International Economics

Developed by

Suman Kalyan Chakraborty

From the Director's Desk

The Directorate of Distance & Continuing Education, originally established as the University Evening College way back in 1962 has travelled a long way in the last 52 years. **'EDUCATION FOR ALL'** is our motto. Increasingly the Open and Distance Learning institutions are aspiring to provide education for anyone, anytime and anywhere. DDCE, Utkal University has been constantly striving to rise up to the challenges of Open Distance Learning system. Nearly one lakh students have passed through the portals of this great temple of learning. We may not have numerous great tales of outstanding academic achievements but we have great tales of success in life, of recovering lost opportunities, tremendous satisfaction in life, turning points in career and those who feel that without us they would not be where they are today. There are also flashes when our students figure in best ten in their honours subjects. Our students must be free from despair and negative attitude. They must be enthusiastic, full of energy and confident of their future. To meet the needs of quality enhancement and to address the quality concerns of our stake holders over the years, we are switching over to self instructional material printed courseware. We are sure that students would go beyond the course ware provided by us. We are aware that most of you are working and have also family responsibility. Please remember that only a busy person has time for everything and a lazy person has none. We are sure, that you will be able to chalk out a well planned programme to study the courseware. By choosing to pursue a course in distance mode, you have made a commitment for self improvement and acquiring higher educational qualification. You should rise up to your commitment. Every student must go beyond the standard books and self instructional course material. You should read number of books and use ICT learning resources like the internet, television and radio programmes etc. As only limited number of classes will be held, a student should come to the personal contact programme well prepared. The PCP should be used for clarification of doubt and counseling. This can only happen if you read the course material before PCP. You can always mail your feedback on the course ware to us. It is very important that one should discuss the contents of the course materials with other fellow learners.

We wish you happy reading.

DIRECTOR

SYLLABUS

International Economics

Unit – I

1. Economic Growth and International Trade: Growth and Trade when growth is unspecified, formal model of economic growth and international trade, increases in factor endowments and international trade, technical progress and international trade, economic growth, International trade and inter movement of factors; a dynamic analysis of pattern of specialization and factor accumulation..

Unit – II

2. Economic expansion and the terms of trade; The British School Premises hypothesis.

3. Intermediate products and international trade; implications of interindustry flows and pure intermediate products.

Unit – III

4. International Trade and factor market distribution with wage differential with factor immobility and factor price rigidity.

Unit – IV

5. International Trade with product market imperfections, the theory of monopoly in general equilibrium.

Unit – V

6. International Trade with nontraded goods.

CONTENTS

UNIT – I

UNIT – II

UNIT – III

UNIT – I

<table>
<tr><td>

Chapter

1

</td><td>

INTRODUCTION

</td></tr>
</table>

Objectives

The objectives of this lesson are to:

- Economic Growth

- Growth and Trade when growth is unspecified

- Formal model of economic growth and International trade

- Increases in factor endowments and international trade

- Technical progress and international trade

- Economic growth,International trade and inter movement of factors

- A dynamic analysis of pattern of specialization and factor accumulation

Structure:

1.1 ECONOMIC GROWTH AND INTERNATIONAL TRADE

Economic Growth

Economic growth is the increase in the inflation-adjusted market value of the goods and services produced by an economy over time. It is conventionally measured as the percent rate of increase in real gross domestic product, or real GDP.

Growth is usually calculated in real terms - i.e., inflation-adjusted terms – to eliminate the distorting effect of inflation on the price of goods produced. Measurement of economic growth uses national income accounting. Since economic growth is measured as the annual percent

change of gross domestic product (GDP), it has all the advantages and drawbacks of that measure. The economic growth rates of nations is commonly compared using the ratio of the GDP to population or per-capita income.

The "rate of economic growth" refers to the geometric annual rate of growth in GDP between the first and the last year over a period of time. Implicitly, this growth rate is the trend in the average level of GDP over the period, which implicitly ignores the fluctuations in the GDP around this trend.

An increase in economic growth caused by more efficient use of inputs (such as labor productivity, physical capital, energy or materials) is referred to as intensive growth. GDP growth caused only by increases in the amount of inputs available for use (increased population, new territory) is called extensive growth. Development of new goods and services also creates economic growth.

Measuring economic growth

The economic growth rate is calculated from data on GDP estimated by countries´statistical agencies. The rate of growth of GDP/capita is calculated from data on GDP and people for the initial and final periods included in the analysis of the analyst.

Determinants of per capita GDP growth

In national income accounting, per capita output can be calculated using the following factors: output per unit of labour input (labour productivity), hours worked (intensity), the percentage of the working age population actually working (participation rate) and the proportion of the working-age population to the total population (demography). The rate of change of GDP/population is the sum of the rates of change of these four variables plus their cross products.

Productivity

Increases in labour productivity (the ratio of the value of output to labor input) have historically been the most important source of real per capita economic growth. In a famous estimate, MIT Professor Robert Solow concluded that technological progress has accounted for 80 percent of the long-term rise in U.S. per capita income, with increased investment in capital explaining only the remaining 20 percent. Increases in productivity lower the real cost of goods. Over the 20th century the real price of many goods fell by over 90 percent.

Historical sources of productivity growth

Economic growth has traditionally been attributed to the accumulation of human and physical capital and the increase in productivity and creation of new goods arising from technological innovation. Further division of labour (specialization) is also fundamental to rising productivity.

Before industrialization technological progress resulted in an increase in the population, which was kept in check by food supply and other resources, which acted to limit per capita income, a condition known as the Malthusian trap. The rapid economic growth that occurred during the Industrial Revolution was remarkable because it was in excess of population growth, providing an escape from the Malthusian trap. Countries that industrialized eventually saw their population growth slowdown, a phenomenon known as the demographic transition.

Increases in productivity are the major factor responsible for per capita economic growth – this has been especially evident since the mid-19th century. Most of the economic growth in the 20th century was due to increased output per unit of labor, materials, energy, and land (less input per

widget). The balance of the growth in output has come from using more inputs. Both of these changes increase output. The increased output included more of the same goods produced previously and new goods and services.

During the Industrial Revolution, mechanization began to replace hand methods in manufacturing, and new processes streamlined production of chemicals, iron, steel, and other products. Machine tools made the economical production of metal parts possible, so that parts could be interchangeable.

During the Second Industrial Revolution, a major factor of productivity growth was the substitution of inanimate power for human and animal labour. Also there was a great increase in power as steam powered electricity generation and internal combustion supplanted limited wind and water power. Since that replacement, the great expansion of total power was driven by continuous improvements in energy conversion efficiency. Other major historical sources of productivity were automation, transportation infrastructures (canals, railroads, and highways), new materials (steel) and power, which includes steam and internal combustion engines and electricity. Other productivity improvements included mechanized agriculture and scientific agriculture including chemical fertilizers and livestock and poultry management, and the Green Revolution. Interchangeable parts made with machine tools powered by electric motors evolved into mass production, which is universally used today.

Productivity lowered the cost of most items in terms of work time required to purchase. Real food prices fell due to improvements in transportation and trade, mechanized agriculture,mechanized agriculture, fertilizers, scientific farming and the Green Revolution.

Great sources of productivity improvement in the late 19th century were railroads, steam ships, horse-pulled reapers and combine harvesters, and steam-powered factories. The invention of processes for making cheap steel were important for many forms of mechanization and transportation. By the late 19th century both prices and weekly work hours fell because less labour, materials, and energy were required to produce and transport goods. However, real wages rose, allowing workers to improve their diet, buy consumer goods and afford better housing.

Mass production of the 1920s created overproduction, which was arguably one of several causes of the Great Depression of the 1930s. Following the Great Depression, economic growth resumed, aided in part by increased demand for existing goods and services, such as automobiles, telephones, radios, electricity and household appliances. New goods and services included television, air conditioning and commercial aviation (after 1950), creating enough new demand to stabilize the work week. The building of highway infrastructures also contributed to post World War II growth, as did capital investments in manufacturing and chemical industries. The post-World War II economy also benefited from the discovery of vast amounts of oil around the world, particularly in the Middle East. By John W. Kendrick's estimate, three-quarters of increase in U.S. per capita GDP from 1889 to 1957 was due to increased productivity.

Demographic changes

Demographic factors may influence growth by changing the employment to population ratio and the labour force participation rate. Industrialization creates a demographic transition in which birth rates decline and the average age of the population increases.

Women with fewer children and better access to market employment tend to join the labor force in higher percentages. There is a reduced demand for child labour and children spend more years in

school. The increase in the percentage of women in the labour force in the U.S. contributed to economic growth, as did the entrance of the baby boomers into the work force.

Other factors affecting growth (Political institutions, property rights, and rule of law)

As institutions influence behavior and incentives in real life, they forge the success or failure of nations. In economics and economic history, the transition to Capitalism from earlier economic systems was enabled by the adoption of government policies that facilitated commerce and gave individuals more personal and economic freedom. These included new laws favorable to the establishment of business, including contract law and laws providing for the protection of private property, and the abolishment of anti-usury laws. When property rights are less certain, transaction costs can increase, hindering economic development. Enforcement of contractual rights is necessary for economic development because it determines the rate and direction of investments. When the rule of law is absent or weak, the enforcement of property rights depends on threats of violence, which causes bias against new firms because they cannot demonstrate reliability to their customers.

Much of this literature was built on the success story of the British state that after the Glorious Revolution of 1688 combined high fiscal capacity with constraints on the power of the king generating some respect for the rule of law. However, others have questioned that this institutional formula is not so easily replicable elsewhere as a change in the Constitution—and the type of institutions created by that change—does not necessarily create a change in political power if the economic powers of that society are not aligned with the new set of rule of law institutions. In England, a dramatic increase in the state's fiscal capacity followed the creation of constraints on the crown, but elsewhere in Europe, increases in state capacity happened before major rule of law reforms.

There are many different ways through which states achieved state (fiscal) capacity and this different capacity accelerated or hindered their economic development. Thanks to the underlying homogeneity of its land and people, England was able to achieve a unified legal and fiscal system since the Middle Ages that enabled it to substantially increase the taxes it raised after 1689. On the other hand, the French experience of state building faced much stronger resistance from local feudal powers keeping it legally and fiscally fragmented until the French Revolution despite significant increases in state capacity during the seventeenth century. Furthermore, Prussia and the Habsburg empire—much more heterogeneous states than England—were able to increase state capacity during the eighteenth century without constraining the powers of the executive. Nevertheless, it is unlikely that a country will generate institutions that respect property rights and the rule of law without having had first intermediate fiscal and political institutions that create incentives for elites to support them. Many of these intermediate level institutions relied on informal private-order arrangements that combined with public-order institutions associated with states, to lay the foundations of modern rule of law states.

In many poor and developing countries much land and housing is held outside the formal or legal property ownership registration system. In many urban areas the poor "invade" private or government land to build their houses, so they do not hold title to these properties. Much unregistered property is held in informal form through various property associations and other arrangements. Reasons for extra-legal ownership include excessive bureaucratic red tape in buying property and building. In some countries it can take over 200 steps and up to 14 years to build on government land. Other causes of extra-legal property are failures to notarize transaction documents or having documents notarized but failing to have them recorded with the official agency.

Not having clear legal title to property limits its potential to be used as collateral to secure loans, depriving many poor countries one of their most important potential sources of capital. Unregistered businesses and lack of accepted accounting methods are other factors that limit potential capital.

Businesses and individuals participating in unreported business activity and owners of unregistered property face costs such as bribes and pay-offs that offset much of any taxes avoided.

"Democracy Does Cause Growth", according to Acemoglu et al. Specifically, "democracy increases future GDP by encouraging investment, increasing schooling, inducing economic reforms, improving public goods provision, and reducing social unrest."

Entrepreneurship

Policy makers and scholars frequently emphasize the importance of entrepreneurship for economic growth. However, surprisingly few research empirically examine and quantify entrepreneurship's impact on growth. This is due to endogeneity - forces that drive economic growth also drive entrepreneurship. In other words, the empirical analysis of the impact of entrepreneurship on growth is difficult because of the joint determination of entrepreneurship and economic growth. A few papers use quasi-experimental designs, and have found that entrepreneurship and the density of small businesses indeed have a causal impact on regional growth.

Capital

Capital in economics ordinarily refers to physical capital, which consists of structures (largest component of physical capital) and equipment used in business (machinery, factory equipment, computers and office equipment, construction equipment, business vehicles, medical equipment, etc.). Up to a point increases in the amount of capital per worker are an important cause of economic output growth. Capital is subject to diminishing returns because of the amount that can be effectively invested and because of the growing burden of depreciation. In the development of economic theory the distribution of income was considered to be between labor and the owners of land and capital. In recent decades there have been several Asian countries with high rates of economic growth driven by capital investment.

New products and services

Another major cause of economic growth is the introduction of new products and services and the improvement of existing products. New products create demand, which is necessary to offset the decline in employment that occurs through labour saving technology (and to a lesser extent employment declines due to savings in energy and materials). In the U.S.A. by 2013 about 60 percent of consumer spending was for goods and services that did not exist in 1869. Also, the creation of new services has been more important than invention of new goods.

Growth phases and sector shares

Economic growth in the U.S. and other developed countries went through phases that affected growth through changes in the labour force participation rate and the relative sizes of economic sectors. The transition from an agricultural economy to manufacturing increased the size of the sector with high output per hour (the high-productivity manufacturing sector), while reducing the size of the sector with lower output per hour (the lower productivity agricultural sector). Eventually high productivity growth in manufacturing reduced the sector size, as prices fell and employment shrank relative to other sectors. The service and government sectors, where output per hour and productivity

growth is low, saw increases in their shares of the economy and employment during the 1990s. The public sector has since contracted, while the service economy expanded in the 2000s.

Importance of long-run growth

Over long periods of time, even small rates of growth, such as a 2percent annual increase, have large effects. For example, the United Kingdom experienced a 1.97 percent average annual increase in its inflation-adjusted GDP between 1830 and 2008. In 1830, the GDP was 41,373 million pounds. It grew to 1,330,088 million pounds by 2008. A growth rate that averaged 1.97 perent over 178 years resulted in a 32-fold increase in GDP by 2008.

The large impact of a relatively small growth rate over a long period of time is due to the power of exponential growth. The rule of 72, a mathematical result, states that if something grows at the rate of x percent per year, then its level will double every 72/x years. For example, a growth rate of 2.5 percent per annum leads to a doubling of the GDP within 28.8 years, whilst a growth rate of 8 percent per year leads to a doubling of GDP within 9 years. Thus, a small difference in economic growth rates between countries can result in very different standards of living for their populations if this small difference continues for many years.

Quality of life

One theory that relates economic growth with quality of life is the "Threshold Hypothesis", which states that economic growth up to a point brings with it an increase in quality of life. But at that point – called the threshold point – further economic growth can bring with it a deterioration in quality of life. This results in an upside-down-U-shaped curve, where the vertex of the curve represents the level of growth that should be targeted. Happiness has been shown to increase with a higher GDP per capita, at least up to a level of $15,000 per person.

Economic growth has the indirect potential to alleviate poverty, as a result of a simultaneous increase in employment opportunities and increased labour productivity. A study by researchers at the Overseas Development Institute (ODI) of 24 countries that experienced growth found that in 18 cases, poverty was alleviated. In some instances, quality of life factors such as healthcare outcomes and educational attainment, as well as social and political liberties, do not improve as economic growth occurs.

Productivity increases do not always lead to increased wages, as can be seen in the United States, where the gap between productivity and wages has been rising since the 1980s.

Business cycle

Economists distinguish between short-run economic changes in production and long-run economic growth. Short-run variation in economic growth is termed the business cycle. Generally, economists attribute the ups and downs in the business cycle to fluctuations in aggregate demand. In contrast, economic growth is concerned with the long-run trend in production due to structural causes such as technological growth and factor accumulation.

Income equality

Some theories developed in the 1970s suggested possible avenues through which inequality may have a positive effect on economic development. Savings by the wealthy, if these increase with inequality, were thought to offset reduced consumer demand.

Later analysis, such as the political economy approach, developed by Alesina and Rodrik (1994) and Persson and Tabellini (1994), stressed the negative impacts of inequality on economic development; inequality generates a pressure to adopt redistributive policies that have an adverse effect on investment and economic growth. However, empirical tests of an extended version of Alesina and Rodrik's model by Li and Zou found that "income inequality is positively, and most of the time significantly, associated with economic growth".

The credit market imperfection approach, developed by Galor and Zeira (1993), argued that inequality in the presence of credit market imperfections has a long lasting detrimental effect on human capital formation and economic development.

A study by Perotti (1996) showed that in accordance with the credit market imperfection approach, inequality is associated with lower level of human capital formation (education, experience, apprenticeship) and higher level of fertility, while lower level of human capital is associated with lower growth and lower levels of economic growth. In contrast, his examination of the political economy channel found no support for the political economy mechanism.

A 1999 review stated that high inequality lowers growth, perhaps because it increases social and political instability; however, changes in the degree of inequality have a relatively minor effect on growth.

Research by Robert Barro, found that there is "little overall relation between income inequality and rates of growth and investment". According to Barro, high levels of inequality reduce growth in relatively poor countries but encourage growth in richer countries. Princeton economist Roland Benabou's research shows that inequality does not matter per se to growth, but inequality in the relative distribution of earnings and political power does matter.

According to Andrew Berg and Jonathan Ostry (2011) of the International Monetary Fund, inequality in wealth and income is negatively correlated with subsequent economic growth. Likewise, economists Dierk Herzer and Sebastian Vollmer found that increased income inequality reduces economic growth, but growth itself also increases income inequality in the long run.

In 2013, French economist Thomas Piketty postulated that in periods when the average annual rate on return on investment in capital (r) exceeds the average annual growth in economic output (g), the rate of inequality will increase. According to Piketty, this is the case because wealth that is already held or inherited, which is expected to grow at the rate r, will grow at a rate faster than wealth accumulated through labour, which is more closely tied to g. An advocate of reducing inequality levels, Piketty suggests levying a global wealth tax in order to reduce the divergence in wealth caused by inequality.

Equitable growth

While acknowledging the central role economic growth can potentially play in human development, poverty reduction and the achievement of the Millennium Development Development Goals, it is becoming widely understood amongst the development community that special efforts must be made to ensure poorer sections of society are able to participate in economic growth. The effect of economic growth on poverty reduction – the growth elasticity of poverty – can depend on the existing level of inequality. For instance, with low inequality a country with a growth rate of 2 percent per head and 40percent of its population living in poverty, can halve poverty in ten years, but a country with high inequality would take nearly 60 years to achieve the same reduction. In the words of the Secretary General of the United Nations Ban Ki-Moon: While economic growth is necessary, it is not sufficient for progress on reducing poverty.

Environmental impact

The marginal costs of a growing economy may gradually exceed the marginal benefits, however measured. Concerns about negative environmental effects of growth have prompted some people to advocate lower levels of growth, or the abandoning of growth altogether. In academia, concepts like uneconomic growth, steady-state economy and degrowth have been developed in order to achieve this. In politics, green parties embrace the Global Greens Charter, recognising that the dogma of economic growth at any cost and the excessive and wasteful use of natural resources without considering Earth's carrying capacity, are causing extreme deterioration in the environment and a massive extinction of species. Those more optimistic about the environmental impacts of growth believe that, though localized environmental effects may occur, large-scale ecological effects are minor. The argument, as stated by commentator Julian Lincoln Simon, states that if these global-scale ecological effects exist, human ingenuity will find ways to adapt to them.

Global warming (At a Glance)

Up to the present, there is a close correlation between economic growth and the rate of carbon dioxide emissions across nations, although there is also a considerable divergence in carbon intensity (carbon emissions per GDP). Up to the present, there is also a direct relation between global economic wealth and the rate of global emissions. The Stern Review notes that the prediction that, "Under business as usual, global emissions will be sufficient to propel greenhouse gas concentrations to over 550 ppm CO_2 by 2050 and over 650–700 ppm by the end of this century is robust to a wide range of changes in model assumptions." The scientific consensus is that planetary ecosystem functioning without incurring dangerous risks requires stabilization at 450–550 ppm.

As a consequence, growth-oriented environmental economists propose government intervention into switching sources of energy production, favouring wind, solar, hydroelectric, and nuclear. This would largely confine use of fossil fuels to either domestic cooking needs (such as for kerosene burners) or where carbon capture and storage technology can be cost-effective and reliable. The Stern Review, published by the United Kingdom Government in 2006, concluded that an investment of 1percent of GDP (later changed to 2 percent) would be sufficient to avoid the worst effects of climate change, and that failure to do so could risk climate-related costs equal to 20 percent of GDP. Because carbon capture and storage is as yet widely unproven, and its long term effectiveness (such as in containing carbon dioxide 'leaks') unknown, and because of current costs of alternative fuels, these policy responses largely rest on faith of technological change.

British conservative politician and journalist Nigel Lawson has deemed carbon emission trading an 'inefficient system of rationing'. Instead, he favours carbon taxes to make full use of the efficiency of the market. However, in order to avoid the migration of energy-intensive industries, the whole world should impose such a tax, not just Britain, Lawson pointed out. There is no point in taking the lead if nobody follows suit.

Resource substitution

Many earlier predictions of resource depletion, such as Thomas Malthus 1798 predictions about approaching famines in Europe, The Population Bomb (1968), and the Simon-Ehrlich wager (1980) have not materialized. Diminished production of most resources has not occurred so far, one reason being that advancements in technology and science have allowed some previously unavailable resources to be produced. In some cases, substitution of more abundant materials, such as plastics for cast metals, lowered growth of usage for some metals. In the case of the limited resource of land, famine was relieved firstly by the revolution in transportation caused by railroads and steam ships, and later by the Green Rvolution and chemical fertilizers, especially the Haber process for ammonia synthesis.

Declining resource quality

Resource quality is composed of a variety of factors including ore grades, location, altitude above or below sea level, proximity to railroads, highways, water supply and climate. These factors affect the capital and operating cost of extracting resources. In the case of minerals, lower grades of mineral resources are being extracted, requiring higher inputs of capital and energy for both extraction and processing. Copper ore grades have declined significantly over the last century. Another example is natural gas from shale and other low permeability rock, which can be developed with much higher inputs of energy, capital, and materials than conventional gas in previous decades. Offshore oil and gas has exponentially increasing cost as water depth increases.

International Trade

International trade is the exchange of capital goods, goods, and services across international borders or territories. In most countries, such trade represents a significant share of gross domestic product (GDP). While international trade has existed throughout history its economic, social, and political importance has been on the rise in recent centuries.Carrying out trade at an international level is a more complex process than domestic trade. Trade takes place between two or more nations. Factors like the economy, government policies, markets, laws, judicial system, currency, etc. influence the trade. The political relations between two countries also influences the trade between them. Sometimes, the obstacles in the way of trading affect the mutual relationship adversly. To avoid this, international economic and trade organisations came up. To smoothen and justify the process of trade between countries of different economic standing, some international economic organisations were formed. These organisations work towards the facilitation and growth of international trade.

International trade takes place on account of many reasons such as:

1. Human wants and countries' resources do not totally coincide. Hence, there tends to be interdependence on a large scale.

2. Factor endowments in different countries differ.

3. Technological advancement of different countries differs. Thus, some countries are better placed in one kind of production and some others superior in some other kind of production.

4. Labour and entrepreneurial skills differ in different countries.

5. Factors of production are highly immobile between countries.

   In short, international trade is the outcome of territorial division of labour and specialisation in the countries of the world.

Salient Features of International Trade:

The following are the distinguishing features of international trade:

1. **Immobility of Factors:** The degree of immobility of factors like labour and capital is generally greater between countries than within a country. Immigration laws, citizenship, qualifications, etc. often restrict the international mobility of labour.

   International capital flows are prohibited or severely limited by different governments. Consequently, the economic significance of such mobility of factors tends to equality within but not between countries. For instance, wages may be equal in Mumbai and Pune but not in Bombay and London.

According to Harrod, it thus follows that domestic trade consists largely of exchange of goods between producers who enjoy similar standards of life, whereas international trade consists of exchange of goods between producers enjoying widely differing standards. Evidently, the principles which determine the course and nature of internal and international trade are bound to be different in some respects at least.

In this context, it may be pointed out that the price of a commodity in the country where it is produced tends to equal its cost of production.

The reason is that if in an industry the price is higher than its cost, resources will flow into it from other industries, output will increase and the price will fall until it is equal to the cost of production. Conversely, resources will flow out of the industry, output will decline, the price will go up and ultimately equal the cost of production.

But, as among different countries, resources are comparatively immobile; hence, there is no automatic influence equalising price and costs. Therefore, there may be permanent difference between the cost of production of a commodity.

In one country and the price obtained in a different country for it. For instance, the price of tea in India must, in the long run, be equal to its cost of production in India. But in the U.K., the price of Indian tea may be permanently higher than its cost of production in India. In this way, international trade differs from home trade.

2. **Heterogeneous Markets:** In the international economy, world markets lack homogeneity on account of differences in climate, language, preferences, habit, customs, weights and measures, etc. The behaviour of international buyers in each case would, therefore, be different.

3. **Different National Groups:** International trade takes place between differently cohered groups. The socio-economic environment differs greatly among different nations.

4. **Different Political Units:** International trade is a phenomenon which occurs amongst different political units.

5. **Different National Policies and Government Intervention:** Economic and political policies differ from one country to another. Policies pertaining to trade, commerce, export and import, taxation, etc., also differ widely among countries though they are more or less uniform within the country. Tariff policy, import quota system, subsidies and other controls adopted by governments interfere with the course of normal trade between one country and another.

6. **Different Currencies:** Another notable feature of international trade is that it involves the use of different types of currencies. So, each country has its own policy in regard to exchange rates and foreign exchange.

For the sake of brevity, features of international trade are mentioned in Chart 1.

Chart 1.1

Factors of Industrial Trade

Impobility of factors or Labour

Heterogeneity of Market

Different Nationals (Indian, America)

Different Political units (American Govt., British Govt. etc.)

Different Trade Policies

Different Currencies (Rs., £, $ etc.)

Differences between Internal Trade and International Trade:

Characteristically, there are marked differences between internal and international trade as stated below:

1. **Specific Terms:** Exports and Imports. Internal trade is the exchange of domestic output within the political boundaries of a nation, while international trade is the trade between two or more nations. Thus, unlike internal trade, the terms "export" and "import" are used in foreign trade. To export means to sell goods to a foreign country. To import goods means to buy goods from a foreign country.

2. **Heterogeneous Group:** An obvious difference between home trade and foreign trade is that trade within a country is trade among the same group of people, whereas trade between countries takes place between differently cohered groups. The socio-economic environment differs greatly between nations, while it is more or less uniform within a country. Frederick List, therefore, put that: "Domestic trade is among us, international trade is between us and them."

3. **Political Differences:** International trade occurs between different political units, while domestic trade occurs within the same political unit. The government in each country is keen about the welfare of its own nationals against that of the people of other countries. Hence, in international trade policy, each government tries to see its own interest at the cost of the other country.

4. **Different Rules:** National rules, laws and policies relating to trade, commerce, industry, taxation, etc. are more or less uniform within a country, but differ widely between countries.

   Tariff policy, import quota system, subsidies and other controls adopted by a government interfere with the course of normal trade between it and other countries. Thus, state interference causes different problems in international trade while the value of theory, in its pure form, which is laissez faire, cannot be applied in toto to the international trade theory.

5. **Different Currencies:** Perhaps the principal difference between domestic and international trade is that the latter involves the use of different types of currencies and each country follows different foreign exchange policies. That is why there is the problem of exchange rates and foreign exchange. Thus, one has to study not only the factors which determine the value of each country's monetary unit, but also the divergent practices and types of exchange resorted to.

6. **Heterogeneous World Markets:** In a way, home trade has a homogeneous market. In foreign trade, however, the world markets lack homogeneity on account of differences in climate, language, preferences, habits, customs, weights and measures etc.

   The behaviour of international buyers in each case would, therefore, be different. For instance, Indians have right-hand drive cars, while Americans have left-hand driven cars. Hence, the markets for automobiles are effectively separated. Thus, one peculiarity of international trade is that it involves heterogeneous national markets.

7. **Factor Immobility:** Another major difference between internal and international trade is the degree of immobility of factors of production like labour and capital which is generally greater between countries than within the country. Immigration laws, citizenship qualifications, etc., often restrict international mobility of labour. International capital flows are prohibited or severely limited by different governments.

Advantages of International Trade:

The following are the major gains claimed to be emerging from international trade:

1. **Optimum Allocation:** International specialisation and geographical division of labour leads to the optimum allocation of world's resources, making it possible to make the most efficient use of them.

2. **Gains of Specialisation:** Each trading country gains when the total output increases as a result of division of labour and specialisation. These gains are in the form of more aggregate production, larger number of varieties and greater diversity of qualities of goods that become available for consumption in each country as a result of international trade.

3. **Enhanced Wealth:** Increase in the exchangeable value of possessions, means of enjoyment and wealth of each trading country.

4. **Larger Output:** Enlargement of world's aggregate output.

5. **Welfare Contour:** Increase in the world's prosperity and economic welfare of each trading nation.

6. **Cultural Values:** Cultural exchange and ties among different countries develop when they enter into mutual trading.

7. **Better International Politics:** International trade relations help in harmonising international political relations.

8. **Dealing with Scarcity:** A country can easily solve its problem of scarcity of raw materials or food through imports.

9. **Advantageous Competition:** Competition from foreign goods in the domestic market tends to induce home producers to become more efficient to improve and maintain the quality of their products.

10. **Larger size of Market:** Because of foreign trade, when a country's size of market expands, domestic producers can operate on a larger scale of production which results in further economies of scale and thus can promote development. Synchronised application of investment to many industries simultaneously become possible. This helps industrialisation of the country along with balanced growth.

Disadvantages of International Trade:

When a country places undue reliance on foreign trade, there is a likelihood of the following disadvantages:

1. **Exhaustion of Resources:** When a country has larger and continuous exports, her essential raw materials and minerals may get exhausted, unless new resources are tapped or developed (e.g., the near-exhausting oil resources of the oil-producing countries).

2. **Blow to Infant Industry:** Foreign competition may adversely affect new and developing infant industries at home.

3. **Dumping:** Dumping tactics resorted to by advanced countries may harm the development of poor countries.

4. **Diversification of Savings:** A high propensity to import may cause reduction in the domestic savings of a country. This may adversely affect her rate of capital formation and the process of growth.

5. **Declining Domestic Employment:** Under foreign trade, when a country tends to specialize in a few products, job opportunities available to people are curtailed.

6. **Over Interdependence:** Foreign trade discourages self-sufficiency and self-reliance in an economy. When countries tend to be interdependent, their economic independence is jeopardised. For instance, for these reasons, there is no free trade in the world. Each country puts some restrictions on its foreign trade under its commercial and political policies.

Importance of International Trade

The buying and selling of goods and services across national borders is known as international trade. International trade is the backbone of our modern, commercial world, as producers in various nations try to profit from an expanded market, rather than be limited to selling within their own borders. There are many reasons that trade across national borders occurs, including lower production costs in one region versus another, specialized industries, lack or surplus of natural resources and consumer tastes.

One of the most controversial components of international trade today is the lower production costs of "developing" nations. There is currently a great deal of concern over jobs being taken away from the United States, member countries of the European Union and other "developed" nations as countries such as China, Korea, India, Indonesia and others produce goods and services at much lower costs. Both the United States and the European Union have imposed severe restrictions on imports from Asian nations to try to stem this tide. Clearly, a company that can pay its workers the equivalent of dollars a day, as compared to dollars an hour, has a distinct selling advantage. Nevertheless, American and European consumers are only too happy to lower their costs of living by taking advantage of cheaper, imported goods.

Even though many consumers prefer to buy less expensive goods, some international trade is fostered by a specialized industry that has developed due to national talent and/or tradition. Swiss watches, for example, will never be price-competitive with mass produced watches from Asia. Regardless, there is a strong market among certain consumer groups for the quality, endurance and even "snob appeal" that owning a Rolex, Patek-Philippe or Audemars Piguet offers. German cutlery, English bone China, Scottish wool, fine French silks such as Hermes and other such products always find their way onto the international trade scene because consumers in many parts of the world are willing to foster the importation of these goods to satisfy their concept that certain countries are the best at making certain goods.

One of the biggest components of international trade, both in terms of volume and value of goods is oil. Total net oil imports in 2005 are over 26 million barrels per day (U.S. Energy Information Administration figures) (Note: Imports include crude oil, natural gas liquids, and refined products.) At a recent average of $50 per barrel, that translates to $1billion, three hundred million, per day. The natural resources of a handful of nations, most notably the nations of OPEC, the

Organization of Petroleum Exporting Countries, are swept onto the international trade scene in staggering numbers each day, and consumer nations continue to absorb this flow. Other natural resources contribute to the movement of international trade, but none to the extent of the oil trade. Diamonds from Africa, both for industrial and jewelry use, wheat and other agricultural products from the United States and Australia, coal and steel from Canada and Russia, all flow across borders from these nations that have the natural resources to the nations that lack them.

Despite complaints about trade imbalances, effects on domestic economies, currency upheavals, and loss of jobs, the reality of goods and services continually crossing borders will not go away. International trade will continue to be the engine that runs most nations.

1.2 GROWTH AND TRADE WHEN GROWTH IS UNSPECIFIED

The issues of international trade and economic growth have gained substantial importance with the introduction of trade liberalization policies in the developing nations across the world. International trade and its impact on economic growth crucially depend on globalization. As far as the impact of international trade on economic growth is concerned, the economists and policy makers of the developed and developing economies are divided into two separate groups.

One group of economists is of the view that international trade has brought about unfavorable changes in the economic and financial scenarios of the developing countries. According to them, the gains from trade have gone mostly to the developed nations of the world. Liberalization of trade policies, reduction of tariffs and globalization have adversely affected the industrial setups of the less developed and developing economies. As an aftermath of liberalization, majority of the infant industries in these nations have closed their operations. Many other industries that used to operate under government protection found it very difficult to compete with their global counterparts.

The other group of economists, which speaks in favor of globalization and international trade, come with a brighter view of the international trade and its impact on economic growth of the developing nations. According to them developing countries, which have followed trade liberalization policies, have experienced all the favorable effects of globalization and international trade. China and India are regarded as the trend-setters in this case.

There is no denying that international trade is beneficial for the countries involved in trade, if practiced properly. International trade opens up the opportunities of global market to the entrepreneurs of the developing nations. International trade also makes the latest technology readily available to the businesses operating in these countries. It results in increased competition both in the domestic and global fronts. To compete with their global counterparts, the domestic entrepreneurs try to be more efficient and this in turn ensures efficient utilization of available resources. Open trade policies also bring in a host of related opportunities for the countries that are involved in international trade.

However, even if we take the positive impacts of international trade, it is important to consider that international trade alone cannot bring about economic growth and prosperity in any country. There are many other factors like flexible trade policies, favorable macroeconomic scenario and political stability that need to be there to complement the gains from trade.

There are examples of countries, which have failed to reap the benefits of international trade due to lack of appropriate policy measures. The economic stagnation in the Ivory Coast during the periods of 1980s and 1990s was mainly due to absence of commensurate macroeconomic stability that in turn

prevented the positive effects of international trade to trickle down the different layers of society. However, instances like this cannot stand in the way of international trade activities that are practiced across the different nations of the world.

In conclusion it can be said that, international trade leads to economic growth provided the policy measures and economic infrastructure are accommodative enough to cope with the changes in social and financial scenario that result from it.

1.3 FORMAL MODEL OF ECONOMIC GROWTH AND INTERNATIONAL TRADE

Formal model of economic growth

Theories and models

Classical growth theory

In classical (Ricardian) economics, the theory of production and the theory of growth are based on the theory or law of variable proportions, whereby increasing either of the factors of production (labour or capital), while holding the other constant and assuming no technological change, will increase output, but at a diminishing rate that eventually will approach zero. These concepts have their origins in Thomas Malthus's theorizing about agriculture. Malthus's examples included the number of seeds harvested relative to the number of seeds planted (capital) on a plot of land and the size of the harvest from a plot of land versus the number of workers employed. Criticisms of classical growth theory are that technology, an important factor in economic growth, is held constant and that economies of scale are ignored.

Natural rate of growth

According to Harrod, the natural growth rate is the maximum rate of growth allowed by the increase of variables like population growth, technological improvement and growth in natural resources.In fact, the natural growth rate is the highest attainable growth rate which would bring about the fullest possible employment of the resources existing in the economy.

Solow–Swan model

Robert Solow and Trevor Swan developed what eventually became the main model used in growth economics in the 1950s. This model assumes that there are diminishing returns to capital and labour. Capital accumulates through investment, but its level or stock continually decreases due to depreciation. Due to the diminishing returns to capital, with increases in capital/worker and absent technological progress, economic output/worker eventually reaches a point where capital per worker and economic output/worker remain constant because annual investment in capital equals annual depreciation. This condition is called the 'steady state'.

In the Solow–Swan model if productivity increases through technological progress, then output/worker increases even when the economy is in the steady state. If productivity increases at a constant rate, output/worker also increases at a related steady-state rate. As a consequence, growth in the model can occur either by increasing the share of GDP invested or through technological progress. But at whatever share of GDP invested, capital/worker eventually converges on the steady state, leaving the growth rate of output/worker determined only by the rate of technological progress. As a consequence, with world technology available to all and progressing at a constant rate, all countries have the same steady state rate of growth. Each country has a different level of GDP/worker

determined by the share of GDP it invests, but all countries have the same rate of economic growth. Implicitly in this model rich countries are those that have invested a high share of GDP for a long time. Poor countries can become rich by increasing the share of GDP they invest. One important prediction of the model, mostly borne out by the data, is that of conditional convergence; the idea that poor countries will grow faster and catch up with rich countries as long as they have similar investment (and saving) rates and access to the same technology.

The Solow–Swan model is considered an "exogenous" growth model because it does not explain why countries invest different shares of GDP in capital nor why technology improves over time. Instead the rate of investment and the rate of technological progress are exogenous. The value of the model is that it predicts the pattern of economic growth once these two rates are specified. Its failure to explain the determinants of these rates is one of its limitations.

Although the rate of investment in the model is exogenous, under certain conditions the model implicitly predicts convergence in the rates of investment across countries. In a global economy with a global financial capital market, financial capital flows to the countries with the highest return on investment. In the Solow-Swan model countries with less capital/worker (poor countries) have a higher return on investment due to the diminishing returns to capital. As a consequence, capital/worker and output/worker in a global financial capital market should converge to the same level in all countries. Since historically financial capital has not flowed to the countries with less capital/worker, the basic Solow–Swan model has a conceptual flaw. Beginning in the 1990s, this flaw has been addressed by adding additional variables to the model that can explain why some countries are less productive than others and, therefore, do not attract flows of global financial capital even though they have less (physical) capital/worker.

Endogenous growth theory

Unsatisfied with the assumption of exogenous technological progress in the Solow–Swan model, economists worked to "endogenize" (i.e., explain it "from within" the models) productivity growth in the 1980s; the resulting endogenous growth theory, most notably advanced by Robert Lucas, Jr. and his student Paul Romer, includes a mathematical explanation of technological advancement. This model also incorporated a new concept of human capital, the skills and knowledge that make workers productive. Unlike physical capital, human capital has increasing rates of return. Research done in this area has focused on what increases human capital (e.g. education) or technological change (e.g. innovation).

Unified growth theory

Unified growth theory was developed by Oded Galor and his co-authors to address the inability of endogenous growth theory to explain key empirical regularities in the growth processes of individual economies and the world economy as a whole. Endogenous growth theory was satisfied with accounting for empirical regularities in the growth process of developed economies over the last hundred years. As a consequence, it was not able to explain the qualitatively different empirical regularities that characterized the growth process over longer time horizons in both developed and less developed economies. Unified growth theories are endogenous growth theories that are consistent with the entire process of development, and in particular the transition from the epoch of Malthusian stagnation that had characterized most of the process of development to the contemporary era of sustained economic growth.

The big push

One popular theory in the 1940s was the big push model, which suggested that countries needed to jump from one stage of development to another through a virtuous cycle, in which large investments in infrastructure and education coupled with private investments would move the economy to a more productive stage, breaking free from economic paradigms appropriate to a lower productivity stage. The idea was revived and formulated rigorously, in the late 1980s by Kevin Murphy, Andrei Shleifer and Robert Vishny.

Schumpeterian growth

Schumpeterian growth is an economic theory named after the 20th-century Austrian economist Schumpeter. The approach explains growth as a consequence of innovation and a process of creative destruction that captures the dual nature of technological progress: in terms of creation, entrepreneurs introduce new products or processes in the hope that they will enjoy temporary monopoly-like profits as they capture markets. In doing so, they make old technologies or products obsolete. This can be seen as an annulment of previous technologies, which makes them obsolete, and destroys the rents generated by previous innovations. A major model that illustrates Schumpeterian growth is the Aghion–Howitt model.

Institutions and growth

According to Daron Acemoglu, Simon Johnson and James Robinson, the positive correlation between high income and cold climate is a by-product of history. Europeans adopted very different colonization policies in different colonies, with different associated institutions. In places where these colonizers faced high mortality rates (e.g., due to the presence of tropical diseases), they could not settle permanently, and they were thus more likely to establish extractive institutions, which persisted after independence; in places where they could settle permanently (e.g. those with temperate climates), they established institutions with this objective in mind and modeled them after those in their European homelands. In these 'neo-Europes' better institutions in turn produced better development outcomes. Thus, although other economists focus on the identity or type of legal system of the colonizers to explain institutions, these authors look at the environmental conditions in the colonies to explain institutions. For instance, former colonies have inherited corrupt governments and geo-political boundaries (set by the colonizers) that are not properly placed regarding the geographical locations of different ethnic groups, creating internal disputes and conflicts that hinder development. In another example, societies that emerged in colonies without solid native populations established better property rights and incentives for long-term investment than those where native populations were large.

Human capital and growth

Many theoretical and empirical analyses of economic growth attribute a major role to a country's level of human capital, defined as the skills of the population or the work force. Human capital has been included in both neoclassical and endogenous growth models.

A country's level of human capital is difficult to measure, since it is created at home, at school, and on the job. Economists have attempted to measure human capital using numerous proxies, including the population's level of literacy, its level of numeracy, its level of book production/capita, its average level of formal schooling, its average test score on international tests, and its cumulative depreciated investment in formal schooling. The most commonly-used measure of human capital is the level (average years) of school attainment in a country, building upon the data development

of Robert Barro and Jong-Wha Lee. This measure is widely used because Barro and Lee provide data for numerous countries in five-year intervals for a long period of time.

One problem with the schooling attainment measure is that the amount of human capital acquired in a year of schooling is not the same at all levels of schooling and is not the same in all countries. This measure also presumes that human capital is only developed in formal schooling, contrary to the extensive evidence that families, neighborhoods, peers, and health also contribute to the development of human capital. Despite these potential limitations, Theodore Breton has shown that this measure can represent human capital in log-linear growth models because across countries GDP/adult has a log-linear relationship to average years of schooling, which is consistent with the log-linear relationship between workers' personal incomes and years of schooling in the Mincer model.

Eric Hanushek and Dennis Kimko introduced measures of students' mathematics and science skills from international assessments into growth analysis. They found that this measure of human capital was very significantly related to economic growth. Eric Hanushek and Ludger Wobmann have extended this analysis. Theodore Breton shows that the correlation between economic growth and students' average test scores in Hanushek and Wößmann's analyses is actually due to the relationship in countries with less than eight years of schooling. He shows that economic growth is not correlated with average scores in more educated countries. Hanushek and Wößmann further investigate whether the relationship of knowledge capital to economic growth is causal. They show that the level of students' cognitive skills can explain the slow growth in Latin America and the rapid growth in East Asia.

Energy consumption and growth

Energy economic theories hold that rates of energy consumption and energy efficiency are linked causally to economic growth. A fixed relationship between historical rates of global energy consumption and the historical accumulation of global economic wealth has been observed. Increases in energy efficiency were a portion of the increase in Total factor productivity. Some of the most technologically important innovations in history involved increases in energy efficiency. These include the great improvements in efficiency of conversion of heat to work, the reuse of heat, the reduction in friction and the transmission of power, especially through electrification. "Electricity consumption and economic growth are strongly correlated". "Per capita electric consumption correlates almost perfectly with economic development.

Importance of International Trade

The buying and selling of goods and services across national borders is known as international trade. International trade is the backbone of our modern, commercial world, as producers in various nations try to profit from an expanded market, rather than be limited to selling within their own borders. There are many reasons that trade across national borders occurs, including lower production costs in one region versus another, specialized industries, lack or surplus of natural resources and consumer tastes.

One of the most controversial components of international trade today is the lower production costs of "developing" nations. There is currently a great deal of concern over jobs being taken away from the United States, member countries of the European Union and other "developed" nations as countries such as China, Korea, India, Indonesia and others produce goods and services at much lower costs. Both the United States and the European Union have imposed severe restrictions on

imports from Asian nations to try to stem this tide. Clearly, a company that can pay its workers the equivalent of dollars a day, as compared to dollars an hour, has a distinct selling advantage. Nevertheless, American and European consumers are only too happy to lower their costs of living by taking advantage of cheaper, imported goods.

Even though many consumers prefer to buy less expensive goods, some international trade is fostered by a specialized industry that has developed due to national talent and/or tradition. Swiss watches, for example, will never be price-competitive with mass produced watches from Asia. Regardless, there is a strong market among certain consumer groups for the quality, endurance and even "snob appeal" that owning a Rolex, Patek-Philippe or Audemars Piguet offers. German cutlery, English bone China, Scottish wool, fine French silks such as Hermes and other such products always find their way onto the international trade scene because consumers in many parts of the world are willing to foster the importation of these goods to satisfy their concept that certain countries are the best at making certain goods.

One of the biggest components of international trade, both in terms of volume and value of goods is oil. Total net oil imports in 2005 are over 26 million barrels per day (U.S. Energy Information Administration figures) (Note: Imports include crude oil, natural gas liquids, and refined products.) At a recent average of $50 per barrel, that translates to $1billion, three hundred million, PER DAY. The natural resources of a handful of nations, most notably the nations of OPEC, the Organization of Petroleum Exporting Countries, are swept onto the international trade scene in staggering numbers each day, and consumer nations continue to absorb this flow. Other natural resources contribute to the movement of international trade, but none to the extent of the oil trade. Diamonds from Africa, both for industrial and jewelry use, wheat and other agricultural products from the United States and Australia, coal and steel from Canada and Russia, all flow across borders from these nations that have the natural resources to the nations that lack them.

Despite complaints about trade imbalances, effects on domestic economies, currency upheavals, and loss of jobs, the reality of goods and services continually crossing borders will not go away. International trade will continue to be the engine that runs most nations.

Formal model International trade

I. Heckscher-Ohlin Theorem of International Trade!

As a matter of fact, Ohlin's theory begins where the Ricardian theory of international trade ends. The Ricardian theory states that the basis of international trade is the comparative costs difference. But he did not explain how after all this comparative costs difference arises.

Ohlin's theory explains the real cause of this difference. Ohlin did not invalidate the classical theory but accepted the comparative advantage as the cause of international trade and then tried to examine and analyse it further in a moral and logical manner. Thus, Ohlin's theory supplements but does not supplant the Ricardian theory.

Ohlin states that trade results on account of the different relative price of different goods in different countries. The relative price commodity difference is the result of relative costs and factor price differences in different countries.

Differences in factor prices are due to differences in factor endowments in different countries. It, thus, boils down to the fact that trade occurs because different countries have different factor endowments. Ohlin's theory is, therefore, also described as the factor endowment theory or the factor proportions analysis.

Ohlin's theory is usually expounded in terms of a two-factor model with labour and capital as the two factors of endowments. The gist of the theory is: what determine trade are differences in factor endowments. Some countries have plenty of capital; others have an abundance of labour. The Heckscher-Ohlin theorem is: countries which are rich in labour will export labour intensive goods and countries which have plenty of capital will export capital-intensive products.

Ohlin's Simple Model:

Ohlin makes the following assumptions of a simplified static model to the analysis:

1. There are two countries A and B.

2. There are two factors, labour and capital.

3. There are two goods; X and Y of which X is labour-intensive and Y is capital-intensive.

4. Country A is labour-abundant country B is capital-rich.

5. There is perfect competition in both the commodity and factor markets.

6. All production functions are homogeneous of the first degree. Hence there are constant returns to the scale.

7. There are no transport costs or other impediments to trade.

8. Demand conditions are identical in both the countries.

These assumptions have been made to explain the meaning of comparative price advantage or relative price difference and to deduce the major propositions of the factor endowment theory.

Given these assumptions, Ohlin's thesis contends that, country exports goods which use relatively a greater proportion of its relatively abundant and thus cheap factors. It is implied that trade occurs because there are differences in relative commodity prices caused by differences in relative factor prices (thus a comparative advantage) as a result of differences in the factor endowments among the countries.

The "relative factor abundance" in the thesis has two conceptions (a) the price criterion of relative factor abundance; and (b) the physical criterion factor abundance.

The Price Criterion of Relative Factor Abundance:

According to the price criterion, a country having capital relatively cheap and labour relatively dear is regarded as relatively capital-abundant, irrespective of its ratio of total quantities of capital to labour in comparison with the other country. In symbolic terms, when:

(PK/PL) A < (PK/PL) B

Country A is relatively capital-abundant. (Here P stands for factor price and K for capital, L for labour, A and B for the two respective countries.) Ohlin's theorem may be verified diagrammatically in Fig. 1.1.
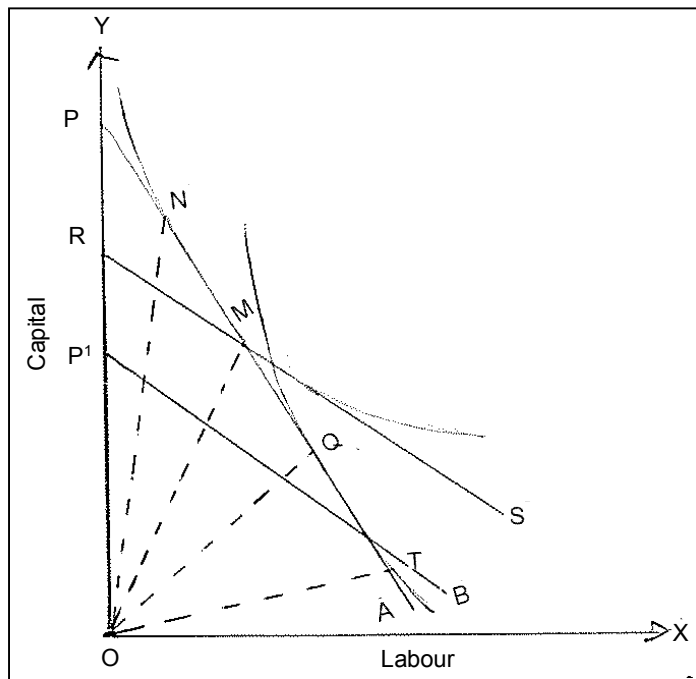
Fig. 1.1: The Price Criterion of Relative Factor Abundance

Fig. 1.1 depicts xx and yy isoquants (equal product curves) for two goods X and Y respectively. These two isoquants intersect only once so that the goods X and Y can be classified unambiguously according to factor intensity.

It is easy to see that x is relatively capital- intensive, since the amount of capital is represented on the vertical axis. Similarly, good Y is labour-intensive, since the amount of labour is represented on the horizontal axis. If the isoquants intersect more than once, good X will not always be capital intensive relatively to Y.

Let us assume that there are two countries A and B A is the relatively capital-abundant and B is labour abundant. Now all possible factor combinations (of labour and capital) that can produce the given amounts of two goods X and Y in each country can be read off from the two isoquants.

Economically, the most efficient factor combination, however, depends upon the relative factor prices. To consider this, let us assume that the slope of the line P represents the relative factor prices in country A, i.e., (PK/PL) A.

The line PA is tangent to yy isoquant at point Q. Similarly, xx isoquant is also tangential to PA at point Z. Since we have assumed that (PK/PL) A < (PK/PL) B i.e., capital in A is relatively cheaper, the slope of the line representing relative factor prices (PK/PL) in B must be less than that of PA.

Thus, line P'B is supposed to represent factor   ratio in B. Line P'B is tangent to the isoquant yy at point T. Now, the line RS is drawn parallel to P'B such that it becomes tangent to the isoquant xx at point M. Line RS lies above the line P'B implying that OR intercept of RS on the capital axis is greater than OP', the intercept of P'B' on the same axis.

Under these assumptions, it appears that the equilibrium factor proportions are OZ for good X and OQ for Y in country A. That means, the cost of producing the given amount of X in country A is the cost of using the quantities of two factors _ labour and capital_ indicated by OZ at relative factor prices given by PA.

This is equal to the cost of using capital in the amount of OP (the point at which PA cuts the capital axis). Similarly, the cost of producing the given amount of Y in country A is equal to the cost of using capital in the same quantity (OP).

In country B, similarly, the equilibrium factor proportions are OM for X and OOT for good Y. The relative factor prices are shown by P'B (or RS). And therefore, the costs of producing the given amounts of X and Y (as assumed for country A) in this country are, in terms of capital, OR and OP respectively. Evidently, in country B the given amount of goods X is more expensive than the given amount of good Y.

Comparing the relative costs of the equal amounts of the two goods X and Y in the countries A and B, we thus find good X is relatively cheaper in A and good Y is relatively cheaper in B. That means, the capital-abundant country has a comparative cost advantage in producing a capital-intensive good. So with the opening of trade with the other country, it must export such goods only. Likewise, the labour abundant country must export labour-intensive goods.

This is how the Heckscher-Ohlin theorem confines to the position that: a country exports goods produced relatively cheaper by using a relatively greater proportion of its relatively abundant factor. Though this conclusion has been inferred without consideration of demand conditions or factor endowments, it may be said that the data about relative factor prices do presuppose the given demand conditions and factor endowments in the two countries, obviously because the prices of factors are determined by the interaction of the supply of and demand for factors. However, the demand for factors, being a derived demand, depends, along with the technical conditions of production, on the demand for final commodities produced by them.

The Physical Criterion of Relative Factor Abundance

Viewing the physical criteria, strictly implying relative factor endowments in physical quantities, a country is relatively capital-abundant only if it possesses a greater proportion of capital to labour as compared to the other country. To put it symbolically, then

$(K/L)_A > (K/L)_B$

Country A is relatively capital-abundant, whether or not the ratio of the prices of capital to labour is lower than in country B.

Using the price criterion of relative factor abundance, Ohlin's conclusion can be traced immediately from the assumptions made above, without consideration of demand conditions or factor proportions. But if the physical criterion is viewed, demand conditions are to be considered in order to establish the theorem.

Ohlin, it seems, chooses the former criterion of determining the relative factor abundance and relative cheapness inter-changeably; but, he also lays down that the difference in factor prices is due to the difference in the relative endowment of the factors between countries. He thus asserts that once the relative physical quantities of each productive factor endowed in both the countries are known, the relative factor-price structure for each country can be easily inferred.

Evidently, a country possessing relatively abundant capital will have a factor price structure such that capital will be cheaper as compared to labour (relatively scarce factor). It follows, thus, that a relatively cheaper factor in a country implies that it is relatively abundant.

Hence, considering physical quantities and scarcities rather than economic scarcities, Ohlin assumes that the supply aspect has a greater significance than demand in determining the relative factor prices in a country.

Ohlin, then, stresses the point that the factor-price structure will be different in two countries when the factor endowments are in differing proportions. Comparative advantages thus arise when the capital-abundant country (A) exports capital-intensive goods and imports labour- intensive goods and the labour abundant country (B) exports labour intensive goods and imports capital- intensive goods; because, $(PK/PL)_A < (PK/PL)_B < (PK/PL)_A$.

If relative factor endowments are identical in two countries and commodity factor intensities are also the same, there will be no comparative price differences $(PK\backslash PL)_A = (PK/PL)_B$; there is no comparative cost difference); hence no theoretical basis for international trade.

The Gist of the Theory

In a nutshell, we can interpret Ohlin's theory as under:

1. Two countries A and B will involve themselves in trade, if relative price of goods X and Y are different. To quote Ohlin, "the immediate cause of inter-regional trade is always that goods can be bought cheaper from outside in terms of money than they can be produced at home."

2. Under comparative market conditions, prices are equal to average costs. Thus, relative price differences are an account of cost differences.

3. Cost differences are taking place because of the factor price differences in the two countries.

4. Factor prices are determined by factors' supply and demand. Assuming a given demand, it follows that a capital-rich country has a cheaper or a lower capital price and a labour- abundant country has a relatively lower labour price.

   In our model, thus, factor-price ratio Price of Labour/Price of Capital in country A is lower than the ratio Price of Labour/Price of Capital in B.

5. Ohlin states that each region has advantages in the production of goods into which enter considerable amounts of factors abundant and cheap in that region.

   Since X is a labour-intensive product in country A, it will be cheaper than in B, because labour is relatively cheaper in A. Similarly Y, the capital- intensive product in country B, is relatively cheaper as B is a capital-rich country and the price of capital is relatively lower.

6. It follows that country A will tend to specialise in the production of X and export its surplus. Likewise, B will specialise in Y and export it.

   In short, a capital-rich and capital-cheap country exports capital intensive products while a labour-abundant and labour-cheap country exports labour-intensive products.

   It also follows that trade takes place because of factor-endowment difference and their international immobility. Sodersten writes, "In a world where factors of production cannot move among countries but where goods can move freely, trade in goods can be viewed as a substitution for factor mobility."

   Thus, Ohlin's theory concludes that:

   (i) The basis of internal trade is the difference in commodity prices in the two countries.

(ii) Differences in commodity prices are due to cost differences which are the results of differences in factor endowments in the two countries.

(iii) A capital-rich country specialises in labour-intensive goods and exports them. A labour-abundant country specialises in labour-intensive goods and exports them.

Ohlin gives the illustration of Australia and England in support of his theory. In Australia, land is plenty and cheap, while labour and capital are scanty and dear. So, Australia specialises in goods like wheat, wool, meat, etc., which are relatively produced cheaper here on account of their specific production functions requiring a larger proportion of land but little use of capital. On the other hand, England is capital-rich but labour- poor.

Thus, goods requiring plenty of capital will tend to be relatively cheaper in England. Examining the trade between England and Australia, it may be observed that Australia imports manufactured or capital-intensive goods from England and exports wheat, meat, etc. Thus, Australia's import is indirectly an import of scarce factors and her export is indirectly an export of factors in abundant supply.

A Further Explanation:

It should be noted that according to Ohlin's theory, relative price differences lead to absolute price differences when a rate of exchange is settled. It is only when an exchange rate between two currencies has been established that one can ascertain whether a factor is cheaper or dearer in region A than in region B.

We may illustrate these points as in Table 1.1 below:

Table 1.1: Comparison of factor Price is two regions with different Currencies

	Factor Price per unit in Regions		Factor price in A in terms of B's currency (Rs.) when the rate of ---- change equal to	
Factors of production	Region B	Region A	$1 = Rs. 5 Rs.	$1 = Rs. 7.50 Rs.
1	2	3	4	5
P	8	1	5	1.50
Q	12	2	10	1.5
R	14	3	15	22.50
S	18	4	20	30

From the above table, we find that there are four factors, P, Q, R, and S in both the regions (A and B). Columns (2) and (3) denote factor prices in B and A in their respective currencies, rupees and dollars. It is clear that in both the regions, P is the cheapest, while S is the dearest factor. However, merely looking at columns (2) and (3), it is not possible to detect which of the factors are relatively cheaper in or dearer in the two regions.

For this, we must find out the absolute price difference between the two regions. This can be done by translating the factor prices of one region in terms of the other region, in view of the prevailing rate of exchange. Suppose the rate of exchange is $1 = Rs.5; then we can express the factor prices in region A in terms of B's currency, as in column (4).

Comparing columns (2) and (4) we find that factors P and Q are relatively cheaper in region A, while R and S factors are relatively cheaper in region A. But if we assume that the rate of exchange is $1 = Rs. 5 i.e., A's currency commands better value in the world market, then we find from column (5) and comparing it with column (2) that only P seems to be cheaper in region A while the rest of the factors are cheaper in region B.

Thus, in the first case, region B will concentrate on the production of those goods which employ large amounts of R and S factors, while region A will produce goods requiring more use of factors P and Q. In the second case, however, region A can produce relatively cheaper only those goods which require more employment of factor P, while region B can produce all other goods containing factors Q, R and S cheaper.

It follows that each region will specialise in and export "cheap factor-bounded commodities" and import "dear factor-bounded commodities." Thus, absolute price differences known from the exchange rates indicate which of the factors are cheap and which are dear in each region and consequently, in what commodities each region will specialise. It should be remembered that the rate of exchange does not determine the relative cheapness or dearness (or abundance or scarcity) of factors between regions. It only indicates a fact.

Ohlin further points out that the rate of exchange and value of inter-regional or international trade are determined by the conditions of reciprocal demand, i. e., by all the basic elements of pricing, in all regions.

Ohlin claims that this theory and conclusions drawn from the simplified model can hold true even by removing the restrictive assumptions of the model and making it more complex akin to reality.

He maintains that:

1. The theory can be extended to any number of regions instead of two, without making any change in the methods or altering the conclusions, but this would only make the theory more complex.

2. For international trade, it is not necessary that two regions should have disproportionate factor supply. Even if two regions have identical factor units, there is the possibility of specialisation in the two regions because of the existence of a larger market (due to foreign trade) which will permit economies of large scale.

3. There may be qualitative differences in the different factors in the two regions. This may render it difficult to compare the relative differences in the two regions. But this difficulty can be solved by classifying all these factors under different groups, i.e., by the stratification of factors for purposes of inter-regional comparison. Moreover, since the theory is based on the general theory of value, demand and supply are important for comparison, and hence it is not a necessary condition to assume that factors are homogeneous in both the regions.

4. In the initial analysis, transport costs were ignored. But we can easily take these into consideration and find out how they will reduce trade and weaken its effect upon prices. In fact, transport costs and other impediments to trade come in the way of full factor price equalisation tendency of the trade.

5. Another assumption is of constant cost. This is also not very essential for the validity of the theory. Firms can work in diminishing costs or increasing returns in both the countries and yet there may be differences in the relative prices of commodities in the two regions.

Thus, the basis of international trade still exists. Diminishing costs or increasing returns increase the scope of international specialisation and trade. But the volume of international trade will be smaller if firms work under diminishing returns or increasing costs in the two regions.

We however, find that Ohlin did not overcome at least the following two assumptions underlying his theory:

(i) The assumptions of full employment, and

(ii) Of perfect competition.

But this is not a very serious drawback. For, until recently, economic analysis was based on these assumptions.

In fact, Ohlin could not have based his theory of international trade without these assumptions. If we try to give up the assumption of full employment, we will have to take into account the effect of cyclical fluctuations on employment and the level of income.

This will make the theory very complicated. Further, Ohlin seeks to extend the principles of general equilibrium analysis to the theory of international trade. But the general theory of value itself is based on the assumption of perfect competition; hence there was no alternative for Ohlin but to base his theory on the assumption of perfect competition.

However, in actual practice, competition is not perfect because of the emergence of international monopoly, absence of free trade or other international impediments to trade, etc. The pattern of international trade, in practice, therefore, gets vitiated as a result of the absence of free trade in the world. But it is not possible for a pure theory of international trade to take into account all these factors at a time.

Thus, barring the assumptions of full employment and perfect competition, all other assumptions are omitted by Ohlin. In this way his theory is better and more acceptable than the classical theory of international trade.

II. Factor-Price Equalisation Theorem

The factor-price equalisation theorem is an important corollary derived from the Heckscher-Ohlin factor-proportions analysis.

Having explained the meaning of comparative price advantages as the basis of international trade, Ohlin proceeds to analyse the effects of international trade on factor prices in a general equilibrium system.

The basic contention of the Heckscher-Ohlin theorem, as has been seen in the previous sections, is that: factor- intensity difference in the production functions to two goods, in conjunction with the differing factor endowments of the two countries, accounts for the international difference in comparative costs, causing differences in the relative commodity prices.

According to Ohlin, thus, trade takes place when relative prices of goods differ between countries and continues until these relative differences (ignoring transport costs) have been eliminated. In the absence of transport costs or other impediments (such as tariffs) to trade, the most immediate effect of international trade is that it would equalise relative commodity prices in all regions.

The commodity price equalisation tendency is inherent, because the opening of free trade between two countries tends to eliminate the pre-trade differences in the comparative costs. As the volume of trade increases, comparative costs difference between the two countries diminishes, so that differences in relative prices become small.

Apparently, the relative commodity prices would become equal when the relative factor prices are equalised. Thus, the most significant consequence of free trade is that it tends to bring about equalisation of factor prices.

The theorem of factor-price equalisation thus contends that: fundamentally, international trade in commodities acts as a substitute of the mobility of factors between countries. When the factors of production are completely immobile internationally, but goods are freely exchanged between countries, then the prices of these factors tend to become equal (both relatively and absolutely) in the countries concerned.

Ohlin realising this tendency argues that in practice when factors lack international mobility in the physical sense, the same is implied in the exchange of goods produced by these factors. When a country exports capital-intensive goods in exchange, it indirectly exports its abundant/cheap capital and imports scarce/dear labour.

Under trade, thus, the factors concerned move in the form of goods. International trade in commodities as such acts as a substitute for the mobility of factors between countries. It therefore, follows that free commodity trade between countries has an effect similar to that of free international mobility of factors of production, i. e., a tendency to make factor prices equal internationally.

An Exposition:

In specific terms, the tendency of factor price equalisation as a result of international trade follows from the fact that export will raise the demand and thus the price of the abundant and cheap factors, and import will reduce the demand and thus the price of the scarce and expensive factors. To elucidate this point, let us take a very simple case of two regions A and B and two factors, labour, and capital. Let us assume that capital is relatively abundant and cheap in region

A, while labour is relatively abundant and cheap in region B. Thus, region B with an abundant supply of labour but a scant supply of capital finds it advantageous to import goods requiring much capital. Since they can be more cheaply produced 'abroad' in region A, and to export goods embodying much labour.

In region B, industries using great quantities of capital will be reduced or stopped; hence, the demand for capital will decrease in this region. Thus price of the scarce factor will fall (its supply being the same with the reduced demand).

On the other hand, in this region, industries that require a large amount of labour will expand, so that the demand for labour will increase. With the increasing demand, this abundant factor — labour will now become relatively scarce.

Thus its price will rise. In short, as a result of international trade the scarcity of capital is reduced and that of labour is increased; hence, the price of the former will fall and that of the latter will rise in region B. Thus, the relative factor price (PK/PL) changes in country B, so that capital will now be substituted for labour in both the industries, labour-intensive and capital-intensive.

In region B, the opening up to trade, as such tends to reduce the disparity between the returns to the factors of production that existed in the pre-trade situation, when trade results in cheapening of

the relatively expensive-scarce factor and an increase in the returns of the relatively cheap-abundant factor. (For with a relative rise in the capital-labour ratio in country B, $(K/L)_B$ the marginal product of labour rises, as does the return to labour, the relatively cheap factor. Correspondingly, the return to capital, the relatively dear factor, falls.

Likewise, region A which has plenty of capital but scarce labour, will import goods requiring much of labour and export goods embodying much of capital. Hence, its concentration on industries using much capital means greater relative scarcity of capital and less relatively scarcity of labour.

Evidently, in both the regions the factor that is relatively abundant becomes more in demand as a result of international trade, whereas demand for the scarce factor falls and it yields relatively a lower reward (price) than before. This reasoning holds good for a greater number of factors also.

As Ohlin elucidated the point, let us assume that some of the factors $(X_1, x_2 \ldots x_1)$ are relatively abundant in A, thus, being cheaper here than in region B. Similarly, the rest of factors $(x_1 \ldots x_n)$ are relatively scarce and dearer in A but cheaper in B.

After opening up of trade, the demand for factors cheaper in region A than in B increases; consequently their prices rise in A but these very factor's demand in region B contracts and their price decreases. Similarly, factors that are relatively dearer in A than in B become less in demand, so that their prices fall there, while the reverse happens in the case of the same factors in B.

As a matter of fact, the relative scarcity of the productive factors is reduced in both the regions on account of international trade, which leads to equalisation of factor prices, implying that the real factor prices must be exactly the same in both the countries.

A Graphical Representation:

By using the geometrical device of the box diagram we may illustrate the factor-price equalisation theorem as in Fig. 1.2.
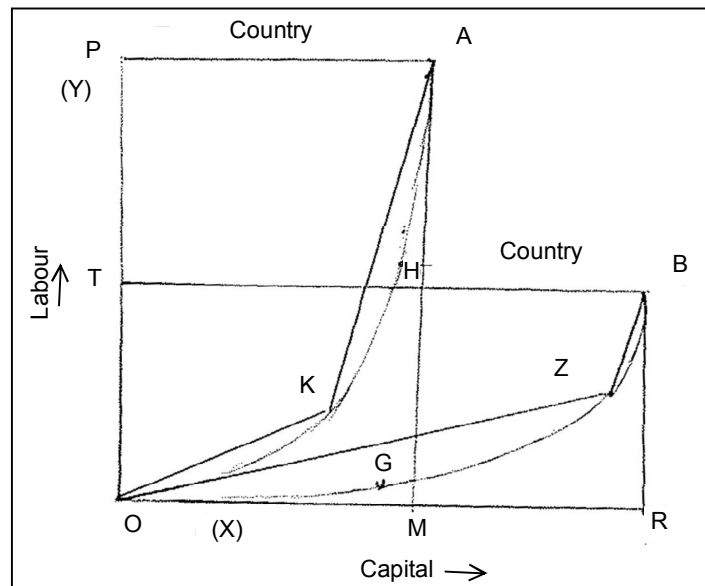

Fig 1.2: Factor – Price Equalisation

In Fig.1.2 OA represents resources diagonal of country A, showing that it is heavily endowed with labour. OB represents the resources diagonal of country B, indicating that it is capital rich. OKHA is country A's efficiency locus or the contract curve. Pre-trade equilibrium of country A is at point H in view of its relative demand for goods X and Y.

Similarly, OGZB is country B's efficiency locus and Z its pre-trade equilibrium position. See that line OH is closer to the labour axis than line OG, implying thereby that country A adopts more labour- intensive techniques in producing X than country B. Likewise, AH is closer to the labour axis than BZ. So, in producing V also, country A resorts to relatively more labour-intensive techniques than country B. Conversely, country B adopts capital-intensive techniques.

When trade occurs between A and B, country A tends to move to K on its contract curve. It may also be noticed that OK and OZ fall on the same straight line and depict the same angle with labour and capital axis. This means now countries A and B have identical production functions of X. Further, AK being parallel to BZ, it appears that A and B have identical production of Y.

Before, trade factor-intensities employed by A and B in producing X and Y were different. A had labour- intensity and B had capital-intensity, as the former being labour-abundant and the latter being capital- rich in factor endowments. This reflects factor prices being different in the two countries, labour being cheaper in A and capital being cheaper in B.

After trade, however, when an equilibrium position is reached, factor intensities in both the countries tend to be equal which obviously implies factor price equality.

Ohlin states that: "the mobility of goods to some extent compensates the lack of inter-regional mobility of the factors. The tendency towards equalisation also of the prices of the factors of production means a better use of them and thus a reduction of the advantages arising from the unsuitable geographical distribution of the productive factors."

Ohlin, however, frankly admits that, in reality, there is no complete factor price equalisation. "It is not worthwhile to analyse in detail why full equalisation does not occur; for, when the costs of transport and other impediments to trade have been introduced into the reasoning, such an equalisation is in any case obviously impossible."
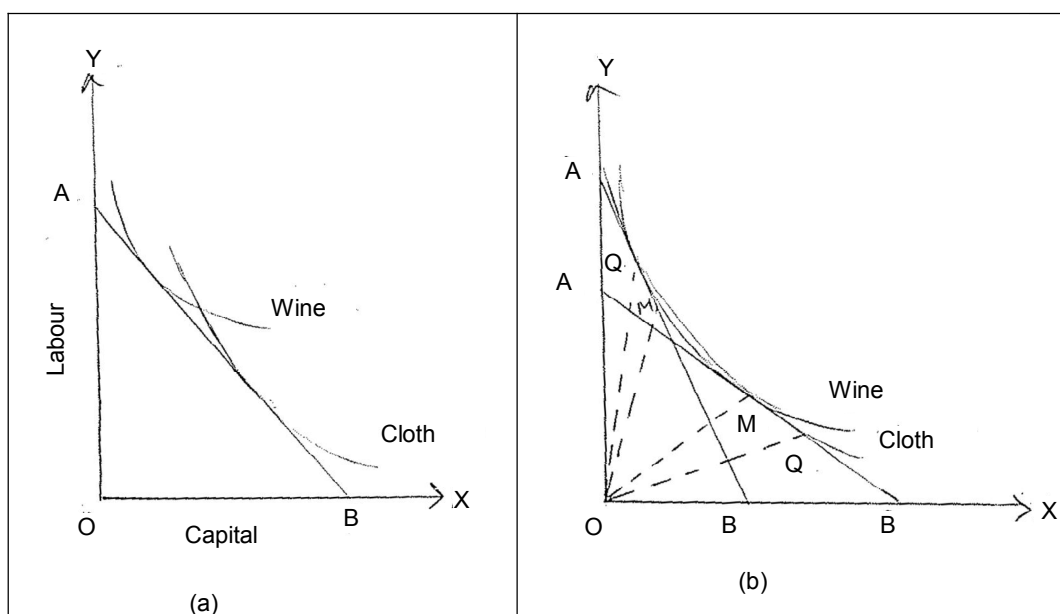

Fig. 1.3: Learner's Illustrations Factors – Price Equation

Learner's Illustration of Factor-Price Equalisation:

Professor Learner has worked out a simple graphical method of illustrating factor price equalisation. In this regard, he uses a single isoquant describing the production functions of the two goods [See Fig. 1.3 (a)]. Such isoquants for the two goods are taken which represent their relative prices or the quantities in which they are exchanged after trade is established.

Under the assumption of linear homogeneous production functions, the shape of successive isoquants indicating larger quantities is obviously identical. Hence, the expansion path is a straight line denoting larger and larger outputs at a given factor price.

Further assuming perfect competition and no transport cost, the units chosen express commodity prices which are identical in both the countries after trade. As such, Fig. 1.3 panel (a) is applicable to both the countries. (Here we have taken England and Portugal.)

From the figure, it follows that there can be only one factor price ratio, as represented by the line or tangency (FP) to the two isoquants. Apparently, factor- price equalisation theorem is established at this point.

If, however, the isoquants cut each other more than once as in Fig. 1.3, panel (b), the theorem loses ground due to factor intensity reversal. Under this situation, a good scope for factor substitution remains in at least one of the commodities, which would allow the same commodity prices to prevail in that two countries at differing factor prices.

In Fig. 1.3 (b) the production function for wine is as in Fig. 1.3(a), but in the former there is enough scope for factor substitution in cloth. Under this situation, England with a high capital/labour ratio may produce cloth with the factor proportions denoted by the ray from the origin OQ, and wine with the proportions OM, fetching a factor price FP. Here cloth is relatively capital-intensive.

In Portugal, however, labour is substituted for capital in producing cloth, and with production at M and Q', cloth is labour-intensive while wine is capital- intensive, so that factor prices would differ. Moreover, it is also difficult to say from factor endowments which country will export which goods.

Limitations of the Theorem: Assumption Underlying the Factor-Price Equalisation Theorem:

It must be noted that under certain limited conditions only, this tendency towards factor-price equalisation will be carried to the point where factor prices are fully equalised.

In other words, the factor-price equalisation theorem is based on the following assumptions:

(i)   There are quantitative differences of factors in different regions, no qualitative differences.

(ii)   Production functions of different products are different, requiring different proportions of different factors in producing different goods.

(iii) There is perfect competition in the commodity markets as well as in the factor markets in all the regions.

(iv)   There are no restrictions on trade, that is, free trade policy is followed by all the countries.

(v)   The consumer's preferences as well as the demand patterns and positions are unchanged.

(vi)   There are stable economic and fiscal policies in the participating nations.

(vii) The transport cost element is ignored.

(viii) Technological progress in different regions is identical.

(ix)   There are constant returns to scales in each region.

    (x)   There is perfect mobility of factors.

  (xi)   There is tendency towards complete specialisation.

Under these assumptions only the theorem holds that free trade between countries tends to reduce the original factor price inequality and a state of complete specialisation in effect leads to complete factor price equality.

Comparison between Classical Theory and Modern Theory of International Trade

Modern theory of international trade differs from the classical comparative cost theory in many ways and is also superior to the latter.

   (i)   According to the classical economists, there was need for a separate theory of international trade because international trade was fundamentally different from internal trade. Heckscher and Ohlin,' on the other hand, felt that there was no need for a separate theory of international trade because international trade was similar to internal trade. The difference between the, two was one of degree, and not of kind.

  (ii)   The classical economists explained the phenomenon of international trade in terms of the old, discredited labour theory of value. The modern theory explained international trade in terms of the general equilibrium theory of value.

 (iii)   The classical theory attributes the differences in the comparative advantage of producing commodities in two countries to the differences in the productive efficiency of workers in the country. The modern theory attributes the differences in the comparative advantage to the differences in factor endowments.

  (iv)   The classical theory presents a one-factor (labour) model, while the modern theory presents a more realistic multi-factor (labour and capital) model.

  (v)   The classical theory never took into account the factor price differences, while the modern theory considers factor price differences as the main .cause of commodity price differences, which, hi turn, provides the basis of international trade,

  (vi)   The classical theory does not provide the cause of differences in comparative advantage. The modern theory explains the differences in comparative advantage in terms of differences in factor endowments.

 (vii)   The classical theory is a single market theory of value, while the modern theory emphasizes the importance of space element in international trade and involves a multi-market theory of value.

(viii)   The classical theory is a normative or welfare-oriented theory, whereas the modern theory, is a positive theory. The classical theory tries to demonstrate the gains from international trade, while the; modern theory concentrates on the basis of trade.

III. The Rybczynski Theorem

In both Heckscher-Ohlin theory and the factor- price equalisation theory, the assumption was taken that the factor endowments were fixed. T.M. Rybczynski, published a paper in 1955 to investigate the effect of an increase in the quantity of a factor of production upon production, consumption and the terms of trade.

This theorem states that the increase in the supply of one of the factor of production, other factors remaining the same, causes the output of the good using the accumulating factor intensively to

increase and the output of the other good to decrease in absolute amount, provided that commodity and factor prices remain unchanged. Suppose in a labour- surplus country, the supply of labour gets increased. It will lead to an increased output of the labour- intensive commodity, say cloth, and reduced output of the capital- intensive commodity, say steel.

Assumptions of the Rybczynski Theorem:

The Rybczynski theorem is based upon the following main assumptions:

   (i)   The trade takes place between two countries. The case of only one of the two countries will be discussed here.

  (ii)   The given country is labour-abundant and capital-scarce.

  (ii)   This country produces two commodities— cloth and steel.

  (iv)   The production of these commodities requires two factors—labour and capital.

  (v)   Capital and labour are perfectly mobile, perfectly divisible and substitutable in some degree.

  (vi)   Cloth is labour-intensive good and steel is a capital-intensive good.

 (vii)   There are the conditions of perfect competition in the product and factor markets.

(viii)   The production functions related to both the commodities are homogenous of the first degree. That implies constant returns to scale in production.

  (ix)   The factor and commodity prices are constant.

  (x)   The supply of the factor labour expands while that of capital remains the same.

It is now clear that Rybczynki makes departure from H-O theorem and factor-price equalisation theorem in respect of his abandoning the assumption of fixed factor supplies. He discusses the effect of an increased supply of the factor in which the country is abundant upon production, factor and commodity prices and the terms of trade. His theorem is explained through Fig.1.4.
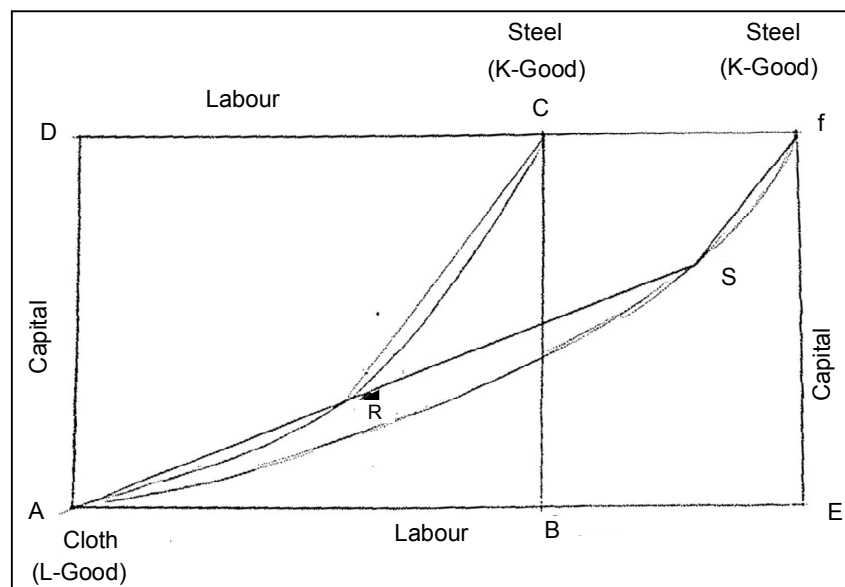

Fig. 1.4: Rybczynski Theorem

ABCD is the Edgeworth box concerning the given country. It shows that this country is labour-abundant and capital-scarce. A is the origin of the commodity cloth which is labour- intensive (L-good). C is the origin for the good steel which is capital- intensive (K-good). AC is the non-linear contract curve sagging downwards. The production takes place at R. The K-L ratio in cloth is measured by the slope of the line AR and K-L ratio in steel is measured by the slope of the line RC.

It is now supposed that the supply of labour is increased by BE, capital stock remaining the same, so that the new box diagram is AEFD. Now A and F are the points of origin for the goods cloth and steel respectively. AF is the non-linear contract curve. A is the origin for the L-good cloth and F is the origin for K-good steel. Production, in this case, takes place at S. The K-L ratio in cloth is measured by the slope of the line AS and the K-L ratio in steel is measured by the slope of the line SF.

The factor-intensity in the two commodities remains unchanged at the points R and S. Since R and S lie on the same straight line AS, the K-L ratio in cloth remains unchanged. On the other hand, the line RC is parallel to SF. Since the slope of RC and SF are equal, there is no change also in the K-L ratio in the capital-intensive commodity steel.

When the factor- intensity in both the commodities remains the same, there will be no change in the prices of the two factors. It shows that the Rybczynaski theorem refutes the possibility of factor price equalisation. As the increase in the supply of labour in the labour-abundant country and increase in capital stock in the capital-abundant country leaves the prices of two factors unchanged, there can be no equalisation in the factor prices.

When there is no change in the prices of the factors of production, the prices of two commodities will also remain the same as before.

The most significant effect of an increase in the supply of factor will be upon the volume of production. The distance of the point of production equilibrium from origin measures the quantity produced of a commodity. In case of cloth, the original production is measured by the distance AR. Subsequently, it is measured by the distance AS. Since AS is greater than AR, it signifies an increase in the production of cloth after there is an increase in the supply of labour.

In case of steel, the production at R was originally indicated by the distance RC and subsequently it is measured by the distance SF. Since SF is shorter than RC, it follows that the production of K-good steel decreases after there is an expansion in the supply of labour in this country. Thus the conclusion can be drawn that the increased supply of one factor, keeping the other unchanged, will raise in absolute amount the production of good intensive in the increasing factor, while the production of the other good will get reduced in absolute amount.

The above analysis suggests that the commodity prices of the two commodities remain constant. This can happen only if the prices of two factors remain constant. It implies that the capital- labour ratio in the two industries remains constant. But how can all this be possible when the quantity of one of the two factors goes on increasing.

In this connection, it may be stated that increase in the supply of labour will result in the entire additional labour going into the labour-intensive industry. There will also be diversion of labour from the capital- intensive industry (steel). Along with the diversion of labour, some amount of capital will also be diverted from the steel industry to the labour-intensive cloth industry.

Consequently, the production of cloth expands and that of steel contracts but the K-L ratios in two industries, factor prices and commodity prices still remain unchanged. If the labour force

continues to expand indefinitely, the country will soon become completely specialised in the production of cloth.

The constancy of the commodity prices implies that the terms of trade will remain unaffected. However, the equilibrium with constant prices, when supply of one factor has been increasing, is not compatible with general equilibrium. It may be possible if one of the two commodities, particularly the commodity intensive in the other factor (capital) is inferior. But neither of the two commodities— cloth and steel, can be considered inferior.

The general equilibrium in such a situation can be possible only if the price of the commodity intensive in the expanding factor decreases. It means the terms of trade are likely to become worse for the country in which one factor has been expanding. This is explained through Fig. 1.5.
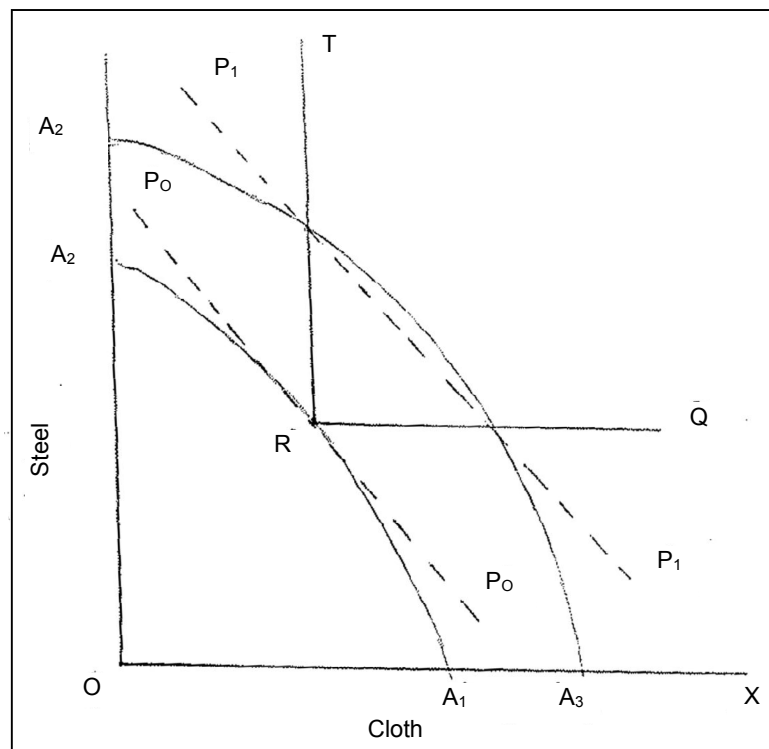
Fig. 1.5: 'Terms of trade are likely to become worse for the country in which one factor has been expanding.'

In Fig. 1.5, the labour-intensive commodity cloth is measured along the horizontal scale and the capital-intensive commodity steel is measured along the vertical scale. The production possibility curve AA_1 is derived from the box ABCD shown in Fig. 1.5. The international terms of trade are denoted by the slope of P_0P_0. The production equilibrium is determined at R.

The expanded supply of labour along with diversion of labour and capital from steel industry to cloth industry gives the new production possibility curve A_2A_3 derived from Box AEFD in Fig. 1.5. If the prices of two commodities remain the same, the terms of trade line P_1P_1 is parallel to P_0P_0. The production equilibrium takes place now at S where P_1P_1 is tangent to A_2A_3.

The point S shows a larger production of labour-intensive commodity cloth and reduced output of the capital-intensive commodity steel. This can happen only if steel is an inferior commodity. The

expansion in labour force and shift in the production possibility curve to the right imply an increase in national income.

In such a situation, barring the inferior goods, the demand for both the goods must increase. Therefore, the new position of equilibrium must lie on that part of the production possibility curve A_2A_3 that lies between the lines RQ and RT. The slope of this segment on the curve A_2A_3 is less steep than the slope of AA_1 at R. It implies that the price of cloth will be relatively lower and that of steel is relatively higher. A lower price of exportable commodity cloth and a higher price of importable commodity steel mean that there is deterioration of terms of trade subsequent to an increase in the supply of labour.

About the pattern of consumption, Rybczynski explained that the pattern of consumption may remain unaltered, or change in favour of one good or the other despite the change in the relative prices of the two commodities. If the marginal propensity to consume of the product intensive in the accumulated factor is equal to or greater than the average propensity to consume, the production and the consumption pattern will change in the direction of the product intensive in that factor.

When the marginal propensity to consume falls short of the average propensity to consume, the new production and consumption pattern may still change in favour of the commodity using much of the factor increased, or may remain unchanged or move in the direction of the other good. This depends upon the relative magnitudes of the average and marginal propensities to consume.

From the above analysis, it is obvious that the Rybczynski theorem has several implications related to production, factor and commodity prices, and terms of trade and consumption pattern. However, its implication related to the factor price equalisation is most clear-cut. When the supply of the abundant factor increases rapidly, the factor price ratio may remain unchanged preventing the equalisation of factor prices among the trading countries.

Criticisms of the Rybczynski Theorem:

E.J. Mishan has raised two major objections against the theorem given by Rybczynski. Firstly, if the increase in the supply of one factor (labour) is accompanied by the increased supply of the other factor (capital), the results suggested by Rybczynski are not likely to follow. Secondly, there is technical difficulty in extending Rybczynski's two- factor model to a multi-factor system.

1.4   INCREASES IN FACTOR ENDOWMENTS AND INTERNATIONAL TRADE

Impact of growth on factor endowment and structure Indian trade. Heckscher-Ohlin theory of international trade envisages the countries to specialize in the production and export of goods which conform to their factor endowment, while the goods which do not conform to factor endowment are imported. This theory, like classical comparative advantage/cost theory, uses assumptions which make its analytical framework static. The theory assumes that factor endowment and production function are given and fixed. Consequently, pattern of production, and hence, composition of trade remains stable through time. The theory also assumes that goods are mobile while land, labour and capital are immobile between the countries. Consequently, inter-country factor immobility and trade leave factor endowment unaltered. The implied fixity of production function rules out the growth to alter factor endowment, and hence, factor reversibility (substitution of one for another factor) in production.

Historical observations, however, show that economic growth based on factor transformation involves upward shift in the production function; this represents shift from less to more advance technology and use of higher quality and lower amount of inputs in production . Growth based on technological transformation results in the rising factor productivity, change in pattern and transformation of structure of production and alterations in factor endowment. Technological change revolves round accumulation of physical/financial capital and acquisition of human capital of better quality for the adoption of more advance technology than before. Such changes bring about drastic changes in volume, pattern and structure of international trade of an economy.

Consequently, at each higher stage of growth, factor endowment differs from those of lower stages. Domination of capital over labour tends to rise at each higher stage of growth. Even if the pattern of trade and factor endowment were initially consistent with each other, these will differ from initial state in the process of growth. As developing economies focus mainly on industrialization which is more capital than labour intensive, structure of production and trade tends to diverge more and more from factor endowment at each successive stage of growth. Developing economies☐ imports are dominated by capital and intermediate goods during the period of initiation and nurturing of industrialization. These imports continuously push down the proportion of imports of industrial consumer goods in the import baskets. Savings, and hence, domestic capital formation as a proportion of GDP rises continuously. Imports of capital goods in the early stages of growth and industrialization are generally replaced by domestic production and some of these goods enter even export basket as the economy moves to mature stages of growth. Thus initial factor endowment, characterized by scarcity of capital and abundance of labour tends to change in the process of growth. In the earlier phases of growth, export of labour intensive primary goods dominate export basket. The main hypothesis of investigation is that there exists an interrelation between economic growth, changing factor endowment and changing pattern of trade of a developing economy like that of India. The past factor endowment governs the current exports stricture and the current exports structure governs the future factor endowment of the country and hence it's production structure.

Impact of Growth on Factor Endowment and Trade Structure Growth of income leads to growth of both consumption and savings/investment, though the rates of growth of income, consumption and investment differ in unbalanced growth. If the structure of production is diversified to fill up the observed gaps, composition of output will also change. This is especially so in the case of a countries like India, which assigned pivotal role to the growth of heavy and basic goods industries to replace imports of capital goods by domestic production to attain self reliance. This strategy not only raise investment but it also radically changes production structure which requires not only more capital per unit of output but more educated and better skilled human capital is also required for production . Heavy and basic goods are used for investment which raises productive capacity and future capital formation; it accelerates industrialization. Growth of income stimulates savings and investment slowly but steadily, which mitigates initial capital scarcity in a labour abundant and capital scarce developing economy and change in production structure affects structure of trade.

Impact of Structure of Trade on Production and Factor Endowment Just as structure of production and growth affect structure of trade, structure of trade, especially capital and labour movements also influences growth and economic structure. Export of particular set of goods continuously over a period of time enables an economy to acquire specialized skills, knowledge and expertise for their production. It also facilitates accumulation of the accumulation of requisite type of capital. Similarly, continuous import of specific capital goods and technology alters capital-labour ratio in the long run. As the economy reaches relatively mature stage of growth and/or adoption of

LPG in the current era, import substitution strategy is replaced by export led growth. This warrants the exporting countries to have a cutting edge in quality and cost in international markets which keeps the emerging market economies on their toes to face increasing competition both in domestic and foreign markets. Many erstwhile imported goods will be domestically produced and several goods, imports of which were disallowed earlier, will now be imported. Under export led growth strategy, the country acquires specialization in the production of both traditional and new export goods. Continuous growth of exports transforms production structure in favour of export sectors. Thus, structure of trade and economic structure are mutually related; they act and react to changes in each other in the dynamic process of growth. Such inter-relations between economic and trade structure make factor endowment also change in the process of growth. Both consumption multiplier and accelerator reinforce each other to propel growth in such a state.

Acceleration of growth creates more job opportunities in the economy, though the state of job market differs between sectors and occupations. Fast growing sectors of the economy lead not only the growth but these sectors also lead in the creation of job opportunities. Technological transformation of production leads to the obliteration of some existing occupations and create new jobs in newly emerged occupations. Skill and knowledge requirements of information and knowledge based economies are different from and higher than those of the older sectors of mortar and bricks economies. If education grows ahead of population and economy, erstwhile scarcity of educated workforce may be transformed into surplus of educated manpower which results in the substitution of less by more educated and general by professional education. In the mature stage, economy grows ahead of population, training and in some cases even education. Hence, current general and educated labour surplus is transformed into scarcity of specific skills and education. Consequently, factor endowment is subject to change both from demand and supply sides of capital and human resources. Indian economy is no exception to this. The rapid growth of the economy has transformed production structure as well as structure of trade and factor endowment. It may be surmised that factor reversals are an essential feature of rapid growth.

R.N. Bharadwaj (1962) estimated the factor intensities of India's export and competitive import of 1953-54 when investigated the structural basis of India's foreign trade. His study revealed that India's export absorbs more labour than its competitive imports. However, when Bhardwaj (1962) conducted a similar test on India's bilateral trade with the US which showed India to be capital abundant relative to the United States; this refuted the prediction of factor endowment theory of trade. Sengupta (1989) tested factor contents of India's foreign trade for 1979-80 and 1984-85, he confirmed India's export being more labour intensive relative to imports. Chakraborty (2006) tested the gains from free trade between India and Bangladesh and found research in this field to be scanty recent years. More recently, Chakraborty (2011) also used Leontief-Leamer □ s framework to analyze factor contents of bilateral trade between India and Sri Lanka and found Indian exports to Sri Lanka capital intensive and imports labour intensive. These results lend some evidence to support Leontief paradox for India. But these results probably suggest that bilateral trade between trade partners may be guided by the partners' factor endowment. Relatively capital abundant trade partner may export capital intensive and import labour in tensive goods, though the same country may not be capital abundant in general terms. Such results may be treated as special cases of factor endowment theory.

Leontief Paradox inspired economists across the globe to examine the validity of factor endowment theory with country specific data. Bharadwaj, R. (1953), and Bharadwaj, R. and Bhagwati, J. N. (1969) found no evidence to support Leontief-paradox for Indian economy. Prasad, K. N. (1976) extended the theme to include natural resources also as a factor in addition to labour and

capital to evaluate the pattern of India's foreign trade. Prakash, S. (1995) also did not find India's factor endowment and trade to differ from each other.

Economic Development and Changing Factor Endowment of India Technological base of production and supply of labour per unit of capital have changed in the course of development of Indian economy. In 1951, saving rate was around 3 to 3.5percent of GDP, which has increased to slightly more than 32.5percent in 2008 and 36.48percent in 2009-10 of GDP in 2009 and 2010. This has decidedly raised the capital base of production. The question is has it altered the scarcity of capital relative to labour in the production processes? Does labour-capital ratio differ between sectors?

Human Capital Base of Production Only less than 5 percent of total population have had an access to education and only .01percent of the people had an access to higher education in 1951. Average completed school years of workforce rose from less than 0.5 in 1961 to 0.85 years of education in 1981 and it has further increased substantially over the years since then. Consequently, Indian workforce was largely dominated by illiterate and uneducated workers even three decades after independence and human capital base was low. But basic education was universalized in 2011, and more than 20 percent population has had an access to higher education, including professional and technical education. There has been continuous substitution of illiterate by literate, less by more educated workers, and general education graduates and above by professional and technical graduates and above in production. This has transformed the human capital base of the country both quantitatively and qualitatively. Nearly 20 percent of senior secondary graduates go for higher education. Besides, education, including higher professional and technical education, has grown exponentially during last 60 years. As a consequence of economic growth and educational development, there is economy wide substitution of educated/literate for uneducated/illiterate, secondary and above for below secondary/matriculation, graduate for under graduate, and technical and professional for general education graduate manpower in Indian economy.

Changing Structure of Production Long term growth at an average annual rate of 3.5 percent of GDP was dominated initially by agriculture and related activities, which accounted for 59 percent of GDP and absorbed more than 80 percent work force in 1951. Agriculture continued to dominate growth of Indian economy till seventies, rapid industrialization notwithstanding. If growth of agriculture accelerated, entire economy was buoyant and vibrant. In agriculture also, growth of output of food grains dominated growth, while food prices dominated general prices. Seventies, eighties, nineties and first decade of the millennium witnessed rapid industrialization and tertiary growth in Indian economy. Technological up-gradation of production has also taken place. In 2009, tertiary sector accounted for 59 percent of GDP, while agriculture and allied activities produced around 20 percent of GDP, but employed 55 percent of the total workforce. Manufacturing activities accounted for remaining 21percent of GDP. Thus, structure of production, capital base and human capital has changed concurrently with growth. New Economic Policy (NEP) of liberalization, privatization and globalization has converted the semi closed Indian economy in to an open economy. India has emerged as an important destination for foreign investment, including FDI, though foreign investment accounted for about 0.5percent of total investment, yet it is large in absolute terms. The absolute and relative share of trade in GDP, an indicator of openness of an economy, has also increased several times from 1951 to 2009-10.

Total trade (exports + imports) has risen from 12.54 in 1950-51 to 30.31 per cent of GNP in current prices in 2009-10. This shows an increase of approximately 2.5 times of base value. Percentage of GNP accounted by trade increased only marginally during the first three decades of planning era, and it remained almost stagnant in eighties. But the proportion of GNP accounted by

trade increased by 7.9 and 7.5 percentage points during the first two decades of LPG, an almost 2.5 fold increase over the base year. As a consequence of growth and structural change during the era of globalization radical transformation in factor endowment and economic structure has taken place. These changes put international trade in goods and services and capital movements in the center stage of Indian economy. Besides the above, substitution of imports by domestic production as growth strategy has raised the domestic supply of basic and heavy goods, including machinery, equipment and plants. Several other new goods also entered the production basket. All above changes have contributed to the transformation of production and trade structure.

Natural resources, especially such minerals as coal, coke, lignite, mica, iron ore, zinc, lime, gas, oil, etc., have been used more extensively for exports and to nurture the growth of minerals based Indian industries. Heavy and basic and consumer goods industries have been established or expanded and diversified. Some minerals or new source of thorium, uranium, gas, oil etc. have been discovered by extensive exploration for production. Such developments are expected to have changed the requirement of labour per unit of capital, natural resources per unit of labour, and natural resources per unit of capital used in production. Such changes are expected to reflect the changes in factor endowment.

1.5   TECHNICAL PROGRESS AND INTERNATIONAL TRADE

The modern world is a highly mechanised world. It is shaped by technical progress. The rapid progress of modern economic societies has become possible due to changes caused by technological and scientific progress.

It must, however, be recognised that, technical progress can affect the volume and mode of international trade to a great extent. As technical progress influences the composition of production function, relative cost-price structure, demand pattern use of resources, so on and so forth, its effect on foreign trade is also bound to be very significant.

2. Forms of Technical Progress

   (i)   Natural Technical Progress: It refers to a neutral innovation - a new process of production. As Hicks put it, in a two-factor production function (say, labour and capital inputs). The effect of neutral innovation is to raise the marginal productivity of both the factors - labour and capital - in the same proportion. Thus, neutral technical progress keeps the relationship between labour and capital unaffected.

  (ii)   Labour-saving Technical Progress: Using Hicksian criterion, labour-saving technical progress may be defined as that kind of technical improvement and change in the process of production which increases the marginal productivity of labour relatively to that of capital. Under labour-saving innovation, the production function is modified with an increasing quantity of capital and reduced input of labour.

 (iii)   Capital-saving Technical Progress : It refers to that new process which tends to increase the marginal productivity of capital relatively to that of labour. The effect of capital-saving innovation on the production function is to reduce the input of capital and increase the quantum of labour.

3. Technical Progress and Terms of Trades

Technical progress can affect the terms of trade of a country by influencing the productivity factory inputs. How it reacts we shall analyse below.Different forms of technical progress will affect the terms of trade and foreign trade of country in different ways.

Effect of Neutral Technical Progress

A general hypothesis may be laid down that, if neutral technical progress takes place in export sector of a country, the country's terms of trade may deteriorate, while technological pro in the import substitutions of the country will help the country to improve its terms of trade.

To explain this phenomenon, let us assume a two-factor, two-good, two-country model, say countries A and B have factors labour (L) and capital (K), and produce goods X and Y. Assume the product X is labour-intensive and F capital-intensive.

When neutral technical progress takes place in Y industry, the isoquant downward, its slope renaming unchanged. This implies that, due to a proportional rise in the productivities of labour and capital, less input of both these factors will be needed to produce the same outputs of Y. If factor prices are unchanged: $P1/IP0$, the same factor proportions Used in the production function as before. But if the same commodity prices are to be maintained, Factor prices will have to be changed. The new factor-price ratio is obtained by drawing a New factor-price line p_2 tangent to the new y'y' isoquant the old xx isoquant. This is reflected in a rise in the relative prices of capital in the Y industry. This is due to the fact that as producers find increased productivity of capital and want to produce of Y the demand for capital tend to increase leading to a rise in the price of capital. But when capital becomes costly, the producers will resort to Labour-intensive techniques in both the industries X and Y. The new ratio of factor-proportions In the production function is, thus, shown by OZ' in Y and OM' in X. Induced by technical progress in the Y industry, when the country produces more of Y with labour-intensive method, the labour input in X decreases, so the output of X contracts. At the constant commodity price, therefore, there will be an excess demand for X Consequently, the price of X will rise and that of Y will tend to fall (caused by its increased supply).

Now, if Y happens to be the country's exportable goods and X its importable goods, the terms of trade of the country will be settled unfavourably on account of the rising domestic price of Y (exportable), leading to contraction in its foreign demand and increasing domestic demand for X, resulting in its high import demand. In this event, the offer curve of the country will shift towards the exportable axis offering more amount of exportable for a given unit of importable. If, however, Y is an import substitute, technical progress in this line will improve the bargaining position of the country so its terms of trade will also improve.

However, the direction in the charge of the terms of trade caused by neutral innovation depends more on elasticities of demand for exports and imports, along with other factors. If the income elasticity of demand for importable goods is less than unity, the deterioration in terms of trade will be less in the unfavorable case and improvement in terms of trade will be more in the favourable case.

Effect of Capital-saving Technical Progress

The basic hypothesis is that capital-saving technological progress will lead to unfavourable terms of trade in a country if its exportables belong to the capital-intensive line of production. If technical progress relates to the import substitution industry (which belongs to the capital-intensive sector), the terms of trade will improve on account of the capital-saving innovation.

To explain this phenomenon, in our illustration model, when capital-saving innovation occurs, the marginal productivity of labour improves; so at unchanged factor prices, the method of production will tend to be more labour-intensive.

If commodity prices are to be kept constant, factor prices must change in favour of capital, so capital has become more dear, producers will resort to labour-intensive techniques in both the lines of production. Since income expands due to increased productivity caused by technological progress, demand for X and Y will tend to increase.

At a constant price therefore, demand for X will be in excess in relation to its supply, assist supply decreases in the process of transferring more labour to Y industry. The price of X will thus rise. Thus, if Y is exportable, the terms of trade will go against the country. If Y is an import substitute, then the country's terms of trade will tend to improve.

Effect of Labour-saving Innovation

In the case of a labour-saving technological progress in a capital-intensive industry, we cannot visualise any determinate effect on the terms of trade, as the relative price of the innovating good might increase or decrease, so on precise theoretical inference is possible.

In the geometric model, when labour-saving technical progress occurs in the case of Y industry, the new isoquant will be y'y' with a changed slope along with, the shift towards origin.

Then, the price of capital (PK) must rise. Because, when technological innovation occurs in the Y (capital-intensive) sector, producers will be inclined to produce more of Y, as such the demand for AT will rise. Further, in a labour-saving innovation capital productivity rises, so also the demand for capital rises, which causes PK to rise. The new factor price line P is derived thus. New Equilibrium points are Z' and M. It appears that ~ ratio falls in A" industry, though, there is no technical progress (but on account of the high price of capital, labour-intensive method is adopted). However, the marginal productivity of capital improves because of labour-saving technical progress, so the producers may be induced to adopt capital-intensive technique of production. The stronger this tendency, the greater will be the use made of the capital-intensive method, despite its high cost.

But if innovation were to lower the costs still further, as is seen from y "y" isoquant, the story would be different. Then, the new factor price line will be p$_2$, which means a very high cost of capital relative to labour. In the X industry, then, labour-intensive method will be adopted (see equilibrium point M"). Similarly, the equilibrium point Z" indicates that in Y industry also, more labour-intensive technique will be used, despite the improved marginal productivity of capital.

In short, labour-saving technical progress in the capital-intensive sector will cause an increase

In the relative price of capital to that of labour and ratio will fall in the labour-intensive production sector. A high ratio in capital-intensive industry will mean a decrease in Y product; but a low Ratio in labour-intensive industry will mean an increase in the production of X at constant prices. Thus, there will be excess demand for 7(caused by rising income and contracting output), the price of Y- (Py) will rise in relation to the price of X- (Px). If, however, reduction in costs cause by innovation is high the reverse will happen. So, we cannot arrive at a determinate conclusion this regard.

To recapitulate, technical progress affects the marginal productivities of factors of production. When the r productivity of a factor rises on account of innovation, a greater proportion of this factor will be employed in the innovating industry than in a non-innovating industry. Hence, reallocation of factors depends on the change in t absolute value of the marginal productivities.

As Bo Sodersten concludes: When technological progress increases the marginal productivities of both the factors (in a. two-factoral production function), the effects on output and relative prices, and terms of trade are clearly determinate. But if the marginal productivity of one of the factors or both the factors falls, then the resulting phenomenon about terms of trade cannot be firmly determined.

Bo Sodersten also states that technical progress in the import substitution field will always have a positive effect on the real income of the country. If it is so in the case of the export sector, and the marginal productivities of factors are decreased by innovation, then only will it have a positive effect on the national income. But an increased marginal productivity caused by the export-oriented innovation produces a negative effect on real income.

1.6 ECONOMIC GROWTH,INTERNATIONAL TRADE AND INTER MOVEMENT OF FACTORS

For Economic growth, International trade please refer previous topics for explanation. Thus not repeated here. Difference between Inter Regional and International Trade are explained hereunder: Nevertheless, there are several reasons to believe the classical view that international trade is fundamentally different from inter-regional trade.

1. **Factor Immobility:** The classical economists advocated a separate theory of international trade on the ground that factors of production are freely mobile within each region as between places and occupations and immobile between countries entering into international trade. Thus, labour and capital are regarded as immobile between countries while they are perfectly mobile within a country.

   There is complete adjustment to wage differences and factor-price disparities within a country with quick and easy movement of labour and other factors from low return to high sectors. But no such movements are possible internationally. Price changes lead to movement of goods between countries rather than factors. The reasons for international immobility of labour are—difference in languages, customs, occupational skills, unwillingness to leave familiar surroundings, and family ties, the high travelling expenses to the foreign country, and restrictions imposed by the foreign country on labour immigration.

   The international mobility of capital is restricted not by transport costs but by the difficulties of legal redress, political uncertainty, ignorance of the prospects of investment in a foreign country, imperfections of the banking system, instability of foreign currencies, mistrust of the foreigners, etc. Thus, widespread legal and other restrictions exist in the movement of labour and capital between countries. But such problems do not arise in the case of inter-regional trade.

2. **Differences in Natural Resources:** Different countries are endowed with different types of natural resources. Hence they tend to specialise in production of those commodities in which they are richly endowed and trade them with others where such resources are scarce. In Australia, land is in abundance but labour and capital are relatively scarce. On the contrary, capital is relatively abundant and cheap in England while land is scarce and dear there.

Thus, commodities requiring more capital, such as manufactures, can be produced in England; while such commodities as wool, mutton, wheat, etc. requiring more land can be produced in Australia. Thus both countries can trade each other's commodities on the basis of comparative cost differences in the production of different commodities.

3. **Geographical and Climatic Differences:** Every country cannot produce all the commodities due to geographical and climatic conditions, except at possibly prohibitive costs. For instance, Brazil has favourable climate geographical conditions for the production of coffee; Bangladesh for jute; Cuba for beet sugar; etc. So countries having climatic and geographical advantages specialise in the production of particular commodities and trade them with others.

4. **Different Markets:** International markets are separated by difference in languages, usages, habits, tastes, fashions etc. Even the systems of weights and measures and pattern and styles in machinery and equipment differ from country to country. For instance, British railway engines and freight cars are basically different from those in France or in the United States.

   Thus goods which may be traded within regions may not be sold in other countries. That is why, in great many cases, products to be sold in foreign countries are especially designed to confirm to the national characteristics of that country. Similarly, in India right-hand driven cars are used whereas in Europe and America left-hand driven cars are used.

5. **Mobility of Goods:** There is also the difference in the mobility of goods between inter-regional and international markets. The mobility of goods within a country is restricted by only geographical distances and transportation costs. But there are many tariff and non-tariff barriers on the movement of goods between countries. Besides export and import duties, there are quotas, VES, exchange controls, export subsidies, dumping, etc. which restrict the mobility of goods at international plane.

6. **Different Currencies:** The principal difference between inter-regional and international trade lids in use of different currencies in foreign trade, but the same currency in domestic trade. Rupee is accepted throughout India from the North to the South and from the East to the West, but if we cross over to Nepal or Pakistan, we must convert our rupee into their rupee to buy goods and services there.

   It is not the differences in currencies alone that are important in international trade, but changes in their relative values. Every time a change occurs in the value of one currency in terms of another, a number of economic problems arise. "Calculation and execution of monetary exchange transactions incidental to international trading constitute costs and risks of a kind that are not ordinarily involved in domestic trade."

   Further, currencies of some countries like the American dollar, the British pound the Euro and Japanese yen, are more widely used in international transactions, while others are almost inconvertible. Such tendencies tend to create more economic problems at the international plane. Moreover, different countries follow different monetary and foreign exchange policies which affect the supply of exports or the demand for imports. "It is this difference in policies rather than the existence of different national currencies which distinguishes foreign trade from domestic trade," according to Kindleberger.

7. **Problem of Balance of Payments:** Another important point which distinguishes international trade from inter-regional trade is the problem of balance of payments. The problem of balance of payments is perpetual in international trade while regions within a

country have no such problem. This is because there is greater mobility of capital within regions than between countries.

Further, the policies which a country chooses to correct its disequilibrium in the balance of payments may give rise to a number of other problems. If it adopts deflation or devaluation or restrictions on imports or the movement of currency, they create further problems. But such problems do not arise in the case of inter-regional trade.

8. **Different Transport Costs:** Trade between countries involves high transport costs as against inter- regionally within a country because of geographical distances between different countries.

9. **Different Economic Environment:** Countries differ in their economic environment which affects their trade relations. The legal framework, institutional set-up, monetary, fiscal and commercial policies, factor endowments, production techniques, nature of products, etc. differ between countries. But there is no much difference in the economic environment within a country.

10. **Different Political Groups:** A significant distinction between inter-regional and international trade is that all regions within a country belong to one political unit while different countries have different political units. Inter-regional trade is among people belonging to the same country even though they may differ on the basis of castes, creeds, religions, tastes or customs.

They have a sense of belonging to one nation and their loyalty to the region is secondary. The government is also interested more in the welfare of its nationals belonging to different regions. But in international trade there is no cohesion among nations and every country trades with other countries in its own interests and often to the detriment of others. As remarked by Friedrich List, "Domestic trade is among us, international trade is between us and them."

11. **Different National Policies:** Another difference between inter-regional and international trade arises from the fact that policies relating to commerce, trade, taxation, etc. are the same within a country. But in international trade there are artificial barriers in the form of quotas, import duties, tariffs, exchange controls, etc. on the movement of goods and services from one country to another.

Sometimes, restrictions are more subtle. They take the form of elaborate custom procedures, packing requirements, etc. Such restrictions are not found in inter-regional trade to impede the flow of goods between regions. Under these circumstances, the internal economic policies relating to taxation, commerce, money, incomes, etc. would be different from what they would be under a policy of free trade.

Therefore, the classical economists asserted on the basis of the above arguments that international trade was fundamentally different from domestic or inter-regional trade. Hence, they evolved a separate theory for international trade based on the principle of comparative cost differences.

1.7 A DYNAMIC ANALYSIS OF PATTERN OF SPECIALIZATION AND FACTOR ACCUMULATION

The integration of the domestic economy through the twin channels of trade and capital flows has accelerated in the past two decades which in turn led to the Indian economy growing from Rs 32 trillion (US$ 474.37 billion) in 2004 to about Rs 153 trillion (US$ 2.3 trillion) by 2016. Simultaneously, the per capita income also nearly trebled during these years. India's trade and external sector had a significant impact on the GDP growth as well as expansion in per capita income.

Total merchandise exports from India grew by 4.48 per cent year-on-year to US$ 25.83 billion in February 2018, while merchandise trade deficit increased 25.81 per cent year-on-year from US $ 11.979 billion during April-February 2017-18 to US $ 9.521 billion during April-February 2017-18, according to data from the Ministry of Commerce & Industry.

According to Mr Suresh Prabhu, Minister for Commerce and Industry, the Government of India is keen to grow exports and provide more jobs for the young, talented, well-educated and even semi-skilled and unskilled workforce of India.

Capital Inflows

According to data released by the Reserve Bank of India (RBI), India's foreign exchange reserves were US$ 421.335 billion as on March 16, 2018.

Foreign Direct Investments (FDI)

During April 2000–December 2017, India received total foreign investment (including equity inflows, re-invested earnings and other capital) worth US$ 532.6 billion. The country was one of the top destinations for FDI inflows from Asian countries, with Mauritius contributing 34 per cent, Singapore 17 per cent and Japan and UK contributing 7 per cent each of the total foreign inflows.

Foreign Institutional Investors (FIIs)

FIIs net investments in Indian equities, debt and hybrid stood at Rs 145,068 crores (US$ 22.34 billion) in 2017-18.

External Sector

India's external sector has a bright future as global trade is expected to grow at 4 per cent in 2018 from 2.4 per cent in 2016.

Bilateral trade between India and Ghana is rising exponentially and is expected to grow from US$ 3 billion to US$ 5 billion over the coming three years, stated Mr Aaron Mike Oquaye Junior, Ghana's Ambassador to India.

India has revised its proposal on trade facilitation for services (TFS) at the World Trade Organisation (WTO) and has issued a new draft, with the contents being more meaningful and acceptable to other member countries.

Indian exports of merchandise shipments is expected to reach US$ 325 billion in 2017-18, compared to US$ 275 billion in 2016-17, as per Mr Ganesh Kumar Gupta, President, Federation of Indian Export Organisations (FIEO).

The Union Cabinet, Government of India, has approved the proposed Memorandum of Understanding (MoU) between Export-Import Bank of India (EXIM Bank) and Export-Import Bank of Korea (KEXIM).

The Goods and Services Network (GSTN) has signed a memorandum of understanding (MoU) with Mr Ajay K Bhalla, Director General of Foreign Trade (DGFT), to share realised foreign exchange and import-export code data, process export transactions of taxpayers under goods and services tax (GST) more efficiently, increase transparency and reduce human interface.

In March 2017, the Union Cabinet approved the signing of the customs convention on the international transport of goods, Transports Internationaux Routiers (TIR) making India the 71st signatory to the treaty, which will enable the movement of goods throughout these countries in Asia and Europe and will allow the country to take full benefit of the International North South Transportation Corridor (INSTC).

Mr Richard Verma, the United States Ambassador to India, has verified that India-US relations across trade, defence and social ties will be among the top priorities of the newly elected US President Mr Donald Trump's administration.

Foreign Trade Policy

In the Mid-Term Review of the Foreign Trade Policy (FTP) 2015-20 the Ministry of Commerce and Industry has enhanced the scope of Merchandise Exports from India Scheme (MEIS) and Service Exports from India Scheme (SEIS), increased MEIS incentive raised for ready-made garments and made- ups by 2 per cent, raised SEIS incentive by 2 per cent and increased the validity of Duty Credit Scrips from 18 months to 24 months.

All export and import-related activities are governed by the Foreign Trade Policy (FTP), which is aimed at enhancing the country's exports and use trade expansion as an effective instrument of economic growth and employment generation.

The Department of Commerce has announced increased support for export of various products and included some additional items under the Merchandise Exports from India Scheme (MEIS) in order to help exporters to overcome the challenges faced by them.

The Central Board of Excise and Customs (CBEC) has developed an 'integrated declaration' process leading to the creation of a single window which will provide the importers and exporters a single point interface for customs clearance of import and export goods.

As part of the FTP strategy of market expansion, India has signed a Comprehensive Economic Partnership Agreement with South Korea which will provide enhanced market access to Indian exports. These trade agreements are in line with India's Look East Policy. To upgrade export sector infrastructure, 'Towns of Export Excellence' and units located therein will be granted additional focused support and incentives.

RBI has simplified the rules for credit to exporters, through which they can now get long-term advance from banks for up to 10 years to service their contracts. This measure will help exporters get into long-term contracts while aiding the overall export performance.

The Government of India is expected to announce an interest subsidy scheme for exporters in order to boost exports and explore new markets.

Road Ahead

India is presently known as one of the most important players in the global economic landscape. Its trade policies, government reforms and inherent economic strengths have attributed to its standing as one of the most sought after destinations for foreign investments in the world. Also, technological

and infrastructural developments being carried out throughout the country augur well for the trade and economic sector in the years to come.

Boosted by the forthcoming FTP, India's exports are expected reach US$ 750 billion by 2018-2019 according to Federation of India Export Organisation (FIEO). Also, with the Government of India striking important deals with the governments of Japan, Australia and China, the external sector is increasing its contribution to the economic development of the country and growth in the global markets. Moreover, by implementing the FTP 2014-19, by 2020, India's share in world trade is expected to double from the present level of three per cent.

1.8 SUMMARY

1. Economic growth is the increase in the inflation-adjusted market value of the goods and services produced by an economy over time.

2. Growth is usually calculated in real terms - i.e., inflation-adjusted terms – to eliminate the distorting effect of inflation on the price of goods produced.

3. The "rate of economic growth" refers to the geometric annual rate of growth in GDP between the first and the last year over a period of time.

4. The economic growth rate is calculated from data on GDP estimated by countries´statistical agencies.

5. Economic growth has the indirect potential to alleviate poverty, as a result of a simultaneous increase in employment opportunities and increased labour productivity.

1.9 SELF ASSESSMENT QUESTIONS

1. What explains the long-run growth of aggregate GDP?

2. Is it possible for an economy to continue growing forever solely by accumulating more capital?

3. What explains the long-run growth of per capita GDP?

4. What is the meaning of International Economics?Why is it important to study International Economics?

5. International trade is an engine of Economic growth. Comment.

൞✳ൠ

UNIT – II

Chapter **2**	**ADVANCED TOPICS OF INTERNATIONAL ECONOMICS**

Objectives

The objectives of this lesson are to:

- Economic expansion and the terms of trade
- Essay on the Terms of Trade and Economic Development /or Effects of Economic development on the terms of trade
- Combined Production and Consumption Effects of Growth
- The British School Premises hypothesis/ English school of international relations theory

Structure:

2.1 Economic expansion and the terms of trade

2.2 The British School Premises hypothesis/English school of international relations theory

2.3 Summary

2.4 Self Assessment Questions

2.1 ECONOMIC EXPANSION AND THE TERMS OF TRADE

Economic expansion

An economic expansion is an increase in the level of economic activity, and of the goods and services available. It is a period of economic growth as measured by a rise in real GDP. The explanation of fluctuations in aggregate economic activity between economic expansions and contractions is one of the primary concerns of macroeconomics.

Typically an economic expansion is marked by an upturn in production and utilization of resources. Economic recovery and prosperity are two successive phases of expansion. Expansion may be caused by factors external to the economy, such as weather conditions or technical change, or by factors internal to the economy, such as fiscal policies, monetary policies, the availability of credit, interest rates, regulatory policies or other impacts on producer incentives. Global conditions may influence the levels of economic activity in various countries.

Economic contraction and expansion relate to the overall output of all goods and services, while the terms inflation and deflation refer to increasing and decreasing prices of commodities, goods and services in relation to the value of money.

Expansion means enlarging the scale of a company. The ways of expansion include internal expansion and integration. Internal expansion means a company enlarges its scale through opening

branches, inventing new products, or developing new businesses. Integration means a company enlarges its scale through taking over or merging with other companies.

Terms of trade

Definition/Meaning and Explanation:

By terms of trade, is meant terms or rates at which the products of one country are exchanged for the products of the other. It is known to us that every country has got its own money. The currency of one country is not legal tender in the other country. So every country has to export commodities in order to import goods. "The rate at which given volume of exports Is exchanged for a given quantity of imports is called the commodity terms of trade". The rate of exchange or the term of exchange depends upon the elasticities of the demand of each country for the products of the other. For instance, if Pakistan's demand for Indian's wheat is much more intense than Indian's demand for Pakistan's cotton, the terms of trade will be more favorable to India than to Pakistan. This is because Pakistan's demand for India's wheat is highly inelastic while India's demand for Pakistan's cotton is highly elastic.

 The country which is more eager to sell or purchase stands at disadvantage in the bargain. In the words of Taussing**:** That country gains more from international trade whose exports are more in demand and which itself has little demand for the things it imports, i.e., for the exports of the other countries, that country gains least which has the most insistent demand for the products of the other country.

That terms of trade are measured by the ratio of import prices to export prices. The terms of trade will be favorable to a country when the export prices are high relatively to import prices. This is because the products of one unit of domestic resources will exchange against the product of more than one unit of foreign exchange. If, on the other hand, the prices of its imports rise relatively to the prices of its exports, the terms of trade will be unfavorable to the country.

Equation/Formula:

The terms of trade can be expressed in the form of equation as such:

$$\text{Terms of Trade} = \frac{\text{Price of Imports and Volume of Imports}}{\text{Price of Exports and volume of Exports}}$$

The terms of trade are of economic significance to a country. If they are favorable to a country, it will be gaining more from international trade and if they are unfavorable, the loss will be occurring to it. When the country's goods are in high demand from abroad, i.e., when its terms of trade are favorable, the level of money income increases. Conversely, when the terms of trade are unfavorable, the level of money income falls.

Measurement of Change in Terms of Trade:

The changes in terms of trade can be measured by the use of an import and export index number. We here take only standardized goods which have internal market and give them weight according to their importance in the international transactions. A certain year is taken as base year and the average of the countries import and export prices of the base year is called 100. We then work out the index of subsequent year. These indices then show as to how the commodity terms of trade move between two countries. The ratio of exchange in export prices to the change in import prices is put in the form of an equation as under:

$$\text{Commodity Terms of Trade} = \frac{\text{Change in Export Prices}}{\text{Change in import Price}}$$

Algebraically, it can be expressed:

$$T^e = \frac{Px^1}{Px^o} \div \frac{Pm^1}{Pm^o}$$

Here:

T^e Represents commodity terms of trade.

Px^1 Represents export price index for the required year.

Px^o Represents exports price index of the base year.

Pm^1 Represents indices of prices of the required year.

Pm^o Represents indices of prices for the base year.

We now apply the above formula by taking a specific example. We take the indices of export and import prices for the year 1982 as 100. We assume also that the export prices index for the year 1982 is 330 and import prices index 380. The ratio of change in export prices to the change in import prices will be:

$$T^e = \frac{300}{100} \div \frac{380}{100}$$

$$T^e = \frac{330}{100} \times \frac{300}{380}$$

$$T^e = 0.87$$

The above example shows that the prices of imports have increased more than the exports prices. The terms of trade are unfavorable to the country by 13%. In other words, the country has to pay 13 percent more for a given amount of imports.

Income Terms of Trade

It is the desire of every country that it should earn the maximum of income out of international exchange by taking permanent favorable terms of trade. In order to secure maximum gain, the country will try to increase the volume and value of exports and reduce the volume of imports and buy it also from the cheapest market. If the country is having a monopoly in the supply of a commodity and the demand for products is inelastic, then it can fetch more income. In case the terms of trade move against the country, then there will be drain of national income, the commodity terms of trade depend upon the following factors:

(i) Ratio of import prices to export prices.

(ii) The volume and value of exports and imports.

(iii) The condition attached to export and import such as insurance charges, supply of machinery and shipping, etc.

If the terms of trade are favorable which may be due to monopolistic supply or inelastic demand or cheap and better kind of exports, etc., the terms of trade will be favorable and the national income will rise. In case of terms of trade are unfavorable over a period of time, the national income will fall.

Net Barter Terms of Trade

In the contemporary world, the concept of net barter terms of trade was introduced by F.W. Taussig. This concept was called as commodity terms of trade by Jacob Viner. It is defined as ratio of export prices to import prices. It can be expressed as:

$T_C = P_X/P_M$

Here T_C = commodity terms of trade or net barter terms of trade, P_X = export price, P_M = import price.

If the net barter terms of trade are to be applied to more than one export and import commodities and the changes in terms of trade over a given period are to be computed, the index numbers of export and import prices rather than prices of individual commodities are taken into account.

In such situations, the net barter terms of trade can be measured as below:

$$Tc = \frac{P_{x_1}/P_{xo}}{P_{N_1}/P_{Mo}} \times 100$$

Here, Px_1 and Px_o are the export price indices of current year (1) and last year(o) respectively. P_{M1} and P_{M0} on the import price indium of current year (1) and base year (o) respectively.

Given the price indius of exports and imports for the base year (say, 2010) as 100 each and its price indices of imports and exports an 180 and 225 is 2015, the net barter terms of trade is:

$$T_C = \frac{P_{X1}/P_{X0}}{PM_1/PM_0} \times 100 = \frac{225/100}{180/100} \times 100 = 225$$

If means the commodity terms of trade in 2015 compared worth 2010 has improved by 25 percent.

If in the box year of 2010, the indices of exports and imports are 100 each and price indium of exports and imports are 172 and 215 respectively in 2015, the net barter terms of trade is:

$$Tc = \frac{P_{X_1}/P_{X_o}}{P_{M_1}/P_{M_o}} \times 100 = \frac{172/100}{215/100} \times 100 = 80$$

It means there is deterioration in country's terms of trade by 20 percent between 2010 and 2015. It is generally believed that an improvement in the commodity terms of trade increases the economic welfare of a country. The sale of home produced goods at higher export prices and the purchase of foreign produced goods at lower prices is expected to increase welfare. From this a conclusion is sometime derived that maximisation of net barter terms of trade will mean the maximisation of welfare. But that is not necessarily true. If the export function of a country is more elastic, a rise in export price will cause considerable reduction in the quantity of export and bring about a significant fall in the export earnings.

Similarly, if the import function is more elastic, a fall in import price will cause a very substantial increase in quantity imported and also an increase in the spending on import. A fall in export earning coupled with an increase in import spending will mean a decline in welfare, even though the commodity terms of trade are favourable.

It is because of this reason that Haberler suggested that a country should try to optimise the terms of trade rather than maximize the terms of trade. The terms of trade get optimised at such levels of export and import prices where the export earning is maximum, while the import spending is the

least possible. The optimum terms of trade, in his opinion, are fully consistent with the maximisation of welfare.

Criticisms:

Even though the concept of net barter terms of trade has been widely accepted as a useful measure of short-term changes in the trade position of a country, yet it suffers from certain limitations because of which it has been subjected to criticism.

The main objections against it are as follows:

(i) **Problems in the Construction of Index Numbers:** This concept involves the use of index numbers of export and import prices. The construction of index numbers is beset with several problems related to the choice of commodities, obtaining of price quotations, choice of base year, use of appropriate weights and the method for computing index numbers.

(ii) **Neglect of Qualitative Changes:** The net barter terms of trade are based on indices of export and import prices. These can measure the relative changes in prices between the current and base period. If there are qualitative changes in output in the two trading countries during a given period, they remain neglected. In such a situation, net barter terms of trade cannot measured exactly the changes in welfare due to foreign trade in general and terms of trade in particular.

(iii) **Misleading:** If the export price index of a country falls, the import price index remaining the same, there is worsening of the net barter terms of trade. As export prices are lower than the import prices, the country will be able to get a smaller quantity of import in exchange of the goods exported. The conclusion may be derived that the economic position of the country has deteriorated. It is possible that the fall in export prices has resulted from a fall in costs of producing export goods.

If the productivity in export sector increases at a greater rate than the worsening of net barter terms of trade, the country actually does not suffer due to trade, it rather gains. From this it follows that the net barter terms of trade can sometimes result in misleading conclusions.

(iv) **Inappropriate for Explaining Distribution of Gains from Trade:** The concept of net barter terms of trade is an inappropriate criterion for explaining the distribution of gains from trade between two countries one of which is advanced and the other is less developed. Suppose the import price index has risen relatively less than the export price index in the latter. It signifies an improvement in the terms of trade and the conclusion is derived that the less developed country gains from trade.

However, if the profits from foreign investments rise large enough to off-set the increase in export prices, the LDC may not derive any gain from trade. Similarly, if the export prices fall but there is also an equivalent fall in the profits of foreign investments, the position of the country is not worse off even though the net barter terms of trade are unfavourable. It is, therefore, evident that the distribution of gains from trade cannot be rightly decided on the basis of changes just in the net barter terms of trade.

(v) **Faulty Index of Gain from Trade:** It is often claimed that the net barter terms of trade provide an index of gains from trade for a country. In this connection, Taussig pointed out that the net barter terms of trade could be an appropriate measure of gains from trade, if the

balance of payments of the country included only the receipts and payments on account of exchange of goods and services.

However, if balance of payments includes also the capital transactions and unilateral transfers, the gain from trade cannot be determined through the ratio of export and import prices.

(vi) Period of Time: The net barter terms of trade are based upon the relative changes in export and import prices over some period between the base year and the current year. If this time interval is too short, there may not be any significant change in the terms of trade. On the contrary, if this duration is too long, there is the possibility of some major changes in the structure of production and demand in the countries such that comparisons on the basis of export and import prices are rendered irrelevant.

(vii) Neglect of Factors Affecting Prices: The net barter terms of trade concentrate only upon the indices of export and import prices. There is absolute neglect of the factors, which cause variation in these prices. The export and import prices are affected by changes in productivity, costs, wages, general business conditions and reciprocal demand in the trading countries. Any conclusion concerning the economic position of a country exclusively on the basis of commodity terms of trade cannot be valid.

(viii) Capacity to Import: The improvement or worsening of the commodity terms of trade cannot give any definite conclusion about the capacity of a country to import. An appropriate measure of the capacity to import can be the income terms of trade rather than the net barter terms of trade. In order to overcome the deficiencies of the net barter terms of trade, Taussig introduced the concept of gross barter terms of trade.

Gross Barter Terms of Trade

The gross barter term of trade is a ratio of total physical quantities of imports to the total physical quantities of exports of a given country.

Given the above definition, the gross barter terms of trade in case of particular commodities can be measured at a point of time through the formula given below:

$T_G = (Q_M/Q_X) \times 100$

Here T_G is gross barter terms of trade, Q_M is aggregate quantity of imports and Q_X is the aggregate quantity of exports. Higher the magnitude of T_G over 100, better are the gross barter terms of trade. It implies that the country can import larger quantities from abroad for the given quantities exported to other countries. On the opposite, if the magnitude of T_G is less than 100, it means the gross barter terms of trade are unfavourable to a given country and it can import smaller quantity of goods from abroad for the same quantity of exports.

If the balance of trade of a country is in a state of balance and the total receipts from export of goods are exactly equal to the payments for import of goods, the net barter terms of trade will be equal to the gross barter terms of trade.

Total Receipts from Exports = Total Payments for Imports

$P_X \cdot Q_X = P_M \cdot Q_M$

$\Rightarrow P_X/P_M = Q_M/Q_X$

$\Rightarrow T_C = T_G$

When there is a deficit or surplus in trade balance, the gross barter and net barter terms of trade will differ from each other (TC < > TG).

When trade involves a large number of commodities and changes in terms of trade have to be compared between two periods, the gross barter terms of trade are a ratio of indices of quantities imported and the quantities exported.

In such a case, the gross barter terms of trade can be determined as:

$$T_Q = \frac{Q_{M_1}/Q_{M_0}}{Q_{X_1}/Q_{X_0}} \times 100$$

Here Q_{M1} and Q_{M0} are the quantity indices of imports in the current year (1) and base year (0) respectively. Q_{X1} and Q_{X0} are the quantity indices of exports in the current year (1) and base year (0) respectively.

Given the quantity indices of imports and exports as 100 each in the base year 2010 and 184 and 230 respectively in the current year 2015, the gross barter terms of trade have turned unfavourable for the given country.

$$T_G = \frac{Q_{M_1}/Q_{M_0}}{Q_{X_1}/Q_{X_0}} \times 100 = \frac{184/100}{230/100} \times 100 = 80$$

If indicates that there is deterioration in terms of trade are this period by 20 purunt.

If Q_{M1} = 180 and Q_{x1} = 150, the counting experience an improvement inits gross barter terms of trade

$$T_G = \frac{Q_{M_1}/Q_{M_0}}{Q_{X_1}/Q_{X_0}} \times 100 = \frac{180/100}{180/100} \times 100 = 120$$

The above illustration shows that the gross barter terms of trade have improved for the given country by 20.00 percent over this period.

Criticisms:

The concept of gross barter terms of trade was considered better than the concept of net barter terms of trade. But there are certain deficiencies in it that resulted in its criticism.

This concept has been criticized on the following grounds:

(i) Aggregation of Goods, Services and Capital Transactions: The gross barter terms of trade attempted to remove the deficiency of the net barter terms of trade by aggregating all exports of goods, services and capital in the index of export quantities. Similarly, the imports of goods, services and capital were aggregated in the index of quantities imported. The lumping together of these non-homogeneous quantities was both unreal and impractical. It was because of this reason that this concept of terms of trade came to be rejected at the hands of economists like Jacob Viner and Haberler.

(ii) Faulty Index of Welfare: A higher ratio of quantity index of imports to the quantity index of exports is sometimes regarded as an index of a higher level of welfare from trade because the country obtains larger quantity of importable good per unit of exportable goods. But this is not necessarily true. If there are such changes in tastes and habits of a people that even a smaller quantity

of imports yields greater satisfaction, the community may derive greater welfare despite an unfavourable gross barter terms of trade.

(iii) Neglect of Productivity: It is possible that a country has unfavourable gross barter terms of trade but that is caused by increased factor productivity in the export sector. The increased factor productivity still indicates the gain from the point of view of the exporting country. The impact of improvement in productivity has been overlooked in this measure of terms of trade.

(iv) Neglect of Qualitative Changes: The gross barter terms of trade ratio undoubtedly takes into account the physical quantities of imports and exports but ignores the fact that there might have been qualitative improvements in production in the exporting and importing countries. Such changes can have very significant effect on the welfare, yet these are not reflected through the gross barter terms of trade.

(v) Neglect of Capital Movements: The international capital movements have quite important influence on the balance of payments and general economic condition of a country. This vital factor, however, has not found proper expression in the measurement of gross barter terms of trade.

Viner's Terms of Trade[Single Factorial Terms of Trade]

The concept of income terms of trade attempted — a correction in the net barter terms of trade for changes in the volume of exports. Jacob Viner made another modification over the net barter or commodity terms of trade. He corrected the commodity terms of trade for changes in factor productivity in the production of export goods.

The concept of terms of trade developed by him is called as the 'Single Factoral Terms of Trade'. It is determined by multiplying the commodity terms of trade with the productivity index in the domestic export sector. The single factoral terms of trade imply a ratio of the export price index and import price index adjusted for changes in the productivity of factors used in the production of export goods.

It can be stated as:

$[T_S = T_C . Z_X]$

Where T_S is the ----- factorial terms of trade, T_C is the commodity terms of trade and Z_X is the export productivity index.

Since the commodity terms of trade T_C are expressed as P_X/P_M, the single factoral terms of trade can be stated also in terms of price indices of exports and imports as below:

$T_S = T_C . Z_X = P_X/P_M .Z_X$

If $P_X = 100$, $P_M = 100$ and $Z_X = 100$ in the base year may 2010, the single factoral terms of trade is 100

$T_S = P_X/P_M. Z_X = 100 \times 100/100 = 100$

If in the current year 2015, $P_X = 170$, $P_M = 190$ and $Z_X = 152$, then

$$T_S = \frac{P_X}{P_M} . Z_X = \frac{170}{190} \times 152 = 136$$

It signifies that there is an improvement in the single factoral terms of trade even though the commodity terms of trade have worsened.

$$T_c = \frac{P_X}{P_M} \times 100 = \frac{170}{190} \times 100 = 89.47$$

In case $P_X = 160$, $P_M = 144$ and $Z_X = 72$ in the current year, there is deterioration in the single factorial terms of trade.

$$T_s = \frac{P_X}{P_M} \cdot Z_X = \frac{160}{144} \times 72 = 80$$

However, the net barter terms of trade of the country show and improvement

$$T_c = \frac{P_X}{P_M} \times 100 = \frac{160}{144} \times 100 = 111.11$$

From the above illustration, it is clear that change in the export productivity index can have highly significant effect on the terms of trade of a country. If the increase in productivity in the export sector causes such a substantial decline in costs that export prices have declined by a marked extent, it is possible that the commodity terms of trade become unfavourable even when the single factorial terms of trade have improved.

From the point of view of a developing country, where the process of growth involves the use of improved techniques of production, the single factorial terms of trade are more representative and scientific compared with the commodity terms of trade.

Criticisms:

This measure of terms of trade is, however, criticised on the following main grounds:

(i) Difficulty in the Measurement of Productivity: The exact measurement of productivity and changes therein is quite difficult, as factor productivity depends upon some non-quantifiable psychological and technical factors. The productivity of a factor unit differs not only from one export industry to another but also from one plant to another. That causes serious complication in the computation of productivity index and changes in it over different periods.

(ii) Not a Reliable Index of Gain from Trade: The terms of trade are supposed to be an index of gains from international trade of a country. It is possible that increase in productivity index makes the single factorial terms of trade favourable but the rise in productivity in export sector and consequent fall in production costs and export price index can transfer the gain from higher productivity and trade to the foreign country. The productivity increase may occur in the exporting country but the productivity and trade gains go to the importing country.

(iii) Increase in Global Inequalities: The increased productivity in the export sectors of the advanced countries like U.S.A., Japan and the West European countries has brought about considerable improvement in their single factorial terms of trade while keeping their net barter terms of trade also favourable for them. However, the improvement in productivity in the export sectors in the LDC's has made both commodity terms of trade and single factorial terms of trade unfavourable.

This has happened because the export prices of poor countries have been secularly declining, whereas the export prices of advanced countries have remained higher despite a rise in productivity. This has accentuated the global inequalities of income and wealth. For this crucial reason, the single factorial terms of trade cannot be an appropriate index of welfare and living standards.

(iv) Neglect of Increase in Productivity in Foreign Countries: The single factorial terms of trade give importance only to improvement in the productivity in the export sector. It fails to take into

account the possible change in the productivity in the foreign countries and their resultant effect on the terms of trade. This deficiency was removed by Jacob Viner through his introduction of the concept of double factoral terms of trade.

$$T_S = T_C . T_X$$

Where T_S is the ----- factoral terms of trade, T_C is the commodity terms of trade and Z_X is the export productivity index.

Since the commodity terms of trade (T_C) are expressed an $\dfrac{P_X}{P_N}$, the right factoral terms of trade

can be stand also interms of price indium of exports and imports as below:

$$T_S = T_C . Z_X = \frac{P_X}{P_N} . Z_X$$

If $P_x = 100$, $P_M = 100$ and $Z_x = 100$ in the base year may 2010, the sing factoral terms of trade is 100

$$T_S = \frac{P_X}{P_N} . Z_X \quad = \quad \frac{100 \times 100}{100} = 100$$

If in the current year 2015, $P_x = 170$, $P_M = 190$ and $Z_X = 152$, then

$$T_S = \frac{P_X}{P_M} . Z_X = \frac{170}{190} \times 152 = 136$$

If ------ that there is an improvement in the sing factoral terms of trade even though the commodity terms of trade have --------

$$T_c = \frac{P_X}{P_M} \times 100 = \frac{170}{190} \times 100 = 89.47$$

In ----$P_x = 160$, $P_M = 144$, and $2_X = TL$, in the sing factoral terms of trade

$$T_S = \frac{P_X}{P_M} . Z_X = \frac{160}{144} \times 72 = 80$$

However, the ---- barter terms of trade of the country show and improvement

$$T_c = \frac{P_X}{P_M} \times 100 = \frac{160}{144} \times 100 = 111.11$$

From the above illustration, it is clear that change in the export productivity index can have highly significant effect on the terms of trade of a country. If the increase in productivity in the export sector causes such a substantial decline in costs that export prices have declined by a marked extent, it is possible that the commodity terms of trade become unfavourable even when the single factoral terms of trade have improved.

From the point of view of a developing country, where the process of growth involves the use of improved techniques of production, the single factoral terms of trade are more representative and scientific compared with the commodity terms of trade.

Factors Affecting the Terms of Trade

The terms of trade among the trading countries are affected by several factors. Some prominent factors out of them are discussed below:

1. Reciprocal Demand: The reciprocal demand signifies the intensity of demand for the product of one country by the other. If the demand for cloth, exportable commodity of country A, is more intense (or inelastic) in country B, the latter will offer more units of steel, its exportable product, to import a given quantity of cloth. On the contrary, if the demand for cloth in country B is less intense (elastic), then B will offer smaller quantity of steel to import the given quantity of cloth.

If the reciprocal demand for steel in country A increases, the offer curve of country A will shift to the right as it will be willing to offer more quantity of cloth for the given import of steel. On the contrary, a decrease in the reciprocal demand for steel in country A, will cause a shift in its offer curve to the left as it will offer a lesser quantity of cloth to import the same quantity of steel. In the former case, the terms of trade get worsened and in the latter case they get improved for country A.

From the point of view of country B, if there is an increase in the reciprocal demand for cloth in country B, the offer curve of this country will shift to the left and the terms of trade for this country become favourable. On the opposite, a decrease in the reciprocal demand for cloth in country B results in a shift in the offer curve of this country to the right. The consequence is the worsening of the terms of trade for this country.

In Figs. 2.1 (i) and 2.1 (ii), cloth, the exportable commodity of country A and importable commodity of country B, is measured along the horizontal scale. Steel, the exportable commodity of country B and importable commodity of country A, is measured along the vertical scale.
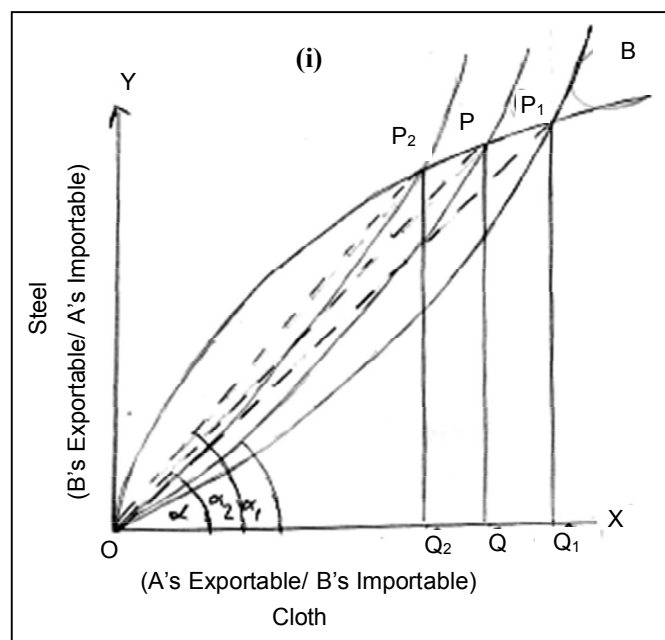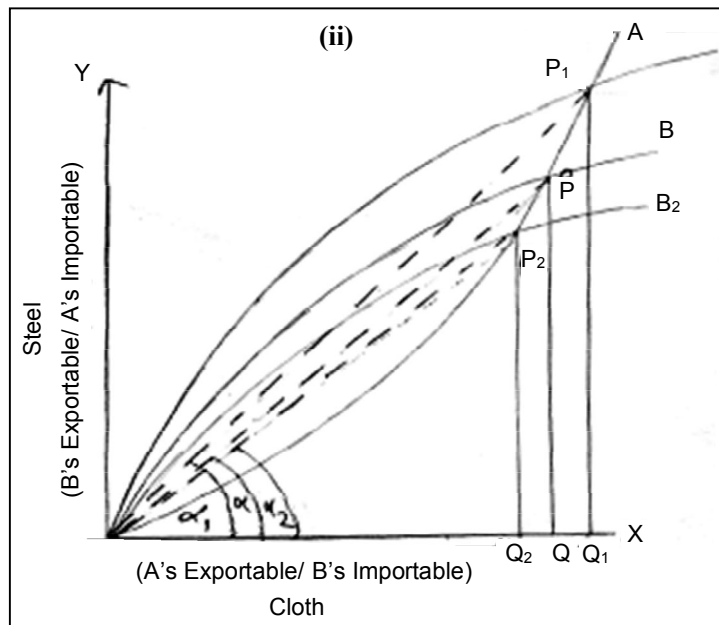

Fig. 2.1 (i)

Fig. 2.1 (ii)

In Fig. 2.1 (i), given the offer curves OA and OB of countries A and B respectively, exchange takes place at P where country A imports PQ quantity of steel and exports OQ quantity of cloth.

TOT for A at P = Q_M/Q_X = PQ/OQ = Slope of line oPα = Tanα

If the reciprocal demand for steel in country A increases, the offer curve of A shifts to the right to OA_1. The intersection of OA_1 and OB takes place at P_1, which is the point of exchange. At this point, country A imports P_1Q_1 quantity of steel and exports OQ_1 quantity of cloth.

TOT for A to P_1 = Q_M/Q_X = P_1/O_1 Slope of Line $OP_{1=}$ Tan$α_1$

Since, Tan α_1 < Tan α there is commodity of the TOT for country A to P_1. If the ------- demand for rural in country A --- the offer curve of country A rifts to the left to OA_2. Given OA_2 and OB offer curves, the exchange take place of P2 where P2Q2 quantity of ------ is imported and OQ_2 quantity of cloth is exported.

TOT for A at P_2 = Q_M/Q_X = P_2Q_2/OQ_2 = Slope of line oP_2 = Tan$α_2$

Since Tan $α_2$ > Tan $α$, there is an improvement in the terms of trade for country A in this situation.

In Fig. 2.1 (ii) originally OA and OB are the offer curves of countries A and B respectively. The exchange takes place at P where country A imports PQ quantity of steel and exports OQ quantity of cloth. If reciprocal demand for cloth in country B increases, the offer curve of country B shifts to the left to OB_1.

The exchange, in this case, takes place at P_1 and country A imports P_1Q_1quantity of steel and exports OQ_1 quantity of cloth. If the reciprocal demand for cloth in country B decreases, the offer curve of country B shifts to the right to OB_2. In this case exchange takes place at P_2 where country A imports P_2Q_2 quantity of steel and exports OQ_2 quantity of cloth.

$$\text{TOT for A at P} = \frac{Q_M}{Q_X} = \frac{PQ}{OQ} = \text{Slope of line Op}$$

$$= \text{Tan} \propto$$

$$\text{TOT for A at } P_1 = \frac{Q_M}{Q_X} = \frac{P_1 Q_1}{OQ_1} = \text{Slope of line } OP_1$$

$$= \text{Tan} \propto$$

$$\text{TOT for A at } P_2 = \frac{Q_M}{Q_X} = \frac{P_2 Q_2}{OQ_2} = \text{Slope of line } OP_1$$

$$= \text{Tan} \propto 2$$

Since Tan α_1 > Tan α, there is an improvement in the terms of trade for country A at P_1 and worsening of the terms of trade for country B. Since Tan α_2 < Tan α, there is worsening of the terms of trade for country A at P_2 and improvement in the terms of trade for country B.

2. Tariff: When a country imposes tariffs on imports from the foreign country, it implies a lesser willingness to absorb the foreign products. It means the reciprocal demand in the tariff-imposing country for the foreign product has got reduced. The tariffs or import duties are, therefore, likely to improve the terms of trade for the tariff- imposing country. It may be explained through Fig. 2.2.
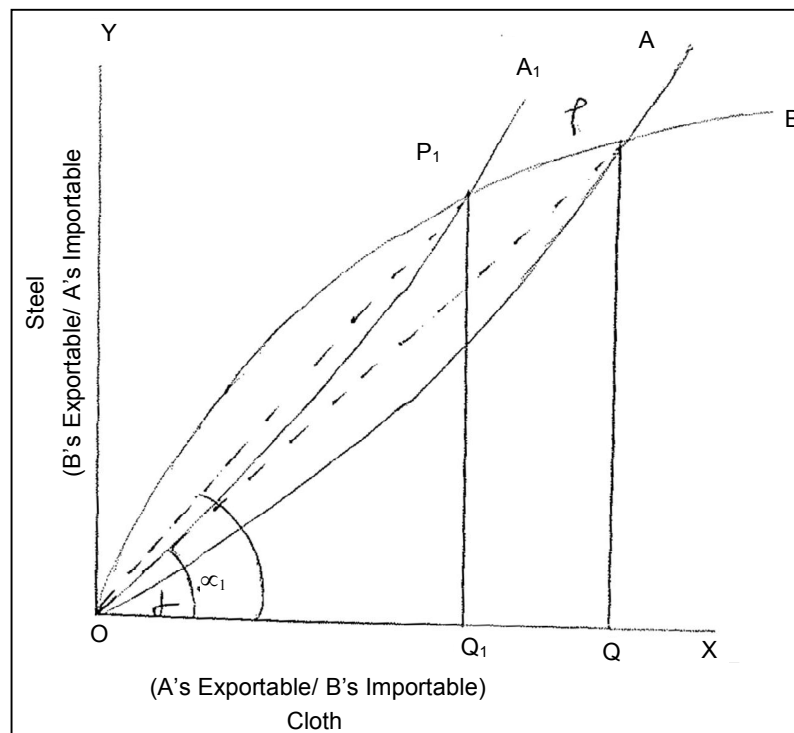

Fig. 2.2: Tariffs or import duties are, therefore, likely to improve the terms of trade for the tariff imposing country

In Fig. 2.2, OA is the offer curve of country A and OB is the offer curve of country B. Their intersection determines the point of exchange P where country A imports PQ quantity of steel and

exports OQ quantity of cloth. The TOT for country A at $P = (Q_M/Q_X) = (PQ/OQ) =$ Slope of Line OP $= \text{Tan } \alpha$.

When tariff is imposed by country A on steel, the offer curve of country A shifts to the left to OA_1. The exchange now takes place at P_1 where P_1Q_1 quantity of steel is imported in exchange of OQ_1 quantity of cloth. The TOT for A at $P_1 = (Q_M/Q_X) = (P_1Q_1/OQ_1) =$ Slope of Line $OP_1 = \text{Tan } \alpha_1$. Since $\text{Tan } \alpha_1 > \text{Tan } \alpha$, the terms of trade have become favorable for the tariff-imposing country A.

In this connection, it should be remembered that tariff will improve the terms of trade for the tariff-imposing country, if the elasticity of offer curve of the other country is more than unity but less than infinity. If the foreign country B imposes retaliatory tariff of the equivalent or relatively larger magnitude, the effect of imposition of tariff by the first country A may get off-set or more than off-set.

3. Changes in Tastes: The terms of trade of a country may also be affected by the changes in tastes. If tastes or preferences of the people in country A shift from the product Y of country B to its own product X, the terms of trade will become favourable to country A. In an opposite situation, the terms of trade will turn against this country. It may be shown through Fig. 2.3.
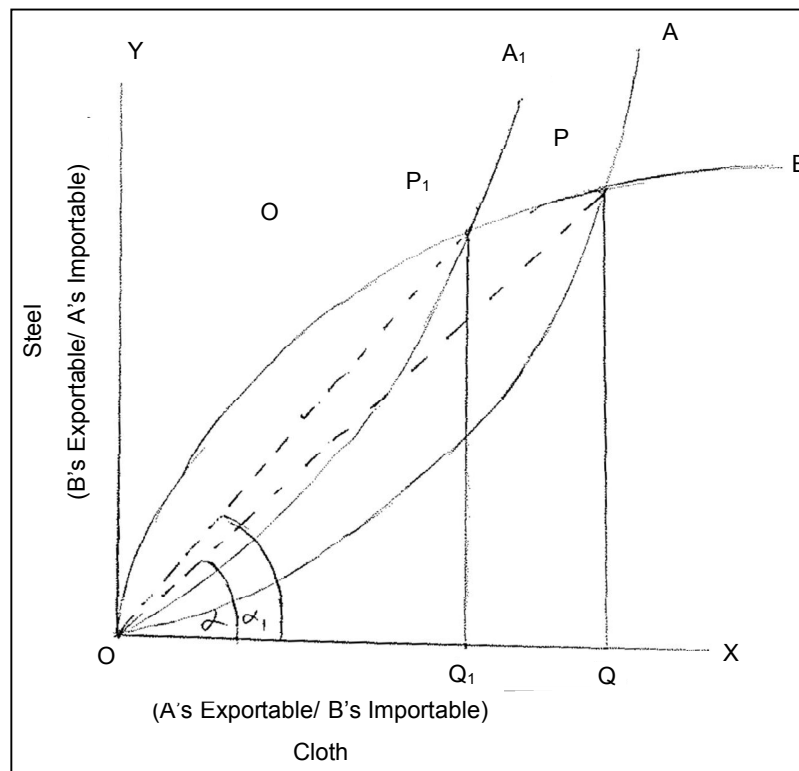
Fig. 2.3: Terms of trade of a country may also be affected by the changes in tastes

In Fig. 2.3, the offer curves OA and OB of countries A and B respectively intersect each other at P. At this point of exchange, country A imports PQ quantity of Y and exports OQ quantity of X.

The TOT for country A at $P = (Q_M/Q_X) = (PQ/OQ) =$ Slope of Line OP $= \text{Tan } \alpha$. If people in country A do not have a stronger preference for the commodity Y and their preference or taste shifts towards their own product X, the offer curve of country A shifts to the left to OA_1. Now exchange takes place at P_1. Country A buys P_1Q_1 quantity of Y in exchange of OQ_1 quantity of X. The TOT for country A at $P_1 = (Q_M/Q_X) = (P_1Q_1/OQ_1) =$ slope of Line $OP_1 = \text{Tan } \alpha_1$. Since $\text{Tan } \alpha_1 > \text{Tan } \alpha$, there is

an improvement in the terms of trade for country A. On the opposite, the shift in preference towards the foreign product Y will result in the worsening of terms of trade for the home country A.

4. **Changes in Factor Endowments:** If there is an increase in the supply of labour in country A, specialising in the production of labour-intensive commodity cloth, while factor endowments in country B remain unchanged, the fall in labour cost will lower the price of cloth. Consequently, more quantity of cloth will be offered by country A for the same quantity of steel resulting in the terms of trade becoming unfavourable to A. If labour becomes scarcer in this country, the terms of trade are likely to become favourable for it. This may be shown through Fig. 2.4.
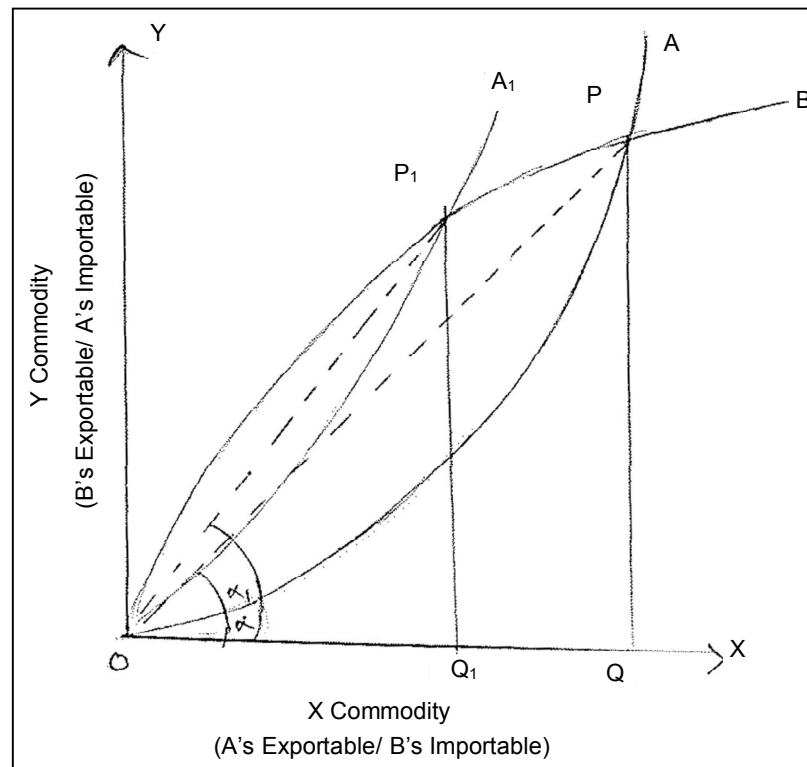

Fig. 2.4: Changes in Factor Endowments and its effeect on the terms of trade

In Fig. 2.4, given OA and OB as the offer curves of countries A and B respectively, exchange takes place originally at P. Country A exports OQ quantity of cloth and imports PQ quantity of steel.

The TOT for country A at P = (Q_M/Q_X) = (PQ/OQ) = Slope of Line OP = Tan α. If there is an increase in the supply of labour in this country, the price of labour will fall. There will also be a fall in the price of labour-intensive commodity cloth relative to the price of steel. For the same quantity of cloth, now less quantity of steel can be bought.

Therefore, the offers curve of country A shifts to the right to OA_1. The exchange takes place at P_1 where P_1Q_1 quantity of steel is imported in exchange of OQ_1 quantity of cloth. The TOT for country A at P_1 = $9Q_M/Q_X$ = (P_1Q_1/OQ_1) = Slope of Line OP_1 = Tan α_1. Since Tan α_1 < Tan α, terms of trade become unfavourable for country A subsequent to change in the factor endowments, i.e., increased supply of labour.

5. **Changes in Technology**: The terms of trade of a country get affected also by the changes in techniques of production. As there is technological improvement in the home country, say A, there is rise in productivity and/or a fall in the cost of producing exportable commodity, say cloth. If the

technological progress is labour-saving in this labour-intensive export sector (cloth industry) there will be worsening of the terms of trade as the offer curve of country A will shift to the right. This may be explained through Fig. 2.5.
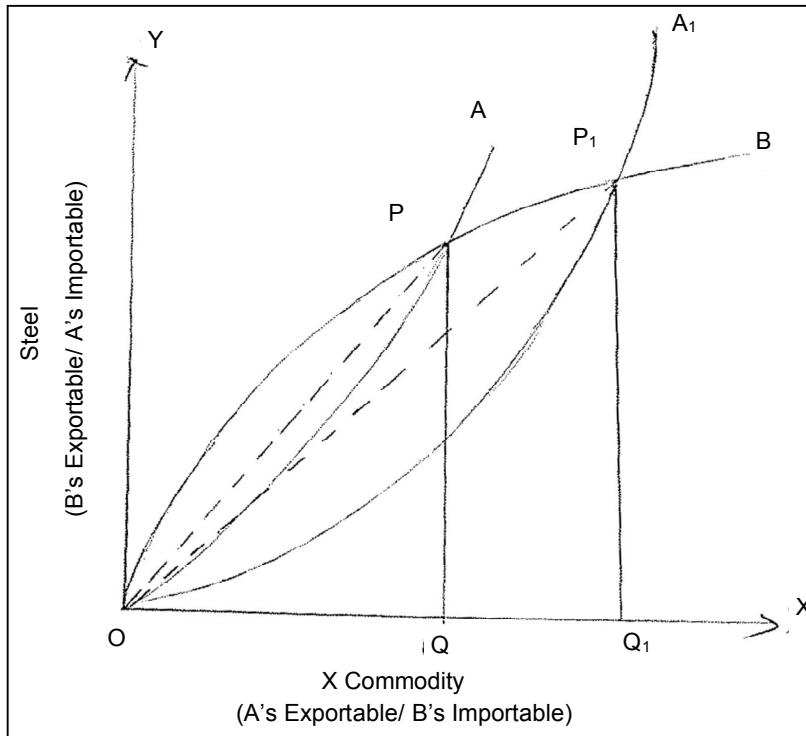

Fig. 2.5: Changes in Technology and its effect on the terms of trade

In Fig. 2.5, OA and OB are the-offer curves of countries A and B respectively. The exchange takes place at P where PQ quantity of steel is imported in exchange of OQ quantity of cloth.

The TOT for A at P = (Q_M/Q_X) = (PQ/OQ) = Slope of Line OP = Tan α. If labour-saving technical progress takes place in the labour-intensive export sector (cloth industry), the offer curve of country A shifts to the right to OA_1 where P_1O_1 quantity of steel is imported in exchange of OQ_1 quantity of cloth. The TOT for country A at $P_1 = (Q_M/Q_X) = (P_1Q_1/OQ_1)$ = Slope of Line OP_1 = Tan α_1. Since Tan α_1 < Tan α, there is worsening of the terms of trade for this country after technological progress.

In case this type of technical progress takes place in the import-competing sector in this county, there will be an improvement in the terms of trade. If capital-saving technical progress takes place in labour-intensive export sector, there can still be the possibility of improvement in the terms of trade.

6. Economic Growth: The economic growth involves a rise in real national product or income of a country over a long period. As growth takes place, there is an expansion in the productive capacity of the country. The increased productive capacity may result from the increased supply of productive factors. It is supposed that there are two countries A and B.

The former is the labour-abundant home country and cloth is its exportable product, which is labour-intensive. Steel, the capital-intensive commodity, is its importable product from the foreign country B. The offer curves of two countries are given.

As the supply of labour in the labour- abundant country A increases or growth takes place, the offer curve of this country will shift to the right. The cost and price of exportable commodity falls

relative to the cost and price of steel in country B. As a result, this country will offer more quantity of
        cloth for the same quantity of steel. In this situation, the terms of trade will get worsened for the
        growing home country A, although the volume of trade will get enlarged.

              If the supply of scarce factor capital increases, subsequent to growth, the cost and price of
        importable good steel will fall relative to the price of cloth. More quantity of steel can be obtained for
        the same quantity of cloth. In this case, the offer curve of country A will shift to the left. This will
        cause the improvement in the terms of trade for the growing home country A but the volume of trade
        will get reduced. This may be explained through Fig. 2.7.
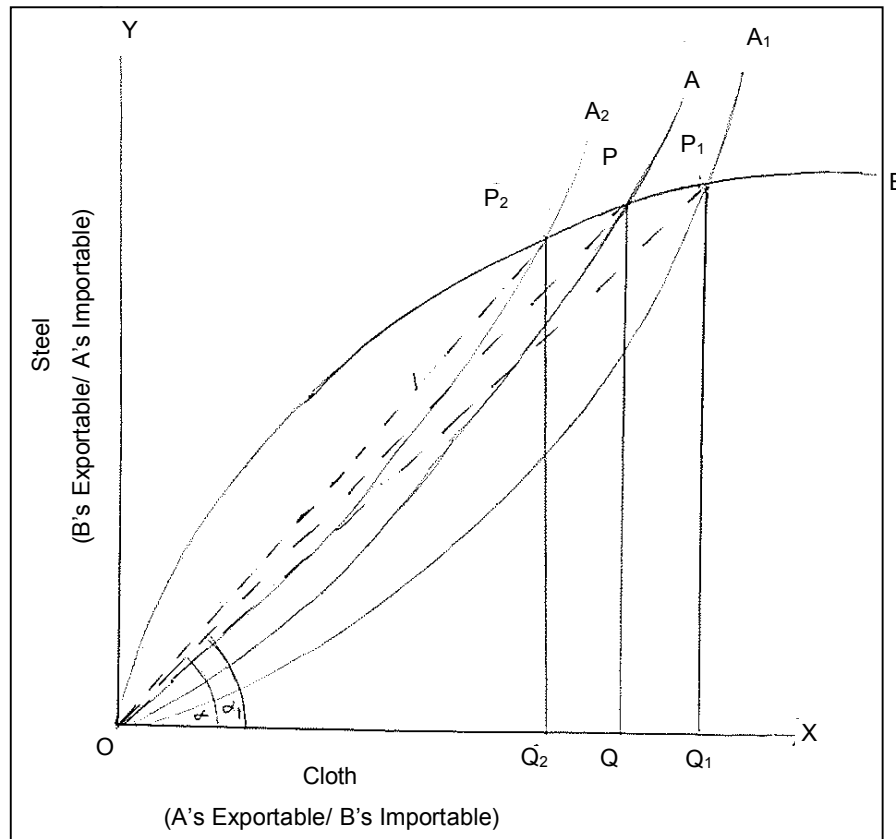
**Fig. 2.7: If the supply of scarce factor capital increases, subsequent to growth, the cost and
price of importable good steel will fall relative to the price of cloth. More quantity of steel can
be obtained for the same quantity of cloth. In this case, the offer curve of country A will shift to
the left. This will cause the improvement in the terms of trade for the growing home country A
but the volume of trade will get reduced.**

              In Fig. 2.7, originally OA and OB are the offer curves of two counties. The exchange takes place
        at P. Country A exports OQ quantity of cloth and imports PQ quantity of steel. The TOT at P =
        $(Q_M/Q_X) = (PQ/OQ)$ = Slope of Line OP = Tan α. If growth takes place and supply of abundant factor
        labour increases, the offer curve of A shifts to the right to OA_1 and exchange takes place at P_1.
        P_1Q_1 quantity of steel is imported and OQ_1 quantity of cloth is exported. The TOT for A at P_1 =
        $(Q_M/Q_X) = (P_1Q_1/OQ_1)$ = Slope of Line OP_1 = Tan α_1.

              Since Tan α_1 < Tan α, there is worsening of the terms of trade for the home country after growth.
        Since there is an expansion of both exports and imports, the volume of trade has however, increased.
        If growth involves the increased supply of scarce factor capital, the offer curve of country A will shift

to the left to OA_2. In this case, exchange takes place at P_2. The quantity imported of steel is P_2Q_2 whereas the quantity exported of cloth is OQ_2.

The TOT at $P_2 = (Q_M/Q_X) = (P_2Q_2/OQ_2) = $ Slope of Line $OP_2 = $ Tan α_2.

Since Tan $\alpha_2 > $ Tan α, the terms of trade for the growing home country have improved. But in this case, the volume of trade of the country has decreased. The export and import of cloth and steel respectively have been less than quantities transacted before the process of growth.

In the above two cases, it was assumed that the relative prices of the two commodities undergo change. Suppose the prices of cloth and steel remain unchanged even after growth, the terms of trade will remain unchanged. If growth involves increased supply of abundant factor labour and prices of two commodities remain the same, the exchange may occur at P_4 where the slope of line OP is exactly equal to the slope of line OP_4 (P and P_4 lie on the same line).

The terms of trade remain the same there, although the volume of trade is much larger than at P. If there is increased supply of scarce factor capital but the prices of commodities remain the same, the exchange occurs at P_3. The terms of trade at P_3 are exactly equal to the term of trade at P (both the points lie on the same line OP). So there is no change in the terms but the volume of trade is smaller than volume of trade at the original position P. It is now clear that growth process can lead to deterioration or worsening of the terms of trade or these may remain unchanged.

7. Devaluation: Devaluation is the reduction of the value of home currency in relation to the value of foreign currency. Since devaluation causes a lowering of export prices relative to import prices, the terms of trade are supposed to get worsened after devaluation of the home currency.

In fact there is much controversy about the impact of devaluation upon the terms of trade among the economists. F.D. Graham and several other classical theorists held the view that the devaluation would leave the terms of trade unaffected because the countries transact at the international prices upon which they have little control.

The neo-classical, theorists, including Joan Robinson, on the contrary, maintained that most countries specialised in the export of a few commodities, the foreign demand of which was relatively inelastic while, at the same time, they imported such goods, the supply of which was relatively more elastic. Consequently devaluation tends to deteriorate their terms of trade.

This is particularly true in the case of the developing countries. If, however, the country enjoys a monopsony power, it will specialise in imports while exporting a variety of goods. It is likely to make imports at a lower price even after devaluation and the terms of trade, as a consequence, will get improved.

The devaluation can be successful or effective if the export prices fall and import prices rise. It means the successful devaluation is likely to make the commodity terms of trade unfavourable. Even the gross barter terms of trade are likely to turn adverse in the event of successful devaluation that result in a balance of trade surplus. As a matter of fact, whether the terms of trade will become adverse or favourable, is determined by the elasticities of demand and supply of exports and imports of the devaluing country.

If the elasticities of supply of exports and imports are higher than the elasticities of demand for exports and imports, so that the product of demand elasticity co-efficients is less than the product of supply elasticity co-efficients ($D_X.D_M < S_X.S_M$), there will be deterioration in the terms of trade after devaluation. Here D_X and D_M are elasticity coefficients of the demand for exports and imports respectively. S_X and S_M are the elasticity coefficients of supply of exports and imports respectively.

If the product of elasticity co-efficients related to demand for exports and imports is exactly equal to the product of the elasticity co-efficients of supply of exports and imports respectively ($D_X.D_M = S_X.S_M$), the devaluation will leave the terms of trade unchanged. If the product of elasticity co-efficients of demand for exports and imports is greater than the product of elasticity co-efficients of supply of exports and imports, ($D_X.D_M > S_X.S_M$), there will be an improvement in the terms of trade after devaluation.

To sum up, the terms of trade will worsen, remain unchanged and improve, consequent upon devaluation, if:

(i) $D_X . D_M < S_X . S_M$

(ii) $D_X . D_M = S_X . S_M$

(iii) $D_X . D_M > S_X . S_M$

8. Balance of Payments Position: If a country is faced with a deficit in balance of trade and payments and it has to adopt measures intended to restrict import and enlarge exports such as internal deflation, devaluation, import and exchange controls, the terms of trade are likely to get worsened. On the opposite, a trade and payments surplus may be tackled through the exchange appreciation and reflationary policies. As a consequence, the terms of trade may get improved.

9. International Capital Flows: An increased flow of capital from abroad involves larger demand for the products of the creditor country and consequent rise in the prices of imported goods. The rise in prices of imports relatively to the prices of exports causes deterioration in the net barter terms of trade. When the borrowing country makes repayments of outstanding loans, there is outflow of capital.

In order to get hold of required foreign currencies for making repayments, there may be sale of home-produced goods at rather low prices. The fall in export prices relative to import prices will again result in the deterioration in the net barter terms of trade.

10. Import Substitutes: If there is sufficient production of close substitutes for import goods within the home country, its reciprocal demand for the foreign products will be weak and the terms of trade are likely to become favourable for the home country. On the opposite, if the close substitutes of the import goods are not available in the home country, the reciprocal demand for foreign products may be relatively high. As a result, the terms of trade are likely to be unfavourable for the home country.

There can be several other minor influences upon the terms of trade such as price movements, business cycles, transfer problems and political conditions.

Impacts of Deterioration of Terms of Trade on Developing Countries

1. Low capacity to import: As the prices of exported primary products have remained lower relative to prices of manufactured product, the capacity of the developing countries to import goods per unit of the exported capacity has become less and less.

2. Balance of payments deficits: The deteriorating terms of trade of the developing countries have enlarged the gap between their export earnings and import bills. As a consequenc, most of the LDC's countries have been facing mounting balanve of payments deficits.

3. Enforcement of stiff borrowing conditions: The adverse terms of trade and consequent balance of payments deficit have led to the increasing dependence of the developing countries upon the borrowings from the advanced countries and the international financial institutions. The

borrowings from the financial institutions are made available under increasingly stiff conditionality. These include the adjustment in exchange rate of home currency, borrowing from commercial banks in advanced countries, liberalization of structure of tariff, larger imports from advanced countries, internal monetary and tax adjustments, changes in plan and development priorities etc. Such conditions, imposed under the pressure of advanced countries are likely to have adverse economic and other consequences for the developing countries.

4. Debt trap: The continuous deterioration in the terms of trade has landed many a developing country in a state of debt trap. The burden of international borrowing upon some of the countries such as Brazil and Mexico has increased to such a large extent that the export receipts are insufficient to pay for debt servicing. The external debt burden in case of India too has reached an alarming level. While in 1989-90, the external borrowings of India were 75-90 billion U.S. dollars and debt servicing accounted for 31.8 percent of the current receipts of that year, the amount of foreign debt soared to 97.86 billions U.S. dollars at the end of Sept., 2000 and the debt servicing stood at 16 percent of the current receipts in 1999-2000. While most of the developing countries are perilously close to the debt trap, where fresh obligations, no satisfactory multilateral debt relief arrangement has so far been evolved because of inflexible attitude of the advanced countries.

5. Adverse effect on growth: The persistent BOP deficits, decline in the capacity to import, mounting external debt and increasing restrictions on the inflow of capital in the wake of deteriorating terms of trade have serious depressing effect upon the growth process in the developing countries.

Effects of Tariffs on Terms of Trade

In the case of a large tariff-imposing country, the tariff is likely to improve the terms of trade for it. But the extent to which tariff can ensure the improvement in terms of trade is determined by the reciprocal demand of the two trading countries or their respective offer curves.

The most crucial factor, however, is the reactions of the foreign countries to the tariff moves of the home country. In other words, whether the terms of trade will become favourable or not for the tariff-imposing home country, depends upon whether the other countries retaliate or not to tariff restrictions imposed by the home country against their products.

Terms of Trade Effect in the Absence of Retaliation:

If a country resorts to the imposition of tariff while the foreign country does not retaliate, two types of effects can follow. Firstly, there is an improvement in the terms of trade of the tariff-imposing country. Secondly, the tariffs result in the contraction in the volume of trade. These effects of tariff can be shown through Fig. 2.7(a).
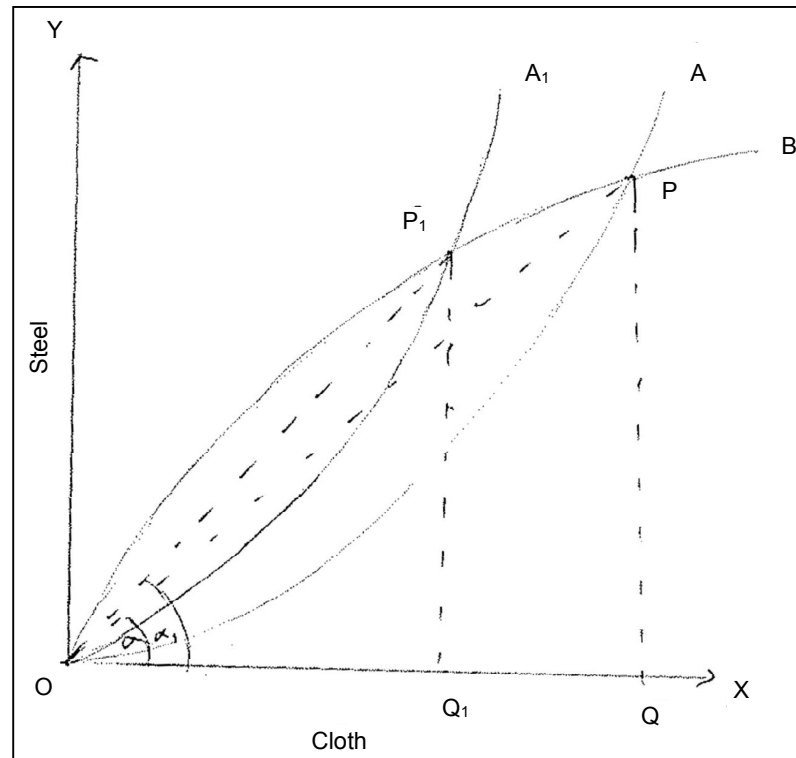
Fig. 2.7(a): 'Terms of Trade Effect in the Absence of Retaliation'

In Fig. 2.7(a) the commodity cloth which is exportable of home country A and importable of foreign country B is measured along the horizontal scale. The commodity steel which is exportable of B and importable of A is measured along the vertical scale. OA is the offer curve of country A and OB is the offer curve of country B. Initially, the exchange takes place at P where country A exports OQ quantity of cloth and imports PQ quantity of steel.

The terms of trade for the home country A at $P = (Q_M/Q_X) = (PQ/OQ) = $ Slope of Line OP = Tan α. If the home country imposes tariff on steel, its offer curve shifts to the left, which indicates that the steel has become relatively more costly than cloth. Now exchange takes place at P_1 where the given offer curve of country B intersects the offer curve OA_1 of country A.

At this point, country A imports P_1Q_1 quantity of steel and exports OQ_1 quantity of cloth. The terms of trade for country A at $P_1 = (Q_M/Q_X) = (P_1Q_1/OQ_1) = $ Slope of Line $OP_1 = $ Tan α_1. Since Tan $\alpha_1 > $ Tan α, there is an improvement in the terms of trade for the tariff-imposing home country A, subsequent upon the imposition of tariff.

Prior to the imposition of tariff, the volume of trade was constituted by OQ exports of cloth plus PQ imports of steel. After the imposition of tariff both exports and imports stand reduced to OQ_1 and P_1Q_1 respectively. Thus there is a fall in the volume of trade after tariff is imposed.

The above analysis concerning the effect of tariff upon terms of trade presumed an absence of retaliation by the foreign country and a less than perfectly elastic offer curve of the foreign country. If it is supposed that the offer curve of the foreign country is perfectly elastic, the tariff imposed by the home country will fail to bring about improvement in the terms of trade. Only effect tariff will have in such a situation is the reduction in the volume of international trade. It may be shown through Fig. 2.8.
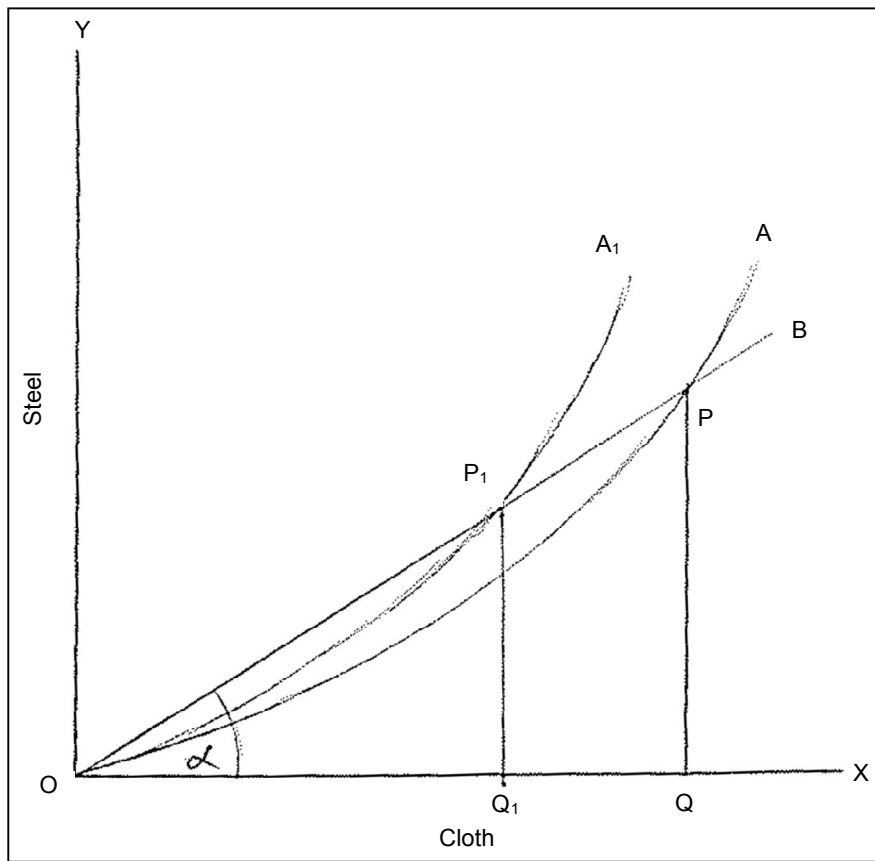
Fig. 2.8: Offer curve of the foreign country is perfectly elastic, the tariff imposed by the home country will fail to bring about improvement in the terms of trade. Only effect tariff will have in such a situation is the reduction in the volume of international trade

In Fig. 2.8, OA is the offer curve of home country A and OB is the perfectly elastic offer curve of foreign country B. Originally the exchange takes place at P where A exports OQ of cloth and imports PQ quantity of steel. The terms of trade $P = (Q_M/Q_X) = (PQ/OQ) =$ Slope of Line OP $=$ Tan α. After tariff is imposed by country A. its offer curve shifts to OA_1 but the offer curve of non-retaliating foreign country remains unaffected. The exchange takes place at P_1 where OQ_1 quantity of cloth is exported in return of P_1Q_1 quantity of cloth.

The terms of trade at $P_1 = (Q_M/Q_X) = (P_1Q_1/OQ_1) =$ Slope of Line $OP_1 =$ Tan α. Since the terms of trade at both P_1 and P are measured by the constant Tan α, it means there is no improvement in the terms of trade for the tariff-imposing home country A.

The effect of tariff is only in the form of reduction in quantities exported and imported of the two commodities to OQ_1 and P_1Q_1 respective. So the tariff leads to a contraction in the volume of trade without effecting improvement in the terms of trade.

In case the offer curve of the foreign country is highly inelastic, tariff can cause improvement in the terms of trade for the home country. No doubt, imports may get enlarged but the contraction in exports being relatively greater, there is still a net reduction in the volume of international trade. This case may be depicted through Fig. 2.9.
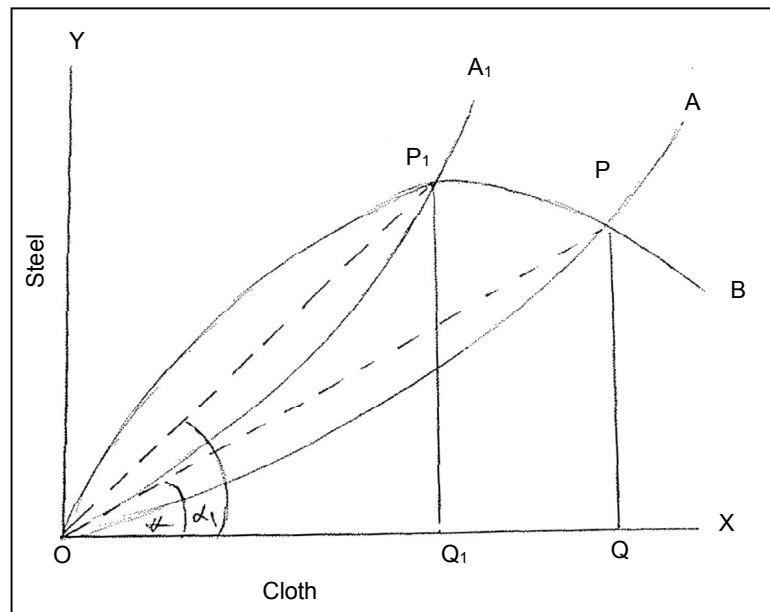
Fig. 2.9: In case the offer curve of the foreign country is highly inelastic, tariff can cause improvement in the terms of trade for the home country. No doubt, imports may get enlarged but the contraction in exports being relatively greater, there is still a net reduction in the volume of international trade.

In Fig. 2.9 the offer curve OB of the foreign country B is highly inelastic. Initially the exchange takes place at P where country A exports OQ quantity of cloth and imports PQ quantity of steel. The terms of trade in this pre-tariff situation P are measured by $(Q_M/Q_X) = (PQ/OQ) =$ Slope of Line OP $=$ Tan α.

After the imposition of tariff by the home country A, its offer curve shifts to OA_1 and the exchange takes place at P_1. Country A exports OQ_1 quantity of cloth in exchange of P_1Q_1 quantity of importable commodity steel. The terms of trade at $P_1 = (Q_M/Q_X) = (P_1Q_1/OQ_1) =$ Slope of Line $OP_1 =$ Tan α_1.

Since Tan $\alpha_1 >$ Tan α, it signifies that there is an improvement in terms of trade even in this situation. Although the quantity imported increases after tariff from PQ to P_1Q_1, yet the decline in export QQ_1 is relatively greater. Therefore, the volume of trade contracts even in this situation.

Terms of Trade Effect in the Event of Foreign Retaliation:

The possibility of improvement in the terms of trade can exist under the assumption that the foreign country does not retaliate to the imposition of tariff by the home country on foreign products. Such an assumption is clearly unrealistic. In fact, tariff restrictions imposed by the home country provoke the foreign country to adopt retaliatory tariff action against the products of the home country. In the event of retaliation, the home country may fail to bring about an improvement in its terms of trade.

One thing, however, is certain that the retaliatory tariffs, will cause a considerable reduction in the volume of trade and consequent decline in the welfare in both the trading countries. The impact of tariff in the event of foreign retaliation can be explained through Fig. 2.10.
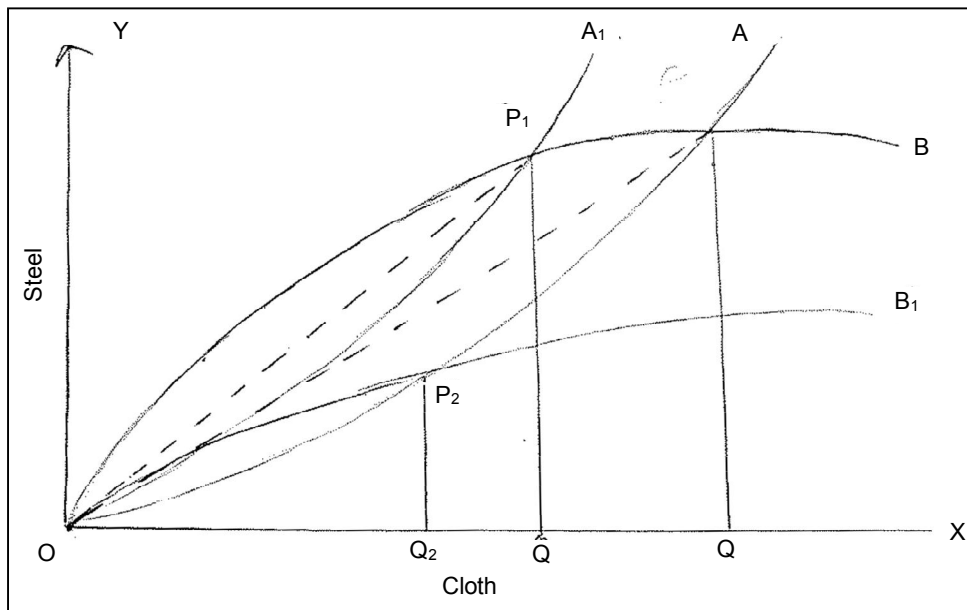
Fig. 2.10: Impact of tariff in the event of foreign retaliation

In Fig. 2.10 original point of exchange is P where the terms or trade are equal to = (Q_M/Q_X) = (PQ/OQ) = Slope of Line OP = Tan α. If country A imposes tariff and there is no retaliation from B, the shift of offer curve of country A to OA_1 determines the point of exchange at P_1. At this point, the terms of trade are measured by (Q_M/Q_X) = (P_1Q_1/OQ_1) = Slope of Line OP_1 = Tan α_1. Since Tan $\alpha_1 >$ Tan α. there is an improvement in terms of trade for country A. Now it is supposed that foreign country B enforces retaliatory tariff upon cloth, exportable of A and importable of B.

Consequently, the offer curve of country B shifts down to OB_1. Given OA_1 and OB_1 as the offer curves of two countries, the exchange now takes place at P_2 where country A exports OQ_2 quantity of cloth in exchange of P_2Q_2 quantity of steel. The terms of trade at P_2 = (Q_M/Q_X) = (P_2Q_2/OQ_2) = Slope of Line OP_2 = Tan α. Since the terms of trade at the original position P and the final position (post-retaliation) P_2 are measured by constant Tan α, it signifies that there is no improvement in the terms of trade for country A.

As both the countries resort to tariff, there is contraction both in their exports and imports such that the volume of trade slumps down very significantly resulting in loss in welfare for both the trading countries.

A regime of tariffs and more particularly, that of retaliatory tariffs, slashes drastically the volume of trade and welfare without assuring an improvement in the terms of trade. This has given way to the present trend of thinking in support of bilateral or multilateral liberalisation of trade through dismantling the structure of restrictive tariffs.

If both the countries A and B reduce or remove tariffs, the point of exchange will shift back to P (according to Fig. 2.10) where the countries will have a larger volume of trade and a higher level of welfare while the terms of trade remain unchanged.

Effects of Devaluation of the terms of trade

What is the Effect of Devaluation on the Terms of Trade?

Devaluation implies the lowering of the exchange rate of a country's currency. It may cause either an improvement or a deterioration in the terms of trade of the devaluing country.

This depends upon the elasticities of demand for and supply of imports and exports of the country. Devaluation will tend to improve the terms of trade if the product of the demand elasticities for the country's imports and exports is greater than the product of the supply elasticities of imports and exports. In algebraic terms: when Dm. Dx > Sm. Sx, the terms of trade will improve with devaluation (here D stands for demand elasticity and S for supply elasticity, m for import and x for export).

It is assumed that, the demand of the devaluing country for imports is elastic (Dm >1) and the demand for its exports is also elastic (Dx > 1), while the supply of imports to the devaluing country is assumed to be inelastic (Sm < 1) and the supply of its export is elastic (Sx > 1).

Before devaluation, the prices (expressed in domestic currency) of imports are OPm and those of exports are OPx. After devaluation, the supply curve of imports will shift upwards to S'm, and the demand curve for exports will shift upwards to D 'x. Then, the new equilibrium prices of imports and exports are OP'm and OP 'x. The price of imports has increased by a lesser extent than I

Similarly, devaluation will deteriorate the terms of trade if the product of elasticities for supply of imports and exports is greater than the product of the demand elasticities. That is, if Sm. Sx>Dm. Dx, the terms of trade will worsen by devaluation.

It may be thus, contended that, the terms of trade of the devaluing underdeveloped countries would generally deteriorate as most of these countries specialise in the export of a few primary products, the foreign demand for which is relatively inelastic (Dx <1), while these countries import a large number of manufactured products from develop countries, the supply of which is relatively elastic (Sm >1).

To many economists, unfavourable movement in the terms of trade on account of devaluation is however, more probable due to imperfect competition in the foreign market and institutional factor" than the relative elasticities of demand for and supply of exports and imports. For, the situation of imperfect competition calls for a considerable reduction in export prices (in terms of home currencies) if exports are to be boosted up considerably.

Its exporters would be able to cut prices from their devaluation profits. But the prices of its imports will not be reduced as foreign exporters have no such devaluation profits to enjoy nor any incentive for giving price concessions to the devaluing country or even otherwise in view of the strict trade restriction practices and exchange control policy followed by almost all the countries of the world.

Essay on the Terms of Trade and Economic Development /or Effects of Economic development on the terms of trade

It is held that favourable terms of trade are very significant for the rapid economic development of the less developed countries. When a country has favourable terms of trade, it can import a larger quantity of goods for the given amount of exports. Thus, the availability of resources, in the country increases so that, rapid growth becomes possible and national income rises. Nurkse thus, regards the advantageous terms of trade as the potential source of capital formation.

However, the development through improved terms of trade becomes possible only if the additional resources thus, made available are saved and invested fruitfully. If the additional resources realised by the improvement in the terms of trade are consumed away and not invested, there will be no capital formation or economic development.

Moreover, the favourable effect of the improvement in the terms of trade may be offset by certain adverse circumstances, as stated below, and rapid economic development may not be realised. These adverse circumstances are:

1. When the improvement in the terms of trade is materialised through restricted exports, resources may remain underutilised in export industries. Thus, the scope of employment, output and income may be limited.

2. If the improvement in the terms of trade is due to high cost of production as a result of inflation, the adverse effect of inflation on the development process will supersede the favourable effect of terms of trade.

3. Further, when the terms of trade are improved by the price rise in exports due to a fall in the supply of exports, the adverse effect lies in the reduction of aggregate exports, so that, relative import capacity may actually decline.

As such, the effect of improved terms of trade on development should be examined cautiously in relation to other pertinent effects like changes in supply, demand, quantum of exports, and imports, employment and income and prices in the country.

Thus, it may be laid down that, other things being equal, there can be no theoretical dispute on the role of the favourable terms of trade in economic development of the primary producing countries. In practice, however, it has been observed that the terms of trade in these poor countries are not improving but actually deteriorating in spite of inflation, scarcity and low productivity in these economies as against abundance and high productivity and relative price stability in advanced countries. This deterioration is due to the following reasons:

1. Population in poor countries is large and growing faster than in advanced countries. Thus, poor countries' demand for imports of capital equipments, etc., are rising faster as against the more or less steady demand for primary exports by the advanced countries.

2. Concentration and expansion of the export industries in the less developed countries have lowered the prices of their exports in the competitive world market.

3. Affluence in domestic production in the advanced countries has decreased their demand for imports from poor countries.

4. Recent technological advancement and other inventions have caused a further decline in raw material import needs of developed countries. For instance, inventions of synthetic substitutes like synthetic rubber, plastics, aluminum, etc. for natural raw materials like jute, cotton, etc. have already affected the exports of less developed nations.

5. The income elasticity of demand of advanced countries for poor countries' primary products and minerals is very low. On the other hand, the income elasticity of demand by poor countries for the manufactured goods of advanced nations is relatively high.

6. Further, a greater degree of flexibility exists in the diversified economies of the industrial countries than those of the subsistence sectors of poor countries. Thus, when world prices of certain commodities are decreasing, industrial nations can easily shift the production of these goods to the production of other goods where prices are not falling. Such adaptability is lacking in the subsistence sectors of the less developed countries, hence, their terms of trade cannot be improved.

7. Lastly, the poor countries have a weak bargaining power in the world market, because of the perishable nature of their exportables. Thus, they have to depend much more on developed countries

both for their imports and exports than vice versa. As such, the terms of trade are set always in favour of the advanced nations, despite GATT and UNCTAD's proposals for better and improved economic and trade relations.

Effects of Economic Growth on International Trade

Economic growth manifests itself in the accumulation of factors and technical progress. Such changes create impact upon trade through the variations in the pattern of production, consumption and the international terms of trade.

Production Effects of Growth

As the process of economic growth facilitates the increased supplies of factor inputs, there can be some change in the domestic output of exportable commodities. The increased production of exportable goods brings about an expansion in the volume of trade. The large production of importable goods, on the other hand, causes a contraction in the volume of trade.

Although the effect of factor growth upon production was analysed by Rybczynski in a quite simple manner, a more elaborate analysis on this issue was made by H.G. Johnson. He identified growth as neutral, export-biased, ultra- export biased, import-biased and ultra-import biased.

Growth is said to be neutral, when the output of both exportable and importable goods increases in the same proportion, consequent upon accumulation of factors and growth. Growth is said to be export-biased or pro-trade, if the increase in the output of exportable goods is more than proportionate to an increase in the output of importable goods.

The growth is supposed to be ultra-export-biased or ultra-trade-biased, if the increased production of exportable goods involves some reduction in the output of importable goods. In case, the growth reduces the production of exportable goods, it is said to be ultra-import- biased or ultra-anti-trade biased. When growth results in a more than proportionate increase in the output of importable goods than the exportable goods, it can be regarded as import-biased or anti- trade-biased.

Assumptions:

The varying implications of growth for the international trade can be analysed on the basis of the following assumptions:

(i)   The trade exists between two countries— A and B.

(ii) The country A is the home country that experiences steady growth.

(iii) There are two productive factors—labour and capital.

(iv) The quantities of the two factors of production increase over the growth process.

(v)   The trade is concerned with two commodities—X and Y.

(vi) The X-commodity is the exportable and Y is the importable commodity of the home country.

(vii) The commodity X is labour-intensive, while Y is capital-intensive.

(viii) There is no change in the techniques of production.

(ix) There is incomplete specialisation.

(x)   The international terms of trade, measured by the ratio of price of exportable commodity to the price of importable commodity remain constant.

Given the above assumptions the production effects of growth are expressed through Fig. 2.11.
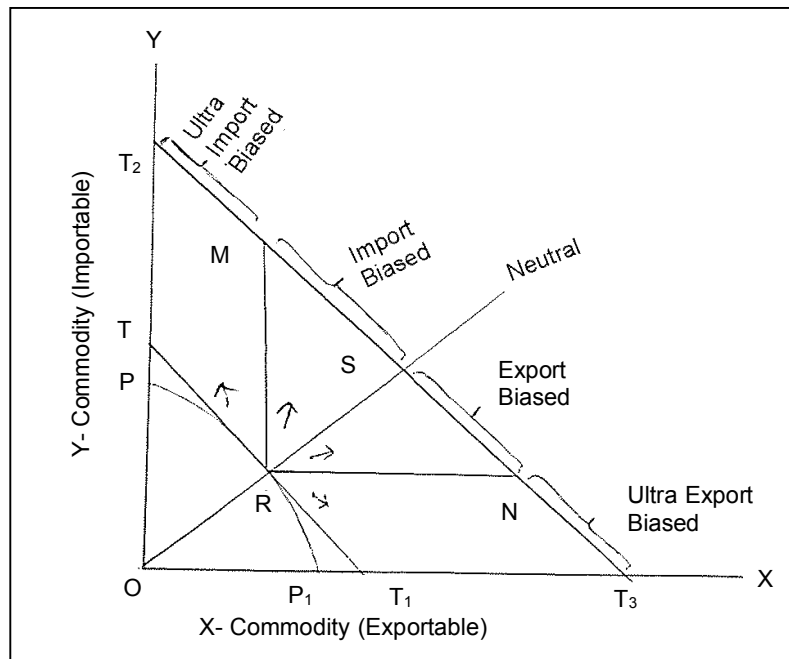

Fig. 2.11: Production effects of growth

In Fig. 2.11, the labour-intensive commodity X, which is the exportable commodity, is measured along the horizontal scale. The capital-intensive commodity Y, which is the importable commodity, is measured along the vertical scale. Originally PP_1 is the production possibility curve, given the factor supplies and technology. TT_1 is the term of trade line. The production takes place at R where TT_1 is tangent to the production possibility curve.

As growth occurs, the factor supplies increase and the production possibility curve shifts to the right. The terms of trade line is T_2T_3 which runs parallel to the original terms of trade line TT_1. It signifies that international price ratio of X and Y remains unchanged despite growth. If production equilibrium occurs at S, the growth is neutral because there is equi-proportionate increase in output of two commodities and the two factors grow in the same proportion.

If the production takes place in the range S and N, the growth is export biased. In this range, the proportionate change in the output of exportable commodity X is greater than the proportionate change in the output of importable commodity Y. It also signifies that the use of labour is proportionately more than that of capital.

If the production equilibrium is determined in the range N to T_3, the growth is ultra-export biased because the increased production of exportable commodity X involves a reduced production of the importable commodity Y. In case the production equilibrium is determined in the range S to M, the growth is import-biased.

In this range, the output of importable commodity increases more than proportionately compared with the increase in output of exportable commodity. In this type of growth, the use of capital is proportionately greater than the use of labour. If the production equilibrium gets determined in the range M to T_2, the growth is said to be ultra-import biased or ultra-antitrade biased.

In this situation, the increased production of the importable commodity Y involves a decline in the production of exportable commodity X. The process of production in this range involves an

increased use of capital with possibly no increase in labour. The ultra-export biased and ultra-import biased patterns of growth are the extreme cases in terms of their effects on the self-sufficiency or trade-dependence of a growing country and may exist in very few cases.

Consumption Effects of Growth:

The process of growth in a given country denoted by the factor growth can bring about changes in its consumption pattern. If there is an increased consumption of the importable commodity, the volume of trade is likely to get enlarged. On the opposite, if the consumption of exportable commodity registers an increase, there is likely to be decline in the volume of trade. As in the case of production, Johnson has classified the consumption effects of factor growth as neutral, export-biased, ultra-export-biased, import-biased and ultra-import-biased.

The process of growth in a country, expressed through increased factor supplies, can bring about an increase in real income. This can result in changes in the consumption of exportable and importable commodities in varying quantities. The relative changes in the quantities consumed of these commodities determine the nature of growth process having varying implications for international trade.

The growth process is said to be neutral, if the increase in the demand for exportable commodity (X) takes place in the same proportion in which the demand for importable commodity (Y) increases. Growth is import-biased or anti-trade-biased, if the increase in demand for importable good is less than proportionate compared with the increase in demand for exportable good.

The process of growth can be regarded as ultra-import biased or ultra- anti-trade-biased, if the demand for importable commodity decreases in absolute terms. There is export-biased or pro-trade-biased growth, when the demand for importable commodity increases more than proportionately compared with the increased demand for the exportable commodity. When the demand for exportable commodity decreases in absolute terms, the growth process is said to be ultra-export biased or ultra-pro-trade biased.

H.G. Johnson pointed out that the output elasticity of demand for importables can measure the nature of growth in relation to trade. The growth process is import-biased, neutral or export- biased, if the output-elasticity of demand for importable commodity is less than, equal to or greater than unity respectively. If the output-elasticity of demand for importable commodity is negative, the growth process is ultra-import-biased. On the opposite, if the output elasticity of demand for exportable commodity is negative, the process of growth is ultra-export-biased.

The consumption effect of growth, given the constancy of tastes, terms of trade and distribution of income can be shown through Fig. 2.12.
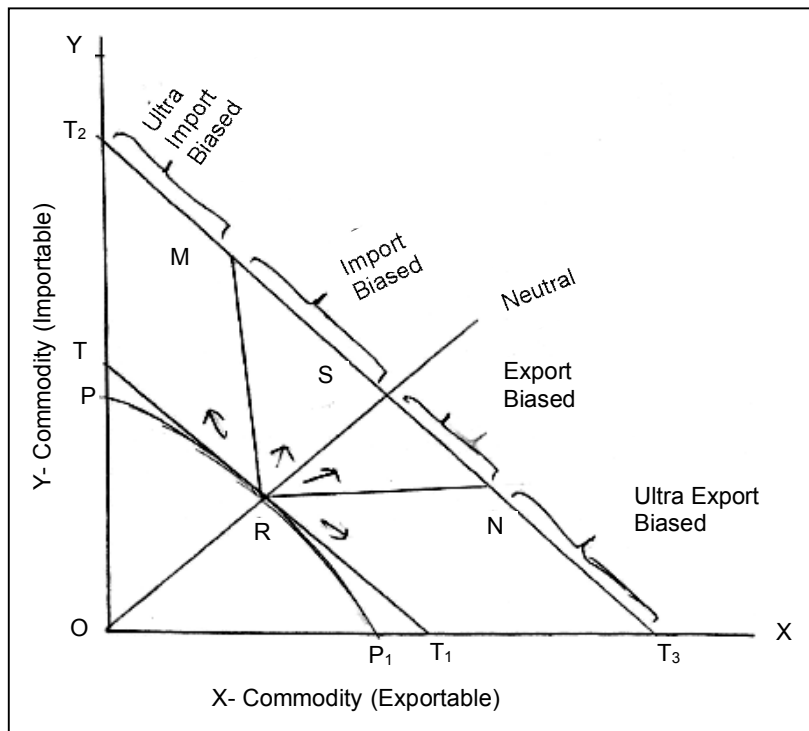
Fig. 2.12: Consumption effect of growth, given the constancy of tastes, terms of trade and distribution of income

In Fig. 2.12, the original position of production and consumption equilibrium is determined at R. At this point, the terms of trade line TT_1 is tangent to the production possibility curve PP_1, on the one hand, and tangent to the community indifference curve I, on the other. If growth takes place, the production equilibrium shifts to S. It is assumed that terms of trade remain unchanged so that the terms of trade line T_2T_3 is parallel to TT_1.

The consumption equilibrium may get determined at any position on T_2T_3 where it becomes tangent to some higher commodity indifference curve. If the consumption takes place at S, and there are proportionate increases in the consumption of two commodities, growth is neutral. If consumption takes place in the range S to M, the growth is export-biased as the demand for importable commodity Y increases at a proportionately greater rate than the demand for exportable commodity.

If consumption takes place in the range M to T_2, the consumption effect of growth is ultra-export-biased. In case, if consumption occurs in the range S to N, there is an import-biased consumption effect. When the consumption takes place in the range N to T_3, the consumption effect of growth is ultra-import- biased.

The output or income elasticity of demand for imports can determine the implication of growth on trade, if the growth results from some factor other than population growth. In this connection, H.G. Johnon writes, "If growth is due to some other cause than population change, income per hand will rise, and the type of growth will depend on the average income elasticity of demand for imports. If imports are luxury goods, growth will be pro-trade-biased; if they are necessary goods, growth will be anti-trade-biased; if imports are inferior goods, growth will be ultra-anti-trade- biased and if exports are inferior goods, growth will be ultra-pro-trade-biased."

So far in this analysis, it was supposed that the tastes pattern and distribution of income remain the same. With the expansion in income, subsequent to growth, there can be change in tastes pattern and income distribution. These factors can bring about significant change in the relative demand for the two commodities.

Combined Production and Consumption Effects of Growth:

In a growing country, the total effect of growth represents the combined result of its effects on production and consumption.

If there is complete specialisation in production, the country does not at all produce the importable commodity and the total effect of growth is determined entirely by the shift in consumption equilibrium due to the expansion of income. In such a situation, the overall effects of growth can again be neutral, export-biased, ultra-export biased, import-biased and ultra-import-biased depending upon the relative changes in the demand for imports and supply of exports.

If there is incomplete specialisation, and the given country produces both the commodities, the demand for her imports is measured by the excess of total demand for and the domestic supply of the concerned commodity. The total growth effect on the demand for imports is, therefore, the net effect of the production and consumption effects of the importable commodity.

This total effect determines the extent or direction of shift in the offer curve of the growing country. As shift takes place in the offer curve of the given country, it becomes possible to ascertain its impact on the volume and terms of international trade.

If both consumption and production effects are neutral, the overall growth effect in the growing country, say A, is also neutral. But the domestic supply of importable commodity being a smaller proportion of the total production than the proportion of consumption of imports to the total consumption, the price of importable commodity is likely to be relatively higher than before. As a result, the terms of trade are likely to become worse, despite neutral overall growth.

The overall effect of growth will be export- biased, if any one of the following possibilities exists:

(i)   The production effect is export-biased and consumption effect is neutral,

(ii) The production effect is neutral and consumption effect is export- biased,

(iii) Both consumption and production effects are export-biased.

The overall or total effect of growth will be import-biased, if:

(i)   The production effect is import-biased and consumption effect is neutral,

(ii) The production effect is neutral and consumption effect is import-biased, and

(iii) Both production and consumption effects are import- biased.

The overall effect of growth is ultra- export-biased when the production effect is ultra- export-biased. In such a situation, the absolute demand for imports increases by more than the entire increase in national income and the supply of exports rises more than its rise in case of export- biased growth. In this situation, the volume of trade gets enlarged but the deterioration in the terms of trade of the home country is more than that occurs in case of the export-biased growth.

The overall effect of growth is ultra-import-biased, if there is an absolute increase in the domestic output of importable and there is an ultra-import bias in production. In this situation, there is an absolute decline in the demand for imports and the supply of exports. If the exportable commodity

is not inferior, there will be an improvement in the terms of trade of the home country in this case. The overall or total growth effect is shown through Fig. 2.13.
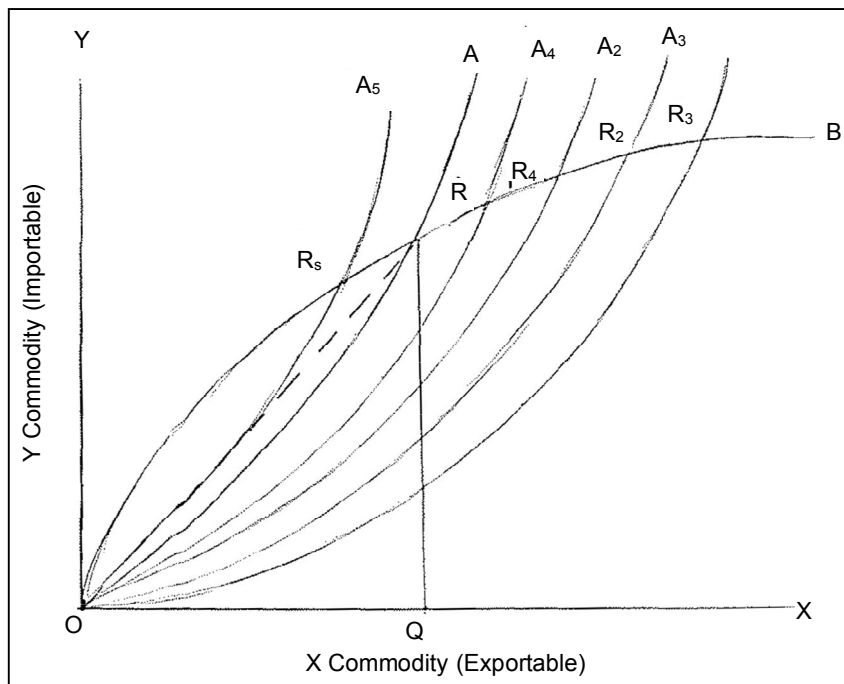

Fig. 2.13: Overall effect of growth is ultra-import-biased, if there is an absolute increase in the domestic output of importable and there is an ultra-import bias in production

In Fig. 2.13, OA is the offer curve of home country A and OB is the offer curve of foreign country B. Originally the equilibrium takes place at R. OQ quantity of X is exported and RQ quantity of Y is imported. The terms of trade are determined by the slope of the line OR. As growth takes place in country A, its offer curve will undergo shifts while the offer curve of country B, not experiencing growth, will remain unchanged.

If the overall or total effect of growth is neutral, the offer curve of country A shifts to the right to OA_1 and the equilibrium takes place at R_1. It shows an increase in the volume of trade but there is worsening of terms of trade for country A. It means the neutral growth bias results in the transfer of gain from country A increasingly to the foreign country. If the offer curve of country A shifts to the right to OA_2, the equilibrium takes place at R_2.

The increase in export is proportionately more than that of imports. The volume of trade increases and the terms of trade for country A get worsened. If the growth is ultra-export-biased, the absolute demand for imports increases by more than the increase in national income and the exports increase by more than the rise in imports. As the offer curve shifts to the right of OA_2, say OA_3, there is an increase in the absolute volume of trade and the terms of trade get further worsened for the home country A.

If the growth is import-biased, the offer curve of A shifts to the left of OA_1 say OA_4, but to the right of original offer curve OA. In this case the demand for imports and supply of exports increase less than proportionately to the total output. The volume of trade increases, although there is antitrade bias in respect of production or consumption or both.

The terms of trade may still get worsened for country A. If the growth is ultra-import-biased, the offer curve of country A may shift to the left of OA, say OA_5. There is absolute reduction in the demand for imports and supply of exports resulting in the absolute reduction in the volume of trade but the terms of trade go in favour of the home country.

Haberler's Opportunity Cost Theory Factor Endowments

Gottfried Haberler has attempted to restate the comparative costs in terms of opportunity cost. He demonstrates that the doctrine of comparative costs can hold valid even if the labour theory of value is discarded. The theory determines the cost of producing a commodity in terms of the alternative production that has to be foregone for producing the commodity in question.

Elaborating upon the opportunity cost, Haberler writes that "the marginal cost of a given quantity X of a commodity A must be regarded as that quantity of commodity B which must be foregone in order that X, instead of (X-1) units of A can be produced. The exchange ratio on the market between A and B must equal their costs in this sense of the terms."

The opportunity cost is what has been given up in order to have some quantity of another thing. If an additional unit of one commodity has to be produced, the productive resources are to be diverted from the production of some other commodity to the given commodity.

The resultant decrease in the quantity of the second commodity represents the opportunity cost of the additional quantity of the given commodity. For instance, if India has to reduce the production of cotton by 2 lakh bales in order to raise the production of wheat by 1 lakh tons, then the opportunity cost of one unit of wheat is two units of cotton (1W = 2C).

Haberler made use of opportunity cost curve to express the opportunity cost of one commodity in terms of the other. The opportunity cost curve has been called as the 'transformation curve' or 'production possibility curve' by Paul Samuelson and 'production frontier' or 'production indifference curve' by A.P. Lerner.

Assumptions of Haberler's Opportunity Cost Theory:
Haberler's opportunity cost theory rests upon the following main assumptions:

  (i)   The economic system is in a state of full employment equilibrium.

  (ii)   There is perfect competition in commodity and factor markets.

  (iii) Price of each commodity equals the marginal cost of producing it.

  (iv)   Price of each factor equals its marginal productivity.

  (v)   The supply of factors is fixed.

  (vi)   The state of technology is given.

  (vii) There are two trading countries A and B.

  (viii) Each country produces two commodities, say X and Y.

  (ix)   Each country has two productive factors- capital and labour.

  (x)   There is perfect factor mobility within each country.

  (xi)   The factors of production are perfectly immobile between the two countries.

  (xii) Neither of the two countries imposes any restrictions upon international trade.

On the basis of the above assumptions, it is possible to determine the opportunity cost curve or the production possibility curve of any country.

The production possibility curve indicates different combinations of two commodities that a country can produce with the given factor endowments and technology. The slope of the production possibility curve is determined by the ratio of units of the commodity given up in order to have one unit of the other commodity. This ratio is termed as a marginal rate of transformation (MRT).

If two commodities X and Y are being

produced by a country and some quantities of labour, capital and other inputs are diverted from the production of Y to the production of X, the additional production of X involves the sacrifice of some quantity of Y. In other words, certain units of Y given up have been transformed into the marginal unit of X. The rate at which marginal unit of X is being substituted for certain units of Y is called the marginal rate of transformation.

$$\text{MRT}_{XY} = -\frac{\delta Y}{\delta X}$$

Alternatively, the MRTxy can be defined as a ratio of the marginal cost of X to the marginal cost of Y.

This can be derived as below:

$$\delta c = \frac{\delta c}{\delta x} . \delta x + \frac{\delta c}{\delta y} . \delta y$$

Here δC stands for change in total cost, $\delta C/\delta X$ and $\delta C/\delta Y$ are the marginal costs of X and Y commodities respectively.

Assuming infinitesimally small changes in X and Y, δC will be equal to zero.

$$\delta c = 0$$

$$\frac{\delta c}{\delta x} . \delta x + \frac{\delta c}{\delta y} . \delta Y = 0$$

$$\frac{\delta c}{\delta y} . \delta y = -\frac{\delta c}{\delta y} . \delta x$$

$$-\frac{\delta y}{\delta x} = \frac{\delta c/\delta x}{\delta c/\delta y}$$

$$\text{MRTxy} = - -\frac{\delta y}{\delta x} = \frac{\delta c/\delta x}{\delta c/\delta y}$$

Since the MRT_{xy} is negative, the opportunity cost curve or transformation curve slopes down from left to right. The opportunity cost curve may be a straight line, convex to the origin or concave to the origin, depending on whether return to scale in a country is constant, increasing or decreasing respectively.

At every point on the straight-line opportunity cost curve AB in Fig. 2.14(a) the MRT_{xy} remains equal, $\text{MRTxy} = -\delta Y/\delta X = PP_1/OQ_1 = P_1P_2/Q_1Q_2$. It also signifies that marginal costs of X and Y remains unchanged and production of both the commodities is governed by constant returns to scale or constant opportunity cost. It implies that all factors of production are equally efficient in all lines of production. Since this is not true in real life, the production possibility curve is not likely to be a falling straight line.
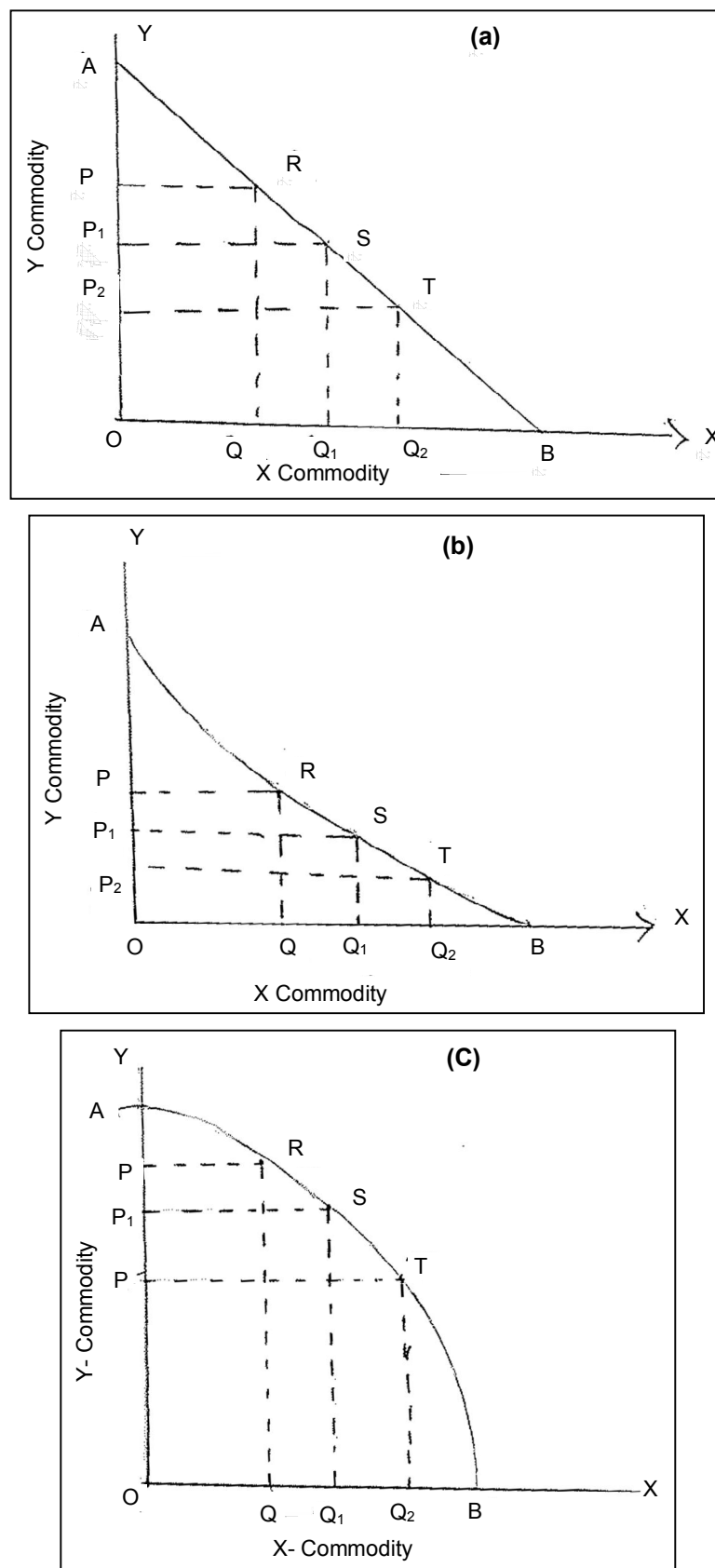
Fig 2.14: Opportunity cost curve

In Fig. 2.14(b), the opportunity cost curve AB is a falling convex towards the origin, MRT_{xy} in this case goes on decreasing.

$(PP_1/QQ_1 > P_1P_2/Q_1Q_2)$

This happens when production is governed by increasing returns to scale or the cost of X in terms Y goes on diminishing as less and less units of Y are given up in order to have more units of X. Even this situation is not realistic because larger production of X will cause reduced significance of X for the commodity in terms of the commodity Y. This figure, on the opposite, indicates increasing marginal significance of X.

In Fig. 2.14(c), the opportunity cost curve AB is a falling concave curve towards the origin. In this case, MRT_{xy} goes on increasing $(PP_1/QQ_1 < P_1P_2/Q_1Q_2)$.

The opportunity cost curve assumes this slope, when production is governed by diminishing returns to scale. As there is an increase in the production of X commodity, MC of X rises while that of Y decreases. This case seems to be more realistic because in this situation, a greater availability of X commodity shows a decreasing significance of this commodity in terms of units of Y commodity.

Gains from Trade:

The Gains from Trade (An Overview)

The below mentioned article provides an overview on the gains from trade.

Nations—developed or underdeveloped- trade with each other because trade is mutually beneficial. In other words, the basic motivation of trade is the gain or benefit that accrues to nations.

In the case of autarky or isolation, benefits of international division of labour do not flow between nations. It is advantageous for all the countries of the world to engage in international trade. However, the gains from trade can never be same for all the trading nations. Some countries may reap a larger gain compared to others. Thus, gains from trade may be inequitable but what is true is that "some trade is better than no trade".

In simple words, gain from trade refers to extra production and consumption effects that countries can achieve through international trade. These gains are, thus, of two types gain from exchange and gain from specialisation in production.

The idea of gains from trade was at the core of the classical theory of international trade propounded by Adam Smith and David Ricardo. According to Smith, the gains from trade arise form the advantages of division of labour and specialisation—both at the national and international level. Such advantages arise, according to Smith, due to the absolute differences in costs. Ricardo goes a step further. He says that trade contributes to increase the mass of commodities, and therefore, the sum of enjoyments. Ricardo adds that the gain from trade consists in the saving of cost resulting from obtaining the imported goods through trade instead of domestic production.

Ricardo's comparative cost thesis may be applied to establish the existence of gains from trade. In other words, gain from trade depends on the comparative cost conditions. Comparative cost doctrine suggests that trade can provide benefit to all countries if they specialise in the production of those goods and, hence, export them in which they have comparative advantage.

A country, thus, specialises in production and export in accordance with its comparative advantage. Ricardo's trading nations acquire complete specialisation in production. As a result, global output becomes larger than under autarky. Trade also enables each country to consume more

than under isolation. Thus, there is a production gain and a consumption gain arising out of international trade. Such gains cannot be reaped in the absence of trade.

However, in determining the exact volume of gains from trade, Ricardo's doctrine is incomplete. For this, what is required is the determination of the actual terms of trade or exchange rate at which trade would take place. The rate at which one commodity (say, export good) is exchanged for another commodity (say, import good) is called terms of trade. Or what import the export buys is called the TOT. Of course, export (and, hence, import) varies with the change in TOT.

This concept of TOT was introduced in the literature by J. S. Mill by introducing the concept of reciprocal demand. By reciprocal demand we mean demand of each country for the other's goods. On the basis of the principle of reciprocal demand, Mill determined a final TOT at which trade between two nations takes place.

At the final TOT, goods demanded by one country are equal to the goods demanded by the other, or one country's supply or the export of good must equal the other country's demand for that good. Thus, TOT is an index of measuring a country's gain from trade. As a result, if a poor, small, less developed country (LDC) trades with a large, rich, developed country's (DC) autarkic or domestic cost ratio, then the LDC will acquire all the gains from trade. If the actual TOT lies between two domestic cost ratios then gains from trade will accrue to both the countries.

However, gains from trade depend on the :

 (i) Relative strengths of elasticity of demand for export and import of goods;

(ii) Size of the country;

(iii) Changes in technology;

(iv) Supply of goods traded; etc.

In general, greater the inelasticity in the foreign demand for exports and greater the elasticity of foreign demand for imports, greater will be the gains from trade.

Further, trade leads to increased competition. Competition enhances efficiency LDCs gain largely in this competitive world. Improved research and technology of the developed world flow in these countries. Openness to trade supports technological upgrading via learning. Evidence on learning and technological up gradation is observed in many activities, mainly in the manufacturing and service sectors.

Larger output and productivity increases indeed can occur not only in the manufacturing sector, but also in other sectors in which technological upgrading of the advanced countries is embodied. In addition, variety of products becomes available to consumers. All these suggest that trade is an 'engine of growth'.

However, gains from trade can never be unambiguous for all the countries. Sometimes, TOT may turn adverse against poor LDCs. Further, trade policy is often designed by the advanced countries in such a way that it reduces benefits of the LDCs from trade. Possibly, due to this fact it is said that free trade is better than restricted trade. Of course, restricted trade has merits too. By imposing a tariff, a poor country can even improve its TOT and, hence, can obtain benefits from trade.

Theory of Reciprocal Demand

In this article we will discuss about the assumptions and criticisms of the theory of reciprocal demand for commodities.

The Ricardian failure to determine the exact rate of international exchange between the two countries was on account of an excessive emphasis upon the supply aspect and a complete neglect of demand aspect. It was J.S. Mill, who attempted to remove this lacuna in the Ricardian comparative costs theory.

According to him, the actual ratio at which commodities are transacted between two countries depends crucially upon the strength and elasticity of each country's demand for the product of the other or the reciprocal demand. By reciprocal demand, Mill meant the quantities of exports that a country would offer at different terms of trade, in return of varying quantities of imports. In other words, reciprocal demand refers to the intensity of demand for the product of one country in the other country.

Assumptions of the Theory

J.S. Mill's theory of reciprocal demand is based upon the following main assumptions:

(i) The trade takes place between two countries, A and B.

(ii) The trade is in two commodities, X and Y.

(iii) In both the countries, the production is governed by constant return to scale.

(iv) The trade between two countries is governed by the principle of comparative costs.

(v) The pattern of demand is similar in two countries.

(vi) There are perfectly competitive conditions in the market.

(vii) There is no restriction on trade and government follows a policy of laissez faire.

(viii) There is full employment of resources in both the countries.

(ix) There is an absence of transport costs.

(x) The exports of each country are sufficient to pay for its imports.

Given the above simplifying assumptions, Mill's theory of reciprocal demand can be explained on the basis of Table 5.1.

According to this table, the pre-trade exchange ratio between X and Y commodities in the two countries are:

Country A:

1 unit of X = 0.63 unit of Y

Country B:

1 unit of X = 0.80 units of Y

If trade commences between them, country A specialises in the production of X while B specialises in the production of Y. But the basic issue is concerned with the rate at which they will exchange their goods. The international rate of exchange will be settled within the two limits of domestic exchange ratio on the basis of reciprocal demand or the relative intensity of demand for the products of each other.

If the demand for X commodity is less elastic in country B but the demand for Y commodity in country A is more elastic, the country B will be willing to give more units of Y for importing a given number of units of X and the international rate of exchange will be closer to the domestic exchange

ratio of country B. It means the exchange ratio or terms of trade are more favourable to country A and she will obtain a larger share out of the total gain from trade.

On the contrary, if the demand for Y commodity is inelastic in country A and the demand for X commodity is more elastic in country B, the latter will be willing to give up an additional unit of Y in exchange of more units of X commodity. In this case, the international exchange ratio will get settled closer to the domestic exchange ratio of country A. The terms of trade are now more favourable to country B and it will secure a larger proportion of gain from trade.

The determination of actual rate of exchange on the strength of reciprocal demand is shown through Fig. 2.15.
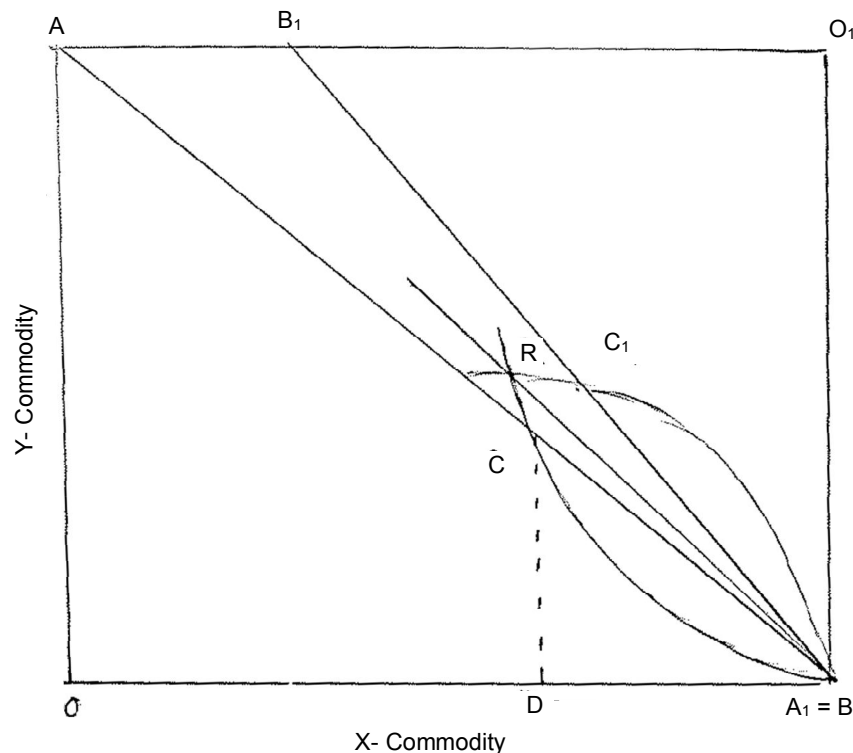
Fig. 2.15: Determination of actual rate of exchange on the strength of reciprocal demand

AA$_1$ represents the production possibility curve of country A. It shows the different combinations of X and Y commodities that country A can produce under constant cost conditions and with the fullest utilization of available labour input. Similarly BB$_1$ represents the production possibility curve of country B with origin as O$_1$. Suppose country A specialises in commodity X and country B specialises in Y.

If there is complete specialisation, the production point is A$_1$=B, where country A devotes all productive resources on producing X and country B on producing Y. AA$_1$ and BB$_1$ production possibility curves represent also the domestic ratio of exchange. Trade will take place within these two limits. So AA$_1$B$_1$ shows the potential trading area. The actual exchange ratio will lie somewhere in this area.

If country A requires OD quantity of X and CD quantity of Y, it can meet the demand through domestic production in the absence of foreign trade. Suppose it requires more quantity of Y than CD. The additional demand for Y can be met by importing it from country B. Now A will offer to give up more quantity of X in order to get additional units of Y. A$_1$CR represents the offer curve of country A.

CA$_1$ part of this curve is imaginary because all these combinations of X and Y commodities can be obtained through domestic production and without external trade.

Similarly BC$_1$R is the offer curve of country B and BC$_1$ part of this curve is imaginary. As we move along CR part of offer curve of country A, the terms of trade become favourable to A. In the same way, the movement along C$_1$R makes the terms of trade more favourable for B. The two offer curves intersect each other at R.

At this equilibrium position, exports of each country are just sufficient to pay for imports. Any change in reciprocal demand will cause a variation in this actual exchange ratio. The more inelastic the offer curve of the country, the more favourable will be the terms of trade for her and vice-versa. The line joining R and A$_1$ (or B) denotes the actual exchange ratio of two commodities for the two countries.

Ellsworth and Leith have summed up the theory of reciprocal demand as follows:

"In summary, (1) the possible range of barter terms is given by the respective terms of trade as set by comparative efficiency in each country; (2) within this range, the actual terms depend on each country's demand for the other country's produce; and (3) finally, only those barter terms will be stable at which the exports offered by each country just suffice to pay for the imports it desires."

It is possible to explain J.S. Mill's theory of reciprocal demand through the use of Marshall's device of offer curve. The offer curve of a country describes the different quantities of her product that can be offered to the foreign country to meet the demand for certain quantities of the product of the foreign country.

It is the demand for the product of each other or reciprocal demand, on the basis of which the offer curve of each country can be determined. In what way the terms of trade between countries A and B related to two commodities X and Y, can be determined is shown through Fig. 2.16.
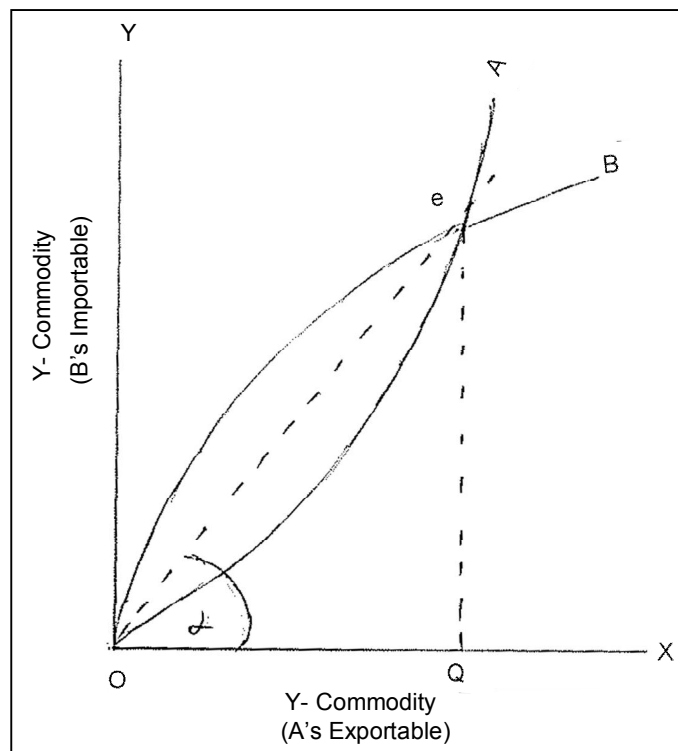

Fig. 2.16: Terms of trade between two countries and related to two commodities

In Fig. 2.16, X-commodity which is A's exportable is measured along the horizontal scale and Y-commodity which is exportable of B is measured along the vertical scale. OA is the offer curve of county A and OB is the offer curve of country B. Every point on curve OA indicates different quantities of X which country A offers in exchange of various quantities of Y.

Similarly the different points on the offer curve OB of country B show the quantities of commodity Y that country B offers for exchanging them with different quantities of X commodity. The equilibrium exchange takes place at C where the two offer curves cut each other. The country A exports OQ quantity of X in exchange of CQ quantity of Y-commodity. The terms of trade (TOT) are measured by the ratio of quantity imported (or demanded) to the quantity exported (or supplied), which in the equilibrium position C is CQ/OQ.

TOT at C = Q_M/Q_X = CQ/OQ= Slope of line OC = Tan $\propto$

If country A's demand for product Y increases, she would be willing to offer more quantities of X for the same quantities of Y. In such a situation, the offer curve of country A will shift to the right. On the opposite, if A's demand for product Y decreases, she would offer less quantities of X in exchange for the same quantities of Y. In this case, the offer curve of country A will shift to the left of its original position.

Similarly, if country B's demand for X increases, she would be willing to offer more quantities of Y in order to have the same quantities of X. That will cause a shift in the offer curve of country B to the left of its original position. On the opposite, a decrease in the demand for X by it will lead to a shift in its offer curve to the right. The impact of these shifts upon the actual equilibrium exchange ratio or terms of trade can be shown through Figs. 2.17 and 2.18.
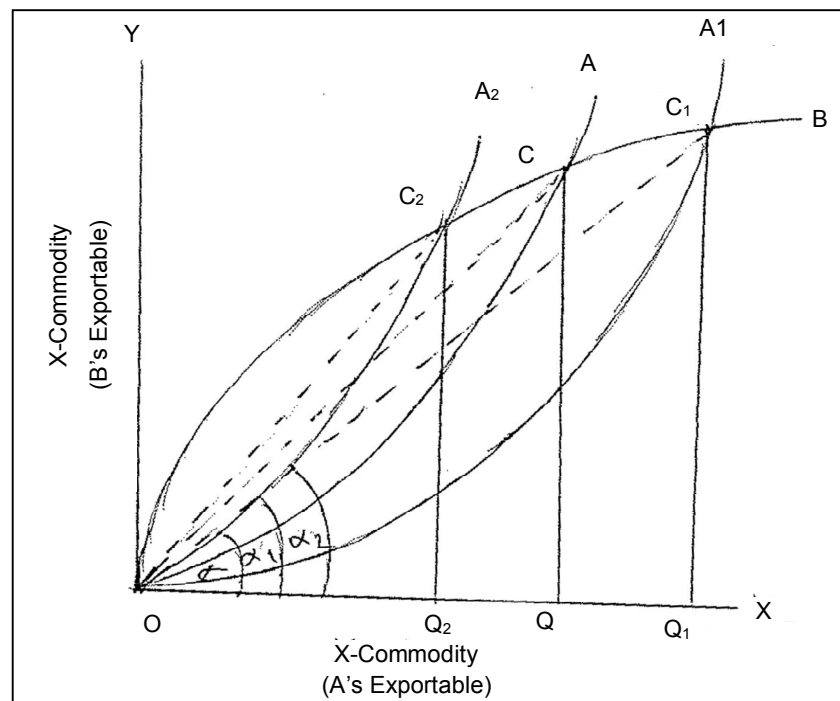
Fig. 2.17: Impact of shifts of offer curve upon the actual equilibrium exchange ratio or terms of trade

In Fig. 2.17, OA and OB are the original offer curves of the two countries A and B respectively. C is the point of equilibrium exchange and TOT at C $= Q_M/Q_X = CQ/OQ =$ Slope of line OC $=$ Tan $\propto$. If A's demand for product Y increases, the offer curve of country A shifts to the right to OA_1. The intersection between OA_1 and OB takes place at C_1, where C_1Q_1 quantity of Y is important in exchange of OQ_1 quantity of X.

The TOT at $C_1 = Q_M/Q_X = C_1 Q_1/OQ_1 =$ Slope of line OC1 $=$ Tan $\propto_1$. Since Tan $\propto_1$

Tan $\propto$, the TOT have become unfavourable for country A or favourable for country B. If A's demand for product Y decreases, the offer curve of A shifts to the left from OA to OA_2 and exchange equilibrium takes place at C_2 through the intersection of curves OA_2 and OB.

Country A imports C_2Q_2 quantity of Y and exports OQ_2 quantity of X. The TOT at $C_2 = Q_M/Q_X = C_2 Q_2/OQ_2 =$ Slope of line $OC_2 =$ Tan $\propto_2$.

Since Tan $\propto_2 >$ Tan α the terms of trade have become favourable for country A or unfavourable for country B.
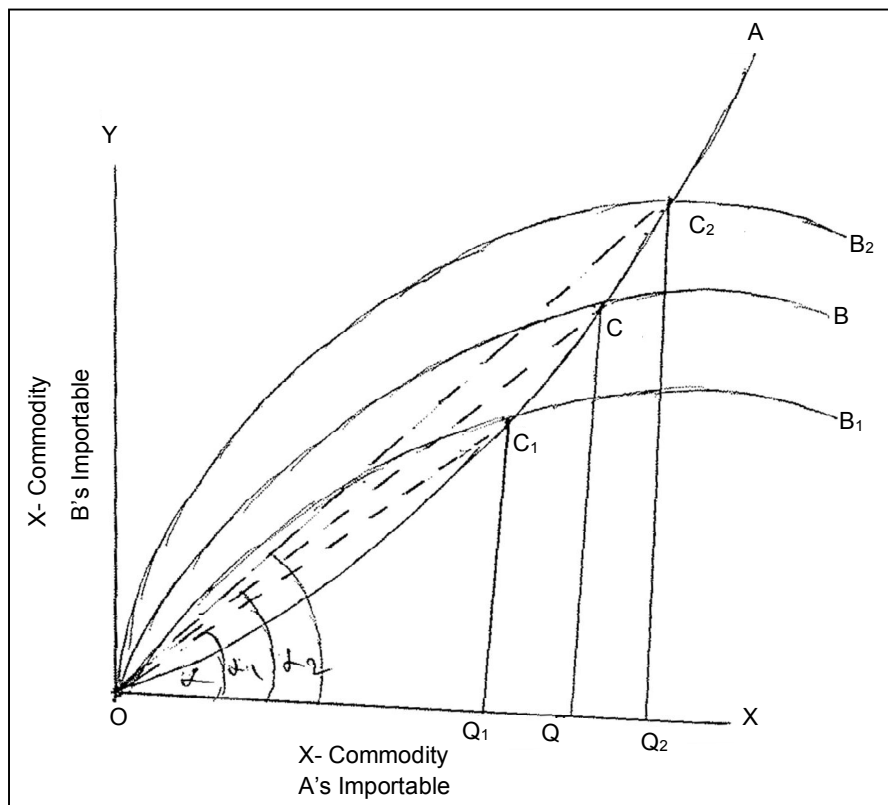
Fig. 2.18: Offer curve of two countries

In Fig. 2.18, given OA and OB as the offer curves of countries A and B respectively, C is the point of exchange. Country A exports OQ quantity of X in order to import CQ quantity of Y. The TOT at C $=$ QM/QX $=$ CQ/ OQ $=$ Slope of line OC $=$ Tan $\propto$. If B's offer curve shifts to the left to OB_2, where B's demand for X-commodity increases, the equilibrium takes place at C_2 through the intersection of OA and OB_2. At point C_2, country B imports OQ_2 quantity of X and exports C_2Q_2 quantity of Y commodity. From the point of view of Country A, the TOT at point $C_2 =$ QM/QX $= C_2Q_2/O_2Q =$ Slope of line $OC_2 =$ Tan $\propto_2$.

Since Tan $\propto_2$ > Tan, there is improvement in the TOT for this country. It signifies that the terms of trade have gone against the country B. On the opposite, if B's demand for X-commodity decreases, it offers less quantities of commodity Y for having the same quantities of X as before. In the situation, the offer curve of country B shifts to the right to OB_1. The exchange takes place at C_1 where OB_1 intersects OA. Country B imports OQ_1 quantity of X and exports C_1Q_1 quantity of Y. From the point of view of country A, the TOT at $C_1 = Q_M/Q_X = CQ_1/O_1Q$ = Slope of line OC_1 = Tan $\propto_1$.

Since Tan $\propto_1$ < Tan $\propto$, there is worsening of the terms of trade for country A while these become favourable for country B. Thus the intensity of demand for the product of each other determines the changes in terms of trade for the trading countries.

The actual equilibrium exchange rate is determined also by the elasticity of the offer curves of the trading countries. Greater the elasticity of the offer curve of a country, the more adverse are the terms of trade for it in relation to the other country and vice-versa.

Mill's theory of reciprocal demand analysed in terms of the offer curves of two countries, can also provide a measure of distribution of gains from trade among the two countries. It can be explained through Fig. 2.19.
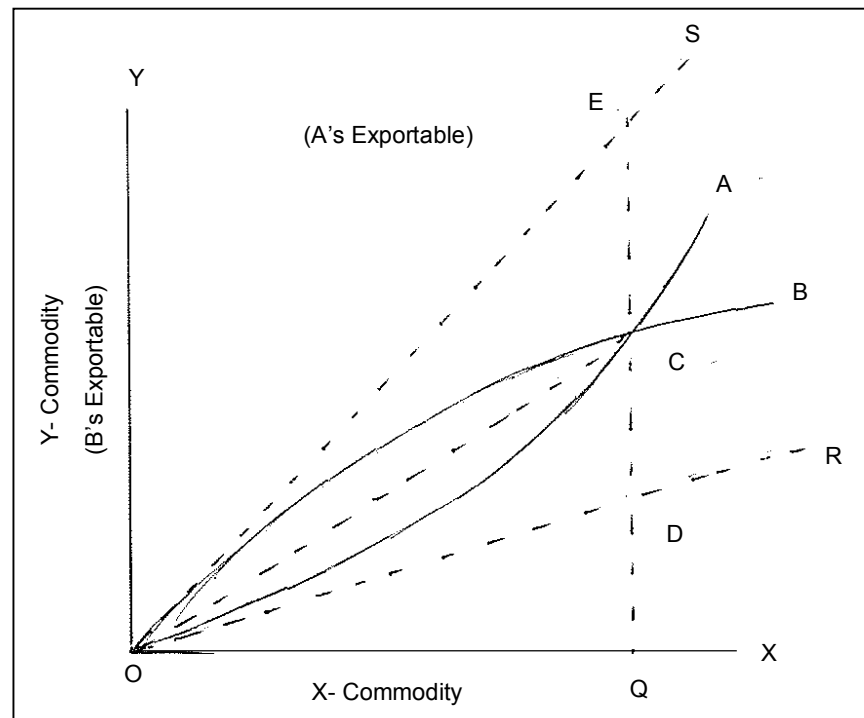
Fig. 2.19: Mill's theory of reciprocal demand

In Fig. 2.19, OA and OB are the offer curves of countries A and B respectively. The slope of the line OR measures the domestic exchange ratio in country A. The slope of line OS measures the domestic exchange ratio of country B. When trade takes place, the exchange equilibrium is determined at C where OA and OB cut each other. The international exchange ratio is measured by CQ/OQ or the slope of line OC.

In the absence of trade, given the domestic exchange ratio line OR, country A exchanges DQ of Y with OQ of X but after trade takes place, she can import CQ quantity of Y in exchange of the

export of OQ quantity of X. Thus gain from trade for country A is equivalent to CQ – DQ = CD units of Y.

In the case of country B, the pre-trade position, given the domestic exchange ratio line OS was that she exchanged EQ quantity of Y with OQ quantity of X. But after trade commences, country B exports only CQ quantity of Y for the import of OQ quantity of X. Thus the gain from trade for country B is EQ – CQ = EC. Closer the international exchange ratio line to the domestic exchange ratio line of one country, greater is the gain from trade for the other country and vice-versa.

Criticisms of the Theory of Reciprocal Demand:

The theoretical structure of J.S. Mill's theory of reciprocal demand rests upon the foundation of Ricardian principle of comparative costs.

Consequently, the theoretical assumptions in Mill's theory are almost the same as in the Ricardian theory. That makes Mill's theory of reciprocal demand susceptible to similar weaknesses as are found in the Ricardian analysis.

In addition to structural deficiencies, Mill's approach has been attacked by F.D. Graham and Jacob Viner on the following main grounds:

(i) Neglect of Supply: According to Graham, the reciprocal demand theory concentrates too much on demand for determining the international values and the supply aspect has been grossly neglected. Such an approach can be accepted, if the theory of international trade is built in terms of fixed quantities of product. In practice, trade involves such commodities the supply of which undergoes significant variations. Therefore, the supply conditions are bound to have decisive effect on the international exchange ratio.

(ii) Unnecessary: Graham dismissed the whole idea of reciprocal demand as unnecessary in the theory of international values. If the production takes place under constant cost conditions, as assumed both by Ricardo and Mill, the supply conditions alone are sufficient to settle the final equilibrium rate of exchange.

(iii) Neglect of Domestic Demand: In this theory, the international exchange is supposed to be influenced by the demand in one country for the product of the other or the reciprocal demand. The domestic demand in each country for her exportable product can also exert an important influence because each country is likely to export the product, which is left after satisfying the domestic demand. The determination of exchange ratio, by overlooking the domestic demand, was clearly faulty.

(iv) Not Relevant in Multi-Country, Multi- Commodity Trade: The entire analysis in the Ricardian-Mill comparative costs theory is in terms of a two-country and two-commodity model. In the real world multi-country, multi-commodity trade situation, there is strong possibility that the international terms of trade are determined by the cost ratios rather than the reciprocal demand.

(v) Size of Trading Countries: The reciprocal demand theory can possibly influence the terms of trade between the two trading countries, provided the two countries are of equal size and the values of their respective products are also equal. However, if one of the two countries is large and the other is small, the gain from trade goes largely to the smaller country rather than the larger country.

Since the produce of smaller country is not sufficient to meet the needs of the larger country and at the same time, the former cannot absorb fully the produce of the latter, there will be incomplete specialisation in the larger country but a complete specialisation in the smaller country. The smaller

country will have to take whatever is offered by the larger country and export what is required by latter.

In the trade between the countries of unequal size, therefore reciprocal demand has little relevance. A small country is usually a price-taker rather than a price- maker. Since the terms of trade are likely to be close to the domestic exchange ratio of larger country, the major beneficiary from trade would be the smaller country rather than the larger country.

(vi) Variations in Income: Mill's theory of reciprocal demand maintains that income levels in two countries remain the same. Such an assumption is unrealistic. In addition the variations in income may have effect upon the terms of trade between the trading countries. This theory tends to overlook the impact of income variations on the terms and pattern of trade.

(vii) Over-Simplification: The theory of reciprocal demand is an over-simplification of reality. In the determination of international terms of trade, it fails to take into account such significant factors as wage-price rigidities, price movements and balance of payments conditions.

There is no doubt that some of the arguments advanced by Graham do carry some weight. The neglect of supply factor was certainly a serious lapse on the part of J.S.Mill but it is not realistic to suppose that the reciprocal demand has absolutely no significance. In the words of Findlay, "The fact that the terms of trade will usually be equal to the cost ratio of some intermediate or 'marginal' country does not mean that demand can be dispensed with, for it is precisely the demand condition that determines which is the marginal country whose cost ratio is equal to the terms of trade."

In fact, much of Graham's criticism of reciprocal demand theory was unwarranted and misguided. In the conditions of increasing costs, when the countries are likely to have incomplete specialisation, both cost ratio and reciprocal demand must determine the terms of trade. It is clearly fallacious to dismiss the reciprocal demand as an irrelevant factor in the trade relations among the countries.

Marshall-Edgeworth Offer Curves

Mill's theory of reciprocal demand has been graphically portrayed by Edgeworth and then by Marshall with so-called "offer curves".

An offer curve is also called as the "reciprocal demand curve" or international demand curve. An offer curve shows how the volumes traded change when the terms of change.

Thus, offer curve is the locus of the pair of export and import quantities desired at each possible price-ratio.

Suppose, there are two countries England and Germany and there are two commodities E-bales and G-bales. England specializes in the production of E-bales and exports E-bales to Germany in exchange for G-bales produced by Germany.

In figure 2.20, we measure along the X axis the number of E-bales supplied by England and along the Y axis the corresponding demand of England for G-bales, thus obtaining the curve OE the supply demand curve of England. The curve OG_1 the demand curves of Germany.
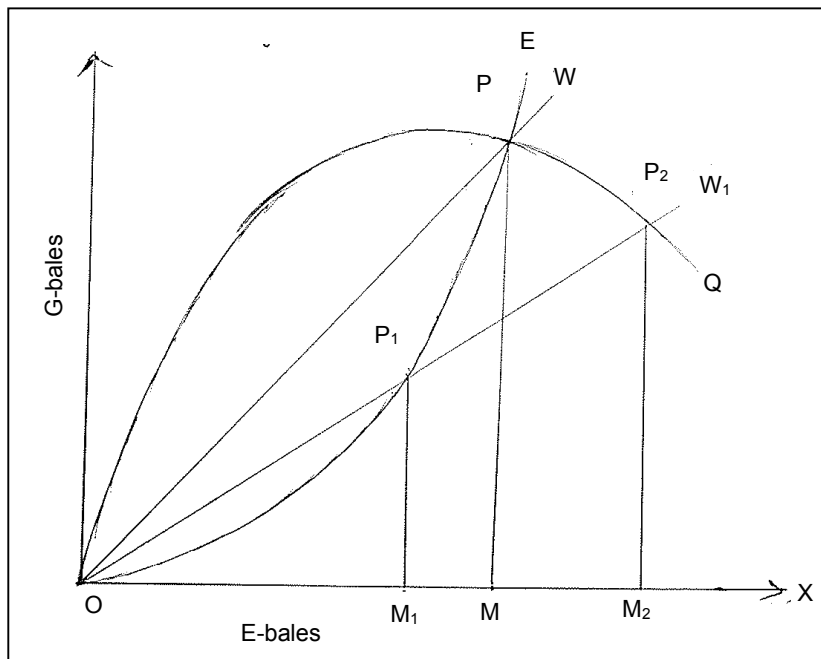
Fig. 2.20: Marshall-Edgeworth Offer Curves

The point P^1, shows the P_1M_1 G-bales can be exchanged in England against OM^1 of E-bales. The exchange ratio is P_1M_1/OM_1, shown by the slope of the straight line OW, relatively to the X axis. But at this exchange ratio ON_2 E-bales will be sold in Germany. This means that the demand of Germany for E-bales is greater than England's supply. Germany's balance of payments will become un-favourable; the monetary mechanism will push prices and wages down in Germany and up in England. England will be induced thereby to take more G- bales. Sooner or later an equilibrium will reached at the point P, at which the demand and supply of England equals the supply and demand of Germany.

Thus, according to the theory of reciprocal demand, the international ratio of exchange between E-bales and G-bales is that ratio at which the supply of E-bales by England is equal to the demand for E-bales by Germany and supply of G-bales by Germany is equal to the demand for E-bales by Germany and supply of G-bales by Germany is equal to the demand for G-bales by England; and at this exchange ratio neither Germany nor England have disequilibria in their respective balances of payments.

Ricardo neglected the role of demand. Mill introduced demand. Marshall and Edgeworth extended this demand analysis still further, particularly through the analytical device of reciprocal demand and supply curves. This approach made possible a general equilibrium solution to international trade a solution in which prices and quantities in production and consumption were counted for.

This is in contrast to the earlier partial equilibrium approach which dealt only with supply conditions. The improved approach used Marshall-Edgeworth offer curves, representing the loci of possible points of trade equilibrium under the assumption that domestic adjustment has been made for each trading position given on the offer curve.

2.2 THE BRITISH SCHOOL PREMISES HYPOTHESIS/ENGLISH SCHOOL OF INTERNATIONAL RELATIONS THEORY

The English School of international relations theory (sometimes also referred to as liberal realism, the International Society school or the British institutionalists) maintains that there is a 'society of states' at the international level, despite the condition of anarchy (that is, the lack of a global ruler or world state). The English school stands for the conviction that ideas, rather than simply material capabilities, shape the conduct of international politics, and therefore deserve analysis and critique. In this sense it is similar to constructivism, though the English School has its roots more in world history, international law and political theory, and is more open to normative approaches than is generally the case with constructivism.

Overview

International system, international society, world society

International system

The classical English school starts with the realist assumption of an international *system* that forms as soon as two or more states have a sufficient amount of interaction. It underlines the English school tradition of realism and Machtpolitik (power politics) and puts international anarchy at the centre of International Relations Theory. Hedley Bull defined the international system as being formed "when two or more have sufficient contact between them, and has sufficient impact on one another's decisions to cause them to behave as part of a whole.

International society

Hedley Bull, however, argued that states share a certain common interest (usually the "fear of unrestricted violence") that lead to the development of a certain set of "rules". He thus defined an international society as existent when a group of states (or, more generally, a group of independent political communities) which not merely form a system, in the sense that the behaviour of each is a necessary factor in the calculations of the others, but also have established by dialogue and consent common rules and institutions for the conduct of their relations, and recognise their common interest in maintaining these arrangements.

In Bull's view, any type of society needed to have rules about restraints on the use of force, about the sanctity of agreements, and about property rights. Without elements of these three there would be no society.

These rules are expressed in a set of institutions that capture the normative structure of any international society. In the classical English School these were: war, the great powers, diplomacy, the balance of power, and international law, especially in the mutual recognition of sovereignty by states. To these could be added: territoriality, nationalism, the market, and human equality. Since these rules are not legally binding and there is no ordering institutions, speaking of norms would probably be more appropriate. States that respect these basic rules form an international society. Brown and Ainley therefore define the international society as a "norm-governed relationship whose members accept that they have at least limited responsibilities towards one another and the society as a whole". States thus follow their interests, but not at all costs. Another way of looking at this would be through Adam Watson's term 'raison de système', a counterpoint to 'raison d'état', and defined as 'the idea that it pays to make the system work'.

There are differing accounts, within the school, concerning the evolution of those ideas, some (like Martin Wight) arguing their origins can be found in the remnants of medieval conceptions of *societas Christiana*, and others such as Hedley Bull, in the concerns of sovereign states to safeguard and promote basic goals, especially their survival. Most English School understandings of international society blend these two together, maintaining that the contemporary society of states is partly the product of a common civilization - the Christian world of medieval Europe, and before that, the Roman Empire - and partly that of a kind of Lockean contract.

World society

Based on a Kantian understanding of the world, the concept of world society takes the global population as a whole as basis for a global identity. However, Buzan also argued that the concept of World Society was the "Cinderella concept of English school theory", as it received almost no conceptual development.

Reexamination of traditional approaches

A great deal of the English School of thought concerns itself with the examination of traditional international theory, casting it — as Martin Wight did in his 1950s-era lectures at the London School of Economics — into three divisions (called by Barry Buzan as the English School's triad, based on Wight's three traditions):

Realist (or Hobbesian, after Thomas Hobbes) and thus the concept of international system

Rationalist (or Grotian, after Hugo Grotius), representing the international society

Revolutionist (or Kantian, after Immanuel Kant) representing world society.

In broad terms, the English School itself has supported the rationalist or Grotian tradition, seeking a middle way (or via media) between the 'power politics' of realism and the 'uptopianism' of revolutionism.

Later Wight changed his triad into a four-part division by adding Mazzini.

The English School is largely a constructivist theory, emphasizing the non deterministic nature of anarchy in international affairs that also draws on functionalism and realism.

Internal divisions

The English School is often understood to be split into two main wings, named after two categories described by Hedley Bull:

The pluralists argue that the diversity of humankind - their differing political and religious views, ethnic and linguistic traditions, and so on - is best contained within a society that allows for the greatest possible independence for states, which can, in their forms of government, express those differing conceptions of the 'good life'. This position is expressed most forcefully by the Canadian academic Robert Jackson, especially in The Global Covenant (2001).

The solidarists, by contrast, argue that the society of states should do more to promote the causes of human rights and, perhaps, emancipation - as opposed to the rights of states to political independence and non-intervention in their internal affairs. This position may be located in the work on humanitarian intervention by, amongst others, Nicholas Wheeler, in Saving Strangers (2000).

There are, however, further divisions within the school. The most obvious is that between those scholars who acquire that the school's approach should be historical and normative (such as Robert

Notes   Jackson or Tim Dunne) and those who think it can be methodologically 'pluralist', making use of 'positivist' approaches to the field (like Barry Buzan and Richard Little).

Affinities to others

The English School does have affinities:

The pluralists have drawn from the classical 'political realism' of Hans Morgenthau, George Kennan

The pluralists have also been influence by the underpinnings of Reinhold Niebuhr's Christian realism

The solidarists have drawn from realist writers, such as Stanley Hoffmann

Contemporary English School writers draw from a variety of sources:

from structural 'neorealism' of Kenneth Waltz, in the case of Barry Buzan;

from social consructivism of Alexander Wendt, see Tim Dunne;

from 'critical theorists', in that of Andrew Linklater; and

even from the 'post-structuralism' of Michel Foucault, in the case of James Der Derian.

2.3   SUMMARY

1. An economic expansion is an increase in the level of economic activity, and of the goods and services available.

2. Expansion means enlarging the scale of a company. The ways of expansion include internal expansion and integration.

3. By terms of trade, is meant terms or rates at which the products of one country are exchanged for the products of the other.

4. The terms of trade can be expressed in the form of equation as such:

$$\text{Terms of Trade} = \frac{\text{Price of Imports and Volume of Imports}}{\text{Price of Exports and volume of Exports}}$$

5. The changes in terms of trade can be measured by the use of an import and export index number.

2.4   SELF ASSESSMENT QUESTIONS

1. Explain the concept of Terms of Trade.

2. What are the factors affecting Terms of Trade?

3. List out the resonsnfor secular deterioration in terms of trade of UDC.

4. Explain the reasons for the unfavourable terms of trade.

5. An improvement on the current account of the balance of payments might come about as a result of a deterioration in the terms of trade. Explain why this might be so.

෴✻෴

Chapter 3

INTERMEDIATE PRODUCTS AND INTERNATIONAL TRADE; IMPLICATIONS OF INTER—INDUSTRY FLOWS AND PURE INTERMEDIATE PRODUCTS

Objectives

The objectives of this lesson are to:

- Intermediate products and international trade
- Implications of inter—industry flows and pure intermediate products

Structure:

3.1 Intermediate products and international trade

3.2 Summary

3.3 Self Assessment Questions

3.1 INTERMEDIATE PRODUCTS AND INTERNATIONAL TRADE

Intermediate inputs – the parts and materials imported to make products for consumption domestically and abroad – are a growing force in world trade. It argues that without better measurement of intermediate imports we run the risk of overestimating the growth effects of exports and severely underestimating the cost of protection and the crucial role that inputs play in enhancing efficiency.

Intermediate inputs – the parts and materials imported to make products for consumption domestically and abroad – are a growing force in world trade. Catalysed by the globalisation of production, the large and rapidly increasing use of imported inputs for exports has important policy implications. Bilateral trade balances are not appropriately measured, the costs of protection are higher than often understood, trade is more volatile, and the importance of exports as drivers of short-term demand is overestimated.

The rise of trade in intermediates

Lower trade barriers, organisational innovations, and progress in information and communication technologies have made slicing up the production process cheaper and easier. Coordination costs have fallen, and different stages of production are now more frequently located in different countries. High labour costs and heavy regulations in rich countries have also helped to accelerate the shift through a wave of outsourcing and offshoring to developing countries.

As a result, intermediate inputs have become a salient part of world trade, particularly as imports of these goods have increased sharply relative to their total use. Intermediate inputs now represent more than half of the goods imported by OECD economies and close to three-quarters of the imports of large developing economies, such as China and Brazil.

Most importantly, they account for a significant chunk of exports, with large differences across countries. According to OECD estimates, imported content accounts for about a quarter of OECD economies' exports, and the European Central Bank estimates that import content accounted for about 44 percent (or 20 percent for extra-EU imports) of EU exports in 2000, ranging from about 35 percent in Italy to about 59 percent in the Netherlands. In the US, the import content of exports was about 10 percent in 2005. Among emerging economies, imported content's share in exports is particularly high in China – about 30 percent, or twice that for India and Brazil.

With globalisation, the use of imported intermediates for exports has been growing. According to the OECD, all but one of its member countries increased the import content of its exports over 1995-2005. The increase was particularly marked in small countries like Luxemburg and Israel, which saw increases of about 20 percentage points, compared to 3-8 percentage points in the large countries, such as the US, Japan, and Germany. This is in keeping with the general trend of import content accounting for a larger share of exports in smaller economies.

Implications

The growing role of imported intermediate inputs has several implications for economic study and therefore policy.

The importance of bilateral trade balances is exaggerated

Economists have long argued that only overall – and not bilateral – trade balances matter. Acting on bilateral imbalances without addressing the underlying causes of the aggregate imbalance simply redistributes that imbalance across trading partners.

Now, with the role of trade in intermediates rising, bilateral trade balances are even less meaningful – they do not reflect value added. As WTO Director General Pascal Lamy argued recently, many countries' exports, including those of China, are economically less significant than they look because so much consists of re-exports and the modest reprocessing of intermediates. Though each iPod touch contributes $150 to the US-China bilateral deficit, for instance, China adds only $4 to the value of each unit.

Various studies find that China's surplus with the US, for example, is 20 percent-40 percent lower when estimated in value-added terms – reflecting the fact that its exports contain only 20 percent-35 percent of domestic value-added. Japan's and South Korea's balances with the US, on the other hand, may be understated, since China relies on content imported from them to produce its exports. As they have exported more parts to China, Japan's and South Korea's share of US imports has declined.

Over the last several decades, world exports have grown at about twice the rate of world GDP on average. The increased trade in intermediate goods – commonly exported several times before becoming embodied in a final product – helps account for this, as shown by the fact that the sectors which have registered large export growth, such as machinery, are also the sectors where the most vertical specialisation growth has occurred.

The growth of trade in intermediate goods also helps explain why exports account for an enormous share of GDP in a few mega-traders, such as Singapore and Hong Kong, sometimes called re-export economies. Because policymakers fail to recognise that imported inputs feed into exports, they often overestimate the importance of exports as a driver of short-term demand but underestimate the importance of trade and specialisation as sources of increased efficiency in the longer term.

Trade has become more volatile and a larger source of shocks

Generally, intermediate imports appear to be more important for exports of manufactures than those of services, particularly in industries such as electronic and communications equipment, and electrical machinery and instruments. In the US and Japan, the import content of manufactures exports – nearly 20 percent – is four times that of services exports; in China, it is twice that of services exports.

At the same time, manufactures, especially durable goods, play a larger role in trade than in GDP – in the US, durables accounted for more than 60 percent of trade in goods in 2008, compared to 24 percent of GDP – but the demand for durable goods tends to fluctuate more than that for services. As a result, trade is more volatile than GDP, and the effect is compounded by the fact that durable goods account for a high share of trade in components.

The Great Recession provided a dramatic illustration of this. Global exports declined by 14 percent in volume terms between the third quarter of 2008 and first quarter of 2009, while world GDP declined by about 3 percent over the same period. Not surprisingly, trade in capital and durable goods was hit particularly hard; according to an IMF study, during the worst of the crisis, it fell about 10 times faster than trade in consumer non-durables, as amid a global credit crunch and loss of confidence consumers postponed any purchases that could be delayed. In addition, due to countries' specialisation in different stages of production, shocks in one country could forcefully translate to shocks to stages undertaken in another, magnifying the disruption.

Though such trade volatility does not necessarily translate into equivalent changes in domestic value-added, it is nonetheless highly disruptive. With trade in intermediates growing, economies are becoming more intertwined, implying greater vulnerability to shocks emanating from abroad. At the same time, increased reliance on foreign demand and supply is making economies less vulnerable to domestic shocks.

The cost of protection is higher

Trade in intermediates means that the cost of protection is higher than is generally understood, and rising. As economists have long known, the effective rate of protection – the tariff as a share of domestic value-added – is higher than the nominal tariff. Consider, for example, a t-shirt produced in the US. Assume it trades at $10 and uses $5-worth of imported fabric. The domestic value-added is therefore $5. Now, if the US imposes a tariff of 50 percent on t-shirts, the price of an imported t-shirt will rise to $15, giving domestic industry a 100percent price advantage.

By the same token, levying a 50 percent tariff on the fabric imports would increase the costs for t-shirt exporters by 50 percent of their value-added – effectively creating an export tax. Because imports increasingly feed into exports, an import tariff on parts and raw materials has a big impact on exports. Tariffs on intermediates may also discourage inward bound foreign direct investment and encourage outward bound instead.

The danger of higher protection is particularly pronounced for smaller economies where the share of intermediate imports in a country's overall exports is large.

In addition, higher trade barriers may be particularly disruptive to intra-regional trade, as countries tend to import intermediate inputs from other countries in their region, partly reflecting production networks' high sensitivity to time constraints, trade, and transportation costs. EU countries tend to import intermediates from other EU members, NAFTA countries from other NAFTA countries, and Japan, China, Korea, and Indonesia from other countries in Asia.

Policy takeaway

It is important to develop better measures of trade flows net of intermediate imports. A failure to do so can lead to the wrong policy conclusions about the importance of bilateral trade imbalances, and can lead us to severely underestimate the cost of protection. Further, large trade in intermediates can lead countries to overestimate exports as a source of demand growth, but also to overlook the crucial role that imports play in enhancing efficiency and exports. Generally, the existence of large and growing trade in intermediates, which is associated with foreign direct investment and the globalisation of production, greatly raises the stakes on countries having an open and predictable trade regime.

Large trade in intermediates also has its dangers, as evidenced by the huge global trade shock imparted during the financial crisis. The answer, however, is not less trade, but building better safeguards against financial instability.

Alternatively, as regards the international dimension of the exchange of intermediate inputs---- Trade in intermediate inputs has been steadily growing over the last decade. However, despite the internationalisation of production and the increasing importance of outsourcing and foreign investment, we found little rise in intermediate goods trade as a share of total trade1. More than half of goods trade is however made up of intermediate inputs and trade in services is even more of an intermediate type with about three quarters of trade flows being comprised of intermediate services. Trade in intermediate goods and services thus deserves special attention from trade policymakers and so far few studies have investigated how it differs from trade in consumption goods or services.

An intermediate good can be defined as an input to the production process that has itself been produced and, unlike capital, is used up in production. The difference between intermediate and capital goods lies in the latter entering as a fixed asset in the production process. Like any primary factor (such as labour, land, or natural resources) capital is used but not used up in the production process. On the contrary, an intermediate good is used, often transformed, and incorporated in the final output. As an input, an intermediate good has itself been produced and is hence defined in contrast to a primary input. As an output, an intermediate good is used to produce other goods (or services) contrary to a final good which is consumed and can be referred to as a "consumption good".

Intermediate inputs are not restricted to material goods; they can also consist of services. The latter can be potentially used as an input to any sector of the economy; that is for the production of the same, or other services, as well as manufacturing goods. Symmetrically, manufacturing goods can be potentially used to produce the same, or other manufacturing goods, as well as services.

An important question we can ask is how to identify inputs among all goods and services produced in an economy. Many types of goods can be easily distinguished as inputs, when their use excludes them from final consumption. Notable examples include chemical substances, construction materials, or business services. The exact same type of good used as an input to some production process can however be destined to consumption. For instance, oranges can be sold to households as a final good, as well as to a factory as an input for food preparation. Telecommunication services can be sold to individuals or to business services firms as an intermediate input for their output. It is however recognized that many commodities that are traded internationally may be put to a variety of uses

The importance of intermediate goods and services in the economy and trade is associated with a number of developments in the last decades. Growth and increased sophistication of production has given birth to strategies involving fragmentation and reorganisation of firm's activities, both in terms

of ownership boundaries, as in terms of the location for production. In what follows, the international dimension of the exchange of intermediate goods and services is explored by clarifying terms and concepts as well as the links between trade in intermediate inputs and FDI.

Sourcing strategies

Some of the most fundamental decisions producers of final goods have to make concern organisational forms. In order to operate, firms make choices on (i) locations for the production of intermediate inputs and on the (ii) ownership structure of their production. Headquarters are always located in the so-called 'home country'. Intermediate inputs on the other hand, can be produced at home, or in a foreign country. The production of intermediates can also be owned by the final-good producer or by an independent supplier. In other words, inputs can be produced and used within the same firm; or produced by one firm, and then sold to and used by another one. Trade is recorded when the good-in-process crosses international borders, but data does not distinguish between in-house (intra-firm) and arm's length (interfirm) transactions.

'Sourcing' is a term that has been used in different ways in the economic literature. In this paper we adopt the use of sourcing in a dynamic context; that is, as an indicator of a change in the supply of intermediate inputs to the production process of a firm.

Box 1. The internationalisation of the supply of inputs: a typology
Global sourcing: the production of an input previously assigned to an external specialised supplier in the domestic market, is now assigned to a specialised foreign supplier based abroad. The boundaries of the firm buying the input are not altered with such a development. The only change we observe is in the location of the external supplier.   **International outsourcing:** the production of an input previously held within the boundaries of the firm in the domestic market, is now assigned to a specialised foreign firm abroad. The production of the input has been moved from within the firm to an independent external supplier abroad.   **Offshoring:** the production of an input previously held within the boundaries of the firm in the domestic market, is now assigned to an affiliated firm abroad. Offshoring of inputs involves only a change in the geographic location but not in the firm's boundaries.

Following the previous analysis, the input supply can change with respect to two factors: (i) the boundaries of the firm and (ii) the location of production. The term 'out' refers to a change in the boundaries of the firm, that is an assignment of the production of intermediate inputs to an independent supplier, outside the firm. The term 'in' (as in 'insourcing') is symmetrically used to indicate the opposite two cases of sourcing excludes the option of the traded goods crossing borders. An intermediate input produced and used by the same firm could cross borders when the firm owns several establishments at different locations internationally, each specialised in some part of the production process. In order to incorporate the location of production in our terminology, we thus distinguish between 'domestic sourcing', standing for a change in the supply of intermediate inputs inside the domestic country, and 'international' referring to the same change but across borders.

The most complex change involves an adjustment in both factors: that is the case of 'international outsourcing', where the production of an input previously held within the boundaries of the firm in the domestic market, is now assigned to a specialised firm in another country. The production of the input has been moved from within the firm to an independent external supplier. A smaller degree of complexity involves the switch from an outside supplier within the domestic

country, to an international supplier: that is the case of 'global sourcing'. The boundaries of the firm buying the input are not altered with such a development. The only change we observe is in the location of the external supplier.

Table 3.1: Sourcing Strategies: Interactions Between Location and Ownership

Columns indicate the location of production and rows indicate the boundaries of the firm. Vertical arrows represent a change in the boundaries of the firm. Horizontal arrows represent a change in the location of production. Dashed lines correspond to vertical FDI.

	Domestic Company	Foreign Company
Production of the input inside the firm	Offshoring	
	International outsourcing	
	Domestic outsourcing	Vertical integration' abroad
Production of the input Outside the firm	Global sourcing	

Table 3.1 summarises changes in firms' choices on the location and ownership pattern of production of intermediate goods while Box 2 provides some examples of the strategies described. Foreign investment occurs, in general, in a horizontal or a vertical form; the former referring to a replication of the entire production facilities in a foreign country to serve domestic consumers, and the latter to the relocation of part of the firm's facilities abroad focusing on segments of the production process. There are three cases of changes in the supply of intermediate inputs involving vertical FDI: in particular (i) when there is fragmentation and relocation of parts of the production chain abroad, without altering the boundaries of the firm ('offshoring') (ii) after a decision to stop buying inputs domestically and produce them through an affiliate abroad, in which case the boundaries of the firm are altered ('international insourcing') (iii) after a decision to acquire an international supplier ('vertical integration' abroad). All three developments involve movement of capital to a foreign country, that is FDI.

Incentives to reorganise production

Growth and increased sophistication of production have been the main driving forces for reorganising the production process. Firms are constantly exposed to new opportunities for cutting costs and increasing their productivity by altering their boundaries, and focusing solely on the activities of their comparative advantage. Intermediate inputs they need can be provided by external sources. High integration of the world economy creates furthermore opportunities arising from cross-country differences in factors of production.

Box 2. Global sourcing, international outsourcing and vertical integration: some examples

The distinction between 'international outsourcing' and 'global sourcing' is made on the basis of the initial

organisation structure of the enterprise. In the first case, the firm was producing an input within its own boundaries, while in the second case the input is supplied by an external supplier within the same country. While the automotive industry has been more vertically integrated in the past, e.g. in the US the

auto part supplier Delphi Corporation has started out as a unit of General Motors, nowadays it offers a good example of 'global sourcing'. Because of the degree of complexity of the final product, the automotive industry typically relies on external suppliers of inputs. Their multilayered production systems involve thousands of firms, including parents, subsidiaries and subcontractors, initially located inside the domestic country. It can hence be used to illustrate 'global sourcing 'as opposed to 'international outsourcing'. The average Japanese automaker's production system comprises 170 first-tier, 4,700 second-tier, and 31,600 third-tier subcontractors. Japanese automobile manufacturers actually reconstituted many aspects of their home-country supplier networks in North America.

On the other hand, the apparel industry offers a classic example of 'international outsourcing' since the degree of complexity of the final product is lower than cars. Initially firms engaged both in the production and the design and marketing of final output. Feenstra (1998) points that apparel products are being imported into the United States at increasingly advanced stages of processing, which suggests that US firms may have been substituting away from these processing activities at home. According to US customs data, retailers such as JC Penney, Walmart, The Limited, Kmart and Sears account for 48% of the value of apparel imports; another 22 percent go to apparel designers such as Liz Claiborne, Donna Karan, Calvin Klein and Ralph Lauren; while domestic producers make up an additional 20 percent of the total. Most clothing companies design the products in one location, manufacture it at a different one, and hire an advertising agency to sell it in stores. There are however, notable examples of enterprises following the opposite strategy. American Apparel is a USD 250 million, 5,000-employee for-profit company, growing in the youth fashion market. The company's approach is that more efficiency can be achieved without outsourcing. On the other hand, the US based Nike provides an example of the 'international outsourcing' strategy: it subcontracts most of its manufacturing to independent producers in Thailand, Indonesia, Cambodia, and Vietnam.

Standard examples of vertical integration revolve around large MNEs such as Intel Corporation. The firm provides an example of the 'offshoring' strategy: it assembles most of its microchips in wholly owned subsidiaries in China, Costa Rica, Malaysia, and the Philippines. Oil companies, both multinational (such as the US ExxonMobil, the Netherlands-based Royal Dutch Shell, or British Petroleum, and the Malaysian Petronas) often adopt a vertically integrated structure. This means that they become active all the way along the supply chain from locating crude oil deposits, drilling and extracting crude, transporting it around the world, refining it into petroleum products such as petrol/gasoline, to distributing the fuel to company-owned retail stations, where it is sold to consumers.

Sources: Antràs and Helpman (2004); Hill et al. (1989); Florida and Kenney (1991); Feenstra (1998); Gereffi (1999).

While the process of outsourcing seems intuitively justified by the principle of comparative advantage, the opposite shift of insourcing (vertical integration) could prove profitable in terms of productivity as well as market structure. In particular, the motivation for vertical integration could be twofold:

(i) to exploit a productivity advantage of an upstream firm at some stage of the production process, while (ii) eliminating oligopolistic distortions in vertical transactions (see Box 3 for a description of vertical integration and the price of the final good).

Box 3. Vertical integration and the price of the final good

Integrated companies are united under a structure of common ownership. Further to that structure, vertically integrated firms specialise at a different stage of a production process yielding one common final good. The term is contrasted with horizontally integrated firms, producing different final goods under a

structure of common ownership. For instance, vertical Integration occurs when a firm previously using inputs bought from an external source, acquires its supplier, or the opposite (if the supplier acquires the buyer). The process can take place domestically or internationally, and is directly associated with in-sourcing, that is an expansion of the boundaries of the firm. Furthermore, integration occurring abroad corresponds to vertical FDI with fragmented production facilities. That type of integration offers a number of advantages to firms, among which a solution to the so-called 'double marginalisation' problem. In particular, double marginalisation occurs when we have multiple imperfectly competitive firms in a vertical relationship. The problem arises from the exercise of market power at successive vertical layers in a supply chain. Suppose that all firms in a vertical relationship are monopolists. Each firm buys an input, transforms and sells it to the next one in the sequence. Due to their monopoly power, each firm adds a mark-up over the competitive price of its output in order to maximize its own profits. The good-in-process becomes more and more expensive as it goes through the production chain, with the risk of being too expensive when it reaches its final customers. In that case, final quantity demanded might be eliminated making losses for all firms in the chain. The sequence of mark-ups leads to a higher price for final goods and lower combined profit for the supply chain than would arise if the firms were vertically integrated. Consider what would happen if the firms integrated into one. The new firm would now face the same final demand curve, but at an equilibrium price significantly lower without the addition of internal mark-ups. Consumers would pay less and consume more. Producers symmetrically would sell more in total, and would earn more profits.

Motivations for vertical integration across borders can be of the same nature as in domestic insourcing: gain possession of productivity advantages of an upstream foreign firm, while eliminating oligopolistic distortions in vertical international transactions. The source of productivity advantages in the case of international insourcing are however expected to be more related to a country's instead of a firm's characteristics. The principle is clearer in both the cases where the firm relocates part of its production facilities abroad ('international insourcing' or 'offshoring'). The new facilities by default cannot possess technology advantages with respect to the rest of the firm. The exploitation of country-specific characteristics such as market resources and price differences in factors of production, justify the transfer entirely.

The choice between vertical integration and outsourcing is also driven by the hold-up problem

arising from the specificity of intermediate inputs and incomplete contracts (see Helpman, 2006, and World Trade Report 2008 for literature reviews). If the supplier of intermediate inputs has to make a relationship-specific investment and if contracts are not enforceable, the final goods producer may hold-up the supplier at the time of delivery offering a lower price than foreseen by the contract. However, the supplier may anticipate this behaviour and, as a result, will underinvest in the production of intermediate inputs. If integration alleviates the hold-up problem, a firm will prefer integration to outsourcing if the hold-up problem is strong.

However, the hold-up problem might persist also in a vertically integrated firm. In such a case,

the choice between integration and outsourcing depends on the relative investment made by the supplier and the final goods producer. Assume that the production of a final good requires headquarter services and components with the former being produced by the final goods firm and the latter by the supplier. The decision of whether to produce the component within or outside the firms depends on the intensity in headquarters services relative to components. A firm will choose integration if its production is headquarter intensive and outsourcing if its production depends heavily on the investment in components made by the supplier. The intuition is that outsourcing implies a transfer of bargaining power to the supplier and hence reduces the underinvestment problem. In his seminal paper Antras (2003) models headquarter services as being capital intensive and components

as being labour intensive. As a result, industries with integrated firms are capital intensive, while industries with many outsourcing firms are labour intensive. The model predicts that there will be more intra-firm trade in capital-intensive industries and more arm's length trade in labour intensive industries. Furthermore, Antras (2003) shows that the share of intra-firm trade in total U.S. trade is positively correlated with the capital abundance of the exporting country.

Vertical FDI can be associated directly with three types of sourcing; in particular, offshoring, international insourcing, and vertical integration abroad. Any choice to transfer, replicate or fragment production facilities using FDI will be associated with (or have an impact on) the location for the production of intermediate inputs used by the firm.

The first question to answer is how the decision to invest affects the direction of trade in inputs between countries. Investment by definition involves new production facilities for the firm, at a new location abroad. The facilities can be created or acquired. Moreover, they can cover the entire production process, or a part of it.

Firms have links with certain suppliers at their home country, and by engaging in FDI they have to choose suppliers for their new facilities. Changing suppliers incurs an additional switching cost, but potentially involves also an extra benefit from the choice of more competitive partners. Therefore, we could assume that (i) it pays off for the firm to supply its new facilities with inputs from the same suppliers it was using before. This assumption is based on the additional switching cost outweighing the benefit from the choice of more competitive partners. If this positive 'network effect' of multinational enterprises holds, the impact on intermediate goods flows is ambiguous: new flows of goods can be created to the new facilities; or the former flows from abroad can be replaced with flows from inside the foreign country. In the opposite case where this effect does not hold (ii) it pays off for the firm to supply its new facilities with inputs from different suppliers than the ones it was using before. In that second case, the volume and direction of new flows cannot be predicted.

Summarising, FDI cannot only generate new directions for existing trade flows in intermediate goods; it can also create trade, which did not exist at all beforehand. Certain types of FDI can also act in the opposite direction, substituting for trade in intermediate goods and services.

While the foreign investment decision is likely to affect patterns of trade in intermediates, the relationship can also work in the opposite way. Trade decisions can have an impact on the pattern of FDI. For instance, if there is a change in exogenous factors favouring trade in intermediates, e.g. a tariff reduction, firms will trade more intermediates and consequently may alter their FDI strategies. Any sourcing decision associated with a change in the intermediate goods and services trade can have an impact on the productivity advantage of a firm relative to its rivals, based on technology, resources or location of production. A change in sourcing strategies can enhance competition, stimulates sales and impacts heavily on the price of the good or service traded.

The rest of the study is organised as follows. Part II gives a brief overview of the methodology used to estimate trade flows of intermediate goods and services and discusses some of the issues involved. Part III captures the stylised facts of trade in intermediate goods and services as they emerge from the dataset created for this study. In Part IV an econometric analysis is conducted to analyse the determinants of trade in intermediates, how it differs from trade in consumption goods or services and to shed light on the trends identified in Part III. Part V concludes and looks at the trade policy implications of the analysis.

II. Methodology used to assess trade in intermediate goods and services

For the analysis of trade in intermediates at the industry level, combining trade statistics with information from input-output (I-O) tables offers two advantages. First, it allows for the estimation of bilateral trade in intermediate services. Contrary to trade in goods, no classification exists for trade in services that allows the breakdown into final and intermediate services. Second, trade in intermediate goods and services can be assessed by both the industry of origin and the using industry.

Trade in intermediates in trade statistics

Trade in intermediate goods is assessed using the United Nation's Broad Economic Categories (BEC) classification. The BEC classification groups commodities according to their main end use into capital goods, intermediate goods and consumption goods, which are the three basic classes of goods in the System of National Accounts (SNA). The traded commodities themselves are defined in terms of the Standard International Trade Classification.commodities to 19 basic categories of goods, eight of which are categories of intermediate goods.

An unavoidable drawback of BEC is that the allocation of commodities according to their main

use is based on expert judgment, which is by nature subjective. Many goods might be both final and intermediate depending on the context. For instance, wheat flour belongs to BEC 121 - Processed food and beverages mainly for industry - and is hence classified as intermediate. Despite being an important input for the food industry, flour is also a consumption good for many households.

In a recent study, Bergstrand and Egger (2008) use the BEC classification to capture trade in

intermediate goods. While describing trade patterns for intermediates between 1990 and 2000, the focus of their study is on the growth of FDI relative to trade. A similar approach has been taken by Yeats (2001). He provides his own breakdown of the SITC classification into final and intermediate goods in order to assess trade in parts and components.

The advantage of trade data as compared to I-O tables is that it allows for the analysis of bilateral trade patterns in intermediate goods at a highly disaggregated level. However, two weaknesses in trade statistics constrain the analysis of trade in intermediates. First, trade data are collected according to the industry of origin and give therefore no indication of the using industry, i.e. the industry that is actually using the intermediate input in its production process. Intermediate goods and services are to a large extent not only used within the same industry at higher stages of the production chain, but also as by other industries. For instance, steel from the steel industry is used as an intermediate input in the motor vehicles industry. Similarly, if a car firm seeks advice from external business consultants on how best to sustain a negative shock in consumer demand, they acquire intermediate business services.

Second, while the BEC classification enables the identification of intermediate goods, no similar classification is available for trade in services. The reason for this is the high level of aggregation in services trade data. For instance, the EBOPS category for telecommunication services does not distinguish between private and business calls. Furthermore, while goods trade data are based on customs declarations allowing the identification of goods at a highly disaggregated level, services trade data are based on a variety of information such as business accounts, administrative sources, surveys, and estimation techniques.

A related point is that for services as compared to goods it might be even more difficult to identify intermediate and final use. However, some services categories do probably consist mostly of intermediate services, such as 'reinsurance services' (EBOPS 257) or 'business and management

consulting and public opinion polling' (EBOPS 278). Unfortunately, the weak country coverage prevents the identification and analysis of intermediate services at this level of aggregation. For instance, in the case of reinsurance services, data is available for only 15 OECD countries and a large share of trade is not allocated to partner countries.

Trade in intermediates has increased but its share in total trade has remained constant

Trade in intermediates represents 56.2 percent of trade in goods and 73.2 percent of trade in services in OECD countries13. World trade flows are mainly comprised of inputs rather than final consumption goods or services. Taking into account capital goods, which represent 17 percent of total trade in goods, it is interesting to see that the share of consumption goods is, at 21 percent, rather low. Services that are not intermediate inputs account for about 27 percent of total trade in services.

The growth rate of trade in intermediates has been significant over the last decade in OECD countries. For goods, the average annual growth rate between 1995 and 2006 has been 6.2 percent (in volume), a rate higher than output growth. For cross-border trade in services, a slightly higher average growth rate (7 percent) is observed over the period 1999-200514. There is no marked difference in the growth rates of the different categories of goods (intermediate, consumption, capital goods). They have been following the general increase in total trade. The story is different for services with a higher growth rate for intermediate services as opposed to final services.

As a consequence, the share of trade in intermediates in total trade has remained largely unchanged. We explore in the next section the reasons and consequences of this unchanged ratio and how it can be understood in a decade characterised by globalisation, outsourcing and the fragmentation of world production. But at the outset of the analysis, it should be highlighted that an apparent explanation to this paradox is that both trade in final and intermediate goods has been boosted by the internationalisation of production.

In the case of services sectors, there is a slight difference between the growth rate of total trade and trade in intermediates leading to an increase of the share of intermediate services traded. But this trend needs to be confirmed as the variation is very small. It suggests, however, that outsourcing in services has indeed increased.

The ratio that has seen an impressive change over the last decade is the one relating FDI to trade,as emphasised by Helpman (2006) and Bergstrand and Egger (2008). Figure 2 below illustrates the increase in the ratio between inward FDI stocks and imports for total trade (goods and services), trade in goods and trade in services. In ten years, FDI has almost doubled as compared to trade, with this ratio increasing from 0.48 in 1995 to 0.86 in 2005. Investment in services has particularly increased, as emphasised in the *2004* World Investment Report.

In the patterns described above, there is no major difference between OECD and non-OECD

economies (at least for the ones included in our analysis). Emerging economies have generally a higher growth rate of trade (both for goods and services) and in some cases they trade more intermediate inputs than OECD economies. But the share of trade in intermediates in total trade has also been stable in the last ten years. Even for China, our results are similar to Feenstra and Wei (2009) who note that the share of processing trade has not changed in overall trade despite an average annual growth rate of 25% in the last seven years.

The regional dimension of trade in intermediates

The largest value of transactions is recorded within and among three regions: Europe, North America and Asia. The maps reveal some patterns of specialisation. For example, Asia is a net exporter of intermediate goods to Europe and to North America. Between Europe and North America, the pattern is the opposite for goods and services. Europe imports more intermediate services from North America but exports more intermediate goods. The largest inter-regional flow for intermediate goods trade is actually exports from the Middle East & North Africa to Asia. But overall trade in intermediate inputs is mostly between developed countries and flows with regions with developing economies are very small.

Intra-regional imports are generally higher than inter-regional imports. The most important value for intra-regional trade is observed in Europe. However, all trade flows between EU countries are recorded in the dataset, thus increasing significantly the value of trade for Europe. High values are nonetheless also found for Asia and North America. In the case of intermediate goods imports, the ratio of European to North American intra-regional trade is close to four. For trade in consumption goods (not shown), a similar pattern can be observed with the ratio being even higher, i.e. 6.5.

Analysis of the determinants of trade in intermediates and its impact on productivity

The descriptive statistics presented in Section III are useful to understand the nature of trade flows in intermediates but they do not provide information on the motivations for firms to trade or establish abroad that would explain the patterns observed. Moreover, these synthetic indicators often aggregate countries and sectors and do not take advantage of the disaggregated level at which the dataset presented was created.

To provide some insights on the determinants of trade in intermediate goods and services and also on the economic benefits associated to such trade, four types of regressions have been run. In order to keep the Section non-technical, all the details of the econometric analysis can be found in Annex 3. In what follows, we go quickly through the results and summarise what can be learned from the analysis as well as outstanding issues. The determinants of trade in intermediate goods and services: gravity regressions.

Trade flows between nations can be explained by two simple variables: trade costs – that is all the costs supported by exporters and importers when they engage in international trade – and the size of markets. Empirically, trade costs can be proxied by the distance between countries while the Gross Domestic Product (GDP) of trading partners can be used to approximate their demand for goods and services (the size of the market). Trade analysis now often relies on this framework known as the 'gravity model'.

In order to identify differences in trade in intermediates and trade in final goods and services, the gravity model with fixed effects can be used at the industry level.

A notable difference between trade in intermediates and trade in final goods deals with the coefficient observed on market size. Final goods are traded more according to the size of the market than intermediate goods. It is not a surprising result as companies export to sell to a large number of final consumers while inputs can be very specialised and profitable to export to smaller markets from where final products may then be shipped to third countries.

Regressions also include two dummy variables indicating whether a country pair is part of the EU or NAFTA capturing the economic integration of these two free trade areas. While their coefficients are positive and significant for all industries and for goods industries, coefficients are

generally not significant in estimates for services industries. The impact of the EU dummy is larger for consumption imports than for intermediate imports underpinning the importance of intra-EU trade for serving final consumers.

Distance is a proxy for trade costs between two countries. These trade costs consist to a large part of transport costs for goods but also of other distance-related costs. Miroudot and Ragoussis (2009) point out that distance captures also regulatory differences (e.g., trade policies, market regulations, national business laws) as well as cultural differences between countries. The importance of distance-related trade costs other than transport costs can be seen by the impact of distance on services imports, which is often Distance has a negative and significant impact on both goods and services imports of total, intermediate and final products. There are however differences in the strength of coefficients.

In order to disentangle the effect of transport costs and trade policy barriers, two alternative variables are used instead of distance: the ratio of the cif to fob trade values as a proxy for transport costs, and simple averages of applied bilateral tariffs as a proxy for trade barriers.

The coefficient of the cif-fob variable is negative and highly significant for all variables except for consumption imports. The negative impact of transport costs as measured by the cif-fob ratio on imports is largest for intermediate goods. Bilateral tariffs have a negative impact on all type of imports. In particular, the effect of tariffs is larger on trade in intermediates than on total trade and on trade in consumption goods.

This higher sensitivity of intermediates imports to trade costs, including both transport costs and trade barriers, can be interpreted in several ways. First, companies engage in global sourcing or outsourcing to cut costs and improve their productivity. They can source inputs from different countries (and also domestically) so that an increase in these sourcing costs can quickly encourage companies to switch to another supplier. Intermediate inputs are less differentiated than final goods and the priceelasticity of their demand is higher.

A second explanation is that production networks are submitted to geographic and time constraints and more than for final goods or services distance can have a detrimental impact on the decision to trade. When assembling complex goods or resorting to high skilled services, being remote is more a handicap than when it comes to supply consumers with a given good or service. In particular, because more interactions are observed between companies and their suppliers than with final consumers. "Just in time" production and other "lean" production processes are less able to accommodate hazards introduced by distance. Perhaps because they are of a more durable nature and less prone to short term costs, capital goods are, on the other hand, the goods for which the elasticity of distance to trade is found to be the lowest.

A third explanation is that some intermediate inputs are of a bulky nature. This is the case for raw material inputs whose value is low as compared to their weight. For such goods, the impact of distance is higher simply because transport costs are too high for these goods to be traded from a remote location.

Regarding transport costs (measured by the difference between cif import values and fob export values for the same trade flows), the results are less clear as signs change in the different specifications, which might be because the distance variable captures already most of trade costs. In two out of the four specifications presented, transport costs of intermediates are found with negative and significant coefficients, which is the relationship expected.

Notes   Coming to FDI and FATS, this is where the analysis becomes especially interesting as it can tell us something about sourcing strategies in relation to investment and sales of foreign affiliates. Both inward and outward FDI have a positive coefficient and the same is observed when FATS variables are introduced in the regression. Foreign investment and activities of foreign affiliates in services sectors are associated with a higher use of foreign inputs. For inward FDI and FATS, it can be explained by imports of intermediates from the parent company or from suppliers in the country of the parent company (or from third countries that are part of the supplier network). In the case of outward FDI and FATS, it can be understood as evidence of vertical production networks with companies processing an intermediate input and shipping it to other countries for further processing. It could be also explained by the fact that domestic companies that invest abroad are the most productive and there is a positive correlation between productivity and the use of foreign inputs.

In order to further investigate the role of investment in trade flows of intermediates, further analysis is provided in the next section looking this time at the direct relationship between trade flows of intermediates and FDI flows.

Trade in intermediates and its relation to operations of Multinational Enterprises (MNEs)

Economic literature has generally found a positive relationship between MNE activity and trade in intermediates. Head and Ries (2001) look at 932 Japanese manufacturing firms for the period 1966-1990. They find that FDI of vertically integrated firms tend to increase more firms' exports than FDI of firms that are not vertically integrated. Blonigen (2001) uses product level data to show that Japanese owned automobile production in the United States is positively related to U.S. imports of automobile parts from Japan. However, he also finds that Japanese owned-production of automobiles parts in the U.S. replaces imports of Japanese parts.

To analyse the relationship between the operations of MNEs and trade in intermediates, we follow the approach taken by Kleinert (2003). He tests for sourcing strategies of MNEs by including inward and outward FDI stocks as explanatory variables in a regression explaining trade in intermediates.By relying on aggregate trade and FDI data of six OECD countries, Kleinert finds some evidence that inward FDI stocks have a significant positive impact on trade in intermediates.

Differently, he finds no robust effect of outward FDI on intermediate imports of goods industries.

However, as rightly pointed out by Bergstrand and Egger (2008), FDI and trade in intermediates are simultaneously determined by decisions of MNEs based on absolute factor endowments, trade costs and investment costs. This means that estimated coefficients of simple OLS regressions will be biased. In order to address this endogeneity problem, it is necessary to find an instrumental variable that explains FDI stocks but not trade in intermediates apart from its impact through FDI.

In the case of vertical inward FDI, a foreign MNE decides to locate a stage of its production process in the importing country. If the affiliate relies on inputs from its parent company, then imports in form of bilateral intra-firm trade will increase. Furthermore, vertical inward FDI might also increase bilateral inter-firm trade, if the affiliate sources intermediates from an independent supplier of the foreign country. For instance, if a firm moves parts of its production abroad, existing local suppliers will have to export their inputs to the respective country.

When considering outward FDI, the perspective of the importing country changes: a domestic

MNE locates a stage of production abroad to reduce costs. In this case, the effect on bilateral imports is less clear. Bilateral imports will increase if the intermediate output of the foreign affiliate

is shipped back home. However, if the output of the foreign affiliate is shipped to a third country, the imports of the home country will remain unaffected. Moreover, if outward FDI is seeking proximity to foreign suppliers,

bilateral imports of intermediates might even decrease, because foreign suppliers will stop shipping their products to the home country.

According to the above reasoning, inward FDI should lead to an increase in imported inputs,

while the impact of outward FDI is less clear. Apart from vertical, the motive for FDI might also be mainly horizontal, i.e., market seeking. Under such circumstances, only inward FDI may result in an increase in imported inputs but not outward FDI. Since the output of a horizontal affiliate is sold in the foreign or to third markets, no intermediate goods will be shipped back to the home country.

As mentioned before, a problem in the econometric analysis is that FDI is likely to be endogenous in a gravity regression explaining trade in intermediates. In order to take this endogeneity into account, we rely on a two-stage least-squares (2SLS) instrumental variable regression. Thereby, we use lagged changes in FDI stocks as instruments[21]. Changes in FDI stocks in the past will be correlated to current FDI stocks. In order to be valid instruments, changes in FDI stocks in the past should have no direct impact on today's trade in intermediates but only an indirect one through its impact on today's FDI stocks.

The relationship between trade in intermediate inputs and productivity gains

The trade and growth literature has focused on the role of capital goods in explaining differences in productivity levels across countries (Nordås et al, 2006). Lee (1995), for example, shows that the ratio of imported to domestically produced capital goods in the composition of investment has a positive effect on per capita growth rates. According to Eaton and Kortum (2001), 25% of productivity differences among countries are explained by differences in the relative price of capital equipment. They estimate that half of this share can be attributed to barriers to trade in capital goods.

As explained by Jones (2008), intermediate goods or services can be seen as just another form of capital, one that depreciates fully in production. There is a productivity multiplier through intermediate inputs, that is higher productivity in upstream sectors increases the productivity in downstream industries. As the same industry can be "upstream" or "downstream" depending on the good or service supplied, there is a multiplier effect similar to the one associated with capital accumulation in the growth literature. The example given by Jones (2008) is the following: higher productivity in electric power generation can reduce costs in the construction sector. In turn, it will be cheaper to build new dams or electric power plants, hence further reducing the cost of electric power generation with further productivity gains in downstream sectors.

Assuming that foreign intermediates provide higher productivity than domestic inputs, one can expect a positive relationship between productivity gains and the ratio of foreign inputs to domestic inputs. This is what is tested in the subsequent quantitative analysis. Not all imported inputs are more technologically advanced and more productive than domestic ones, but one can reasonably assume that if they are imported they have some type of advantage over domestic inputs and that in most cases they are used to increase the productivity of domestic firms.

How can foreign inputs improve the productivity of the economy (as opposed to domestic inputs)? A first explanation is that imported intermediate goods and services embody foreign technologies. Assuming that better technologies are available in the foreign country, switching from a domestic supplier to a foreign supplier can allow indirect access to better technologies[22] without any

Notes   need to know these technologies or to support a cost for adopting them. Not only IT goods or services are likely to incorporate new technologies but also any intermediate input, including basic raw materials, to the extent that it is provided at a cheaper price, in a timelier manner or more in line with the specifications given by the importing company. The characteristics of the intermediate good or service will reflect the better technology used by the foreign company and domestic companies using it in their production process will see an improvement in their productivity.

In addition to productivity gains related to an access to new technologies embodied in intermediate goods and services, trade in intermediates can also help companies to improve their own technologies and have an impact on how efficiently domestic companies use factors of production (labour and capital). If one assumes that all countries share the same "production frontier", defined as the maximum output that can be achieved with a given amount of factors of production, the use of foreign inputs can help countries to move closer to the frontier. Intermediate goods and services that "embody" foreign technologies are those produced at the frontier with "frontier technologies". To incorporate them in the production process is the first source of productivity gains. But a second source can come from different spillover effects arising from the use of foreign inputs or from the interaction between foreign suppliers and domestic buyers.

Using product level data for Hungarian manufacturing firms during 1992-2003, Halpern, Koren and Szeidl (2009) find that a higher share of imported inputs increases the productivity of firms. They identify and disentangle two possible channels through which imported inputs may increase productivity. They find that 40% of the total productivity gain are due to better quality or technology of foreign inputs, while the remaining 60% of productivity gains come from what they call a complementarity channel referring to the idea that the combination of different inputs is more than their sum. This latter channel can result from imperfect substitution of inputs.

Further firm level evidence on imported inputs and productivity is provided by Amiti and Konings (2007) for Indonesian manufacturing firms for the period 1991 to 2001. They find that firms that import any input are on average 9.2% more productive than firms importing none of their inputs.

Furthermore, they show that trade liberalisation of intermediates might lead to large productivity gains of domestic firms. Estimates predict that a 10 percent decrease in input tariffs increases the productivity of Indonesian firms that import inputs by 12 percent, as compared to 3 percent for firms not using imported inputs.

For services such as training services, computer services, research and development, it is the aim of the service to improve the productivity of the firm. It is also true for a large array of other services such as transport services, logistics services, professional services or financial services. Goods as well can have a direct impact on the total factor productivity of firms (e.g., office and machinery equipments) beyond their cheaper price or higher quality that reflects the embodied foreign technology.

Whether the foreign technology is "embodied" or the intermediate good or service leads to efficiency gains, what is expected at the end is higher productivity for firms where foreign inputs are more widely used. Of course, not all foreign intermediates are made with better technologies or can lead to productivity spillovers. The domestic economy can be the one using the "frontier technology" and producing the best inputs.

Even in this case, one can however expect some gains from the use of foreign inputs, in particular if one looks for gains not at the firm level but at the sector level (or for the whole economy). First, competition effects can also lead to productivity gains because prices for inputs are more

competitive and suppliers have more incentives to tailor inputs to the needs of buying companies. The best technology can be in the domestic economy but the incentive to maximise productivity can come from the competition of foreign inputs.

Moreover, what international trade brings at the macro level is specialisation. The use of foreign inputs means that domestic producers of inputs can focus on intermediates where the economy has a comparative advantage and export these intermediates to foreign countries as well as supplying the domestic economy. The basis of comparative advantage is relative productivity and thus even an economy producing all inputs with better technologies would still have an advantage in trading some as it will be relatively more efficient in the production of some of them. The same argument applies if comparative advantage is based on different relative factor endowments across countries. A country specialises in the production of intermediates that uses predominantly the factors it is relatively abundant in and will import intermediates that require factors it is relatively scarcely endowed with.

This is why a positive relationship between the ratio of foreign intermediates to domestic intermediates is expected across the board and to hold despite differences among countries and sectors. However, whether there are indeed such productivity gains from the use of foreign intermediate goods and services remains an empirical question as the growth literature has often shown that it is difficult to empirically find a relationship between trade variables and productivity growth.

A simple test of the contribution of trade in intermediates to output growth

A very simple way of testing this relationship is to introduce a variable reflecting the use of foreign inputs in a production function. For a given country and a specific sector, the production function estimates the contribution of production factors (capital, labour and intermediate inputs) to gross output. Using the 2008 edition of the OECD STAN database, we can estimate production functions for 10 OECD econmies at the sector level (using the 29 sectors of our trade dataset).

From the above equation, one can see that real gross output is predominantly explained by the contribution of intermediate inputs, but also the production factors capital and labour make a large contribution. The two other variables which are the share of foreign inputs over domestic inputs and the inward FDI stock also contribute positively to the growth of output. Because the use of capital, labour and intermediate inputs has been controlled for, their role can be understood as a positive impact on the productivity of the factors of production (the total factor productivity).

We find the expected relationship which is a positive and significant contribution of the share of foreign intermediate inputs to productivity. The more an industry makes use of foreign inputs the larger the output for a given amount of production factors. Since the share of foreign intermediate inputs is likely to be positively correlated with the level of foreign-controlled firms in the economy, it is important to include also inward FDI stocks in the regression in order to distinguish the impact of both variables. Foreign controlled companies might namely not only increase output through a higher use of foreign inputs, but also through better management. Hence, the impact of the foreign share of intermediates can be attributed to trade in intermediates and is not confounded with FDI effects. FDI stocks also show a positive correlation with output.

The role of foreign intermediates in the reduction of inefficiency effects: a stochastic frontier analysis

It was previously mentioned that in addition to the technology gain offered by foreign inputs, an improvement in the use of technologies was also likely to stem from trade in intermediate goods and

services. To analyse whether available statistics can give some evidence of this happening, we proceed with another trade and growth analysis relying on "stochastic frontier analysis" (SFA). SFA is an econometric technique that allows the decomposition of productivity gains into technological change and efficiency change. In the previous regression, we have found a positive correlation between output growth and trade in intermediate inputs but it is not clear whether the impact comes from technology or is due to a more efficient use of available inputs for a given technology (efficiency change).

In stochastic frontier analysis, it is assumed that all countries have access to the best technologies and that they share a common "technology frontier" that defines the maximum output they can reach (for a given amount of capital and labour). What distinguishes countries is how far they are from the frontier. A random distribution of countries behind the frontier is assumed but the distribution has some specific properties. We assume that whether countries trade intermediate inputs or not has some impact on the distribution of countries behind the frontier and on their "technical inefficiency" (the further from the frontier, the higher the technical inefficiency).

From the analysis presented in this section, the impact of trade in intermediates on productivity is twofold. First, it appears to have a direct contribution to output growth as part of the "total factor productivity" measured in growth analysis. It suggests a direct impact on the technology of production, which can be explained by the technology embedded in foreign inputs. Second, when distinguishing between technological change and efficiency change, the ratio of foreign to domestic input is also found to have a positive role in the reduction of inefficiency. It gives support to the idea that through trade in intermediate inputs there is also an indirect impact on productivity that enables countries to reduce inefficiencies. Thus, trade in intermediates is likely to both expand the technology frontier and to help countries and industries come closer to the new expanded frontier. Above analysis confirms some of the recent trends in world trade and production that have been pointed out in the policy debate on globalisation: the higher interdependence between economies, the rise in trade of intermediates and outsourcing, the role of vertical specialisation networks, the complementary relationship between trade and investment and the important role of MNEs in explaining trade patterns.

However, the report provides stylised facts that depart sometimes from the popular assessment of globalisation and nuance the scope of the changes that have taken place. The fact that intermediate goods(and to a lesser extent services) trade has not increased as a share of total trade does not mean that the fragmentation of production has not occurred but it offers several insights:

First, we can assume that the increase in FDI and production abroad implies sourcing strategies that both increase and decrease trade in intermediate inputs. While the vertical specialization networks create additional trade flows of goods and services that are sequentially processed in different countries, firms are also likely to switch from foreign to local suppliers for some of the inputs required. Sourcing from more competitive local suppliers while avoiding trade costs is often a motivation for fragmenting and offers an explanation of why the unbundling of production does not lead to a significant increase in trade in intermediates as a share of total trade.

Second, as this constant share is explained by the concomitant increase in overall trade and intermediate inputs trade, the internationalisation of production appears to be to the benefit of all producers and all countries (whether specialised in inputs or consumption goods and services).

While the fragmentation of production creates new trade flows of intermediates, there are also new trade flows of final goods and services at the end of the global value chain. The rationale for

fragmenting is an increase in productivity that in the end benefits the final good or service which is then exported to a greater extent with a higher level of specialisation for all economies.

Third, there is no widespread evidence of outsourcing occurring in all industries and all countries.

It is difficult to distinguish between 'global sourcing' and 'outsourcing' but the evidence presented in this study on flows of intermediates within the same sector and on the role of FDI and FATS in explaining trade in inputs does not corroborate the idea of a massive migration of (high skill) jobs from OECD to developing countries. This would imply a change in the patterns of trade flows of intermediates that so far is not found in the data.

On the contrary, the dataset and the results of the quantitative analysis point to the positive impact of imported inputs on productivity. Recent trade literature has also highlighted the diversity of firm strategies when it comes to sourcing and the heterogeneity of producers (in terms of productivity). As a result, and without underestimating the breadth of current changes in production patterns, there are no new imbalances in world trade flows that could be associated with the unbundling of production (i.e. all countries benefit from these changes).

Policy implications

Policymakers should always keep in mind that trade in intermediate goods and services is first and foremost decided at the firm level where sourcing strategies are determined. Any decision made by firms regarding their operations and production methods can have an impact on trade in intermediates. In particular, a firm's decision to (i) simply engage in trade of final goods (ii) engage in sourcing of different types or (iii) engage in FDI, can all be associated with changes in the direction and volume of trade in intermediate goods and services. Furthermore, the location decision of a multinational enterprise may also influence the location decision of its suppliers and hence also affects trade. Consequently, government policy affecting any of these decisions will have an impact on trade in intermediates.

More specifically, increased trade in final goods, when targeting a larger number of international markets, will require more inputs; hence as long as vertical links exist, exchanges of intermediates will grow. On the other hand, a decision to alter the boundaries of the firm by vertically integrating or establishing partnerships with foreign firms will also affect trade in intermediates. Vertical FDI is directly linked to sourcing and therefore will by definition alter the direction and nature of trade in intermediates. A decision to serve a foreign market through horizontal FDI is nevertheless also expected to have an impact on trade in intermediates. The choice of replicating facilities abroad will involve some provision for inputs. The direction and volume of trade will change.

What are the implications of these observations? A wide range of policies, not initially targeting intermediate goods and services, are expected to have an indirect impact on such trade. Apart from sourcing, any policy affecting FDI, or trade in final goods can have an indirect impact on trade in intermediates. In the rest of this section we focus on what is new in the context of this paper; that is what directly affects trade in intermediates, abstracting the discussion from policies for trade in final goods, or investment.

Restricting trade in intermediate goods and services can have a very negative impact on growth

The positive relationship found between the use of foreign inputs and productivity means that discouraging imports of intermediate goods and services can have a detrimental impact on growth. One should keep in mind the multiplier effect that is involved. A less efficient domestic input will not

Notes   only diminish the productivity of using industries but also the productivity of all other industries to which the using industry is providing inputs.

Input-output tables, studied together with trade flows, help to understand the consequences of protectionist policies in other industries of the economy. While domestic producers shielded from foreign competition may benefit, producers of other industries of the economy will be negatively affected. Protectionist policies are often presented as a trade-off between the wealth of consumers and the income of domestic producers. The input-output analysis shows that many domestic producers in other industries can also be hurt in addition to consumers.

The relationship between trade, FDI and strategies of firms highlighted in this study further weaken the protectionist reasoning as the lines between "domestic" producers and "foreign" producers are blurred. The foreign producer can be a subsidiary of a domestic MNE and the domestic producer a subsidiary of a foreign firm.

Trade in intermediates and outsourcing

The rise of outsourcing as a business strategy has created important policy challenges. The issue has been discussed in many countries, where long debates on policies encouraging it or not still take place. Though not new as a phenomenon, its expansion to services and its international dimension have received particular attention.

From a trade perspective, outsourcing is associated with the same type of costs and benefits as any other type of arm's length trade with a potential loss for import-competing sectors and an overall gain for the economy. The advantages of outsourcing lie primarily at the firm level. New opportunities for cutting production costs by altering firms' boundaries, and focusing solely on the activities of firms' comparative advantage, is the main driving force for the phenomenon. More opportunities rise from cross country differences in prices and quality of factors of production. Types of sourcing involving vertical integration act also in the direction of eliminating oligopolistic distortions in vertical international transactions. For these reasons the phenomenon has been primarily approached as a competitiveness issue.

Moreover, at the aggregate economy level, outsourcing can stimulate competition and hence contribute to reducing prices of final goods, as well as to higher quality of output. The size of economic activity expands for the country as a whole. The analysis presented in Section IV has pointed to the productivity gains arising from outsourcing and more generally trade in intermediate inputs. On the other hand, since the phenomenon affects by definition factors of production, employment and wage patterns are not expected to remain the same. There are segments of the society potentially gaining and others losing from its expansion. Studies conducted by the OECD on the impact of outsourcing on employment patterns sometimes find a negative impact on labour demand in sectors exposed but such impact is generally modest.

Outsourcing is associated with the process of 'creative destruction', a term referring to the evolution of market structure and employment patterns when radical innovations are introduced in the economy. Outsourcing (together with strategies of offshoring) introduces a novel organisation of the production process with new ownership structures across firms. Though a continually innovating economy generates new opportunities for workers to participate in more productive enterprises (provided they can acquire the necessary skills), 'creative destruction' can cause some hardship in the short term. The overall assessment of the process should however take into account (i) productivity gains for the domestic economy; (ii) gains for domestic consumers; and (iii) the pace at which employment is affected and the potential for adjustment.

Trade in intermediates as means of economic integration

Although the study has stressed that it is mainly between OECD countries that intermediates trade takes place, it is in emerging economies that the highest growth rates are observed. Trade in intermediate goods and services can be approached through a different perspective in recently developed and developing economies. The report has highlighted that emerging economies such as Brazil, China, India or Indonesia are more specialised in trade of intermediate inputs than OECD countries. One reason is that trade in intermediates can for some countries offer better means of economic integration into the global economy than final goods trade.

This observation is based on the fact that, contrary to intermediates, sales of final goods and services are subject to choices made by final consumers. Their preferences, customs and habits determine largely their selection from the variety of options they are exposed to. From the side of the producers, advertising and promotion of *final* products adds fixed costs to firms increasing their presence in foreign markets, through either trade in final goods or FDI. *Intermediate* goods are not traded in such a context.

Sales of intermediates still occur on the production, and not the consumption side of the economy. As long as the good or service provided from abroad is appropriate to the production process of some final output, then it can be more easily promoted beyond the preferences and habits of final consumers. In the economic literature, this has been described through the "home market bias" which is less pronounced for intermediates than for final goods and services.

While there is no 'one-size-fits-all' development strategy, the experience of newly industrialised countries suggests that emphasising trade in intermediates can be effective to integrate in the world economy. Final goods from remote locations may prove unsuccessful in the international markets because of consumer habits and tastes imposing significant barriers to market entry. Such barriers are less pronounced for intermediate goods, where a country can fully exploit its comparative advantage. Once foreign firms are known and have more experience with the destination market, they can switch to the production of the final goods or services. For example, computer manufacturers of South East Asia started by exporting parts and components to US and Japanese manufacturers and now have moved on to sell hardware to final consumers under their own brand.

Trade policies targeting trade in intermediate goods and services

Three of the characteristics of trade in intermediates highlighted in this report should inspire trade policies aimed at facilitating their exchange: Trade in intermediates is more sensitive to trade barriers. It suggests that trade policies aiming at fully benefiting from international production networks should reach a higher degree of liberalisation. This does not mean that barriers to trade in final goods and services should be higher than for intermediates. Tariff escalation should be avoided and uniform liberalisation is recommended. Furthermore, policies should aim to reduce the time of transport for goods so that firms can save on time costs which are critical for production networks.

A corollary is that companies with international production networks are likely to quickly anticipate any perceived risk of new barriers. This implies that countries tempted by any form of protectionism will quickly pay the cost of such policies with a reduction in intermediate trade and a negative multiplier effect in the entire economy for local companies indirectly depending on such trade.

Trade in intermediates has an important regional dimension. Keeping in mind that trade in intermediates is more sensitive to trade barriers, it is in the context of regional strategies where trade

Notes   liberalisation can go further and where investment and trade in services are also likely to be liberalised that trade flows can be the most encouraged. It does not mean that the relevant level of trade negotiation is regional rather than multilateral. On the contrary, multilateral liberalisation is fully needed for trade in final goods and services and for inputs that are sourced from other regions. But the regional nature of certain production networks suggests that regional policies or initiatives are relevant.

Trade in intermediates depends less on the size of the market and on the "home bias" of consumers. As we have highlighted before, this represents a chance for emerging economies and more generally for small economies that can specialise in inputs and attract foreign suppliers for their own companies. There is less of a disadvantage for small economies when it comes to inputs trade.

Implications of inter—industry flows and pure intermediate products

Labour mobility plays an important role in economics. On the one hand, industry-specific technology or demand shocks often necessitate a transfer of productive capacity, and thus of workers, from shrinking to growing industries. On the other hand, labour mobility diffuses know-how across firms, industries and locations, and is therefore important in organization allearning and regional and national growth. Unsurprisingly, therefore, labour mobility has received much scholarly attention from both labour economists and innovation economists. However, one aspect of labour mobility has hitherto been relatively neglected, namely, the mobility patterns of workers across industry boundaries. As a consequence, the inter-industry structure of labour flows is still poorly understood. This is surprising, given that if inter-industry labour flows exhibit a high degree of structure, mobility of workers across industries will be constrained by this structure. Because any constraints to such mobility will limit both, the reallocation of labour, and the diffusion of knowledge, a deeper understanding of inter-industry labor flows may shed light on a wide range of economic phenomena, from individual careers to economic development, structural change and innovation.

Here, we contribute to our understanding of inter-industry labour flows, showing that they exhibit strong regularities. We summarize these regularities in a set of stylized facts that are organized around three related topics: (1) the expression of human capital specificities in the structure labour flows, (2) the use of labour-flow-networks as measures of inter-industry relatedness and (3) the way in which the constraints on inter-industry labour-flows these networks express affect diversification and labour reallocation in local economies. In particular, we ask a number of interrelated questions: Do labour flows concentrate in relatively few industry pairs? How stable is the network of inter-industry labour flows? Is this net- work general or specific to an occupation? Does the sparseness of the inter-industry labour-flow-network condition a region's growth path? And, finally, does this sparseness constrain a local economy's capacity to reallocate labour from contracting to expanding industries?

These questions complement a vast literature on general labour flows and job switching. For instance, labor economists have extensively studied job-switching rates (or, their complement, employment durations) and how they depend on business cycles, industry and worker characteristics. Recent work in this tradition finds that workers often change jobs across industries that belong to completely different sectors. This finding may lead to the conclusion that human capital has no strong industry-specific component. However, because this research fails to take into consideration which industries exchange workers, it implicitly assumes that all industries are equidistant from one another in terms of human capital requirements. We show that a closer analysis of the network structure of

inter-industry labour flows casts doubts on this conclusion. These analyses are collected in a first set of stylized facts that describe how much structure inter-industry labor flows exhibit.

A different group of scholars at the intersection of innovation economics and economic geography has studied the role of labour flows as conduits of knowledge diffusion, typically focusing on the mobility of highly skilled workers, such as inventors. However, although the spatial limits to mobility are central in much of this research, also here, the question of whether there are `inter-industry` constraints to labour mobility has typically been neglected.

A second debate to which our work relates takes place in the literature on inter-industry relatedness. In spite of the relative neglect of inter-industry labour flows in labor and innovation economics, an increasing number of papers has turned to such flows as an expression of inter-industry relatedness. These papers assume that human capital is to some extent industry specific. Consequently, labour flows are constrained and will predominantly take place between industries with similar human-capital requirements. This has resulted in labor-flow-based skill-relatedness measures, which have been used in a variety of papers. In accordance with this literature, a second set of stylized facts analyzes inter-industry labour flows through the prism of skill relatedness. In particular, we are interested in four issues. First, how volatile are skill-relatedness structures? That is, do they change much from one year to the next or are they relatively stable? Second, how generalare skill-relatedness measures? That is, do different types of workers exhibit different skill-relatedness patterns? Third, given that many workers tend to search for jobs in their own region, skill-relatedness measures may just reflect industrial allocation patterns. We therefore ask: do short-distance and long-distance flows differ in the skill-relatedness structure they exhibit? Fourth and finally, we ask: what is the predictive validity of skill-relatedness measures vis-a-vis alternative relatedness measures?

We derive stylized facts from Germany's social security records between 1999 and 2008, which cover over 80 percent of the working population. We find that, although workers often do switch industries, even at a very high level of aggregation, labour flows are highly structured. In particular, on average, related industries that together represent just 5 percent of employment absorb over 60 percent of an industry's total worker outflow. Moreover, the underlying network of labour flows is largely independent of a worker's occupation: workers in different occupations tend to make the same industry switches. This suggests that, independently of any occupational specificities, job switches are guided by a non-negligible industry-specific component in human capital. When we turn to labour flows as a measure of inter-industry relatedness, we find that the derived skill-relatedness index is remarkably stable, general across occupations and wage levels. Furthermore, given that intra-regional flows follow a similar skill-relatedness structure as long-distance flows, skill-relatedness is not simply a reflection of the industrial composition of local economies. Moreover, in a direct comparison, our labour-flow-based measure out performs commonly used alternative relatedness measures in predicting entry and growth rates of local industries . Finally, skill-related industries have uncorrelated growth patterns, suggesting that skill-relatedness should typically not impede the reallocation of labour from shrinking to growing industries.

Although we limit the analysis in the paper to skill-relatedness among the industries of the classification systems in use between 1999 and 2008, we have constructed skill-relatedness matrices for various industrial and occupational classification systems between 1975 and 2014. To facilitate future research, these matrices are available for online download.

Notes   **Human capital specificity and job switching**

Human capital and skills are pivotal inputs in today's production processes, which is why a firm's workforce is regarded as an exceedingly important competitive asset. Moreover, today's workforces are highly specialized: individual workers often invest heavily in education and training to acquire specific skills that allow them to carry out specific tasks, running the gamut from engineering to financial management and from construction work to food preparation. Because workers specialize, their human capital is often held to be specific to the firm where they work, to an industry and to occupations and tasks performed. However, there is considerable debate overwhich of these dimensions of skill specificity dominate. For instance, Kambourov and Manovskii (2009) study the value of occupation tenure and industry tenure and report that only the former is rewarded with higher wages, casting doubt on the existence of industry specificities in human capital. In contrast, Sullivan (2010) shows that industry tenure sometimes does reap high rewards that are not explained by occupation tenure, but that these rewards depend on the occupation. An alternative way of thinking about the skill content of human capital is described by Lazear (2009). Lazear argues thatit is not skills that are specific to a firm, but rather the exact combination in which the firm uses them. Accordingly, human capital consists of a number of different skills, all of which are general in the sense that they are demanded by a wide range of firms. However, firms differ from one another in the weights they attach to each skill. Consequently, workers with a given skill profile are more productive in one firm than in another. Firm-specific skill weights yield many of the same predictions as firm-specific human capital, such as that workers will incur wage losses upon involuntary job separations, but they canalso explain some empirical facts that are harder to square with a theory based on the existence of firm-specific humancapital.We approach the question of whether human capital has an industry-specific component in a way that is closely alignedwith Lazear's skill weights interpretation of human capital. The starting point is that job-switching patterns contain valuable information on the nature of human capital. In Lazear's terminology, industries differ in how they weigh different skills.Consequently, when a worker switches jobs, she will render some human capital redundant, whenever the old and the newjob require a different skill mix. To avoid such human capital depreciation, workers will predominantly switch to jobs thatallow them to reuse as many of their skills as possible. This suggests that overlap in industries' human capital requirements,or, more accurately, an absence of such overlap, should constrain inter-industry labour movements. Therefore, inter-industry job switches contain information on which industries value similar skills and know-how, indirectly shedding light on theexistence of human capital specificities. Job switches have been studied in great detail in labor economics. Much of this literature's interest in labour flows is driven by their role in readjusting the allocation of labour across firms. Research in this tradition has resulted in numerous papers summarized in various reviews. These papers mainly study the rate at which jobs are created and destroyed, the rate at which workers change jobs, and whether workers do so voluntarily or involuntarily. Other important questions are how job-switching rates develop over the business cycle and what this means for unemployment dynamics and labour-market institutions.Although most of this work in labour economics has focused on the question of how often and why workers change jobs, more recently, scholars have turned to the issue of workers switching industries. These studies find that, in the United States, workers change 1-digit industries at relatively high rates of between 12 percent and 20 percent a year. These findings may be interpreted as a sign that workers are not strongly constrained in their movements across industries, implying that human capital is not highly specific to an industry. But this conclusion rests on the assumption that the hierarchy of the industry classification system groups industries by their human capital requirements. However, a similar notion – that industry classification systems reflect similarities in

use of strategic resources– has been heavily criticized in strategic management. In the empirical section, we will show that such assumptions are indeed not just problematic, but that evidence based on them is even misleading.

Knowledge spill overs

Labour mobility has also been studied in a different context, namely, as a mechanism for knowledge diffusion. Accordingly,workers who switch jobs do not just reallocate labour, but often also carry with them valuable knowledge, expertise and networks they acquired at their previous employer. Because most individuals change jobs within their regions, such knowledge spillovers tend to be spatially constrained. The spatially bounded nature of knowledge spillovers has received much attention. However, the scope for knowledge spillovers may also be limited by human capital specificities. In particular, economic activities that employ radically different skills and knowhow will have limited scope for exchanging workers, making it less likely that knowledge and technologies are shared.

Related diversification

Because inter-industry labour flows will mostly occur among related industries, inter-industry labour flows might be used to measure inter-industry relatedness. The concept of inter-industry relatedness has played an important role in the literature on firm diversification and more recently, also in economic geography and the literature on geographical clusters of firms. For instance, Porter (1998) identifies local clusters of related economic activities as important sources of competitive advantage, with Silicon Valley as the archetypal example. Although originally stressing local value chains, the cluster concept has evolved to include more general linkages that "create externalities of various types". To measure such linkages, scholars have used information on the co-location patterns of industries and the co-occurrence of products in countries' export portfolios. Although these and other relatedness measures have proven highly predictive of the growth of local industries, recently, labour-flow based inter-industry relatedness measures have been gaining support. For instance, Greenstone et al. (2010) show that large-plant openings create spillovers to local firms, but in particular to firms in industries that are related to the new plant's industry as measured by labor flows. Similar labour-flow-based measures have been used in studies in economic geography, trade, strategic management and entrepreneurship research. To our knowledge, however, hitherto there has not been any detailed investigation of the structure of inter-industry labour flows that would assess the legitimacy of such labour-flow based relatedness measures.

Definition of labour flows

Labour flows arise when workers switch establishments from one year to the next. Workers who enter or exit the social-security data in this period are ignored in these flows.As a consequence, these labour flows predominantly reflect job-to-job switches. Moreover, establishment identifiers in the EH are not perfectly reliable. For instance, spin-offs, mergers, break-ups or mere recodings all would introduce new establishment identifiers that do not correspond to de-novo entries. Hethey and Schmieder (2010) find that for only 35 percent to 40 percent of all establishments with over three employees a new (or a disappearing) establishment identifier can be interpreted unambiguously as an entry (or as an exit) of an economic establishment. In the other cases, workers move in larger blocks from one establishment to another. To avoid that such spurious identifier changes contaminate our labor-flow measurements,we remove 531,000 job switches (27.5 percent) from a total of 1.8 million yearly job switches.

Labor-flow segments

In this section, we decompose flows into different segments. We introduce three kinds of segmen-tations. The first is based on the geography of flows, the second captures workers' skills and the third distinguishes between an eastern and a western labour market.The first segmentation is motivated by the potential concern that the structure of inter-industry labour flows is governed by the availability of local jobs. In that case, inter-industry labour flows could simply be an expression of the co-location patterns of industries. We look into this by comparing job switches over short and long distances, where long distances refer to switches where the old and the new job are at least 100 kilometers apart. Second, to proxy workers human capital levels, we segment the labour market into workers who earn below and those who earn above the median wage in their industries. To explore whether the type of human capital matters, we also split workers into eight occupational groups that are associated with different broad sets of tasks. In particular, we distinguish among managers, sales-related employees, accountants, information technology (IT) workers, office clerks, cleaners, security personnel and other workers. These occupations were chosen because they are found in a wide range of industries so that we are not limiting the analysis to a small subset of the economy. Furthermore, the latter two segmentations are based on a worker's wage and occupation at the origin of a job switch, not (necessarily) its destination. Third, we investigate whether there are regional differences in labour-flow patterns by splitting the labour market.

3.2 SUMMARY

1. Intermediate inputs – the parts and materials imported to make products for consumption domestically and abroad – are a growing force in world trade.

2. Lower trade barriers, organisational innovations, and progress in information and communication technologies have made slicing up the production process cheaper and easier.

3. With globalisation, the use of imported intermediates for exports has been growing.

4. The growing role of imported intermediate inputs has several implications for economic study and therefore policy.

5. Over the last several decades, world exports have grown at about twice the rate of world GDP on average.

3.3 SELF ASSESSMENT QUESTIONS

1 Explain the importance of international trade

2. Why International Trade Is So Important? What Are The Characteristics Of International Trade?

3. What Are The Problems Or Difficulties In International Trade?

4. What Are The Factors Determine Size Of Gain of International Trade?

5. The growing role of imported intermediate inputs has several implications for economic study and therefore policy.Comment.

ಇ✴ಞ

UNIT – III

Chapter **4**	**INTERNATIONAL TRADE AND FACTOR MARKET DISTRIBUTION WITH WAGE DIFFERENTIAL WITH FACTOR IMMOBILITY AND FACTOR PRICE-RIGIDITY**

Objectives

The objectives of this lesson are to:

- Factor Pricing and Income Distribution
- Factor Immobility (Labour Markets)

Structure:

4.1 Factor Pricing and Income Distribution

4.2 Factor Immobility (Labour Markets)

4.3 Summary

4.4 Self Assessment Questions

4.1 FACTOR PRICING AND INCOME DISTRIBUTION

Let us discuss three topics related to factor payments. We first examine the pricing of fixed factors of production and the associated concepts of economic rent and quasi-rent.

We next examine some of the main factors which give rise to wage differentials.

Finally, we discuss the problem of factor shares in relation to the total value of the output of an economy, 'the exhaustion' problem, which has attracted the interest of economists for a long time.

A. Pricing of Fixed Factors: Rents and Quasi Rents:

1. Factors with Fixed Supply in the Long Run:

We will examine the pricing of factors whose supply is fixed either in the short run or in the long run.

Fixed factors do not have a marginal product. Hence their price must be explained on different lines. The theory of pricing of fixed factors is based on the concept of economic rent. Economic rent is the payment to a factor over and above what is required to keep the factor in its current employment. In other words, economic rent is a payment to a factor in excess of its opportunity cost. If a factor has no alternative use its opportunity cost is zero; hence all its payment is rent.

In the nineteenth century economists associated rent to the factor land. Later, however, the concept of rent was extended to all factors of production: any factor may receive an economic rent. The best example of economic rent is the payment to a factor whose supply is completely inelastic.

For example the total area of land of a country, lakes, forests, mineral deposits are in fixed supply. The supply curve of such factors may be presented by a vertical line, such as the SS' curve of figure 21.40; the available quantity of the factor is given irrespective of its price.

We may say that the price of a factor in fixed supply has no incentive function, in the sense that it cannot induce (give an incentive to) its owners to offer more of the factor as its price increases. As we will presently see, the price of the fixed factor has only an allocative role it ensures the use of the factor where it is most needed.

When an input is in fixed supply its price is determined by the conditions of demand alone, since its supply is a constant quantity. For example assume that the land suitable for the production of grapes is OS (figure 4.1). If the demand for grapes gives rise to the demand curve D_1 for the grape-producing land the price of land (per unit) is However, assume that the demand for grapes increases; this shifts the demand for the particular land to D_2. Given the perfectly fixed supply, the price of land increase to R_2.
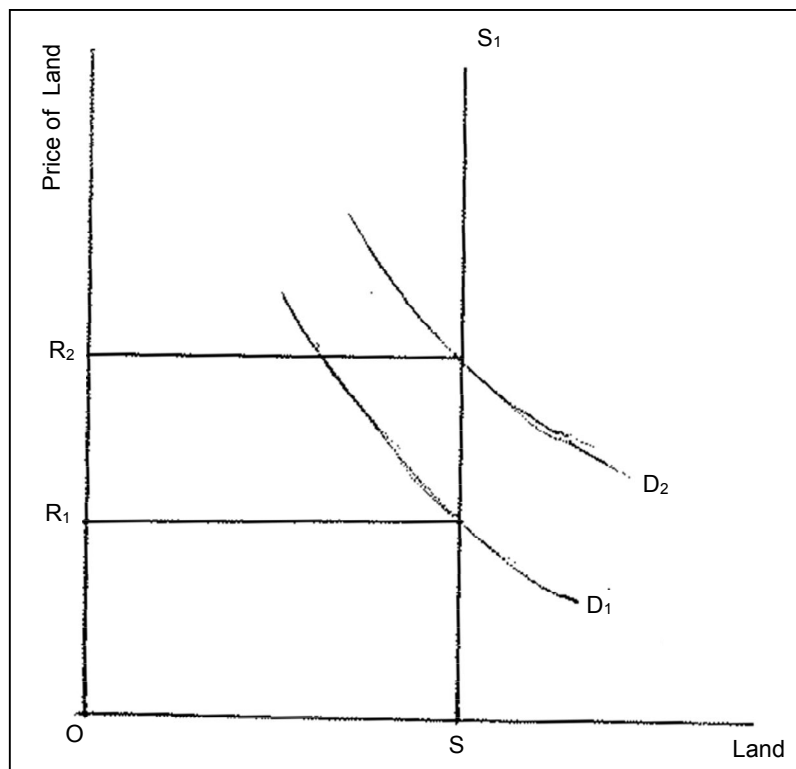

Fig. 4.1: When an input is in fixed supply its price is determined by the conditions of demand alone, since its supply is a constant quantity

This change in the rent of land is solely due to the forces of demand. Under these conditions rent is not a cost entering in the determination of the price of grapes, but is the effect of the price of grapes, which, in turn, leads to a shift in the demand for the factor (land). In short, rent is price-determined, not price-determining, for the economy as a whole. For the individual firm (or farmer), however, all rents are costs, since the firm must pay such rents to the factors that create them in order to attract and keep these inputs, which otherwise would be bidden away by other firms in the industry.

If the fixed factor has no alternative use all its payment is rent the availability of the factor in its present use is not affected by whether its price is high or low. To state this in another way, if the

factor has no alternative use its opportunity cost is zero, and nothing has to be paid to retain it in its present use. Hence, all payments to this factor is rent. It is clear that reducing (or taxing away) the payment to a fixed resource which has only one use does not affect its supply.

The return to a factor whose supply is completely fixed is often referred to as a pure economic rent. If the supply of a factor has some elasticity, part of its price is rent. To see that let us examine the market of a factor whose demand and supply curves are shown in figure 4.2. The equilibrium price is W and the equilibrium quantity L.
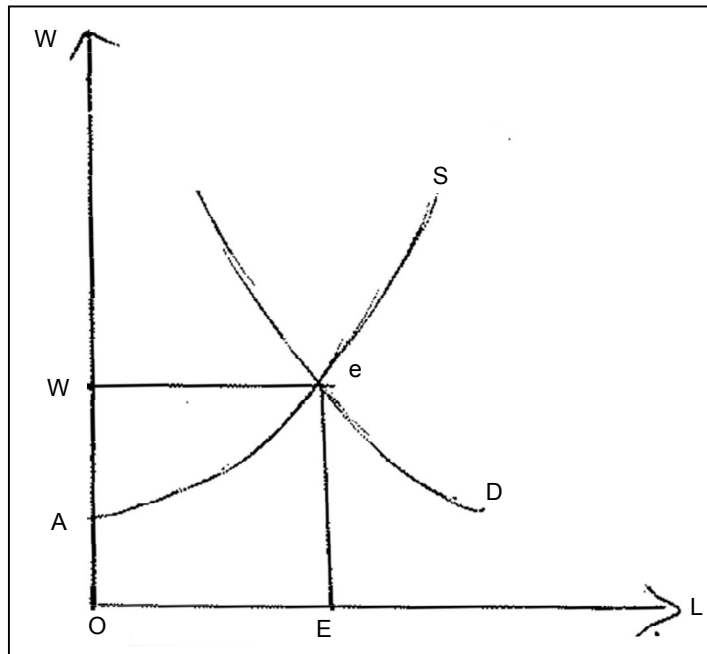

Fig. 4.2: Return to a factor whose supply is completely fixed

The total payment to the factor is (0w) – (0L) = O Lew. This payment can be split in two parts the opportunity cost of the factor, that is the amount that must be paid to the factor to keep 0L units in their current use, and the rent of the factor, that is any payment in excess of the opportunity cost. We know that the supply curve shows the MC (marginal cost) of offering an additional unit of the factor.

Hence the amount required to keep 0L units in their current employment is the area OAeL. The remainder, Aew, is economic rent for the factor; it shows payment above what is required to keep each of the 0L units where it is currently employed. The economic rent, in this sense, is a surplus. Alfred Marshall called this economic rent 'producer's surplus' it is a surplus return to the factor in excess of its opportunity cost.

It should be clear from the above discussion that any factor whose supply is less than perfectly elastic earns an economic rent. The steeper the supply curve of the factor, the greater is its economic rent. If the supply is perfectly elastic the factor payment contains no rent; it is all opportunity cost. If the supply is perfectly inelastic the entire payment to the factor is economic rent.

It is important to note that whether a payment is rent or not depends (a) on the elasticity of its supply, (b) on its alternative uses. Thus in each case we must be clear whether we are considering the supply of a factor to a firm, an industry or the economy as a whole. For example for the economy as a whole all land is paid a rent; its supply would not change if no price were paid. Consider next 'agricultural land', which refers to the supply of land to an 'industry'.

Since agricultural land has alternative uses in other industries (e.g. housing construction), the price of agricultural land is partly rent and partly opportunity cost for the industry and the economy. In this event the supply of agricultural land would have a positive slope. The price of agricultural land paid by a single farmer, however, is opportunity cost. All rents are costs for individual producers.

It is important to know whether or not a certain payment to a factor is rent. Because if it is rent its reduction will not influence the supply and use of the factor. Whereas, if it is not a rent, a reduction in the payment is likely to change the allocation of the resource.

2. Factors with Fixed Supply in the Short Run:

In the short run some factors are fixed, while in the long run they become variable. The payment to an input which is in fixed supply in the short run is called quasi-rent, because it disappears in the long run (as the factor becomes variable), unlike rents which persist in the long run.

In the short run fixed inputs cannot be withdrawn from their present use and transferred to another where payments are higher, while variable inputs are free to move to alternative uses where returns are highest. Thus, firms pay the variable inputs their opportunity cost (otherwise these factors would move elsewhere), while the fixed inputs receive what is left over; quasi-rents are a residual payment. To understand this we examine the short-run equilibrium of a firm in a perfectly competitive market (figure 4.3). Assume the price is P. The firm maximises its profit, producing OX units of output, from which it receives a total revenue (TR) equal to the area OPeX.
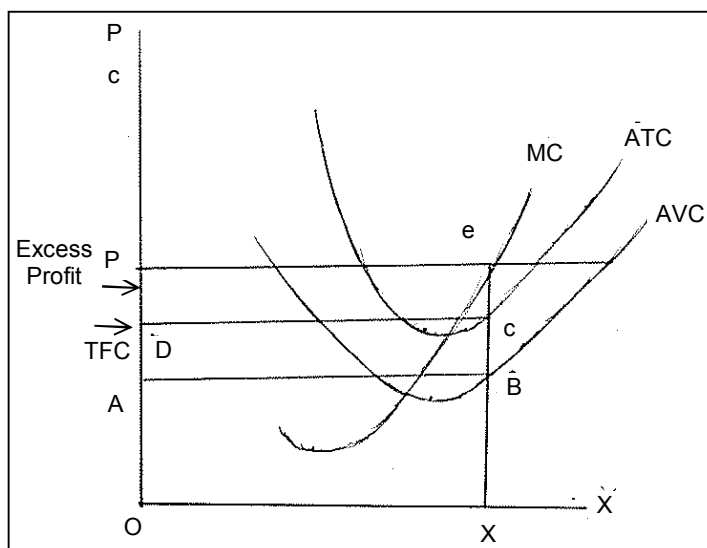
Fig. 4.3: Factors with Fixed Supply in the Short Run

The firm pays 0XBA = TVC to the variable factors. (It cannot pay less and keep them in its employ yment.) The fixed factors earn the residual ABeP, which is the quasi-rent. Thus

Quasi-rent = TR – TVC

The quasi-rent can be divided into two parts, the total fixed cost (area ABCD in figure 4.3) and excess (or pure) profit (DCeP). The TFC is the opportunity cost of the fixed factors, that is, the return that would have been earned if the fixed factors were utilized in their best alternative employment (e.g. by another firm in the same industry which pays higher returns on the fixed factors).

The excess profit is the difference between the quasi-rent and the TFC:

Quasi-rent = TFC + excess Π

or

Excess Π = Quasi-rent – TFC

In the long run the quasi-rent becomes zero and the firm is in equilibrium, earning just normal profits. In summary, the price of a factor, whose supply is fixed in the long run, is called rent. The price of a factor, which is in fixed supply only in the short run, is called quasi-rent. Rent persists in the long run, whereas quasi-rent disappears in the long run as the factor becomes variable.

B. Non-Homogeneous Factors and Wage Differentials:

We have assumed that factors are homogeneous. However, in the real world there are many different kinds of labour and each one commands a different price. The determination of the price of each kind of labour can be analysed within the general framework . We discuss briefly some of the factors that explain wage differentials for types of labour which are only partial (imperfect) substitutes for one another.

Let us first examine how wage differential arise. Assume that there are only two types of labour, skilled and unskilled, each with a perfectly inelastic supply curve. The market demand for each type of labour is the aggregate MRP curve, derived from the summation of the individual firms' marginal revenue product curves.

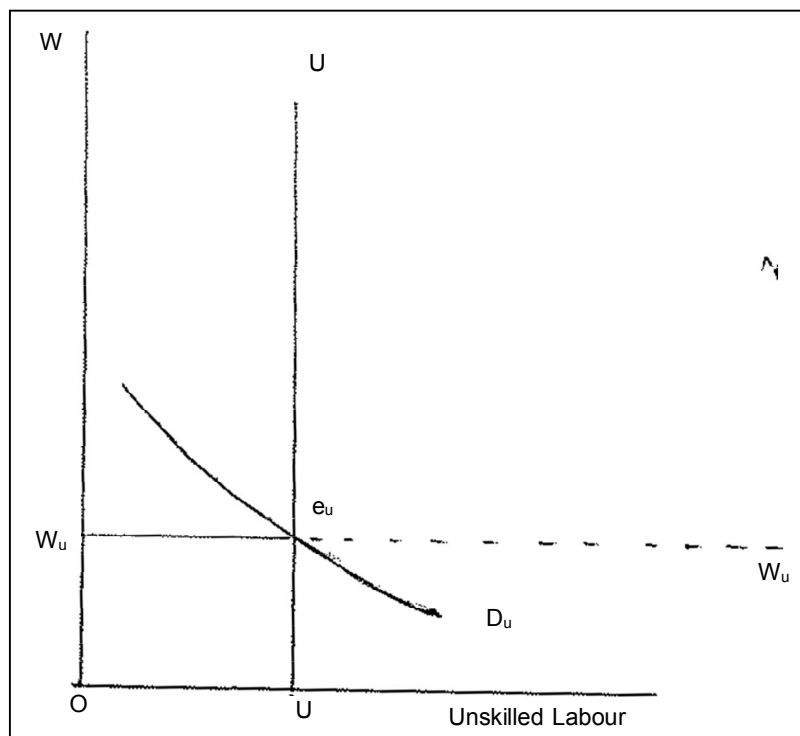The two markets are shown in figures 4.4 and 4.5.

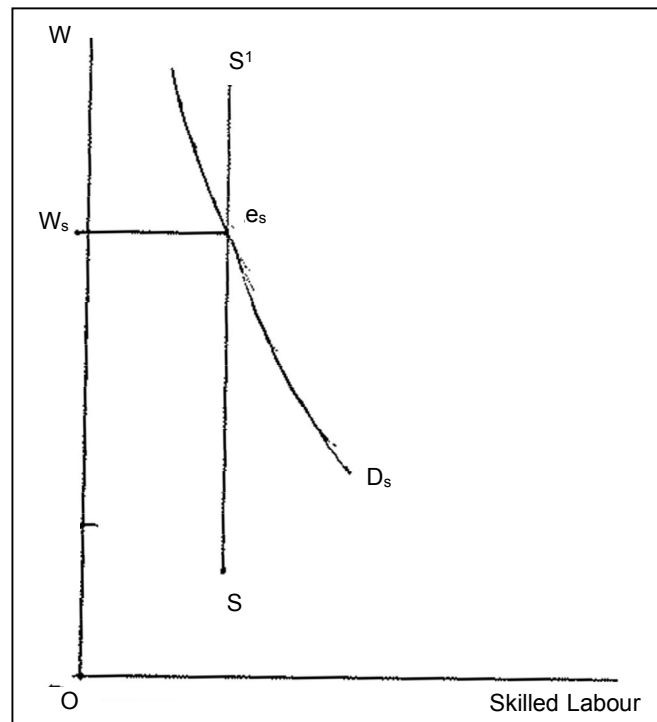**Fig. 4.4: Non-Homogeneous Factors and Wage Differentials**

Fig. 4.5: Non-Homogeneous Factors and Wage Differentials

The supply of skilled labour is zero below the wage rate w_u prevailing in the market of unskilled labour. If the wage for skilled labour is below w_u nobody would be willing to undertake the cost and effort required to acquire the skills of the skilled market. The equilibrium wages are defined by the intersection of the demand and supply curves in each market. At equilibrium the wage differential between skilled and unskilled labour is w_u w_s.

The Causes of Wage Differentials can be classified in Four Groups:

(a) Differences in the nature of the various occupations,

(b) Differences in the biological and acquired abilities of the various individuals which give rise to differences in their marginal productivities,

(c) Differences in the price of the output which labour produces,

(d) Market imperfections.

Differentials arising from the characteristics of the occupations are called compensating or equalizing differentials, because they represent payments made to equalize the net remuneration and compensate the workers for differences in their job.

Such Differences Arise from the Following Factors:

1. Differences in the cost of training. Some occupations require large investments in training, while others require a much smaller expenditure for training. A physicist must spend eight years in undergraduate and graduate training. A surgeon may require ten or more years of training. During this period income is forgone and heavy educational costs must be incurred.

2. Differences in the costs of performing the job. For example dentists, psychologists and doctors in general require expensive equipment and incur high expenditures for running

their practice. In order for net compensation to be equalized, such 'workers' must be paid more than others.

3. Differences in the degree of difficulty or unpleasantness of the work. For example miners work under unpleasant conditions relative to farmers.

4. Differences in the risk of the occupation. For example a racing driver or an airplane pilot run more risks than a college teacher.

5. Differences in the number of hours required for an 'adequate' practice. For example doctors are required to put longer hours in practising their profession than post office employees.

6. Differences in the stability of employment. Construction work and athletic coaching are subject to frequent layoffs and hence have little job security, whereas tenured university teachers have a high job security.

7. Differences in the length of the employment. For example boxers and football players have a short working life.

8. Differences in the prestige of various jobs. For example a white-collar worker has a more prestigious position in society than a truck driver.

9. Differences in the environment. For example an engineer sent to Alaska or to a politically unstable African nation must be paid more than an engineer working in London.

10. Differences in the cost of living in various areas. Living costs generally are lower in small towns than in big cities.

Differentials in wages arise also from biological and acquired differences in the quality of labour offered by various people. These are called non-equalizing or non-compensating wage differentials because they are due to the differences in the marginal productivities of individuals.

Human beings are born with different abilities and in different environments, which define largely the opportunities to develop their inherent qualities. For example not many people are born with the biological qualities required for becoming successful tennis players or surgeons, writers or artists. And relatively few have the means and opportunities to develop themselves into tennis players or surgeons or artists. Biological and acquired quality differences among people are the major reasons why there are so many different wage rates even within the same occupation; the marginal productivities of workers differ.

A major cause of wage differentials is the price of the commodities which labour produces. For example consider two hunters, the one hunting seals and the other hunting beavers. Both hunters are equally skilled, but the value of their output differs because the price of seal skins is higher than the price of beaver skins. In this case the difference in wages paid to the two individuals will equal the difference in the total value of their output.

Suppose that individual A (with the appropriate equipment and materials) produces an output with a value of £500 per week, while individual B (with the same equipment and materials) produces an output with a value of £450. In equilibrium the weekly wage of A would be £50 higher than that of B.

If the difference in wage was less than £50 an entrepreneur would replace B with A, since this would add to the value of output £50 and to costs less than £50. If the difference in wage was more than £50 the entrepreneur would replace A with B, since the decrease in the value of the output would be £50, but the decrease in costs would be more than £50.

Finally, wage differential arise from market imperfections. Imperfect knowledge of job opportunities may keep wages high in some regions. Immobility of labour may cause chronic unemployment and low wages in depressed areas. Labour unions, minimum-wage requirements and discrimination against minorities may also explain many wage differentials.

Wage differentials may widen or narrow over time. If the higher-paying jobs induce people to acquire the required skills, and if there are no union or professional bodies to bar entry in such jobs, wage differentials will tend to decrease. Referring to figures 4.6 and 4.7, the training of a larger number of previously unskilled labour, will shift the supply curve for skilled labour to the right and the supply curve for unskilled labour to the left.
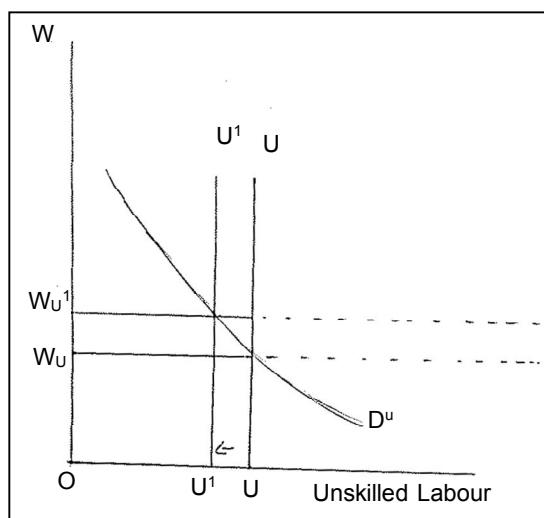
Fig. 4.6: Wage Differentials
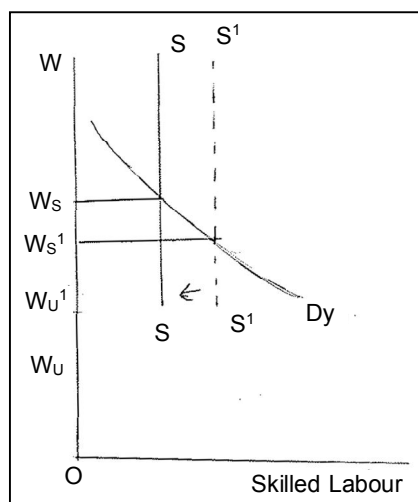
Fig. 4.7: Wage Differentials

These shifts will increase the wage of unskilled labour and decrease the wage of skilled labour, thus narrowing the wage differential to w'_s w'_u. Labour unions and professional bodies resist such equalisation movements. Labour union apprenticeship rules and the medical profession's insistence on keeping down the enrolments in medical schools illustrate the forces which restrict entry to various occupations in an attempt to maintain or increase wage differentials.

On the other hand, government policy in granting more scholarships and students' loans as well as in encouraging technical education tends to increase the supply of technicians and professionals. Such policies tend to narrow wage differentials or prevent them from becoming wider.

C. The 'Adding-Up' Problem: 'Product Exhaustion' Theorems:

In the late 1930s considerable controversy surrounded the problem whether the factor prices, determined by the marginal productivity theory, would be such as to satisfy the basic 'accounting' identity

[Value of product] = [cost of return] × [cost of capital]

$$[PQ] = [W.L] \times [V.K] \qquad (1)$$

This identity require that the factor ---- to add to unity. Divinity (1) by (P.Q) are find

$$1 = \frac{W.L}{P.Q} + \frac{r.k}{P.Q}$$

$$1 = [\text{Share or labour}] + [\text{ Share of capital}] \qquad (2)$$

The value of the product must be exhausted by the factor payments. The question is whether the marginal productivity theory determines factor prices at the levels required to fulfil the basic 'product = income' identity.

The answer to this question is affirmative if the physical output is exhausted by paying each factor its marginal physical product, that is, if

Q = (MPPL). L + (MPP K). K (3)

Because: If we multiply through by P we obtain

PQ = (MPPL. P) L+ (MPPk . P) K (4)

But

(MPPL . P) = value of the marginal product of labour

(MPPk . P) = value of the marginal product of capital

and

PQ = value of output

Thus from (4) we see that if the factors are paid a price equal to their VMP, the total factor payments will exhaust the total value of the product, that is, the marginal productivity theory leads to the correct 'adding-up' of the factor shares.

1. Euler's 'Product Exhaustion' Theorem:

The mathematician Leonhard Euler proved that expression (3) holds for production functions which exhibit constant returns to scale (i.e. production functions which are linear homogeneous). Euler's theorem states that for a production function with constant returns to scale

$$Q = \frac{\delta Q}{\delta L}.L + \frac{\delta Q}{\delta K}.K$$

Where, $\frac{\delta Q}{\delta L} . = MPP_L$ and $\frac{\delta Q}{\delta k} . = MPP_k$

Thus, the marginal productivity theory satisfies from the adding -up condition

[Share or labour] + [Share of capital] = 1

For the special case of constant return to scale.

Total physical (real) payments to factors would exhaust the total physical output. Now, Multiplying through by P, the price of output, we see that in the case of constant returns to scale that is, payment of factors according to their VMP exhausts the value of output, and share factors add up to unity.

$PQ = L- (MPP_L. P) + K. (MPP_k. P)$

Euler's theorem is an identity it holds true for all values of the variables.

2. The Clark-Wicksteed-Walras 'Product Exhaustion' Theorem:

Clark, Wicksteed and Walras showed that the assumption of a homogeneous production function is not necessary for the fulfillment of the postulates of the marginal productivity theory. Their proof implies that, regardless of the production function, if factors are paid the value of their marginal physical product, then total factor payments will exactly exhaust the total value of the product in the long-run competitive equilibrium.

In the long run firms produce at the minimum point of their U-shaped LAC curve, and therefore the requirements of the Euler theorem hold. The Clark-Wicksteed-Walras proof is not an identity, since it holds only for the values of the variables in the long-run equilibrium.

Furthermore, it holds for all types of production functions, and hence it shows that product exhaustion is not a characteristic of the special case of the linear homogeneous production function. We present below a graphical proof of this theorem.

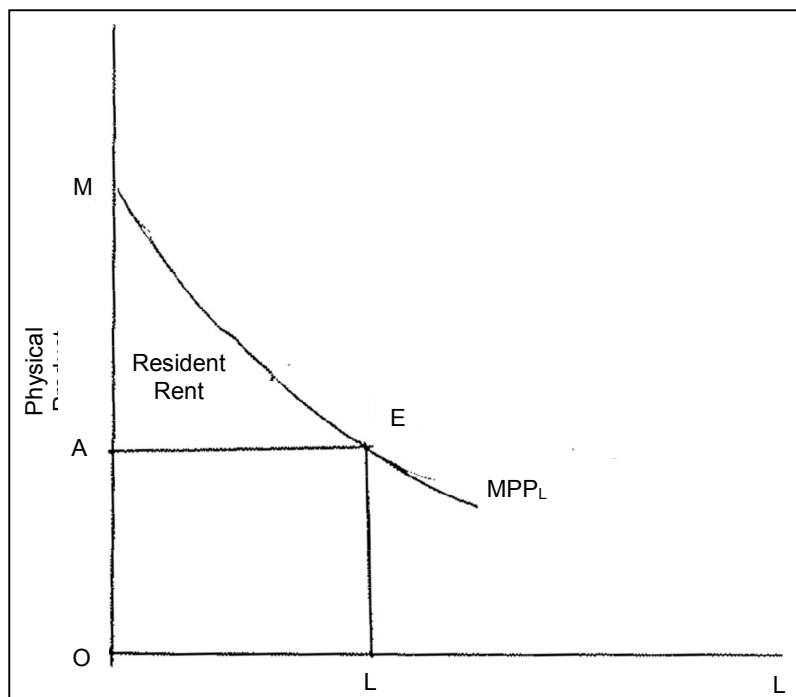Assume that an economy consists of n identical firms. Figure 4.8 shows the product of a single firm.

Fig. 4.8: Product of a single firm

International Trade and Factor Market Distribution with Wage Differential with Factor......................... **133**

Notes

The MPP$_L$ curve shows the marginal physical product of labour. Assume that the firm employs 0L workers and a unit of land. The total product of each firm is the area 0MEL. If each worker is given his marginal physical product, then the 'physical' wage would be OA = LE and the total wages would be OAEL (shaded area in figure 4.8).

In other words the area OAEL is the total marginal physical product 'paid' to labour, or the share of labour (in physical units) in the total output of the firm. The remaining (physical) product AME is the rent of the fixed factor, land. We have to show that this residual rent is the total marginal product of land, that is, the share of land in output. With this proof we will establish the product exhaustion theorem.

The total product in the economy is equal to the product of all n firms:

[Total product of 'n' firms] = (n). (OMEL)   (1)

Assume that a new firm is added to the economy, having a plot of land identical to the land of the already existing firms, but not workers. For all the (n + 1) firms to be identical the total labour (n. (0L)) must be equally distributed between all of them. Thus each firm will employ less workers, say 0L, so that

(n+ 1)- (0L') = n (0L) …(1)
and
0L = n- (0L — 0L) = n. (LL') …(2)

The new output of each firm drops to 0MCL (figure 4.9). This consists of 'physical wages' 0BCL and a residual rent BMC. We will show that this residual rent is the share of land in the total output of the firm, so that the shares of the two factors exhaust the total product.
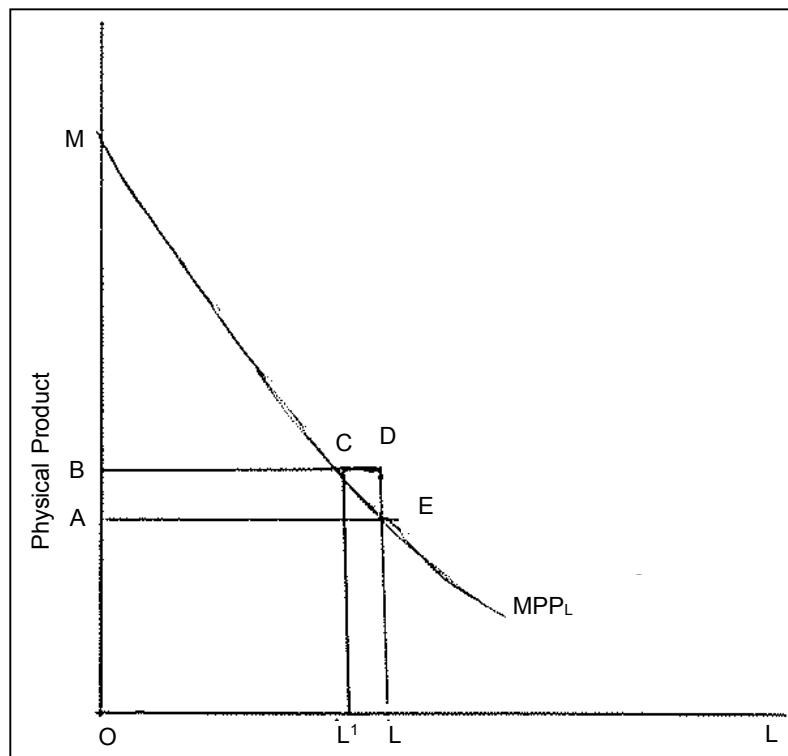

Fig 4.9: New output of each firm'

and the numerator (s) = denominators(s) when there are constant returns to scale.

Note that if ε = 1 (and there are constant returns to scale) the average cost is also constant. This is precisely what happens in the long-run equilibrium of a perfectly competitive firm the firm produces at the minimum point of its LAC. Thus the Clark-Wicksteed-Walras theorem holds only at the point of long-run competitive equilibrium; it does not hold for other values of the variables. In other words the Clark-Wicksteed-Walras proof renders the exhaustion expression (1) a theorem, not an identity holding for any set of values of the variables.

4.2 FACTOR IMMOBILITY (LABOUR MARKETS)

One cause of market failure is the immobility of Factors of production. There are two main types of factor immobility, occupational and geographical immobility.

Immobility of labour- a cause of unemployment and market failure

One of the main causes of unemployment is that workers lack the skills required by expanding industries in the economy.

Occupational Immobility

Occupational immobility occurs when there are barriers to the mobility of factors of production between different sectors of the economy leading to these factors remaining unemployed, or being used in ways that are not efficient.

Some capital inputs are occupationally mobile – a computer can be put to use in many different industries. And commercial buildings such as shops and offices can be altered to provide a base for many businesses. However some units of capital are specific to the industry they have been designed for – a printing press or a nuclear power station for example!

People often experience occupational immobility. For example, workers made redundant in the steel

Industry or in heavy engineering may find it difficult to find a new job. They may have specific skills that are not necessarily needed in growing industries which causes a mismatch between the skills on offer from the unemployed and those required by employers looking for workers. This problem is called structural unemployment. Clearly this leads to a waste of scarce resources and represents market failure.

4.3 SUMMARY

1. The theory of pricing of fixed factors is based on the concept of economic rent.

2. Economic rent is a payment to a factor in excess of its opportunity cost.

3. The best example of economic rent is the payment to a factor whose supply is completely inelastic.

4. If the supply is perfectly elastic the factor payment contains no rent.

5. The excess profit is the difference between the quasi-rent and the TFC:

Quasi-rent = TFC + excess Π

4.4 SELF ASSESSMENT QUESTIONS

1. What is the difference between marginal physical product and marginal revenue product?

2. Under what conditions value of the marginal physical product (VMP) of an input is equal to the marginal revenue product (MRP) of that input and VMP is not equal to MRP?

3. How do you explain the demand curve of an input?

4. Why is an input demand called 'derived demand'?

5. Will economic rent arise if input supply is perfectly elastic and perfectly inelastic?

03✱80

UNIT – IV

Chapter	INTERNATIONAL TRADE WITH PRODUCT
5	**MARKET IMPERFECTIONS, THE THEORY OF MONOPOLY IN GENERAL EQUILIBRIUM**

Objectives

The objectives of this lesson are to:

- Trade Policies with Market Imperfections and Distortions

Structure:

5.1   TRADE POLICIES WITH MARKET IMPERFECTIONS AND DISTORTIONS

Most models showing the advantages of international trade and the costs associated with protection assume that the world is perfectly competitive. The problem is that for a variety of reasons markets are usually not perfectly competitive, at least not completely so. Economists use the term "market imperfections" to describe situations that deviate from perfect competition. And when such deviations occur, interesting things happen.

For example, it is valid to say that in a world with market imperfections, free trade may not be the best policy to maximize national welfare; instead, some type of trade protection may be better. This chapter illustrates a series of examples with models that incorporate market imperfections to demonstrate this result. However, application of another theory in economics, the theory of the second best, and some other issues are shown to mitigate this result. In other words, even though trade policies can be used to raise a nation's welfare, there may be a better way to achieve a superior result.

Most of the models previously discussed incorporate a very standard economic assumption: namely, that markets are perfectly competitive. This was true in the Ricardian model, the Heckscher-Ohlin model, the specific factor model, and all the partial equilibrium analyses of trade and domestic policies using supply and demand curves in specific markets. The only deviation from perfect competition was in the discussion of economies-of-scale models and monopolistic competition. This is important because almost all the results concerning the effects of trade and trade policies presume that markets are perfectly competitive. But what if they're not?

Many critics of the economic conclusions about trade argue that the assumptions of perfect competition are unrealistic and that as a result standard trade theory misses some of the important impacts of trade found in the real world. There is much truth to this. By default, perfect competition models include many assumptions that are unrealistic. However, in defense, that is the nature of

model building. Simplification is necessary to make the models tractable and solvable. If we were to try to create a model that included many or most of the complexities that we can imagine are present in real-world markets, we would no doubt quickly be overwhelmed with the model's intractability and might find it impossible to even identify an equilibrium solution. Indeed, in the real world, being in "equilibrium" might even be a rare occurrence.

Criticisms of economic theory along these lines, however, fail to recognize that economic analysis includes many attempts to incorporate market realities. Although it remains difficult to include many complexities simultaneously, it is possible to study them in a piecemeal way: one at a time.

The all-encompassing terms economists use to describe these complexities are market imperfections, or market failures, and market distortions. These cases are worthy of study because it is clear that markets rarely satisfy all the assumptions made under perfect competition. These cases offer compelling arguments for protection, including the infant industry argument, the optimal tariff argument, strategic trade policy arguments, and arguments concerning national security.

Market imperfections or market distortions, generally, are any deviations from the assumptions of perfect competition. These include monopoly and oligopoly markets, production with increasing returns to scale, markets that do not clear, negative and positive externalities in production and consumption, and the presence of public goods.

When imperfections or distortions are present in a trade model, it is usually possible to identify a trade policy that can raise aggregate economic efficiency. In this chapter many cases are demonstrated in which trade policies improve national welfare. These welfare-improving policies, although detrimental to national welfare when used in a perfectly competitive setting, act to correct the imperfections or distortions present in the market. As long as the welfare impact of the correction exceeds the standard welfare loss associated with the trade policy, the policy will raise welfare.

Trade policies with market imperfections and distortions represent applications of the theory of the second best, formalized by Richard G. Lipsey and Kelvin Lancaster. See R. G. Lipsey and K. Lancaster, "The General Theory of the Second Best," Review of Economic Studies .When imperfections or distortions are present in an international trade model, we describe the resulting equilibrium as second best. In this case, the standard policy prescriptions to maximize national welfare in a first-best or nondistorted economy will no longer hold true. Also, the implementation of what would be a detrimental policy in a first-best world can become a beneficial policy when implemented within a second-best world. For example, tariffs applied by a small country in the presence of domestic distortions can sometimes raise national welfare.

In 1971, Jagdish Bhagwati presented a general theory of distortions in trade situations.See J. N. Bhagwati, "The Generalized Theory of Distortions and Welfare," in Trade, Balance of Payments and Growth, ed. J. N. Bhagwati, R. W. Jones, R. A. Mundell, and J. Vanek (Amsterdam: North-Holland Publishing Co., 1971). He characterized many of the distortions that can occur and considered which policies could be used to correct each distortion and raise national welfare. He considered not only trade policies but also domestic tax or subsidy policies. He showed that for most distortions, a trade policy is inferior (in terms of the extent to which it can raise national welfare) to other purely domestic policies. The most appropriate or first-best policy, in general, would be the policy that most directly corrects the distortion or imperfection present in the market. This chapter provides numerous examples of policy rankings and applications of this general rule.

In one case, a trade policy does prove to be first best. This is the case of a large import or export country in international markets. In this case, the first-best policy is the optimal tariff or the optimal export tax.

Thus the results of this section are somewhat schizophrenic. On the one hand, these models offer some of the most compelling arguments supporting protection. For example, one can easily use these models to justify protection when national defense is a concern, when unemployment may arise in a market, when trade causes environmental degradation, or when there are infant industries in a country. On the other hand, in almost all of these cases, a trade policy is not the most effective policy tool available to correct the problems caused by the distortion or imperfection.

Finally, when more complex markets are considered, as when there are multiple distortions or imperfections present simultaneously, our ability to identify welfare-improving policies rapidly diminishes. The theory of the second best states that correcting one distortion in the presence of many may not improve welfare even if the policy makes perfect sense within the partial equilibrium framework containing the one distortion. The reason is that correcting one distortion may have unintentional (and probably immeasurable) impacts in other sectors due to the presence of other distortions. For example, suppose a trade policy is implemented to correct an environmental problem. One might be able to measure the welfare costs of the trade policy and the environmental benefits that would accrue to society and conclude that the benefits exceed the costs. However, the trade policy will have an impact on prices and resource allocation, potentially spreading across numerous sectors. Suppose one other sector, adversely affected, generates positive spillover effects that act to raise well-being for some groups. Then it is conceivable that the loss of the positive spillover effects would more than outweigh the net benefit accruing to society due to the environmental improvement. This means that the well-intentioned and reasonably measured environmental trade policy could result in an unintentional welfare loss for the nation. The more complex is the economy and the more distortions and imperfections that are present, the more likely it is that we simply cannot *know* what the national effects of trade policies will be.

5.2 SUMMARY

1. Economists use the term "market imperfections" to describe situations that deviate from perfect competition.

2. Market imperfections or market distortions, generally, are any deviations from the assumptions of perfect competition. These include monopoly and oligopoly markets, production with increasing returns to scale, markets that do not clear, negative and positive externalities in production and consumption, and the presence of public goods.

3. Trade policies with market imperfections and distortions represent applications of the theory of the second best, formalized by Richard G. Lipsey and Kelvin Lancaster.See R. G. Lipsey and K. Lancaster, "The General Theory of the Second Best," Review of Economic Studies .When imperfections or distortions are present in an international trade model, we describe the resulting equilibrium as second best.

4. The most appropriate or first-best policy, in general, would be the policy that most directly corrects the distortion or imperfection present in the market.

5. Many critics of the economic conclusions about trade argue that the assumptions of perfect competition are unrealistic and that as a result standard trade theory misses some of the important impacts of trade found in the real world.

5.3   SELF ASSESSMENT QUESTIONS

1. How optimal price or maximize profit can be obtained in a monopolistic market?

2. How does elasticity impact market efficiency?

3. Explain why, if a monopolist takes over a perfectly competitive industry and takes advantage of no economies of scale, then the monopolist will reduce the quantity available for sale and at the same time raise the price.

4. 'The monopolist is constrained by the demand curve for the product'. Comment.

5. What are the major barriers to entry that explain the existence of monopoly?

 C3✱80

UNIT – V

Chapter	INTERNATIONAL TRADE WITH
6	**NON-TRADED GOODS**

Objectives

The objectives of this lesson are to:

- The Role of the Traded and Non-Traded Sectors in Economic Growth
- The Traded and Non-Traded Sectors - A New Reality

Structure:

6.1   THE ROLE OF THE TRADED AND NON-TRADED SECTORS IN ECONOMIC GROWTH

Growth in any economy is determined by the accumulation of its stock of physical capital, the skills and education of its labour force, its natural endowment of resources and the technology it employs in turning these inputs into output. Investment in these stocks is of crucial importance in stimulating the economic growth process. In a small open economy like Ireland, the level of this investment depends on the attractiveness of the traded sector, which is therefore seen as the key to economic expansion. By comparing the roles of the traded and non-traded sectors, first section of this essay will establish the former's primary importance as the engine of growth in a small open economy. As trade is vital for the Irish economy, competition and growth policies have focussed on its open

sector, while the role of the non-traded sector is considered of less importance. However, in the second section, I will present the argument that, due to the limited impact of domestic policy on variables within the traded markets, only the performance of the non-traded sector is within the scope of such policy and therefore holds significance as the sector that governments can influence. Finally, I will discuss how the distinctions between the two sectors are changing over time and portray the effects of a single market on accelerating this process.

The Importance of the Traded Sector

The domestic production structure can be decomposed into the traded-goods sector, containing all those production activities in which industries are exposed to international competition (shoes, cars and zinc, for example) and the non-traded sector, comprising all other goods (including construction, public administration and health services). Within the traded sector a further division can be made between a natural resource-based industry, such as agriculture sector. The importance of this subdivision lies in the fact that the location of the farmer is determined by the geographical location of natural resources, which imposes constraints on a nation's output, a limitation, which does not arise in the context of the non resource-based sector. While 63.2% of the Irish labour force were employed in the non-traded sector in 1985, the primacy of the traded sector can be acknowledged by the fact that a small open economy such like Ireland must trade its output in order to import goods from abroad. This crucial assumption implies that as national expenditure must equal the total value of the output produced in the economy, any deficits resulting from importation must be paid-for by exporting domestically produced goods to foreign markets. As the non-traded sector serves only internal markets, its output value is limited to the share of natural expenditure within this sector, as surpluses could not be exported.

In the Irish case, due to the limited potential for increasing exports from the main resource-based traded sector (agriculture), we must concentrate on raising production in internationally traded manufactured goods in order to increase domestic consumption and future output growth without pressure on our balance of payments. The vital importance of trade to Ireland is evident since we must import goods for production and consumption due to our limited supply of natural resources and therefore must exchange exports to pay our way. Yet even if we were to imagine an economy that could be totally self-sufficient, differences in consumer tastes and economies of scale would still make it uneconomical to remain isolated. Two important points can therefore be made concerning the relative roles of the traded and non-traded sectors of a small open economy. Firstly the traded sector is vital if the economy needs to purchase imports, and secondly it is this sector that really determines the total level of national output. Total output is determined by production in both sectors, but since the value added to this total from the non-traded sector is determined by its allocated proportion of national spending, it is expansion of the traded sector and its multiplier effects on the protected sector that determine the overall expansion of national output.

Economic policy in Ireland has concentrated on facilitating expansion of output in this sector. As prices for traded good are exogenously given from international markets, policy has focused on attempting to increase the share of world and Irish investment that the domestic open sector can attract. One of the most obvious policy measures that discriminates between the sectors is the differential tax rates on profits, with the non-traded and traded sectors subject to a 38% and 10% tax on profits respectively. Government grants and subsidies have also been directed largely towards developing export industries which are seen as the primary means to aid the balance of payments and to indirectly enhance growth and employment in other sectors of the economy. The generally accepted view of policy makers, therefore has been that enhancing the competitive position of the

economy to attract a greater share of world investment to its traded sector is the key to economic expansion.

A Role for the Non-Traded Sector

The non-traded sector is crucial to attracting foreign investment into our economy. Some economists suggest that domestic policy has a limited influence on the traded sector as it cannot affect the prices of goods traded abroad or the prices of any imports into the economy for use in production. It could be argued that what will really attract footloose investors is the relatively inexpensive input costs in the non-traded sector. Therefore, if the government wants to increase the competitiveness of the traded sector and the economy as a whole, it should concentrate on improving the supply of non-traded inputs to traded-sector industries, and ensure that they are of a comparable price and quality to import substitutes.

Over 900 foreign firms operate in Ireland but less than one-third of their material input needs are met internally. By ensuring foreign firms can be competitively supplied by domestic markets, the output of the non-traded sector as well as the real value added by foreign firms to the economy can be raised. The infrastructure and institutional environment of a country may also serve as important determinants for potential investors, so it is desirable to maintain a supply of utilities. The relative price and quality of labour is also another key competitive factor, and as the most powerful Irish trade unions are based in the non-traded industries, national wage levels are determined to a large extent within this sector. Government efforts to moderate wage levels, therefore, must be directed towards the non-traded sector,and improving education and training services should be at the top of the government's agenda. Finally, it must be recognised that spending on non-traded goods and services accounts for around 60% of national output, which means that policies aimed at price reductions and quality improvements within this sector will not only enhance our competitive position, but also directly improve the living standards and incomes of the population. In essence, the non-traded sector is crucial for the nation's economic welfare and if policy can get the non-traded sector "right", the open sector will take care of itself.

The Traded and Non-Traded Sectors - A New Reality

Although the previous discussion may highlight some important considerations for economic policy, the procedure for comparing the roles of the two sectors and assessing their relative importance in facing a new set of challenges as we move towards the competitive environment of a single European market. The increased integration of markets and elimination of trade barriers has meant that traditionally non-traded industries, particularly services, are now being faced with similar competitive conditions to those in the traded sector. the removal of tariff barriers, quotas and legal regulations and the reduced transport costs within the community has left very few goods and services which are protected from foreign competition.

The effects of a single market are most prevalent in the previously unpenenetrated Irish services sector, which will force many firms to drop prices to remain competitive. In this decade, the services sector will face the same shake-out that took place in manufacturing when Ireland joined the EEC in 1973. Dramatic changes have already come to pass in the distribution, transport and financial services sectors, whilst moves to liberalise public purchasing are beginning to expose the traditionally protected public utilities, such as energy and telecommunications to new levels of competition. The movement towards a common market for telecommunications services and equipment (as spelled out in the European Commission 1987 Green Paper) has coaxed Telecom Éireann to review its cost and pricing structures. Finally, with increased mobility of labour and capital in the EU, the prices

of goods that remain non-traded will also become indirectly linked with prices in other countries are increasingly harmonised.

Therefore, it is important to realise that if a non-traded sector's performance is damaging Irish competitiveness, the government may be able to alter the sector into a traded one. Foreign competition may then reduce prices and improve quality if the reasons that the sector is non-traded have to do with government policy. The 1992 programme implies precisely such changes for many service industries that have been non-traded.

6.2 CARTEL

A **cartel** is a group of apparently independent producers whose goal is to increase their collective profits by means of price fixing, limiting supply, or other restrictive practices. Cartels typically control selling prices, but some are organized to control the prices of purchased inputs. Antitrust Laws attempt to deter or forbid cartels. A single entity that holds a monopoly by this definition cannot be a cartel, though it may be guilty of abusing said monopoly in other ways. Cartels usually occur in oligopolies, where there are a small number of sellers and usually involve homogeneous products.

In general, cartels can be divided into domestic and international agreements. Export cartels constitute a special case of international cartels. Unlike other cartels they are legal in virtually all jurisdictions, despite their harmful effects on affected markets.

Overview

In general, cartel agreements are economically unstable in that there is an incentive for members to cheat by selling at below the agreed price or selling more than the production quotas set by the cartel. This has caused many cartels that attempt to set product prices to be unsuccessful in the long term. Empirical studies of 20th century cartels have determined that the mean duration of discovered cartels is from 5 to 8 years. However, once a cartel is broken, the incentives to form the cartel return and the cartel may be re-formed. Publicly-known cartels that do not follow this cycle include, by some accounts, the Organization of the Petroleum Exporting Countries (OPEC).

Price fixing is often practiced internationally. When the agreement to control price is sanctioned by a multilateral treaty or protected by national sovereignty, no antitrust actions may be initiated. Examples of such price fixing include oil whose price is partly controlled by the supply by OPEC countries. Also international airline tickets have prices fixed by agreement with the IATA, a practice for which there is a specific exception in antitrust law.

Prior to World War II (except in the United States), members of cartels could sign contracts that were enforceable in courts of law. There were even instances where cartels are encouraged by states. For example, during the period before 1945, cartels were tolerated in Europe and were promoted as a business practice in German-speaking countries. This was the norm due to the accepted benefits, which even the U.S. Supreme court has noted. In the case, the U.S. v. National Lead Co. et al., it cited the testimony of individuals, who cited that a cartel, in its protean form, is "a combination of producers for the purpose of regulating production and, frequently, prices, and an association by agreement of companies or sections of companies having common interests so as to prevent extreme or unfair competition."

Today, however, price fixing by private entities is illegal under the antitrust laws of more than 140 countries. Examples of prosecuted international cartels are lysine, citric acid, graphite electrodes

and bulk vitamins. This is highlighted in countries with market economy wherein price-fixing and the concept of cartels are considered inimical to free and fair competition, which is considered the backbone of political democracy. The current condition makes it increasingly difficult for cartels to maintain sustainable operations. Even if international cartels might be out of reach for the regulatory authorities, they will still have to contend with the fact that their activities in domestic markets will be affected.

Examples

OPEC: As its name suggests, OPEC is organized by sovereign states. The traditional view holds that it cannot be held to antitrust enforcement in other jurisdictions by virtue of the doctrine of state immunity under public international law. It serves as an example of state entanglement in anticompetitive conduct.

Many trade associations, especially in industries dominated by only a few major companies, have been accused of being fronts for cartels or facilitating secret meetings among cartel members.

Although cartels are usually thought of as a group of corporations, the free-market economist Charles W. Baird considers trade unions to be cartels, as they seek to raise the price of labour (wages) by preventing competition. For example, negotiated cartelism is a labour arrangement in which labor prices are held above the market clearing level through union leverage over employers.

An example of a new international cartel is the one created by the members of the Asian Racingn Federation and documented in the Good Neighbor Policy signed on September 1, 2003.

6.3   COMMODITY AGREEMENTS

The market for commodities is particularly susceptible to sudden changes in the conditions of supply conditions, which are called supply shocks. Shocks such as bad weather, disease, and natural disasters are largely unpredictable, and cause commodity markets to become highly volatile. In comparison, markets for the final products derived from these commodities are much more stable.

As with petrol pump prices, the prices of finished goods rarely reflect changes in the prices of basic commodities from which they are derived. For example, cocoa and sugar prices fluctuate considerably as harvests vary from year to year, but the prices of confectionery rarely change from year to year. There are many reasons for this, including the following:

The cost of the commodity input, such as cocoa, represents a small proportion of total costs of the final product, such as a bar of chocolate. The price of chocolate is largely determined by the refining, manufacturing, and packaging costs of the manufacturer, and the retailer's costs including labour, rents and marketing costs.

Indirect taxes, like VAT, often form a larger proportion of the price than commodity costs, and such indirect taxes tend to remain stable of time.

The existence of stocks of commodities act as a buffer against sudden changes in commodity prices, so manufacturers will be using old stocks purchased at the old prices.

Futures contracts help reduce some of the underlying volatility in commodity markets. In the case of cocoa, the large confectioners, such as Nestle and Cadbury-Schweppes, agree cocoa prices in advance by fixing contracts with suppliers, such as those based in the Ivory Coast and Ghana, the two largest cocoa exporters.

Manufacturers and retailers may choose not to pass on cost changes following commodity price changes for a number of reasons, such as a preference for stable prices, or the need to remain price competitive.

Example

The International Cocoa Agreement

In 2003, an agreement was made between the seven main cocoa exporting countries, Cameroon, Ivory Coast, Gabon, Ghana, Malaysia, Nigeria and Togo, and the main importing countries including the EU members, Russia, and Switzerland. The main purpose of this agreement was to promote the consumption and production of cocoa on a global basis as well as stabilise cocoa prices, which had been falling steadily. The agreement was planned to continue until 2010, but in that year it was decided to extend the agreement for a further two years, until 2012. In 2012 the signatories decided on a further extension, until 2026.

Commodity agreements often involve intervention schemes, such as buffer stocks, and usually only last for a few years, whereupon they are re-negotiated. They differ from cartels such as OPEC, largely because discussions and negotiations involve both producer and consumer countries, unlike cartels, which are established to protect the interest of producers only.

6.4 QUOTA AGREEMENT

What is a 'Quota'?

A quota is a government-imposed trade restriction that limits the number or monetary value of goods that a country can import or export during a particular period. Countries use quotas in international trade to help regulate the volume of trade between them and other countries. Countries sometimes impose them on specific goods to reduce imports and increase domestic production. In theory, quotas boost domestic production by restricting foreign competition.

Breaking Down 'Quota'

Quotas are different than tariffs or customs, which place taxes on imports or exports. Governments impose both quotas *and* tariffs as protective measures to try to control trade between countries, but there are distinct differences between them. Quotas focus on limiting the quantities of a particular good a country imports or exports, whereas tariffs impose specific fees on those goods.

Governments design tariffs to raise the overall cost to the producer or supplier seeking to sell goods within a country.

Import Quota Regulatory Agencies

The U.S. Customs and Border Protection Agency, a federal law-enforcement agency of the U.S. Department of Homeland Security, oversees the regulation of international trade, collecting customs and enforcing U.S. trade regulations. Within the United States, there are three forms of quotas: absolute, tariff-rate and tariff preference level.

An absolute quota provides a definitive restriction on the quantity of a particular good that may be imported into the United States, although this level of restriction is not always in use. Tariff-rate quotas allow a certain quantity of a particular good to be brought into the country at a reduced duty rate. Once the tariff-rate quota is met, all subsequent goods brought in are charged at a higher rate. Tariff preference levels are created through separate negotiations, such as those established through Free Trade Agreements (FTAs).

Goods Subject to Tariff-Rate Quotas

Various commodities are subject to tariff-rate quotas when entering the United States. This includes, but is not limited to, milk and cream, cotton fabric, blended syrups, Canadian cheese, cocoa powder, infant formula, peanuts, sugar and tobacco.

Risks Associated with Quotas and Tariffs

Highly restrictive quotas coupled with high tariffs can lead to trade disputes and other problems between nations. For example, in January 2018, President Trump imposed 30 percent tariffs on imported solar panels from China. This move signaled a more aggressive approach toward China's political and economic stance, but it also was a blow for the $28 billion solar industry in the United States, which imports 80 percent of its solar panel products.

Buffer Stock Agreement

A **buffer stock scheme** (commonly implemented as **intervention storage**, the "**ever-normal granary**") is an attempt to use commodity storage for the purposes of stabilising prices in an entire economy or, more commonly, an individual (commodity) market. Specifically, commodities are bought when a surplus exists in the economy, stored, and are then sold from these stores when economic shortages in the economy occur

Foreign Trade and the Economic Growth of Country

International trade refers to exchange of goods and services between one country and another (bilateral trade) or between one country and the rest of the world (multilateral trade).

The basis of international trade, from the supply side, is the Ricardian theory of comparative cost (advantage).

According to Ricardo the source of comparative advantage is difference in labour cost between two countries. Modern economists have extended Ricardo's theory and identified various other sources of comparative advantage, such as differences in factor endowments, tastes and preferences, technological gaps and product cycles. Ricardo's theory is static in nature.

The same is true of the modern theory of comparative advantage, viz., the Heckscher-Ohlin theory. Given a nation's factor endowments, technology and taste, Heckscher-Ohlin theory proceeded to determine a nation's comparative advantage and the gains from trade. However, factor endowments change over time; technological improvement occurs in the long run; and tastes may also change. Consequently the nation's comparative advantage also changes over time.

Over time a nation's population grows and with it the size of its labour force. Similarly, a nation increases its capital stock in the long run. Moreover, natural resources (such as minerals) can be depleted or new ones found through discoveries or new applications.

All these changes lead to faster economic growth and changing pattern of comparative advantage over time. Technical change also leads to faster growth of real per capita income and is thus an important source of growth of nations and also a determinant of comparative advantage.

The growth of resources (such as land, labour, capital) and technological progress cause a nation's production possibilities curve (frontier) to shift outward.

There are the two main sources of growth:

1. Increase in the supplies of resources and

2. Technological progress. The effect of growth on the volume of trade depends on the rates at which the output of the nation's exportable and importable commodities grow and with the consumption pattern of the nation as its real per capita income increases through growth and trade.

6.5 THE EFFECT OF GROWTH ON TRADE: THE SMALL COUNTRY CASE

If the output of the nation's exportable goods increases proportionately faster than that of its importable commodities at constant relative prices (or terms of trade), then growth tends to led to greater than proportionate expansion of trade. Economic growth has natural effect of leading to the same rate of expansion of trade.

On the other hand, if the nation's consumption of its importable commodity increases proportionately more than the nation's consumption of its exportable commodity, at constant prices, then the consumption effect tends to lead to a greater than proportionate expansion of trade. What in fact happens to the volume of trade in the process of growth depends on the net result of these production and consumption effects. This prediction is relevant for a small country which cannot influence world prices of tradable goods.

Growth and Trade: The Large-Country Case:

Economic growth is more relevant for one development of LDCs. If economic growth, what-ever its source may be, expands the nation's volume of trade at constant prices, then the nation's terms of trade (which is the ratio of the price index of exports to that of imports) tend to deteriorate. On the other hand, if growth reduces the nation's volume of trade at constant prices, the nation's terms of trade will improve. This is known as the terms-of-trade effect of growth.

The effect of economic growth on the nation's welfare depends on the net result of terms-of-trade effect and a wealth effect. The wealth effect refers to the change in output per capita as a result of growth. A favourable wealth effect, by itself, tends to increase the nation's welfare.

Otherwise, the nation's welfare tends to decline or remain unchanged. If the wealth effect is positive and the nation's terms of trade improve as a result of growth and trade, the nation's welfare will surely improve. If they are both unfavourable, there is a loss of social welfare. If the wealth effect and the terms-of-trade effect move in opposite directions, the nation's welfare may deteriorate, improve or remain unchanged depending on the relative strength of these two opposing forces.

Immeserising Growth

Even if the wealth effect, by itself, tends to increase the nation's welfare, the terms of trade may deteriorate so much that there a net loss of social welfare. This is termed as immeserising growth by Jagdish Bhagwati. The term refers to a situation in which a developing country's attempt to increase its growth potential through exports actually results in a retardation of that potential.

This is very much an exceptional situation confined only in theory to a country where export speciality (some mineral or agricultural crop) accounts for a major share of world trade in the product. The country needs to export more to earn the foreign exchange to finance the capital imports which it requires to accelerate its rate of economic growth.

If all its export effort is concentrated on its speciality, this could lead to an 'oversupply' of its product resulting in a deteriorating of the country's terms of trade. As a result, the country's foreign exchange earnings will now buy fewer imports and domestic growth potential will be impaired.

So long we briefly explained the effects of economic growth on a country's foreign trade but not the other side of the coin, the effects of trade on growth. Those effects are much more important for developing countries, at least, from the policy point of view. It is to this issue that we may turn now.

6.6 TRADE THEORY AND ECONOMIC DEVELOPMENT

The clasical (Ricardian)-trade theory predicts that if each nation specialises in the production of the commodity of its comparative advantage, world output will be greater, and, through trade, each nation will share in the gains from specialisation and exchange.

According to the modern theory of comparative advantage (known as the factor endowments or Heckscher-Ohlin theory) developing countries should specialise primarily in the production and export of raw materials, fuels, minerals and food to developed nations in exchange for manufactured products.

It is now believed that this pattern of specialisation and trade relegates developing countries to a subordinate position vis-a-vis developed nations and keeps them from deriving the dynamic benefits of industrialising and maximising their welfare in the long run.

The dynamic benefits include a more trained labour force, more innovations, higher and more stable prices for the nation's exports, and higher per capita income. With developing countries specialising in primary commodities and developed nations in manufactured goods, most, if not all, of these dynamic benefits of industry and trade accrue to developed nations, leaving developing countries poor, backward and dependent.

Another reason for this is that all developed nations are primarily industrial, while most developing nations are largely agricultural or engaged in extractive activities such as construction and mining. For these reasons the traditional theory of comparative advantage is static and irrelevant to the process of economic development.

Critics comment that as a developing nation accumulates capital and improves its technology, its comparative advantage shift away from primary products to simple manufactured goods first and then to more sophisticated items. This has recently occurred in Brazil, Korea, Mexico and other developing countries.

6.7 TRADE AS AN ENGINE OF GROWTH

During the 19th century, the export sector of resource-poor developing countries, mainly Great Britain (where most of the world's modern industrial production was concentrated), was the leading sector that propelled these economies into rapid growth and development.

Thus international trade acted as an engine of growth for these nations. The expansion of exports stimulated the rest of the economy. For other countries, including the USA foreign trade shaped their factor endowments and furnished investment opportune ties for foreign as well as domestic capital.

According to Ragnar Nurkse the industrial revolution happened to originate on a small island with a limited range of natural resources, at a time when synthetic materials were yet unknown. In these circumstances, economic expansion was transmitted to less developed areas by a steep and steady demand for primary commodities which those area were well suited to produce.

Local factors of production overseas, whose growth may in part have been induced by trade, were thus largely absorbed in the expansion of profitable primary production for export. On top of this, the centre's increasing demand for raw materials and foodstuffs created incentives -for capital and labour to move from the centre to outlying areas, accelerating the process of growth transmission from the former to the latter.

Nurkse has argued that the young economies of the 19th century, viz., the USA, Canada and Australia had temperate climates and unusual factor endowments — vast quantities of land and small amounts of labour. They could therefore supply coffee, wheat and other staples needed at the centre of the world economy. Furthermore, the new countries of the 19th century (often called areas of recent settlement) were peopled by recent immigrants from Europe, who brought with them institutions and traditions conductive to the growth of a modern economy.

However, some economists, notably Kravis, hold a different view on the relation between trade and growth. According to them, rapid growth of such nations as Canada, Argentina and Australia during the 19th century was primarily due to very favourable internal conditions (such as an abundant supply of natural resources), with international trade playing only an important supportive role.

Modem economists generally believe that today's developing nations can rely much less on trade for their growth and development. This is due to less favourable demand and supply conditions.

Prima facie, the demand for food and raw materials is growing much more slowly today than was the case during the 19th century.

There are at least five reasons for this:

1. **Low income elasticity of demand:** The income elasticity of demand in developed nations for many of the food and agricultural raw materials exports of developing countries is low (the coefficient is often less than 1). This means that as income rises in developed countries, their demand for the agricultural exports of developing nation's increases proportionately less than the increase in income.

2. **Development of synthetics:** The development of synthetics has reduced the demand for natural raw materials. For example, synthetic rubber has reduced the demand for natural rubber, nylon the demand for cotton and plastics the demand for hides and skins. The demand for Indian jute goods has also fallen for the same reason, i.e., use of plastic materials instead of jute bags for packing purposes.

3. **Technological progress:** Technological advances have reduced the raw material content of many products, such as tin-plated cans and micro circuits.

4. **Growth of service output:** The output of services (with lower raw material requirements than commodities) has grown faster than the output of commodities in developed nations.

5. **Trade restrictions:** Developed countries have imposed trade restrictions on many agricultural exports (such as wheat, vegetables, sugar, oils and other products) of developing nations.

On the supply side the following four factors have been identified:

1. **Factor endowments:** Most of today's developing countries are much less endowed with natural resources (except for petroleum- exporting countries) than were the western countries during the 19th century.

2. **Population growth:** Most of today's developing countries are overpopulated. This means that the major portion of any increase in their output of food and raw materials is absorbed domestically, leaving, very little, if any, export surplus.

3. **Factor mobility:** There is much less flow of capital in developing countries today than was observed in the 19th century. At the same time there is outflow of skilled labour from such countries on a fairly large scale.

4. **Neglect of agriculture:** Finally, until recently, developing nations have somewhat neglected their agriculture in favour of more rapid industrialisation. This has hampered their export growth in particular and development prospects in general.

The Contributions of Trade to Development:

Today international trade cannot be expected to act as an 'engine of growth'. Yet there are many ways in which it can contribute to the economic growth of today's developing nations.

1. **Full utilisation of resources:** Trade can lead to full utilisation of a country's idle and under-employed resources as Fig. 8.3 shows. In the absence of trade a developing country is operating at point I (an inefficient point). International trade enables it to operate at point E (an efficient point) and thus produce more of both consumption and capital goods.

   This is the essence of the vent for surplus theory, developed by Hla Myint. According to this theory, international trade represents an outlet for its potential surplus of agricultural commodities and raw materials. This has really happened in many developing countries, particularly those in South-east Asia and West Africa.

2. **Division of labour and specialisation:** There is not much scope for division of labour and specialisation if production of a commodity takes place for the narrow domestic market. If, instead, production is for the wider and unlimited export market there is much greater scope for specialisation. This has actually occurred in the production of light manufacturers in small economies such as Taiwan, Hong Kong and Singapore.

3. **Transmission of knowledge:** International trade often acts as a vehicle for the transmission of new ideas, new technology and new managerial and organisational skills. And knowledge is the only factor of production which is not subject to diminishing returns.

4. **Capital inflow:** International trade also stimulates and facilitates the flow of financial capital from developed to developing countries. In case of foreign direct investment, where the foreign firms or multinational corporations (MNCs) retain managerial control over its investment, foreign capital is often accompanied by foreign skilled personnel to operate the production units.

5. **Stimulating domestic demand:** In case of India, Brazil and other large developing countries, imports of new manufactured goods have stimulated domestic demand in the initial stages when efficient domestic production of these goods were not economically feasible.

Contact with the rest of the world has acted as a powerful factor in creating demand for manufactured goods in the initial stages of industrialisation and stimulating domestic production of import-substitute items at a later stage of industrialisation and economic development.

6. **Promoting competition:** International trade often acts as an anti-monopoly weapon by foreign domestic producers to achieve greater efficiency so as to be able to introduced foreign competition and survive in the long run. This is no doubt very important for keeping the cost and price of intermediate and semi-finished products used as the main or subsidiary inputs in the domestic production of various commodities low.

Trade as a Hindrance to Growth

International trade is not an unmixed blessing for developing countries. It can also act as an obstacle (hindrance) to growth in more ways than one. Firstly, developing countries suffer from deteriorating terms of trade. Secondly, the gains from trade are not equally shared by all sections of society.

Producers of import-substitute manufactured goods gain at the expense of primary producers. As a result there is more inequality in the distribution of income. These and other issues discussed in the context of trade problems of developing countries. Moreover, many developing countries of today lack the institutions conducive to rapid growth.

In spite of all these most economists continue to believe that trade is the most promising engine of growth for the developing countries, and they argue that the doctrine of comparative advantage applies with particular force to those countries, which should attempt to make the best possible use of their scarce human factor (skills) and limited physical capital.

While making an overall assessment of the effects of trade on growth Peter B. Kenen writes: "Many developing countries did not welcome private foreign capital because it had colonial overtones. Nor were they willing to serve forever as suppliers of raw materials. They feared the instability of raw materials prices and wanted to draw back from export dependence. Above all, they identified economic development with industrialisation and sought to build modern factories to symbolise their independence and assert their maturity. Invoking the infant industry argument, countries in Asia and Latin America engaged in systematic import substitution. They protected their import- competing industries, penalised their export industries and tended to neglect agricultural development."

Protectionism in Developed Countries

The future success of international trade in serving as an engine of growth for developing economies depends only in part on the developing economies' willingness to eliminate trade barriers and integrate their economies into the world economy. It also depends on the willingness of the developed countries to open their economies to trade with the developing countries.

The truth is that the developed economies are very 'protectionist' against industries in which developing economies are most likely to enjoy a comparative advantage. Given the importance of international trade for economic growth, the protectionism by the developing economies may be a major cause of the lack of convergence in per capita output in the world.

To conclude, becoming increasingly difficult to treat international trade, international investment and immigration as separate phenomena. Trade often requires supporting investments in distribution and marketing facilities.

Improved transportation and communications permit multinational corporations to increasingly establish and spread production centres in accordance with every country's comparative advantage, and thus many foreign investments directly increase imports and exports. And people frequently accompany trade and investment flows.

All of these components of globalisation are also closely related to economic growth. After all, globalisation is just an international extension of the increased specialisation, exchange and interdependence that characterise the process of economic growth.

6.8 DIFFERENCE BETWEEN BALANCE OF TRADE AND BALANCE OF PAYMENTS

After the implementation of globalization policy, world has become a small village and now every contry freely transacts with the other countries of the world. In this context, two statements are prepared to keep a record of the transactions made by the country internationally; they are Balance of Trade (BOT) and Balance of Payments (BOP). The **balance of payment** keeps a track of transaction in goods, services, and assets between the country's residents, with the rest of the world.

On the other hand, the balance of exports and import of the product and services is termed as **Balance of Trade**.

The scope of BOP is greater than BOT, or you can also say that Balance of Trade is a major section of Balance of Payment. Let's understand the difference between Balance of Trade and Balance of Payment in the article given below.

Comparison Chart

BASIS FOR COMPARISON	BALANCE OF TRADE	BALANCE OF PAYMENT
Meaning	Balance of Trade is a statement that captures the country's export and import of goods with the remaining world.	Balance of Payment is a statement that keeps track of all economic transactions done by the country with the remaining world.
Records	Transactions related to goods only.	Transactions related to both goods and services are recorded.
Capital Transfers	Are not included in the Balance of Trade.	Are included in Balance of Payment.
Which is better?	It gives a partial view of the country's economic status.	It gives a clear view of the economic position of the country.
Result	It can be Favorable, Unfavorable or balanced.	Both the receipts and payment sides tallies.
Component	It is a component of Current Account of Balance of Payment.	Current Account and Capital Account.

Definition of Balance of Trade

Trade refers to buying and selling of goods, but when it comes to buying and selling of goods globally, then it is known as import and export. The Balance of Trade is the balance of the imports and exports of commodities made to/by a country during a particular year. It is the most important part of the current account of the country's Balance of Payment. It keeps records of tangible items only.

The Balance of Trade shows the variability in the imports and exports of merchandise made by a country with the rest of the world over a period. If the imports and exports made to/by the country tallies, then this situation is known as Trade Equilibrium, but if imports exceed exports, then the condition is unfavourable as it states that the economic status of the country is not good, and so this situation is termed as Trade Deficit. Now, if the value of exports is greater than the value of imports, this is a favourable situation because it indicates the good economic position of the country, thus known as trade surplus.

Definition of Balance of Payments

The Balance of Payments is a set of accounts that recognises all the commercial transactions performed by the country in a particular period with the remaining countries of the world. It keeps the record of all the monetary transactions done globally by the country on commodities, services and income during the year.

It combines all the public-private investments to know the inflow and outflow of money in the economy over a period. If the BOP is equal to zero, then it means that both the debits and credits are equal, but if the debit is more than credit, then it is a sign of deficit while if the credit exceeds debit, then it shows a surplus. The Balance of Payment has been divided into the following sets of accounts:

Current Account: The account that keeps the record of both tangible and intangible items. Tangible items include goods while the intangible items are services and income.

Capital Account: The account keeps a record of all the capital expenditure made and income generated collectively by the public and private sector. Foreign Direct Investment, External Commercial Borrowing, Government loan to Foreign Government, etc. are included in Capital Account.

Errors and Omissions: If in case the receipts and payments do not match with each other then balance amount will be shown as errors and omissions.

Key Differences Between Balance of Trade and Balance of Payments

The following are the major differences between the balance of trade and balance of payments:

A statement recording the imports and exports done in goods by/from the country with the other countries, during a particular period is known as the Balance of Trade. The Balance of Payment captures all the monetary transaction performed internationally by the country during a course of time.

The Balance of Trade accounts for, only physical items, whereas Balance of Payment keeps track of physical as well as non-physical items.

The Balance of Payments records capital receipts or payments, but Balance of Trade does not include it.

The Balance of Trade can show a surplus, deficit or it can be balanced too. On the other hand, Balance of Payments is always balanced.

The Balance of Trade is a major segment of Balance of Payment.

The Balance of Trade provides the only half picture of the country's economic position. Conversely, Balance of Payment gives a complete view of the country's economic position.

Conclusion

Every country of the world keeps the record of inflow and outflow of money in the economy with the help of a Balance of Trade and Balance of Payments. They reflect the actual position of the whole economy. With the help of BOT and BOP, analysis and comparisons can also be made that how much trade has increased or decreased, since the last period.

Income Terms of Trade

The concept of income terms of trade was developed by G.S. Dorrance and H. Staehle. This concept is an improvement upon the net barter terms of trade. It takes into account the indices of export and import prices and quantity index of exports. The income terms of trade are determined by the product of net barter terms of trade and the quantity index of exports.

It is also possible that the income terms of trade of a country show an improvement but the commodity terms of trade get deteriorated. On the opposite, there can also be a possibility that income terms of trade have deteriorated, although the commodity terms of trade have improved between two periods. .

According to Jacob Viner, the income terms of trade reflect the 'capacity to import' of a country. If P_X, P_M, Q_M and Q_X represent the absolute magnitudes of price of export, price of import, quantity imported and quantity exported respectively, the equality between total receipts from exports and total payments due to imports can be expressed as below:

Total Receipts from Exports = Total Payments for Imports

$P_x . Q_x = P_m . Q_m$

$=> Q_m = P_x . Q_x / P_m$

Or, $Q_m = T_1$

The capacity to import of a country will increase if there is:

 (i) A rise in export prices,

 (ii) A rise in quantity exported, and

 (iii) A fall in the prices of imports and vice versa.

This concept of terms of trade has great relevance for the less developed countries. In these countries, the capacity to import is low on account of lower export prices and quantities of goods exported, while the prices of imports are relatively higher.

Criticisms:

The concept of income terms of trade is criticised on the following grounds:

 (i) Not an Accurate Measure of Gain from Trade: This concept cannot give an exact measure of the gain from trade. An improvement in income terms of trade may show that the capacity of a country to import has increased. It will force the country to raise its exports large enough to pay for imports. If the increased exports involve some depletion of

real resources of the country, the long run growth potential and prospect of improving the standard of living are adversely affected.

(ii) **Not a Measure of Total Import Capacity:** The income terms of trade measure only the export- based import capacity of a country and not its total import capacity which depends also upon its foreign exchange receipts. It is possible that income terms of trade of a country get worsened but the foreign exchange reserves have risen for some reasons that will mean a larger total import capacity despite adverse income terms of trade.

(iii) **Cannot Replace the Commodity Terms of Trade:** It is sometimes believed that the income terms of trade are superior to the commodity terms of trade. In view of contradictory conclusions given by the two indices, the former alone is clearly inadequate. It can supplement but by no means replace the commodity terms of trade or net barter terms of trade.

(iv) **Misleading Indicator of Welfare Gain:** The income terms of trade may prove to be a faulty and misleading indicator of direction of change of the welfare of a country. From this point of view, the net barter terms of trade can serve as a better indicator of welfare gain to a country from the international trade.

Single Factorial Terms of Trade

The concept of income terms of trade attempted — a correction in the net barter terms of trade for changes in the volume of exports. Jacob Viner made another modification over the net barter or commodity terms of trade. He corrected the commodity terms of trade for changes in factor productivity in the production of export goods.

The concept of terms of trade developed by him is called as the 'Single Factorial Terms of Trade'. It is determined by multiplying the commodity terms of trade with the productivity index in the domestic export sector. The single factorial terms of trade imply a ratio of the export price index and import price index adjusted for changes in the productivity of factors used in the production of export goods.

From the point of view of a developing country, where the process of growth involves the use of improved techniques of production, the single factorial terms of trade are more representative and scientific compared with the commodity terms of trade.

Criticisms:

This measure of terms of trade is, however, criticised on the following main grounds:

(i) **Difficulty in the Measurement of Productivity:** The exact measurement of productivity and changes therein is quite difficult, as factor productivity depends upon some non-quantifiable psychological and technical factors. The productivity of a factor unit differs not only from one export industry to another but also from one plant to another. That causes serious complication in the computation of productivity index and changes in it over different periods.

(ii) **Not a Reliable Index of Gain from Trade:** The terms of trade are supposed to be an index of gains from international trade of a country. It is possible that increase in productivity index makes the single factorial terms of trade favourable but the rise in productivity in export sector and consequent fall in production costs and export price index can transfer the gain from higher productivity and trade to the foreign country. The

productivity increase may occur in the exporting country but the productivity and trade gains go to the importing country.

(iii) Increase in Global Inequalities: The increased productivity in the export sectors of the advanced countries like U.S.A., Japan and the West European countries has brought about considerable improvement in their single factoral terms of trade while keeping their net barter terms of trade also favourable for them. However, the improvement in productivity in the export sectors in the LDC's has made both commodity terms of trade and single factoral terms of trade unfavourable.

This has happened because the export prices of poor countries have been secularly declining, whereas the export prices of advanced countries have remained higher despite a rise in productivity. This has accentuated the global inequalities of income and wealth. For this crucial reason, the single factoral terms of trade cannot be an appropriate index of welfare and living standards.

(iv) Neglect of Increase in Productivity in Foreign Countries: The single factoral terms of trade give importance only to improvement in the productivity in the export sector. It fails to take into account the possible change in the productivity in the foreign countries and their resultant effect on the terms of trade. This deficiency was removed by Jacob Viner through his introduction of the concept of double factoral terms of trade.

Double Factorial Terms of Trade

The concept of double factoral terms of trade, formulated by Jacob Viner takes into account the change in factor productivity both in the domestic export industries and export industries of the foreign countries.

This concept can be expressed as:

$$T_D = T_C \cdot (Z_X/Z_M)$$

Here T_D is the double factoral terms of trade, T_C is the commodity terms of trade, Z_X is the productivity index in domestic export sector and Z_M is the productivity index in the export sector of the foreign countries or it is import productivity index.

Criticisms:

The concept of double factoral terms of trade has met with criticism on the following main grounds:

(i) Measurement of Productivity: Like single factoral terms of trade, this concept too has a limitation related to exact measurement of productivity of the factors and changes therein both in the export sectors of home country and the foreign country. Although E. Devons attempted to compute single factoral terms of trade in Britain for 1948-53 periods, yet no significant headway could be made in the computation of double factoral terms of trade.

(ii) Misplaced Emphasis: The double factoral terms of trade emphasises upon the relative productivity indices in the two trading countries. Such an emphasis seems to be misplaced. The matter which is of greater concern for any country is the quantities of commodities that can be imported with a given quantity of its exports rather than the quantity of productive factors required in a foreign country to produce the goods imported by the home country. This line of argument suggests that even gross barter terms of trade are better than the double factoral terms of trade.

(iii) **Faulty Concept:** This concept attempts to establish a relation between the productivity of the factors in two trading countries. Kindleberger has objected to it and has regarded this concept as faulty. He even treats single factoral terms of trade as a better concept than the double factoral terms of trade. In his words, "The single factoral term of trade is a much more relevant concept than the double factoral terms of trade. We are interested in what our factors can earn in goods, not what our factor services can command in services of foreign factor."

(iv) **Difficulty in the Determination of Gains from Trade:** It is difficult to measure the gains from trade for a country with the help of this concept of terms of trade. The relative changes in factor productivity in two trading countries can affect the quantities of exported and imported goods and their respective prices in such a way that the conclusion about the gains from trade cannot be easily derived.

(v) **Neglect of Real Costs:** When the two trading countries make efforts to increase the production of export goods, there is diversion of productive resources including some additional real cost. The concept ignores the real cost as a factor influencing the terms as well as the gains from trade. This deficiency was, however, removed through the concept of real cost terms of trade.

Despite the above deficiencies, the concept of terms of trade is regarded as a logical and scientific concept to interpret the historical changes in the terms of a country.

Real Cost Terms of Trade

The increased production of export good requires the diversion of productive resources from other sectors to the export sector. The amount of utility lost or sacrificed per unit of resources employed in the production of export good constitutes the real cost of producing exports. Whether a country gains from trade or not, can be truly measured if the real costs are taken into consideration. Jacob Viner involved real costs in measuring the terms of trade through his concept of Real Terms of Trade.

The real cost terms of trade can be measured by multiplying the single factoral terms of trade by the index of the amount of disutility (pain, sacrifice, irksomeness etc.,) per unit of the resources employed in producing export goods.

The real cost terms of trade can be expressed as**:**

$T_r = T_s \cdot R_x$

Where T_R = real cost terms of trade and R_X = index of the amount of disutility suffered per unit of resources employed in producing exports goods.

Criticisms:

Although the real cost terms of trade can be treated as a better measure of real economic welfare or gains from trade, it has some weaknesses because of which it is subjected to criticism.

The main grounds on which it is criticised are as follows:

(i) **Subjective Concept:** The disutility or real cost involved in the additional production of export goods is a highly subjective concept which cannot be measured in precise quantitative terms.

(ii) Neglect of Real Cost of Diverting Domestically Consumed Goods to Exports: This concept gives prominence to real cost involved in the production of export goods but it fails to take into account the real cost involved in diverting the goods being used for domestic consumption to supplement exports for paying the imports.

(iii) Neglect of Real Cost of Producing Import- Substitutes: This concept neglects the real cost involved in the production of import-substitutes within the country because the domestic production of import-substitutes can have significant effect on quantity imported (Q_M) as well as the price of imported goods (P_M).

With the object of removing this deficiency, Jacob Viner introduced still another concept of utility terms of trade.

Eurodollar

Eurodollars are time deposits denominated in U.S. dollars at banks outside the United States, and thus are not under the jurisdiction of the Federal Reserve. Consequently, such deposits are subject to much less regulation than similar deposits within the U.S. The term was originally coined for U.S. dollars in European banks, but it expanded over the years to its present definition. A U.S. dollar-denominated deposit in Tokyo or Beijing would be likewise deemed a Eurodollar deposit. There is no connection with the euro currency or the eurozone.

More generally, the euro- prefix can be used to indicate any currency held in a country where it is not the official currency: for example, Euroyen or even Euroeuro.

Market of Euro-Dollar : Meaning, Benefits, Effects and Short Comings

Though the emergence of Euro-dollar in the international financial system is of recent origin, in the late sixties, it has caused a profound influence upon the money and capital markets of the Western world.

Presently, however, the Euro-dollar Market has become a permanent integral part of the international monetary system.

The Meaning of Euro-Dollar:

By Euro-dollar is meant all U.S. dollar deposits in banks outside the United States, including the foreign branches of U.S. banks. A Euro-dollar is, however, not a special type of dollar. It bears the same exchange rate as an ordinary U.S. dollar has in terms of other currencies.

Euro-dollar transactions are conducted by banks not resident in the United States. For instance, when an American citizen deposits (lends) his funds with a U.S. Bank in London, which may again be used to make advances to a business enterprise in the U.S., then such transactions are referred to as Euro-dollar transactions. All Euro-dollar transactions are, however, unsecured credit.

Euro-dollars have come into existence on account of the Regulation issued by the Board of Governors of the U.S. Federal Reserve System, which does not permit the banks to pay interest to the depositors above a certain limit.

As such, banks outside the United States tend to expand their dollar business by offering higher deposit rates and charging lower lending rates, as compared to the banks inside the U.S. Increase or decrease in the potential for Euro-dollar holdings, however, depends, directly upon U.S. deficits and surplus, respectively.

Euro-Dollar Market:

Euro-dollar market is the creation of the international bankers. It is simply a short-term money market facilitating banks' borrowings and lendings of U.S. dollars. The Euro-dollar market is principally located in Europe and basically deals in U.S. dollars.

But, in a wider sense, Euro-dollar market is confined to the external lending and borrowing of the world's most important convertible currencies like dollar, pound, sterling, Swiss franc, French franc, Deutsche mark and the Netherlands guilder.

In short, the term Euro-dollar is used as a common term to include the external markets in all the major convertible currencies.

Euro-dollar operations are unique in character, since the transactions in each currency are made outside the country where that currency originates.

The Euro-dollar market attracts funds by offering high rates of interest, greater flexibility of maturities and a wider range of investment qualities.

Though Euro-dollar market is wholly unofficial in character, it has become an indispensable part of the international monetary system. It is one of the largest markets for short-term funds.

The Euro-dollar market has the following characteristics:

1. It has emerged as a truly international short-term money market.

2. It is unofficial but profound.

3. It is free.

4. It is competitive.

5. It is a more flexible capital market.

Original customers of the Euro-dollar market were the business firms in Europe and the Far East which found Euro-dollars a cheaper way of financing their imports from the United States, since the lending rates of dollars in the Euro-dollar market were relatively less.

The Euro-dollar market has two facts:

(i) It is a market which accepts dollar deposits from the non-banking public and gives credit in dollars to the needy non-banking public.

(ii) It is an inter-bank market in which the commercial banks can adjust their foreign currency position through inter-bank lending and borrowing.

The existence of Euro-dollar market in a country, however, depends on the freedom given to the commercial banks to hold, borrow and lend foreign currencies — especially dollars — and to exchange them at fixed official exchange rate.

Benefits of the Euro-Dollar Market:

Following benefits seem to have accrued to the countries involved in the Euro-dollar market:

1. It has provided a truly international short-term capital market, owing to a high degree of mobility of the Euro-dollars.

2. Euro-dollars are useful for the financing of foreign trade.

3. It has enabled the financial institutions to have greater flexibility in adjusting their cash and liquidity positions.

4. It has enabled importers and exporters to borrow dollars for financing trade, at cheaper rates than otherwise obtainable.

5. It has helped in reducing the profit margins between deposit rates and lending rates.

6. It has enhanced the quantum of funds available for arbitrage.

7. It has enabled monetary authorities with inadequate reserves to increase their reserves by borrowing Euro-dollar deposits.

8. It has enlarged the facilities available for short-term investment.

9. It has caused the levels of national interest rates more akin to international influences.

Effects of Euro Dollar Market on International Financial System:

1. The position of dollar has been strengthened temporarily, since its operations of borrowing of dollars have become more profitable rather than its holdings.

2. It facilitates the financing of balance of payments surpluses and deficits. Especially, countries having deficit balance of payments tend to borrow funds from the Euro-dollar market, thereby lightening the pressure on their foreign exchange reserves.

3. It has promoted international monetary cooperation.

4. Over the last decade, the growth of Euro-dollar has helped in easing of the world liquidity problem.

Shortcomings of the Euro-Dollar Market:

The major drawbacks of the Euro-dollar market may be mentioned as under:

1. It may lead banks and business firms to overtrade.

2. It may weaken discipline within the banking communities.

3. It involves a grave danger of sudden large- scale withdrawal of credits to a country.

4. It has rendered official monetary policies less effective for the countries involved.

In fact, the Euro-dollar market has created two major problems for an individual country dealing in it. Firstly, there is the danger of over-extension of the dollar credit by domestic banks of the country; consequently, high demand pressure on the official foreign exchange may take place.

Secondly, the Euro-dollar market appears as another channel for the short-term international capital movement for the country, so that the country's volume of outflow or inflow capital may increase which may again endanger the foreign exchange reserves and the effectiveness of domestic economic policies.

It has destabilisation effect. It increases the pressure on exchange rate and official foreign exchange reserves. This may require additional liquidity. If such additional reserves are not provided, it may endanger existence of the present gold exchange standard.

Above all, the Euro-dollar market has caused the growth of semi-independent international interest rates, on which there can be no effective control by a single country or an institution.

The Development of the Eurodollar Market

Due to the huge expansion in international trade from the early 1970's, there was a huge growth in demand for foreign currencies to settle trade transactions. The availability of currencies for trading, and so the development of the FX markets itself, was facilitated by the development of the Eurodollar/Eurocurrency market.

Eurocurrency is money deposited with a bank outside the currency's country of origin. The Eurocurrency markets or Euromarkets are markets for borrowing and lending currencies outside their countries of origin.

A Eurodollar, for example, is created when the owner of a US dollar deposit with a bank in the US transfers the money to an account with a bank outside the US. These deposits are lent to other customers by the bank, creating Eurodollar market activity.

A Eurocurrency deposit has the essential characteristic that the bank receiving the deposit must be resident outside the country of origin of the currency. For example, US dollars deposited with a bank in London are Eurodollars, regardless of whether the depositor resides inside or outside the US.

An organisation wishing to borrow Yen, for example could borrow on the Japanese domestic money market from a Japanese bank, or in the Eurocurrency market, for example, by borrowing euro yens from a bank in Paris.

Until the late 1950s, US dollars deposited with banks outside the US were quickly repatriated because the banks taking the deposits invested the money in the US money markets. From the late 1950's however as the dollar superseded sterling as the main international trading currency, the demand for US dollars by non-US residents increased. Dollars deposited in Europe were increasingly lent to borrowers in Europe, and the Eurodollar market grew. The supply of Eurodollars was increased by the US balance of trade deficit in the late 1950's and early 1960's , which created a flow of dollars into the hands of non-US residents.

The Euromarkets were further boosted in the 1960's and 1970's by domestic banking restrictions, particularly in the US, resulting in:

Increasing demand for Eurodollars from the European subsidiaries of US corporations, which were unable to borrow dollars in the US.

Higher interest rates on Eurodollars than the domestic dollar deposits. US banks used their European branches to move dollars into the euro market, thereby circumventing restrictive US domestic banking regulations.

Although restrictive regulations in the US were eased in the early 1970's the Eurodollar market was sufficiently well established by then to survive and compete with the domestic US markets. In the 1970's the Eurodollar market played a key role in recycling the petro dollars of oil-producing countries. Large dollar loans were made to countries suffering a balance of payments deficit as a consequence of the large increase in oil prices at that time.

Although the Euromarkets originated with the Eurodollar, and the Eurodollar remains the most heavily–traded currency, there are markets for other Eurocurrencies (euro deutschemarks, euroyen etc.)

Euromarkets and the FX markets

The Euromarkets are for borrowing and lending currencies, whereas the FX markets are for buying and selling them. However, there is a very close connection between the two markets.

The difference between spot rates of exchange and forward rates of exchange in the FX markets are accounted for by the interest rate differentials between the currencies in the Euromarkets.

There is little difference between a Eurocurrency loan and a forward swap in the FX markets. A forward swap is an agreement to buy one currency in exchange for a second currency and a simultaneous agreement to sell back the currency at a future date, but at a different rate of exchange. The difference between the exchange rate for the initial purchase and subsequent sellback is accounted for by the interest rate differential between the Eurocurrencies.

6.9   EURO CURRENCY MARKET

Now a day, there are so many avenues open to companies to procure the funds to meet their financial needs. They can tap not only national market but also international markets to finance their operations. On one hand, international financial markets enable them to raise funds at lower costs of finance; on the other hand, attractive returns on offshore deposits have induced investors to invest their funds abroad to fetch higher returns. Lending and borrowing in foreign currency to finance the international trade and industry has led to the development of Euro currency market. Euro currency market is the largest international debt market. Initially, Euro currency market was originated as dollar denominated Euro deposits and Euro loans, but now Euro market is not confined only to Euro dollar market. So many other currencies have also taken the form of Euro currency. Euro banking involves attracting funds from non-residents and making loans to other non-residents. Initially it was confined only to dollar deposits and loans but now it has taken so many shapes i.e. GDRs, ADRs, FRNs, EMTNs, FRCDs, ECPs, EBs and so many other instruments. Euro market includes both capital market and money market.

"Euro" in common parlance refers to the funds that are intermediate outside the country of the currency in which these funds are denominated. In this way, Euro currency market is a market where Euro banks accept deposits and make loan which are essentially denominated in a currency other than the currency of the country where that Euro banks are located e.g .Euro dollars are dollar denominated deposits in the banks outside the United States.In gross sense, Euro currency market includes all Euro currency liabilities whether it is inter bank deposit or transactions between Euro banks and non bank users .But in its net sense , Euro currency market includes only those deposits and loans which take place between Euro banks and non-bankers. Though so many currencies have entered in Euro market yet Euro dollar market remains the major player in Euro currency market. London is main center of Euro currency.

Features of Euro Market

1. **Whole sale market:** Euro currency market is wholesale market. Size of transactions is large. Transactions are rarely for less than $ 1 million and sometimes they are for $ 100 million.

2. **Inter-Bank operations:** The vast bulk of Euro currency market is confined to inter bank operations.

3. **Unsecured credits:** No doubt Euro currency borrowers are big corporate who have status and name in the market and thus credit risk is comparatively low . As, Euro currency loans are unsecured credits, special attention is required to judge credit worthiness of borrower before providing any loan.

4. **Concentrated:** Euro currency market is focused upon London who is almost 1/3 of Euro currency market.

5. **Telephone linked:** Euro currency market is linked through Telecommunication which has facilitated Euro currency transaction.

6. **Commercial banks:** Commercial banks play dominant role in Euro currency market. They act as both depositors and lenders . They accept primary deposits & enter into inter bank transactions with Euro banks. These features led investors to move their funds more freely. It gives gave lenders and   borrowers more options .

7. **Maturity Transformation:** Euro banks are also engaged in maturity transformation by borrowing short and lending long .

Types of Instruments in Euro Market

1. Global Depository Receipts

GDR is a negotiable certificate, denominated in US dollars that represents a non US company's publicly traded local currency security , which can be equity instrument /debt instrument . A company when issues ordinary shares keeps them with custodian/depository banks against which bank issue Drs to the foreign investors. GDRs are listed on the Luxemburg stock exchange. These GDRs are traded freely in the overseas market either on a foreign stock exchange or in over the counter market or among qualified institutional buyers . Holders of GDRs participate in the economic benefits like an ordinary shareholders. But they can not avail voting rights. GDRs are settled through CEDEL and Euro clear international book entry systems. Investors may get GDR cancelled anytime after a cooling off period of 45 days. When any depository bank receives a request from an investor to cancel GDR, it gets corresponding underlying security released in favor of such investor.

Procedure of issue of GRD:-

1. The investor purchases the shares of any company from the domestic stock market.

2. He delivers those shares to the local   custodian bank where these are converted into depository receipts.

3. The local custodian bank instructs the depository bank to issue GDR.

Pricing of GRD issue: Pricing of GDR issue depends on so many factors like prospective earnings, market price and price earning ratio. Prospective earnings of the company have direct impact on the investors perception about their future gains. GDR is usually issued at a discount of 10 – 20 % to the current market price of the security.

Fungibility of GRD issue: GDR issues can also be replaced by an identical security. Fungibilities are of two types:-

(a) **One way Fungiility:** In this case , investor has an option to cancel GDR by withdrawing foreign exchange from the country.

(b) **Two way Fungiility:** In this case, not only investor has an option to cancel GDR but the company also have an option to convert shares into GDRs.

Benefits

1. As GDRs are usually quoted in dollars, interest and dividend payments are also in dollars. It can be paid in multiple currencies.

2. GDRs are as liquid as the underlying securities.

3. GDRs are negotiable

4. In case of GDR no Global custodian /safe keeping charges are required to be paid.

5. GDRs overcome foreign investment restrictions.

6. Company can raise debt as well as equity.

7. Company can increase demand for its securities.

Disadvantages

1. GDR issue dilute earnings on equity shares.

2. GDRs are expected to be issued at a discount.

2. American Depository Receipts

ADRs are depository receipts are issued by a company in USA. In this case, a non US company deposits its securities with a custodian bank which in turn informs the depository in US that ADRs can be issued . The holder of such receipts enjoys same ownership rights of underlying securities.

Types of ADRs

1. **Unsponsored ADRs:** Before issuing unsponsored ADRs, there is no formal agreement between issuing company and depository. In this case, cost of disbursement of dividends, lie on the shoulders of investors.

3. **Sponsored ADRs:** In this case, there is a formal agreement between issuing company and depository . Some of the sponsored ADRs are privately placed white some of these ADRs are publicity placed and traded.

4. **Unrestricted ADRs/ URADRs:** These ADRs are issued in US capital market to the general investing public. There are three levels of URADRs. Level I URADRs are exempted from the requirements to conform their financial data to US before going for such issue. That's why these are comparatively cheaper. In case of Level II URADRs, issuing companies have to conform their financial data to US and meet other requirements of security exchange commission . These are listed on one of the US national stock exchanges. Though these are costlier yet they attract potential investors by promising higher visibility. In case of Level III URADRs, issuing companies have to fulfill all the requirements of SEC, GAAP . These are issued to general public.

Advantages

1. Very low information search cost.

2. It eliminates the problems of unfamiliarity with foreign markets and foreign laws, regulations and foreign trade practices .

3. There is no such problem of foreign language.

4. There is no need to locate a borrower or custodian.

5. In case of ADRs, dividends are paid promptly .

6. As ADRs are registered in US, it provides assurance to the investors regarding the protection of their ownership rights.

7. Depository transmits all important information related to the issuing company to the investors, on continuous basis .

8. ADRs has increased access to US capital markets by lowering the costs of investing in ADRs.

9. ADRs has increased the liquidity of issuing company's securities.

10. ADRs also raise issuing company's visibility and international familiarity which facilitate issuing co. to raise funds from the market at lower cost .

Disadvantages

1. ADRs act as a disincentive to the development of local capital market. Increasing issue of ADRs can retard development of domestic market .

5. **Eurobonds**: Eurobonds are bonds which are denominated in currencies other than that of the country in which the bonds are sold. In the Eurobond market risk of lending is borne directly by the lender whereas in case of Euro currency market such risk is borne by financial institutions.

6. **Euro convertible bonds:** Euro convertible bond is a debt instrument with an option to convert it into a pre determined number of equity shares of the company. It carries a fixed rate of interest. Euro convertible bonds can be issued with call option and put option. In case of call option, issuer company can any time call bonds for conversion into equity shares prior to the date of maturity . Generally company exercises this option when share prices reach up to 130% to 150% of conversion price /redemption price. In case of put option, holder of bond has a right to sell back bonds to the company. In this case usually, issuer company makes payment in US dollars . Euro convertible bonds are also known as a deferred equity issue.

7. **Euro bonds with equity warrants:** In case of these bonds, equity warrants are attached to the bonds. These equity warrant are detachable and can be traded in market. These bonds carry a coupon rate which is determined by the market rates. Advantage of Eurobonds

   1. Cost of issue of Eurobonds is low which is around 2.5% of face value of the issue.

   2. Eurobond market offer the bonds with maturities that suits to long term funding requirements.

   3. There exists a sound institutional framework for underwriting, distribution and placing of securities.

   4. Eurobonds are issued in bearer form which enable the investor to evade domestic income tax.

   5. Issuers of Eurobonds have an excellent reputation for credit worthiness.

8. **Euro notes:** The traditional function of commercial banks, was to lend money over the medium term. But now, instead of lending money, they can go for securitization where they simply commit their resources, under Euro note issuance facilities, to guaranteeing that it will be available over the medium term. The actual funds are provided by non-bank investors. A borrower can raise money by issuing short term Euro notes, with maturity of 3-6 months. Such Euro notes are negotiable like certificate of deposits . Thus they can be placed with non-bank investors .Before going for Euro notes

borrowers have to be sure that they will always be able to find buyers for their notes in the markets .It give rise to so many other ways e.g. NIfs (note issuance facilities), RUFs (revolving underwriting facilities), MOFF's(multiple option funding facilities), TRUFs (transferable revolving underwriting facilities), and BONUS (borrower's option for notes and underwritten stand by) and so on.

9. **Certificate of deposit**: It is a negotiable instrument evidencing a deposit with a bank. Whenever investor requires cash, he can easily dispose it in secondary market. Final holder of Certificate of deposit gets face value along with the interest on maturity. These are issued in large denominations. Interest on Certificate of deposit with maturity exceeding one year, is paid annually rather than semiannually. Floating rate Certificate of deposits are also prevalent now a days, where interest rate is periodically reset.

10. **Euro Commercial Papers:** CP is a corporate short term, unsecured promising note issued on a discount to yield basis. It is redeemable at a face value on maturity. Its maturity generally does not exceed 270 days. Issuers usually roll over the issue and use the proceeds from the new issue to retire the old issue. CP is a cheap and flexible source of funds especially for highly rated borrowers. It is cheaper than banks Loans. But generally these require a backup credit line from a bank ranging from 50% -100%. Investors in CP consists of money market funds, insurance companies, pension funds, other financial institutions and corporations with short term cash surpluses.

Disadvantages

As there exists no apparent control mechanism in Euro market, it may create some adverse effects.

1. **Speculation:** It induces short term speculative activities which results in generation of "hot money". It makes more difficult for central banks to stabilize their currency exchange rates.

2. **Less effective national monetary policy:** Since the doors are open for offshore market, national monetary authorities lose effective control over monetary policy .It makes national monetary policy less effective .

3. **Inflation Tendencies:** Euro market creates too much of international liquidity which may hamper the balance of world economy. It may result in inflationary tendencies.

4. **Sovereign Risk:** In Case of domestic deposit, there is only risk of intervention by one government. But in case of Euro deposits, there is risk of intervention of both the governments. The government of the country in which Euro bank operates may seize the assets of the bank and block repayment of liabilities or other wise restrict its activities through political action .When host country imposes restrictions on Euro banks' assets , their offshore operations are at risk. Generally there is a question that who is the "lender of last resort". When difficulties originate. As in case of domestic banking central banks act as lender of last resort.

Advantages

1. **International capital mobility:** In Euro market fixed and managed exchange rates provide for perfect capital mobility. It has induced depositors to go for investing their funds abroad and earn higher rate of return. It has also motivated borrowers to borrow

from offshore market at lower rate of interest. It has increased the degree of international capital mobility.

2. **International liquidity:** Euro currency markets create international liquidity. A company can increase the market of its securities. It can increase the liquidity of securities by making them globally tradable. It enables the companies to attract more buyers for their securities. It can enhance the image of the company in the international market.

3. **Deficit Financing:** In case of deficit,any country can easily borrow from Euro market to adjust her balance of payment.

4. **Efficient allocation of capital worldwide:** It allows the investors to diversify their portfolio globally.

5. **Better financial risk management:** Euro market has enhanced the ability of business to manage their financial risk in much better ways.

6. **Cheaper Financing:** In Euro market the company can raise large amount of funds at lower costs. It is very economical source of financing. Moreover as the holders of Euro securities do not get voting rights, it does not cause any harm to the managerial control of the issuer company.

7. **Closer to market price:** The companies can issue Euro securities at a price which is closer to the market price of securities at the time of issue.

8. **Better rates on deposits & loans:** As Euro markets are not subject to so many regulations, interest rate ceilings or any other pressure to allocate funds for unprofitable purposes as generally imposed by government, they can offer better rates for Euro deposits and Euro loans. Moreover they can keep margins small and overhead costs low. They can also take benefits of low tax locations.

9. **Freedom and Flexibility:** Euro market has a freedom and flexibility which is not found in domestic markets .

10. **Size and depth:** Euro market has capacity to absorb large and frequent issues due to its size and depth .

6.9 INTERNATIONAL LIQUIDITY: CONCEPT, PROBLEM AND IMPORTANCE

Concept of International Liquidity

The late Per Jacobsson said, "By liquidity, I understand the supply of credit in national currencies as needed to finance and provide the means of payment for trade and production."

International liquidity consists essentially in the resources available to national monetary authorities to finance potential balance of payments deficit…it may consist in the possession of assets like gold, foreign exchange and in the ability to borrow internationally.

Apart from this, most baffling has been the problem as to the form, the new international reserve asset should take. Opinions differed in the past amongst leading countries as to the true nature and form of the new international reserve asset.

It is rather difficult to determine as to what will constitute the adequate level of international liquidity under the dynamic conditions of expanding world trade and growth in developing economies. It is said that the quantum of international money needed by the world depends on the size of international trade, that is, more trade will require more money to finance it. But, this is not true because trade is not financed normally by reserves.

International reserves finance not the volume of international trade but the balance of payments deficits. The amount or the quantity of international reserves needed, therefore, varies with the size of the swings in the balance of payments.

It may, therefore, be said that in a sense the aggregate needs of international liquidity are in one way related to factors like world trade, capital movements and imbalances in BOP. But their adequacy is also affected by psychological attitudes towards what is minimum or desired levels of natural reserves, by reserve movements and by the use of available credit facilities. Because other influencing factors cannot be quantified growth in imports seems to be the most relevant indicator of the need for reserves.

According to Triffin, "The ratio of gross reserves to annual imports is the first and admittedly rough approach to the appraisal of reserve adequacy". But it is not easy to determine the correct ratio of gross reserves to annual imports. It will, thus, be seen that the factors which determine the adequacy of international liquidity are, in practice, not precisely measurable.

It is not simply a matter of arithmetical relationship. Broadly speaking, the question of adequacy of liquidity—national or international—is a matter of judgment, depending on the economic circumstances prevailing in a country, on the time and on the purpose for which the reserves are to be used. We may conclude that a country will regard its liquidity or reserves as adequate when, in its opinion, the level of liquidity or reserves are sufficient to meet unforeseen deficits in its balance of payments without adopting restrictive policies affecting economic growth and international trade.

Importance:

The importance of international liquidity lies in providing means by which disequilibrium in the BOP of different countries participating in international trade is settled, As such, it helps in the smooth flow of international trade by facilitating the availability of international means of payment. It make be understood that these means or reserves are used to finance deficits in the BOPs.

These reserve are not used to finance the inflows or outflows of trade. Changes in the balance of payments— temporary deficits and surplus—must be met by transfers of gold, convertible currencies or international borrowing facilities.

All these go to constitute international liquidity. The greater the stock of these items of international liquidity held by any country and by countries in the aggregate, the less will the need for changes in exchange rates.

In a world, in which there are considerable fluctuations in economic activities, accompanied by a growing demand for stability, the importance of international liquidity reserves lies in serving as a buffer, giving each country some leeway for the regulation of its national income and employment and providing it with a means to soften the impact of economic fluctuations arising on account of international trade and transactions.

A greater world holding of international liquidity reserves becomes necessary to maintain stable exchange rates over the whole business cycle than to meet any seasonal or short-run fluctuations. It is in this sense that adequacy or otherwise of foreign liquid reserves is an important determinant of the

levels of world trade and economic activity. If there are enough or sufficient international liquid reserves, specially with those countries which are likely to incur deficits—there will be less worry or panic for adjustment.

On the other hand, if there is too little international liquidity in the world, deficit countries will have no or little time to adjust and they will be forced to impose restrictions on trade and capital movements. As a result the world growth in international trade will be hampered and the prices of primary products will fall, turning the terms of trade in an unfavorable manner for developing economies. Easy access to international liquidity reserves makes it possible for the swings in the balance of payments to be financed, otherwise, the world trade may be strangled for want of international liquidity.

It implies not only sufficient quantity but the right composition and distribution of international liquid reserves. In other words, stability of reserves (in monetary system) has to be provided in terms of scale, composition and distribution, scale refers to the supply of liquid funds to the system as a whole ; while distribution applies to the distribution of liquid reserves amongst countries. Composition implies the currency composition of reserve holdings.

Regarding scale the major limitation is its inability to adjust the supply of reserves in a manner which exerts a stabilizing influence on the world economy. Again, the compositional problem inherent in multi-currency reserve system with floating exchange rates has to be looked into. The distributional problems have to be sorted out to the extent to which some countries have easier, less costly, access to international credits or reserves than do other countries in similar circumstances.

Role of International Monetary Fund (IMF) in India

International Monetary Fund (IMF):

The International Monetary Fund, which is briefly called IMF, is one of the twin institutions which were established as a result of discussion among the monetary and financial delegations of the member countries of the United Nations held at Bretton Woods (U.S.A.) in 1944.

Its establishment on 1st March, 1947, is a great landmark in the history of international economic relations, particularly in the monetary field.

IMF and its Membership

The funds of the IMF. consist of the subscription of the members, who have been assigned their respective subscription quotas. In 1982, it had 146 members whose total subscribed capital stood at $ 60 billion. Twenty-five per cent of the quota or 10 per cent of the official gold holdings of the member country, whichever is less, is payable in gold—the rest of the quota is to be paid in terms of the member's national currency. Recently, the requirement of gold payment has been done away with.

Under the IMF articles, a member country can purchase foreign currency not exceeding one-fourth of its quota in any 12-month period. The total holdings of foreign currencies by a member country must not, however, exceed 200 per cent of its quota, which means in effect that the upper limit for IMF's short-term assistance is equivalent to the country's quota plus its gold contribution.

With effect from January 2, 1970 a system of Special Drawing Rights (SDRs) was set up. The SDRs are designed to supplement the gold and the reserve currencies, viz., the pound and the dollar. The SDRs represent entirely a new form of paper money which will serve like gold or US dollar, and hence are called Paper Gold.

Main Functions of IMF:

The main functions of the International Monetary Fund are:

(i) Regulating Rate of Exchange: Each member-country on joining the Fund has to declare the par value of its currency in terms of gold or U.S. dollars (now in terms of SDRs) is required to maintain this parity. It can, however, change it up to 10 per cent without the IMF's permission.

For further changes up to 10 per cent the IMF will have to be consulted which will have to give the acceptance or refusal to the proposed change within 72 hours. Changes beyond 20 per cent can be effected but only with the concurrence of the IMF and only to correct a "fundamental disequilibrium" in the balance of payments. The internal policies of the member-countries to restore equilibrium are not to be interfered with by the IMF.

(ii) Assistance for Meeting Balance of Payments Deficit: When a country suffers from a deficit in its balance of payments on current account, it can obtain from the IMF, in exchange for its own currency, the currency which it needs to pay off its deficit. There is, however, a limit to the amount which it can thus obtain.

(iii) Rationing out Scarce Currencies: Currencies which are in great demand by the member-countries and IMF cannot meet all demands for them are declared as scarce currencies and are rationed by IMF among the countries needing them. The IMF can also increase the supply of such 'scarce' currencies by borrowing or by purchasing them against gold. The member-countries are permitted to impose exchange restrictions in cash of such 'scarce' currencies.

(iv) Elimination of Exchange Restrictions: IMF has to see that the member-countries do not impose exchange restrictions on current transactions. In view of the abnormal conditions existing after the war. IMF allowed a period of transition extending over 3 years during which the members could remain such restrictions. The period is over and many countries have relaxed their exchange restrictions. However, their complete removal is not likely in the near future.

Leading Mechanism by IMF

The IMF helps its member countries under a number of different programmes:

Stand-by Arrangements

The most widely used way to lend by IMF is stand-by arrangements. Under this arrangement a credit tranche which is equal to 100 per cent of member country's quota is available for lending to it. A member country can borrow from IMF from this credit tranche to meet its balance of payments difficulties. A certain norms regarding government expenditure and money supply targets have to be fulfilled before resources are released, especially in higher credit tranches.

It is expected that government of a country borrowing under this arrangement will adopt measures to rectify the balance of payments disequilibrium. Typically, stand-by arrangements last for 12-18 months period. Repayments of loans under this arrangement are made within 3-5 years of each drawing the money from IMF.

Extended Fund Facility (EFF)

The Extended Fund Facility was created in 1974 to help the developing countries over longer periods (upto 3 years) than stand-by arrangements (12-18 months). Further, in this facility developing countries can borrow more than their quota. The loans taken under this facility can be paid back over a period of 4-10 years.

Under the extended fund facility, since developing countries can borrow to meet for long- term balance of payments difficulties stringent conditions are to be fulfilled for availing borrowing facility under this scheme. A country borrowing under this programme has to provide every year a detailed statement of measures and policies it has adopted to solve its balance of payments problems.

IMF releases resources in installments with conditionality's regarding the particular steps to be taken by the borrowing country, Commenting on this extended fund facility, Thirwall writes that despite the conditionality's "the facility represented an important and significant shift in emphasis from viewing the balance Of payments as a stabilisation problem to recognising the balance of payments as a fundamental long-term constraint on growth that cannot be rectified in a short period of time."

Stand-by arrangement and extended fund facility (EFI) are very important methods of finance support by IMF for meeting balance of payments difficulties of developing countries. However in recent years other special facilities provided by IMF are being extensively used by the developing countries to tackle their problem arising from balance of payments.

The important special facilities are:

1. Poverty Reduction and Growth Facility (PRGF)

2. Supplemental Reserve Facility (SRF), and

3. Contingent Credit Line (CCL).

We briefly explain them below:

Poverty Reduction and Growth Facility (PRGF):

This was set up in 1999 to provide financial assistance to low income (i.e., developing) countries for reduction of poverty. Prior to this, IMF provided financial assistance to the poor developing countries under a programme known as Enhanced Structural Adjustment Facility (ESAF) so that they can undertake structural adjustment reforms. In 1999 it was felt to focus more on poverty reduction in the developing countries.

Therefore, in 1999 Enhanced Structural Adjustment Facility was replaced by Poverty Reduction and Growth Facility (PRGF). Assistance under this programme is given by IMF on the basis of Poverty Reduction Strategy Paper prepared by a poor country in cooperation with World Bank and other experts. Interest charged on the loans given by IMF under this programme is only 0.5 per cent per annum. Moreover, the borrowing country can repay the loans taken under this programme in a long period of 10 years.

Supplemental Reserve Facility (SRF):

This was set up in 1997 in response to Financial Crisis in East Asia and other developing countries. Under this facility, IMF provides financial assistance to the member countries who are experiencing exceptional balance of payments problems arising from a sudden loss of market confidence in their currencies. Assistance under SRF in not subject to usual quota limits but instead

depends on the country's requirements, its ability to repay the loan and policies it adopts to restore confidence. The repayments have to be made within 2.5 years of taking the loan.

Contingent Credit Line (CCL)

This facility was established in 199 to deal with the problem of countries who are anticipating a financial crises that well cause capital outflow on capital account of balance of payments. It was a precautionary measure to provide assistance to a country to overcome the impending crises on capital account. It may be noted that financial assistance under this facility was aviated only when crises actually occurred. The repayment period for the loan taken is also 2.5 years.

Special Oil Facility

The oil crises of 1973 touched off by the Arab oil producing countries created a most serious balance of payments problem for the developed as well as developing countries. Among the developing countries India was the most severely hit. To aid member-countries, the IMF has started a special fund, from which the member-countries in acute difficulties are helped out. This is called the special oil facility.

6.10 BENEFITS TO INDIA FROM INTERNATIONAL MONETARY FUND'S MEMBERSHIP

It is good that India joined the IMF. There is no doubt that this membership has been greatly beneficial to India.

(i) International regulation by IMF in the field of money has certainly contributed towards expansion of international trade and thus prosperity. India has, to that extent, benefitted from these fruitful results.

(ii) Large Financial Assistance. Not only indirectly but directly also, her membership has been of great advantage. We know how, in the post-partition period, India had serious balance of payments deficits, particularly with the dollar and other hard currency countries.

She could not possibly reduce her imports, since these consisted of essential foodstuffs, capital equipment and industrial raw materials. Her exports, on the other hand, could not be immediately expanded since under conditions of limited production in the country, increased exports were sure to create serious internal shortages. Under such difficult circumstance, it was the IMF that came to her rescue.

Subsequently, India has been one of the most frequent borrowers from the IMF. From the inception of IMF up to March 31, 1971, India purchased foreign currencies of the value of Rs. 817.5 crores from the IMF, and the same have been fully repaid. Recently, since 1970, the assistance that India, as other member countries of the IMF, can obtain from it has been increased through the setting up of the Special Drawing Rights (SDRs).

India had recourse to borrowing from the Fund in the wake of the steep rise in the prices of its imports, food, fuel and fertilizers. A total of Rs. 753.8 crores had been drawn till the end of August 1975, when the second oil facility drawing of Rs. 207 crores took place. In November 1981, India was given a massive loan of about Rs. 5,000 crores to overcome foreign exchange crisis resulting from persistent deficit in balance of payments on current account.

(iii) The total figures of borrowings by India from the IMF do not convey the extent of the support that it extended to her. What are of greater significance are the crucial timings of and special circumstances under which such assistance was availed of. Such help was forthcoming when the country was faced with critical foreign exchange situations.

(iv) Aid from World Bank and Other International Financial Agencies. The membership of the IMF has benefited India in yet another important way. India wanted large foreign capital for her various river projects, land reclamation schemes and for the development communications. Since private foreign capital was not forthcoming, the only practicable method of obtaining the necessary capital was to borrow from the International Bank for Reconstruction and Development (i.e. World Bank).

The membership of the IMF is a necessary condition precedent to the membership of the World Bank. Thus, India's membership of the IMF has entitled her to be a member of the World Bank and its affiliates viz., International Finance Corporation (IFC) and International Development Association (IDA). In fact, in absolute figures though not on per capita basis, India has been the largest borrower from the World Bank group.

The International Finance Corporation:

The International Finance Corporation (IFC) has made substantial investment in Indian companies engaged in the production of fertilizers, caustic soda, ball and bearings, pumps, etc. A large bulk of the financial assistance obtained by India from World Bank is from the Soft-loan Affiliate, the IDA—loans from it are payable over 50 years, are interest-free; bear only a service- charge of 0.75 per cent per annum.

Since the fiscal year 1975-76 (July-June), the World Bank has been extending "Third Window" loans meant to help countries with a per capita income of less than $ 375. India got a substantial share out of the 'Third Window' fund.

(v) India has availed of the services of specialists of the IMF for the purpose of assessing the state of the Indian economy. Teams of experts have often been coming to India and submitting reports. In this way India has had the benefit of independent scrutiny and advice.

(vi) Contribution to International Monetary Concord. The important place which India has thus occupied in the international councils in the fields of world trade and finance has been a guarantee that her interests would not suffer. Rather, she can avail of whatever facilities are available from the more fortunate nations. Then, apart from her own gain, by her membership, she is contributing to international concord and co-operation in the monetary and financial fields.

(vii) Provision of Oil Facility. The balance of payments position of India having gone utterly out of gear on account of the oil price escalation since October 1973, the IMF has started making available oil facility by setting up a special fund for the purpose. According to a report of the IMF,

India is the worst hit among the developing countries of the world. This special aid from IMF is, therefore, of great value to her. In October 1974, India drew Rs. 194 crores from IMF and Rs. 207 crores in August 1975.

In 1981 India succeeded in getting a massive loan of Rs. 5000 crores from IMF to tide over the balance of payments problem faced by it. This was the single largest loan made by IMF

to a member country. India prudently used this loan and used only Rs. 3900 crores and surrendered the balance to IMF.

IMF and European Debit Crisis

The IMF has been called upon to bail out several European countries such as Greece, Spain, Italy, Portugal which are faced with severe sovereign debt crisis. The IMF has $ 384 billion in its lending funds which are quite insufficient and limited to finance the needs of European countries' needs. At the same time current economic and political climate in the advanced economies such as the US, Germany makes it highly unlikely that they are in a position to provide additional resources to the IMF.

Tripling IMF resources was part of the G20 leaders' response to the global recession in 2009. As the European debt crisis threatens to spread and further damp the global recovery, the IMF was asked by its steering committee in Oct. 2011 to review whether its resources are sufficient.

According to Christine Laggard, the present chairman of IMF, the funds credibility and hence effectiveness rests on its perceived capacity to cope with worst-case scenarios. She further adds that lending capacity "looks comfortable today but pales in comparison with the potential financing needs of vulnerable countries and crisis in the debt-ridden European Countries".

A Critique of the Role of IMF

The role of IMF in providing financial assistance to developing countries for overcoming balance of payments problem and undertaking structural adjustment for promoting economic development has been severely criticised. Besides, the manner in which IMF dealt with financial crisis in East Asian countries in the late nineties has also come under severe attack.

In its structural adjustment policies IMF has been guided by the supremacy of the free market in promoting economic growth. Thus, according to Stiglitz, a winner of Nobel Prize in economies. "Over the years since its inception the IMF has changed markedly. Founded on the belief that markets often worked badly, it now champions market supremacy with ideological fervor. Founded on the belief that there is a need for international pressure on countries to have more expansionary economic policies such as increasing expenditures, reducing taxes or lowering interest sates to stimulate economy, today the IMF typically provides funds only if countries engage in policies like cutting deficits or raising interest rates that lead to a contraction of the economy".

The same policy approach has been applied to the vast majority of developing countries as if they all were one homogeneous mass and could be properly treated in the same way. Joseph Stiglitz has severely criticised the functioning of IMF for serving the needs of G-7 (the group of seven developed countries) and has failed to promote global economic stability for which it was set up.

He writes, "A half country after its founding, it is clear that IMF has failed in its mission. It has not done what it was supposed to do… provide funds for countries facing an economic downturn, and in spite of IMF efforts during the past quarter century, crisis around the world have been more frequent (and with the exception of the Great Depression, deeper….. Worse, many of the policies that the IMF pushed, in particular premature capital market liberalisation have contributed to global instability."

IMF policy of providing financial assistance to the poor developing countries subject to the fulfillment of certain conditions by the latter has come in for severe criticism.

These conditionalities refer to the structural adjustment policies, namely:

1. Privatisation of public enterprises,
2. Capital market liberalisation,
3. Market-based pricing (that is, withdrawal of subsidies granted by the government),
4. Liberalisation of foreign trade and investment.

If commitments regarding fulfillment of these conditionalities by the developing countries in need of finance were not forthcoming, no financial assistance was provided. In fact, capital market liberalisation proved to be disastrous for many countries because they were not ready and able to deal with the great volatility of capital inflows and outflows.

This policy of premature capital-market liberalisation actually resulted in severe East Asian crisis in the late nineties. The Fund was undoubtedly shaken by the 1997 East Asian crisis which it does not foresee even though there was a massive build-up of current account deficits and capital had started to flow out of South-East Asia long before the crises hit" The IMF now concedors that liberalising capital and financial markets contributed to the East Asia's crisis of 1990.

As regards market-based pricing which involves elimination of food and fuel subsidies also landed the poor developing countries into trouble. Elimination of subsidies has been resisted by the people in developing countries. So far even in India government has not succeeded very much in this regard. The riots broke out in Indonesia in 1998 when food and fuel subsidies were withdrawn at the instance of the IMF.

Even policy of trade liberalisation has not been entirely successful in attaining its objective of reduction of poverty and unemployment. The issue of trade liberalisation is being hotly debated at WTO sponsored Ministerial Conferences where developed countries of EU (European Union) and the United States are reluctant to eliminate subsidies and reduce tariffs sufficiently which they are providing to protect their agriculture and manufacturing industries. As 2 result, market access for the products of developing countries is quite limited.

Besides, the result of liberalisation of trade (i.e., heavy reduction of tariffs and removal of quantitative restrictions) by the developing countries resulted in increase in unemployment in them. Commenting on this Stiglitz writes, "It is easy to destroy jobs and this is often the immediate impact of trade liberalisation as inefficient industries close down under pressures from international competition. IMF ideology holds that new more productive jobs will be created as the old, inefficient jobs that have been created behind protectionist walls are eliminated. But this is simply not the case…. It takes capital and entrepreneurship to create new jobs and in development countries there is often shortage of them. … The IMF in many countries has made matters worse because its austerity programmes often entailed such high interest rates sometimes exceeding 20 per cent".

In the view of present author the small-scale and medium enterprises in India which employ a large number of workers could not complete with the imported products and also multinational corporations. As a result, many small firms in India closed down. Of course these is higher industrial growth due to the use of highly capital-intensive technologies but unemployment rate has increased in the post-reform period as a result of structural adjustment policies.

To conclude, IMF policy of laying emphasis on elimination of subsidies, liberalisation of trade and capital market privatisation as conditions for providing financial assistance to the developing countries has not led to the solution of the twin problems of poverty and unemployment in the developing countries. In case of many developing countries IMF policies led to economic crises. In

recent years there has been realisation on the part of IMF of the improper nature of its policies and therefore some corrections are being made to achieve the goals of rapid global growth, global economic stability and the solutions of the problems of poverty and unemployment in the poor developing countries.

Special drawing rights

Special drawing rights (SDR)are supplementary foreign exchange reserve assets defined and maintained by the International Monetary Fund (IMF). The XDR is the unit of account for the IMF, and is not a currency per se. XDRs instead represent a claim to currency held by IMF member countries for which they may be exchanged. The XDR was created in 1969 to supplement a shortfall of preferred foreign-exchange reserve assets, namely gold and the U.S. dollar.

XDRs are allocated to countries by the IMF. Private parties do not hold or use them. The amount of XDRs in existence was around XDR 21.4 billion in August 2009. During the global financial crisis of 2009, an additional XDR 182.6 billion were allocated to "provide liquidity to the global economic system and supplement member countries' official reserves". By October 2014, the amount of XDRs in existence was XDR 204 billion.

The value of the XDR is based on a basket of key international currencies reviewed by IMF every five years. The weights assigned to each currency in the XDR basket are adjusted to take into account their current prominence in terms of international trade and national foreign exchange reserves. In the review conducted in November 2015, the IMF decided that the Renminbi (Chinese yuan) would be added to the basket effective October 1, 2016. From that date, the XDR basket now consists of the following five currencies: U.S.dollar 41.73%, Euro 30.93%, Renminbi (Chinese yuan) 10.92%, Japanese yen 8.33%, British pound 8.09%.

6.11 SUMMARY

1. Growth in any economy is determined by the accumulation of its stock of physical capital, the skills and education of its labour force, its natural endowment of resources and the technology it employs in turning these inputs into output.

2. The domestic production structure can be decomposed into the traded-goods sector, containing all those production activities in which industries are exposed to international competition (shoes, cars and zinc, for example)

3. As the non-traded sector serves only internal markets, its output value is limited to the share of natural expenditure within this sector, as surpluses could not be exported.

4. The traded sector is vital if the economy needs to purchase imports, and secondly it is this sector that really determines the total level of national output.

5. The non-traded sector is crucial to attracting foreign investment into our economy.

6.12 SELF ASSESSMENT QUESTIONS

1. Growth in any economy is determined by the accumulation of its stock of physical capital, the skills and education of its labour force, its natural endowment of resources and the technology it employs in turning these inputs into output.Comment.

2. What is the importance of the Traded Sector in International trade?

3. The non-traded sector is crucial to attracting foreign investment into our economy.Elucidate.   *Notes*

4. Compare and contrast traded and non traded sector and their relative importance in india's International trade.

5. The tradable sector of a country's economy is made up of theindustry sectors whose output in terms of goods and services are traded internationally. Comment

ೞ✳ೲ