

Ricardian Model

Ricardian Model:

- Simplest analysis of trade
- Answers the most basic questions:
 - Why countries trade?
 - Why is trade is beneficial?
 - What is the pattern of trade?
 - Does trade affect our living standards?
- Exposes weaknesses in anti-trade arguments

Readings: F&T Chapter 2

- Completely omit Section 4
- Skim parts using indifference curves

Outline of Theoretical Model:

1. **Assumptions:** boundaries of the box in which we will play.
2. **Notation:** crucial to keeping it sane!
3. **Technical tools:** diagrams and/or math. Ex: PPF, Indifference curves
4. **Definitions:** super important! Ex: Opportunity cost, equilibrium, autarky
5. **Deductions:** use all the above to draw logical conclusions about.....
 1. Autarky prices and wages
 2. Pattern of trade
 3. How prices change after trade
 4. How standard of living changes
6. **Conclusions**

Basics

Basic assumptions:

- Two goods: food (F) and clothing (C)
- Single input: labor (L)
- Fixed total amount of L (“endowment”)
- Constant **opportunity cost of production**-
assumption on technology- means fixed MC of
production
- Perfect competition
 \Rightarrow price equals cost
- Perfect Mobility of Labour between sectors
 \Rightarrow wage rate equal

Notation:

a_{LF} = # of units of labor required to produce a unit of
food in country A

L^A = endowment of labor in country A

F = quantity of food

C = quantity of clothing

w^A = wage in A (= price of labor)

Basics

Definition: Opportunity cost of X in terms of Y

- What you have to give up to get something
- The value of the next best alternative.
- How many units of good Y do we need to give up to get 1 extra unit of X?

What is a_{LF} ?

= # of units of labor required to produce a unit of food in country A

= 1/# of units of F produced by 1 worker

= 1/Marginal Product of Labor

= 1/MPL (textbook notation)

Production Possibilities Curve- Represents technology and resources in diagram

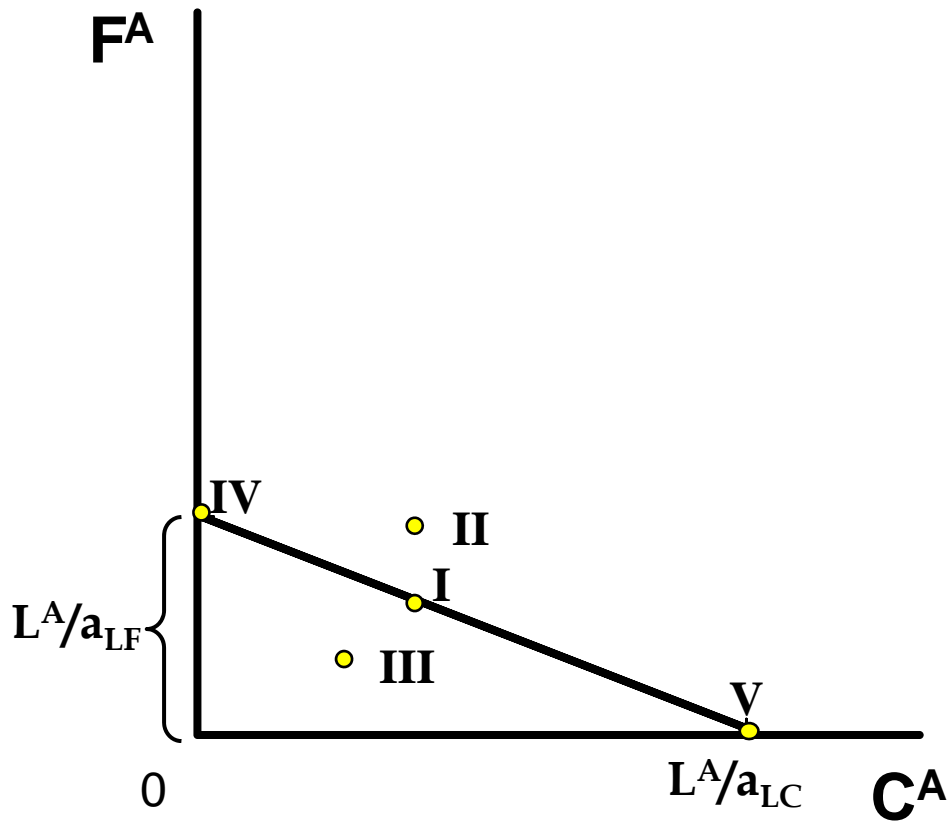
L^A = amount of L in A

a_{LF} is L needed to produce 1 of F

So if A does not produce any C then it can produce L^A/a_{LF} units of F. (Point IV)

If A does not produce any F then it can produce L^A/a_{LC} units of C. (Point V)

A can produce any combination on the ***Straight Line***.



- Why is the production possibilities curve straight?
– assumption of constant opportunity cost

- Slope of PPC = $-(L^A/a_{LF}) / (L^A/a_{LC})$
= $-a_{LC}/a_{LF}$

- **Opportunity Cost for Food**

= what you give up when you produce 1 extra unit of F

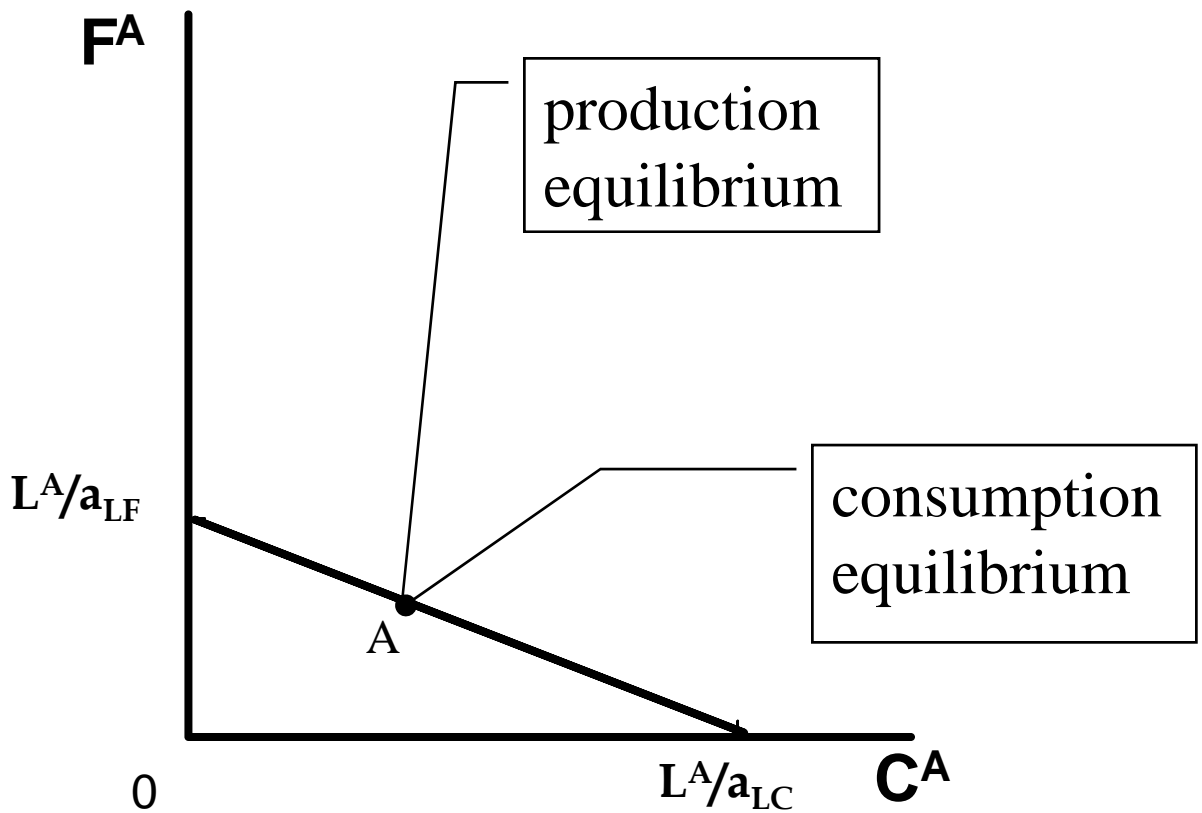
(C is only alternative use of resources)

1 of F requires a_{LF} of L

with a_{LF} of L can make a_{LF}/a_{LC} of C

\Rightarrow opportunity cost of F is a_{LF}/a_{LC} units of C

- Opportunity cost of C is (a_{LC}/a_{LF}) of F
- Two ways to show trade-off - Opportunity cost and slope of PPC



Equilibrium in autarky

Under Autarky, Production=Consumption
at any point on the PPC

Autarky Equilibrium (contd)

Price Determination:

Perfect Competition → In equilibrium

• Price = Marginal Cost or

• wage = $P * MPL$

Marginal Cost = Cost of 1 extra unit of F = $w^A \cdot a_{LF}$

Thus,

$$\begin{array}{l} P_F^A = w^A \cdot a_{LF} \\ P_C^A = w^A \cdot a_{LC} \end{array} \quad \rightarrow \quad \frac{P_F^A}{P_C^A} = \frac{a_{LF}}{a_{LC}}$$

⇒ Relative Price of F = Opportunity Cost of F to C

Real Wages/ Living Standards:

$$\left(\frac{\text{wage}}{P_F^A} \right) = \frac{1}{a_{LF}} \quad \text{units of food}$$

$$\left(\frac{\text{wage}}{P_C^A} \right) = \frac{1}{a_{LC}} \quad \text{units of clothing}$$

⇒ Real wages/living standards determined by technology!!!

Trade: Compare Our & Their Prices!

P_F^W price of F in world

P_C^W price of C in world

Suppose data tells us the following:

$$\left(\frac{P_F^A}{P_C^A} \right)^{\text{autarky}} < \left(\frac{P_F^W}{P_C^W} \right)$$

Suppose you are a producer of F in country A. Suddenly trade opens (above relationship holds). Where would you like to sell your output of F? At home or abroad?

⇒ A exports good F and imports good C

⇒ A produces less C and more F

Does country A gain from these changes?

Move 1 unit of labor from C production to F production:

Fall in output of C = $-1/a_{LC}$

Rise in output of F = $+1/a_{LF}$

Sell the extra F abroad and receive $\frac{P_F^W}{a_{LF}}$

Use this to buy $\frac{P_F^W}{a_{LF}} \cdot \frac{1}{P_C^W}$ units of C

Net result of imports and reduced production of C:

$$\begin{aligned} & \frac{P_F^W}{a_{LF}} \cdot \frac{1}{P_C^W} - (1/a_{LC}) \\ &= \frac{1}{a_{LF}} \cdot \left[\frac{P_F^W}{1} \cdot \frac{1}{P_C^W} - \frac{a_{LF}}{a_{LC}} \right] \text{ units of C} \end{aligned}$$

We already know:

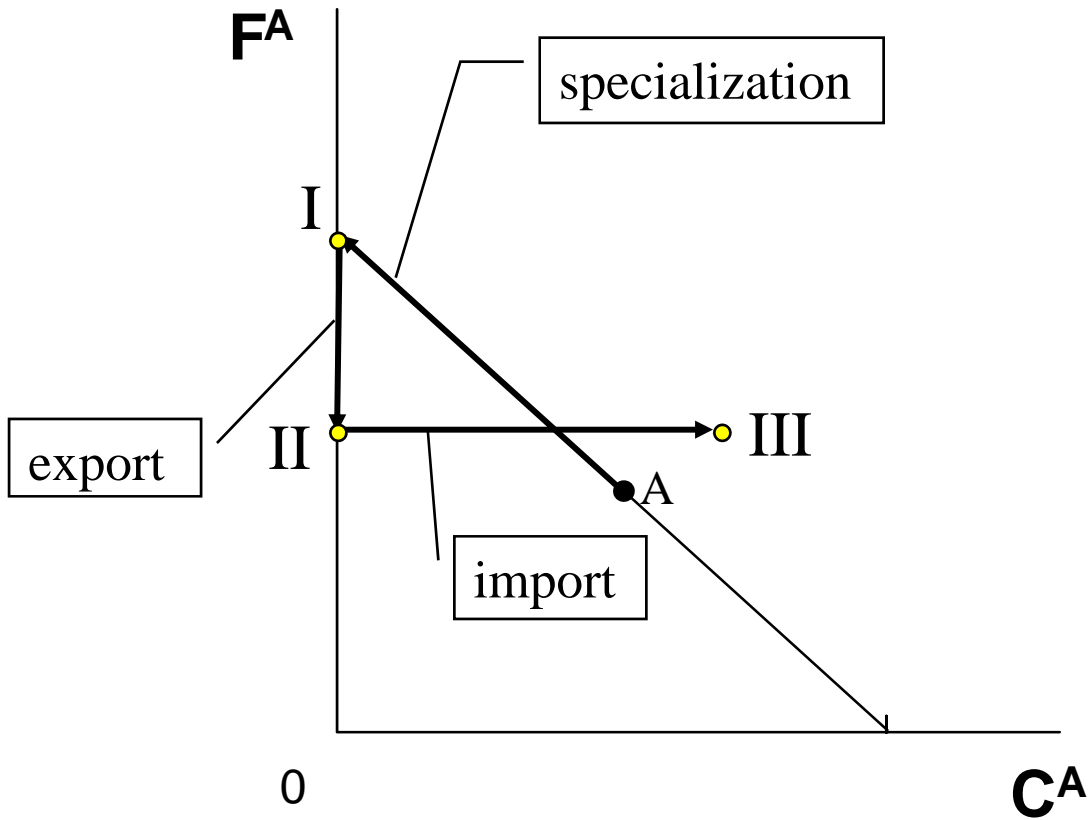
$$\frac{P_F^W}{P_C^W} > \left(\frac{P_F^A}{P_C^A} \right)^{\text{autarky}} = \frac{a_{LF}}{a_{LC}}$$

\Rightarrow So the country gains from:

Producing less C and more F – specialization

and

Exporting F and Importing C – trade



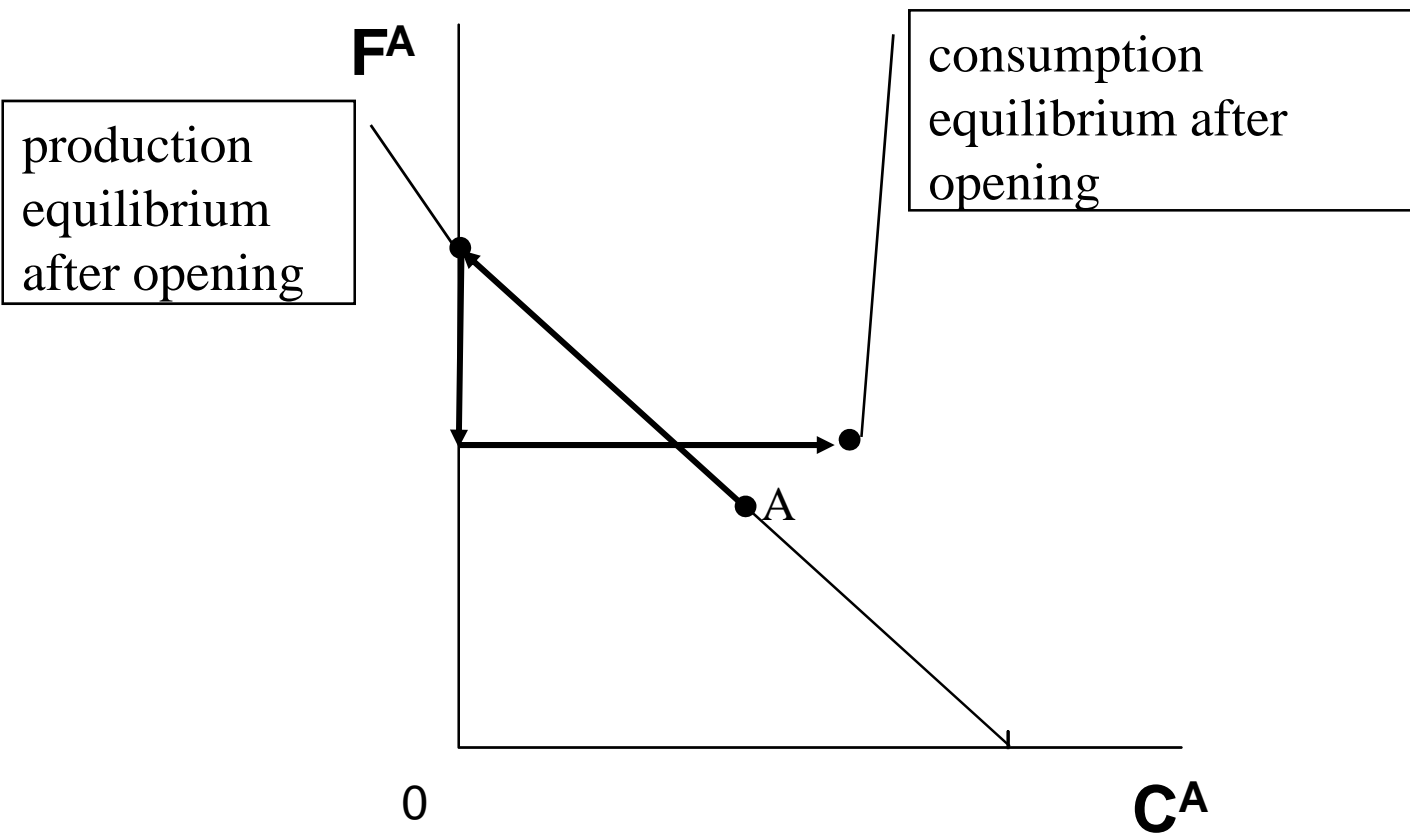
Gains from Specialization and Trade

Point A: Autarky Production & Consumption

Point I: Production & Consumption under Full Specialization but No Trade

Point III: Consumption under Full Specialisation & Free Trade

Where is Production under Free Trade?



Equilibrium after opening to world trade

If there are no barriers to trade, arbitrage ensures

$$\left(\frac{P_F^A}{P_C^A} \right)^{\text{freetrade}} = \left(\frac{P_F^W}{P_C^W} \right)$$

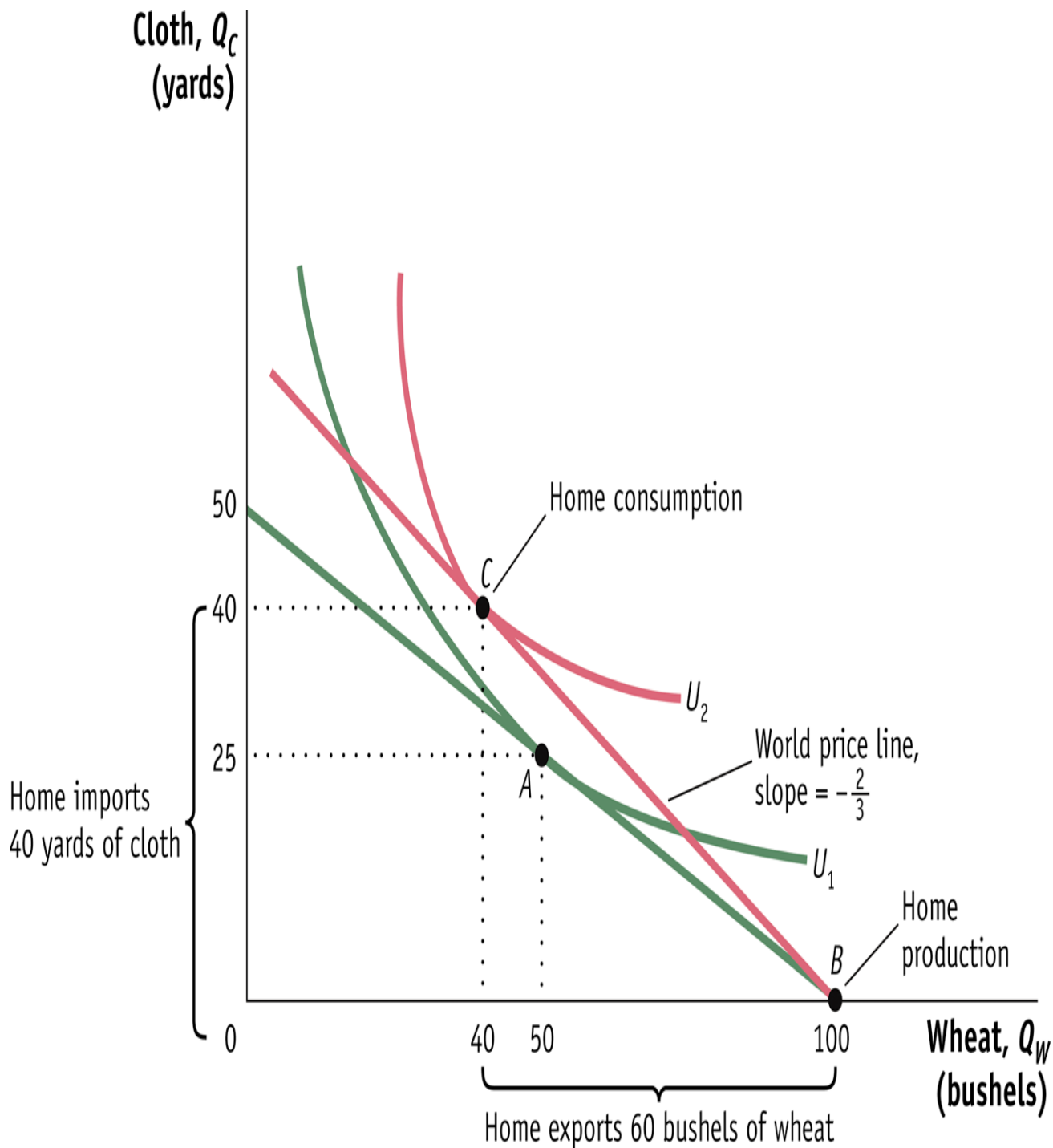


Figure 2.5 Home Equilibrium with Trade

Real Wages after Trade:

A country always gains from Trade

Country A produces F and sells it on the world market.

⇒ Price of food = Marginal Cost

$$P_F^W = \text{wage} \cdot a_{LF}$$

$$\Rightarrow \left(\frac{\text{wage}}{P_F^W} \right) = \frac{1}{a_{LF}}$$

⇒ workers can buy same amount of F as in autarky.

But now A imports clothing:

$$\left(\frac{\text{wage}}{P_C^W} \right) = \left(\frac{\text{wage}}{P_C^W} \right) \cdot \left(\frac{P_F^W}{P_F^W} \right) = \left(\frac{1}{a_{LF}} \right) \cdot \left(\frac{P_F^W}{P_C^W} \right) > \left(\frac{1}{a_{LF}} \right) \cdot \left(\frac{P_F^A}{P_C^A} \right)^{\text{autarky}} = \left(\frac{1}{a_{LF}} \right) \cdot \left(\frac{a_{LF}}{a_{LC}} \right)$$

$$\left(\frac{\text{wage}}{P_C^W} \right) > \left(\frac{1}{a_{LC}} \right) = \left(\frac{\text{wage}}{P_C^A} \right)^{\text{autarky}}$$

⇒ workers can buy more of C than in autarky.

➔ Trade increases real wages.

and Trade lowers the relative price of the imported good.