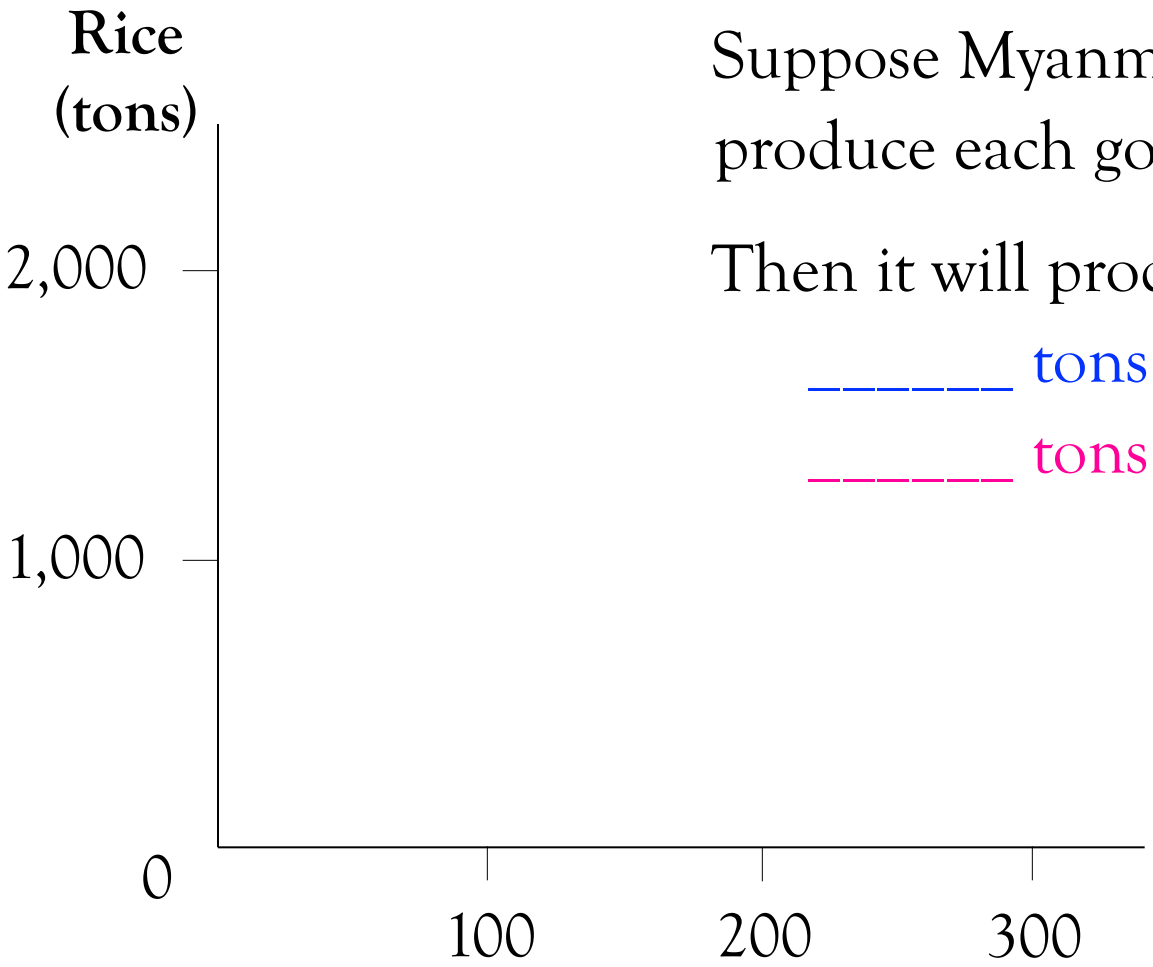
Myanmar has enough labor to produce

tons of opium,

tons of rice,

or any combination along the PPF.

Myanmar Without Trade



Suppose Myanmar uses half its labor to produce each good.

Then it will produce and consume

_____ tons of opium and

_____ tons of rice.

Consumption With and Without Trade

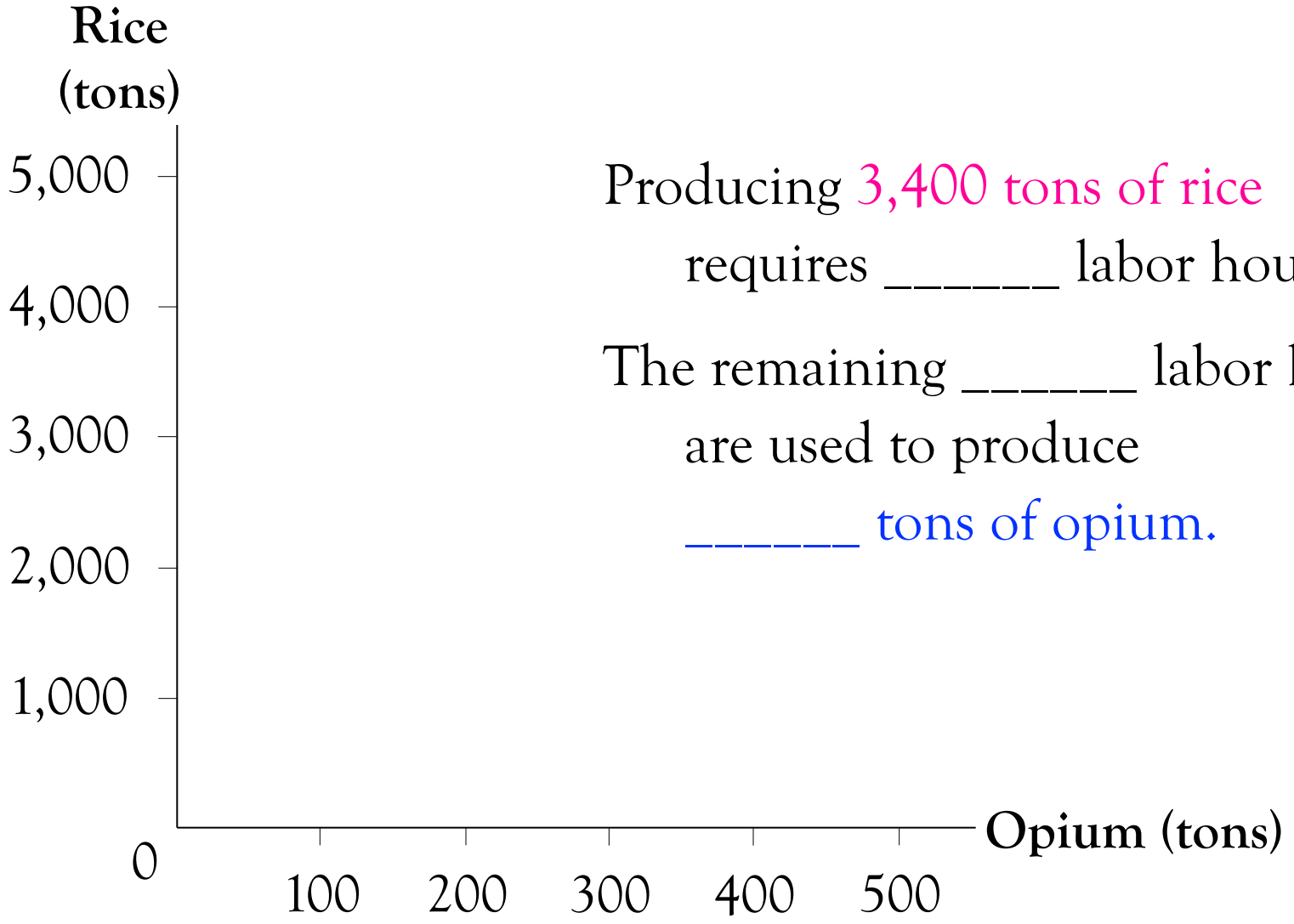
- Without trade,
  - Vietnam consumes 250 tons of opium and 2,500 tons of rice.
  - Myanmar consumes 120 tons of opium and 600 tons of rice.
- We will compare *consumption without trade* to *consumption with trade*.
- First, we need to see how much of each good is produced and traded by each country.

ACTIVE LEARNING *1.6*
Production With Trade

	Vietnam	Myanmar
Hours of labor	50,000	30,000
1 ton of opium	100 hours	125 hours
1 ton of rice	10 hours	25 hours

- Suppose Vietnam produces 3,400 tons of rice. How many tons of opium would Vietnam be able to produce with its remaining labor? Plot this combination on Vietnam's PPF.
- Suppose Myanmar produces 240 tons of opium. How many tons of rice would Myanmar be able to produce with its remaining labor? Plot this combination on Myanmar's PPF.

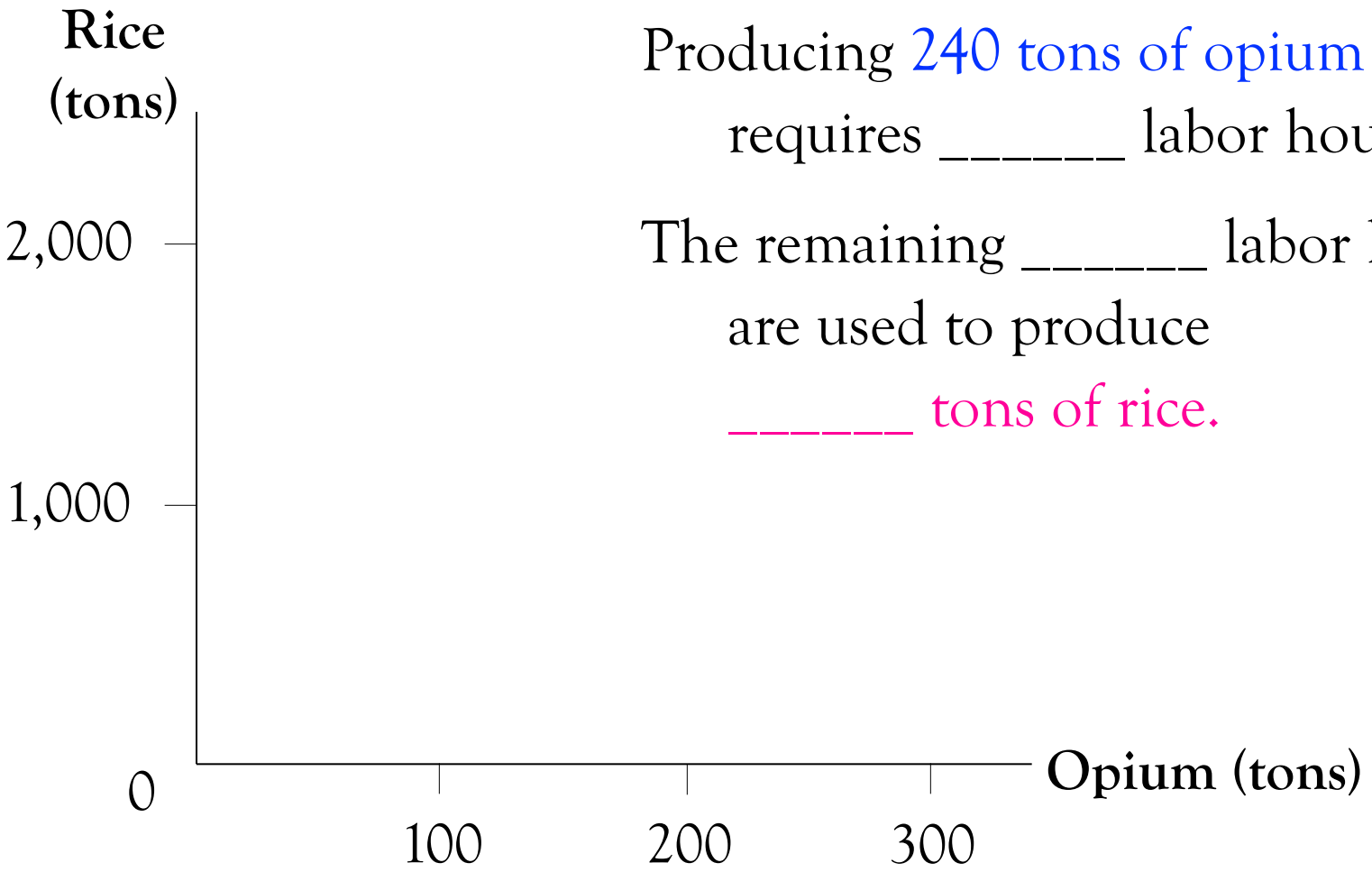
Vietnam's Production With Trade



Producing 3,400 tons of rice requires _____ labor hours.

The remaining _____ labor hours are used to produce _____ tons of opium.

Myanmar's Production With Trade



Producing 240 tons of opium requires _____ labor hours.

The remaining _____ labor hours are used to produce _____ tons of rice.

ACTIVE LEARNING *1.7*

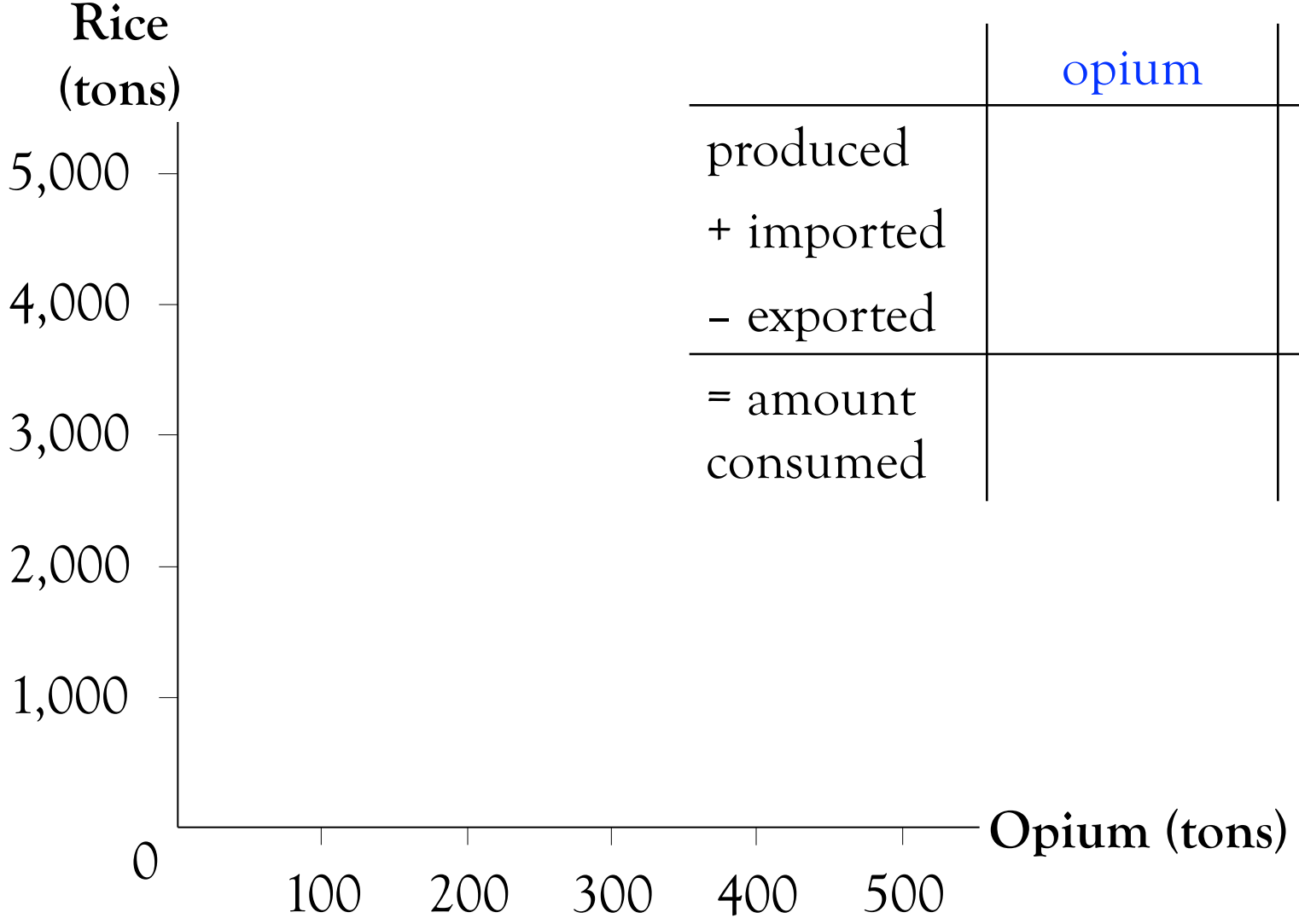
Consumption With Trade

Suppose Vietnam exports 700 tons of rice to Myanmar, and imports 110 tons of opium from Myanmar.

(Myanmar imports 700 tons of rice and exports 110 tons of opium.)

- How much of each good is consumed in Vietnam? Plot this combination on Vietnam's PPF.
- How much of each good is consumed in Myanmar? Plot this combination on Myanmar's PPF.

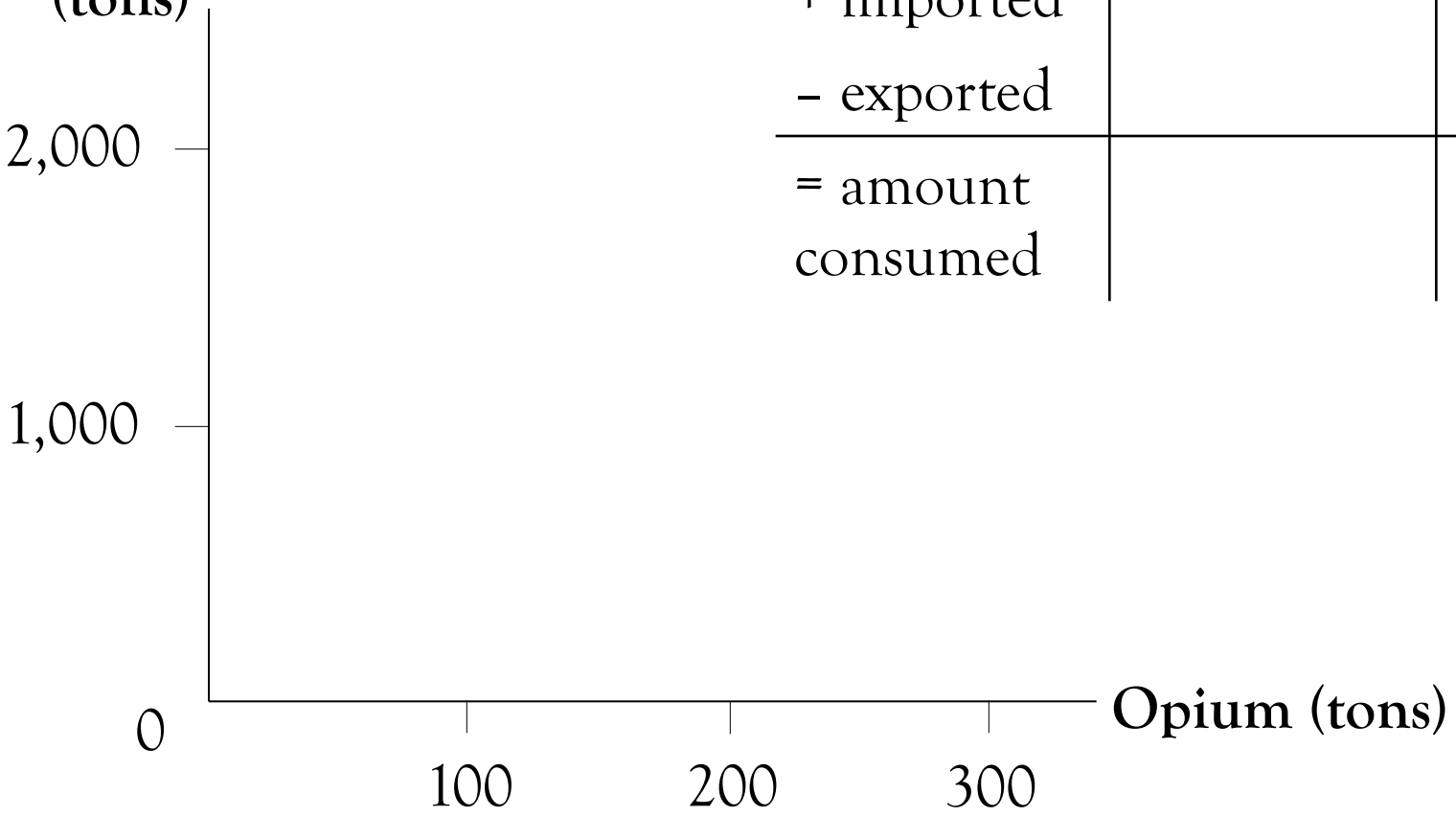
Vietnam's Consumption With Trade



	opium	rice
produced		
+ imported		
– exported		
= amount consumed		

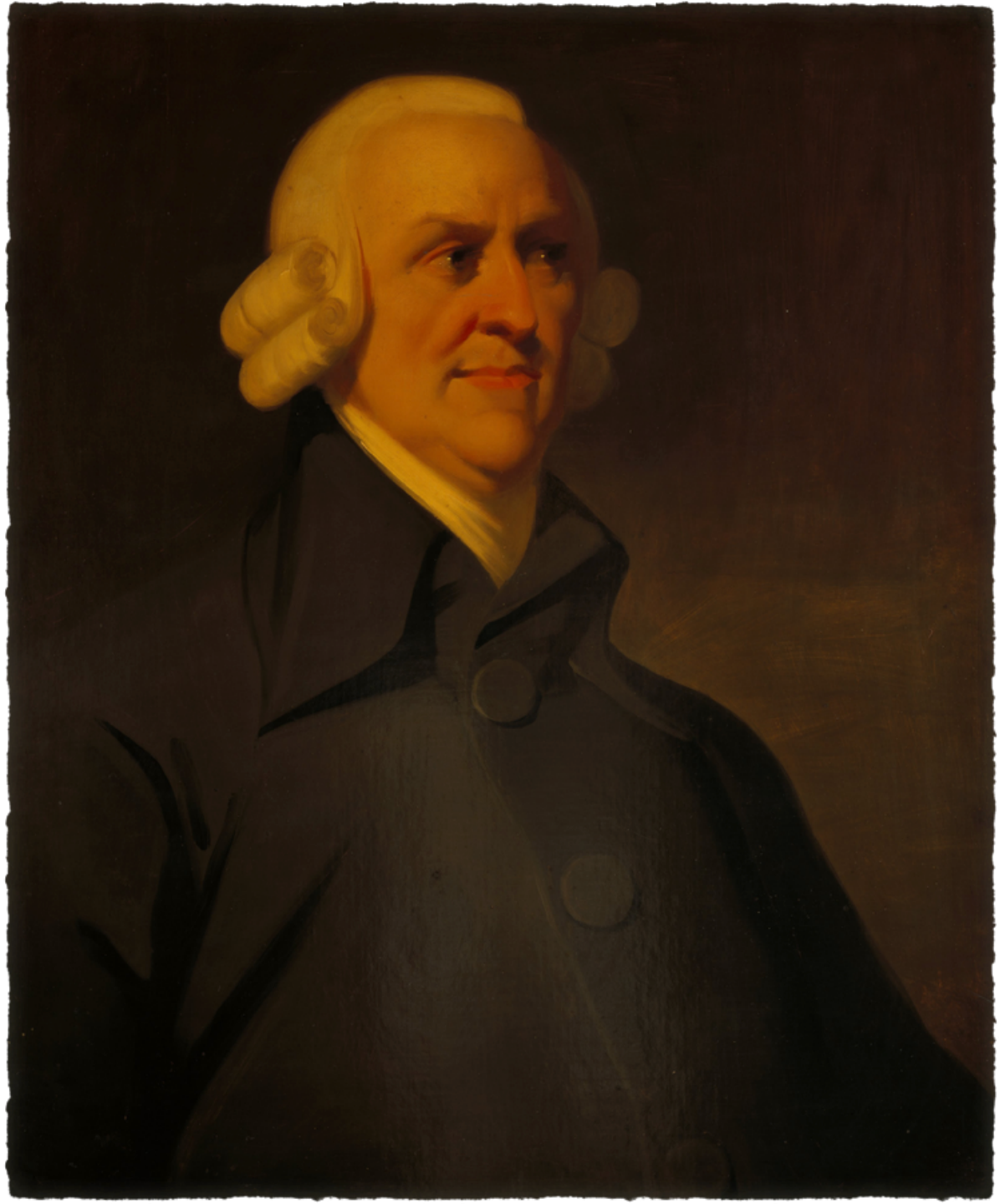
Myanmar's Consumption With Trade

	opium	rice
produced		
+ imported		
– exported		
= amount consumed		



Trade Makes Both Countries Better Off

Vietnam			
	consumption without trade	consumption with trade	gains from trade
opium	250	270	20
rice	2,500	2,700	200
Myanmar			
	consumption without trade	consumption with trade	gains from trade
opium	120	130	10
rice	600	700	100



Adam Smith

(1723–1790)

It is the maxim of every prudent master of a family,
never to attempt to make at home
what it will cost him more to make than to buy . . .
What is prudence in the conduct of every private family,
can scarce be folly in that of a great kingdom.
If a foreign country can supply us with a commodity
cheaper than we ourselves can make it,
better buy it of them
with some part of the produce of our own industry,
employed in a way in which we have some advantage.

Absolute Advantage

- **Absolute advantage:**
  the ability to produce a good using *fewer inputs*
  than another producer.

- Producing one ton of rice requires
  - 10 labor hours in Vietnam.
  - 25 labor hours in Myanmar.

- *Vietnam* has an **absolute advantage** in rice.

- If each country has an absolute advantage in one good and specializes in that good,
  then both countries can gain from trade.

Absolute Advantage

- Which country has an absolute advantage in opium?
- Producing one ton of opium requires
  - 100 labor hours in Vietnam.
  - 125 labor hours in Myanmar.
- *Vietnam* has an **absolute advantage** in opium.

So why does Myanmar specialize in opium?

Why do both countries gain from trade?

Two Measures of the Cost of a Good

- Two countries can gain from trade when each specializes in the good it produces at *lowest cost.*
- **Absolute advantage** measures the cost of a good in terms of the inputs required to produce it.
- Another measure of cost is *opportunity cost.*
  - In our example, the opportunity cost of a ton of opium is the amount of rice that could be produced using the labor needed to produce a ton of opium.

David Ricardo

(1772–1823)

It is quite as important to the happiness of mankind,
that our enjoyments should be increased
by the better distribution of labour,
by each country producing those commodities for which by
its situation,
its climate,
and its other natural or artificial advantages,
it is adapted,
and by their exchanging them
for the commodities of other countries,
as that they should be augmented
by a rise in the rate of profits.

Comparative Advantage

- **Comparative advantage:**
  the ability to produce a good at a *lower opportunity cost* than another producer.

- Which country has a comparative advantage in opium?

- To answer this, we must determine
  the *opportunity cost* of a ton of opium in each country.

Comparative Advantage

- Producing a ton of opium requires
  - 100 labor hours in Vietnam, which instead could produce 100/10 = 10 tons of rice.
  - 125 labor hours in Myanmar, which instead could produce 125/25 = 5 tons of rice.
- The opportunity cost of a ton of opium is
  - 10 tons of rice in Vietnam.
  - 5 tons of rice in Myanmar.
- *Myanmar* has a **comparative advantage** in opium.

Absolute vs. Comparative Advantage

	Opium	Rice
Absolute advantage	*Vietnam*	*Vietnam*
Comparative advantage	*Myanmar*	*Vietnam*

Absolute advantage is NOT necessary for comparative advantage!

Comparative Advantage

- Gains from trade arise from *comparative advantage* (differences in opportunity costs).

- When each country specializes in the good in which it has a comparative advantage,
  total production in all countries is higher,
  the world's economic pie is bigger,
  and all countries can *gain* from trade.

- The same applies to individuals specializing in different goods or services and trading with one another.

Focus on Your Comparative Advantage

ACTIVE LEARNING *1.8*

Absolute Advantage & Comparative Advantage

Argentina and Brazil each have 10,000 hours of labor per month.

In Argentina,

- producing one pound of coffee requires 2 hours
- producing one bottle of wine requires 4 hours

In Brazil,

- producing one pound of coffee requires 1 hour
- producing one bottle of wine requires 5 hours

A. Which country has an absolute advantage in coffee?

B. Which country has a comparative advantage in wine?

ACTIVE LEARNING *1.8*

A. Absolute Advantage

	Argentina	Brazil
1 lb coffee		
1 bottle wine		

ACTIVE LEARNING *1.8*

B. Comparative Advantage

	Argentina	Brazil
1 lb coffee		
1 bottle wine		

Test Yourself

- The individual who can produce a good with fewer inputs has a/an _____ advantage in producing that good.
- The individual with the lower opportunity cost of producing a good has a/an _____ advantage in producing that good.
- The gains from trade are based on _____ advantage.