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Lecture notes

New Theories of international trade

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New Theories of International Trade

CONTENTS

List of figures **4**
List of tables **5**
Preface **6**
Introduction **7**
Chapter 1: Introduction to International Trade **10**
1. History and Evolution of International Trade 10
2. World Trade in Statistics 14
Chapter 2: Classical and Neoclassical Theories of International Trade **20**
1.Theory of Absolute and Comparative Advantage 20
2. Factorial Theory Neoclassical Heckscher-Ohlin-Samuelson Model 33
Chapter 3: New Theories of International Trade **50**
1. Theory of Intra Industry Trade 50
2. Theory of Differentiated Goods by Helpman and Krugman 53
3.The Theory of Reciprocal Dumping 54
*4.*Theory of Vertical Intra Industry Trade 57
5.Theory of Contestable Markets 66
6. The Theory of Unequal Exchange: Arghiri Emmanuel's Analysis of International Trade Inequality ..... **Erreur ! Signet non défini.**
7.The product cycle theory developed by Vernon (1966): 74
8. Strategic Trade Policy: 77
9. Strategic Operating Models and Product Operations: A Framework for Organizational Excellence 82
Chapter 4: New Theory of Trade **89**
1.The Melitz Model 89
2. Heterogeneous Firm Selection and Trade Flows the Antras Model (2003) Antràs and 91
Chapter 5: Firm Behaviour and International Trade **99**
1. Choice of Firm Organization and International Equilibrium by Grossman and Helpman (2002,2003,2005) 99
2. Contribution of the Theory of the Firm to International Economics 101
References **106**

List of figures

Figure 1 : Ratio of manufactures Trade to production 10
Figure 2: World trade composition 12
Figure 3: Percent of exports 13
Figure 4: World merchandise trade volume, 2019 Q1- 2023 Q1 (Volume index 2015=100 and year on year percentage change) 14
Figure 5: World merchandise trade volume and GDP Growth, 2015-2022 (Annual percentage change) 15
Figure 6: World commercial services exports by category, 2022Q1-2022Q4 (Year-on-year percentage change in US$ values) 16
Figure 7: Monthly average prices for primary commodities, January 2019-May 2023 18
Figure 8: The CPP of Agra or CPP (A) 22
Figure 9: The CPP of Inda or CPP (I) 22
Figure 10: Inda and the international exchange 25
Figure 11: Agra and the international exchange 31
Figure 12: The Production Possibility Frontier Without Factor Substitution 34
Figure 13: *The Production Possibility Frontier with Factor Substitution* 35
Figure 14*:* Prices and Production 37
Figure 15: Input Possibilities in Food Production 38
Figure 16: *Factor Prices and Input Choices* 38
Figure 17: Factor Prices and Goods Prices 39
Figure 18: *From Goods Prices to Input Choices* 40
Figure 19 : *Resources and Production Possibilities* 41
Figure 20: Trade Leads to a Convergence of Relative Prices 42
Figure 21: Production, Consumption, and Trade in the Standard Model 46
Figure 22*: Equilibrium Relative Price with Trade and Associated Trade Flows* 47
Figure 23 : Domestic and Foreign market and marginal costs 54
Figure 24 : - External economies and Market equilibrium 59
Figure 25: *External Economies Before Trade* 60
Figure 26: Trade and Prices with external economies 61
Figure 27 : Vietnam and China costs curves 62
Figure 28: External Economies and Losses from Trade 63
Figure 29: The Learning Curve 64
Figure 30: Contestable market and prices 66
Figure 31: Product life Cycle 75
Figure 32 : Strategic Trade Policy 78
Figure 33: Inflows of Foreign Direct Investment 93
Figure 34: Outward Foreign Direct Investment for Top 25 Countries, Yearly Average 2013-2015 94
Figure 35: U.S. International Trade in Business Services, 1986- 2015 96

List of tables

Table 1: Average Daily Productivity of the Workforce (PL) 21
Table 2: International trade between Agra and Inda..... 32
Table 3: Factor Content of U.S. Exports and Imports for 1962..... 45
Table 4: Indexes of Intra-Industry Trade for U.S. Industries, 2009 51

Preface

This modest contribution constitutes a concise manual offering a systematic overview of the theoretical frameworks explaining international trade.

The primary objective is to provide students with a comprehensive understanding of international trade phenomena and establish a robust theoretical framework for analyzing the dynamic transformations characterizing contemporary international exchanges in all their complexity and diversification.

Following years of teaching the "International Economics" module to undergraduate students, the "International Trade Theories" module to Master I International Economics students, and currently the "New Theories of International Trade" module to the same Master I cohort, we have compiled these notes to serve as a valuable resource for students in their academic pursuits.

This work endeavors to provide students with a comprehensive and current resource for international trade studies. By incorporating recent empirical data in the opening chapter, we seek to illustrate the dynamic patterns and evolving directions characterizing contemporary international trade.
We trust that this contribution will enhance the educational experience and deepen understanding for our academic audience.

Introduction

Within the modern economic landscape, international trade represents a pivotal element that reflects the complementary relationships and complex interdependencies among producers and consumers worldwide, consequently limiting the scope for independent national economic policy-making.

In today's rapidly changing world, particularly driven by the spectacular growth of information and communication technologies and artificial intelligence, nations are becoming more interconnected through international relations that necessitate continuous dialogue, rigorous analysis, and strategic planning to enable states to maximize their potential gains.

In a world of over 190 nations varying dramatically in size and economic development, economic activities continuously unfold as goods and services are produced, traded, and consumed. International trade has assumed growing importance for the global economy, particularly since the 1960s when world exports began expanding far more rapidly than global production.

This upward trend reached explosive levels during the 1990s, culminating in world exports more than doubling between 1990 and 2007. Several key factors drove this unprecedented expansion of international trade, notably the substantial reduction of trade barriers and declining transportation and communication costs. Technological advances proved instrumental in this evolution, with revolutionary developments such as containerization, supertanker shipping, and satellite-based telecommunications networks transforming the mechanics of global commerce.

Contemporary global challenges—including financial crises, the COVID-19 pandemic, geopolitical conflicts in Ukraine and Gaza, Sino-American trade tensions, and the adoption of protectionist policies—underscore the critical importance of studying international trade theories. Although nations acknowledge the fundamental value of commercial partnerships, conventional theoretical frameworks are insufficient to explain the evolving patterns and strategic behaviors that characterize the new architecture of global trade

Nevertheless, different empirical validation attempts demonstrate that traditional international trade theories, although still relevant, fail to fully explain all observed trade flows. More recent theories incorporating imperfect competition have helped complete the theoretical framework and thereby provide explanations for trade between countries without marked comparative advantages.

In this handout, we attempt to answer the question; why do nations engage in the international trade, our work covers the most important theories in this field.

This manual is structured into five chapters. The initial chapter offers a broad description of international trade flows, utilizing authentic WTO data to illustrate the magnitude of international commerce and its evolution compared to production levels, accompanied by specific insights into the trade dynamics of major commodities and services.

The second chapter addresses traditional trade theory, which serves as the foundation for understanding international commerce and its benefits for trading partners. We examine the contributions of Adam Smith and Ricardo, particularly Ricardo's seminal work on comparative advantage. We then explore how neoclassical economists extended this framework by explaining differences in relative product costs and their underlying causes through factor endowments, while incorporating capital as a production factor—in contrast to the classical approach that calculated costs solely based on labor hours. The third chapter focuses on new developments in international trade theory, specifically Theory of Intra Industry Trade, Theory of Differentiated Goods by Helpman and Krugman, Theory of Reciprocal Dumping by Brander and Krugman, Theory of Vertical Intra Industry Trade, Contestable Markets, Unequal Exchange, Theory of Product Life Cycle, the Strategic Theory of Trade and Operational Models.

The fourth chapter examines the most modern theoretical framework by Melitz's contributions, Heterogeneous Firm Selection and Trade Flows concluding with Antras 's insights.

Finally, the fifth chapter explores the latest theoretical developments by Grossman. And Helpman on the Firm Behaviour and International Trade (Choice of Firm Organization and International Equilibrium)

Chapter 1 *Introduction to International Trade*

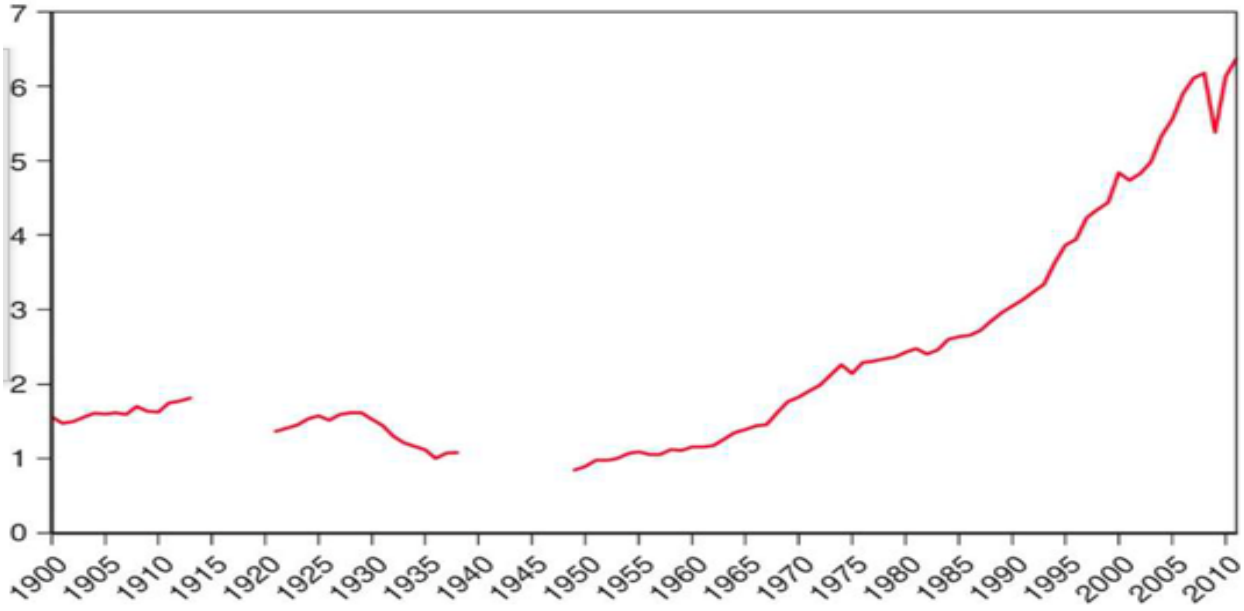
Chapter 1: Introduction to International Trade

1. History and Evolution of International Trade

All countries engage in international trade, though to varying degrees. This participation involves two fundamental flows: exports, which consist of domestically produced goods and services sold to foreign economic agents—including individuals, firms, and governments—and imports, representing goods and services purchased from other countries. The extent of international trade participation varies significantly across nations, reflecting differences in economic structure, development levels, and trade policies.

Nations are now more closely linked than ever before.

Figure 1 : Ratio of manufactures Trade to production



Source: UN Monthly Bulletin of Statistics, World Trade Organization.

The ratio of world exports of manufactured goods to world industrial production rose in the decades before World War I but fell sharply in the face of wars and protectionism. It didn't return to 1913 levels until the 1970s but has since reached new heights.

1.1. Description

U.S. exports and imports as shares of gross domestic product have been on an upward trend.

- International trade has roughly tripled in importance compared to the economy as a whole in the past 50 years.

- Both imports and exports fell substantially in 2009 due to the recession.

Technologies have increased trade:

-Wheels, sails, compasses, railroads, telegraph, steam power, automobiles, telephones, airplanes, computers, fax machines, Internet, Fiber optics, personal digital assistants, GPS satellites. . .

1.2. The Changing Pattern of World Trade:

Has the World Gotten Smaller?

- Political factors, such as wars, can change trade patterns much more than innovations in transportation and communication.

-World trade grew rapidly from 1870 to 1913.

-Then it suffered a sharp decline due to the two world wars and the Great Depression.

- It started to recover around 1945 but did not recover fully until around 1970.

Since 1970, world trade as a fraction of world GDP has achieved unprecedented heights.

- Vertical disintegration of production has contributed to the rise in the value of world trade through extensive

cross-shipping of components.

- A $100 product can give rise to $200 or $300 worth of international trade flows.

The ratio of world exports of manufactured goods to world industrial production rose in the decades before World War I but fell sharply in the face of wars and protectionism. It didn't return to 1913 levels until the

1970s but has since reached new heights. Source: UN Monthly Bulletin of Statistics, World Trade Organization.

What Do We Trade?

-What kinds of products do nations trade now, and how does this composition compare to the past?

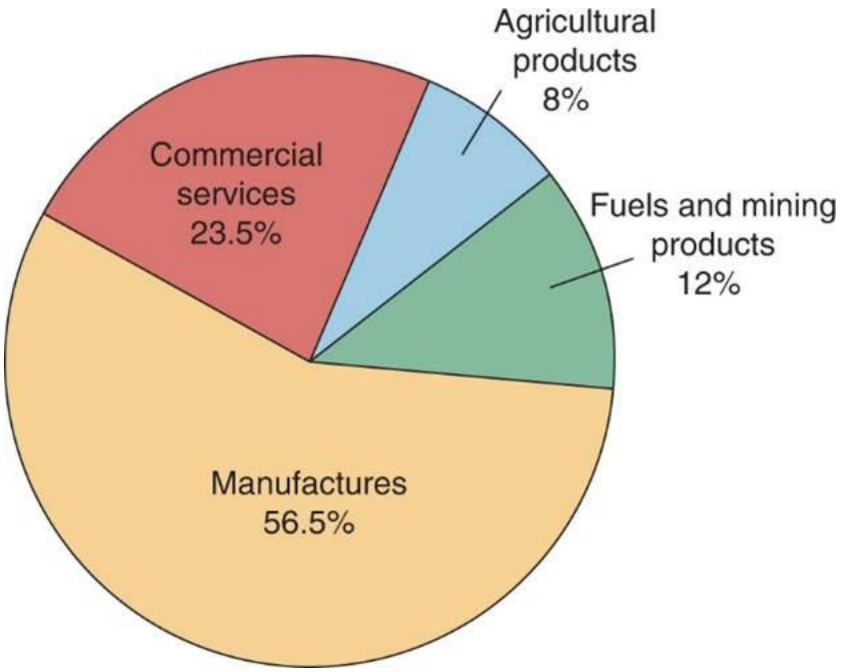
- Most (about 57%) of the volume of trade today is in manufactured products such as automobiles, computers, and clothing.

- Services such as shipping, insurance, legal fees, and spending by tourists account for about 24% of the volume of trade.

- Mineral products (ex., petroleum, coal, copper) remain an important part of world trade at 12%

- Agricultural products are a relatively small part of trade at 8%.

Figure 2: World trade composition



Source: World Trade Organization.

Most world trade is in manufactured goods, but minerals mainly oil remains important.

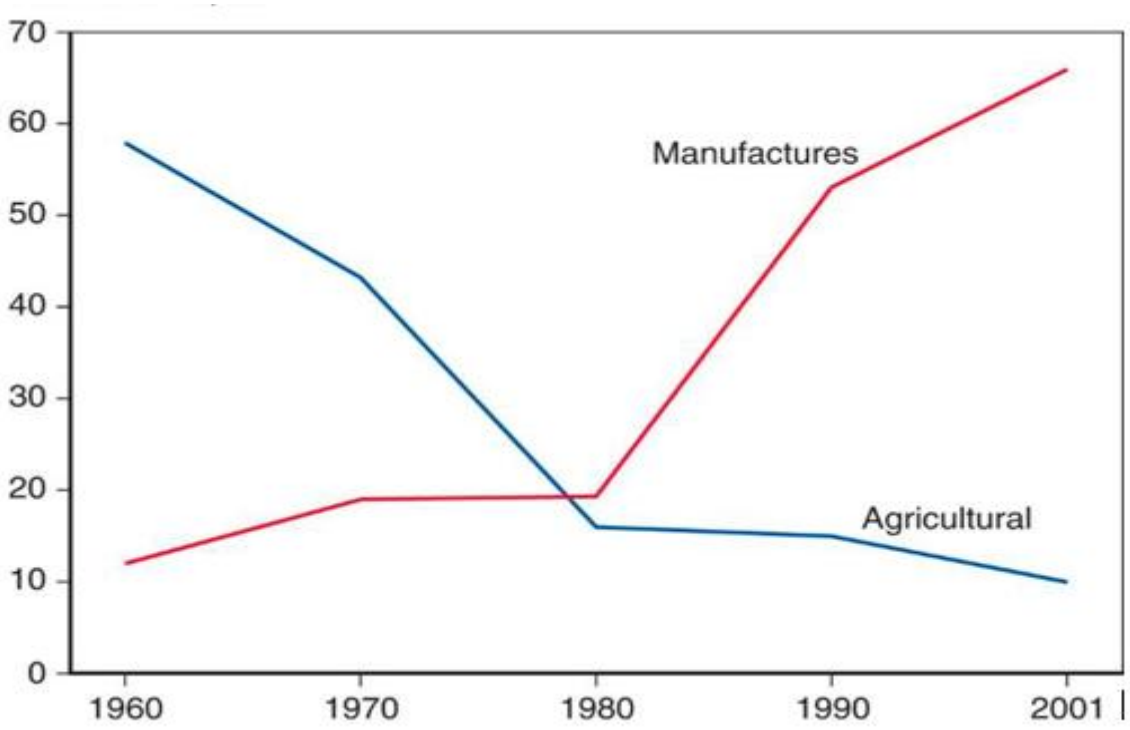
Low- and middle-income countries have changed the composition of their trade.

- In 2001, about 65% of exports from low- and middle-income countries were manufactured products, and only 10% of exports were agricultural products.

- In 1960, about 58% of exports from low- and middle-income countries were agricultural products and only 12% of exports were manufactured products.

- More than 90 % of the exports of China, the largest developing country and a rapidly growing force in world trade, consist of manufactured goods.

Figure 3: Percent of exports



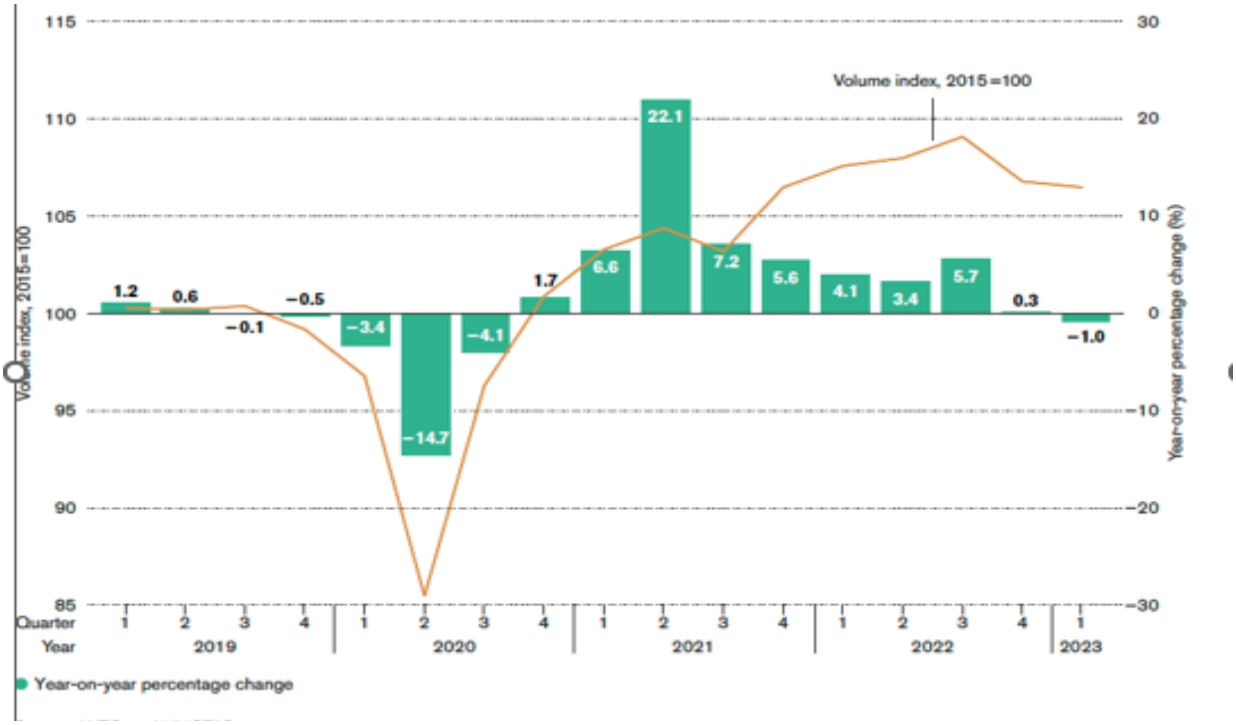
Source: United Nations Council on Trade and Development

Over the past 50 years, the exports of developing countries have shifted toward manufactures.

2. World Trade in Statistics

The volume of world merchandise trade grew more strongly than expected in the first three quarters of 2022 before falling sharply in the fourth quarter. Trade continued to contract in the first quarter of 2023 but at a slower pace.

Figure 4: World merchandise trade volume, 2019 Q1- 2023 Q1 (Volume index 2015=100 and year on year percentage change)



Source: WTO and UNCTAD

Year-on-year growth in the seasonally-adjusted volume of world merchandise trade was surprisingly strong at 4.4% in the first three quarters of 2022, before a 2.1% quarteron-quarter decline in Q4 reduced growth for the year.

• Several factors contributed to the trade decline inQ4. High food prices reduced disposable incomes of households in many economies, particularly some in Africa and the Middle East that imported large quantities of grain from Ukraine before the war. Meanwhile, high energy prices and rising interest rates raised costs in manufacturing and discouraged investment in industrialized economies, especially in Europe.

Renewed outbreaks of COVID‐19 in China also disrupted production and trade in Q4 but the relaxation of pandemic control measures in the country promises to boost growth in 2023.

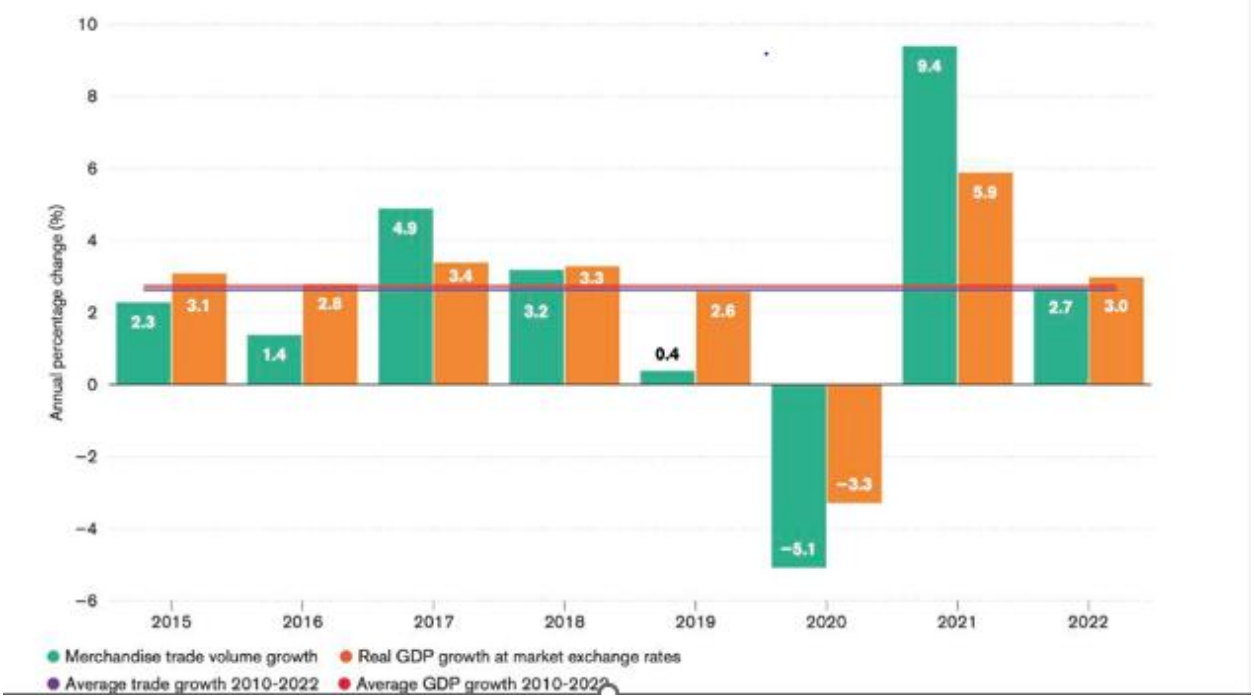
• Merchandise trade volume in Q1 of 2023 was down 1.0% compared to the same period in 2022. Trade growth will need to be stronger in the remainder of the year to reach the WTO's forecast of 1.7% for 2023.

Merchandise trade volume
Volume index, 2015=100
- World trade and economic growth, 2022-23

Merchandise trade growth has slowed in most regions since the outbreak of the war in Ukraine and the impact of the COVID-19 pandemic has proven long-lasting.

tariff disturbances follow a strong year for world trade in 2024 where merchandise trade grew 2.9% and commercial services trade rose 6.8%. Meanwhile, market-weighted world GDP grew 2.8%, making 2024 the first year since 2017 (excluding the rebound from the COVID-19 pandemic) where merchandise trade grew faster than output.

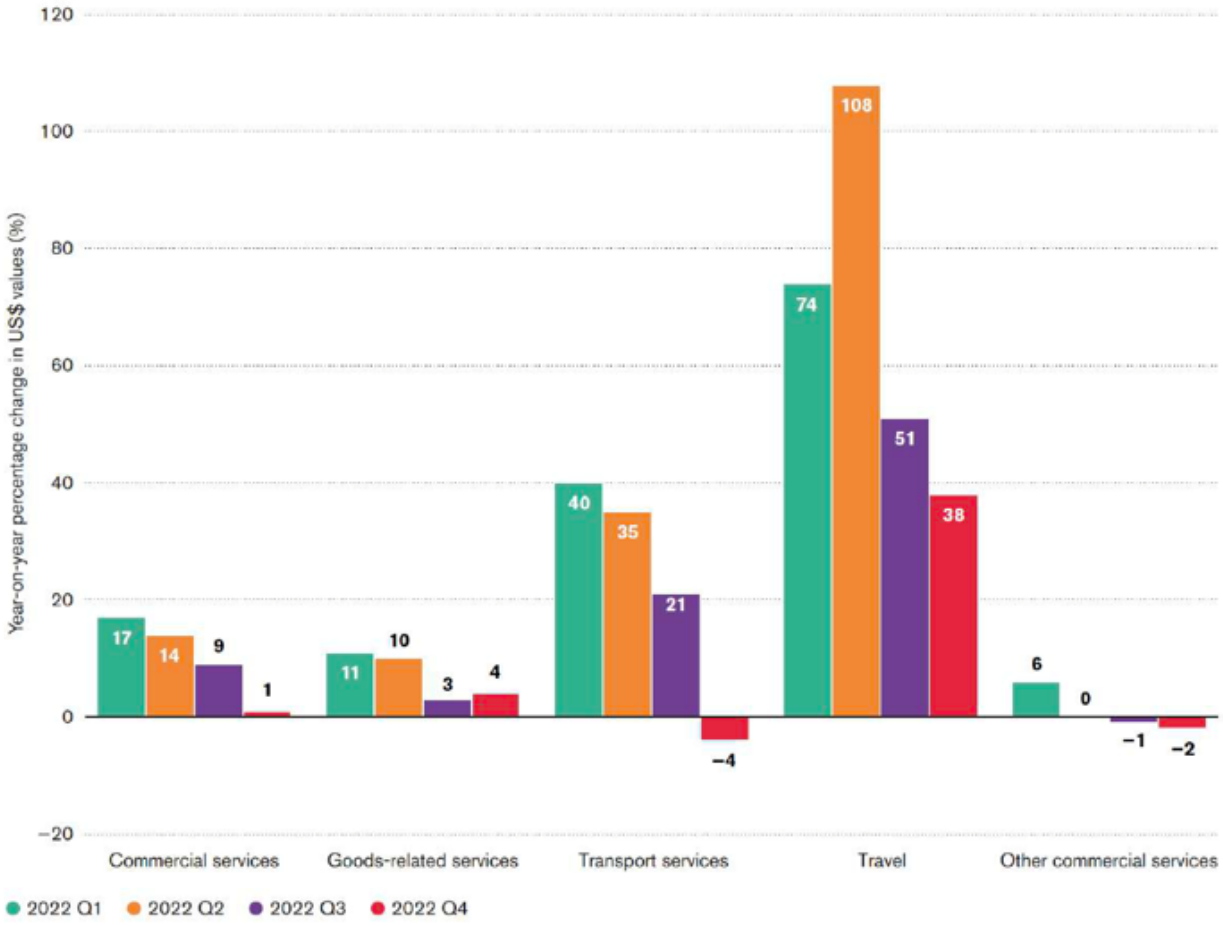
Figure 5: World merchandise trade volume and GDP Growth, 2015-2022 (Annual percentage change)



Source: WTO for marchandise trade volume, consensus estimates for GDP.

- The volume of world merchandise trade as measured by the average of exports and imports increased by 2.7% in 2022 after growing 9.4% in 2021 as the global economy rebounded from the COVID-19 pandemic. Trade growth in 2022 was accompanied by real GDP growth at market exchange rates of 3.0%, down from 5.9% in 2021.

Figure 6: World commercial services exports by category, 2022Q1-2022Q4 (Year-on-year percentage change in US$ values)



Source: WTO and UNCTAD.

The value of world commercial services exports in 2024 rose 9% to US$ 8.69 trillion. The United States was both the largest exporter (US$ 1.08 trillion) and the largest importer (US$ 787 billion).

In 2024, computer services rose by 12% reaching the US$ 1 trillion mark. The growing adoption of AI in areas such as the development of chatbots, machine learning and predictive analytics, as well as for cybersecurity needs, has further accelerated global demand for computer services.

The rapid rise of e-commerce and digital platforms, including in developing economies, has also boosted this process.

-Digitally delivered services

The statistical definition of digitally delivered trade is "All international trade transactions that are delivered remotely over computer networks", which is contained in the second edition of the IMF-OECD-UNCTAD-WTO Handbook on Measuring Digital Trade (2023).

The Handbook adopts the convention that only services can be delivered digitally. This is consistent with international statistical standards. The Handbook identifies the following service categories in the Extended Balance of Payments Services classification (EBOPS 2010) as digitally deliverable. On this basis of this list, the WTO has estimated the value of services exports that are actually digitally delivered cross border.

– Insurance and pension services

– Financial services

– Charges for the use of intellectual property n.i.e.

– Telecommunications, computer, and information services

– Research and development services

– Professional and management consulting services

– Architectural, engineering, scientific, and other technical services

– Trade-related services

– Other business services n.i.e.

– Audio-visual and related services

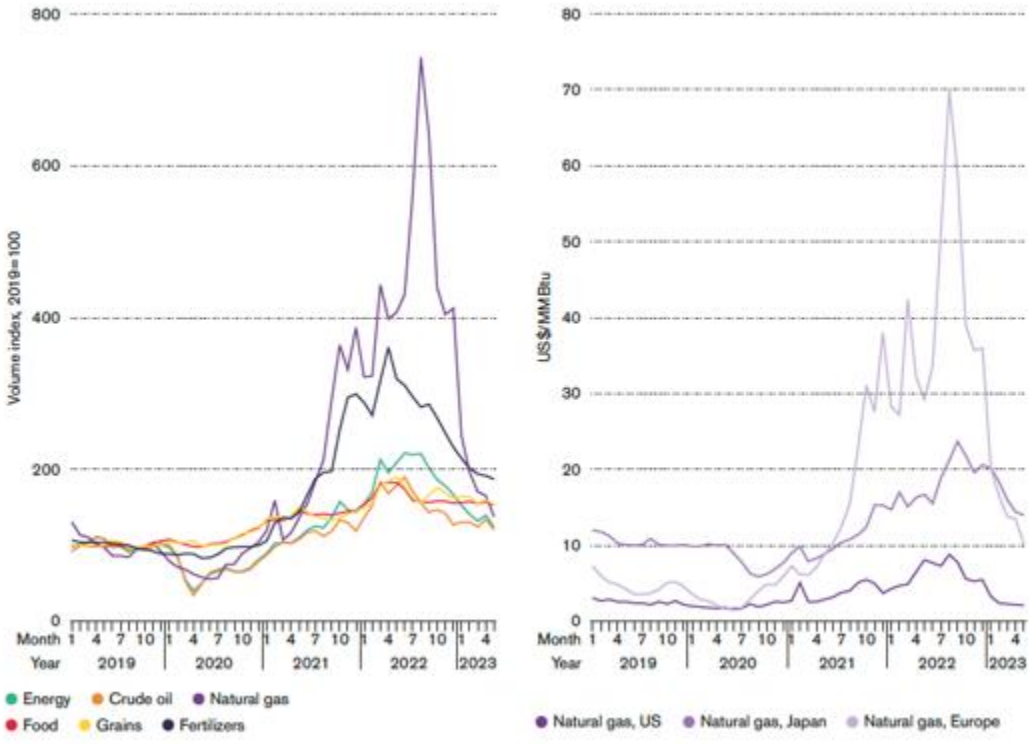
– Health services

– Education services

– Heritage and recreational services

Figure 7: Monthly average prices for primary commodities, January 2019-May 2023

Index 2019=100 and US$ per million Btu



Source : World Bank

- Prices of primary commodities, particularly food and energy, rose sharply in 2022 following the outbreak of the war in Ukraine, helping to stoke inflation in many economies. Prices eventually receded from their peaks but by May 2023 they remained high by historical standards.
- Natural gas prices in May 2023 were down 81% from their peak in August 2022 but they were still 38% above their average level in 2019, before the COVID-19 pandemic. Similarly, global grain prices, in May were 19% below their 2022 peak but 54% higher than in 2019. Prices of fertilizers also remained very high, up 87% in May compared to 2019.

Prices of primary commodities receded from their 2022 peaks by the middle of 2023 but they remain high compared to 2019.

Chapter 2

Classical and Neoclassical Theories of International Trade

Chapter 2: Classical and Neoclassical Theories of International Trade

1.Theory of Absolute and Comparative Advantage

1.1. Absolute advantage: Adam Smith, often regarded as the father of modern economics, introduced the concept of absolute advantage in his seminal work *The Wealth of Nations* (1776). This theory explains how countries can benefit from specializing and trading based on their natural efficiencies.

- A country has an absolute advantage in producing a good if it can produce that good more efficiently (using fewer resources or at a lower cost) than another country.
- Countries should specialize in producing goods where they have an absolute advantage to maximize efficiency.
- **Trade Benefits:** When countries specialize and trade based on absolute advantage, both can benefit by obtaining goods at a lower cost than if they produced everything domestically.

1.1. 1.The Theory Explained:

- Suppose Country A can produce 10 units of cloth or 20 units of wine with the same resources, while Country B can produce 15 units of cloth or 15 units of wine.
- In This scenario :
- Country A has an absolute advantage in wine (more wine per resources).
- Country B has an absolute advantage in cloth (more cloth per resources).
- Both countries should specialize:
- Country A should focus on producing wine.
- Country B should focus on producing cloth.
- By trading, both countries can obtain both goods at a lower total cost than producing them domestically.
- **1.1.2. Implications :**
- Absolute advantage explains the pattern of international trade before the development of more complex theories.
- It emphasizes the importance of efficiency and productivity.

- However, it does not explain situations where one country has an absolute advantage in all goods; this led to the development of the theory of comparative advantage.

1.1.3. Limitations :

- Absolute advantage alone cannot fully explain trade patterns, especially when one country is more efficient across all products.

Adam Smith's absolute advantage theory shows that nations benefit from focusing on producing goods where they are most efficient and trading to acquire other goods. This specialization enhances overall global productivity and wealth.

1.2. Comparative advantage and Labour productivity: the Ricardian model

A significant concept within this theoretical framework is the theory of comparative advantage, introduced by David Ricardo in 1817. This theory posits that even if one nation can produce all goods more efficiently than another, both nations can still benefit from trade by specializing in the production of goods for which they have the lowest opportunity cost. Ricardo's insights challenged the prevailing mercantilist view that countries should strive for self-sufficiency and underscored the potential for mutually beneficial gains from trade through specialization.

1.2.1. Comparative advantage

Let's consider two fictional countries: A Agra and B Inda. Each of them is likely to produce bananas and shirts. The only factor of production they use is labor.

The starting information we have is the average daily productivity of the workforce (PL) in each of the two countries and in each of the two productions. It is given in table 1.

Table 1: Average Daily Productivity of the Workforce (PL)

	Agra	Inda
Bananas	4 kg	1 kg
Shirts	8 units	6 units

According to this table, if in Agra a worker is in the fields, he will produce 4 kg of bananas per day. On the other hand, if he is in the factory, he will produce 8 shirts. In Inda, the corresponding daily productions are 1 kg of bananas and 6 shirts.

Note. Let Q be the total quantity of a good produced per day and L the quantity of labor used in this production. The average labor productivity PL is equal to Q/L. If PL is constant regardless of L, which is the case here, PL is

equal to the marginal labor productivity Δ q/Δ l (with "Δ" absolute variation) and the production function Q(L) has, in the space L-Q, the shape of a line starting from the origin and whose slope is equal to PL, itself equal to Δ q/Δ l.

Suppose that the workforce is 1,000 workers for Agra and 3,000 workers for Inda. This allows us to construct graphs 1 and 2, graph 1 concerning Agra and graph 2 concerning Inda. Each of the two graphs has on the x-axis the quantity of bananas (Qb) (in thousands of kg) and on the y-axis the quantity of shirts (Qc) (in thousands of units). On each of the two graphs appears, in the form of a line drawn continuously, the curve of production possibilities (CPP) of the country studied.

Figure 8: The CPP of Agra or CPP (A)

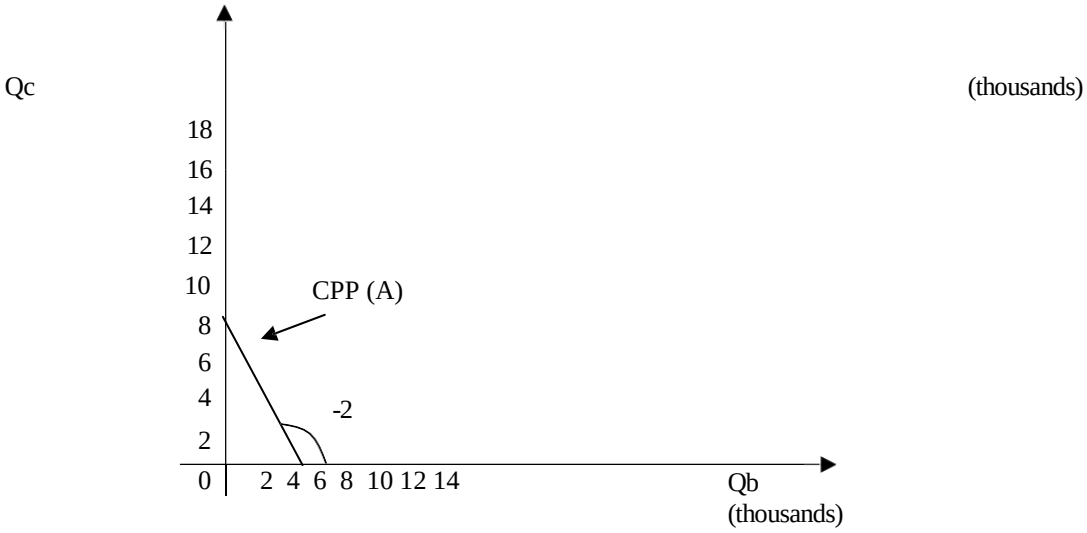
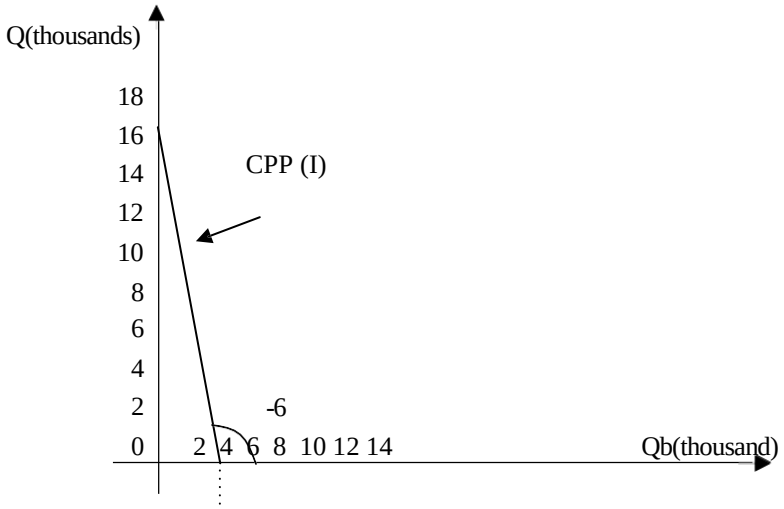


Figure 9: The CPP of Inda or CPP (I)



3

The CPP of Agra, or CPP (A), has as extreme points (4-0) on the abscissa and (0-8) on the ordinate. The CPP of Inda, or CPP (I), has as extreme points (3-0) on the abscissa and (0-18) on the ordinate. Indeed, if, in Agra, the 1,000 workers are fully assigned to banana production, banana production is 4,000 kg and shirt production is zero. On the other hand, if these 1,000 workers are entirely assigned to shirt production, banana production is zero and shirt production is 8,000 units. In Inda, if the 3,000 workers are entirely assigned to banana production, banana production is 3,000 kg and shirt production is zero. On the other hand, if these 3,000 workers are entirely assigned to shirt production, banana production is zero and shirt production is 18,000 units.

The CPP (A) is thus given by:

$$Qc = 8{,}000 - 2\,Qb \quad (1)$$

The CCP (I) is given by:

$$Qc = 18{,}000 - 6\,Qb \quad (2)$$

Generally speaking, the slope of the CPP, expressed in absolute value, is equal to:

$$COPb = \left| \Delta Qc / \Delta Qb \right| = (PLc / PLb) = (Pb / Pc) \quad (3)$$

where COPb means the opportunity cost of producing one kg of bananas, expressed in terms of shirts, Δ « variation » (either in units of shirts or in kg of bananas), PLc productivity in the production of shirts, PLb productivity in the production of bananas, Pb monetary or nominal price of one kg of bananas and Pc monetary or nominal price of one shirt. (PLc/ PLb) itself is the relative productivity in shirt production and (Pb/Pc) the relative price, also known as real, of bananas, that is to say expressed in units of shirts.

If (3) is applied to Agra (index A), we have:

$$COPb\ (A) = \Delta Qc/ \Delta Qb\ (A) = (PLc/ PLb)\ (A) = (Pb/ Pc)\ (A) = 8/ 4 = \mathbf{2} \quad (4)$$

If (3) is applied to Inda (subscript I), we have:

$$COPb\ (I) = \Delta Qc/ \Delta Qb\ (I) = (PLc/ PLb)\ (I) = (Pb/ Pc)\ (I) = 6/ 1 = \mathbf{6} \quad (5)$$

Indeed, in Agra, a worker is 2 times more productive in the production of shirts than in the production of bananas. It is therefore normal that if this worker moves from shirt production to banana production, the production of an additional kg of bananas will lead to a decrease in shirt production equal to 2 units and the relative price of a kg of bananas will be equal to 2 shirts. A similar reasoning applies to Inda where the relative price of one kg of bananas will be 6 shirts.

(Pb/ Pc) (A) = 2 and (Pb/ Pc) (I) = 6 are more precisely the relative prices of so-*called autarchic* bananas, that is to say those prevailing in the two countries before they engage in a process of mutual exchange. It should be emphasized here that the price in autarky (Pb/Pc), given that it is constant and equal to COPb, will prevail *regardless* of the position of the marginal advantage curve for bananas

*Not*e. COPb can also be considered to be the marginal cost *of producing bananas expressed in units of shirts.*

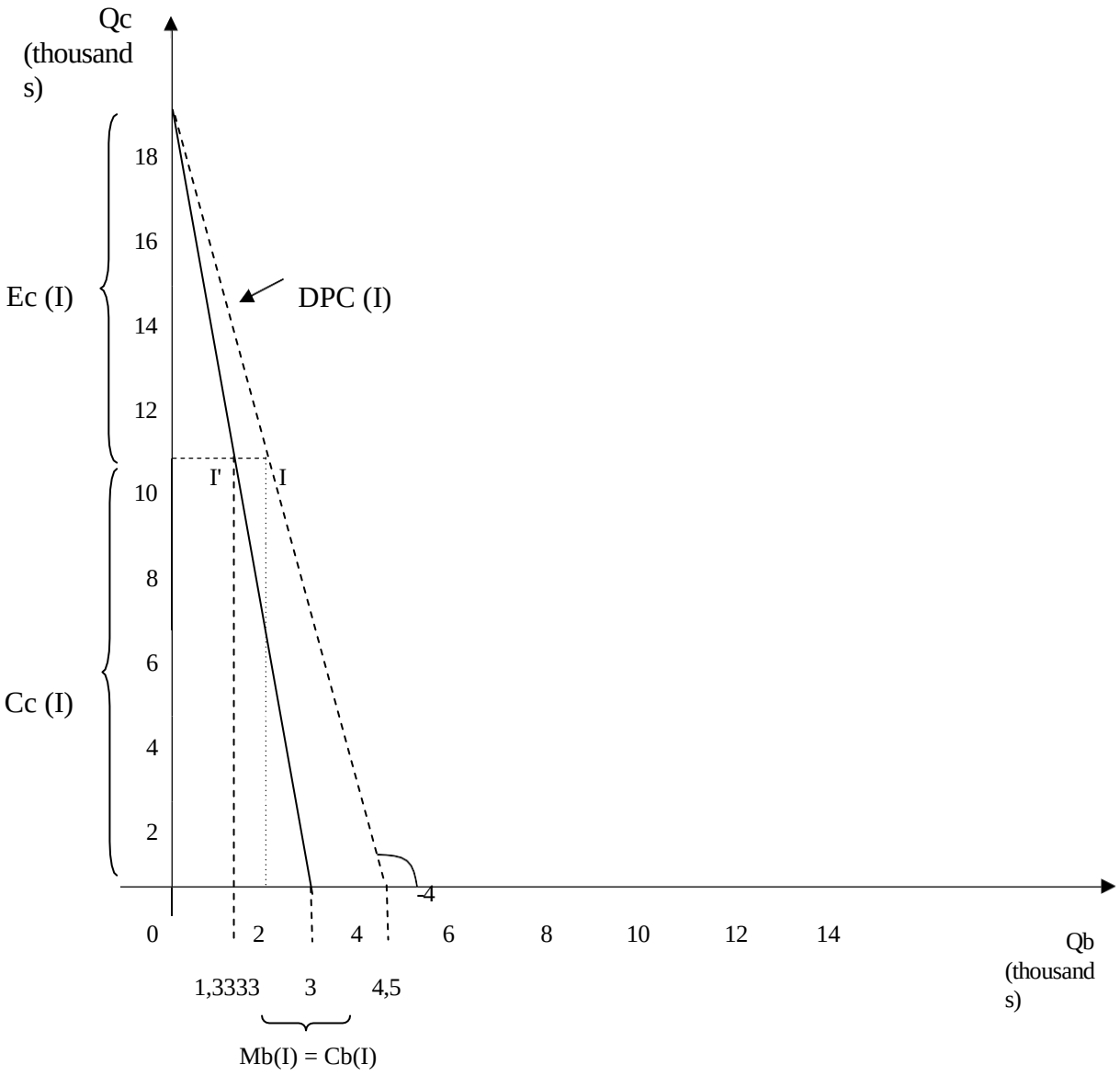
Given this situation, the first question to ask is: *do Agra and Inda have an interest in trading and which products?* We will indeed assume here that the 2 countries can only exchange products, as the workforce cannot migrate from one country to another.

Before answering the question, and to facilitate understanding, it is useful to also calculate the relative price of *self-sufficient shirts* in both countries. They are:

(Pc/ Pb) (A) = 1/ (Pb/ Pc) (A) = COPc (A) = (PLb/ PLc) (A) = 1/ 2, that is, in Agra, 0.5 kg of bananas per jacket

(Pc/ Pb) (I) = 1/ (Pb/ Pc) (I) = COPc (I) = (PLb/ PLc) (I) = 1/ 6, that is, in Inda, 0.17 kg of bananas per shirt.

Figure 10: Inda and the international exchange



where COPc is the opportunity cost of a shirt expressed in kg of bananas, that is Δ Qb/ Δ Qc .

Rappel. If we calculate (Pb/ Pc), the shirt is the *cash*. If, on the other hand, we calculate (Pc/ Pb), it is the banana that constitutes the currency.

We are now in a position to answer the question asked without difficulty.

The inhabitants of Agra realize that one kg of bananas costs them at home, that is to say in autarchy, 2 shirts whereas it would cost them 6 shirts in Inda. They are therefore not interested in Inda's bananas. On the other hand, they realize that a shirt costs them 0.5 kg of bananas at home while it would only cost them 0.17 kg in Inda. They are therefore interested in Inda's shirts.

What about the inhabitants of Inda? They realize that a shirt costs them 0.17 kg of bananas independently, but that this same shirt would cost them 0.5 kg in Agra. They are therefore not interested in Agra shirts. On the other hand, they realize that one kg of bananas costs them 6 shirts independently, whereas this kg of bananas would only cost them 2 shirts in Agra. They are therefore interested in bananas from Agra.

The conditions for the exchange are thus met: Agra is interested in importing shirts from Inda by exporting bananas to it and Inda is interested in importing bananas from Agra by exporting shirts to it. Clearly, this is due to the fact that in Agra the relative productivity in banana production is

(PLb/ PLc) (A), is 0.5 while it is only 0.17 in Inda, either (PLb/ PLC) (I), and in Inda, the relative productivity in shirt production, either (PLc/ PLb) (I), is 6 whereas it is only 2 in Agra, either (PLc/ PLb) (A), which means that Agra has a comparative advantage in producing bananas and Inda in producing shirts.

Note. The reader will have noticed that, in the example, Agra has an absolute *advantage* in both productions: PLb (A) > PLBb (I) **and**

PLc (A) > PLc (I).

1.2.2. The international exchange

The question we must ask ourselves is: how many bananas will Agra export and how many shirts will it import? Or conversely: what is the quantity of shirts that Inda will export and what is the quantity of bananas it will import? The assumption that will be made is that each of the 2 countries balances the value of its imports and that of its exports. In other words, neither of the two countries can import (export) by value more than it exports (imports) by value, the net flows of capital between the 2 countries being assumed to be zero, therefore non-existent.

It is obvious that the opening of the 2 countries to international trade, following the increased demand for the 2 products, will have two opposite effects:

> the international *relative price* of bananas, (Pb/ Pc)*, that is to say on the world market, will increase compared to (Pb/ Pc) (A) = 2, following the increased demand for bananas from Inda;

> the international *relative price* of shirts, (Pc/ Pb)*, will increase compared to (Pc/ Pb) (I) = 0.17, following the increased demand for shirts from Agra.

In other words, we will witness, on the world market, the determination of an international *relative price* which will be such that:

(Pb/ Pc) (A) < (Pb/ Pc)* <(Pb/ Pc) (I) (6) with 2 <(Pb/ Pc)* > 6

or, conversely, (Pc/ Pb) (A) > (Pc/ Pb)* > (Pc/ Pb) (I) (7)

with 0.5 > (Pc/ Pb)* > 0.17

Indeed, if (Pb/ Pc)* is < 2, for example 1.5, the inhabitants of Inda are still interested in importing bananas from Agra, as they only cost them 1.5 shirts per kilo on the world market. On the other hand, the inhabitants of Agra are no longer interested in importing shirts from Inda, as they cost them on the global market 0.67 kg of bananas per shirt (= 1/ 1.5), which is higher than the relative price of the self-sufficient shirt which is 0.5 kg of bananas. If, on the other hand, (Pb/ Pc)* > 6, for example 8, the inhabitants of Agra are still interested in importing shirts from Inda, as they only cost them 0.13 kg of bananas per shirt on the world market (= 1/ 8). On the other hand, the inhabitants of Inda are no longer interested in importing bananas from Agra, as they cost them 8 shirts per kg, which is higher than the relative price of self-sufficient bananas, which is 6 shirts per kg. For there to be an exchange, the relationship (6), or the opposite (7), be satisfied.

Note. (Pb/ Pc) * and (Pc/ Pb)* are what is called *the terms of external trade*, respectively of Agra and Inda, namely the ratio of the price of their exports and the price of their imports.

With additional information on the intensity of demand from both countries, we could calculate accurately (Pb/ Pc)* or its inverse (Pc/ Pb)*. In the absence of this information, we will assume that (Pb/ Pc)* = 4, or else, that (Pc/ Pb) * = 0.25, which satisfies respectively (6) and (7). We could naturally have retained for (Pb/ Pc) * the values 3 or 5, among others, each of them satisfying (6) and consequently (7).

Consider charts 4 and 5 in which the CPPs of Agra and Inda appear from charts 1 and 2, respectively CPP (A) and CPP (I). For (Pb/ Pc)* = 4, we can now introduce, in each of the two graphs, a new line, drawn in dotted lines and called *the exchange line or* the consumption possibilities' (DPC) line.

In graph 11 concerning Agra, the CPD, or CPD (A), has as extreme points (4-0) on the abscissa and (0-16) on the ordinate. This means that if all of Agra's maximum banana production, which we know is 4,000 kg, were exported, Agra could, at the relative international price of bananas (Pb/ Pc)* equal to 4, import 16,000 shirts from Inda (= 4 x 4). In graph 5 concerning Inda, the CPD, or CPD (I), has as extreme points (4.5-0) on the abscissa and (0-18) on the ordinate. This means that if all the maximum production of shirts from Inda, which we know is 18,000 shirts, were exported, Inda could, at the relative international price of shirts (Pc/ Pb)* equal to 0.25, import 4,500 kg of bananas from Agra (= 18 x 0.25). We can therefore express DPC (A) and DPC (I) respectively as:

$$Qc = 16{,}000 - 4\,Qb \quad (8)$$

$$Qc = 18{,}000 - 4\,Qb \quad (9)$$

In other words, for each of the 2 countries, the DPC gives, as its name indicates, the location of the possibilities of consumption of the 2 products following the opening to international trade. The fact that the DPC is to the right of the CCP, except, obviously, for the extreme point on the abcisse in the case of Agra and for the extreme point on the ordinate in the case of Inda, shows that opening up to international trade allows increasing the consumption possibilities of the 2 countries "beyond" of their production possibilities. International trade is therefore mutually beneficial for them, the slope, expressed in absolute value, of the CPD being itself equal to the international relative price of bananas equal to 4.

The fact that each of the 2 countries *completely* specializes in the production of the good for which it has a comparative advantage, bananas for Agra, shirts for Inda, is due to the existence of constant COP here, meaning that in the absence of factors of production other than labor, the reallocation of a worker from the production of bananas (shirts) to that of shirts (bananas) leads to the same decrease in the production of shirts (bananas) regardless of the quantity of bananas produced (shirts).

It is however obvious that Agra will not export all its banana production, namely 4,000 kg (symbol

Xb (A)). The inhabitants of Agra indeed wish to keep part of this production for their own food.

It is equally obvious that Inda will not export all of its shirt production, i.e. 18,000 units (symbol Xc (I)). The inhabitants of Inda also have clothing needs.

Suppose, here quite arbitrarily, that the inhabitants of Agra wish to consume 2,000 kg of bananas (symbol Cb (A)). This means that they have 2,000 kg left that they can export (symbol Eb (A)), i.e. Xb (A) – Cb (A). However, this export will allow them, at the international price (Pb / Pc)* of 4, to import 8,000 shirts (symbol Mc (A)), or 2,000 x 4, which will correspond to their consumption of shirts (symbol Cc (A)). The result is that now the inhabitants of Agra have a basket of consumption corresponding to point A (2-8) of the DPC (A) in graph 4 and are no longer at point A' (2-4) located on the CPP (A), point before the exchange where they could only consume 4,000 shirts for a consumption of 2,000 kg of bananas. The gain of the exchange for Agra is thus 4000 shirts, or 8,000 – 4000.

What about Inda? Inda's banana import (symbol Mb (I)) is obviously equal to Eb (A)), which is 2000 kg, which is equal to her banana consumption (symbol Cb (I)). Just as obviously, the export of shirts from Inda (symbol Ec (I)) is equal to Mc (A), or 8000 units. He therefore has a consumption of shirts (symbol Cc (I)) equal to 10,000 units, that is, Xc (I) – Ec (I). The result is that

now the inhabitants of Inda have a consumption basket corresponding to point I (2-10) of the DPC (I) in Chart 5 and no longer at point I' (1,333-10) located on the CPP (I), the pre-exchange point where they could only consume 1,333 kg of bananas for a consumption of 10,000 shirts. The gain from the exchange for Inda is thus 667 kg of bananas, or 2,000 – 1,333.

Note. it will be noted that we could also have chosen, as the starting point of the argument, Cc (I) equal to 10,000 shirts, instead of Cb (A), which would have allowed to calculate Ec (I), either Xc (I) – Cc (I), or 8000 shirts, which are exported at the international relative price (Pc / Pb)* equal to 0.25, would have given Mb (I) = 2,000 kg of bananas.

Figure 11: Agra and the international exchange

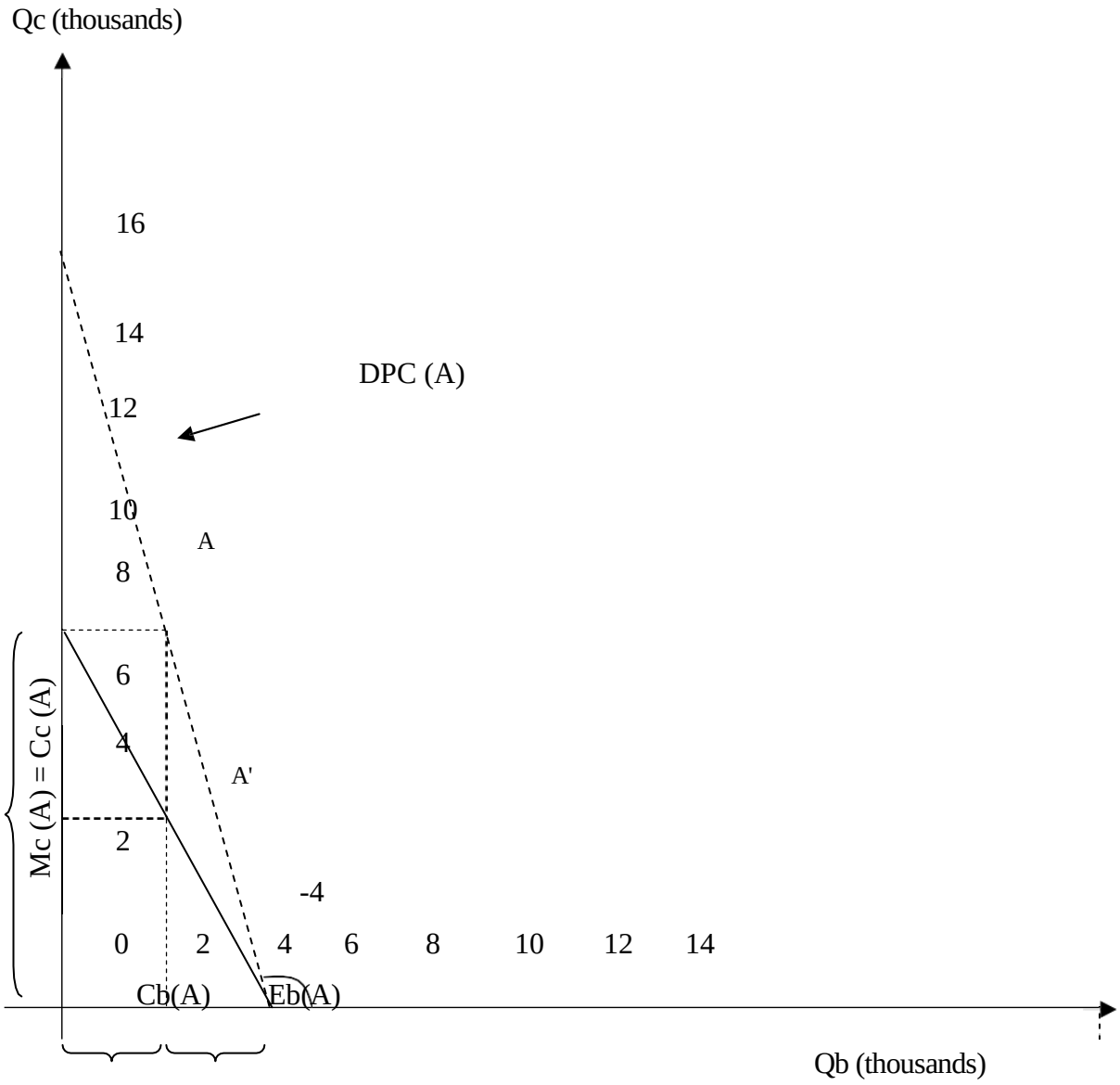


Table 2 summarizes the results given above in the text

	Agra (A)				*Inda (I)*			
Products	X (A)	M (A)	E (A)	C (A)	X (I)	M (I)	E (I)	C (I)
Bananas (tonnes)	4	0	2	2	0	2	0	2
shirts (1 000 unités)	0	8	0	8	18	0	8	10

Table 2: International trade between Agra and Inda

Legend. X = production; M = imports ; E = exports ; C =, consumption with C = X + M – E.

As we had assumed for each of the 2 countries, the value of its imports must be equal to ('fully financed by') the value of its exports. The balance of each country's trade account in the balance of external payments is therefore zero. We can verify that this is indeed the case.

Indeed, for Agra, this means:

Pc* M(A) = Pb* E (A)

with Pc* international monetary price, that is to say denominated in $, a shirt and Pb* international price

monetary of one kilo of bananas. This can be rewritten:

M (A) = (Pb/ Pc)* E (A) (10)

Replace, in (10), M (A), (Pb / Pc)* and E (A) with their numerical values. One obtains:

8 = 4 x 2

For Inda, this means:

Pb* M(I) = Pc* E (I)

which can be rewritten:

M (I) = (Pc/ Pb)* E (I) (11)

Let's replace, in (11), M (I), (Pc / Pb)* and E (I) with their numerical values. We obtain:

2 = 0.25 x 8

The value of trade between the two countries is therefore well balanced.

Note. If the hypothesis of trade balance in value had not been adopted, we could for example have had Pc* M (A) > Pb* E (A), which would have meant Pb* M (I) < Pc* E (I) and, with M (A) = E (I) and M(I) = E (A),

Pc* M (A) - Pb* E (A) = Pc* E (I) – Pb* M (I) = F, where F is the trade deficit of Agra and the trade surplus of Inda, or said otherwise, an import of capital (loan) for Agra and an export of capital (loan) for Inda.

Productivity differences play an important role in international trade

Comparative advantage (not absolute advantage) matters for trade

2. Factorial Theory Neoclassical Heckscher-Ohlin-Samuelson Model

2.1. The Heckscher-Ohlin Model

In addition to differences in labor productivity, trade occurs due to differences in resources across countries.

The Heckscher-Ohlin theory argues that trade occurs due to differences in labor, labor skills, physical capital, capital, or other factors of production across countries.

Countries have different relative abundance of factors of production.

Production processes use factors of production with different relative intensity.

2.1.1. Two Factor Heckscher-Ohlin Model

- Two countries: home and foreign.
- Two goods: cloth and food.
-Two factors of production: labor and capital.
- The mix of labor and capital used varies across goods.
-The supply of labor and capital in each country is constant and varies across countries.
-In the long run, both labor and capital can move across sectors, equalizing their returns (wage and rental rate) across sectors.

2.1.2. Production Possibilities

-With more than one factor of production, the opportunity cost in production is no longer constant and the PPF is no longer a straight line. Why?

- Numerical example:

K = 3000, total amount of capital available for production

L = 2000, total amount of labor available for production

Production possibilities are influenced by both capital and labor:

aKCQC + aKFQF = K

aLCQC + aLFQF = L

Constraint on capital that capital used cannot exceed supply:

2QC + 3QF = 3000

-Constraint on labor that labor used cannot exceed labor supply:

2QC + QF = 2000

Economy must produce subject to both constraints i.e., it

must have enough capital and labor.

- Without factor substitution, the production possibilities

frontier is the interior of the two factor constraints.

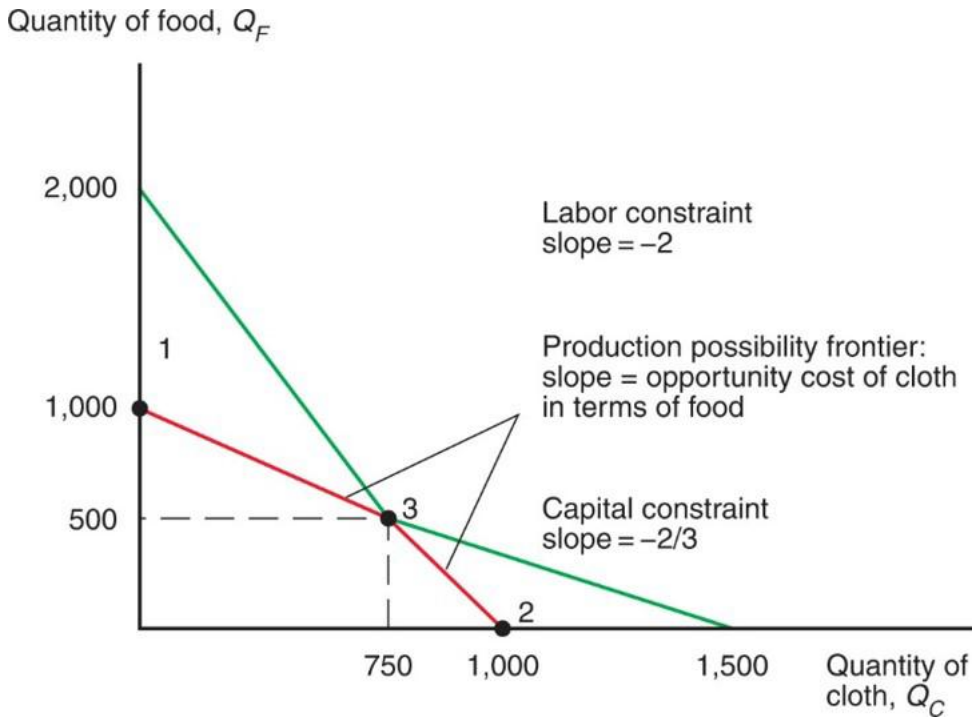
Max food production 1000 (point 1) fully uses capital, with

excess labor.

- Max cloth 1000 (point 2) fully uses labor, with excess capital.

- Intersection of labor and capital constraints occurs at 500 calories of food and 750 yards of cloth (point 3).

Figure 12: The Production Possibility Frontier Without Factor Substitution



- If capital cannot be substituted for labor or vice versa, the production possibility frontier in the factor-proportions model would be defi ned by two resource constraints:

- The economy can't use more than the available supply of labor (2,000 work-hours) or capital (3,000 machine-hours).

- So, the production possibility frontier is de ned by the red line in this figure.

The opportunity cost of producing one more yard of cloth, in terms of food, is not constant:

- low (2/3 in example) when the economy produces a low amount of cloth and a high amount of food

- high (2 in example) when the economy produces a high amount of cloth and a low amount of food

- Why? Because when the economy devotes more resources towards production of one good, the marginal productivity of those resources tends to be low so that the opportunity cost is high.

The above PPF equations do not allow substitution of capital for labor in production.

- Unit factor requirements are constant along each line segment of the PPF.

-If producers can substitute one input for another in the production process, then the PPF is curved (bowed).

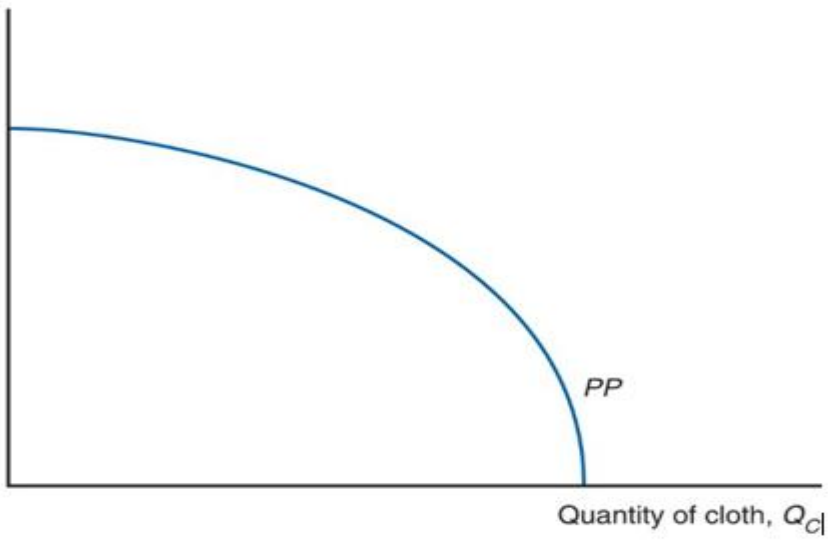
-Opportunity cost of cloth increases as producers make more cloth.

2.1.3. The Production Possibility Frontier with Factor Substitution

If capital can be substituted for labor and vice versa, the production possibility frontier no longer has a kink.

-But it remains true that the opportunity cost of cloth in terms of food rises as the economy's production mix shifts toward cloth and away from food.

Figure 13: *The Production Possibility Frontier with Factor Substitution*



What does the country produce?

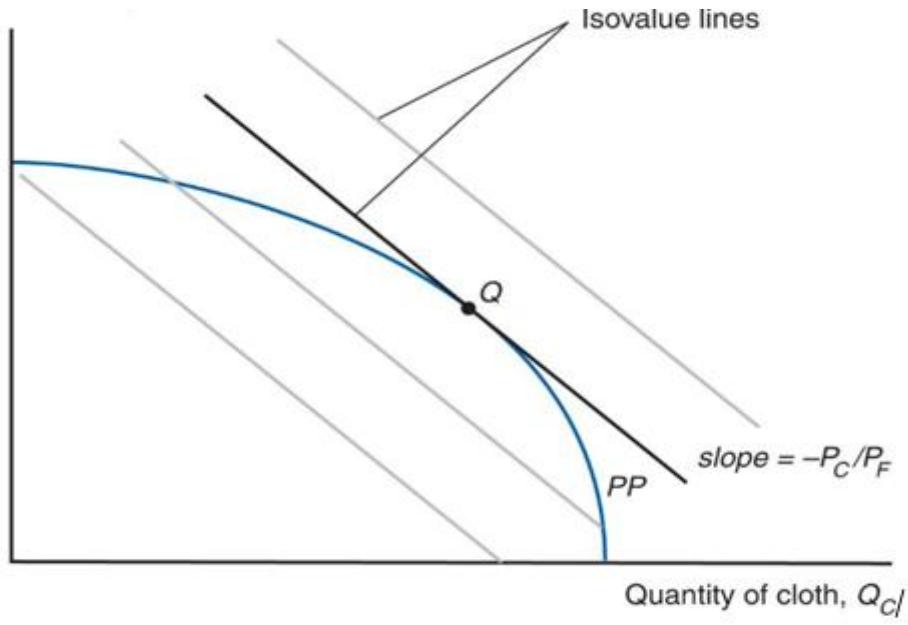
- The economy produces at the point that maximizes the value of production, V.

- An isovalue line is a line representing a constant value of production, V:

V = PCQC + PFQF

- where PC and PF are the prices of cloth and food.
- slope of isovalue line is - (PC =PF)

Figure 14*:* Prices and Production



The economy produces at the point that maximizes the value of production given the prices it faces; this is the point on the highest possible isovalue line. At that point, the opportunity cost of cloth in terms of food is equal to the relative price of cloth, PC > PF.

Given the relative price of cloth, the economy produces at the point Q that touches the highest possible isovalue line.

At that point, the relative price of cloth equals the slope of the PPF, which equals the opportunity cost of producing cloth.

The trade-off in production equals the trade-off according to market prices.

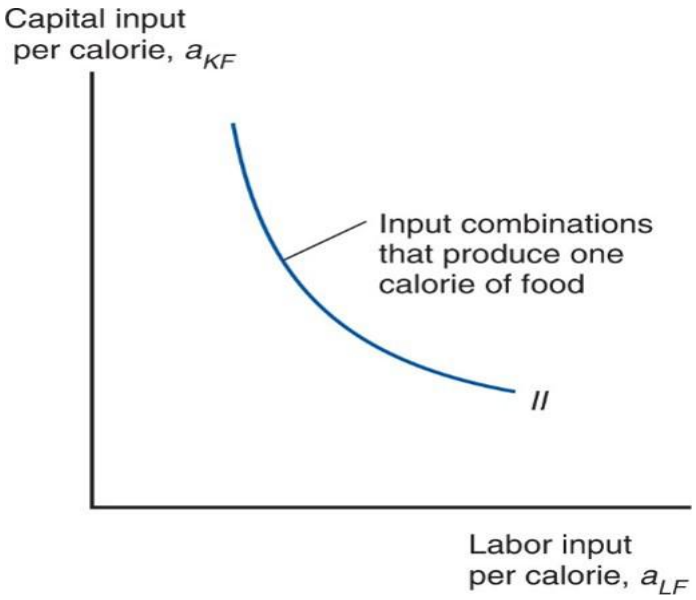
2.1.4. Choosing the Mix of Inputs

Producers may choose different amounts of factors of production used to make cloth or food.

- Their choice depends on the wage, w, paid to labor and the rental rate, r, paid when renting capital.

- As the wage w increases relative to the rental rate r, producers use less labor and more capital in the production of both food and cloth.

Figure 15: Input Possibilities in Food Production



A farmer can produce a calorie of food with less capital if he or she uses more labor, and vice versa.

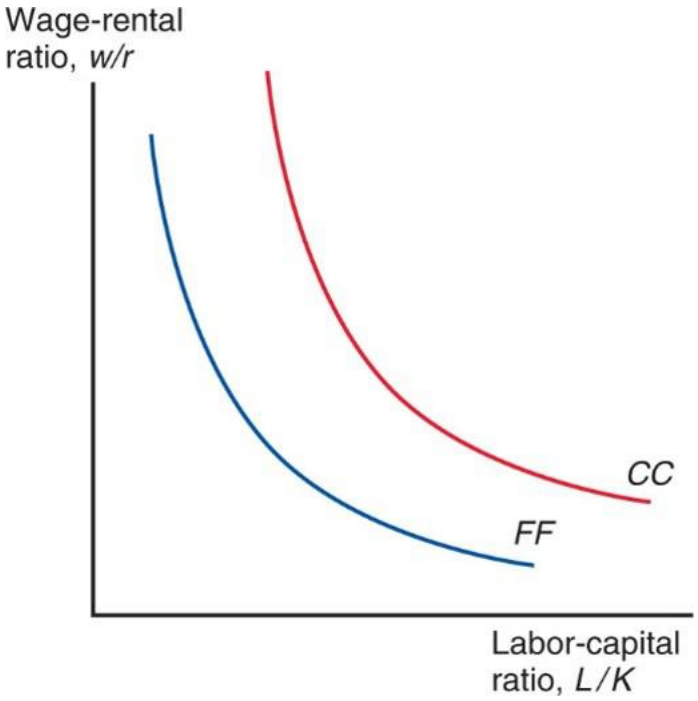
Assume that at any given factor prices, cloth production uses more labor relative to capital than food production uses:

aLC =aKC > aLF =aKF or LC =KC > LF =KF

Production of cloth is relatively labor intensive, while production of food is relatively land intensive.

Relative factor demand curve for cloth CC lies outside that for food FF.

Figure 16: *Factor Prices and Input Choices*



At any given wage-rental ratio, cloth production uses a higher labor-capital ratio;

when this is the case, we say that cloth production is labor-intensive and that food production is capital-intensive**.**

2.2. Factor Prices and Input Choices

In competitive markets, the price of a good should equal its cost of production, which depends on the factor prices.

How changes in the wage and rent affect the cost of producing a good depends on the mix of factors used.

An increase in the rental rate of capital should affect the price of food more than the price of cloth since food is the capital-intensive industry.

Changes in w/r are tied to changes in PC =PW **.**

Figure 17: Factor Prices and Goods Prices



Because cloth production is labor-intensive while food production is capital-intensive, the higher the relative cost of labor, the higher must be the relative price of the labor-intensive good.

2.3.-Stolper-Samuelson theorem

If the relative price of a good increases, then the real wage or rental rate of the factor used intensively in the production of that good increases, while the real wage or rental rate of the other factor decreases.

-Any change in the relative price of goods alters the distribution

of income

- Under competition, the real wage/return is equal to the

marginal productivity of the factor. Marginal productivity of a factor increases as the level of that factor used in production decreases.

We have a theory that predicts changes in the distribution of

income when the relative price of goods changes, say because of trade.

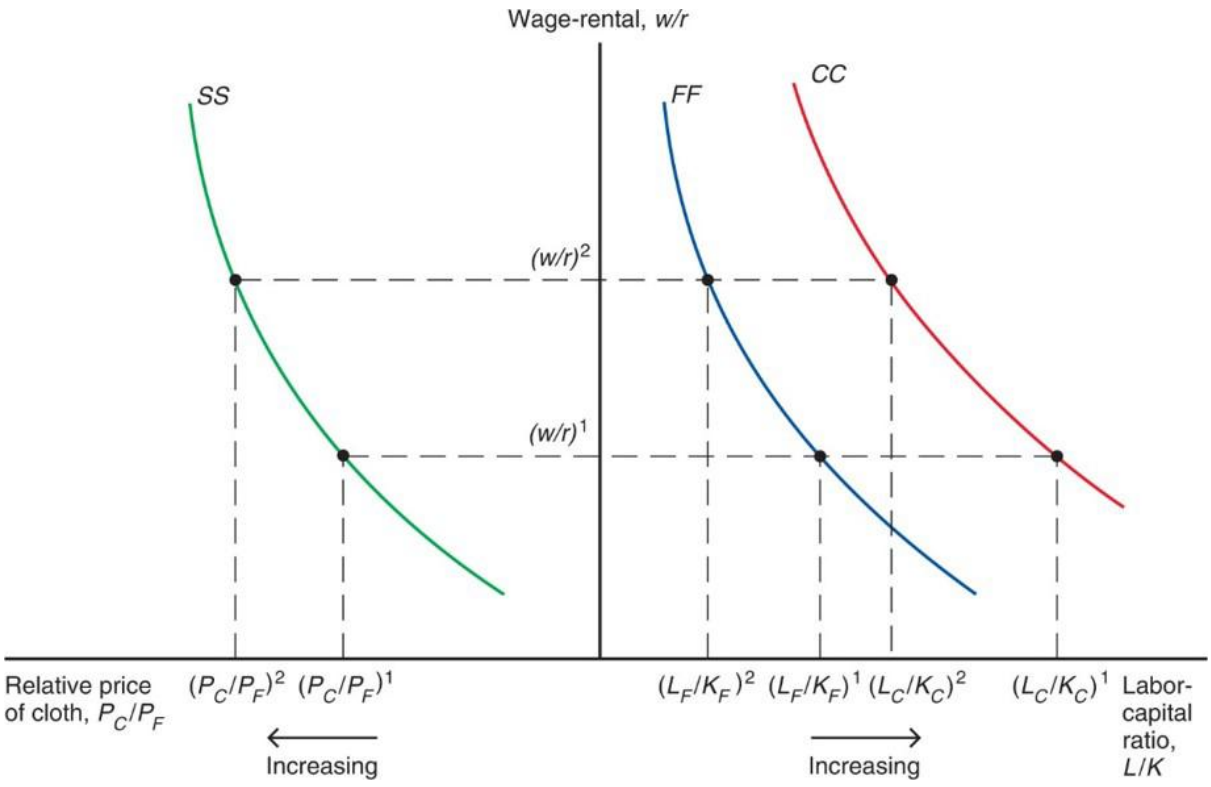
-An increase in the relative price of cloth, PC /PF , will:

- raise income of workers relative to that of landowners, w/r.

- raise the ratio of capital to labor, K/L, in both industries and raise the marginal product of labor in both industries and lower the marginal product of capital in both industries.

- raise the real income of workers and lower the real income of capital owners.

Figure 18: ***From Goods Prices to Input Choices***



If the relative price of cloth rises, the wage-rental ratio must rise. This will cause the labor-capital ratio used in the production of both goods to drop.

An increase in the relative price of cloth, PC =PF, is predicted to

- raise income of workers relative to that of capital owners, w/r.
- raise the ratio of capital to labor services, K=L, used in both industries.
- raise the real income (purchasing power) of workers and lower the real income of capital owners.

How do levels of output change when the economy's resources change?

***2.4*-Rybczynski theorem:**

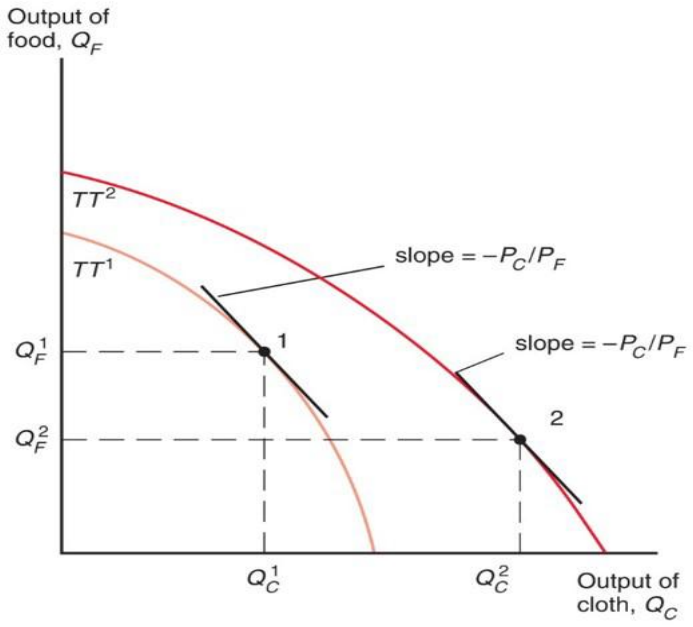
If you hold output prices constant as the amount of a factor of production increases, then the supply of the good that uses this

factor intensively increases and the supply of the other good decreases.

Assume an economy's labor force grows, which implies that its ratio of labor to capital L/K increases.

- Expansion of production possibilities, is biased toward cloth.
- At a given relative price of cloth, the ratio of labor to capital used in both sectors remains constant.
- To employ the additional workers, the economy expands production of the relatively labor-intensive good cloth and contracts production of the relatively capital-intensive good food.

Figure 19 : ***Resources and Production Possibilities***



An increase in the supply of labor shifts the economy's production possibility frontier outward disproportionately in the direction of cloth production. At an unchanged relative price

of cloth, food production declines.

2.5. Resources and Output

An economy with a high ratio of labor to capital produces a high output of cloth relative to food.

- Suppose that Home is relatively abundant in labor and Foreign in capital:

$L/K > L^* /K^*$

Likewise, Home is relatively scarce in capital and Foreign in labor.

Home will be relatively efficient at producing cloth because cloth is relatively labor intensive.

2.5.1. Trade in the Heckscher-Ohlin Model

The countries are assumed to have the same technology and the same tastes.

With the same technology, each economy has a comparative advantage in producing the good that relatively intensively uses the factors of production in which the country is relatively well endowed.

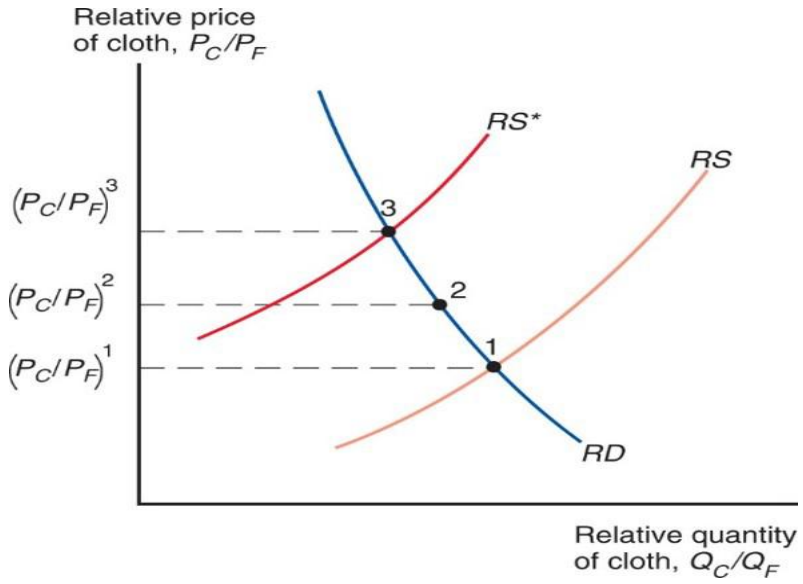
- With the same tastes, the two countries will consume cloth to food in the same ratio when faced with the same relative price of cloth under free trade.

Since cloth is relatively labor intensive, at each relative price of cloth to food, Home will produce a higher ratio of cloth to food than Foreign.

- Home will have a larger relative supply of cloth to food than Foreign.

-Home's relative supply curve lies to the right of Foreign's.

Figure 20: Trade Leads to a Convergence of Relative Prices



In the absence of trade, Home's equilibrium would be at point 1, where domestic relative supply RS intersects the relative demand curve RD.

-Similarly, Foreign's equilibrium would be at point 3. Trade leads to a world relative price that lies between the pretrade prices, such as at point 2

Like the Ricardian model, the Heckscher-Ohlin model predicts a convergence of relative prices with trade.

With trade, the relative price of cloth rises in the relatively labor abundant (home) country and falls in the relatively labor scarce (foreign) country.

Relative prices and the pattern of trade: In Home, the rise in the relative price of cloth leads to a rise in the relative production of cloth and a fall in relative consumption of cloth.

- Home becomes an exporter of cloth and an importer of food.
- The decline in the relative price of cloth in foreign leads it to become an importer of cloth and an exporter of food.

2.5.2. Heckscher-Ohlin theorem:

The country that is abundant in a factor exports the good whose production is intensive in that factor.

-This result generalizes to a correlation:

- Countries tend to export goods whose production is intensive in factors with which the countries are abundantly endowed.

2.5.3. Trade and the Distribution of Income

Changes in relative prices can affect the earnings of labor and capital.

- A rise in the price of cloth raises the purchasing power of labor in terms of both goods while lowering the purchasing power of capital in terms of both goods.
- A rise in the price of food has the reverse effect.

Thus, international trade can affect the distribution of income, even in the long run:

- Owners of a country's abundant factors gain from trade, but owners of a country's scarce factors lose.
- Factors of production that are used intensively by the import-competing industry are hurt by the opening of trade regardless of the industry in which they are employed.

Compared with the rest of the world, the United States is abundantly endowed with highly skilled labor while low-skilled labor is correspondingly scarce.

- International trade has the potential to make low-skilled workers in the United States worse off - not just temporarily, but on a sustained basis.

Changes in income distribution occur with every economic change, not only international trade.

- Changes in technology, changes in consumer preferences, exhaustion of resources and discovery of new ones all affect income distribution.
- Economists put most of the blame on technological change and the resulting premium paid on education as the major cause of increasing income inequality in the US.
- It would be better to compensate the losers from trade (or any economic change) than prohibit trade.
- The economy as a whole does benefit from trade.

There is a political bias in trade politics: potential losers from trade are better politically organized than the winners from trade.

- Losses are usually concentrated among a few, but gains are usually dispersed among many.
- Each of you pays about $8/year to restrict imports of sugar, and the total cost of this policy is about $2 billion/year.
- The benefits of this program total about $1 billion, but this amount goes to relatively few sugar producers.

2.6. Factor Price Equalization

Unlike the Ricardian model, the Heckscher-Ohlin model predicts that factor prices will be equalized among countries that trade.

- Free trade equalizes relative output prices.
- Due to the connection between output prices and factor prices, factor prices are also equalized.

- Trade increases the demand of goods produced by relatively abundant factors, indirectly increasing the demand of these factors, raising the prices of the relatively abundant factors**.**

In the real world, factor prices are not equal across countries.

- The model assumes that trading countries produce the same goods, but countries may produce different goods if their factor ratios radically differ.

- The model also assumes that trading countries have the same technology, but different technologies could affect the productivities of factors and therefore the wages/rates paid to these factors.

The model also ignores trade barriers and transportation costs,

which may prevent output prices and thus factor prices from equalizing.

The model predicts outcomes for the long run, but after an economy liberalizes trade, factors of production may not quickly move to the industries that intensively use abundant factors.

- In the short run, the productivity of factors will be determined by their use in their current industry, so that their wage/rental rate may vary across countries.

2.7. Empirical Evidence on the Heckscher-Ohlin Model

-Tests on US data

Leontief found that U.S. exports were less capital-intensive than U.S. imports, even though the U.S. is the most capital-abundant country in the world: Leontief paradox.

- Tests on global data

Bowen, Leamer, and Sveikauskas tested the Heckscher-Ohlin model on data from 27 countries and confirmed the Leontief paradox on an international level.

Table 3: Factor Content of U.S. Exports and Imports for 1962

	Imports	Exports
Capital per million dollars	$2,132,000	$1,876,000
Labor (person-years) per million $	119	131
Capital-labor ratio ($ per worker)	$17,916	$14,321
Aver.years of educ. per worker	9.9	10.1
Proport. of eng. and scient. in work force	0.0189	0.0255

Source: Robert Baldwin, Determinants of the Commodity Structure of U.S. Trade, American Economic Review 61(March 1971), pp. 126-145.

Because the Heckscher-Ohlin model predicts that factor prices will be equalized across trading countries, it also predicts that factors of production will produce and export a certain quantity goods until factor prices are equalized.

- In other words, a predicted value of services from factors of production will be embodied in a predicted volume of trade between countries.

But because factor prices are not equalized across countries, the predicted volume of trade is much larger than actually occurs.

- A result of missing trade discovered by Daniel Trefler.

-The reason for this missing trade appears to be the assumption of identical technology among countries.

- Technology affects the productivity of workers and therefore the value of labor services.

A country with high technology and a high value of labor services would not necessarily import a lot from a country with low technology and a low value of labor services.

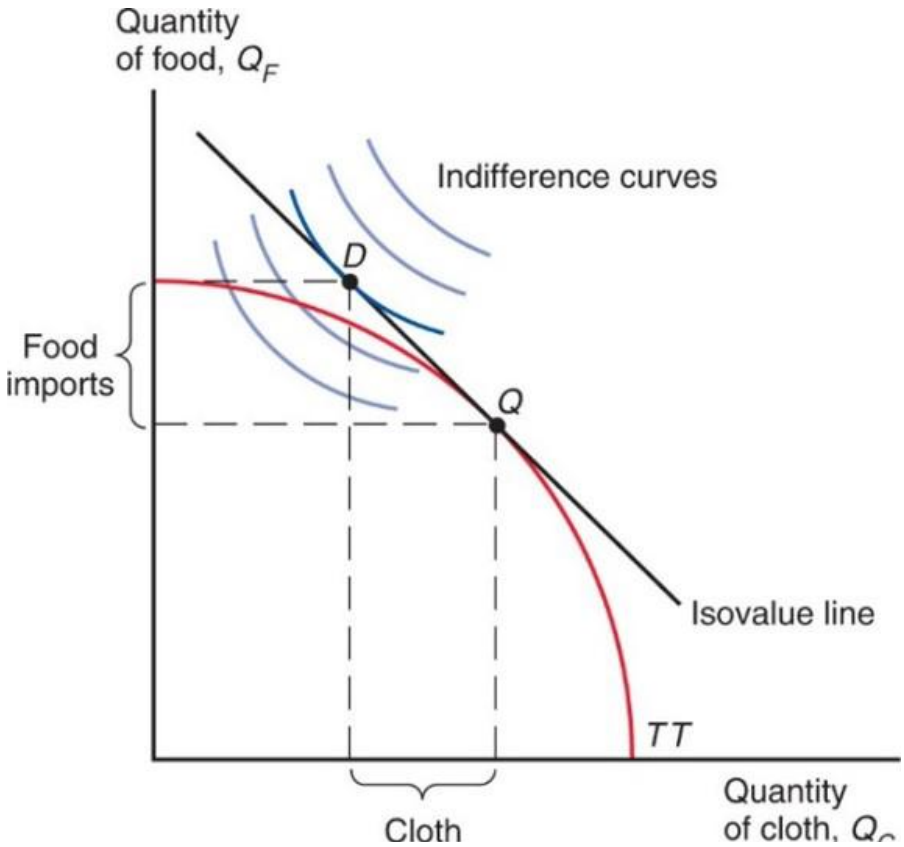
Overall, the empirical support of the Heckscher-Ohlin model is weak except for cases involving trade between high-income countries and low/middle- income countries or when technology differences are included.

3. Standard trade model is a general model that includes Ricardian, specific factors, and Heckscher-Ohlin models as special cases.

Two goods, food (F) and cloth (C).

Each country's PPF is a smooth curve.

Figure 21: Production, Consumption, and Trade in the Standard Model

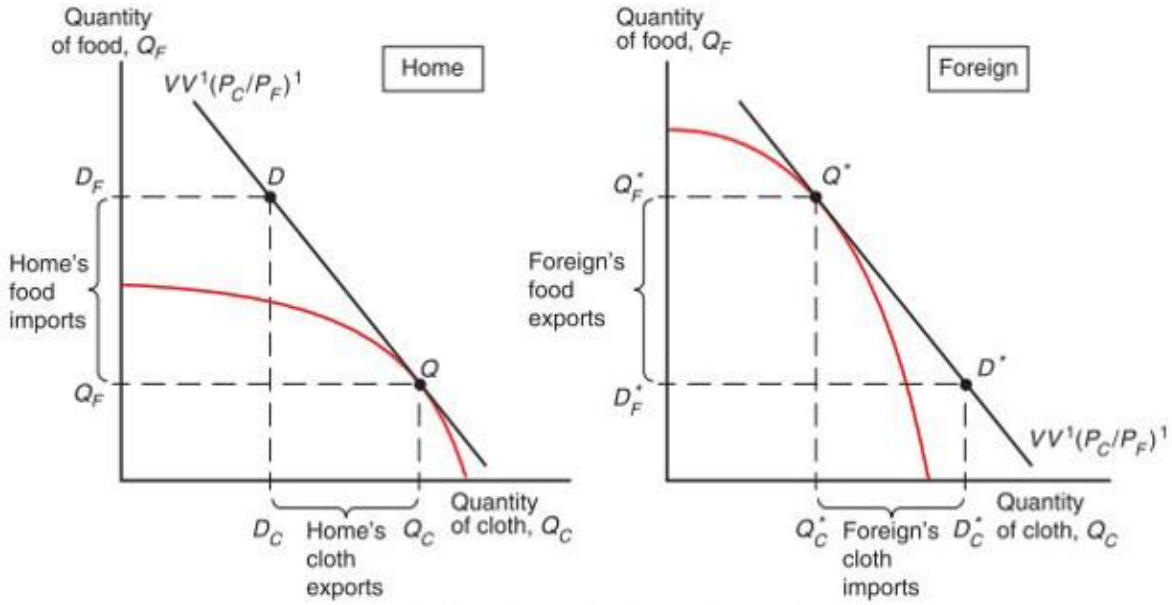


The economy produces at point Q, where the production possibility frontier is tangent to the highest possible isovalue line.

It consumes at point D, where that isovalue line is tangent to the highest possible indifference curve.

The economy produces more cloth than it consumes and therefore exports cloth; correspondingly, it consumes more food than it produces and therefore, imports food.

Figure 22*: Equilibrium Relative Price with Trade and Associated Trade Flows*



(b) Production, Consumption, and Trade

Chapter 3

New Theories of International Trade

Chapter 3: New Theories of International Trade

1. Theory of Intra Industry Trade

The different attempts at empirical validation show, however, that the theories discussed, if they remain relevant, are not sufficient to account for all the flows actually observed. More recent theories, which make use of imperfect competition, have made it possible to complete the corpus and thus provide explanations for trade between countries that do not present very marked comparative advantages

The model developed in this chapter is based on the recently developed theory of **intra-industry** trade. In this theory, an "industry" is a group of products which are all produced with the same factor proportions. Whether a country is a net importer or exporter in an industry thus depends on the conventional forces of comparative advantage. Because of scale economies in production, however, each country specializes in a limited subset of the products within each industry. The result is "intra-industry" trade for countries which are net exporters in a particular industry will still be gross importers, because foreigners will be producing differentiated products.

This theory of trade helps explain why there is so much trade between similar countries and why the trade between these countries consists largely of two-way trade in similar products.

1.1. The Significance of Intra-industry Trade

Intra-industry trade refers to two-way exchanges of similar goods.

Two new channels for welfare benefits from trade:

Benefit from a greater variety at a lower price.

Firms consolidate their production and take advantage of economies of scale.

A smaller country stands to gain more from integration than a larger country.

About 25-50% of world trade is intra-industry.

Most prominent is the trade of manufactured goods among advanced industrial nations, which accounts for the majority of world trade.

For the United States, industries that have the most intra-industry trade such as pharmaceuticals, chemicals, and specialized machinery require relatively larger amounts of skilled labor, technology, and physical capital.

The Linder theory of overlapping demands suggests that goods must first be produced for home markets and then exported to similar countries. According to Linder's (1961) hypothesis, a negative relationship between income differences and IIT is to be expected.

Linder's (1961) theory can also explain VIIT. The less developed countries with low per-capita incomes specialize in, and export, low- quality products (varieties), whereas the developed countries with high per-capita incomes specialize in, and export, high-quality products (varieties of the same product). So, Linder's theory proposes that the higher the difference in per-capita income, the greater the VIIT.

Linder (1961) and other studies use per capita income differences as proxies for consumer tastes and preferences. It has been argued that as per capita incomes of two countries become equal, their tastes and preferences also become similar.

Table 4: Indexes of Intra-Industry Trade for U.S. Industries, 2009

Metalworking Machinery	*0.97*
Inorganic Chemicals	*0.97*
Power-Generating Machines	*0.86*
Medical and Pharmaceutical Products	*0.85*
Scientific Equipment	*0.84*
Organic Chemicals	*0.79*
Iron and Steel	*0.76*
Road Vehicles	*0.70*
Office Machines	*0.58*
Telecommunication Equipment	*0.46*
Furniture	*0.30*
Clothing and Apparel	*0.11*
Footwear	*0.10*

1.2. Intra-Industry Trade in Action: The North American Auto Pact of 1964 and NAFTA

Before 1965, tariff protection by Canada and the United States produced a Canadian auto industry that was largely

self-sufficient, neither importing nor exporting much.

The Canadian auto industry was about 1/10 the size of the United States and had a labor productivity about 30 percent lower than that of the United States.

- Most Canadian plants produced several different things, requiring the plants to shut down periodically to change over from producing one item to producing another, to hold larger

inventories, to use less specialized machinery.

The United States and Canada agreed in 1964 to establish free trade in automobiles, which allowed the auto companies to reorganize their production.

The overall level of Canadian production and employment was maintained.

Canadian subsidiaries cut how many products were made in Canada. Production levels for the models produced in Canada rose dramatically, as those Canadian plants became one of the main (or only) supplier of that model for the whole North American market.

- Canada imported the models from the United States that it was no longer producing.

Both exports and imports increased sharply.

- By the early 1970s, the Canadian industry was comparable to the U.S. industry in productivity.

-Later on, this transformation of the automotive industry was extended to include Mexico.

- This process continued with the implementation of NAFTA (the North American Free Trade Agreement between the United States, Canada, and Mexico).

- For each model of car, there is typically a plant in one of these three countries that sells to the whole North American market.

The manufacture of auto parts was also consolidated throughout the North American market.

- In the first decade following NAFTA, trade in automotive parts between the United States and Mexico more than doubled in both directions, and then doubled again in the ensuing decade, highlighting the increasing importance of intra-industry trade.

Concerns raised over a few final assembly plants relocating from the United States to Mexico rarely mentions the large growth of U.S. autos and parts exports to Mexico: Over two-thirds of Mexican automotive imports originated in the U.S. in 2002.

- Ending NAFTA likely would not would not result in higher car production in the United States.

Lower demand for U.S. imports in Mexico and Canada (along with higher prices for all consumers) would lead to lower car production in the United States.

-Only car production outside North America would increase.

1.3. intra-industry and Inter-industry trade

Definition 1: According to the trade recovery approach, intra-industry trade, for a given industry, is defined as the share of imports and exports (measured in value) perfectly covered (overlapped) by trade flow in the opposite direction. Inter-industry trade is the residual share of flows observed in this industry, i.e. the share of exports or imports that is not covered by a flow of imports or export in the opposite direction.

Definition 2: According to the type of trade approach, for a given industry, if the ratio of the minority flow to the majority flow is not "too low", then the set flows ob- served in this industry will be considered intra-industry trade. Otherwise, all flows will be considered inter-trade. Here, the minority (majority) flow is the minimum (maximum) important flow between exports and imports in value.

The criterion not "too low" is defined more precisely by presenting detailed methods proposed by Abd-el Rahman (1987, 1991) and Vona (1990, 1991) to distinguish between intra- industry and inter-industry trades.

2. Theory of Differentiated Goods by Helpman and Krugman

The development of intra-industry trade (IIT) models emerged from the seminal contributions of Krugman (1979, 1980), Lancaster (1980), Helpman (1981), and Eaton and Kierzkowski (1984). These theoretical frameworks share a common foundation in horizontal product differentiation, where product varieties maintain similar quality levels while being distinguished by their actual or perceived characteristics.

The literature encompasses two distinct analytical approaches. Neo-Chamberlinian models, exemplified by Krugman's framework, adopt the assumption of symmetric utility functions across all varieties. This approach embodies the "love of variety" principle, where consumers derive utility from consuming the broadest possible range of product variants. Conversely, neo-Hotelling models, such as Lancaster's contribution, incorporate asymmetric preferences through the "favorite variety" approach, recognizing that consumers exhibit heterogeneous preferences and typically favor one particular variety over alternatives.

Both theoretical frameworks operate under the assumption of decreasing costs in production for each variety. When countries engage in trade liberalization, the similarity in demand patterns across nations generates intra-industry trade flows. This mechanism represents a fundamental departure from traditional trade theory explanations.

Horizontal intra-industry trade (HIIT) exhibits a strong propensity to occur between countries with comparable factor endowments, potentially assuming identical factor intensities across trading partners. This characteristic distinguishes HIIT from conventional trade patterns predicted by traditional trade theories, which emphasize comparative advantages based on factor endowment differences. Consequently, HIIT phenomena cannot be adequately explained within the framework of classical trade theories, necessitating the development of these specialized models to capture the complexities of modern international trade patterns.

3.The Theory of Reciprocal Dumping

The Theory of Reciprocal Dumping developed by James Brander and Paul Krugman (1983) is a seminal contribution to international trade theory that explains how firms can simultaneously export and import similar products, leading to two-way trade in homogeneous goods.

What is Dumping?

Dumping is the practice of charging a lower price for exported goods than for goods sold domestically.

- Dumping is an example of price discrimination: the practice of charging different customers different prices.
- Price discrimination and dumping may occur only if imperfect competition exists: firms are able to influence market prices.

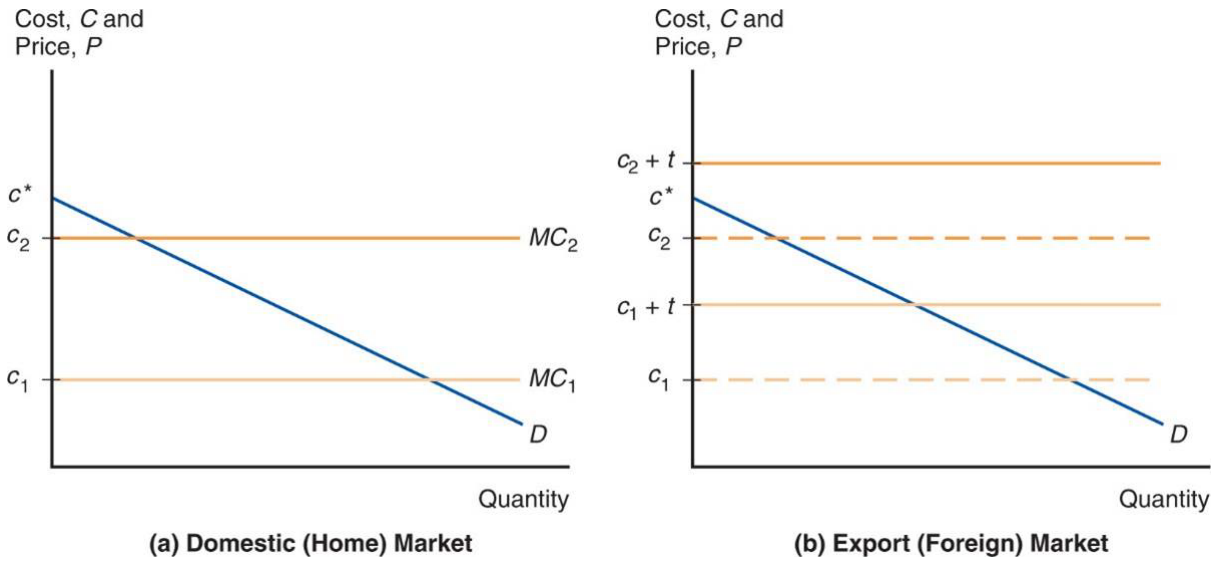
Markets are segmented so that goods are not easily bought in one market and resold in another.

Dumping can be a profit-maximizing strategy:

- A firm with a higher marginal cost chooses to set a lower markup over marginal cost, because it faces more intense competition due to its lower market share.
- Therefore, an exporting firm will respond to the trade cost by lowering its markup for the export market.

Let's consider Firm 1 in Figure 23 that faces a higher marginal cost in the export market (c+t) because of the trade cost in comparison to the domestic market (c).

Figure 23 : Domestic and Foreign market and marginal costs



Let's PD and PX denote the prices charged in, respectively, the domestic market and export market.

The firm will choose to set a lower markup in the export market in comparison to the domestic market, i.e.

$PX - (c + t) < PD - c$

It follows that the price charge in the export market net of the trade cost will be lower than the one charged in the domestic market: $PX - t < PD$

This strategy is considered to be dumping, regarded by most countries as an “unfair” trade practice.

Reciprocal dumping occurs when firms in different countries sell their products in each other's markets at prices below their domestic prices, while also serving their home markets. This creates a situation where identical or very similar goods are traded in both directions between countries.

3.1. Insights and Implications

a. Trade in Similar Products

- Explains why we observe **intra-industry trade** in homogeneous goods
- Shows that trade can occur even without comparative advantage
- Demonstrates that **imperfect competition** can be a driver of trade

b. Policy Implications

- **Anti-dumping policies** may be counterproductive if they reduce beneficial competition
- **Trade liberalization** can increase welfare even when it leads to reciprocal dumping
- Transport cost reductions may not always improve welfare if they increase "wasteful" cross-hauling

3.2. Market Structure

- **Oligopolistic competition** with few firms in each market
- Firms produce **homogeneous goods** (identical products)
- **Segmented markets** - firms can charge different prices in different countries
- **Transport costs** exist between countries

Firm Behavior

- Firms engage in **Cournot competition** (quantity-setting)
- Each firm treats other firms' quantities as given
- Firms maximize profits in each market separately

3.3. Positive Effects

- **Increased competition**: More firms compete in each market
- **Lower prices**: Competition drives down prices for consumers
- **Product variety**: Even with homogeneous goods, consumers benefit from competitive pressure

3.4. Negative Effects

- **Transport costs**: Resources are "wasted" on shipping similar goods in both directions
- **Potential inefficiency**: Production may not occur in the most cost-effective locations

3.5.Net Welfare Effect

The overall welfare impact is **ambiguous** and depends on:

- The magnitude of transport costs
- The degree of competition increase
- The initial market structure
- The Brander-Krugman theory of reciprocal dumping provides important insights into how **imperfect competition** and **strategic firm behavior** can drive international trade patterns. While the pure model may have limited direct empirical applications, it has been influential in developing our understanding of trade under oligopolistic market structures and has contributed to the broader literature on trade and industrial organization.
- The theory highlights that trade can be beneficial even when it appears "wasteful" from a transport cost perspective, due to the pro-competitive effects of international market integration.

3.6. Protectionism and Dumping

A U.S. firm may appeal to the Commerce Department to investigate if dumping by foreign firms has injured the U.S. firm.

The Commerce Department may impose an “anti-dumping” duty (tax) to protect the U.S. firm.

Tax equals the difference between the actual and “fair” price of imports, where “fair” means” price the product is normally sold at in the manufacturer's domestic market.”

Next, the International Trade Commission (ITC) determines if injury to the U.S. firm has occurred or is likely to occur.

If the ITC determines that injury has occurred or is likely to occur, the anti-dumping duty remains in place.

Most economists believe that the enforcement of dumping claims is misguided.

Trade costs have a natural tendency to induce firms to lower their markups in export markets.

Such enforcement may be used excessively as an excuse for protectionism.

In the early 1990s, the bulk of anti-dumping complaints were directed at developed countries.

But since 1995, developing countries have accounted for the majority of anti-dumping complaints.

Among those countries, China has attracted a particularly large number of complaints.

A nonmarket economy with substantial export growth, China has been subject to antidumping duties on:

TVs, furniture, crepe paper, hand trucks, shrimp, ironing tables, plastic shopping bags, iron pipe fittings, saccharin, solar panels, tires, and cold-rolled steel.

These duties are as high as 78% on colour TVs, 266% for cold-rolled steel, and 330% on saccharin.

Chinese cost data likely distorted by subsidized loans, rigged markets, and the controlled yuan.

Data from other developing nations regarded as market economies used instead.

***4*.Theory of Vertical Intra Industry Trade**

The theoretical models of Falvey (1981) & Helpman and Krugman (1987) suggest that the consequences of these two types of intra- industry trade are very different. In particular, adjustment costs (linked to the reallocation of resources from the importing to exporting sectors) generated by the exchanges of verti- cally differentiated products are greater than those generated through trade in horizontally differentiated products.

4.1. Vertical intra-industry trade: the exchange of an intermediate good and a final good that requires the intermediate good in the same industry. A factor endowment model is extended to a setting with a technological difference in the production of the intermediate good between countries.

The models of comparative advantage thus far assumed constant returns to scale:

When inputs to an industry increase at a certain rate, output increases at the same rate.

If inputs were doubled, output would double as well.

But there may be increasing returns to scale or economies of scale:

This means that when inputs to an industry increase at a certain rate, output increases at a faster rate.

A larger scale is more efficient: the cost per unit of output falls as a firm or industry increases output.

For example, suppose an industry produces widgets using only one input, labor.

Consider how the amount of labor required depends on the number of widgets produced.

The presence of economies of scale may be seen from the fact that

doubling the input of labor more than doubles the industry's output.

- the average amount of labor used to produce each widget is less when the industry produces more.

Mutually beneficial trade can arise as a result of economies of scale.

- International trade permits each country to produce a limited range of goods without sacrificing variety in consumption.

- With trade, a country can take advantage of economies of scale to produce more efficiently than if it tried to produce everything for itself.

4.2. Economies of Scale and Market Structure

Economies of scale could mean either that larger firms or a larger industry would be more efficient.

External economies of scale occur when cost per unit of output depends on the size of the industry.

- Internal economies of scale occur when the cost per unit of output depends on the size of a firm.

Both external and internal economies of scale are important causes of international trade.

They have different implications for the structure of industries:

An industry where economies of scale are purely external will typically consist of many small firms and be perfectly competitive.

Internal economies of scale result when large firms have a cost advantage over small firms, causing the industry to become imperfectly competitive.

4.3. The Theory of External Economies

In the United States, the semiconductor industry is concentrated in Silicon Valley, investment banking in New York, and the entertainment industry in Hollywood.

In developing countries such as China, external economies are pervasive in manufacturing.

One town in China produces most of the world's underwear, another nearly all cigarette lighters.

- External economies played a key role in India's emergence as a major exporter of information services.

Indian information services companies are still clustered in Bangalore.

For a variety of reasons, concentrating production of an industry in one or a few locations can reduce the industry's costs, even if the individual firms in the industry remain small.

External economies may exist for a few reasons:

Specialized equipment or services may be needed for the industry, but are only supplied by other firms if the industry is large and concentrated.

For example, Silicon Valley in California has a large concentration of silicon chip companies, which are serviced by companies that make special machines for manufacturing silicon chips.

These machines are cheaper and more easily available there than elsewhere.

Labor pooling: a large and concentrated industry may attract a pool of workers, reducing employee search and hiring costs for each firm.

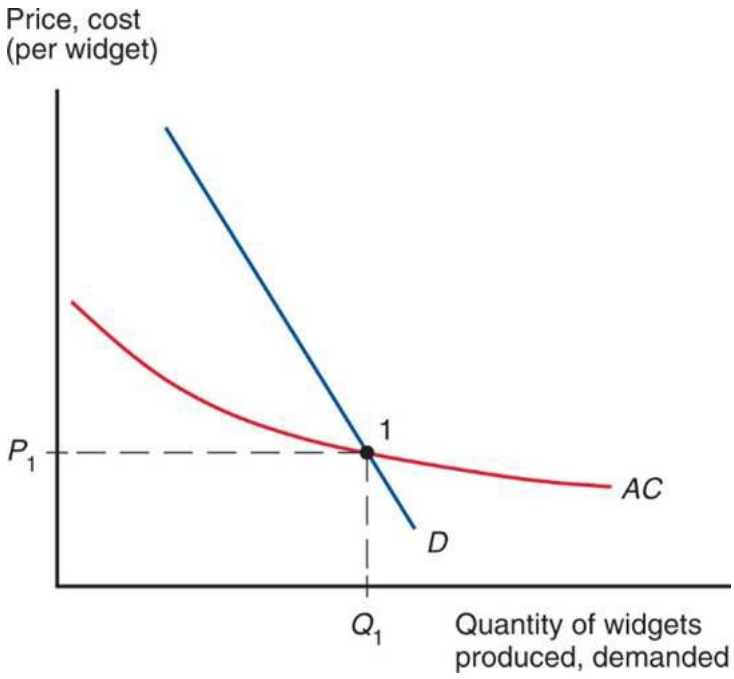
Knowledge spillovers: workers from different firms may more easily share ideas that benefit each firm when a large and concentrated industry exists.

Represent external economies simply by assuming that the larger the industry, the lower the industry's costs.

- There is a forward-falling supply curve: the larger the industry's output, the lower the price at which firms are willing to sell.

Without international trade, the unusual slope of the supply curve doesn't matter much.

Figure 24 : - External economies and Market equilibrium



When there are external economies of scale, the average cost of producing a good, falls as the quantity produced rises.

Given competition among many producers, the downward-sloping average cost curve AC can be interpreted as a forward-falling supply curve.

As in ordinary supply-and-demand analysis, market equilibrium is at point 1, where the supply curve intersects the demand curve, D.

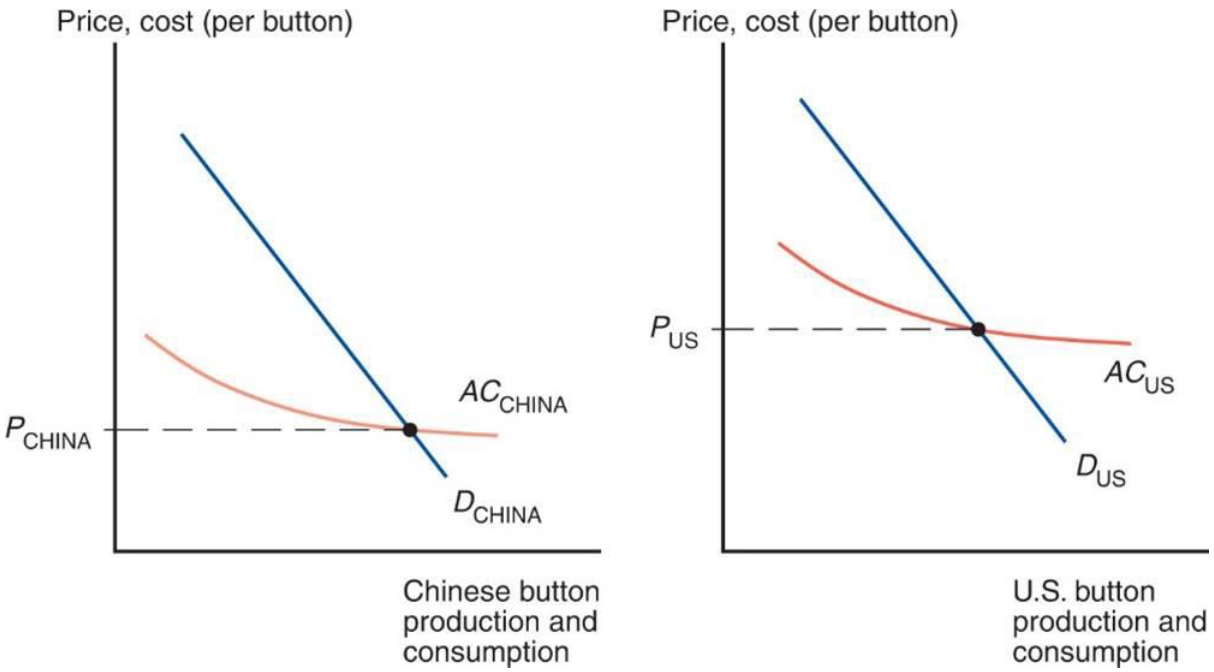
The equilibrium level of output is Q1, the equilibrium price P1

4.3.1. External Economies and International Trade

Prior to international trade, equilibrium prices and output for each country would be at the point where the domestic supply curve intersects the domestic demand curve.

- Suppose Chinese button prices in the absence of trade would be lower than U.S. button prices.

Figure 25: ***External Economies Before Trade***



In the absence of trade, the price of buttons in China, PCHINA, is lower than the price of buttons in the United States, PUS.

What will happen when the countries open up the potential for trade in buttons?

The Chinese button industry will expand, while the U.S. button industry will contract.

This process feeds on itself: As the Chinese industry's output rises, its costs will fall further; as the U.S. industry's output falls, its costs will rise.

In the end, all button production will be in China.

How does this concentration of production affect prices?

Chinese button prices were lower than U.S. button prices before trade.

Because China's supply curve is forward-falling, increased production as a result of trade leads to a button price that is lower than the price before trade.

- Trade leads to prices that are lower than the prices in either country before trade!

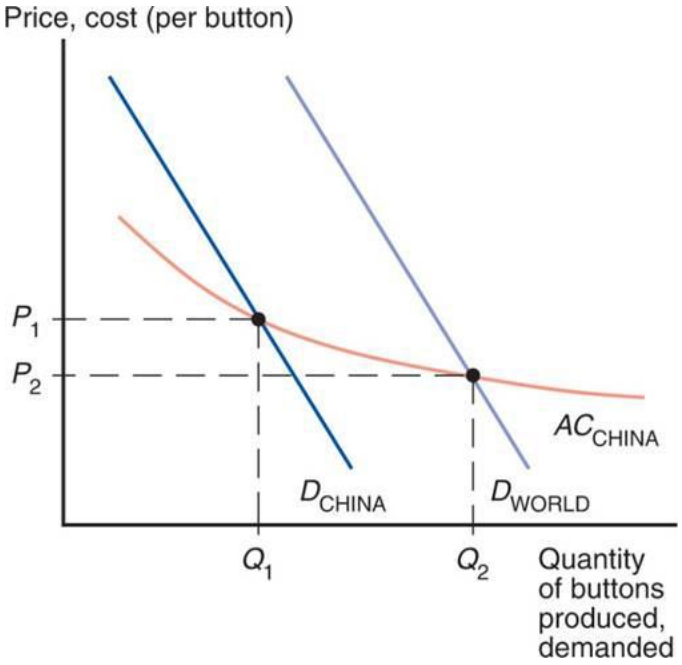
Very different from the implications of models without increasing returns.

In the standard trade model relative prices converge as a result of trade.

If cloth is relatively cheap in the home country and relatively expensive in the foreign country before trade opens, the effect of trade was to raise cloth prices in Home and reduce them in Foreign.

With external economies, by contrast, the effect of trade is to reduce prices everywhere.

Figure 26: Trade and Prices with external economies



When trade is opened, China ends up producing buttons for the world market, which consists both of its own domestic market and of the U.S. market.

Output rises from Q1 to Q2, leading to a fall in the price of buttons from P1 to P2, which is lower than the price of buttons in either country before trade.

What might cause one country to have an initial advantage from having a lower price?

One possibility is comparative advantage due to underlying differences in technology and resources.

If external economies exist, however, the pattern of trade could be due to historical accidents:

-Countries that start as large producers in certain industries tend to remain large producers even if another country could potentially produce more cheaply.

A tufted blanket, crafted as a wedding gift by a 19th-century teenager, gave rise to the cluster of carpet manufacturers around Dalton, Georgia.

- Silicon Valley may owe its existence to two Stanford graduates named Hewlett and Packard who started a business in a garage there.

The Importance of Established Advantage

Assume that the Vietnamese cost curve lies below the Chinese curve because Vietnamese wages are lower than Chinese wages.

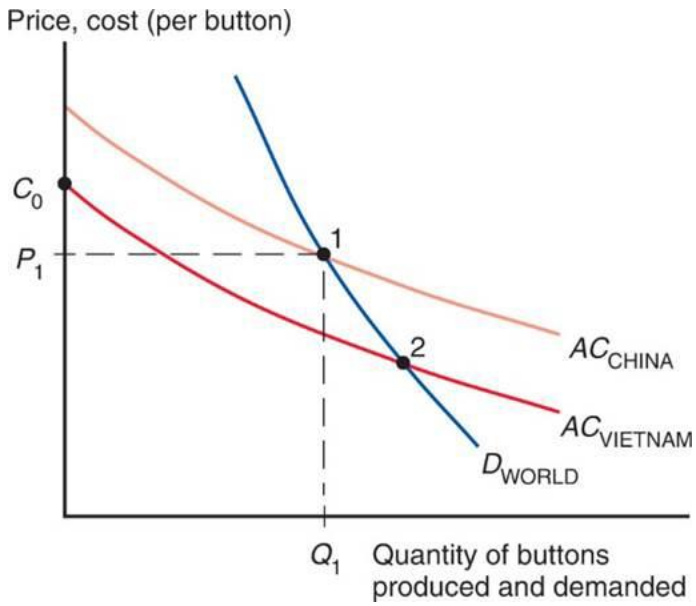
At any given level of production, Vietnam could manufacture buttons more cheaply than China.

One might hope that this would always imply that Vietnam will in fact supply the world market.

But this need not always be the case if China has enough of a head start.

No guarantee that the right country will produce a good that is subject to external economies.

Figure 27 : Vietnam and China costs curves



The average cost curve for Vietnam, ACVIETNAM, lies below the average cost curve for China, ACCHINA.

-Thus, Vietnam could potentially supply the world market more cheaply than China.

- If the Chinese industry gets established first, however, it may be able to sell buttons at the price P1, which is below the cost C0 that an individual Vietnamese firm would face if it began production on its own.

So, a pattern of specialization established by historical accident may persist even when new producers could potentially have

Trade based on external economies has an ambiguous effect on national welfare.

There will be gains to the world economy by concentrating production of industries with external economies.

It's possible that a country is worse off with trade than it would have been without trade: a country may be better off if it produces everything for its domestic market rather than pay for imports.

Imagine that Thailand could make watches more cheaply, but Switzerland got there first.

The price of watches could be lower in Thailand with no trade.

Trade could make Thailand worse off, creating an incentive to protect its potential watch industry from foreign competition.

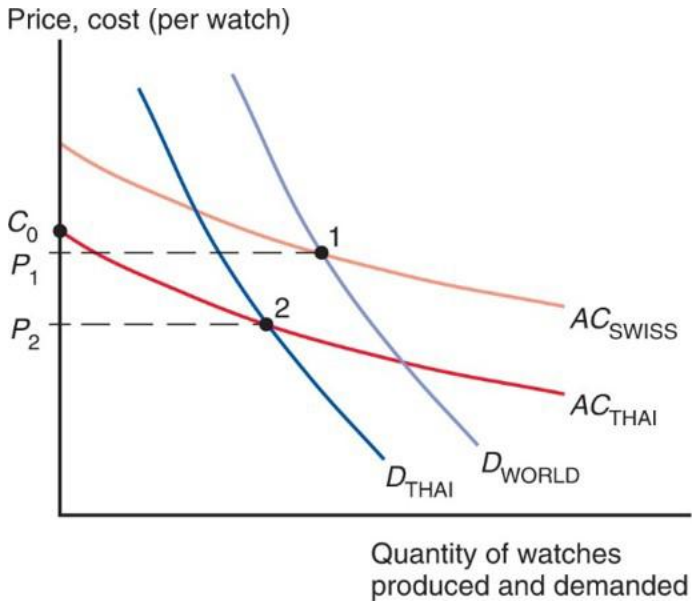
- What if Thailand reverts to autarky?

Note that it's still to the bene t of the world economy to take advantage of the gains from concentrating industries.

- Each country wanting to reap the benefits of housing an industry with economies of scale creates trade conflicts.

Overall, it's better for the world that each industry with external economies be concentrated somewhere.

Figure 28: External Economies and Losses from Trade



When there are external economies, trade can potentially leave a country worse off than it would be in the absence of trade.

In this example, Thailand imports watches from Switzerland, which is able to supply the world market (DWORLD) at a price (P1) low enough to block entry by Thai producers, who must initially produce the watches at cost C0.

Yet if Thailand were to block all trade in watches, it would be able to supply its domestic market (DTHAI) at the lower price, P2.

4.3.2. Dynamic Increasing Returns

So far, we have considered cases where external economies depend on the amount of current output at a point in time.

But external economies may also depend on the amount of cumulative output over time.

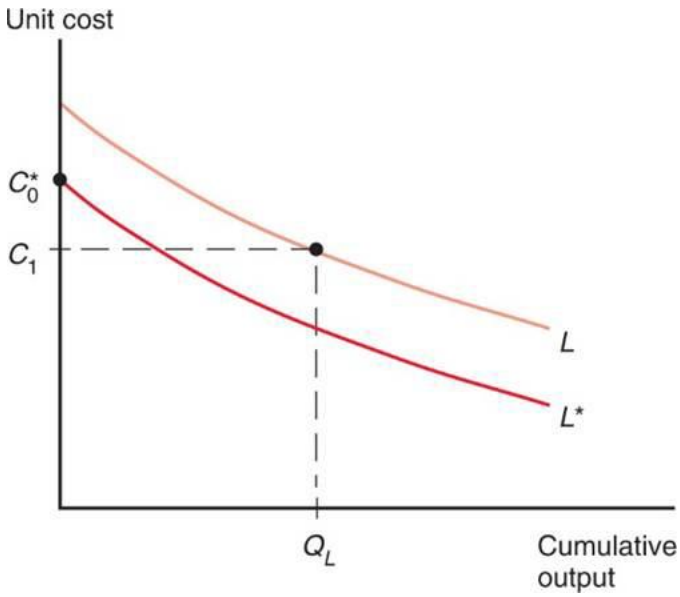
Dynamic increasing returns to scale exist if average costs fall as cumulative output over time rises.

Dynamic increasing returns to scale imply dynamic external economies of scale.

Dynamic increasing returns to scale could arise if the cost of production depends on the accumulation of knowledge and experience, which depend on the production process over time.

- A graphical representation of dynamic increasing returns to scale is called a learning curve.

Figure 29: The Learning Curve



The learning curve shows that unit cost is lower the greater the cumulative output of a country's industry to date.

- A country that has extensive experience in an industry (L) may have a lower unit cost than a country with little or no experience, even if that second country's learning curve (L*) is Lower- for example, because of lower wages.

Like external economies of scale at a point in time, dynamic increasing returns to scale can lock in an initial advantage or a head start in an industry.

- Can also be used to justify protectionism.

- Temporary protection of industries enables them to gain experience: infant industry argument.

Which industry to protect? And how for long?

Temporary is often for a long time, and it is hard to identify when external economies of scale really exist.

4.4. International trade and economic geography

- External economies may also be important for interregional trade within a country.

-Many movie producers located in Los Angeles produce movies for consumers throughout the U.S.

-Many financial firms located in New York provide financial services for consumers throughout the U.S.

If external economies exist, the pattern of interregional trade may be due to historical accidents:

Regions that start as large producers in certain industries tend to remain large producers even if another region could potentially produce more cheaply.

More broadly, economic geography refers to the study of international trade, interregional trade and the organization of economic activity in metropolitan and rural areas.

* Economic geography studies how humans transact with each other across space.

* Communication changes such as the Internet, e-mail, text mail, video conferencing, mobile phones (as well as modern transportation) are changing how humans transact with each other across space.

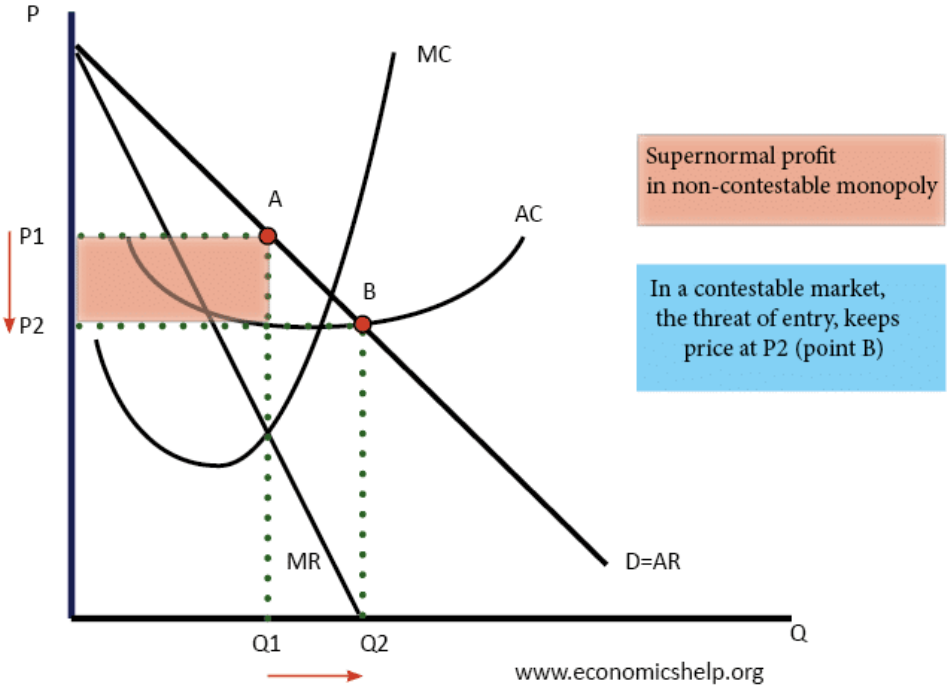
5.Theory of Contestable Markets

The contestable market theory was introduced to the world by economist William J. Baumol in 1982, via his book "Contestable Markets and the Theory of Industrial Structure". Baumol argued that contestable markets always yield competitive equilibrium due to the continuous threat of new entrants.

5.1. What Is Contestable Market Theory?

The contestable market theory is an economic concept stating that companies with few rivals behave in a competitive manner when the market they operate in has weak barriers to entry. The theory holds that in situations where there are no barriers to entry in the market, incumbents will still act in a competitive manner. Existing market participants will do their utmost to prevent new entrants from shutting down their business in the absence of barriers such as government regulation and high entry costs.

Figure 30: Contestable market and prices



- If the market was a monopoly with high barriers to entry, the firm would maximise profits at P1, Q1 (point A)
- If the market became perfectly contestable – with freedom of entry and exit, then the existing firm would have an incentive to cut prices to P2 (point B) – Otherwise, new firms would enter the market until normal profits are made.
- Therefore, contestable markets will have lower profits than monopoly.

Characteristics of a contestable market include:

- There are no barriers to entry or exit barriers
- There are low or no sunk costs: costs that have already been incurred and cannot be recovered
- Both incumbent companies and new entrants have access to thesame level of technology

Contestable in economics means that a company can be challenged or contested by rival companies looking to enter the industry or market. In other words, a contestable market is a market where companies can enter and leave freely with low sunk costs(an expense that cannot be recovered).

According to contestable market theory, when access to technology is equal and barriers to entry are weak, low, or non-existent, there is a constant threat that new competitors will enter the marketplace and challenge the existing, well-established companies.

The continuous risk of contestability weighs on the companies that already operate in the space, keeping them on their toes and influencing how they conduct business. Such an environment generally keeps prices low and prevents monopolistic pricing and behavior from occurring.

5.2. Contestable Market Theory Methods

In a contestable market, entrants might execute a hit-and-run strategy. The new entrants can "hit" the market, given there are no or low barriers to entry, make profits, and then "run," without incurring any exit costs.

These types of risks play on the minds of the executive management teams within the industry, leading them to adjust their business strategies and gravitate toward sales maximization rather than profit maximization. According to the theory, unlimited profits would be pushed down to normal profits in a truly contestable market.

Consequently, even a monopoly might be forced to operate competitively if barriers to entry are weak. Those operating a monopoly might conclude that if they're too profitable, a competitor could easily enter the market, contest their business, and undercut their profits.

- The contestable market theory states that even companies with few rivals behave in a competitive manner when the market they operate in has weak barriers to entry.
- The continuous risk of new entrants emerging and stealing market share leads incumbents to focus more on maximizing sales rather than profits.
- They realize that if they are too profitable, an entrant could easily come and undercut their business.

5.3. Limitations of Contestable Market Theory

The requisites for a perfectly contestable market are hard to come by. It is seldom easy for an upstart to enter another company's turf and immediately find itself on a level playing field.

Costs to enter and exit a market are rarely minimal, while factors such as economies of scale almost always reward companies that have been around for longer.

Special Considerations

Aspects of contestable market theory heavily influence the views and methods of government regulators. That's because opening up a market to potential new entrants may be sufficient to encourage efficiency and discourage anti-competitive behavior.

For example, regulators may force existing companies to open-up their infrastructure to potential entrants or to share technology. This approach of increasing contestability is common in the communications industries, where incumbents are likely to have significant power or control over the network and infrastructure

6. Theory of unequal exchange

The theory of unequal exchange developed by Arghiri Emmanuel in his 1969 work "L'échange inégal: Essais sur les antagonismes dans les rapports économiques internationaux" (Unequal Exchange: A Study of the Imperialism of Trade) represents a major contribution to the critical analysis of international trade. This theory challenges traditional trade orthodoxy by demonstrating how international exchanges, though apparently equitable, can perpetuate and even intensify structural inequalities between nations.

Emmanuel proposes a systematic theoretical framework for understanding the mechanisms by which developed and developing countries benefit unequally from international trade, thereby questioning the assumptions of classical trade theory that postulates mutual benefits for all participants.

6.1. Theoretical Foundations

6.2.1 The Simple Commodity Economy Model

Emmanuel begins his theoretical construction with a simplified model of price formation in a single-factor economy where labor serves as the sole production input. In this idealized framework, he envisions a society of independent workers who own their tools as inalienable

property and engage in free exchange based on the socially necessary labor time invested in production.

Key characteristics of the simple model:

- Exchange values are measured by labor time devoted to production
- Factor rewards correspond directly to labor contributions
- Equilibrium prices reflect points where factor movements between economic sectors cease
- Equal rewards for the homogeneous factor across all applications

This foundational model draws heavily on Marx's labor theory of value as outlined in Capital Volume 1, where individual labor contributions are reduced to homogeneous labor units through social processes.

6.2.2 Extension to Multi-Factor Production

Theoretical complexity increases significantly when Emmanuel extends his analysis to incorporate multiple factors of production, particularly capital and labor. This extension reveals fundamental differences in factor characteristics that have profound implications for price formation and exchange relationships.

Labor characteristics:

- Can be reduced to homogeneous units through social processes
- Subject to mobility constraints, particularly across national boundaries
- Wages determined through social and institutional factors

Capital characteristics:

- Inherently homogeneous by nature
- Highly mobile, especially in advanced capitalist economies
- Seeks uniform rates of return across all applications

6.2.3 The Proportionality Problem and Causality

Emmanuel identifies a critical condition for maintaining equivalence between labor theory of value and cost of production approaches: factors must be homogeneous, mobile, and enter production in identical proportions across all commodities. When this proportionality condition is violated—as it typically is in real economies—exchange values can only be calculated based on factor rewards through cost of production analysis.

6.3. International Trade Analysis Framework

6.3.1 Historical Transformation of Factor Mobility

Emmanuel's international trade analysis begins with Ricardo's classical assumption of factor immobility across borders, where international trade serves as the mechanism for price equalization. However, Emmanuel traces the historical evolution of the global capitalist economy and identifies a fundamental transformation: capital has become highly mobile while labor remains largely immobile across national boundaries.

This mobility asymmetry creates the structural foundation for unequal exchange:

- Capital mobility ensures uniform international profit rates
- Labor immobility maintains significant wage differentials between developed and developing countries

6.3.2 Structural Characteristics of Center and Periphery

Developed Countries (Center):

- High wage levels
- High organic composition of capital (capital-intensive production)
- Continuous technological innovation
- High labor productivity
- Lower rates of exploitation and profit

Underdeveloped Countries (Periphery):

- Low wage levels
- Low organic composition of capital (labor-intensive production)
- Limited technological advancement
- Lower labor productivity
- Higher rates of exploitation and profit

6.4. The Two Forms of Unequal Exchange

6.4.1 Unequal Exchange in the Broad Sense

This form of unequal exchange emerges from differences in organic composition of capital between countries, occurring even when both profit rates and wage rates equalize internationally. The mechanism operates through the transformation of labor values into market prices.

Process :

1. International equilibrium prices are established based on weighted average profit and wage rates
2. These prices facilitate transfers of surplus value from enterprises and countries with below-average organic composition to those with above-average composition

3. Equalization occurs both within countries and between them

Emmanuel considers this form less theoretically significant because it exists in all capitalist exchanges and does not represent a phenomenon unique to international trade.

6.4.2 Unequal Exchange in the Strict Sense

This form represents Emmanuel's central theoretical contribution and focuses on wage differentials as the primary driver of international inequality.

Mechanism:

- Production prices are determined by the sum of constant capital, variable capital, and the uniform international profit rate
- Lower wages in peripheral countries result in lower production prices for their exports
- The socially necessary labor content of products remains independent of wage rates
- Peripheral countries sell products below their social value while center countries receive prices above their products' social values

6.4.3 Mathematical Representation and Market Dynamics

The resulting international price structure creates systematic disadvantages for peripheral countries:

- **Peripheral exports:** Priced below social value
- **Center exports:** Priced above social value
- **Overall effect:** International prices become disproportionate to relative amounts of socially necessary labor

Dynamic process :

1. Higher profit rates in peripheral countries attract capital inflows
2. Increased supply leads to price reductions
3. Profit rates decline toward world average
4. Final prices settle below the product's labor value

6.5. Exploitation and Class Relations

6.5.1 The Mechanism of International Exploitation

Emmanuel characterizes unequal exchange in the strict sense as a form of exploitation that operates between regions rather than solely within countries. He defines this phenomenon as "the proportion between equilibrium prices that is established through the equalization of profits between regions in which the rate of surplus value is institutionally different."

Since differences in surplus value rates result directly from wage differentials, Emmanuel concludes that wage inequality alone, holding all other factors constant, causes exchange inequality.

6.5.2. The Paradox of International Exploitation

This analysis reveals a paradoxical form of international class exploitation where the working class of developed countries—as primary consumers of peripheral goods—effectively exploits fellow workers in peripheral countries. This complicates traditional notions of national exploitation through consumption patterns and living standards of center country workers who benefit from artificially low prices for peripheral goods.

6.6. Critics and Controversies

6.6.1 C. Bettelheim's Critique

The most immediate and probably most comprehensive evaluation of Emmanuel's theory comes from C. Bettelheim, published as Appendix I to the English edition of the book. While acknowledging the importance of the work and the problem it addresses, Bettelheim considers the theory debatable and partial for several reasons:

Methodological critics:

- Emmanuel's use of the concept of factor reward to explain the formation of production prices is inappropriate
- Conceptualizing the labor theory of value as working only in a simple commodity mode of production and not in the capitalist mode of production leads to two different laws of value
- Emmanuel divorces the formation of value from the social and material conditions of production

Conceptual critics:

- Emmanuel's definition of a factor of production as an established claim to a primary share in society's economic product challenges the theory of value
- Production prices in the Marxian sense cannot be conceived as the sum of rewards for factors
- Emmanuel's use of Marxist concepts gives them a status similar to that of the categories of vulgar political economy

6.6.2. Theoretical Implications and Empirical Questions

Emmanuel's theory has generated extensive debates raising fundamental questions about:

Methodological approaches:

- The relationship between labor theory of value and neoclassical price theory

- The role of institutional factors in determining exchange rates
- The validity of equilibrium assumptions in analyzing dynamic processes

Policy implications :

- The effectiveness of free trade policies for developing countries
- The role of wage policy in international competitiveness
- The potential for trade-based development strategies

Empirical questions :

- The measurability of labor values in complex modern economies
- The significance of wage differentials versus productivity differences
- The historical accuracy of center-periphery characterizations

Conclusion

Emmanuel's theory of unequal exchange provides a sophisticated framework for understanding how structural inequalities between nations can be perpetuated and even intensified through international trade mechanisms. By focusing on the asymmetric mobility of capital and labor, combined with institutionally determined wage differentials, the theory explains how formally equal exchange relationships can produce substantively unequal outcomes.

The enduring relevance of Emmanuel's analysis lies not only in its specific conclusions about international trade but also in its demonstration of how institutional factors, factor mobility patterns, and historical structures shape the distributional consequences of market exchanges.

While the theory has faced significant criticism and refinement over the decades since its introduction, it continues to influence discussions about global inequality, development strategy, and the political economy of international trade. The broad scope of controversies generated by Emmanuel's work reflects both the ambitious nature of his theoretical project and the fundamental importance of the questions he addressed.

7.The product cycle theory developed by Vernon (1966):

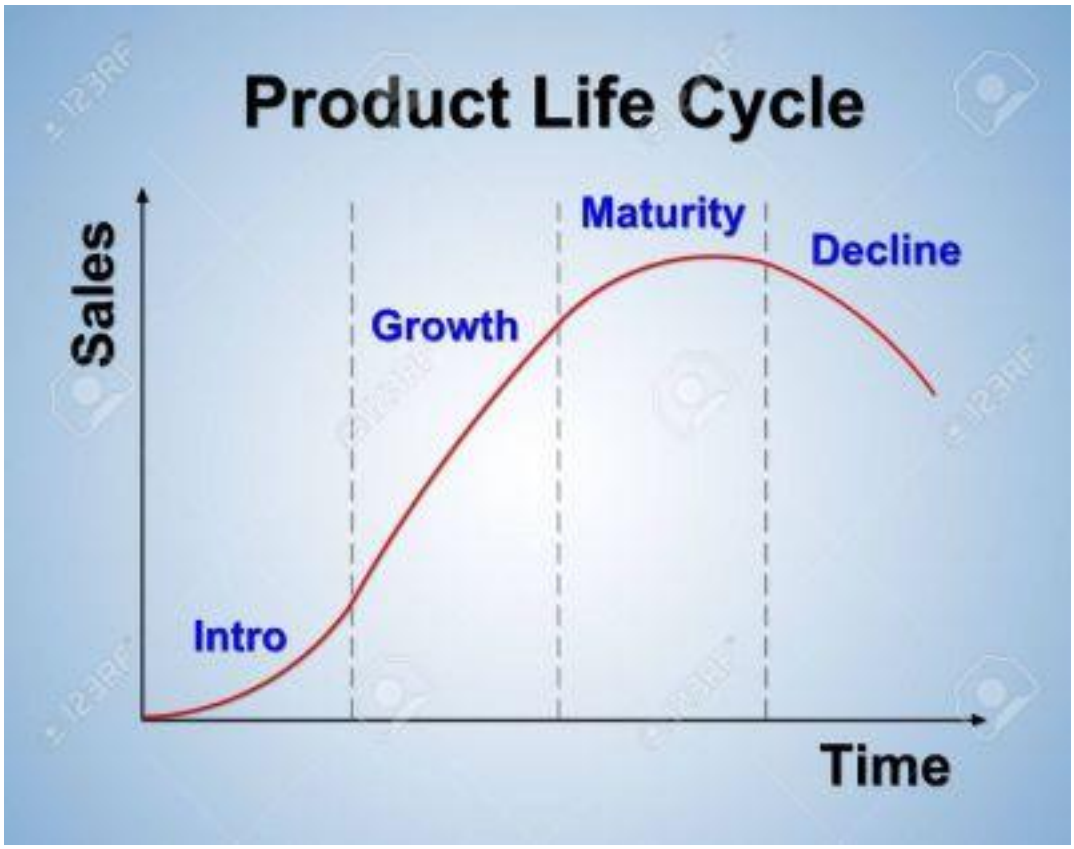
The theory is based on marketing and indicates that a product goes through three main stages in its life cycle.

Vernon’s theory divides the life cycle of the new product into three stages: new product stage, maturing product stage and standardized product stage. The country source of exports shifts throughout the life cycle of the product and the foreign direct investment (FDI) has a

decisive role in this dynamic process. In the last product stage, the technology becomes available to the less- developed countries through the FDI.

This allows these countries to export low- quality differentiated products to the developed countries, importing at the same time the high-quality product varieties from these countries. So, Vernon's theory suggests a positive relationship between VIIT and per-capita income differences and between VIIT and FDI.

Figure 31: Product life Cycle



7.1. Stages of the Product Life Cycle

1. New Product

- In this initial stage, a product is introduced to the market. Innovation and development are key, with production typically located in the country of origin to closely monitor market response and manage the high costs associated with R&D.

2. Maturing Product

- As the product gains acceptance and market share, production processes become more streamlined, and the focus shifts towards enhancing efficiency and expanding market reach. Companies may benefit from increasing customer service options during this time to assist with the rising number of customers. Another challenge in the maturity phase is customers wanting to replace their product with something new. Even if the product still functions properly, they may want to upgrade to something with newer features. As a result, businesses may spend a significant amount of resources on marketing to boost sales as much as possible.
- This phase marks the transition towards more competitive pricing and broader distribution channels.

3. Standardized Product

- In the final stage, the product becomes fully standardized, with an emphasis on cost minimization. Production often shifts to low-cost countries to leverage cheaper labor and materials, reflecting a global approach to manufacturing.
- When marketing or promotion cannot prevent sales numbers from declining, a product enters the DECLINE stage. This stage may occur naturally when customers lose interest in an older product, or it may arise due to competitors surpassing the product in either features or price.
- During the final stage the business may continue to sell the product until production costs are higher than generated profits.

The PC serves as a classic example of Vernon's Product Life Cycle Theory. Introduced as a new product in the 1970s, the PC evolved through the 1980s and 1990s into a mature product. Today, it exemplifies a standardized product, with the majority of its manufacturing now taking place in low-cost countries across Asia and Mexico.

7.2. Examples

VCRs

A VCR is a device for the recording and playback of video on a television. These devices were once very popular but have significantly decreased in sales with the invention of more technologically advanced products. The Product life cycle for a VCR may include:

- **Introduction:** The VCR is first released in 1977. As a new device, it allowed video playback of television screens and users recorded their favorite TV shows and movies to rewatch them later.

- **Growth:** As more people learned of the VCR, sales increased. Eventually, multiple companies began to produce their own VCR devices.
- **Maturity:** The VCR became a common household item. Producers had to find ways to reduce costs and add features to keep selling their VCRs.
- **Decline:** As technology improved, VCRs became less popular. Most households now rely on streaming services to watch content.

Smartphones

Phone providers typically release a new smartphone every few months as companies try to improve their products against competitors. Here's a typical product life cycle for a new smartphone device:

- **Introduction:** A provider releases a new smartphone into the market and anticipation is very high because of previous models of this device. The result is immediate sales from launch day, quickly moving the product into the growth stage.
- **Growth:** Demand continues to rise for the newest smartphone as more people use it. Competitors study its latest features and begin planning their own devices that can improve upon this model.
- **Maturity:** The smartphone has lost some initial excitement following the launch, and sales have plateaued. Customers continue to buy the product, but they're also increasingly looking at other alternatives, which may also offer the features that this model includes.
- **Decline:** Eventually, customers view this newest smartphone model as outdated, competitors find a way to produce a better product, and consumers want the latest model. The company that created the original phone may even have developed a newer version of its model, replacing it in the marketplace.

Conclusion

Raymond Vernon's Product Life Cycle Theory provides a valuable framework for understanding the evolution of products from innovation to global standardization. It highlights the dynamic nature of product development and the strategic shifts in production and marketing that occur as a product moves through its life cycle.

8. **Strategic Trade Policy:**

The government could become a significant player in the area of differentiated products (i.e. manufactures) that are characterized by increasing returns to scale.

Strategic Trade Policy (STP) is defined as government policy which attempts to shift excess profits in an oligopolistic international market towards the home country firms. These policies typically would take the form of subsidies, such as outright grants, loans at lower-than-market interest rates, promises to purchase a large volume of production, etc. However, the aid could also be more innovative--such as setting industry standards to benefit your home country firms (as in HDTV).

It works under conditions:

-International Oligopolies--ie few players. This implies barriers to entry, excess profits.

-First mover advantages.

- Lack of retaliation.

- Enough information to target the correct industries

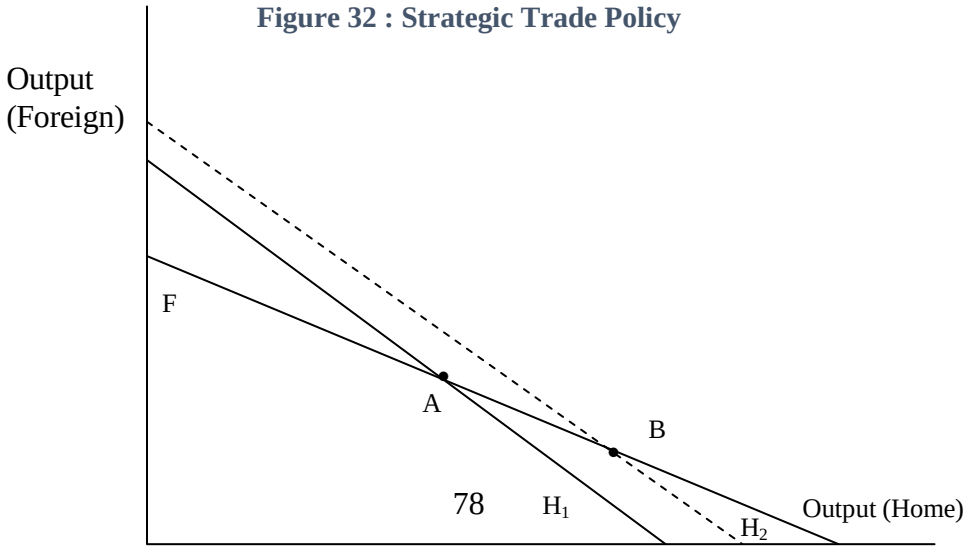
The use of strategic trade policy:

- for profit shifting

- As retaliation in a "tit" for "tat" strategy. An economist asked individuals to submit strategies for a prisoner's dilemma type of game, then used a computer to figure out the winning strategy. The winning strategy every time was tit for tat: you cooperate in the first round of the game, then do whatever your rival does in the next move (ie cooperate if he/she does, play nasty of he/she does too). This suggests that strategies where you cooperate if your rival cooperates and then quickly but briefly punish non-cooperative behavior are remarkably successful.

In a market where there are only a few players and positive profits, each company wants to increase their market share at the expense of the other. If the other firm produces more, you'll feel compelled to produce less-- otherwise, production will increase in average, resulting in lower prices and lower profits. To describe this inverse relationship between your production and your competitor's production, we can draw "reaction" functions for the home (H) and foreign (F) firm. The way to think about these is as Boeing versus Airbus.

Figure 32 : Strategic Trade Policy



These functions slope downwards because the more you produce, the less your competitor produces, and vice versa. Intuitively, if your competitor expands capacity in a market with a limited demand, you will sell less, not more, to maintain prices (and profits).

The equilibrium is where the two curves intersect. Ideally, you would prefer to be at point B, where F (Airbus) produces less and you produce more. But your competitor knows this is not credible given your cost structure. How can you make your threat to grab market share and produce more (forcing F to produce less) a credible threat? The answer is you can't--but the government can, by subsidizing you and lowering your costs.

The subsidy in effect changes the rules of the game, moving you to H2 at the new intersection B.

8.1. Examples of Strategic Trade Policy.

- Example: Boeing versus Airbus. Since the 1970s, the aircraft industry has been at the center stage of many trade disputes between the European community as a result of the subsidies that the European Community has given to Airbus. The US trade representatives claim that the subsidies have helped Airbus increase its market share at the expense of the US producers. The latest chapters in this story, was Boeingís merger with McDonnell Douglas. The sticking point (as least as far as the Europeans were concerned) were the exclusive 20-year supply agreements which Boeing had signed with 3 US airlines.

8.2. The Prisoner's Dilemma in Strategic Trade Policy

8.2.1. The Strategic Trade Policy Paradox

Strategic trade policy presents governments with a fundamental paradox that exemplifies the classic prisoner's dilemma in international economics. When one country implements strategic trade policies—such as subsidizing domestic firms or protecting them through tariffs and non-tariff barriers—it shifts competitive advantages in favor of its domestic companies at the expense of foreign competitors.

8.2.2.The Mechanism of Strategic Interaction

The core challenge arises from the interactive nature of these policy decisions. When a government subsidizes or protects its domestic firms, it effectively shifts the reaction function of these companies outward, enhancing their competitive position in both domestic and international markets. This strategic advantage, however, creates strong

incentives for rival governments to respond with similar measures to protect their own domestic industries.

8.3.The Prisoner's Dilemma Framework

The prisoner's dilemma emerges when both countries simultaneously pursue strategic trade policies in response to each other's actions. In this scenario:

Individual Rationality vs. Collective Irrationality: Each country, acting rationally from its individual perspective, implements protective or promotional policies to support its domestic firms. However, when both countries pursue these strategies simultaneously, the result is a collectively suboptimal outcome.

Mutual Retaliation: As rival governments match each other's strategic interventions, both countries find themselves worse off than they would have been under a cooperative approach. The competitive advantages sought through individual strategic policies are neutralized, while both countries bear the economic costs of subsidization and protection.

Cost Escalation: The dynamic interaction between competing strategic trade policies leads to escalating subsidy costs and increasingly distortive protective measures, reducing overall economic efficiency in both countries.

The Cooperation Challenge

The prisoner's dilemma framework illuminates why international cooperation in trade policy would theoretically benefit all parties involved. Under a cooperative approach, countries could avoid the costly cycle of strategic retaliation while maintaining more efficient economic structures.

Theoretical Benefits of Cooperation:

- Elimination of wasteful subsidy competition
- Reduced trade distortions and improved global resource allocation
- Lower government expenditures on protective measures
- Enhanced consumer welfare through increased competition

Barriers to Cooperation: Despite the clear theoretical advantages of cooperation, several factors prevent consistent collaborative approaches in real-world trade relations:

- **Enforcement Challenges:** International agreements lack supranational enforcement mechanisms, making it difficult to ensure compliance with cooperative arrangements.
- **Asymmetric Incentives:** Countries may have different industrial structures, competitive advantages, or political pressures that make cooperation less attractive for some parties.

- **Short-term Political Pressures:** Domestic political considerations often favor visible protection of local industries over abstract benefits of international cooperation.
- **Information Asymmetries:** Governments may lack complete information about other countries' true intentions or capabilities, leading to defensive strategic policies.

Real-World Implications

The prisoner's dilemma in strategic trade policy helps explain several observable patterns in international economic relations:

Trade Wars and Escalation: Periods of trade conflict often follow the prisoner's dilemma logic, with countries imposing increasingly costly protective measures in response to each other's actions.

Multilateral Trade Agreements: The existence of organizations like the World Trade Organization reflects attempts to overcome the prisoner's dilemma through institutional mechanisms that facilitate cooperation and provide enforcement mechanisms.

Regional Cooperation: Bilateral and regional trade agreements represent partial solutions to the prisoner's dilemma, allowing smaller groups of countries to achieve cooperative outcomes even when global cooperation proves elusive.

Policy Implications

Understanding the prisoner's dilemma in strategic trade policy offers important insights for policymakers:

The Value of Institutional Frameworks: International institutions and agreements serve crucial roles in helping countries overcome the natural tendency toward non-cooperative strategic trade policies.

Long-term Perspective: Policy decisions should consider not only immediate competitive advantages but also the likely responses from trading partners and the resulting equilibrium outcomes.

Credible Commitment Mechanisms: Successful cooperation requires mechanisms that make commitments to cooperative behavior credible and sustainable over time.

The prisoner's dilemma thus provides a powerful analytical framework for understanding why countries often find themselves trapped in mutually destructive trade conflicts despite the clear benefits of cooperation, and why institutional solutions to facilitate collaboration remain essential for optimal global economic outcomes.

9. Strategic Operating Models and Product Operations: A Framework for Organizational Excellence

The Leadership Imperative

In today's complex business environment, organizations require visionary leaders capable of articulating and integrating diverse organizational aspects while driving strategic transformation. These leaders function as catalysts who synthesize various elements of the organization to achieve operational excellence and strategic objectives.

The Foundation of Operational Excellence

Strategic improvements in business process integration and standardization create cascading benefits across organizational performance dimensions. Companies that make informed choices in these areas experience significant enhancements in operational excellence, customer impact, product development capabilities, and strategic agility. This foundation becomes the cornerstone for sustainable competitive advantage and long-term organizational success.

The Four Operating Models Framework

Ross, Weill, and Robertson developed a comprehensive two-dimensional model that categorizes operating approaches based on the intersection of business process integration and standardization levels. This framework provides organizations with a clear methodology for positioning themselves strategically to optimize service and product delivery to customers.

Model Classifications

1. Diversification Model (Low Standardization, Low Integration) This approach accommodates high organizational flexibility and diversity in operations. Companies operating under this model maintain independent business units with minimal shared processes or standardized procedures. While this provides maximum autonomy, it may limit economies of scale and organizational learning opportunities.

2. Coordination Model (Low Standardization, High Integration) Organizations employing this model maintain diverse operational approaches while ensuring strong integration across business units. This balance allows for specialized responses to different market segments while maintaining organizational coherence and shared resource utilization.

3. Replication Model (High Standardization, Low Integration) This approach emphasizes standardized processes and procedures across the organization while maintaining relatively independent operational units. Companies using this model can achieve consistency and efficiency through standardization while allowing units to operate with significant autonomy.

4. Unification Model (High Standardization, High Integration) The most cohesive approach combines high levels of both standardization and integration. Organizations using this model operate with unified processes and strong interconnectedness across all units, maximizing efficiency and coordination while potentially sacrificing some flexibility.

Performance Impact of Operating Model Selection

Research demonstrates that companies establishing a solid foundation for execution supporting their chosen operating model achieve substantially superior performance across multiple dimensions:

- Strategic Effectiveness: 17% improvement over companies without structured operating models
- Operational Proficiency: 31% enhancement in operational capabilities
- Customer Intimacy: 33% improvement in customer relationship management
- Product Leadership: 34% advancement in product innovation and market position
- Strategic Agility: 29% increase in ability to respond to market changes

These performance improvements correlate positively with profitability, demonstrating the tangible business value of strategic operating model implementation.

The Product Operating Model: Modern Business Architecture

The product operating model represents a contemporary approach to organizational structure that emphasizes customer-centricity, agility, and outcome-focused delivery. This model has emerged as particularly effective in technology-driven industries and customer-focused organizations.

Core Principles of Product Operations

1. Iterative Development and Continuous Delivery Organizations implementing the product model prioritize small, frequent, and reliable releases. This approach leverages continuous integration and continuous deployment (CI/CD) practices to enable rapid response to customer needs, early problem detection, and validation of new capabilities' intended value delivery.

2. Empowered Product Teams Rather than simply executing predetermined feature lists, product teams are empowered to solve problems and achieve desired outcomes. Teams

receive authority to determine optimal solutions while ensuring that their approaches remain valuable, usable, feasible, and viable for both customers and the organization.

3. Customer-Centric Vision and Strategy Product leaders collaborate systematically to identify the most critical problems requiring solutions. This collaboration is guided by compelling product visions that maintain unwavering focus on customer needs and market opportunities.

4. Outcome-Focused Success Metrics Success measurement emphasizes the impact of solutions on customers and business outcomes rather than merely tracking feature delivery. This approach ensures that organizational efforts contribute meaningfully to strategic objectives and customer value creation.

Product Operations: The Strategic Enabler

Product operations emerge as a critical discipline within the product model, functioning as the infrastructure that enables effective scaling of product management capabilities. This discipline ensures that teams receive essential inputs for strategy setting, prioritization, and operational efficiency optimization.

Key Functions of Product Operations

Financial Integration and Software Delivery Alignment Product operations creates direct linkages between financial performance metrics and software feature delivery, ensuring that development efforts align with business objectives and contribute measurably to organizational success.

Cross-Functional Collaboration Enhancement The discipline facilitates improved working relationships between go-to-market teams and software development teams, fostering better communication, cooperation, and shared understanding of objectives and constraints.

Information Flow Optimization Product operations ensures that relevant information reaches appropriate teams at optimal times, supporting rapid decision-making and enabling agile strategy adjustments in response to market conditions or customer feedback.

Operating Model Implementation The function helps establish structured approaches for managing and monitoring product strategies effectively, creating systematic processes that support consistent execution and performance measurement.

The Philosophical Foundation: Product Operations as Organizational Synthesis

Drawing from Hegelian philosophical concepts, product operations functions as a synthesizing force within organizations, integrating diverse elements to drive innovation and progress. This role embodies several key characteristics:

Holistic Organizational Perspective

Product operations provide comprehensive organizational views by integrating financial performance data, customer insights, and market intelligence to inform product strategies. This holistic perspective enables organizations to align product visions with business goals effectively, creating the foundation for sustainable innovation and growth.

Vision Integration and Synthesis

The discipline synthesizes various data sources and stakeholder inputs to create unified product visions and strategies. This synthesis capability proves crucial for ensuring organizational alignment and directing collective efforts toward common objectives, ultimately enabling successful product development and market entry.

Obstacle Navigation and Resolution

Product operations play a vital role in identifying and overcoming organizational barriers that hinder product model implementation. By facilitating cross-team communication and streamlining processes, the function enhances overall organizational efficiency and enables smoother strategic implementation.

Team Empowerment and Capability Enhancement

Through the provision of necessary tools, data, and processes, product operations empowers product teams to make informed decisions and innovate effectively. This empowerment enables teams to solve complex problems and deliver products that exceed customer expectations while contributing to organizational objectives.

Strategic Implementation Considerations

Organizations seeking to implement or optimize their operating models should consider several key factors:

Assessment of Current State: Organizations must honestly evaluate their current levels of process integration and standardization to determine their existing position within the operating model framework.

Strategic Objective Alignment: The chosen operating model should align with broader organizational strategy, market position, and competitive requirements.

Cultural and Organizational Readiness: Implementation success depends on organizational culture, change management capabilities, and leadership commitment to the chosen approach.

Measurement and Continuous Improvement: Organizations should establish clear metrics for evaluating operating model effectiveness and create mechanisms for continuous optimization based on performance feedback and changing market conditions.

Conclusion: The Path to Operational Excellence

The strategic selection and implementation of appropriate operating models represents a fundamental driver of organizational performance and competitive advantage. Whether organizations choose diversification, coordination, replication, or unification approaches, the key lies in deliberate alignment between operating model selection and strategic objectives.

Product operations emerge as particularly relevant in modern business environments, providing the infrastructure and capabilities necessary for customer-focused, agile organizations to thrive. By embracing the principles of iterative development, team empowerment, customer-centricity, and outcome focus, organizations can build sustainable competitive advantages while delivering exceptional value to customers and stakeholders.

The integration of philosophical understanding with practical operational excellence creates opportunities for organizations to achieve both immediate performance improvements and long-term strategic success. Leaders who can effectively synthesize these diverse elements while maintaining focus on customer value and organizational objectives position their organizations for sustained success in increasingly competitive markets.

Chapter 04
New Theory of Trade

Chapter 4: New Theory of Trade

1.The Melitz Model

More recently, the literature introduced also firm heterogeneity in terms of labor productivity. This line of research was initiated by Melitz (2003) and subsequently extended by Helpman et al. (2004) to include the choice between exporting and horizontal foreign direct investment (FDI).

The Melitz model, developed by Marc Melitz in 2003, extends the traditional trade models by introducing firm heterogeneity—firms differ in productivity levels. This allows us to understand why not all firms participate in international trade and how trade impacts the composition of firms within a country.

Theoretical research in international trade increasingly emphasizes firm-level decisions in understanding the causes and consequences of aggregate trade. Motivated by empirical findings using micro-level data on plants and firms, this theoretical literature emphasizes heterogeneity in productivity, size, and other characteristics even within narrowly defined industries. This heterogeneity is systematically related to trade participation, with exporters larger and more productive than non-exporters even prior to entering export markets. Trade liberalization leads to within-industry reallocations of resources, which raise average industry productivity, as low-productivity firms exit and high-productivity firms expand to enter export markets. The increase in firm scale induced by export market entry enhances the return to complementary productivity-enhancing investments in technology adoption and innovation, with the result that trade liberalization also raises firm productivity.

Models of firm heterogeneity provide a natural explanation for these and other features of disaggregated trade data that cannot be directly interpreted using representative firm models (whether based on comparative advantage or love of variety

The theoretical literature on firm heterogeneity and trade has been influenced by a number of empirical findings from micro data. One first set of empirical findings showed that firms participating in trade perform better along a number of dimensions. Using US Census data, Bernard and Jensen (1995, 1999) find that exporters are larger, more productive, more capital intensive, more skill intensive, and pay higher wages than non-exporters within the same industry.

While the early empirical literature using plant and firm data focused on exports, more recent research using customs transactions data has shown that importers display many of the same characteristics as exporters.

Indeed, firms that simultaneously export and import typically exhibit the highest levels of performance

Theoretical research in international trade increasingly focuses on the decisions of heterogeneous firms. This theoretical research rationalizes a number of features of disaggregated trade data (e.g. performance differences between exporters and non-exporters), highlights new mechanisms through which trade affects welfare (e.g. reallocation across firms and within-firm productivity growth), and points to new margins along which economies respond to changes in trade costs (e.g. the extensive margins of the number of exporting firms and exported products).

- **Core Concepts:**
  - Productivity Heterogeneity: Firms vary in productivity; only the more productive firms can compete effectively in international markets after incurring fixed costs of exporting.
  - Selection Effect: International trade induces a selection mechanism where only the most productive firms export, leading to a reallocation of resources toward more efficient producers.
  - Trade Flows: The model explains observed differences in export participation, export sizes, and the extensive margin (number of firms exporting) versus the intensive margin (volume per firm).
- **Implications :**
  - Trade liberalization encourages less productive firms to exit export markets.
  - Exporting increases average productivity within a country.
  - It accounts for firm-level responses to trade policy changes and explains the heterogeneity observed in real-world data.

2. Heterogeneous Firm Selection and Trade Flows the Antras Model (2003) Antràs and *Helpman(2005)*

The Antras and Helpman (2005) Model: Firm Heterogeneity and Vertical Integration

- **Overview:**
  Antras and Helpman (2005) build on Melitz's framework, emphasizing the role of input sourcing and vertical integration in international trade.
- **Main Features:**
  - Hierarchical Firms: Firms are segmented into upstream and downstream units, with heterogeneity in productivity influencing decisions to produce in-house or outsource.
  - Trade in Intermediate Goods: The model incorporates trade in intermediate inputs, with firms choosing whether to import or produce domestically, impacting their cost structure and productivity.
  - Market Structure & Vertical Linkages: The degree of vertical integration and sourcing strategies impact firm productivity and trade patterns.
- **Key Insights :**
  - Firms with higher productivity are more likely to vertically integrate and participate actively in trade.
  - The model explains patterns of offshoring, outsourcing, and global supply chain configurations.
  - It highlights the role of firm heterogeneity in explaining variations in trade participation across sectors and countries.
- Melitz (2003) introduces fixed exporting costs in order to explain why large firms export whereas small firms don't.
- Only a small number of firms export, which suggests that fixed exporting costs are large.

Both models emphasize firm heterogeneity as a critical factor in trade analysis. Melitz's model focuses on the selection mechanism driven by productivity differences, explaining which firms trade and the effects on domestic industries. Antras and Helpman expand this by examining the internal organization of firms and their decisions regarding sourcing and vertical integration, enriching our understanding of global value chains.

2.1. Multinationals and Outsourcing

Foreign direct investment refers to investment in which a firm in one country directly controls or owns a subsidiary in another country.

If a foreign company invests in at least 10% of the stock in a subsidiary, the two firms are typically classified as a multinational corporation.

10% or more of ownership in stock is deemed to be sufficient for direct control of business operations.

Green eld FDI is when a company builds a new production facility abroad.

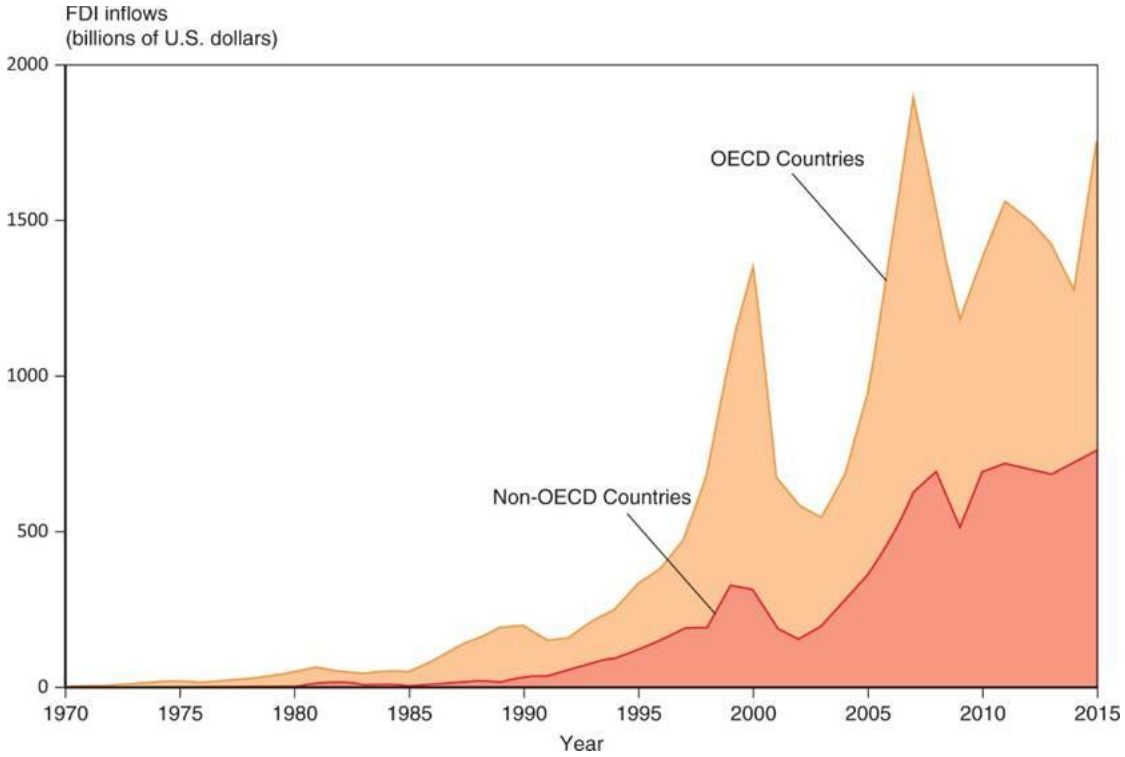
- Brown eld FDI (or cross-border mergers and acquisitions) is when a domestic firm buys a controlling stake in a foreign firm.
- Green eld FDI has tended to be more stable, while cross-border mergers and acquisitions tend to occur in surges.

Developed countries have been the biggest recipients of inward FDI.

-stull, they are much more volatile than FDI going to developing and transition economies.

- Steady expansion in the share of FDI flowing to developing and transition countries.
- They accounted for half of worldwide FDI flows in 2009.
- Sales of FDI affiliates are often used as a measure of multinational activity.

Figure 33: Inflows of Foreign Direct Investment



Worldwide flows of FDI have significantly increased since the mid-1990s, though the rates of increase have been very uneven.

- Historically, most of the inflows of FDI have gone to the developed countries in the OECD.
- However, the proportion of FDI in flows going to developing and transition economies has steadily increased over time and accounted for roughly half of worldwide FDI flows since 2009.

Two main types of FDI:

- Horizontal FDI when the affiliate replicates the production process (that the parent firm undertakes in its domestic facilities) elsewhere in the world.
- Vertical FDI when the production chain is broken up, and parts of the production processes are transferred to the affiliate location.

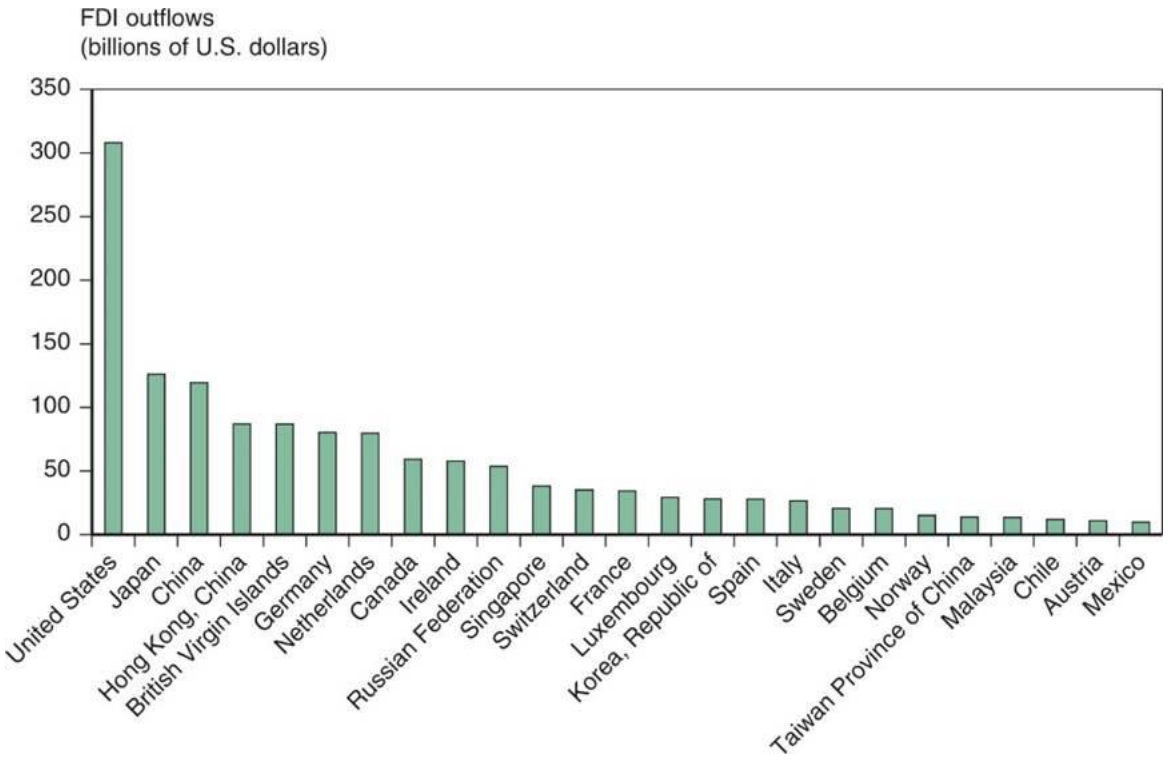
Vertical FDI is mainly driven by production cost differences between countries (for those parts of the production process that can be performed in another location).

- Vertical FDI is growing fast and is behind the large increase in FDI in flows to developing countries.

Horizontal FDI is dominated by flows between developed countries.

- Both the multinational parent and the affiliates are usually located in developed countries.
- The main reason for this type of FDI is to locate production near a firm's large customer bases.
- Hence, trade and transport costs play a much more important role than production cost differences for these FDI decisions.

Figure 34: Outward Foreign Direct Investment for Top 25 Countries, Yearly Average 2013-2015



Developed countries dominate the list of the top countries whose firms engage in outward FDI. More recently, firms from some big developing countries such as China and India have performed significantly more FDI.

Source: United Nations Conference on Trade and Development, World Investment Report, 2015.

2.2. The Firm's Decision Regarding Foreign Direct Investment

- Proximity-concentration trade-off:

High trade costs associated with exporting create an incentive to locate production near customers.

- Increasing returns to scale in production create an incentive to concentrate production in fewer locations.

FDI activity concentrated in sectors with high trade costs.

When increasing returns to scale are important and average plant sizes are large, we observe higher export volumes relative to FDI.

- Multinationals tend to be much larger and more productive than other firms (even exporters) in the same country.

The horizontal FDI decision involves a trade-off between the per-unit export cost t and the fixed cost F of setting up an additional production facility.

I If t.Q > F, costs more to pay trade costs t on Q units sold abroad than to pay fixed cost F to build a plant abroad.

- When foreign sales large Q > F/t, exporting is more expensive and FDI is the profit-maximizing choice.

- Low costs make more apt to choose FDI due to larger sales.

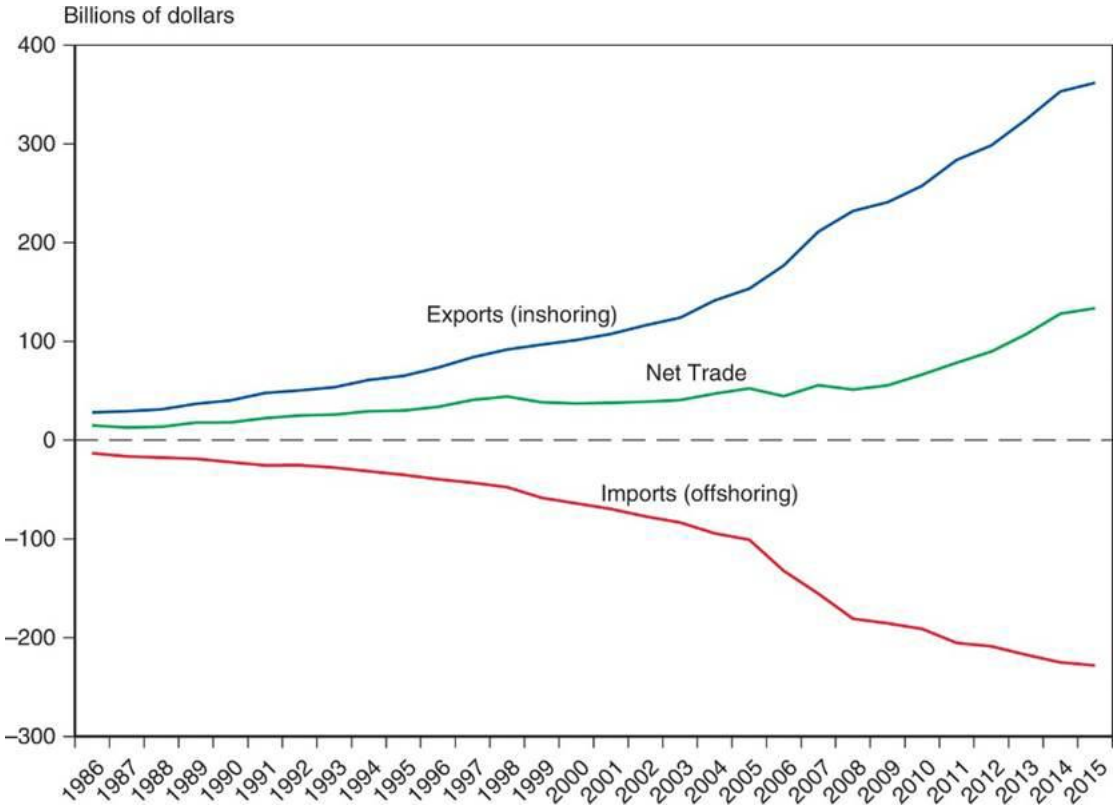
The vertical FDI decision also involves a trade-off between cost savings and the fixed cost F of setting up an additional production facility.

- Cost savings related to comparative advantage make some stages of production cheaper in other countries.

Foreign outsourcing or off shoring occurs when a firm contracts with an independent firm to produce in the foreign location.

- In addition to deciding the location of where to produce, firms also face an internalization decision: whether to keep production done by one firm or by separate firms.

Figure 35: U.S. International Trade in Business Services, 1986- 2015



U.S. service off shoring is captured by U.S. imports of business services. Although service off shoring has dramatically increased over the past decade, U.S. inshoring (exports of business services) has grown even faster. The net balance is positive and has also substantially increased over the past decade.

Internalization occurs when it is more profitable to conduct transactions and production within a single organization.

- Reasons for this include:

- Technology transfers: transfer of knowledge or another form of technology may be easier within a single organization than through a market transaction between separate organizations.

- Patent or property rights may be weak or non-existent.

- Knowledge may not be easily packaged and sold.

Vertical integration involves consolidation of different stages of a production process.

- Consolidating an input within the firm using it can avoid holdup problems and hassles in writing complete contracts.
- But an independent supplier could benefit from economies of scale if it performs the process for many parent firms.

Foreign direct investment should benefit the countries involved for reasons similar to why international trade generates gains.

Multinationals and firms that outsource take advantage of cost differentials that favor moving production (or parts thereof) to particular locations.

- FDI is very similar to the relocation of production that occurred across sectors when opening to trade.
- There are similar welfare consequences for the case of multinationals and outsourcing:
- Relocating production to take advantage of cost differences leads to overall gains from trade.

Chapter 5
Firm Behaviour and International Trade

Chapter 5: Firm Behaviour and International Trade

This chapter examines the theoretical contributions of leading economists, particularly Grossman, Helpman, and Antràs, to our understanding of firm behavior in international trade. The analysis focuses on how firms make organizational choices regarding Foreign Direct Investment (FDI), vertical integration, and international production fragmentation. We explore how these micro-level decisions aggregate to influence international trade patterns, wage distributions, and economic equilibrium. The paper synthesizes key theoretical frameworks and empirical insights that have revolutionized modern trade theory by incorporating firm-level heterogeneity and strategic organizational considerations.

The evolution of international trade theory has been significantly shaped by the incorporation of firm-level heterogeneity and organizational decision-making processes. Traditional trade theories, while foundational, failed to capture the complex strategic decisions that firms face when engaging in international markets. Leading economists including Grossman, Helpman, and Antràs have revolutionized our understanding by developing models that analyze Foreign Direct Investment (FDI) from a firm-level perspective, addressing fundamental questions about why firms engage in FDI, how they decide where and when to invest abroad, and what are the strategic implications of these decisions.

1. Choice of Firm Organization and International Equilibrium by Grossman and Helpman (2002,2003,2005)

1.1 Theoretical Foundations: Works by Grossman and Helpman (2002-2005)

The seminal contributions of Grossman and Helpman (2002, 2003, 2005) established a comprehensive framework for understanding how organizational choices influence international trade patterns. Their work extends beyond the traditional binary choice between

domestic production and export activities, incorporating a much broader array of strategic options that internationally engaged firms actually confront.

1.1.1 Evolution Beyond the Melitz Framework

While Melitz (2003) established that heterogeneous firms self-select into organizational forms based on productivity, this binary choice represents a significant simplification of complex real-world decisions. Grossman and Helpman's framework expands this analysis to include:

Horizontal FDI: Firms establish production facilities in foreign countries to serve local markets directly, avoiding trade costs and tariffs while gaining proximity to customers.

Vertical FDI: Companies fragment their production processes across multiple countries, exploiting international differences in factor costs and capabilities. This fragmentation can involve either maintaining ownership control (vertical integration) or engaging in arm's-length transactions with independent suppliers.

1.1.2 Firm-Level Heterogeneity in International Trade

International trade exhibits substantial heterogeneity originating at the firm level, revealing several key empirical patterns:

Export Participation Patterns: Not all firms choose to export, and those that do consistently outperform non-exporters across multiple performance metrics. Even among active exporters, significant variation exists in performance and scale.

Concentration of Export Activity: The largest exporters dominate international trade, accounting for a disproportionately large share of total exported value. This concentration reflects the advantages that the most productive firms hold in international markets.

Export Success Variability: Exporters face divergent outcomes over time. Some fail quickly and exit international markets, while others succeed and expand their global presence. Many exporters operate at relatively small scales, suggesting that fixed costs of exporting may be lower than traditionally assumed.

1.2 Theoretical Contributions and Extensions

The theoretical framework developed by Grossman and Helpman encompasses several key contributions:

Helpman, Melitz, and Yeaple (2004) focus primarily on horizontal FDI decisions, examining how firms choose between exporting and establishing foreign production facilities. Their analysis reveals that this choice depends critically on the relative magnitudes of trade costs versus fixed costs of establishing foreign operations.

Antràs and Helpman (2004) concentrate on vertical integration decisions, analyzing when firms choose to maintain ownership control over their international supply chains versus outsourcing to independent suppliers. This work incorporates insights from property rights theory and transaction cost economics.

1.2.1 Industry-Level Implications

The organizational choices available to firms generate predictable industry-level patterns. Industries characterized by higher productivity dispersion across firms (lower shape parameter k_0) exhibit distinct characteristics:

- Lower fractions of firms engaging in outsourcing within developed countries (the North)
- Higher fractions of firms pursuing vertical integration in developing countries (the South)
- Greater overall levels of offshoring combined with more vertical integration

1.3 International Division of Productive Processes (DIPP)

Modern multinational corporations engage in value-added production activities across multiple countries, whether for complete products or individual components. Helpman demonstrates that firms may pursue international vertical separation to exploit differences in factor prices through the International Division of Productive Processes (DIPP), also known as fragmentation of the value chain or modularization.

This strategy has been facilitated by reductions in tariffs and transportation costs. Vertically integrated multinational corporations typically operate in industrial sectors with complex production processes for processed or assembled products, such as automotive, home appliances, textiles, and clothing industries.

2. Contribution of the Theory of the Firm to International Economics

2.1 Comparative Analysis: Antràs versus Grossman and Helpman

While both research streams contribute critically to understanding firm behavior in international trade, they approach the subject from complementary angles:

2.1.1 Antràs (2003) Framework

Focus Areas:

- Investigates firm productivity heterogeneity and its relationship to trade flows
- Focuses on export participation decisions based on productivity thresholds
- Analyzes how firm selection processes determine trade flow patterns and volumes
- Explains the distribution of export participation across firms

Methodology:

- Employs heterogeneous firm models with productivity thresholds
- Explains trade patterns through selection effects
- Emphasizes productivity enhancement as a pathway to international market access

2.1.2 Grossman and Helpman Framework

Focus Areas:

- Concentrates on organizational choices, particularly vertical integration versus specialization
- Examines how organizational decisions affect international economic equilibria
- Explores firm-level choices regarding production location and organizational form
- Studies the influence of firm organization on trade policies, productivity, and broader economic outcomes

Methodology:

- Concentrates on organizational choice analysis
- Studies equilibrium outcomes by incorporating internal decision-making processes
- Draws from property rights theory, transaction cost economics, and incomplete contracting literature

2.2 How Organizational Decisions Shape Trade's Impact on Wages

Organizational decisions fundamentally influence how international trade affects wages by altering production structures, resource allocation, and worker productivity incentives within firms. This influence operates through several interconnected mechanisms:

2.2.1 Internalization and Firm Boundaries

Firms face critical decisions about which activities to internalize versus outsource, fundamentally shaping the global distribution of tasks and expertise. When firms choose internalization, they typically concentrate more skill-intensive and high-value activities

within their organizational boundaries, affecting labor demand patterns across different sectors and influencing wage structures.

2.2.2 Contractual Frictions and Investment Dynamics

Incomplete contracting and various contractual frictions constrain firms' ability to coordinate effectively and invest in relationship-specific assets. Trade liberalization often reduces these frictions, prompting firms to reconfigure their organizational structures, altering the relative demand for skilled versus unskilled labor and creating corresponding changes in wage distributions.

2.2.3 Global Value Chain Participation

Firms' decisions to fragment production across international borders significantly impact how value-added activities are distributed globally. Internal organizational choices determine which sectors and skill sets experience increased demand, ultimately shaping wage patterns both within and across countries.

2.3 Impact of Value Chain Fragmentation on Multinational Firms

The practice of slicing value chains across countries creates profound effects on multinational firms across multiple dimensions:

2.3.1 Cost Optimization and Efficiency Enhancement

Fragmenting production enables firms to locate each production stage where it can be performed most cost-effectively, leveraging comparative advantages across different locations and improving overall competitiveness.

2.3.2 Organizational Complexity and Management Challenges

Cross-border value chain fragmentation substantially increases organizational complexity, requiring sophisticated coordination, control, and contractual arrangements. These complexities influence internal firm structures and decision-making authority distribution.

2.3.3 Strategic Implications

Trade-Offs in Organizational Decision-Making:

- **High-Productivity Firms and Vertical Integration**: More productive firms demonstrate greater propensity toward vertical integration because they can more effectively absorb associated fixed costs while capitalizing on control benefits.
- **Low-Productivity Firms and Outsourcing Strategies**: Less productive firms typically prefer outsourcing arrangements due to resource constraints and the need to minimize fixed cost commitments.

2.4 Impact on International Economic Equilibrium

2.4.1 Trade Pattern Determination

The organizational choice framework provides explanations for observed variations in industrial structure across sectors. Some industries are characterized by global supply chains with extensive vertical integration, while others maintain more domestically oriented production patterns.

2.4.2 Market Structure Dynamics

Organizational choices fundamentally influence the number and size distribution of firms participating in international trade. The framework predicts that industries with significant organizational advantages for integration will be dominated by fewer, larger firms.

3. Policy Implications and Contemporary Relevance

3.1 Business Strategy Development

Understanding organizational choice patterns enables firms to make more informed decisions about supply chain design by systematically weighing fixed costs, transaction costs, and market conditions. This framework provides a structured approach to strategic decision-making regarding international operations.

3.2 Policy Design Considerations

The organizational choice framework offers valuable insights for policymakers seeking to promote efficient trade and investment patterns. Trade policies and tariff structures can systematically shift organizational decisions, affecting the structure of entire industries and global production networks.

3.3 Economic Development Applications

The framework has particular relevance for understanding economic development patterns, explaining how firms in different stages of development are likely to organize their operations and participate in international markets.

Conclusion

The incorporation of organizational decisions into trade models creates richer, more flexible theoretical frameworks while simultaneously enhancing organizational theories with

additional testable implications. Grossman and Helpman's work illuminate the complex interplay between organizational choices and international trade, demonstrating that firm heterogeneity and decision-making processes at the organizational level are critical for understanding modern trade dynamics.

Their models reveal that the ability of firms to organize production processes across countries fundamentally alters patterns of comparative advantage and the overall pattern of international trade. This evolution in economic thinking provides a more nuanced and realistic understanding of how modern international commerce operates, incorporating the strategic complexity that characterizes contemporary global business environments.

The theoretical contributions of these economists have established a foundation for understanding how firms navigate the complex landscape of international trade, balancing considerations of cost efficiency, organizational control, and strategic positioning in an increasingly interconnected global economy.

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