Introductory
Macroeconomics

Textbook in Economics for Class XII

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विद्यया ऽमृतमश्नुते

एन सी ई आर टी
NCERT

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NCERT Campus
Sri Aurobindo Marg
New Delhi 110 016 **Phone : 011-26562708**

108, 100 Feet Road
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Banashankari III Stage
Bengaluru 560 085 **Phone : 080-26725740**

Navjivan Trust Building
P.O.Navjivan
Ahmedabad 380 014 **Phone : 079-27541446**

CWC Campus
Opp. Dhankal Bus Stop
Panihati
Kolkata 700 114 **Phone : 033-25530454**

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Maligaon
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Publication Team

Head, Publication Division	:	*M. Siraj Anwar*
Chief Editor	:	*Shveta Uppal*
Chief Production Officer	:	*Arun Chitkara*
Chief Business Manager	:	*Bibash Kumar Das*
Editor	:	*R.N. Bhardwaj*
Production Officer	:	*A.M. Vinod Kumar*

Cover, Layout and Illustrations
Blue Fish

Cartoonist
Irfan

Foreword

The National Curriculum Framework (NFC) 2005, recommends that children's life at school must be linked to their life outside the school. This principle marks a departure from the legacy of bookish learning which continues to shape our system and causes a gap between the school, home and community. The syllabi and textbooks developed on the basis of NCF signify an attempt to implement this basic idea. They also attempt to discourage rote learning and the maintenance of sharp boundaries between different subject areas. We hope these measures will take us significantly further in the direction of a child-centred system of education outlined in the National Policy on Education (1986).

The success of this effort depends on the steps that school principals and teachers will take to encourage children to reflect on their own learning and to pursue imaginative activities and questions. We must recognise that, given space, time and freedom, children generate new knowledge by engaging with the information passed on to them by adults. Treating the prescribed textbook as the sole basis of examination is one of the key reasons why other resources and sites of learning are ignored. Inculcating creativity and initiative is possible if we perceive and treat children as participants in learning, not as receivers of a fixed body of knowledge.

These aims imply considerable change in school routines and mode of functioning. Flexibility in the daily time-tables is as necessary as rigour in implementing the annual calendar so that the required number of teaching days are actually devoted to teaching. The methods used for teaching and evaluation will also determine how effective this textbook proves for making children's life at school a happy experience, rather than a source of stress or problem. Syllabus designers have tried to address the problem of curricular burden by restructuring and reorienting knowledge at different stages with greater consideration for child psychology and the time available for teaching. The textbook attempts to enhance this endeavour by giving higher priority and space to opportunities for contemplation and wondering, discussion in small groups, and activities requiring hands-on experience.

The National Council of Educational Research and Training (NCERT) appreciates the hardwork done by the textbook development committee responsible for this textbook. We wish to thank the Chairperson of the advisory group in Social Sciences, Professor Hari Vasudevan, and the *Chief Advisor* for this textbook, Professor Tapas Majumdar, for guiding the work of this committee. Several teachers

contributed to the development of this textbook; we are grateful to their principals for making this possible. We are indebted to the institutions and organisations which have generously permitted us to draw upon their resources, material and personnel. We are especially grateful to the members of the National Monitoring Committee, appointed by the Department of Secondary and Higher Education, Ministry of Human Resource Development under the Chairpersonship of Professor Mrinal Miri and Professor G.P. Deshpande, for their valuable time and contribution. As an organisation committed to systemic reform and continuous improvement in the quality of its products, NCERT welcomes comments and suggestions which will enable us to undertake further revision and refinement.

Director
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New Delhi
16 February 2007

Textbook Development Committee

Chairperson, Advisory Committee For Social Science Textbooks at the Higher Secondary Level

Hari Vasudevan, *Professor,* Department of History, University of Calcutta, Kolkata

Chief Advisor

Tapas Majumdar, *Professor Emeritus of Economics,*
Jawaharlal Nehru University, New Delhi.

Advisor

Satish Jain, *Professor,* Centre for Economics Studies and Planning, School of Social Sciences, Jawaharlal Nehru University, New Delhi

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Sanmitra Ghosh, *Lecturer*, Department of Economics, Jadavpur University, Kolkata

Malbika Pal, *Senior Lecturer*, Department of Economics, Miranda House, University of Delhi, New Delhi

Member-Coordinator

Jaya Singh, *Lecturer,* Economics, Department of Education in Social Sciences, NCERT, New Delhi

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We would like to place on record the precious advise of (Late) Dipak Banerjee, *Professor* (Retd.), Presidency College, Kolkata. We could have benefited much more of his expertise had his health permitted.

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Chapter 1

Introduction

You must have already been introduced to a study of basic microeconomics. This chapter begins by giving you a simplified account of how macroeconomics differs from the microeconomics that you have known.

Those of you who will choose later to specialise in economics, for your higher studies, will know about the more complex analyses that are used by economists to study macroeconomics today. But the basic questions of the study of macroeconomics would remain the same and you will find that these are actually the broad economic questions that concern all citizens – Will the prices as a whole rise or come down? Is the employment condition of the country as a whole, or of some sectors of the economy, getting better or is it worsening? What would be reasonable indicators to show that the economy is better or worse? What steps, if any, can the State take, or the people ask for, in order to improve the state of the economy? These are the kind of questions that make us think about the health of the country's economy as a whole. These questions are dealt within macroeconomics at different levels of complexity.

In this book you will be introduced to some of the basic principles of macroeconomic analysis. The principles will be stated, as far as possible, in simple language. Sometimes elementary algebra will be used in the treatment for introducing the reader to some rigour.

If we observe the economy of a country as a whole it will appear that the output levels of all the goods and services in the economy have a tendency to move together. For example, if output of food grain is experiencing a growth, it is generally accompanied by a rise in the output level of industrial goods. Within the category of industrial goods also output of different kinds of goods tend to rise or fall simultaneously. Similarly, prices of different goods and services generally have a tendency to rise or fall simultaneously. We can also observe that the employment level in different production units also goes up or down together.

If aggregate output level, price level, or employment level, in the different production units of an economy,

bear close relationship to each other then the task of analysing the entire economy becomes relatively easy. Instead of dealing with the above mentioned variables at individual (disaggregated) levels, we can think of a single good as the representative of all the goods and services produced within the economy. This representative good will have a level of production which will correspond to the average production level of all the goods and services. Similarly, the price or employment level of this representative good will reflect the general price and employment level of the economy.

In macroeconomics we usually simplify the analysis of how the country's total production and the level of employment are related to attributes (called 'variables') like prices, rate of interest, wage rates, profits and so on, by focusing on a single imaginary commodity and what happens to it. We are able to afford this simplification and thus usefully abstain from studying what happens to the many real commodities that actually are bought and sold in the market because we generally see that what happens to the prices, interests, wages and profits etc. for one commodity more or less also happens for the others. Particularly, when these attributes start changing fast, like when prices are going up (in what is called an inflation), or employment and production levels are going down (heading for a depression), the general directions of the movements of these variables for all the individual commodities are usually of the same kind as are seen for the aggregates for the economy as a whole.

We will see below why, sometimes, we also depart from this useful simplification when we realise that the country's economy as a whole may best be seen as composed of distinct sectors. For certain purposes the interdependence of (or even rivalry between) two sectors of the economy (agriculture and industry, for example) or the relationships between sectors (like the household sector, the business sector and government in a democratic set-up) help us understand some things happening to the country's economy much better, than by only looking at the economy as a whole.

While moving away from different goods and focusing on a representative good may be convenient, in the process, we may be overlooking some vital distinctive characteristics of individual goods. For example, production conditions of agricultural and industrial commodities are of a different nature. Or, if we treat a single category of labour as a representative of all kinds of labours, we may be unable to distinguish the labour of the manager of a firm from the labour of the accountant of the firm. So, in many cases, instead of a single representative category of good (or labour, or production technology), we may take a handful of different kinds of goods. For example, three general kinds of commodities may be taken as a representative of all commodities being produced within the economy: agricultural goods, industrial goods and services. These goods may have different production technology and different prices. Macroeconomics also tries to analyse how the individual output levels, prices, and employment levels of these different goods gets determined.

From this discussion here, and your earlier reading of microeconomics, you may have already begun to understand in what

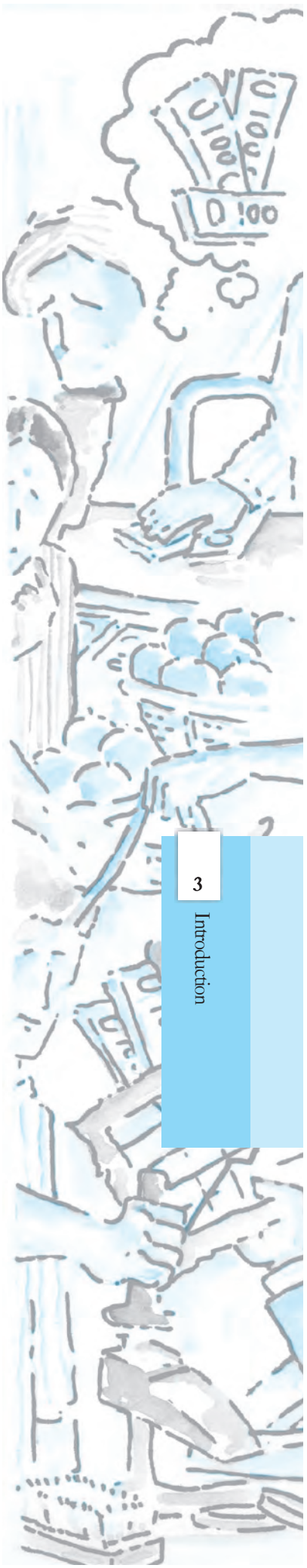
way macroeconomics differs from microeconomics. To recapitulate briefly, in microeconomics, you came across individual 'economic agents' (see box) and the nature of the motivations that drive them. They were 'micro' (meaning 'small') agents – consumers choosing their respective optimum combinations of goods to buy, given their tastes and incomes; and producers trying to make maximum profit out of producing their goods keeping their costs as low as possible and selling at a price as high as they could get in the markets. In other words, microeconomics was a study of individual markets of demand and supply and the 'players', or the decision-makers, were also individuals (buyers or sellers, even companies) who were seen as trying to maximise their profits (as producers or sellers) and their personal satisfaction or welfare levels (as consumers). Even a large company was 'micro' in the sense that it had to act in the interest of its own shareholders which was not necessarily the interest of the country as a whole. For microeconomics the 'macro' (meaning 'large') phenomena affecting the economy as a whole, like inflation or unemployment, were either not mentioned or were taken as given. These were not variables that individual buyers or sellers could change. The nearest that microeconomics got to macroeconomics was when it looked at General Equilibrium, meaning the equilibrium of supply and demand in each market in the economy.

Economic Agents

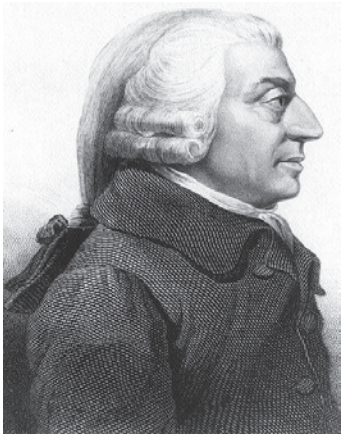
By economic units or economic agents, we mean those individuals or institutions which take economic decisions. They can be consumers who decide what and how much to consume. They may be producers of goods and services who decide what and how much to produce. They may be entities like the government, corporation, banks which also take different economic decisions like how much to spend, what interest rate to charge on the credits, how much to tax, etc.

Macroeconomics tries to address situations facing the economy as a whole. **Adam Smith**, the founding father of modern economics, had suggested that if the buyers and sellers in each market take their decisions following only their own self-interest, economists will not need to think of the wealth and welfare of the country as a whole separately. But economists gradually discovered that they had to look further.

Economists found that first, in some cases, the markets did not or could not exist. Secondly, in some other cases, the markets existed but failed to produce equilibrium of demand and supply. Thirdly, and most importantly, in a large number of situations society (or the State, or the people as a whole) had decided to pursue certain important social goals unselfishly (in areas like employment, administration, defence, education and health) for which some of the aggregate effects of the microeconomic decisions made by the individual economic agents needed to be modified. For these purposes macroeconomists had to study the effects in the markets of taxation and other budgetary policies, and policies for bringing about changes in money supply, the rate of interest, wages, employment, and output. Macroeconomics has,



Adam Smith



Adam Smith is regarded as the founding father of modern economics (it was known as political economy at that time). He was a Scotsman and a professor at the University of Glasgow. Philosopher by training, his well known work *An Enquiry into the Nature and Cause of the Wealth of Nations* (1776) is regarded as the first major comprehensive book on the subject. The passage from the book. 'It is not from the benevolence of the butcher, the brewer, of the baker, that we expect our dinner, but from their regard to their own interest. We address ourselves, not to their humanity but to their self-love, and never talk to them of our own necessities but of their advantage' is often cited as an advocacy for free market economy. The Physiocrats of France were prominent thinkers of political economy before Smith.

therefore, deep roots in microeconomics because it has to study the aggregate effects of the forces of demand and supply in the markets. However, in addition, it has to deal with policies aimed at also modifying these forces, if necessary, to follow choices made by society outside the markets. In a developing country like India such choices have to be made to remove or reduce unemployment, to improve access to education and primary health care for all, to provide for good administration, to provide sufficiently for the defence of the country and so on. Macroeconomics shows two simple characteristics that are evident in dealing with the situations we have just listed. These are briefly mentioned below.

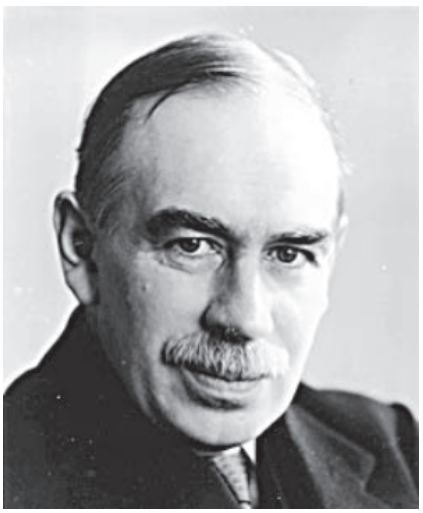
First, who are the macroeconomic decision makers (or 'players')? Macroeconomic policies are pursued by the State itself or statutory bodies like the Reserve Bank of India (RBI), Securities and Exchange Board of India (SEBI) and similar institutions. Typically, each such body will have one or more public goals to pursue as defined by law or the Constitution of India itself. These goals are not those of individual economic agents maximising their private profit or welfare. Thus the macroeconomic agents are basically different from the individual decision-makers.

Secondly, what do the macroeconomic decision-makers try to do? Obviously they often have to go beyond economic objectives and try to direct the deployment of economic resources for such public needs as we have listed above. Such activities are not aimed at serving individual self-interests. They are pursued for the welfare of the country and its people as a whole.

1.1 Emergence of Macroeconomics

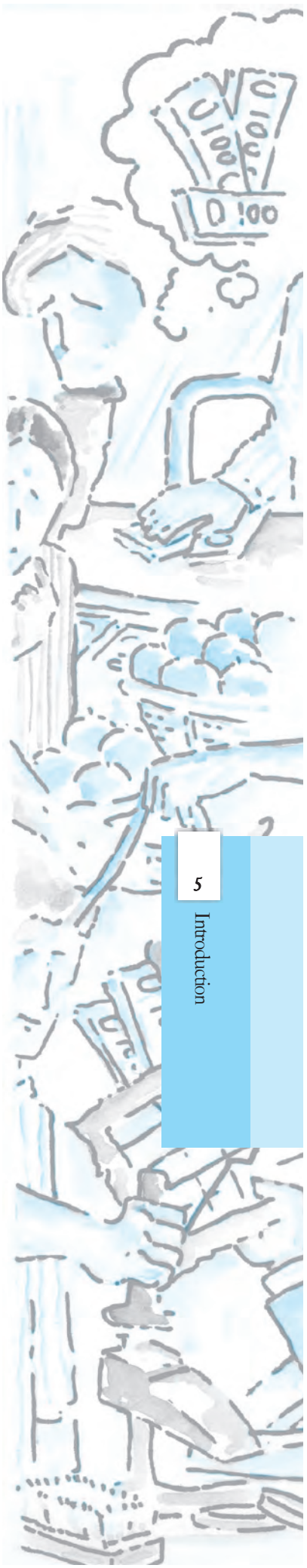
Macroeconomics, as a separate branch of economics, emerged after the British economist **John Maynard Keynes** published his celebrated book *The General Theory of Employment, Interest and Money* in 1936. The dominant thinking in economics before Keynes was that all the labourers who are ready to work will find employment and all the factories will be working at their full capacity. This school of thought is known as the classical tradition.

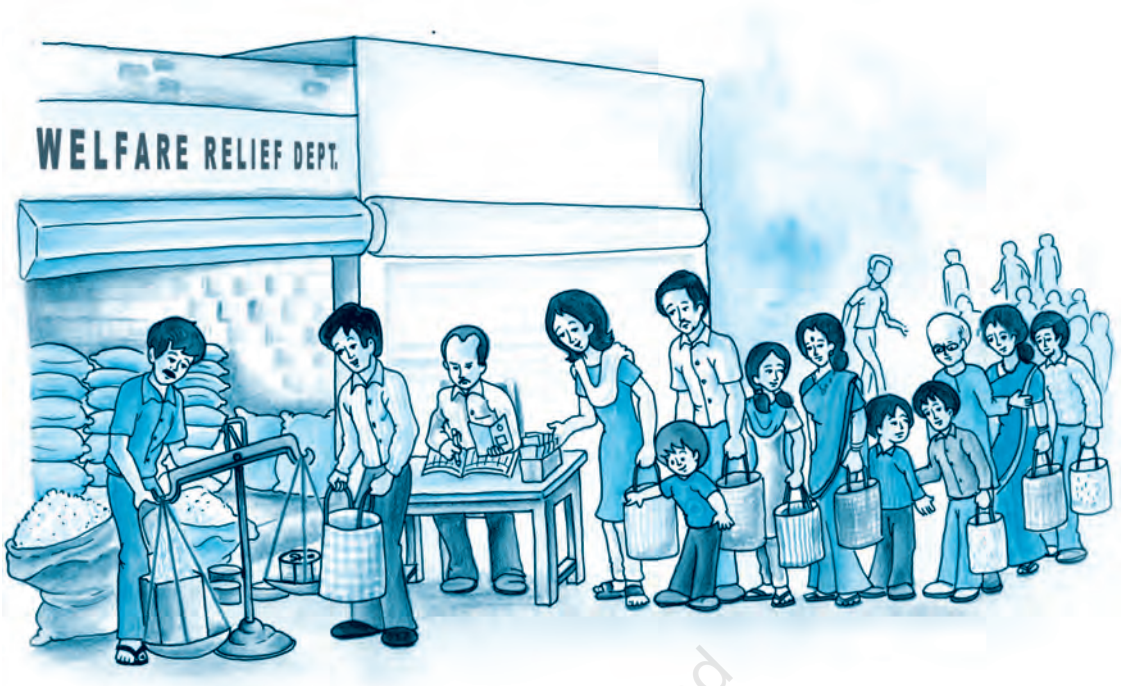
John Maynard Keynes



John Maynard Keynes, British economist, was born in 1883. He was educated in King's College, Cambridge, United Kingdom and later appointed its Dean. Apart from being a sharp intellectual he actively involved in international diplomacy during the years following the First World War. He prophesied the break down of the peace agreement of the War in the book *The Economic Consequences of the Peace* (1919). His book *General Theory of Employment, Interest and Money* (1936) is regarded as one of the most influential economics books of the twentieth century. He was also a shrewd foreign currency speculator.

However, **the Great Depression** of 1929 and the subsequent years saw the output and employment levels in the countries of Europe and North America fall by huge amounts. It affected other countries of the world as well. Demand for goods in the market was low, many factories were lying idle, workers were thrown out of jobs. In USA, from 1929 to 1933, **unemployment rate** rose from 3 per cent to 25 per cent (unemployment rate may be defined as the number of people who are not working and are looking for jobs divided by the total number of people who are working or looking for jobs). Over the same period aggregate output in USA fell by about 33 per cent. These events made economists think about the functioning of the economy in a new way. The fact that the economy may have long lasting unemployment had to be theorised about and explained. Keynes' book was an attempt in this direction. Unlike his predecessors, his approach was to examine the working of the economy in its entirety and examine the interdependence of the different sectors. The subject of macroeconomics was born.





1.2 Context of the Present Book of Macroeconomics

We must remember that the subject under study has a particular historical context. We shall examine the working of the economy of a capitalist country in this book. In a **capitalist country** production activities are mainly carried out by capitalist enterprises. A typical capitalist enterprise has one or several **entrepreneurs** (people who exercise control over major decisions and bear a large part of the risk associated with the firm/enterprise). They may themselves supply the **capital** needed to run the enterprise, or they may borrow the capital. To carry out production they also need **natural resources** – a part consumed in the process of production (e.g. raw materials) and a part fixed (e.g. plots of land). And they need the most important element of human labour to carry out production. This we shall refer to as **labour**. After producing output with the help of these three factors of production, namely capital, land and labour, the entrepreneur sells the product in the market. The money that is earned is called **revenue**. Part of the revenue is paid out as rent for the service rendered by land, part of it is paid to capital as interest and part of it goes to labour as wages. The rest of the revenue is the earning of the entrepreneurs and it is called **profit**. Profits are often used by the producers in the next period to buy new machinery or to build new factories, so that production can be expanded. These expenses which raise productive capacity are examples of **investment expenditure**.

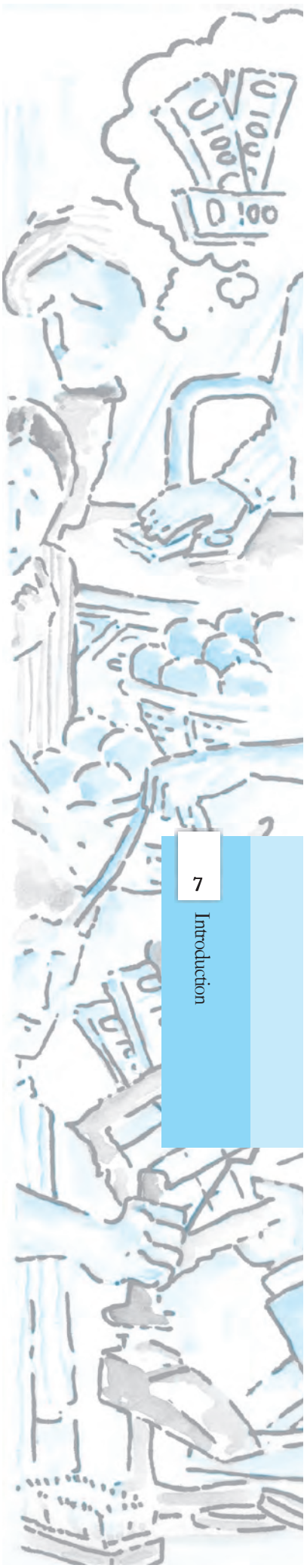
In short, a capitalist economy can be defined as an economy in which most of the economic activities have the following characteristics (a) there is private ownership of means of production (b) production takes place for selling the output in the market (c) there is sale and purchase of labour services at a price which is called the **wage rate** (the

labour which is sold and purchased against wages is referred to as **wage labour**).

If we apply the above mentioned four criteria to the countries of the world we would find that capitalist countries have come into being only during the last three to four hundred years. Moreover, strictly speaking, even at present, a handful of countries in North America, Europe and Asia will qualify as capitalist countries. In many underdeveloped countries production (in agriculture especially) is carried out by peasant families. Wage labour is seldom used and most of the labour is performed by the family members themselves. Production is not solely for the market; a great part of it is consumed by the family. Neither do many peasant farms experience significant rise in capital stock over time. In many tribal societies the ownership of land does not exist; the land may belong to the whole tribe. In such societies the analysis that we shall present in this book will not be applicable. It is, however, true that many developing countries have a significant presence of production units which are organised according to capitalist principles. The production units will be called **firms** in this book. In a firm the entrepreneur (or entrepreneurs) is at the helm of affairs. She hires wage labour from the market, she employs the services of capital and land as well. After hiring these inputs she undertakes the task of production. Her motive for producing goods and services (referred to as output) is to sell them in the market and earn profits. In the process she undertakes risks and uncertainties. For example, she may not get a high enough price for the goods she is producing; this may lead to fall in the profits that she earns. It is to be noted that in a capitalist country the factors of production earn their incomes through the process of production and sale of the resultant output in the market.

In both the developed and developing countries, apart from the private capitalist sector, there is the institution of State. The role of the state includes framing laws, enforcing them and delivering justice. The **state**, in many instances, undertakes production – apart from imposing taxes and spending money on building public infrastructure, running schools, colleges, providing health services etc. These economic functions of the state have to be taken into account when we want to describe the economy of the country. For convenience we shall use the term **"Government"** to denote state.

Apart from the firms and the government, there is another major sector in an economy which is called the **household sector**. By a household we mean a single individual who takes decisions relating to her own consumption, or a group of individuals for whom decisions relating to consumption are jointly determined. Households also save and pay taxes. How do they get the money for these activities? We must remember that the households consist of people. These people work in firms as workers and earn wages. They are the ones who work in the government departments and earn salaries, or they are the owners of firms and earn profits. Indeed the market in which the firms sell their products could not have been functioning without the demand coming from the households. Moreover, they can also earn rent by leasing land or earn interest by lending capital.



So far we have described the major players in the domestic economy. But all the countries of the world are also engaged in external trade. The **external sector** is the fourth important sector in our study. Trade with the external sector can be of two kinds

1. The domestic country may sell goods to the rest of the world. These are called **exports**.
2. The economy may also buy goods from the rest of the world. These are called **imports**. Besides exports and imports, the rest of the world affects the domestic economy in other ways as well.
3. Capital from foreign countries may flow into the domestic country, or the domestic country may be exporting capital to foreign countries.

Summary

Macroeconomics deals with the aggregate economic variables of an economy. It also takes into account various interlinkages which may exist between the different sectors of an economy. This is what distinguishes it from microeconomics; which mostly examines the functioning of the particular sectors of the economy, assuming that the rest of the economy remains the same. Macroeconomics emerged as a separate subject in the 1930s due to Keynes. The Great Depression, which dealt a blow to the economies of developed countries, had provided Keynes with the inspiration for his writings. In this book we shall mostly deal with the working of a capitalist economy. Hence it may not be entirely able to capture the functioning of a developing country. Macroeconomics sees an economy as a combination of four sectors, namely households, firms, government and external sector.

Key Concepts

Rate of interest
Profits
Great Depression
Four factors of production
Inputs
Labour
Entrepreneurship
Wage labour
Firms
Output
Government
Exports
Wage rate
Economic agents or units
Unemployment rate
Means of production
Land
Capital
Investment expenditure
Capitalist country or capitalist economy
Capitalist firms
Households
External sector
Imports

Exercises

1. What is the difference between microeconomics and macroeconomics?
2. What are the important features of a capitalist economy?
3. Describe the four major sectors in an economy according to the macroeconomic point of view.
4. Describe the Great Depression of 1929.

Suggested Readings

1. Bhaduri, A., 1990. *Macroeconomics: The Dynamics of Commodity Production*, pages 1 – 27, Macmillan India Limited, New Delhi.
2. Mankiw, N. G., 2000. *Macroeconomics*, pages 2 – 14, Macmillan Worth Publishers, New York.

Chapter 2

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National Income Accounting

In this chapter we will introduce the fundamental functioning of a simple economy. In section 2.1 we describe some primary ideas we shall work with. In section 2.2 we describe how we can view the aggregate income of the entire economy going through the sectors of the economy in a circular way. The same section also deals with the three ways to calculate the national income; namely product method, expenditure method and income method. The last section 2.3 describes the various sub-categories of national income. It also defines different price indices like GDP deflator, Consumer Price Index, Wholesale Price Indices and discusses the problems associated with taking GDP of a country as an indicator of the aggregate welfare of the people of the country.

2.1 Some Basic Concepts of Macroeconomics

One of the pioneers of the subject we call in economics today, Adam Smith, named his most influential work – *An Enquiry into the Nature and Cause of the Wealth of Nations.* What generates the economic wealth of a nation? What makes countries rich or poor? These are some of the central questions of economics. It is not that countries which are endowed with a bounty of natural wealth – minerals or forests or the most fertile lands – are naturally the richest countries. In fact the resource rich Africa and Latin America have some of the poorest countries in the world, whereas many prosperous countries have scarcely any natural wealth. There was a time when possession of natural resources was the most important consideration but even then the resource had to be transformed through a production process.

The economic wealth, or well-being, of a country thus does not necessarily depend on the mere possession of resources; the point is how these resources are used in generating a flow of production and how, as a consequence, income and wealth are generated from that process.

Let us now dwell upon this flow of production. How does this flow of production arise? People combine their energies with natural and manmade environment within a certain social and technological structure to generate a flow of production.

In our modern economic setting this flow of production arises out of production of commodities – goods and services by millions of enterprises large and small. These enterprises range from giant

corporations employing a large number of people to single entrepreneur enterprises. But what happens to these commodities after being produced? Each producer of commodities intends to sell her output. So from the smallest items like pins or buttons to the largest ones like aeroplanes, automobiles, giant machinery or any saleable service like that of the doctor, the lawyer or the financial consultant—the goods and services produced are to be sold to the consumers. The consumer may, in turn, be an individual or an enterprise and the good or service purchased by that entity might be for final use or for use in further production. When it is used in further production it often loses its characteristic as that specific good and is transformed through a productive process into another good. Thus a farmer producing cotton sells it to a spinning mill where the raw cotton undergoes transformation to yarn; the yarn is, in turn, sold to a textile mill where, through the productive process, it is transformed into cloth; the cloth is, in turn, transformed through another productive process into an article of clothing which is then ready to be sold finally to the consumers for final use. Such an item that is meant for final use and will not pass through any more stages of production or transformations is called a **final good**.

Why do we call this a final good? Because once it has been sold it passes out of the active economic flow. It will not undergo any further transformation at the hands of any producer. It may, however, undergo transformation by the action of the ultimate purchaser. In fact many such final goods are transformed during their consumption. Thus the tea leaves purchased by the consumer are not consumed in that form – they are used to make drinkable tea, which is consumed. Similarly most of the items that enter our kitchen are transformed through the process of cooking. But cooking at home is not an economic activity, even though the product involved undergoes transformation. Home cooked food is not sold to the market. However, if the same cooking or tea brewing was done in a restaurant where the cooked product would be sold to customers, then the same items, such as tea leaves, would cease to be final goods and would be counted as inputs to which economic value addition can take place. Thus it is not in the nature of the good but in the economic nature of its use that a good becomes a final good.

Of the final goods, we can distinguish between **consumption goods** and **capital goods**. Goods like food and clothing, and services like recreation that are consumed when purchased by their ultimate consumers are called consumption goods or consumer goods. (This also includes services which are consumed but for convenience we may refer to them as consumer goods.)

Then there are other goods that are of durable character which are used in the production process. These are tools, implements and machines. While they make production of other commodities feasible, they themselves don't get transformed in the production process. They are also final goods yet they are not final goods to be ultimately consumed. Unlike the final goods that we have considered above, they are the crucial backbone of any production process, in aiding and enabling the production to take place. These goods form a part of capital, one of the crucial factors of production in which a productive enterprise has invested, and they continue to enable the production process to go on for continuous cycles of production. These are capital goods and they gradually undergo wear and tear, and thus are repaired or gradually replaced over time. The stock of capital that an economy possesses is thus preserved, maintained and renewed partially or wholly over time and this is of some importance in the discussion that will follow.

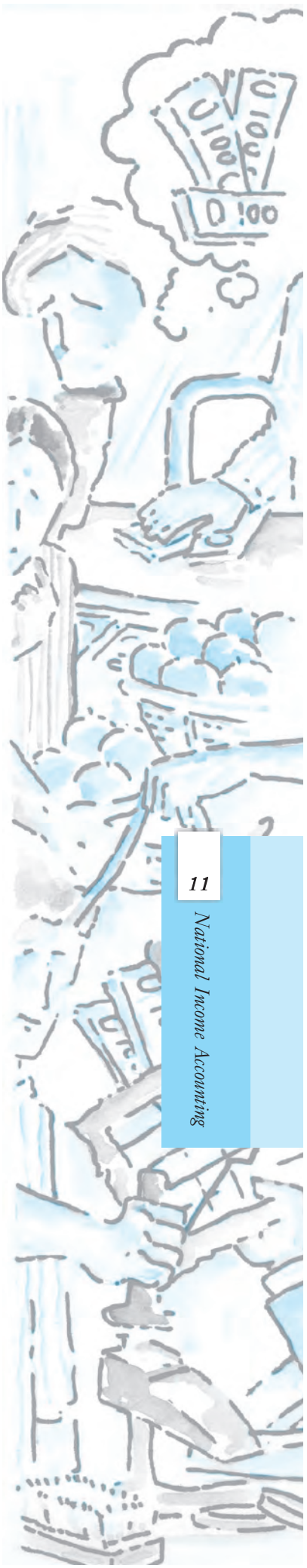
We may note here that some commodities like television sets, automobiles or home computers, although they are for ultimate consumption, have one characteristic in common with capital goods – they are also durable. That is, they are not extinguished by immediate or even short period consumption; they have a relatively long life as compared to articles such as food or even clothing. They also undergo wear and tear with gradual use and often need repairs and replacements of parts, i.e., like machines they also need to be preserved, maintained and renewed. That is why we call these goods **consumer durables**.

Thus if we consider all the final goods and services produced in an economy in a given period of time they are either in the form of consumption goods (both durable and non-durable) or capital goods. As final goods they do not undergo any further transformation in the economic process.

Of the total production taking place in the economy a large number of products don't end up in final consumption and are not capital goods either. Such goods may be used by other producers as material inputs. Examples are steel sheets used for making automobiles and copper used for making utensils. These are **intermediate goods**, mostly used as raw material or inputs for production of other commodities. *These are not final goods*.

Now, to have a comprehensive idea of the total flow of production in the economy, we need to have a quantitative measure of the aggregate level of final goods produced in the economy. However, in order to get a quantitative assessment – a measure of the total final goods and services produced in the economy – it is obvious that we need a *common measuring rod*. We cannot add metres of cloth produced to tonnes of rice or number of automobiles or machines. Our common measuring rod is money. Since each of these commodities is produced for sale, *the sum total of the monetary value of these diverse commodities gives us a measure of final output*. But why are we to measure final goods only? Surely intermediate goods are crucial inputs to any production process and a significant part of our manpower and capital stock are engaged in production of these goods. However, since we are dealing with value of output, we should realise that the value of the final goods already includes the value of the intermediate goods that have entered into their production as inputs. Counting them separately will lead to the error of *double counting*. Whereas considering intermediate goods may give a fuller description of total economic activity, counting them will highly exaggerate the final value of our economic activity.

At this stage it is important to introduce the concepts of **stocks** and **flows**. Often we hear statements like the average salary of someone is Rs 10,000 or the output of the steel industry is so many tonnes or so many rupees in value. But these are incomplete statements because it is not clear whether the income which is being referred to is yearly or monthly or daily income and surely that makes a huge difference. Sometimes, when the context is familiar, we assume that the time period is known and therefore do not mention it. But inherent in all such statements is a definite period of time. Otherwise such statements are meaningless. Thus income, or output, or profits are concepts that make sense only when a time period is specified. These are called flows because they occur in a period of time. Therefore we need to delineate a time period to get a quantitative measure of these. Since a lot of accounting is done annually in an economy, many of these are expressed annually like annual profits or production. **Flows are defined over a period of time**.



In contrast, capital goods or consumer durables once produced do not wear out or get consumed in a delineated time period. In fact capital goods continue to serve us through different cycles of production. The buildings or machines in a factory are there irrespective of the specific time period. There can be addition to, or deduction from, these if a new machine is added or a machine falls in disuse and is not replaced. These are called stocks. ***Stocks are defined at a particular point of time***. However we can measure a *change in stock* over a specific period of time like how many machines were added this year. Such changes in stocks are thus flows, which can be measured over specific time periods. A particular machine can be part of the capital stock for many years (unless it wears out); but that machine can be part of the flow of new machines added to the capital stock only for a single year when it was initially installed.

To further understand the difference between stock variables and flow variables, let us take the following example. Suppose a tank is being filled with water coming from a tap. The amount of water which is flowing into the tank from the tap per minute is a flow. But how much water there is in the tank at a particular point of time is a stock concept.

To come back to our discussion on the measure of final output, that part of our final output that comprises of capital goods constitutes **gross investment** of an economy[1]. These may be machines, tools and implements; buildings, office spaces, storehouses or infrastructure like roads, bridges, airports or jetties. But all the capital goods produced in a year do not constitute an addition to the capital stock already existing. A significant part of current output of capital goods goes in maintaining or replacing part of the existing stock of capital goods. This is because the already existing capital stock suffers wear and tear and needs maintenance and replacement. A part of the capital goods produced this year goes for replacement of existing capital goods and is not an addition to the stock of capital goods already existing and its value needs to be subtracted from gross investment for arriving at the measure for net investment. This deletion, which is made from the value of gross investment in order to accommodate regular wear and tear of capital, is called **depreciation**.

So new addition to capital stock in an economy is measured by net investment or new capital formation, which is expressed as

Net Investment = Gross investment – Depreciation

Let us examine this concept called depreciation a little more in detail. Let us consider a new machine that a firm invests in. This machine may be in service for the next twenty years after which it falls into disrepair and needs to be replaced. We can now imagine as if the machine is being gradually used up in each year's production process and each year one twentieth of its original value is getting depreciated. So, instead of considering a bulk investment for replacement after twenty years, we consider an annual depreciation cost every year. This is the usual sense in which the term depreciation is used and inherent in its conception is the expected life of a particular capital good, like twenty years in our example of the machine. Depreciation is thus an annual allowance for wear and tear of a

[1]This is how economists define investment. This must not be confused with the commonplace notion of investment which implies using money to buy physical or financial assets. Thus use of the term investment to denote purchase of shares or property or even having an insurance policy has nothing to do with how economists define investment. Investment for us is always capital formation, a gross or net addition to capital stock.

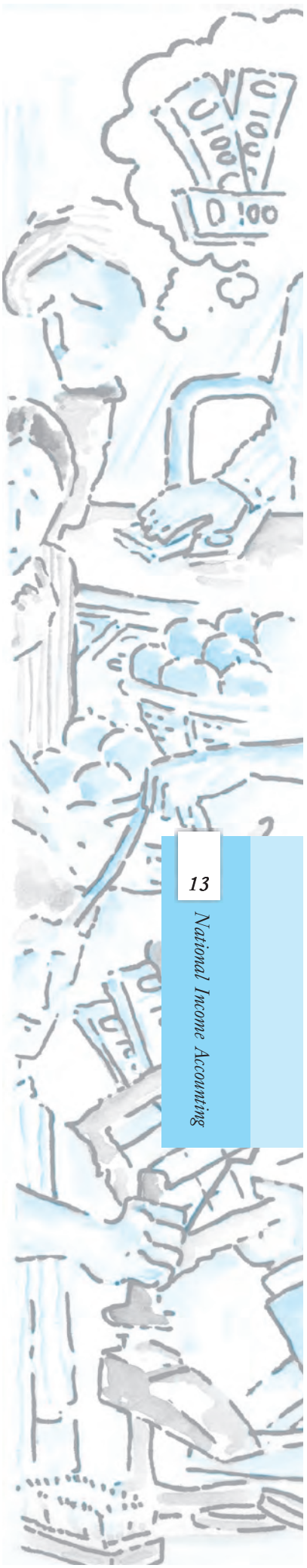
capital good.[2] In other words it is the cost of the good divided by number of years of its useful life.[3]

Notice here that depreciation is an accounting concept. No real expenditure may have actually been incurred each year yet depreciation is annually accounted for. In an economy with thousands of enterprises with widely varying periods of life of their equipment, in any particular year, some enterprises are actually making the bulk replacement spending. Thus, we can realistically assume that there will be a steady flow of actual replacement spending which will more or less match the amount of annual depreciation being accounted for in that economy.

Now if we go back to our discussion of total final output produced in an economy, we see that there is output of consumer goods and services and output of capital goods. The consumer goods sustain the consumption of the entire population of the economy. Purchase of consumer goods depends on the capacity of the people to spend on these goods which, in turn, depends on their income. The other part of the final goods, the capital goods, are purchased by business enterprises. They are used either for maintenance of the capital stock because there are wear and tear of it, or they are used for addition to their capital stock. In a specific time period, say in a year, thetotal production of final goods can thus be either in the form of consumption or investment. This implies that there is a trade-off. If an economy, produces more of consumer goods, it is producing less of capital goods and vice-versa.

It is generally observed that more sophisticated and heavy capital goods raise the ability of a labourer to produce goods. The traditional weaver would take months to weave a sari but with modern machinery thousands of pieces of clothing are produced in a day. Decades were taken to construct the great historical monuments like the Pyramids or the Taj Mahal but with modern construction machinery one can build a skyscraper in a few years. More production of newer varities of capital goods therefore would help in the greater production of consumer goods.

But aren't we contradicting ourselves? Earlier we have seen how, of the total output of final goods of an economy, if a larger share goes for production of capital goods, a smaller share is available for production of consumer goods. And now we are saving more capital goods would mean more consumer goods. There is no contradiction here however. What is important here is the element of time. At a *particular period*, given a level of total output of the economy, it is true if more capital goods are produced less of consumer goods would be produced. But production of more capital goods would mean that in *future* the labourers would have more capital equipments to work with. We have seen that this leads to a higher capacity of the economy to produce with the same number of labourers. Thus total input itself would be higher compared to the case when less capital goods were produced. If total output is higher the amount of consumer goods that can be produced would surely be higher.



[2]Depreciation does not take into account unexpected or sudden destruction or disuse of capital as can happen with accidents, natural calamities or other such extraneous circumstances.

[3]We are making a rather simple assumption here that there is a constant rate of depreciation based on the original value of the asset. There can be other methods to calculate depreciation in actual practice.

Thus the economic cycle not only rolls on, higher production of capital goods enables the economy to expand. It is possible to find another view of the circular flow in the discussion we have made so far.

Since we are dealing with all goods and services that are produced for the market, the crucial factor enabling such sale is demand for such products backed by purchasing power. One must have the necessary ability to purchase commodities. Otherwise one's need for commodities does not get recognised by the market.

We have already discussed above that one's ability to buy commodities comes from the income one earns as labourer (earning wages), or as entrepreneur (earning profits), or as landlord (earning rents), or as owner of capital (earning interests). In short, the incomes that people earn as owners of factors of production are used by them to meet their demand for goods and services.

So we can see a circular flow here which is facilitated through the market. Simply put, the firms' demand for factors of production to run the production process creates payments to the public. In turn, the public's demand for goods and services creates payments to the firms and enables the sale of the products they produce.

So the social act of consumption and production are intricately linked and, in fact, there is a circular causation here. The process of production in an economy generates factor payments for those involved in production and generates goods and services as the outcome of the production process. The incomes so generated create the capacity to purchase the final consumption goods and thus enable their sale by the business enterprises, the basic object of their production. The capital goods which are also generated in the production process also enable their producers to earn income – wages, profits etc. in a similar manner. The capital goods add to, or maintain, the capital stock of an economy and thus make production of other commodities possible.

2.2 Circular Flow of Income and Methods of Calculating National Income

The description of the economy in the previous section enables us to have a rough idea of how a simple economy – without a government, external trade or any savings – may function. The households receive their payments from the firms for productive activities they perform for the latter. As we have mentioned before, there may fundamentally be four kinds of contributions that can be made during the production of goods and services (a) contribution made by human labour, remuneration for which is called wage (b) contribution made by capital, remuneration for which is called interest (c) contribution made by entrepreneurship, remuneration of which is profit (d) contribution made by fixed natural resources (called 'land'), remuneration for which is called rent.

In this simplified economy, there is only one way in which the households may dispose off their earnings – by spending their entire income on the goods and services produced by the domestic firms. The other channels of disposing their income are closed: we have assumed that the households do not save, they do not pay taxes to the government – since there is no government, and neither do they buy imported goods since there is no external trade in this simple economy. In other words, factors of production use their remunerations to buy the goods and services which they assisted in producing. The aggregate consumption by the households of the economy is equal to the aggregate expenditure on goods and services produced by the firms in the economy. The

entire income of the economy, therefore, comes back to the producers in the form of sales revenue. There is no leakage from the system – there is no difference between the amount that the firms had distributed in the form of factor payments (which is the sum total of remunerations earned by the four factors of production) and the aggregate consumption expenditure that they receive as sales revenue.

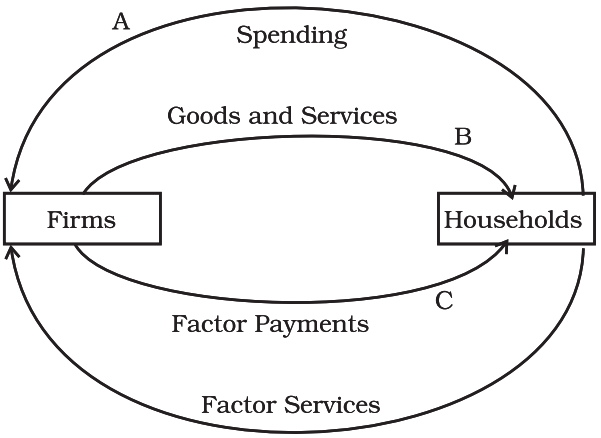
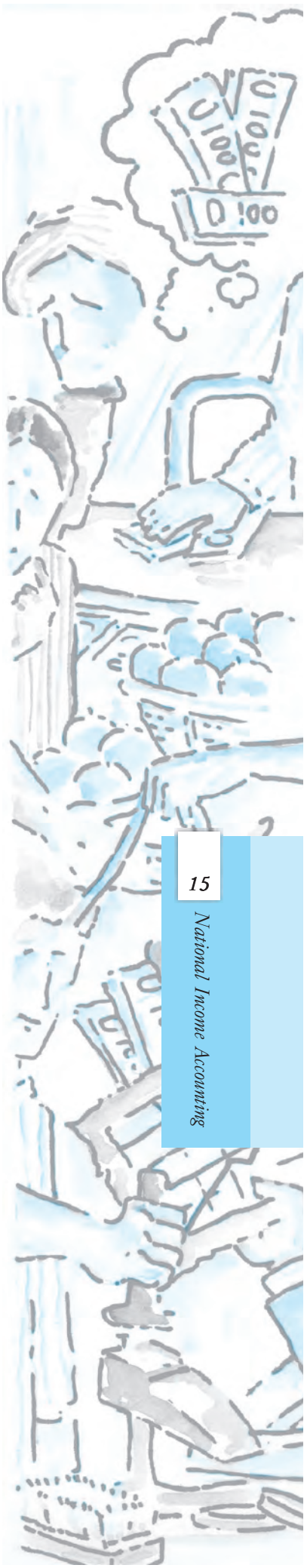


Fig. 2.1: *Circular Flow of Income in a Simple Economy*

In the next period the firms will once again produce goods and services and pay remunerations to the factors of production. These remunerations will once again be used to buy the goods and services. Hence year after year we can imagine the aggregate income of the economy going through the two sectors, firms and households, in a circular way. This is represented in Fig. 2.1. When the income is being spent on the goods and services produced by the firms, it takes the form of *aggregate expenditure* received by the firms. Since the value of expenditure must be equal to the value of goods and services, we can equivalently measure the aggregate income by *"calculating the aggregate value of goods and services produced by the firms"*. When the aggregate revenue received by the firms is paid out to the factors of production it takes the form of aggregate income.

In Fig. 2.1, the uppermost arrow, going from the households to the firms, represents the spending the households undertake to buy goods and services produced by the firms. The second arrow going from the firms to the households is the counterpart of the arrow above. It stands for the goods and services which are flowing from the firms to the households. In other words, this flow is what the households are getting from the firms, for which they are making the expenditures. In short, the two arrows on the top represent the goods and services market – the arrow above represents the flow of payments for the goods and services, the arrow below represents the flow of goods and services. The two arrows at the bottom of the diagram similarly represent the factors of production market. The lower most arrow going from the households to the firms symbolises the services that the households are rendering to the firms. Using these services the firms are manufacturing the output. The arrow above this, going from the firms to the households, represents the payments made by the firms to the households for the services provided by the latter.

Since the same amount of money, representing the aggregate value of goods and services, is moving in a circular way, if we want to estimate the aggregate value of goods and services produced during a year we can measure the annual value of the flows at any of the dotted lines indicated in the diagram. We can measure the uppermost flow (at point A) by measuring the aggregate value of spending that the firms receive for the final goods and services which they produce. This method will be called the **expenditure method**. If we measure the flow at B by measuring the aggregate value of final goods and services produced by all



the firms, it will be called **product method**. At C, measuring the sum total of all factor payments will be called **income method**.

Observe that the aggregate spending of the economy must be equal to the aggregate income earned by the factors of production (the flows are equal at A and C). Now let us suppose that at a particular period of time the households decide to spend more on the goods and services produced by the firms. For the time being let us ignore the question where they would find the money to finance that extra spending since they are already spending all of their income (they may have borrowed the money to finance the additional spending). Now if they spend more on the goods and services, the firms will produce more goods and services to meet this extra demand. Since they will produce more, the firms must also pay the factors of production extra remunerations. How much extra amount of money will the firms pay? The additional factor payments must be equal to the value of the additional goods and services that are being produced. Thus the households will eventually get the extra earnings required to support the initial additional spending that they had undertaken. In other words, the households can decide to spend more – spend beyond their means. And in the end their income will rise exactly by the amount which is necessary to carry out the extra spending. Putting it differently, an economy may decide to spend more than the present level of income. But by doing so, its income will eventually rise to a level consistent with the higher spending level. This may seem a little paradoxical at first. But since income is moving in a circular fashion, it is not difficult to figure out that a rise in the flow at one point must eventually lead to a rise in the flow at all levels. This is one more example of how the functioning of a single economic agent (say, a household) may differ from the functioning of the economy as a whole. In the former the spending gets restricted by the individual income of a household. It can never happen that a single worker decides to spend more and this leads to an equivalent rise in her income. We shall spend more time on how higher aggregate spending leads to change in aggregate income in a later chapter.

The above mentioned sketchy illustration of an economy is admittedly a simplified one. Such a story which describes the functioning of an imaginary economy is called a **macroeconomic model**. It is clear that a model does not describe an actual economy in detail. For example, our model assumes that households do not save, there is no government, no trade with other countries. However models do not want to capture an economy in its every minute detail – their purpose is to highlight some essential features of the functioning of an economic system. But one has to be cautious not to simplify the matters in such a way that misrepresents the essential nature of the economy. The subject of economics is full of models, many of which will be presented in this book. One task of an economist is to figure out which model is applicable to which real life situation.

If we change our simple model described above and introduce savings, will it change the principal conclusion that the aggregate estimate of the income of the economy will remain the same whether we decide to calculate it at A, B or C? It turns out that this conclusion does not change in a fundamental way. No matter how complicated an economic system may be, the annual production of goods and services estimated through each of the three methods is the same.

We have seen that the aggregate value of goods and services produced in an economy can be calculated by three methods. We now discuss the detailed steps of these calculations.

2.2.1 The Product or Value Added Method

In product method we calculate the aggregate annual value of goods and services produced (if a year is the unit of time). How to go about doing this? Do we add up the value of all goods and services produced by all the firms in an economy? The following example will help us to understand.

Let us suppose that there are only two kinds of producers in the economy. They are the wheat producers (or the farmers) and the bread makers (the bakers). The wheat producers grow wheat and they do not need any input other than human labour. They sell a part of the wheat to the bakers. The bakers do not need any other raw materials besides wheat to produce bread. Let us suppose that in a year the total value of wheat that the farmers have produced is Rs 100. Out of this they have sold Rs 50 worth of wheat to the bakers. The bakers have used this amount of wheat completely during the year and have produced Rs 200 worth of bread. What is the value of total production in the economy? If we follow the simple way of aggregating the values of production of the sectors, we would add Rs 200 (value of production of the bakers) to Rs 100 (value of production of farmers). The result will be Rs 300.

A little reflection will tell us that the value of aggregate production is not Rs 300. The farmers had produced Rs 100 worth of wheat for which it did not need assistance of any inputs. Therefore the entire Rs 100 is rightfully the contribution of the farmers. But the same is not true for the bakers. The bakers had to buy Rs 50 worth of wheat to produce their bread. The Rs 200 worth of bread that they have produced is not entirely their own contribution. To calculate the net contribution of the bakers, we need to subtract the value of the wheat that they have bought from the farmers. If we do not do this we shall commit the mistake of 'double counting'. This is because Rs 50 worth of wheat will be counted twice. First it will be counted as part of the output produced by the farmers. Second time, it will be counted as the imputed value of wheat in the bread produced by the bakers.

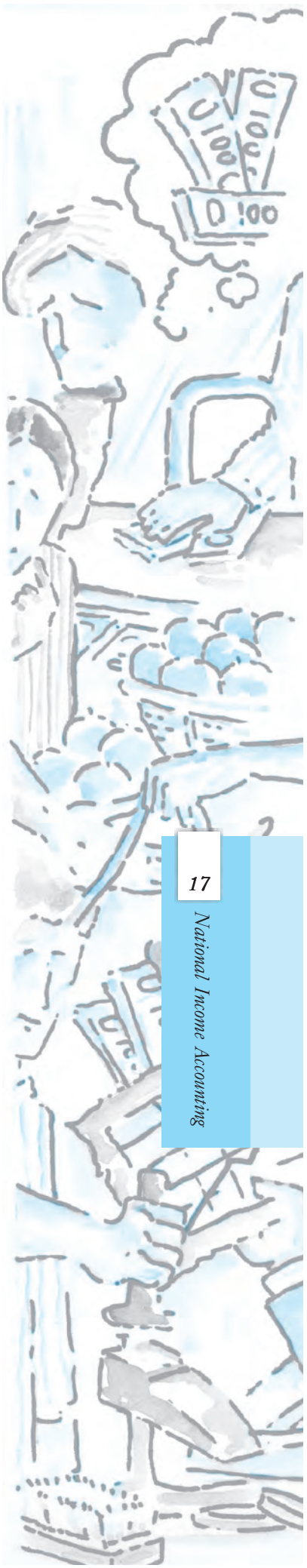
Therefore, the net contribution made by the bakers is, Rs 200 – Rs 50 = Rs 150. Hence, aggregate value of goods produced by this simple economy is Rs 100 (net contribution by the farmers) + Rs 150 (net contribution by the bakers) = Rs 250.

The term that is used to denote the net contribution made by a firm is called its **value added**. We have seen that the raw materials that a firm buys from another firm which are completely used up in the process of production are called 'intermediate goods'. Therefore the value added of a firm is, *value of production of the firm – value of intermediate goods used by the firm*. The value added of a firm is distributed among its four factors of production, namely, labour, capital, entrepreneurship and land. Therefore wages, interest, profits and rents paid out by the firm must add up to the value added of the firm. Value added is a flow variable.

Table 2.1: **Production, Intermediate Goods and Value Added**

	Farmer	*Baker*
Total production	100	200
Intermediate goods used	0	50
Value added	100	200 – 50 =150

We can represent the example given above in terms of Table 2.1.



Here all the variables are expressed in terms of money. We can think of the market prices of the goods being used to evaluate the different variables listed here. And we can introduce more players in the chain of production in the example and make it more realistic and complicated. For example, the farmer may be using fertilisers or pesticides to produce wheat. The value of these inputs will have to be deducted from the value of output of wheat. Or the bakers may be selling the bread to a restaurant whose value added will have to be calculated by subtracting the value of intermediate goods (bread in this case).

We have already introduced the concept of depreciation, which is also known as consumption of fixed capital. Since the capital which is used to carry out production undergoes wear and tear, the producer has to undertake replacement investments to keep the value of capital constant. The replacement investment is same as depreciation of capital. If we include depreciation in value added then the measure of value added that we obtain is called **Gross Value Added**. If we deduct the value of depreciation from gross value added we obtain **Net Value Added**. Unlike gross value added, net value added does not include wear and tear that capital has undergone. For example, let us say a firm produces Rs 100 worth of goods per year, Rs 20 is the value of intermediate goods used by it during the year and Rs 10 is the value of capital consumption. The gross value added of the firm will be, Rs 100 – Rs 20 = Rs 80 per year. The net value added will be, Rs 100 – Rs 20 – Rs 10 = Rs 70 per year.

It is to be noted that while calculating the value added we are taking the *value of production* of firm. But a firm may be unable to sell all of its produce. In such a case it will have some unsold stock at the end of the year. Conversely, it may so happen that a firm had some initial unsold stock to begin with. During the year that follows it has produced very little. But it has met the demand in the market by selling from the stock it had at the beginning of the year. How shall we treat these stocks which a firm may intentionally or unintentionally carry with itself? Also, let us remember that a firm buys raw materials from other firms. The part of raw material which gets used up is categorised as an intermediate good. What happens to the part which does not get used up?

In economics, the stock of unsold finished goods, or semi-finished goods, or raw materials which a firm carries from one year to the next is called **inventory**. Inventory is a stock variable. It may have a value at the beginning of the year; it may have a higher value at the end of the year. In such a case inventories have increased (or accumulated). If the value of inventories is less at the end of the year compared to the beginning of the year, inventories have decreased (decumulated). We can therefore infer that the *change of inventories of a firm during a year ≡ production of the firm during the year – sale of the firm during the year.*

The sign '≡' stands for identity. Unlike equality ('='), an identity always holds irrespective of what variables we have on the left hand and right hand sides of it. For example, we can write $2 + 2 \equiv 4$, because this is always true. But we must write $2 \times x = 4$. This is because two times x equals to 4 for a particular value of x, (namely when $x = 2$) and not always. We cannot write $2 \times x \equiv 4$.

Observe that since production of the firm ≡ value added + intermediate goods used by the firm, we get, change of inventories of a firm during a year ≡ value added + intermediate goods used by the firm – sale of the firm during a year.

For example, let us suppose that a firm had an unsold stock worth of Rs 100 at the beginning of a year. During the year it had produced Rs 1,000

worth of goods and managed to sell Rs 800 worth of goods. Therefore, the Rs 200 is the difference between production and sales. This Rs 200 worth of goods is the change in inventories. This will add to the Rs 100 worth of inventories the firm started with. Hence the inventories at the end of the year is, Rs 100 + Rs 200 = Rs 300. Notice that change in inventories takes place over a period of time. Therefore it is a **flow variable**.

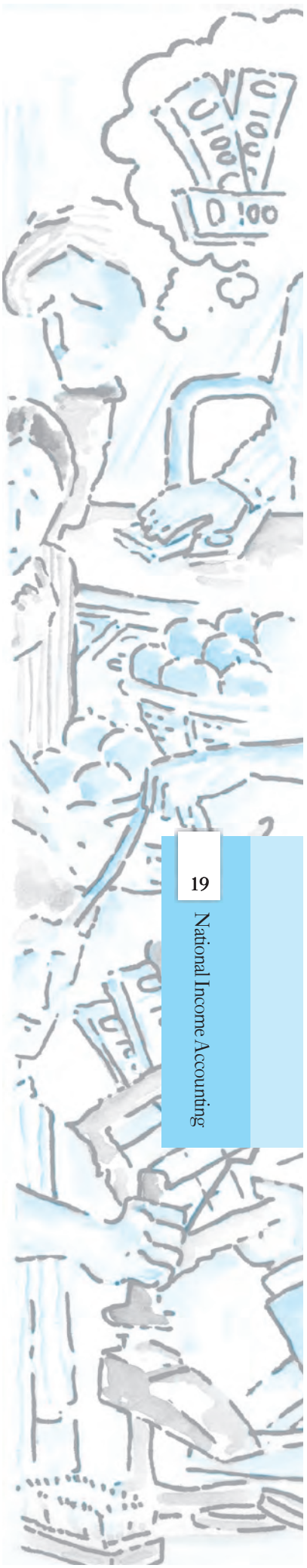
Inventories are treated as capital. Addition to the stock of capital of a firm is known as **investment**. Therefore, change in the inventory of a firm is treated as investment. There can be three major categories of investment. First is the rise in the value of inventories of a firm over a year which is treated as investment expenditure undertaken by the firm. The second category of investment is the fixed business investment, which is defined as the addition to the machinery, factory buildings and equipment employed by the firms. The last category of investment is the residential investment, which refers to the addition of housing facilities.

Change in inventories may be planned or unplanned. In case of an unexpected fall in sales, the firm will have unsold stock of goods which it had not anticipated. Hence there will be **unplanned accumulation of inventories**. In the opposite case where there is unexpected rise in the sales there will be **unplanned decumulation of inventories**.

This can be illustrated with the help of the following example. Suppose a firm produces shirts. It starts the year with an inventory of 100 shirts. During the coming year it expects to sell 1,000 shirts. Hence, it produces 1,000 shirts, expecting to keep an inventory of 100 at the end of the year. However, during the year, the sales of shirts turn out to be unexpectedly low. The firm is able to sell only 600 shirts. This means that the firm is left with 400 unsold shirts. The firm ends the year with 400 + 100 = 500 shirts. The unexpected rise of inventories by 400 will be an example of unplanned accumulation of inventories. If, on the other hand, the sales had been more than 1,000 we would have unplanned decumulation of inventories. For example, if the sales had been 1,050, then not only the production of 1,000 shirts will be sold, the firm will have to sell 50 shirts out of the inventory. This 50 unexpected reduction in inventories is an example of unexpected decumulation of inventories.

What can be the examples of **planned accumulation** or **decumulation of inventories?** Suppose the firm wants to raise the inventories from 100 shirts to 200 shirts during the year. Expecting sales of 1,000 shirts during the year (as before), the firm produces 1000 + 100 = 1,100 shirts. If the sales are actually 1,000 shirts, then the firm indeed ends up with a rise of inventories. The new stock of inventories is 200 shirts, which was indeed planned by the firm. This rise is an example of planned accumulation of inventories. On the other hand if the firm had wanted to reduce the inventories from 100 to 25 (say), then it would produce 1000 – 75 = 925 shirts. This is because it plans to sell 75 shirts out of the inventory of 100 shirts it started with (so that the inventory at the end of the year becomes 100 – 75 = 25 shirts, which the firm wants). If the sales indeed turn out to be 1000 as expected by the firm, the firm will be left with the planned, reduced inventory of 25 shirts.

We shall have more to say on the distinction between unplanned and planned change in inventories in the chapters which follow.



Taking cognizance of change of inventories we may write

Gross value added of firm, i ($GVAi$) ≡ Gross value of the output produced by the firm i (Qi) – Value of intermediate goods used by the firm (Zi)

$GVAi$ ≡ Value of sales by the firm (Vi) + Value of change in inventories (Ai) – Value of intermediate goods used by the firm (Zi) (2.1)

Equation (2.1) has been derived by using: Change in inventories of a firm during a year ≡ Production of the firm during the year – Sale of the firm during the year.

It is worth noting that the sales by the firm includes sales not only to domestic buyers but also to buyers abroad (the latter is termed as exports). It is also to be noted that all the above mentioned variables are flow variables. Generally these are measured on an annual basis. Hence they measure value of the flows per year.

Net value added of the firm i ≡ $GVAi$ – Depreciation of the firm i (Di)

If we sum the gross value added of all the firms of the economy in a year, we get a measure of the value of aggregate amount of goods and services produced by the economy in a year (just as we had done in the wheat-bread example). Such an estimate is called **Gross Domestic Product** (**GDP**). Thus GDP ≡ Sum total of gross value added of all the firms in the economy.

If there are N firms in the economy, each assigned with a serial number from 1 to N, then GDP ≡ Sum total of the gross value added of all the firms in the economy

$$\equiv GVA_1 + GVA_2 + ... + GVA_N$$

Therefore

$$\text{GDP} \equiv \sum_{i=1}^{N} GVA_i \qquad (2.2)$$

The symbol $\sum$ is a notation – it is used to denote summation. Suppose, there are 3 students, having pocket money of Rs. 200, 250 and 350 respectively. We can say, if i^{th} student has pocket money X_i, then, $X_1 = 200, X_2 = 250, X_3 = 300$. The total pocket money will be given by $X_1 + X_2 + X_3$. The summation notation given above is useful in writing it in a shorter form: $X_1 + X_2 + X_3$ can be written as $\sum_{i=1}^{3} X_i$, which means that there are three values of X corresponding to the three individuals 1 to 3, and we are referring to the sum of the values of X for individuals 1 to 3. This notation is particularly useful in macroeconomics since we deal with aggregates. For instance, suppose there are 1000 consumers in the economy, having consumption $c_1, c_2, ..., c_{1000}$. If we want to compute the aggregate consumption for this economy, we have to add up all these values, which means aggregate consumption for this economy will be given by $C = c_1 + c_2 + ... + c_{1000}$. The summation notation, however, allows us to write it in a much shorter form. Since we are summing up the values of consumption for individual 1 to individual 1000, where the value of

consumption for the individual i is c_i, aggregate consumption will be $C = \sum_{i=1}^{1000} c_i$.

In general, if we are taking sum of a quantity x_i over individuals 1 to n, it will be denoted by $\sum_{i=1}^{n} x_i$.

2.2.2 Expenditure Method

An alternative way to calculate the GDP is by looking at the demand side of the products. This method is referred to as the expenditure method. In the farmer-baker example that we have described before, the aggregate value of the output in the economy by expenditure method will be calculated in the following way. In this method we add the final expenditures that each firm makes. Final expenditure is that part of expenditure which is undertaken not for intermediate purposes. The Rs 50 worth of wheat which the bakers buy from the farmers counts as intermediate goods, hence it does not fall under the category of final expenditure. Therefore the aggregate value of output of the economy is Rs 200 (final expenditure received by the baker) + Rs 50 (final expenditure received by the farmer) = Rs 250 per year.

Firm *i* can make the final expenditure on the following accounts (a) the final consumption expenditure on the goods and services produced by the firm. We shall denote this by C_i. We may note that mostly it is the households which undertake consumption expenditure. There may be exceptions when the firms buy consumables to treat their guests or for their employees (b) the final investment expenditure, I_i, incurred by other firms on the capital goods produced by firm *i*. Observe that unlike the expenditure on intermediate goods which is not included in the calculation of GDP, expenditure on investments is included. The reason is that investment goods remain with the firm, whereas intermediate goods are consumed in the process of production (c) the expenditure that the government makes on the final goods and services produced by firm *i*. We shall denote this by G_i. We may point out that the final expenditure incurred by the government includes both the consumption and investment expenditure (d) the export revenues that firm *i* earns by selling its goods and services abroad. This will be denoted by X_i.

Thus the sum total of the revenues that the firm *i* earns is given by

$RV_i \equiv$ Sum total of final consumption, investment, government and exports expenditures received by the firm *i*

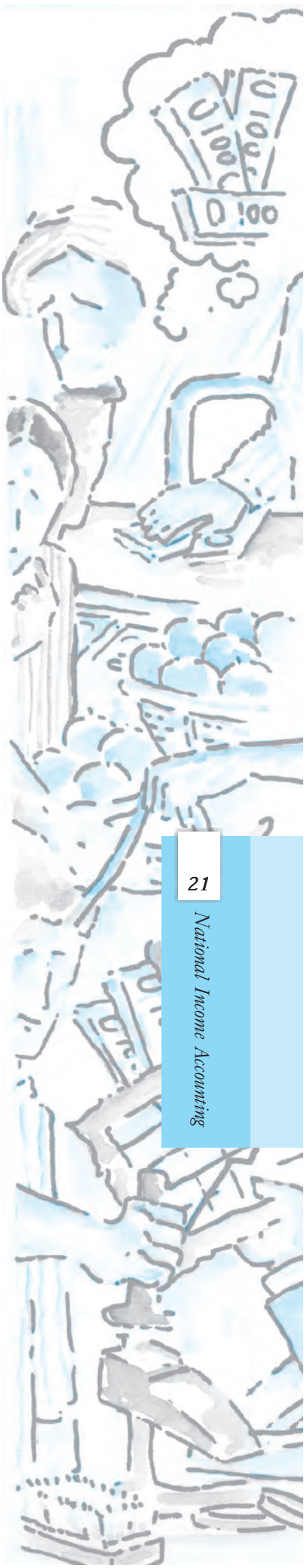
$$\equiv C_i + I_i + G_i + X_i$$

If there are *N* firms then summing over *N* firms we get

$\sum_{i=1}^{N} RV_i \equiv$ Sum total of final consumption, investment, government and exports expenditures received by all the firms in the economy

$$\equiv \sum_{i=1}^{N} C_i + \sum_{i=1}^{N} I_i + \sum_{i=1}^{N} G_i + \sum_{i=1}^{N} X_i \qquad (2.3)$$

Let *C* be the aggregate final consumption expenditure of the entire economy. Notice that a part of *C* is spent on imports of consumption goods *C*



$= \sum_{i=1}^{N} C_i + C_m$. Let C_m denote expenditure on the imports of consumption goods. Therefore $C - C_m$ denotes that part of aggregate final consumption expenditure that is spent on the domestic firms. Similarly, let $I - I_m$ stand for that part of aggregate final investment expenditure that is spent on domestic firms, where I is the value of the aggregate final investment expenditure of the economy and out of this I_m is spent on foreign investment goods. Similarly $G - G_m$ stands for that part of aggregate final government expenditure that is spent on the domestic firms, where G is the aggregate expenditure of the government of the economy and G_m is the part of G which is spent on imports.

Therefore, $\sum_{i=1}^{N} C_i \equiv$ Sum total of final consumption expenditures received by all the firms in the economy $\equiv C - C_m$; $\sum_{i=1}^{N} I_i \equiv$ Sum total of final investment expenditures received by all the firms in the economy $\equiv I - I_m$; $\sum_{i=1}^{N} G_i \equiv$ Sum total of final government expenditures received by all the firms in the economy $\equiv G - G_m$. Substituting these in equation (2.3) we get

$$\begin{aligned}\sum_{i=1}^{N} RV_i &\equiv C - C_m + I - I_m + G - G_m + \sum_{i=1}^{N} X_i \\ &\equiv C + I + G + \sum_{i=1}^{N} X_i - (C_m + I_m + G_m) \\ &\equiv C + I + G + X - M\end{aligned}$$

Here $X \equiv \sum_{i=1}^{N} X_i$ denotes aggregate expenditure by the foreigners on the exports of the economy. $M \equiv C_m + I_m + G_m$ is the aggregate imports expenditure incurred by the economy.

We know, GDP $\equiv$ Sum total of all the final expenditure received by the firms in the economy.

In other words

$$\text{GDP} \equiv \sum_{i=1}^{N} RV_i \equiv C + I + G + X - M \qquad (2.4)$$

Equation (2.4) expresses GDP according to the expenditure method. It may be noted that out of the five variables on the right hand side, investment expenditure, I, is the most unstable.

2.2.3 Income Method

As we mentioned in the beginning, the sum of final expenditures in the economy must be equal to the incomes received by all the factors of production taken together (final expenditure is the spending on final goods, it does not include spending on intermediate goods). This follows from the simple idea that the revenues earned by all the firms put together must be distributed among the factors of production as salaries, wages, profits, interest earnings and rents. Let there be M number of households in the economy. Let W_i be the wages and salaries received by the i-th household in a particular year. Similarly, P_i, In_i, R_i be the gross profits, interest payments and rents received by the i-th household in a particular year. Therefore, GDP is given by

$$\text{GDP} \equiv \sum_{i=1}^{M} W_i + \sum_{i=1}^{M} P_i + \sum_{i=1}^{M} In_i + \sum_{i=1}^{M} R_i \equiv W + P + In + R \qquad (2.5)$$

Here, $\sum_{i=1}^{M} W_i \equiv \text{W}$, $\sum_{i=1}^{M} P_i \equiv \text{P}$, $\sum_{i=1}^{M} In_i \equiv \text{In}$, $\sum_{i=1}^{M} R_i \equiv \text{R}$.

Taking equations (2.2), (2.4) and (2.5) together we get

$$\text{GDP} \equiv \sum_{i=1}^{N} GV\ A_i \equiv C + I + G + X - M \equiv W + P + In + R \qquad (2.6)$$

It is to be noted that in identity (2.6), I stands for sum total of both planned and unplanned investments undertaken by the firms.

Since, the identities (2.2), (2.4) and (2.6) are different expressions of the same variable, namely GDP, we may represent the equivalence by Fig. 2.2.

Now, let us look at a numerical example to see how all the three methods of estimating GDP give us the same answer.

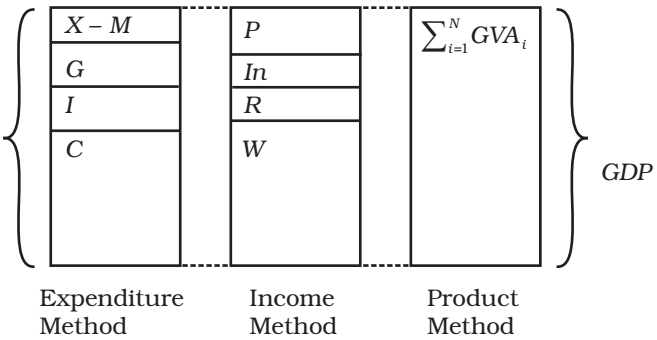


Fig. 2.2: Diagramtic Representation of GDP by the Three Methods

Example: There are two firms, A and B. Suppose A uses no raw material and produces cotton worth Rs. 50. A sells its cotton to firm B, who uses it to produce cloth. B sells the cloth produced to consumers for Rs. 200.

1. GDP in the phase of production or the value added method:
Recall that value added (VA) = Sales – Intermediate Goods
Thus,

$VA_A = 50 - 0 = 50$
$VA_B = 200 - 50 = 150$

Thus,

$GDP = VA_A + VA_B = 200.$

Table 2.2: Distributions of GDPs for firms A and B

	Firm A	Firm B
Sales	50	200
Intermediate consumption	0	50
Value added	50	150

2. GDP in the phase of disposition or the expenditure method:
Recall that GDP = Sum of final expenditure or expenditures on goods and services for end use. In the above case, final expenditure is expenditure by consumers on cloth. Therefore, GDP = 200.

3. GDP in the phase of distribution or Income method
Let us look at the firms A and B again.

Now, of this 50 received by A, the firm gives Rs. 20 to the workers as wages, and keeps the remaining 30 as its profits. Similarly, B gives 60 as wages and keeps 90 as profits.

Table 2.3: Distributions of factor incomes of firms A and B

	Firm A	Firm B
Wages	20	60
Profits	30	90

Recall that GDP by income method = sum total of factor incomes, which is equal to total wages received (workers of A and B) and total profits earned (by A and B), which is equal[4] to 80 + 120 = 200.

2.2.4 Factor Cost, Basic Prices and Market Prices

In India, the most highlighted measure of national income has been the GDP at factor cost. The Central Statistics Office (CSO) of the Government of India has been reporting the GDP at factor cost and at market prices. In its revision in January 2015 the CSO replaced GDP at factor cost with the GVA at basic prices, and the GDP at market prices, which is now called only GDP, is now the most highlighted measure.

The idea of GVA has already been discussed: it is the value of total output produced in the economy less the value of intermediate consumption (the output which is used in production of output further, and not used in final consumption). Here we discuss the concept of basic prices. The distinction between factor cost, basic prices and market prices is based on the distinction between net **production** taxes (production taxes less production subsidies) and net **product** taxes (product taxes less product subsidies). Production taxes and subsidies are paid or received in relation to production and are independent of the volume of production such as land revenues, stamp and registration fee. Product taxes and subsidies, on the other hand, are paid or received per unit or product, e.g., excise tax, service tax, export and import duties etc. Factor cost includes only the payment to factors of production, it does not include any tax. In order to arrive at the market prices, we have to add to the factor cost the total indirect taxes less total subsidies. The basic prices lie in between: they include the production taxes (less production subsidies) but not product taxes (less product subsidies). Therefore in order to arrive at market prices we have to add product taxes (less product subsidies) to the basic prices.

As stated above, now the CSO releases GVA at basic prices. Thus, it includes the net production taxes but not net product taxes. In order to arrive at the GDP (at market prices) we need to add net product taxes to GVA at basic prices. Thus,

GVA at factor costs + Net production taxes = GVA at basic prices

GVA at basic prices + Net product taxes = GVA at market prices

Table 2.5 at the end of the chapter gives the figures for GDP (at market prices) and GVA at basic prices, while Table 2.6 gives the composition of GDP from expenditure side.

[4] In this example, we have left out factor payments in the form of rent and interest. But this will not make any difference to the basic result, because after paying wages the remainder of value added by a firm will be distributed between rent, interest and profits (together called operating surplus).

2.3 Some Macroeconomic Identities

Gross Domestic Product measures the aggregate production of final goods and services taking place within the domestic economy during a year. But the whole of it may not accrue to the citizens of the country. For example, a citizen of India working in Saudi Arabia may be earning her wage and it will be included in the Saudi Arabian GDP. But legally speaking, she is an Indian. Is there a way to take into account the earnings made by Indians abroad or by the factors of production owned by Indians? When we try to do this, in order to maintain symmetry, we must deduct the earnings of the foreigners who are working within our domestic economy, or the payments to the factors of production owned by the foreigners. For example, the profits earned by the Korean-owned Hyundai car factory will have to be subtracted from the GDP of India. The macroeconomic variable which takes into account such additions and subtractions is known as **Gross National Product (GNP)**. It is, therefore, defined as follows

The foreigners have a share in your domestic economy. Discuss this in the classroom.

GNP ≡ GDP + Factor income earned by the domestic factors of production employed in the rest of the world – Factor income earned by the factors of production of the rest of the world employed in the domestic economy

Hence, GNP ≡ GDP + Net factor income from abroad

(Net factor income from abroad = Factor income earned by the domestic factors of production employed in the rest of the world – Factor income earned by the factors of production of the rest of the world employed in the domestic economy).

We have already noted that a part of the capital gets consumed during the year due to wear and tear. This wear and tear is called depreciation. Naturally, depreciation does not become part of anybody's income. If we deduct depreciation from GNP the measure of aggregate income that we obtain is called **Net National Product (NNP)**. Thus

NNP ≡ GNP – Depreciation

It is to be noted that all these variables are evaluated at market prices. Through the expression given above, we get the value of NNP evaluated at market prices. But market price includes **indirect taxes**. When indirect taxes are imposed on goods and services, their prices go up. Indirect taxes accrue to the government. We have to deduct them from NNP evaluated at market prices in order to calculate that part of NNP which actually accrues to the factors of production. Similarly, there may be **subsidies** granted by the government on the prices of some commodities (in India petrol is heavily taxed by the government, whereas cooking gas is subsidised). So we need to add subsidies to the NNP evaluated at market prices. The measure that we obtain by doing so is called **Net National Product at factor cost** or **National Income**.

Thus, NNP at factor cost ≡ National Income (NI) ≡ NNP at market prices – (Indirect taxes – Subsidies) ≡ NNP at market prices – Net indirect taxes (Net indirect taxes ≡ Indirect taxes – Subsidies)

We can further subdivide the National Income into smaller categories. Let us try to find the expression for the part of NI which is received by households. We shall call this **Personal Income** (**PI**). First, let us note that out of NI, which is earned by the firms and government enterprises, a part of profit is not distributed among the factors of production. This is called **Undistributed Profits** (**UP**). We have to deduct UP from NI to arrive at PI, since UP does not accrue to the households. Similarly, Corporate Tax, which is imposed on the earnings made by the firms, will also have to be deducted from the NI, since it does not accrue to the households. On the other hand, the households do receive interest payments from private firms or the government on past loans advanced by them. And households may have to pay interests to the firms and the government as well, in case they had borrowed money from either. So, we have to deduct the net interests paid by the households to the firms and government. The households receive transfer payments from government and firms (pensions, scholarship, prizes, for example) which have to be added to calculate the Personal Income of the households.

Thus, Personal Income (PI) ≡ NI – Undistributed profits **– Net interest payments made by households – Corporate tax + Transfer payments to the households from the government and firms.**

However, even PI is not the income over which the households have complete say. They have to pay taxes from PI. If we deduct the **Personal Tax Payments** (income tax, for example) and **Non-tax Payments** (such as fines) from PI, we obtain what is known as the Personal Disposable Income. Thus

Personal Disposable Income (PDI) ≡ PI – Personal tax payments – Non-tax payments.

Personal Disposable Income is the part of the aggregate income which belongs to the households. They may decide to consume a part of it, and save the rest. In Fig. 2.3 we present a diagrammatic representation of the relations between these major macroeconomic variables.

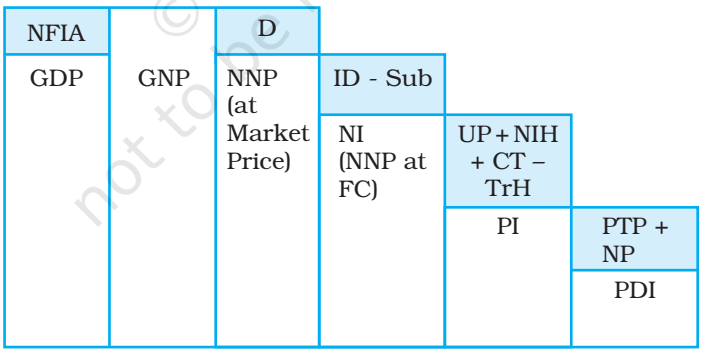


Fig. 2.3: *Diagrammatic representation of the subcategories of aggregate income. NFIA: Net Factor Income from Abroad, D: Depreciation, ID: Indirect Taxes, Sub: Subsidies, UP: Undistributed Profits, NIH: Net Interest Payments by Households, CT: Corporate Taxes, TrH: Transfers recived by Households, PTP: Personal Tax Payments, NP: Non-Tax Payments.*

National Disposable Income and Private Income

Apart from these categories of aggregate macroeconomic variables, in India, a few other aggregate income categories are also used in National Income accounting

- **National Disposable Income** = Net National Product at market prices + Other current transfers from the rest of the world

The idea behind National Disposable Income is that it gives an idea of

what is the maximum amount of goods and services the domestic economy has at its disposal. Current transfers from the rest of the world include items such as gifts, aids, etc.

- **Private Income** = Factor income from net domestic product accruing to the private sector + National debt interest + Net factor income from abroad + Current transfers from government + Other net transfers from the rest of the world.

Table 2.4: Basic National Income Aggregates[5]

1.	**Gross Domestic Product at Market Prices (GDP_{MP})**	• GDP is the market value of all final goods and services produced within a domestic territory of a country measured in a year. • All production done by the national residents or the non-residents in a country gets included, regardless of whether that production is owned by a local company or a foreign entity. • Everything is valued at market prices. $GDP_{MP} = C + I + G + X - M$
2.	**GDP at Factor Cost (GDP_{FC})**	• GDP at factor cost is gross domestic product at market prices, less net product taxes. • Market prices are the prices as paid by the consumers Market prices also include product taxes and subsides. The term factor cost refers to the prices of products as received by the producers. Thus, factor cost is equal to market prices, minus net indirect taxes. GDP at factor cost measures money value of output produced by the firms within the domestic boundaries of a country in a year. $GDP_{FC} = GDP_{MP} - NIT$
3.	**Net Domestic Product at Market Prices (NDP_{MP})**	• This measure allows policy-makers to estimate how much the country has to spend just to maintain their current GDP. If the country is not able to replace the capital stock lost through depreciation, then GDP will fall. $NDP_{MP} = GDP_{MP} - Dep.$
4.	**NDP at Factor Cost (NDP_{FC})**	• NDP at factor cost is the income earned by the factors in the form of wages, profits, rent, interest, etc., within the domestic territory of a country. $NDP_{FC} = NDP_{MP} - Net\ Product\ Taxes - Net\ Production\ Taxes$

[5]Following the System of National Accounts 2008 (SNA2008) given by the United Nations in partnership with some other agencies, countries are now switching to new aggregates. India shifted to these aggregates a few years back.

5.	**Gross National Product at Market Prices (GNP_{MP})**	• GNP_{MP} is the value of all the final goods and services that are produced by the normal residents of India and is measured at the market prices, in a year. • GNP refers to all the economic output produced by a nation's normal residents, whether they are located within the national boundary or abroad. • Everything is valued at the market prices. $GNP_{MP} = GDP_{MP} + NFIA$
6.	**GNP at Factor Cost (GNP_{FC})**	• GNP at factor cost measures value of output received by the factors of production belonging to a country in a year. $GNP_{FC} = GNP_{MP} - Net\ Product\ Taxes - Net\ Production\ Taxes$
7.	**Net National Product at Market Prices (NNP_{MP})**	• This is a measure of how much a country can consume in a given period of time. NNP measures output regardless of where that production has taken place (in domestic territory or abroad). $NNP_{MP} = GNP_{MP} - Depreciation$ $NNP_{MP} = NDP_{MP} + NFIA$
8.	**NNP at Factor Cost (NNP_{FC})** **Or** **National Income (NI)**	• NNP at factor cost is the sum of income earned by all factors in the production in the form of wages, profits, rent and interest, etc., belonging to a country during a year. • It is the National Product and is not bound by production in the national boundaries. It is the net domestic factor income added with the net factor income from abroad. $NI = NNP_{MP} - Net\ Product\ Taxes - Net\ Production\ Taxes$ $= NDP_{FC} + NFIA = NNP_{FC}$
9.	**GVA at Market Prices**	• GDP at market prices
10.	**GVA at basic prices**	• GVA_{MP} - Net Product Taxes
11.	**GVA at factor cost**	• GVA at basic prices - Net Production Taxes

2.4 Nominal and Real GDP

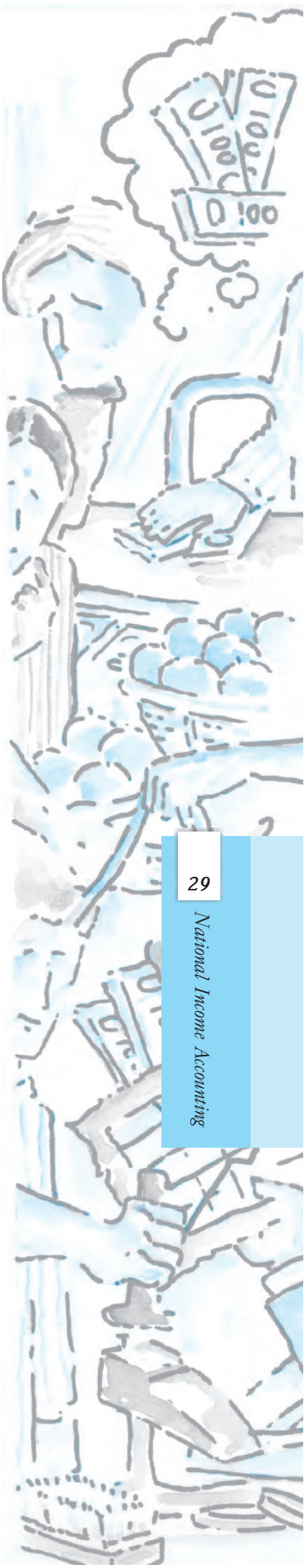
One implicit assumption in all this discussion is that the prices of goods and services do not change during the period of our study. If prices change, then there may be difficulties in comparing GDPs. If we measure the GDP of a country in two consecutive years and see that the figure for GDP of the latter year is twice that of the previous year, we may conclude that the volume of production of the country has doubled. But it is possible that only prices of all goods and services have doubled between the two years whereas the production has remained constant.

Therefore, in order to compare the GDP figures (and other macroeconomic variables) of different countries or to compare the GDP figures of the same country at different points of time, we cannot rely on GDPs evaluated at current market prices. For comparison we take the help of **real GDP**. Real GDP is calculated in a way such that the goods and services are evaluated at some **constant set of prices** (or **constant prices**). Since these prices remain fixed, if the Real GDP changes we can be sure that it is the volume of production which is undergoing changes. **Nominal GDP**, on the other hand, is simply the value of GDP at the current prevailing prices. For example, suppose a country only produces bread. In the year 2000 it had produced 100 units of bread, price was Rs 10 per bread. GDP at current price was Rs 1,000. In 2001 the same country produced 110 units of bread at price Rs 15 per bread. Therefore nominal GDP in 2001 was Rs 1,650 (=110 × Rs 15). Real GDP in 2001 calculated at the price of the year 2000 (2000 will be called the base year) will be 110 × Rs 10 = Rs 1,100.

Notice that the ratio of nominal GDP to real GDP gives us an idea of how the prices have moved from the **base year** (the year whose prices are being used to calculate the real GDP) to the current year. In the calculation of real and nominal GDP of the current year, the volume of production is fixed. Therefore, if these measures differ it is only due to change in the price level between the base year and the current year. The ratio of nominal to real GDP is a well known index of prices. This is called **GDP Deflator**. Thus if GDP stands for nominal GDP and gdp stands for real GDP then, GDP deflator = $\frac{\text{GDP}}{\text{gdp}}$.

Sometimes the deflator is also denoted in percentage terms. In such a case deflator = $\frac{\text{GDP}}{\text{gdp}}$ × 100 per cent. In the previous example, the GDP deflator is $\frac{1,650}{1,100}$ = 1.50 (in percentage terms this is 150 per cent). This implies that the price of bread produced in 2001 was 1.5 times the price in 2000. Which is true because price of bread has indeed gone up from Rs 10 to Rs 15. Like GDP deflator, we can have GNP deflator as well.

There is another way to measure change of prices in an economy which is known as the **Consumer Price Index** (**CPI**). This is the index of prices of a given basket of commodities which are bought by the representative consumer. CPI is generally expressed in percentage terms. We have two years under consideration – one is the base year, the other is the current year. We calculate the cost of purchase of a given basket of commodities in the base year. We also calculate the cost of purchase of the same basket in the current year. Then we express the latter as a percentage of the former. This gives us the Consumer Price Index of the current year vis-´a-vis the base year. For example let us take an economy which produces two goods, rice and cloth. A representative consumer buys 90 kg of rice and 5 pieces of cloth in a year. Suppose in the



year 2000 the price of a kg of rice was Rs 10 and a piece of cloth was Rs 100. So the consumer had to spend a total sum of Rs 10 × 90 = Rs 900 on rice in 2000. Similarly, she spent Rs 100 × 5 = Rs 500 per year on cloth. Summation of the two items is, Rs 900 + Rs 500 = Rs 1,400.

Now suppose the prices of a kg of rice and a piece of cloth has gone up to Rs 15 and Rs 120 in the year 2005. To buy the same quantity of rice and clothes the representative will have to spend Rs 1,350 and Rs 600 respectively (calculated in a similar way as before). Their sum will be, Rs 1,350 + Rs 600 = Rs 1,950. The CPI therefore will be $\frac{1,950}{1,400} \times 100 = 139.29$ (approximately).

It is worth noting that many commodities have two sets of prices. One is the retail price which the consumer actually pays. The other is the wholesale price, the price at which goods are traded in bulk. These two may differ in value because of the margin kept by traders. Goods which are traded in bulk (such as raw materials or semi-finished goods) are not purchased by ordinary consumers. Like CPI, the index for wholesale prices is called **Wholesale Price Index** (**WPI**). In countries like USA it is referred to as Producer Price Index (PPI). Notice CPI (and analogously WPI) may differ from GDP deflator because

1. The goods purchased by consumers do not represent all the goods which are produced in a country. GDP deflator takes into account all such goods and services.
2. CPI includes prices of goods consumed by the representative consumer, hence it includes prices of imported goods. GDP deflator does not include prices of imported goods.
3. The weights are constant in CPI – but they differ according to production level of each good in GDP deflator.

2.5 GDP and Welfare

Can the GDP of a country be taken as an index of the welfare of the people of that country? If a person has more income he or she can buy more goods and services and his or her material well-being improves. So it may seem reasonable to treat his or her income level as his or her level of well-being. GDP is the sum total of value of goods and services created within the geographical boundary of a country in a particular year. It gets distributed among the people as incomes (except for retained earnings). So we may be tempted to treat higher level of GDP of a country as an index of greater well-being of the people of that country (to account for price changes, we may take the value of real GDP instead of nominal GDP). But there are at least three reasons why this may not be correct.

1. **Distribution of GDP – how uniform is it:** If the GDP of the country is rising, the welfare may not rise as a consequence. This is because the rise in GDP may be concentrated in the hands of very few individuals or firms. For the rest, the income may in fact have fallen. In such a case the welfare of the entire country cannot be said to have increased. For example, suppose in year 2000, an imaginary country had 100 individuals each earning Rs 10. Therefore the GDP of the country was Rs 1,000 (by income method). In 2001, let us suppose the same country had 90 individuals earning Rs 9 each, and the rest 10 individual earning Rs 20 each. Suppose there had been no change in the prices of goods and services between these two periods. The GDP of the country in the year 2001 was 90 × (Rs 9) + 10 × (Rs 20) = Rs 810 + Rs 200 = Rs 1,010. Observe that

compared to 2000, the GDP of the country in 2001 was higher by Rs10. But this has happened when 90 per cent of people of the country have seen a drop in their real income by 10 per cent (from Rs 10 to Rs 9), whereas only 10 per cent have benefited by a rise in their income by 100 per cent (from Rs 10 to Rs 20). 90 per cent of the people are worse off though the GDP of the country has gone up. If we relate welfare improvement in the country to the percentage of people who are better off, then surely GDP is not a good index.

2. **Non-monetary exchanges:** Many activities in an economy are not evaluated in monetary terms. For example, the domestic services women perform at home are not paid for. The exchanges which take place in the informal sector without the help of money are called barter exchanges. In barter exchanges, goods (or services) are directly exchanged against each other. But since money is not being used here, these exchanges are not registered as part of economic activity. In developing countries, where many remote regions are underdeveloped, these kinds of exchanges do take place, but they are generally not counted in the GDPs of these countries. This is a case of underestimation of GDP. Hence, GDP calculated in the standard manner may not give us a clear indication of the productive activity and well-being of a country.

How uniform is the distribution of GDP? It still seems that a majority of the people are poor and a few benefited.

3. **Externalities:** Externalities refer to the benefits (or harms) a firm or an individual causes to another for which they are not paid (or penalised). Externalities do not have any market in which they can be bought and sold. For example, let us suppose there is an oil refinery which refines crude petroleum and sells it in the market. The output of the refinery is the amount of oil it refines. We can estimate the value added of the refinery by deducting the value of intermediate goods used by the refinery (crude oil in this case) from the value of its output. The value added of the refinery will be counted as part of the GDP of the economy. But in carrying out the production the refinery may also be polluting the nearby river. This may cause harm to the people who use the water of the river. Hence their well being will fall. Pollution may also kill fish or other organisms of the river on which fish survive. As a result, the fishermen of the river may be losing their livelihood. Such harmful effects that the refinery is inflicting on others, for which it will not bear any cost, are called externalities. In this case, the GDP is not taking into account such negative externalities. Therefore, if we take GDP as a measure of welfare of the economy we shall be overestimating the actual welfare. This was an example of negative externality. There can be cases of positive externalities as well. In such cases, GDP will underestimate the actual welfare of the economy.

Summary

At a very fundamental level, the macroeconomy (it refers to the economy that we study in macroeconomics) can be seen as working in a circular way. The firms employ inputs supplied by households and produce goods and services to be sold to households. Households get the remuneration from the firms for the services rendered by them and buy goods and services produced by the firms. So we can calculate the aggregate value of goods and services produced in the economy by any of the three methods (a) measuring the aggregate value of factor payments (income method) (b) measuring the aggregate value of goods and services produced by the firms (product method) (c) measuring the aggregate value of spending received by the firms (expenditure method). In the product method, to avoid double counting, we need to deduct the value of intermediate goods and take into account only the aggregate value of final goods and services. We derive the formulae for calculating the aggregate income of an economy by each of these methods. We also take note that goods can also be bought for making investments and these add to the productive capacity of the investing firms. There may be different categories of aggregate income depending on whom these are accruing to. We have pointed out the difference between GDP, GNP, NNP at market price, NNP at factor cost, PI and PDI. Since prices of goods and services may vary, we have discussed how to calculate the three important price indices (GDP deflator, CPI, WPI). Finally we have noted that it may be incorrect to treat GDP as an index of the welfare of the country.

Key Concepts

Final goods	Consumption goods
Consumer durables	Capital goods
Intermediate goods	Stocks
Flows	Gross investment
Net investment	Depreciation
Wage	Interest
Profit	Rent
Circular flow of income	Product method of calculating National Income
Expenditure method of calculating National Income	Income method of calculating National Income
Macroeconomic model	Input
Value added	Inventories
Planned change in inventories	Unplanned change in inventories
Gross Domestic Product (GDP)	Net Domestic Product (NDP)
Gross National Product (GNP)	Net National Product (NNP) (at market price)
NNP (at factor cost) or National Income (NI)	Undistributed profits
Net interest payments made by households	Corporate tax
Transfer payments to the households from the government and firms	Personal Income (PI)
Personal tax payments	Non-tax payments
Personal Disposable Income (PDI)	National Disposable Income

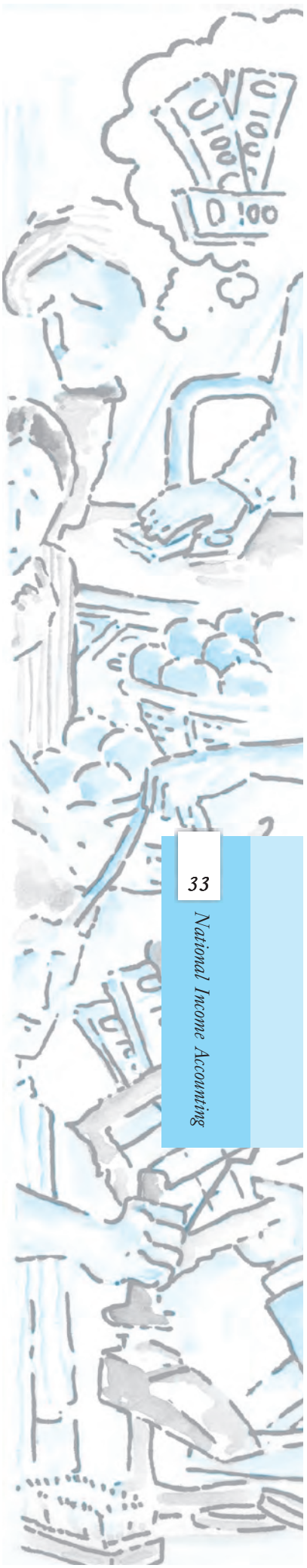
Private Income
Real GDP
GDP Deflator
Wholesale Price Index (WPI)
Nominal GDP
Base year
Consumer Price Index (CPI)
Externalities

Exercises

1. What are the four factors of production and what are the remunerations to each of these called?
2. Why should the aggregate final expenditure of an economy be equal to the aggregate factor payments? Explain.
3. Distinguish between stock and flow. Between net investment and capital which is a stock and which is a flow? Compare net investment and capital with flow of water into a tank.
4. What is the difference between planned and unplanned inventory accumulation? Write down the relation between change in inventories and value added of a firm.
5. Write down the three identities of calculating the GDP of a country by the three methods. Also briefly explain why each of these should give us the same value of GDP.
6. Define budget deficit and trade deficit. The excess of private investment over saving of a country in a particular year was Rs 2,000 crores. The amount of budget deficit was (–) Rs 1,500 crores. What was the volume of trade deficit of that country?
7. Suppose the GDP at market price of a country in a particular year was Rs 1,100 crores. Net Factor Income from Abroad was Rs 100 crores. The value of Indirect taxes – Subsidies was Rs 150 crores and National Income was Rs 850 crores. Calculate the aggregate value of depreciation.
8. Net National Product at Factor Cost of a particular country in a year is Rs 1,900 crores. There are no interest payments made by the households to the firms/government, or by the firms/government to the households. The Personal Disposable Income of the households is Rs 1,200 crores. The personal income taxes paid by them is Rs 600 crores and the value of retained earnings of the firms and government is valued at Rs 200 crores. What is the value of transfer payments made by the government and firms to the households?
9. From the following data, calculate Personal Income and Personal Disposable Income.

		Rs (crore)
(a)	Net Domestic Product at factor cost	8,000
(b)	Net Factor Income from abroad	200
(c)	Undisbursed Profit	1,000
(d)	Corporate Tax	500
(e)	Interest Received by Households	1,500
(f)	Interest Paid by Households	1,200
(g)	Transfer Income	300
(h)	Personal Tax	500

10. In a single day Raju, the barber, collects Rs 500 from haircuts; over this day, his equipment depreciates in value by Rs 50. Of the remaining Rs 450, Raju pays sales tax worth Rs 30, takes home Rs 200 and retains Rs 220 for improvement and buying of new equipment. He further pays Rs 20 as income tax from his income. Based on this information, complete Raju's contribution to the following measures of income (a) Gross Domestic Product (b) NNP



at market price (c) NNP at factor cost (d) Personal income (e) Personal disposable income.

11. The value of the nominal GNP of an economy was Rs 2,500 crores in a particular year. The value of GNP of that country during the same year, evaluated at the prices of same base year, was Rs 3,000 crores. Calculate the value of the GNP deflator of the year in percentage terms. Has the price level risen between the base year and the year under consideration?
12. Write down some of the limitations of using GDP as an index of welfare of a country.

Suggested Readings

1. Bhaduri, A., 1990. *Macroeconomics: The Dynamics of Commodity Production*, pages 1 – 27, Macmillan India Limited, New Delhi.
2. Branson, W. H., 1992. *Macroeconomic Theory and Policy*, (third edition), pages 15 – 34, Harper Collins Publishers India Pvt Ltd., New Delhi.
3. Dornbusch, R and S. Fischer. 1988. *Macroeconomics*, (fourth edition) pages 29–62, McGraw Hill, Paris.
4. Mankiw, N. G., 2000. *Macroeconomics*, (fourth edition) pages 15–76, Macmillan Worth Publishers, New York.

Appendix 2.1

Table 2.5: GVA and GDP for India at constant (2011-12) prices[6]

S.No.	*Item*	*PE (Provisional Estimates) 2017–18 (Rs. Lakh Crore)*
1.	GVA at basic prices	119.76
2.	Net production taxes	10.35
3.	GDP (1+2)	130.11

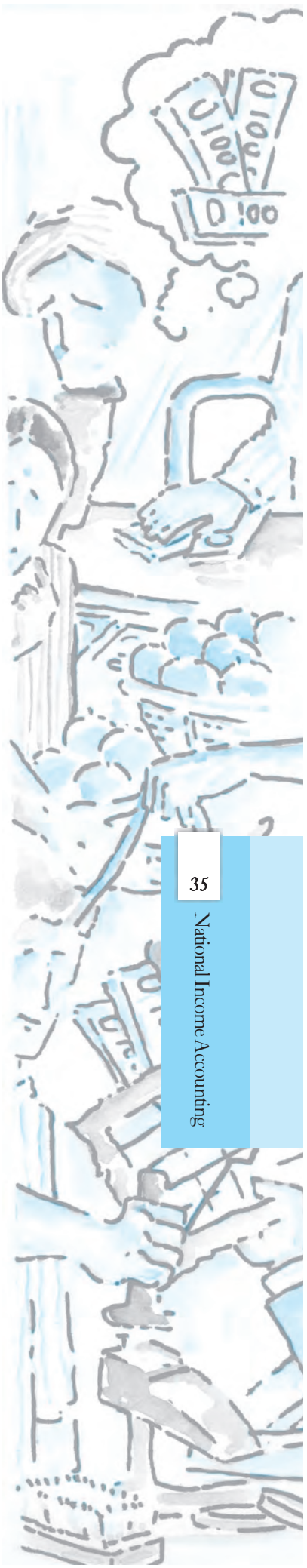
[6]These are provisional estimates released by the CSO in 2018.

Appendix 2.2

Table 2.6: Composition of GDP: expenditure side (2011-12 prices)

S.No.	*Item*	*(First Advance Estimates) 2017–18 (Rs. Lakh Crore)*
1.	Private Final Consumption Expenditure (PFCE)	72.382
2.	Government Final Consumption Expenditure (GFCE)	14.544
3.	Gross Fixed Capital Formation (GFCF)	37.55
4.	Change in Stocks	3.01
5.	Valuables	2.54
	Investment (3+4+5)	**43.20**
6.	Exports of Goods and Services	25.98
7.	Imports of Goods and Services	28.26
	Net Exports (6-7)	**2.28**
8.	Discrepancies	2
9.	**GDP (1+2+3+4+5+6-7+8)**	**129.85**

Source: *CSO in January 5, 2018*



Chapter 5

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Government Budget and the Economy

We introduced the government in chapter one as denoting the state. We stated that apart from the private sector, there is the government which plays a very important role. An economy in which there is both the private sector and the Government is known as a **mixed economy**. There are many ways in which the government influences economic life. In this chapter, we will limit ourselves to the functions which are carried on through the **government budget**.

This chapter proceeds as follows. In section 5.1 we present the components of the government budget to bring out the sources of government revenue and avenues of government spending. In section 5.2 we discuss the topic of balanced, surplus or deficit budget to account for the difference between expenditures and revenue collection. It specifically deals with the meaning of different kinds of budget deficits, their implications and the measures to contain them. Box. 5.1 deals with fiscal policy and a simple description of the multiplier. The role the government plays has implications for its deficits which further affect its debt- what the government owes. The chapter concludes with an analysis of the debt issue.

5.1 Government Budget — Meaning and its Components

There is a constitutional requirement in India (Article 112) to present before the Parliament a statement of estimated receipts and expenditures of the government in respect of every financial year which runs from 1 April to 31 March. This 'Annual Financial Statement' constitutes the main **budget** document of the government.

Although the budget document relates to the receipts and expenditure of the government for a particular financial year, the impact of it will be there in subsequent years. There is a need therefore to have two accounts- those that relate to the current financial year only are included in the revenue account (also called **revenue budget**) and those that concern the assets and liabilities of the government into the capital account (also called **capital budget**). In order to understand the accounts, it is important to first understand the objectives of the government budget.

5.1.1 Objectives of Government Budget

The government plays a very important role in increasing the welfare of the people. In order to do that the government intervenes in the economy in the following ways.

Allocation Function of Government Budget

Government provides certain goods and services which cannot be provided by the market mechanism i.e. by exchange between individual consumers and producers. Examples of such goods are national defence, roads, government administration etc. which are referred to as **public goods**.

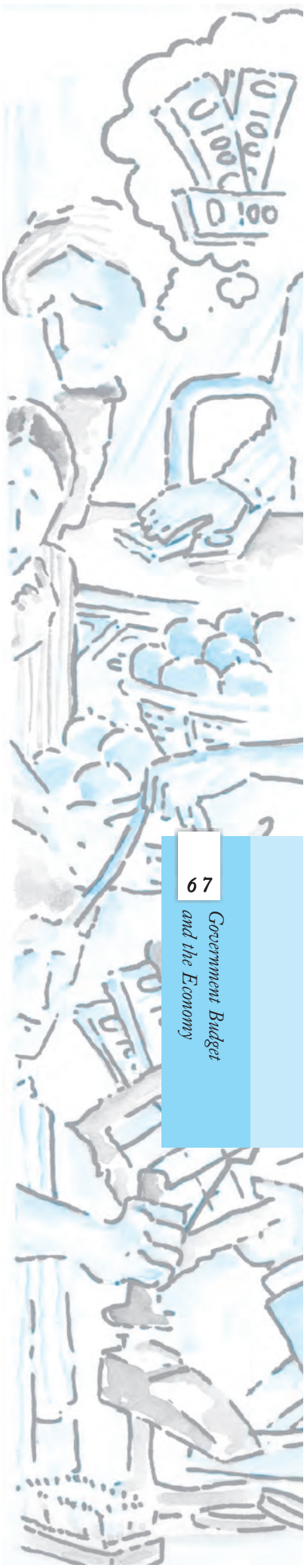
To understand why public goods need to be provided by the government, we must understand the difference between **private goods** such as clothes, cars, food items etc. and public goods. There are two major differences. One, the benefits of public goods are available to all and are not only restricted to one particular consumer. For example, if a person eats a chocolate or wears a shirt, these will not be available to others. It is said that this person's consumption stands in rival relationship to the consumption of others. However, if we consider a public park or measures to reduce air pollution, the benefits will be available to all. One person's consumption of a good does not reduce the amount available for consumption for others and so several people can enjoy the benefits, that is, the consumption of many people is not **'rivalrous'**.

Two, in case of private goods anyone who does not pay for the goods can be excluded from enjoying its benefits. If you do not buy a ticket, you will not be allowed to watch a movie at a local cinema hall. However, in case of public goods, there is no feasible way of excluding anyone from enjoying the benefits of the good. That is why public goods are called **non-excludable**. Even if some users do not pay, it is difficult and sometimes impossible to collect fees for the public good. These non-paying users are known as **'free-riders'**. Consumers will not voluntarily pay for what they can get for free and for which there is no exclusive title to the property being enjoyed. The link between the producer and consumer which occurs through the payment process is broken and the government must step in to provide for such goods.

There is, however, a difference between **public provision** and **public production**. Public provision means that they are financed through the budget and can be used without any direct payment. Public goods may be produced by the government or the private sector. When goods are produced directly by the government it is called public production.

Redistribution Function of Government Budget

From chapter two we know that the total national income of the country goes to either the private sector, that is, firms and households (known as private income) or the government (known as public income). Out of private income, what finally reaches the households is known as personal income and the amount that can be spent is the personal disposable income. The government sector affects the personal disposable income of households by making transfers and collecting taxes. It is through this that the government can change the distribution of income and bring about a distribution that is considered 'fair' by society. This is the **redistribution function**.



Stabilisation Function of Government Budget

The government may need to correct fluctuations in income and employment. The overall level of employment and prices in the economy depends upon the level of aggregate demand which depends on the spending decisions of millions of private economic agents apart from the government. These decisions, in turn, depend on many factors such as income and credit availability. In any period, the level of demand may not be sufficient for full utilisation of labour and other resources of the economy. Since wages and prices do not fall below a level, employment cannot be brought back to the earlier level automatically. The government needs to intervene to raise the aggregate demand.

On the other hand, there may be times when demand exceeds available output under conditions of high employment and thus may give rise to inflation. In such situations, restrictive conditions may be needed to reduce demand.

The intervention of the government whether to expand demand or reduce it constitutes the **stabilisation function**.

5.1.2 Classification of Receipts

Revenue Receipts: Revenue receipts are those receipts that do not lead to a claim on the government. They are therefore termed non-redeemable. They are divided into tax and non-tax revenues. Tax revenues, an important component of revenue receipts, have for long been divided into direct taxes (personal income tax) and firms (corporation tax), and indirect taxes like excise taxes (duties levied on goods produced within the country), customs duties (taxes imposed on goods imported into and exported out of India) and service tax[1]. Other direct taxes like wealth tax, gift tax and estate duty (now abolished) have never brought in large amount of revenue and thus have been referred to as 'paper taxes'.

The redistribution objective is sought to be achieved through progressive income taxation, in which higher the income, higher is the tax rate. Firms are taxed on a proportional basis, where the tax rate is a particular proportion of profits. With respect to excise taxes, necessities of life are exempted or taxed at low rates, comforts and semi-luxuries are moderately taxed, and luxuries, tobacco and petroleum products are taxed heavily.

Non-tax revenue of the central government mainly consists of interest receipts on account of loans by the central government, dividends and profits on investments made by the government, fees and other receipts for services rendered by the government. Cash grants-in-aid from foreign countries and international organisations are also included.

The estimates of revenue receipts take into account the effects of tax proposals made in the Finance Bill[2].

Capital Receipts: The government also receives money by way of loans or from the sale of its assets. Loans will have to be returned to the agencies from which they have been borrowed. Thus they create liability. Sale of government assets, like sale of shares in Public Sector Undertakings (PSUs) which is referred

[1]The India Tax system witnessed a dramatic change with the introduction of the GST (Goods and Services Tax) which encompasses both goods and services and was be implemented by the Centre, 28 states and 7 Union territories from 1 July, 2017.

[2]A Finance Bill, presented along with the Annual Financial Statement, provides details on the imposition, abolition, remission, alteration or regulation of taxes proposed in the Budget.

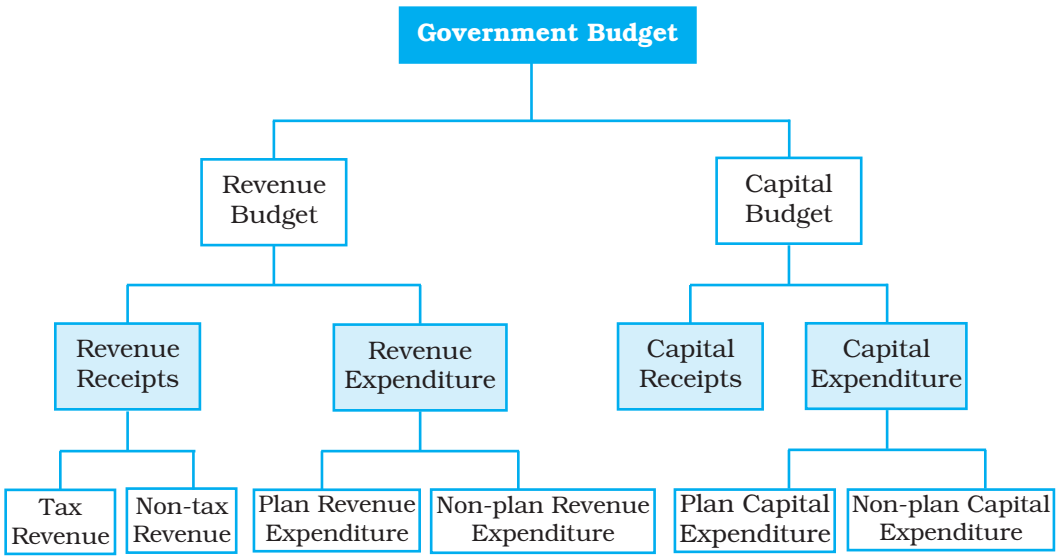


Chart 1: The Components of the Government Budget

to as PSU disinvestment, reduce the total amount of financial assets of the government. All those receipts of the government which create liability or reduce financial assets are termed as capital receipts. When government takes fresh loans it will mean that in future these loans will have to be returned and interest will have to be paid on these loans. Similarly, when government sells an asset, then it means that in future its earnings from that asset, will disappear. Thus, these receipts can be debt creating or non-debt creating.

5.1.3. Classification of Expenditure

Revenue Expenditure

Revenue Expenditure is expenditure incurred for purposes other than the creation of physical or financial assets of the central government. It relates to those expenses incurred for the normal functioning of the government departments and various services, interest payments on debt incurred by the government, and grants given to state governments and other parties (even though some of the grants may be meant for creation of assets).

Budget documents classify total expenditure into **plan and non-plan expenditure**[3]. This is shown in item 6 on Table 5.1 within revenue expenditure, a distinction is made between plan and non-plan. According to this classification, plan revenue expenditure relates to central Plans (the Five-Year Plans) and central assistance for State and Union Territory plans. Non-plan expenditure, the more important component of revenue expenditure, covers a vast range of general, economic and social services of the

[3]A case against this kind of classification has been put forth on the ground that it has led to an increasing tendency to start new schemes/projects neglecting maintenance of existing capacity and service levels. It has also led to the misperception that non-plan expenditure is inherently wasteful, adversely affecting resource allocation to social sectors like education and health where salary comprises an important element.

government. The main items of non-plan expenditure are interest payments, defence services, subsidies, salaries and pensions.

Interest payments on market loans, external loans and from various reserve funds constitute the single largest component of non-plan revenue expenditure. Defence expenditure, is committed expenditure in the sense that given the national security concerns, there exists little scope for drastic reduction. Subsidies are an important policy instrument which aim at increasing welfare. Apart from providing implicit subsidies through under-pricing of public goods and services like education and health, the government also extends subsidies explicitly on items such as exports, interest on loans, food and fertilisers. The amount of subsidies as a per cent of GDP was 2.02 per cent in 2014-15 and is 1.7 percent of GDP in 2015-16 (B.E).

Capital Expenditure

There are expenditures of the government which result in creation of physical or financial assets or reduction in financial liabilities. This includes expenditure on the acquisition of land, building, machinery, equipment, investment in shares, and loans and advances by the central government to state and union territory governments, PSUs and other parties. Capital expenditure is also categorised as plan and non-plan in the budget documents. Plan capital expenditure, like its revenue counterpart, relates to central plan and central assistance for state and union territory plans. Non-plan capital expenditure covers various general, social and economic services provided by the government.

The budget is not merely a statement of receipts and expenditures. Since Independence, with the launching of the Five-Year Plans, it has also become a significant national policy statement. The budget, it has been argued, reflects and shapes, and is, in turn, shaped by the country's economic life. Along with the budget, three policy statements are mandated by the Fiscal Responsibility and Budget Management Act, 2003 (FRBMA)[4]. The Medium-term Fiscal Policy Statement sets a three-year rolling target for specific fiscal indicators and examines whether revenue expenditure can be financed through revenue receipts on a sustainable basis and how productively capital receipts including market borrowings are being utilised. The Fiscal Policy Strategy Statement sets the priorities of the government in the fiscal area, examining current policies and justifying any deviation in important fiscal measures. The Macroeconomic Framework Statement assesses the prospects of the economy with respect to the GDP growth rate, fiscal balance of the central government and external balance[5].

5.2 Balanced, Surplus and Deficit Budget

The government may spend an amount equal to the revenue it collects. This is known as a **balanced** budget. If it needs to incur higher expenditure, it will have

[4]Box 5.2 provides a brief account of this legislation and its implication for Government finances.

[5]The 2005-06 Indian Budget introduced a statement highlighting the gender sensitivities of the budgetary allocations. Gender budgeting is an exercise to translate the stated gender commitments of the government into budgetary commitments, involving special initiatives for empowering women and examination of the utilisation of resources allocated for women and the impact of public expenditure and policies of the government on women. The 2006-07 budget enlarged the earlier statement.

to raise the amount through taxes in order to keep the budget balanced. When tax collection exceeds the required expenditure, the budget is said to be in **surplus**. However, the most common feature is the situation when expenditure exceeds revenue. This is when the government runs a budget **deficit**.

5.2.1 Measures of Government Deficit

When a government spends more than it collects by way of revenue, it incurs a budget deficit[6]. There are various measures that capture government deficit and they have their own implications for the economy.

Revenue Deficit: The revenue deficit refers to the excess of government's revenue expenditure over revenue receipts

Revenue deficit = Revenue expenditure – Revenue receipts

Table 5.1: Receipts and Expenditures of the Central Government, 2018-19 (PA)

	(As per cent of GDP)
1. Revenue Receipts (a+b)	8.2
(a) Tax revenue (net of states' share)	6.9
(b) Non-tax revenue	1.3
2. Revenue Expenditure of which	10.6
(a) Interest payments	3.1
(b) Major subsidies	1.0
(c) Defence expenditure	1.0
3. Revenue Deficit (2–1)	2.3
4. Capital Receipts (a+b+c) of which	3.9
(a) Recovery of loans	0.1
(b) Other receipts (mainly PSU[1] disinvestment)	0.4
(c) Borrowings and other liabilities	3.4
5. Capital Expenditure	1.6
6. Non-debt Receipts [1+4(a)+4(b)]	8.8
7. Total Expenditure [2+5=7(a)+7(b)]	2.2
(a) Plan expenditure	–
(b) Non-plan expenditure	–
8. Fiscal deficit [7-1-4(a)-4(b)]	3.4
9. Primary Deficit [8–2(a)]	0.3

Source: *Economic Survey*, 2018-19

[1] Public Sector Undertaking

Item 3 in Table 5.1 shows that revenue deficit in 2018-19 was 2.3 per cent of GDP. The revenue deficit includes only such transactions that affect the current income and expenditure of the government. When the government incurs a revenue deficit, it implies that the government is dissaving and is using up the savings of the other sectors of the economy to finance a part of its consumption expenditure. This situation means that the government will have to borrow not only to finance its investment but also its consumption requirements. This will lead to a build up of stock of debt and interest liabilities and force the government,

[6]More formally, it refers to the excess of total expenditure (both revenue and capital) over total receipts (both revenue and capital). From the 1997-98 budget, the practice of showing budget deficit has been discontinued in India.

eventually, to cut expenditure. Since a major part of revenue expenditure is committed expenditure, it cannot be reduced. Often the government reduces productive capital expenditure or welfare expenditure. This would mean lower growth and adverse welfare implications.

Fiscal Deficit: Fiscal deficit is the difference between the government's total expenditure and its total receipts excluding borrowing

Gross fiscal deficit = Total expenditure – (Revenue receipts + Non-debt creating capital receipts)

Non-debt creating capital receipts are those receipts which are not borrowings and, therefore, do not give rise to debt. Examples are recovery of loans and the proceeds from the sale of PSUs. From Table 5.1 we can see that non-debt creating capital receipts equals 8.8 per cent of GDP, obtained by subtracting, borrowing and other liabilities from total capital receipts [1+4(a)+4(b)]. The fiscal deficit, therefore turn out to be 3.4 per cent of GDP. The fiscal deficit will have to be financed through borrowing. Thus, it indicates the total borrowing requirements of the government from all sources. From the financing side

Gross fiscal deficit = Net borrowing at home + Borrowing from RBI + Borrowing from abroad

Net borrowing at home includes that directly borrowed from the public through debt instruments (for example, the various small savings schemes) and indirectly from commercial banks through Statutory Liquidity Ratio (SLR). The gross fiscal deficit is a key variable in judging the financial health of the public sector and the stability of the economy. From the way gross fiscal deficit is measured as given above, it can be seen that revenue deficit is a part of fiscal deficit (Fiscal Deficit = Revenue Deficit + Capital Expenditure - non-debt creating capital receipts). A large share of revenue deficit in fiscal deficit indicated that a large part of borrowing is being used to meet its consumption expenditure needs rather than investment.

Primary Deficit: We must note that the borrowing requirement of the government includes interest obligations on accumulated debt. The goal of measuring primary deficit is to focus on present fiscal imbalances. To obtain an estimate of borrowing on account of current expenditures exceeding revenues, we need to calculate what has been called the primary deficit. It is simply the fiscal deficit minus the interest payments

Gross primary deficit = Gross fiscal deficit – Net interest liabilities

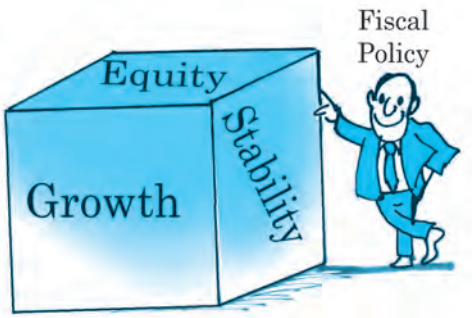
Net interest liabilities consist of interest payments minus interest receipts by the government on net domestic lending.

Box 5.1: Fiscal Policy

One of Keynes's main ideas in *The General Theory of Employment, Interest and Money* was that government fiscal policy should be used to stabilise the level of output and employment. Through changes in its expenditure and taxes, the government attempts to increase output and income and seeks to stabilise the ups and downs in the economy. In the process, fiscal policy creates a *surplus* (when total receipts exceed expenditure) or a *deficit budget* (when total expenditure

exceed receipts) rather than a *balanced budget* (when expenditure equals receipts). In what follows, we study the effects of introducing the government sector in our earlier analysis of the determination of income.

The government directly affects the level of equilibrium income in two specific ways – government purchases of goods and services (G) increase aggregate demand and taxes, and transfers affect the relation between income (Y) and disposable income (YD) – the income available for consumption and saving with the households.



How does the Fiscal Policy try to achieve its basic objectives?

We take taxes first. We assume that the government imposes taxes that do not depend on income, called **lump-sum taxes** equal to T. We assume throughout the analysis that government makes a constant amount of transfers, $\bar{TR}$. The consumption function is now

$$C = \bar{C} + cYD = \bar{C} + c(Y - T + \bar{TR}) \qquad (5.1)$$

where YD = disposable income.

We note that taxes lower disposable income and consumption. For instance, if one earns Rs 1 lakh and has to pay Rs 10,000 in taxes, she has the same disposable income as someone who earns Rs 90,000 but pays no taxes. The definition of aggregate demand augmented to include the government will be

$$AD = \bar{C} + c(Y - T + \bar{TR}) + I + G \qquad (5.2)$$

Graphically, we find that the lump-sum tax shifts the consumption schedule downward in a parallel way and hence the aggregate demand curve shifts in a similar fashion. The income determination condition in the product market will be $Y = AD$, which can be written as

$$Y = \bar{C} + c(Y - T + \bar{TR}) + I + G \qquad (5.3)$$

Solving for the equilibrium level of income, we get

$$Y^* = \frac{1}{1-c}(\bar{C} - cT + c\bar{TR} + I + G) \qquad (5.4)$$

Changes in Government Expenditure

We consider the effects of increasing government purchases (G) keeping taxes constant. When G exceeds T, the government runs a deficit. Because G is a component of aggregate spending, planned aggregate expenditure will increase. The aggregate demand schedule shifts up to AD'. At the initial level of output, demand exceeds supply and firms expand production. The new equilibrium is at E'. The multiplier mechanism (described in Chapter 4) is in operation. The government spending multiplier is derived as follows:

Suppose G changes to a new level $(G+\Delta G)$ and as a result Y changes to a new level $(Y^* + \Delta Y)$. The new levels of G and Y can also be put into equation (5.4).

So $(Y^* + \Delta Y) = \frac{1}{1-c}\left(\bar{C} - cT + c\bar{TR} + I + G + \Delta G\right)$ (5.4a)

Subtracting equation (5.4) from equation (5.4a) we get

$$\Delta Y = \frac{1}{1-c}\Delta G \quad (5.5)$$

or

$$\frac{\Delta Y}{\Delta G} = \frac{1}{1-c} \quad (5.6)$$

In Fig. 5.1, government expenditure increases from G to G' and causes equilibrium income to increase from Y to Y'.

Changes in Taxes

We find that a cut in taxes increases disposable income (Y – T) at each level of income. This shifts the aggregate expenditure schedule upwards by a fraction c of the decrease in taxes. This is shown in Fig 5.2.

From equation 5.3, we can calculate the tax multiplier using the same method as for the government expenditure multiplier.

$$\Delta Y^* = \frac{1}{1-c}(-c)(\Delta T) \quad (5.7)$$

The tax multiplier

$$= \frac{\Delta Y}{\Delta T} = \frac{-c}{1-c} \quad (5.8)$$

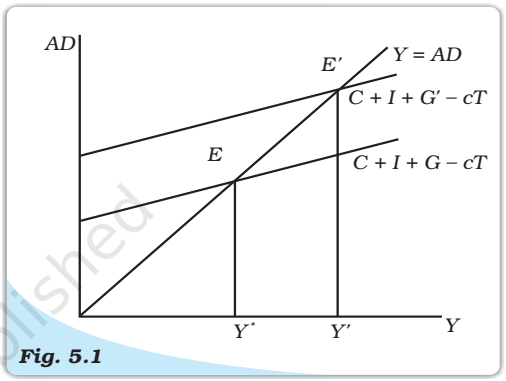


Fig. 5.1

Effect of Higher Government Expenditure

Because a tax cut (increase) will cause an increase (reduction) in consumption and output, the tax multiplier is a negative multiplier. Comparing equation (5.6) and (5.8), we find that the tax multiplier is smaller in absolute value compared to the government spending multiplier. This is because an increase in government spending directly affects total spending whereas taxes enter the multiplier process through their impact on disposable income, which influences household consumption (which is a part of total spending).

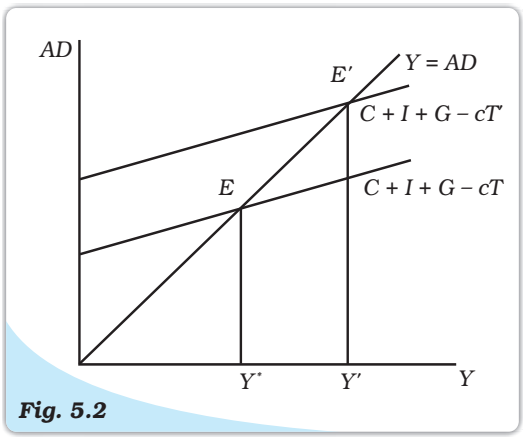


Fig. 5.2

Effect of a Reduction in Taxes

Thus, with a ΔT reduction in taxes, consumption, and hence total spending, increases in the first instance by $c\Delta T$. To understand how the two multipliers differ, we consider the following example.

EXAMPLE 5.1

Assume that the marginal propensity to consume is 0.8. The government expenditure multiplier will then be

$\frac{1}{1-c} = \frac{1}{1-0.8} = \frac{1}{0.2} = 5$. For an increase in government spending by 100, the equilibrium income will increase by $500 (\frac{1}{1-c} \Delta G = 5 \times 100)$.

The tax multiplier is given by

$\frac{-c}{1-c} = \frac{-0.8}{1-0.8} = \frac{-0.8}{0.2} = -4.$

A tax cut of 100 ($\Delta T = -100$) will increase equilibrium income by 400. Thus, the equilibrium income increases in this case by less than the amount by which it increased under a G increase.

Why is the poor man crying? Suggest measures to wipe off his tears.

Within the present framework, if we take different values of the marginal propensity to consume and calculate the values of the two multipliers, we find that the tax multiplier is always one less in absolute value than the government expenditure multiplier. This has an interesting implication. If an increase in government spending is matched by an equal increase in taxes, so that the budget remains balanced, output will rise by the amount of the increase in government spending. Adding the two policy multipliers gives

$$\text{The balanced budget multiplier} = \frac{\Delta Y^*}{\Delta G} = \frac{1}{1-c} + \frac{-c}{1-c} = \frac{1-c}{1-c} = 1 \qquad (5.9)$$

A balanced budget multiplier of unity implies that a 100 increase in G financed by 100 increase in taxes increases income by just 100. This can be seen from Example 1 where an increase in G by 100 increases output by 500. A tax increase would reduce income by 400 with the net increase of income equal to 100. The equilibrium income refers to the final income that one arrives at in a period sufficiently long for all the rounds of the multipliers to work themselves out. We find that output increases by exactly the amount of increased G with no induced consumption spending due to increase in taxes. To see why the balanced budget multiplier is 1, we examine the multiplier process. The increase in government spending by a certain amount raises income by that amount directly and then indirectly through the multiplier chain increasing income by

$$\Delta Y = \Delta G + c\Delta G + c^2\Delta G + \ldots = \Delta G\,(1 + c + c^2 + \ldots) \qquad (5.10)$$

But the tax increase only enters the multiplier process when the cut in disposable income reduces consumption by c times the reduction in taxes. Thus the effect on income of the tax increase is given by

$$\Delta Y = -c\Delta T - c^2\Delta T + \ldots = -\Delta T(c + c^2 + \ldots) \qquad (5.11)$$

The difference between the two gives the net effect on income. Since $\Delta G = \Delta T$, from 5.10 and 5.11, we get $\Delta Y = \Delta G$, that is, income increases by the amount by which government spending increases and the balanced budget multiplier is unity. This multiplier can also be derived from equation 5.3 as follows

$\Delta Y = \Delta \bar{G} + c\,(\Delta Y - \Delta T)$ since investment does not change ($\Delta I = 0$)

(5.12)

Since, $\Delta \bar{G} = \Delta T$, we have

$$\frac{\Delta Y}{\Delta G} = \frac{1-c}{1-c} = 1 \qquad (5.13)$$

Case of Proportional Taxes: A more realistic assumption would be that the government collects a constant fraction, t, of income in the form of taxes so that $T = tY$. The consumption function with proportional taxes is given by

$$C = \bar{C} + c\,(Y - tY + \bar{TR}) = \bar{C} + c\,(1-t)\,Y + c\bar{TR} \qquad (5.14)$$

We note that proportional taxes not only lower consumption at each level of income but also lower the slope of the consumption function. The mpc out of income falls to $c\,(1-t)$. The new aggregate demand schedule, AD', has a larger intercept but is flatter as shown in Fig. 5.3.

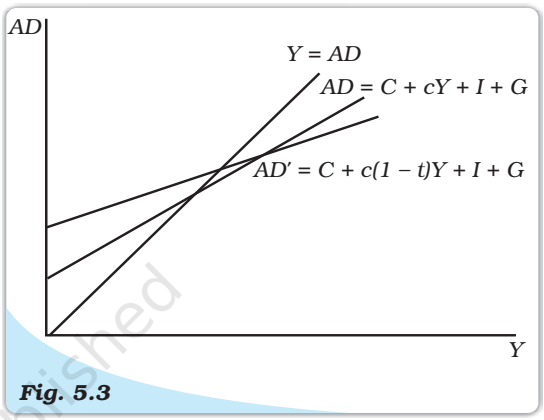


Fig. 5.3

Government and Aggregate Demand (proportional taxes make the AD schedule flatter)

Now we have

$$AD = \bar{C} + c(1-t)Y + c\bar{TR} + I + G = \bar{A} + c(1-t)Y \qquad (5.15)$$

Where $\bar{A}$ = autonomous expenditure and equals $\bar{C} + c\bar{TR} + I + G$. Income determination condition in the product market is, $Y = AD$, which can be written as

$$Y = \bar{A} + c\,(1-t)Y \qquad (5.16)$$

Solving for the equilibrium level of income

$$Y^* = \frac{1}{1-c(1-t)}\bar{A} \qquad (5.17)$$

so that the multiplier is given by

$$\frac{\Delta Y}{\Delta \bar{A}} = \frac{1}{1-c(1-t)} \qquad (5.18)$$

Comparing this with the value of the multiplier with lump-sum taxes case, we find that the value has become smaller. When income rose as a result of an increase in government spending in the case of lump-sum taxes,

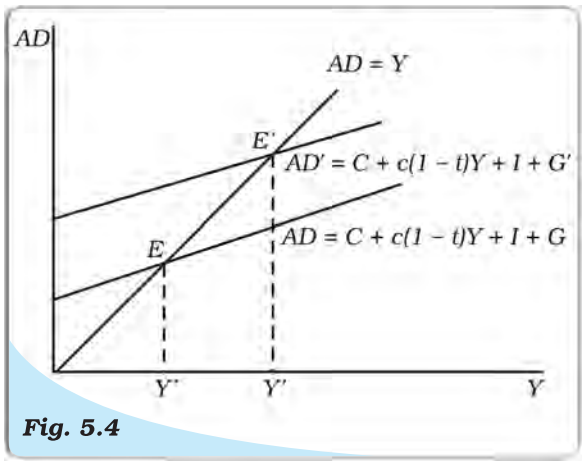


Fig. 5.4

Increase in Government Expenditure (with proportional taxes)

consumption increased by c times the increase in income. With proportional taxes, consumption will rise by less, ($c - ct = c(1 - t)$) times the increase in income.

For changes in G, the multiplier will now be given by

$$\Delta Y = \Delta \bar{G} + c(1 - t)\Delta Y \quad (5.19)$$

$$\Delta Y = \frac{1}{1 - c(1 - t)} \Delta \bar{G} \quad (5.20)$$

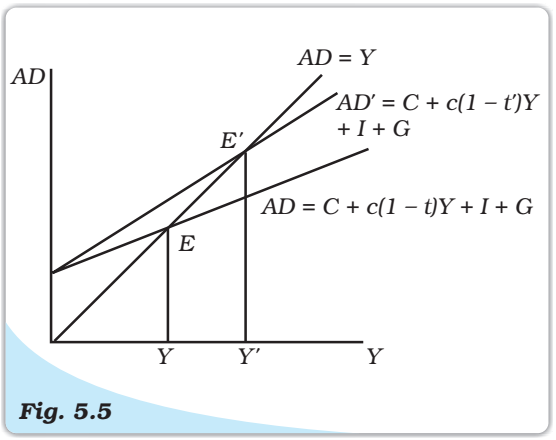


Fig. 5.5

Effects of a Reduction in the Proportional Tax Rate

The income increases from Y^* to Y' as shown in Fig. 5.4.

The decrease in taxes works in effect like an increase in propensity to consume as shown in Fig. 5.5. The AD curve shifts up to AD'. At the initial level of income, aggregate demand for goods exceeds output because the tax reduction causes increased consumption. The new higher level of income is Y'.

EXAMPLE 5.2

In Example 5.1, if we take a tax rate of 0.25, we find consumption will now rise by 0.60 ($c(1 - t) = 0.8 \times 0.75$) for every unit increase in income instead of the earlier 0.80. Thus, consumption will increase by less than before. The government expenditure multiplier will be $\frac{1}{1 - c(1 - t)} = \frac{1}{1 - 0.6} = \frac{1}{0.4} = 2.5$ which is smaller than that obtained with lump-sum taxes. If government expenditure rises by 100, output will rise by the multiplier times the rise in government expenditure, that is, by $2.5 \times 100 = 250$. This is smaller than the increase in output with lump-sum taxes.

The proportional income tax, thus, acts as an **automatic stabiliser** – a shock absorber because it makes disposable income, and thus consumer spending, less sensitive to fluctuations in GDP. When GDP rises, disposable income also rises but by less than the rise in GDP because a part of it is siphoned off as taxes. This helps limit the upward fluctuation in consumption spending. During a recession when GDP falls, disposable income falls less sharply, and consumption does not drop as much as it otherwise would have fallen had the tax liability been fixed. This reduces the fall in aggregate demand and stabilises the economy.

We note that these fiscal policy instruments can be varied to offset the effects of undesirable shifts in investment demand. That is, if investment falls from I_0 to I_1, government spending can be raised from G_0 to G_1 so that autonomous expenditure ($C + I_0 + G_0 = C + I_1 + G_1$) and equilibrium income remain the same. This deliberate action to stabilise the economy is often referred to as **discretionary fiscal policy** to distinguish it from the inherent automatic stabilising properties of the fiscal system. As discussed earlier, proportional taxes help to stabilise the economy against upward and downward movements. Welfare transfers also help to stabilise income.

During boom years, when employment is high, tax receipts collected to finance such expenditure increase exerting a stabilising pressure on high consumption spending; conversely, during a slump, these welfare payments help sustain consumption. Further, even the private sector has built-in stabilisers. Corporations maintain their dividends in the face of a change in income in the short run and households try to maintain their previous living standards. All these work as shock absorbers without the need for any decision-maker to take action. That is, they work automatically. The built-in stabilisers, however, reduce only part of the fluctuation in the economy, the rest must be taken care of by deliberate policy initiative.

Transfers: We suppose that instead of raising government spending in goods and services, government increases transfer payments, $\overline{TR}$. Autonomous spending, $\overline{A}$, will increase by $c\Delta\overline{TR}$, so output will rise by less than the amount by which it increases when government expenditure increases because a part of any increase in transfer payments is saved. Using the method used earlier for deriving the government expenditure multipier and the taxation multiplier the change in equilibrium income for a change in transfers is given by

$$\Delta Y = \frac{c}{1-c}\Delta TR \tag{5.21}$$

or

$$\frac{\Delta Y}{\Delta TR} = \frac{c}{1-c} \tag{5.22}$$

EXAMPLE 5.3

We suppose that the marginal propensity to consume is 0.75 and we have lump-sum taxes. The change in equilibrium income when government purchases increase by 20 is given by $\Delta Y = \frac{1}{1-0.75}\Delta G = 4 \times 20 = 80$. An increase in transfers of 20 will raise equilibrium income by $\Delta Y = \frac{0.75}{1-0.75}\Delta TR = 3 \times 20 = 60$. Thus, we find that income increases by less than it increased with a rise in government purchases.

Debt

Budgetary deficits must be financed by either taxation, borrowing or printing money. Governments have mostly relied on borrowing, giving rise to what is called government debt. The concepts of deficits and debt are closely related. Deficits can be thought of as a *flow* which add to the *stock* of debt. If the government continues to borrow year after year, it leads to the accumulation of debt and the government has to pay more and more by way of interest. These interest payments themselves contribute to the debt.

Perspectives on the Appropriate Amount of Government Debt: There are two interlinked aspects of the issue. One is whether government debt is a burden and two, the issue of financing the debt. The burden of debt must be discussed keeping in mind that what is true of one small trader's debt may not be true for the government's debt, and one must deal with the 'whole' differently from the 'part'. Unlike any one trader, the government can raise resources through taxation and printing money.

By borrowing, the government transfers the burden of reduced consumption on future generations. This is because it borrows by issuing bonds to the people living at present but may decide to pay off the bonds some twenty years later by raising taxes. These may be levied on the young population that have just entered the work force, whose disposable income will go down and hence consumption. Thus, national savings, it was argued, would fall. Also, government borrowing from the people reduces the savings available to the private sector. To the extent that this reduces capital formation and growth, debt acts as a 'burden' on future generations.

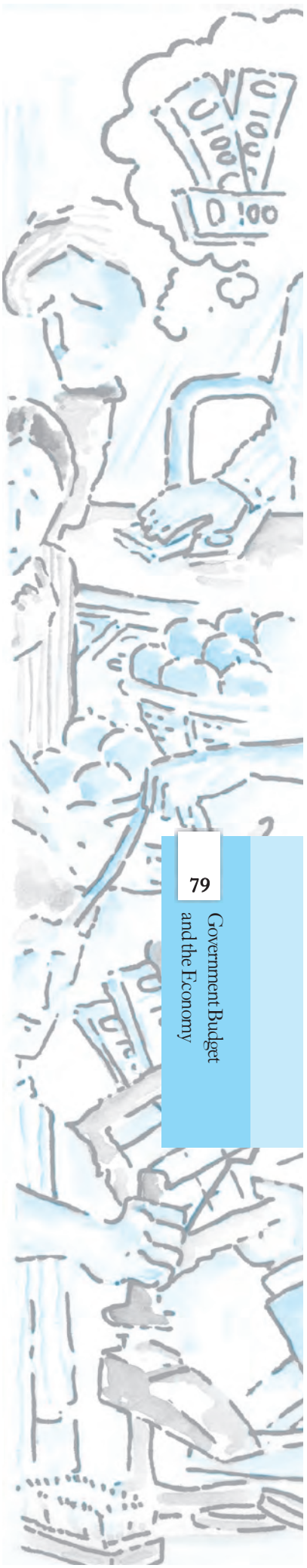
Traditionally, it has been argued that when a government cuts taxes and runs a budget deficit, consumers respond to their after-tax income by spending more. It is possible that these people are short-sighted and do not understand the implications of budget deficits. They may not realise that at some point in the future, the government will have to raise taxes to pay off the debt and accumulated interest. Even if they comprehend this, they may expect the future taxes to fall not on them but on future generations.

A counter argument is that consumers are forward-looking and will base their spending not only on their current income but also on their expected future income. They will understand that borrowing today means higher taxes in the future. Further, the consumer will be concerned about future generations because they are the children and grandchildren of the present generation and the family which is the relevant decision making unit, continues living. They would increase savings now, which will fully offset the increased government dissaving so that national savings do not change. This view is called **Ricardian equivalence** after one of the greatest nineteenth century economists, David Ricardo, who first argued that in the face of high deficits, people save more. It is called 'equivalence' because it argues that taxation and borrowing are equivalent means of financing expenditure. When the government increases spending by borrowing today, which will be repaid by taxes in the future, it will have the same impact on the economy as an increase in government expenditure that is financed by a tax increase today.

It has often been argued that 'debt does not matter because we owe it to ourselves'. This is because although there is a transfer of resources between generations, purchasing power remains within the nation. However, any debt that is owed to foreigners involves a burden since we have to send goods abroad corresponding to the interest payments.

Other Perspectives on Deficits and Debt: One of the main criticisms of deficits is that they are inflationary. This is because when government increases spending or cuts taxes, aggregate demand increases. Firms may not be able to produce higher quantities that are being demanded at the ongoing prices. Prices will, therefore, have to rise. However, if there are unutilised resources, output is held back by lack of demand. A high fiscal deficit is accompanied by higher demand and greater output and, therefore, need not be inflationary.

It has been argued that there is a decrease in investment due to a reduction in the amount of savings available to the private sector. This is because if the government decides to borrow from private citizens by issuing bonds to finance its deficits, these bonds will compete with corporate bonds and other financial instruments for the available supply of funds. If some private savers decide to buy bonds, the funds remaining to be invested in private hands will be smaller. Thus, some private borrowers will get 'crowded out' of the financial markets as the government claims an increasing share of the economy's total savings. However, one must note that the economy's flow of savings is not really



fixed unless we assume that income cannot be augmented. If government deficits succeed in their goal of raising production, there will be more income and, therefore, more saving. In this case, both government and industry can borrow more.

Also, if the government invests in infrastructure, future generations may be better off, provided the return on such investments is greater than the rate of interest. The actual debt could be paid off by the growth in output. The debt should not then be considered burdensome. The growth in debt will have to be judged by the growth of the economy as a whole.

***Deficit Reduction*:** Government deficit can be reduced by an increase in taxes or reduction in expenditure. In India, the government has been trying to increase tax revenue with greater reliance on direct taxes (indirect taxes are regressive in nature – they impact all income groups equally). There has also been an attempt to raise receipts through the sale of shares in PSUs. However, the major thrust has been towards reduction in government expenditure. This could be achieved through making government activities more efficient through better planning of programmes and better administration. A recent study[7] by the Planning Commission has estimated that to transfer Re1 to the poor, government spends Rs 3.65 in the form of food subsidy, showing that cash transfers would lead to increase in welfare. The other way is to change the scope of the government by withdrawing from some of the areas where it operated before. Cutting back government programmes in vital areas like agriculture, education, health, poverty alleviation, etc. would adversely affect the economy. Governments in many countries run huge deficits forcing them to eventually put in place self-imposed constraints of not increasing expenditure over pre-determined levels (Box 5.2 gives the main features of the FRBMA in India). These will have to be examined keeping in view the above factors. We must note that larger deficits do not always signify a more expansionary fiscal policy. The same fiscal measures can give rise to a large or small deficit, depending on the state of the economy. For example, if an economy experiences a recession and GDP falls, tax revenues fall because firms and households pay lower taxes when they earn less. This means that the deficit increases in a recession and falls in a boom, even with no change in fiscal policy.

[7] "Performance Evaluation of the Targeted Public Distribution System" by the Programme Evaluation Organisation, Planning Commission.

Summary

1. Public goods, as distinct from private goods, are collectively consumed. Two important features of public goods are – they are non-rivalrous in that one person can increase her satisfaction from the good without reducing that obtained by others and they are non-excludable, and there is no feasible way of excluding anyone from enjoying the benefits of the good. These make it difficult to collect fees for their use and private enterprise will in general not provide these goods. Hence, they must be provided by the government.
2. The three functions of allocation, redistribution and stabilisation operate through the expenditure and receipts of the government.
3. The budget, which gives a statement of the receipts and expenditure of the government, is divided into the revenue budget and capital budget to distinguish between current financial needs and investment in the country's capital stock.
4. The growth of revenue deficit as a percentage of fiscal deficit points to a deterioration in the quality of government expenditure involving lower capital formation.
5. Proportional taxes reduce the autonomous expenditure multiplier because taxes reduce the marginal propensity to consume out of income.
6. Public debt is burdensome if it reduces future growth in output.

Key Concepts

Public goods
Automatic stabiliser
Discretionary fiscal policy
Ricardian equivalence

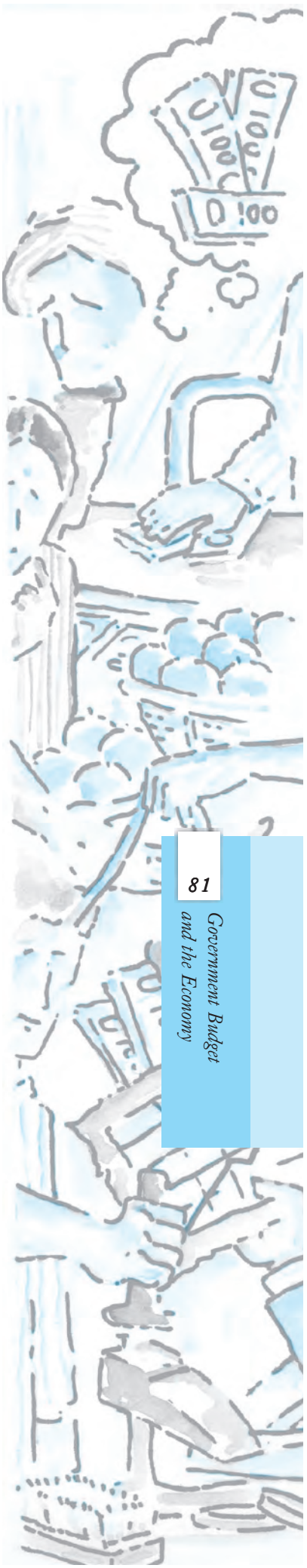
Box 5.2: Fiscal Responsibility and Budget Management Act, 2003 (FRBMA)

In a multi-party parliamentary system, electoral concerns play an important role in determining expenditure policies. A legislative provision, it is argued, that is applicable to all governments – present and future – is likely to be effective in keeping deficits under control. The enactment of the FRBMA, in August 2003, marked a turning point in fiscal reforms, binding the government through an institutional framework to pursue a prudent fiscal policy. The central government must ensure inter-generational equity and long-term macro-economic stability by achieving sufficient revenue surplus, removing fiscal obstacles to monetary policy and effective debt management by limiting deficits and borrowing. The rules under the Act were notified with effect from July, 2004.

Main Features

1. The Act mandates the central government to take appropriate measures to reduce fiscal deficit to not more than 3 percent of GDP and to eliminate the revenue deficit by March 31, 2009[8] and thereafter build up adequate revenue surplus.
2. It requires the reduction in fiscal deficit by 0.3 per cent of GDP each year and the revenue deficit by 0.5 per cent. If this is not achieved

[8]This has been rescheduled by one year to 2009-10, primarily on account of a shift in plan priorities in favour of revenue expenditure - intensive programmes and schemes.



through tax revenues, the necessary adjustment has to come from a reduction in expenditure.

3. The actual deficits may exceed the targets specified only on grounds of national security or natural calamity or such other exceptional grounds as the central government may specify.
4. The central government shall not borrow from the Reserve Bank of India except by way of advances to meet temporary excess of cash disbursements over cash receipts.
5. The Reserve Bank of India must not subscribe to the primary issues of central government securities from the year 2006-07.
6. Measures to be taken to ensure greater transparency in fiscal operations.
7. The central government to lay before both Houses of Parliament three statements–Medium-term Fiscal Policy Statement, The Fiscal Policy Strategy Statement, The Macroeconomic Framework Statement along with the Annual Financial Statement.
8. Quarterly review of the trends in receipts and expenditure in relation to the budget be placed before both Houses of Parliament.

The act applies to the central government. However, 26 states have already enacted fiscal responsibility legislations which have made the rule based fiscal reform programme of the government more broad based. Although the government has emphasised that the FRBMA is an important instituional mechanism to ensure fiscal prudence and support macro economic balance there have been fears that welfare expenditure may get reduced to meet the targets mandated by the Act.

FRBM Review Committee

In the last thirteen years since the FRBM act was enacted, the Indian economy has graduated to a middle income country. At the time of enactment of the FRBM, there was a general thinking that fiscal rules were better than discretion. However, since then the advanced countries have moved away from this but in India, the government has affirmed its faith in the fiscal policy principles set out in the FRBM. Therefore, there is support for retaining the basic operational framework designed in 2003 but to revamp it to incorporate the changing scenario in India and also with an eye for the future path of growth – the task that has been handed to the FRBM Review Committee.

Box 5.3: GST: One Nation, One Tax, One Market

Goods and Service Tax (GST) is the single comprehensive indirect tax, operational from 1 July 2017, on supply of goods and services, right from the manufacturer/ service provider to the consumer. It is a destination based consumption tax with facility of Input Tax Credit in the supply chain. It is applicable throughout the country with one rate for one type of goods/service. It has amalgamated a large number of Central and State taxes and cesses. It has replaced large number of taxes on goods and services levied on production/ sale of goods or provision of service.

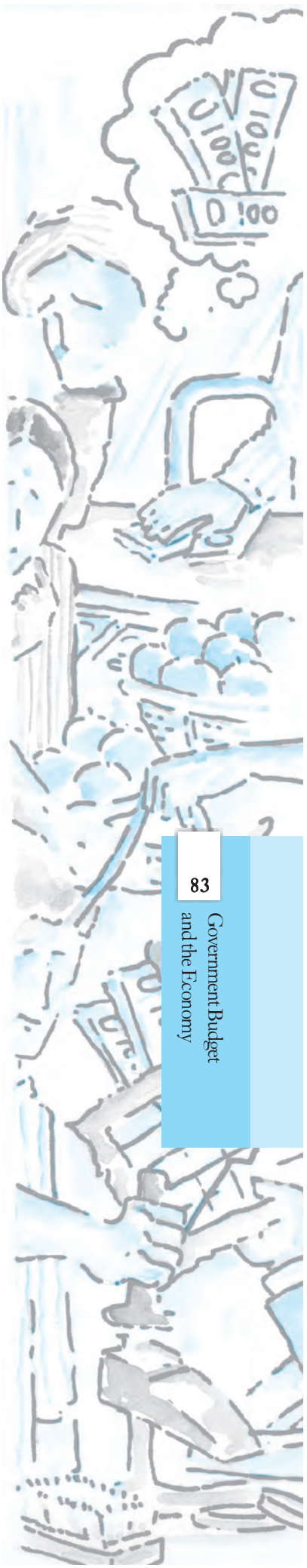
As there have been a number of intermediate goods/services, which were manufactured/provided in the economy, the pre GST tax regime imposed taxes not on the value added at each stage but on the total value of the commodity/service with minimal facility of utilisation of Input Tax

Credit (ITC). The total value included taxes paid on intermediate goods/services. This amounted to cascading of tax. Under GST, the tax is discharged at every stage of supply and the credit of tax paid at the previous stage is available for set off at the next stage of supply of goods and/or services. It is thus effectively a tax on value addition at each stage of supply. In view of our large and fast growing economy, it addresses to establish parity in taxation across the country, and extend principles of 'value- added taxation' to all goods and services.

It has replaced various types of taxes/cesses, levied by the Central and State/UT Governments. Some of the major taxes that were levied by Centre were Central Excise Duty, Service Tax, Central Sales Tax, Cesses like KKC and SBC. The major State taxes were VAT/Sales Tax, Entry Tax, Luxury Tax, Octroi, Entertainment Tax, Taxes on Advertisements, Taxes on Lottery /Betting/ Gambling, State Cesses on goods etc. These have been subsumed in GST.

Five petroleum products have been kept out of GST for the time being but with passage of time, they will get subsumed in GST. State Governments will continue to levy VAT on alcoholic liquor for human consumption. Tobacco and tobacco products will attract both GST and Central Excise Duty. Under GST, there are 6 (six) standard rates applied i.e. 0%, 3%,5%, 12%,18% and 28% on supply of all goods and/or services across the country.

GST is the biggest tax reform in the country since independence and was rolled out on the mid-night of 30 June/1 July, 2017 during a special midnight session of the Parliament. The 101th Constitution Amendment Act received assent of the President of India on 8 September, 2016. The amendment introduced Article 246A in the Constitution cross empowering Parliament and Legislatures of States to make laws with reference to Goods and Service Tax imposed by the Union and the States. Thereafter CGST Act, UTGST Act and SGST Acts were enacted for GST. GST has simplified the multiplicity of taxes on goods and services. The laws, procedures and rates of taxes across the country are standardised. It has facilitated the freedom of movement of goods and services and created a common market in the country. It is aimed at reducing the cost of business operations and cascading effect of various taxes on consumers. It has also reduced the overall cost of production, which will make Indian products/services more competitive in the domestic and international markets. It will also result into higher economic growth as GDP is expected to rise by about 2%. Compliance will also be easier as all tax payment related services like registration, returns, payments are available online through a common portal www.gst.gov.in. It has expanded the tax base, introduced higher transparency in the taxation system, reduced human interface between Taxpayer and Government and is furthering ease of doing business.



Exercises

1. Explain why public goods must be provided by the government.
2. Distinguish between revenue expenditure and capital expenditure.
3. 'The fiscal deficit gives the borrowing requirement of the government'. Elucidate.
4. Give the relationship between the revenue deficit and the fiscal deficit.
5. Suppose that for a particular economy, investment is equal to 200, government purchases are 150, net taxes (that is lump-sum taxes minus transfers) is 100 and consumption is given by $C = 100 + 0.75Y$ (a) What

is the level of equilibrium income? (b) Calculate the value of the government expenditure multiplier and the tax multiplier. (c) If government expenditure increases by 200, find the change in equilibrium income.

6. Consider an economy described by the following functions: $C = 20 + 0.80Y$, $I = 30$, $G = 50$, $TR = 100$ (a) Find the equilibrium level of income and the autonomous expenditure multiplier in the model. (b) If government expenditure increases by 30, what is the impact on equilibrium income? (c) If a lump-sum tax of 30 is added to pay for the increase in government purchases, how will equilibrium income change?
7. In the above question, calculate the effect on output of a 10 per cent increase in transfers, and a 10 per cent increase in lump-sum taxes. Compare the effects of the two.
8. We suppose that $C = 70 + 0.70YD$, $I = 90$, $G = 100$, $T = 0.10Y$ (a) Find the equilibrium income. (b) What are tax revenues at equilibrium income? Does the government have a balanced budget?
9. Suppose marginal propensity to consume is 0.75 and there is a 20 per cent proportional income tax. Find the change in equilibrium income for the following (a) Government purchases increase by 20 (b) Transfers decrease by 20.
10. Explain why the tax multiplier is smaller in absolute value than the government expenditure multiplier.
11. Explain the relation between government deficit and government debt.
12. Does public debt impose a burden? Explain.
13. Are fiscal deficits inflationary?
14. Discuss the issue of deficit reduction.
15. What do you understand by G.S.T? How good is the system of G.S.T as compared to the old tax system? State its categories.

Suggested Readings

1. Dornbusch, R. and S. Fischer. 1994. *Macroeconomics*, sixth edition. McGraw-Hill, Paris.
2. Mankiw, N.G., 2000. *Macroeconomics*, fourth edition. Macmillan Worth publishers, New York.
3. *Economic Survey*, Government of India, various issues.

Chapter 6

Open Economy Macroeconomics

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An **open economy** is one which interacts with other countries through various channels. So far we had not considered this aspect and just limited to a closed economy in which there are no linkages with the rest of the world in order to simplify our analysis and explain the basic macroeconomic mechanisms. In reality, most modern economies are open. There are three ways in which these linkages are established.

1. **Output Market**: An economy can trade in goods and services with other countries. This widens choice in the sense that consumers and producers can choose between domestic and foreign goods.
2. **Financial Market**: Most often an economy can buy financial assets from other countries. This gives investors the opportunity to choose between domestic and foreign assets.
3. **Labour Market**: Firms can choose where to locate production and workers to choose where to work. There are various immigration laws which restrict the movement of labour between countries.

Movement of goods has traditionally been seen as a substitute for the movement of labour. We focus on the first two linkages. Thus, an open economy is said to be one that trades with other nations in goods and services and most often, also in financial assets. Indians for instance, can consume products which are produced around the world and some of the products from India are exported to other countries.

Foreign trade, therefore, influences Indian aggregate demand in two ways. First, when Indians buy foreign goods, this spending escapes as a **leakage** from the circular flow of income decreasing aggregate demand. Second, our exports to foreigners enter as an **injection** into the circular flow, increasing aggregate demand for goods produced within the domestic economy.

When goods move across national borders, **money** must be used for the transactions. At the international level there is no single currency that is issued by a single bank. Foreign

economic agents will accept a national currency only if they are convinced that the amount of goods they can buy with a certain amount of that currency will not change frequently. In other words, the currency will maintain a stable purchasing power. Without this confidence, a currency will not be used as an international medium of exchange and unit of account since there is no international authority with the power to force the use of a particular currency in international transactions.

In the past, governments have tried to gain confidence of potential users by announcing that the national currency will be freely convertible at a fixed price into another asset. Also, the issuing authority will have no control over the value of that asset into which the currency can be converted. This other asset most often has been gold, or other national currencies. There are two aspects of this commitment that has affected its credibility — the ability to convert freely in unlimited amounts and the price at which this conversion takes place. The **international monetary system** has been set up to handle these issues and ensure stability in international transactions.

With the increase in the volume of transactions, gold ceased to be the asset into which national currencies could be converted (See Box 6.2). Although some national currencies have international acceptability, what is important in transactions between two countries is the currency in which the trade occurs. For instance, if an Indian wants to buy a good made in America, she would need dollars to complete the transaction. If the price of the good is ten dollars, she would need to know how much it would cost her in Indian rupees. That is, she will need to know the price of dollar in terms of rupees. The price of one currency in terms of another currency is known as the **foreign exchange rate** or simply the **exchange rate**. We will discuss this in detail in section 6.2.

6.1 The Balance of Payments

The balance of payments (BoP) record the transactions in goods, services and assets between residents of a country with the rest of the world for a specified time period typically a year. There are two main accounts in the BoP — the current account and the capital account[1].

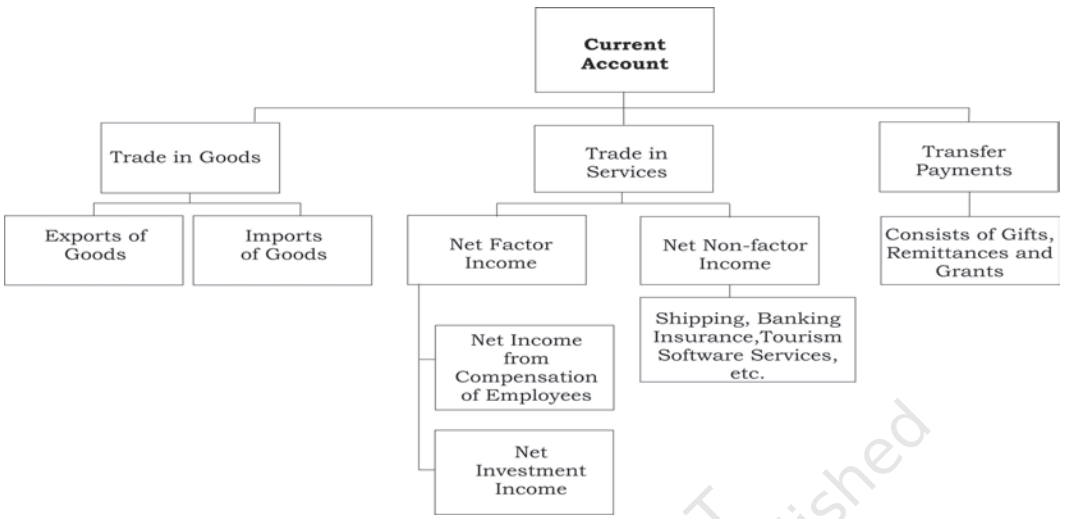
6.1.1 Current Account

Current Account is the record of trade in goods and services and transfer payments. Figure 6.1 illustrates the components of Current Account. Trade in goods includes exports and imports of goods. Trade in services includes factor income and non-factor income transactions. Transfer payments are the receipts which the residents of a country get for 'free', without having to provide any goods or services in return. They consist of gifts, remittances and grants. They could be given by the government or by private citizens living abroad.

[1] There is a new classification in which the balance of payments have been divided into three accounts — the current account, the financial account and the capital account. This is as per the new accounting standards specified by the International Monetary Fund (IMF) in the sixth edition of the Balance of Payments and International Investment Position Manual (BPM6). India has also made the change but the Reserve Bank of India continues to publish data accounting to the old classification.

Buying foreign goods is expenditure from our country and it becomes the income of that foreign country. Hence, the purchase of foreign goods or imports decreases the domestic demand for goods and services in our country. Similarly, selling of foreign goods or exports brings income to our country and adds to the aggregate domestic demand for goods and services in our country.

Fig. 6.1: Components of Current Account



Balance on Current Account

Current Account is in balance when receipts on current account are equal to the payments on the current account. A surplus current account means that the nation is a lender to other countries and a deficit current account means that the nation is a borrower from other countries.

Current Account Surplus	Balanced Current Account	Current Account Deficit
Receipts > Payments	Receipts = Payments	Receipts < Payments

Balance on Current Account has two components:

- ·Balance of Trade or Trade Balance
- ·Balance on Invisibles

Balance of Trade (BOT) is the difference between the value of exports and value of imports of goods of a country in a given period of time. Export of goods is entered as a credit item in BOT, whereas import of goods is entered as a debit item in BOT. It is also known as Trade Balance.

BOT is said to be in balance when exports of goods are equal to the imports of goods. Surplus BOT or Trade surplus will arise if country exports more goods than what it imports. Whereas, Deficit BOT or Trade deficit will arise if a country imports more goods than what it exports.

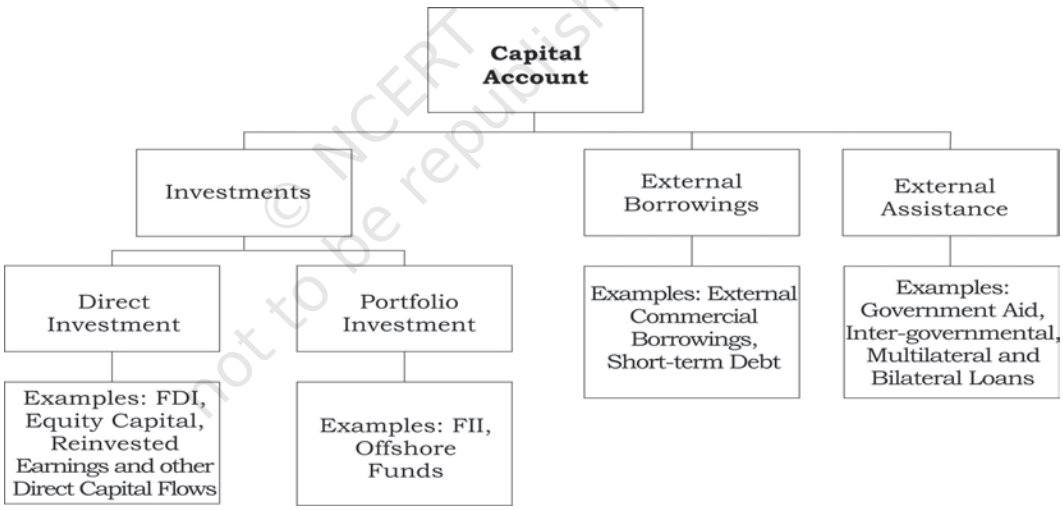
Net Invisibles is the difference between the value of exports and value

of imports of invisibles of a country in a given period of time. Invisibles include services, transfers and flows of income that take place between different countries. Services trade includes both factor and non-factor income. Factor income includes net international earnings on factors of production (like labour, land and capital). Non-factor income is net sale of service products like shipping, banking, tourism, software services, etc.

6.1.2 Capital Account

Capital Account records all international transactions of assets. An asset is any one of the forms in which wealth can be held, for example: money, stocks, bonds, Government debt, etc. Purchase of assets is a debit item on the capital account. If an Indian buys a UK Car Company, it enters capital account transactions as a debit item (as foreign exchange is flowing out of India). On the other hand, sale of assets like sale of share of an Indian company to a Chinese customer is a credit item on the capital account. Fig. 6.2 classifies the items which are a part of capital account transactions. These items are Foreign Direct Investments (FDIs), Foreign Institutional Investments (FIIs), external borrowings and assistance.

Fig. 6.2: Components of Capital Account



Balance on Capital Account

Capital account is in balance when capital inflows (like receipt of loans from abroad, sale of assets or shares in foreign companies) are equal to capital outflows (like repayment of loans, purchase of assets or shares in foreign countries). Surplus in capital account arises when capital inflows are greater than capital outflows, whereas deficit in capital account arises when capital inflows are lesser than capital outflows.

6.1.3 Balance of Payments Surplus and Deficit

The essence of international payments is that just like an individual who spends more than her income must finance the difference by selling assets or by borrowing, a country that has a deficit in its current account

(spending more than it receives from sales to the rest of the world) must finance it by selling assets or by borrowing abroad. Thus, any current account deficit must be financed by a capital account surplus, that is, a net capital inflow.

$$\text{Current account} + \text{Capital account} \equiv 0$$

In this case, in which a country is said to be in balance of payments equilibrium, the current account deficit is financed entirely by international lending without any reserve movements.

Alternatively, the country could use its reserves of foreign exchange in order to balance any deficit in its balance of payments. The reserve bank sells foreign exchange when there is a deficit. This is called **official reserve sale**. The decrease (increase) in official reserves is called the **overall balance of payments deficit (surplus).** The basic premise is that the monetary authorities are the ultimate financiers of any deficit in the balance of payments (or the recipients of any surplus).

We note that official reserve transactions are more relevant under a regime of fixed exchange rates than when exchange rates are floating. (See sub heading 'Fixed Exchange Rates' under section 6.2.2)

Autonomous and Accommodating Transactions

International economic transactions are called **autonomous** when transactions are made due to some reason other than to bridge the gap in the balance of payments, that is, when they are independent of the state of BoP. One reason could be to earn profit. These items are called 'above the line' items in the BoP. The balance of payments is said to be in surplus (deficit) if autonomous receipts are greater (less) than autonomous payments.

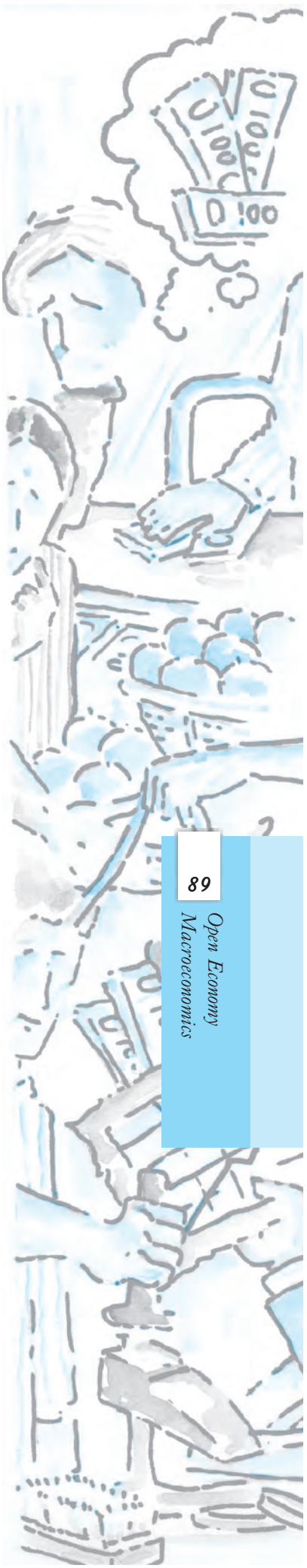
Accommodating transactions (termed 'below the line' items), on the other hand, are determined by the gap in the balance of payments, that is, whether there is a deficit or surplus in the balance of payments. In other words, they are determined by the net consequences of the autonomous transactions. Since the official reserve transactions are made to bridge the gap in the BoP, they are seen as the accommodating item in the BoP (all others being autonomous).

Errors and Omissions

It is difficult to record all international transactions accurately. Thus, we have a third element of BoP (apart from the current and capital accounts) called **errors and omissions** which reflects this.

Table 6.1 provides a sample of Balance of Payments for India.
Note in this table, there is a trade deficit and current account deficit but a capital account surplus. As a result, BOP is in balance.

BoP Deficit	Balanced BoP	BoP Surplus
Overall Balance < 0	Overall Balance = 0	Overall Balance > 0
Reserve Change > 0	Reserve Change = 0	Reserve Change < 0



Box 6.1: The balance of payments accounts presented above divide the transactions into two accounts, current account and capital account. However, following the new accounting standards introduced by the International Monetary Fund in the sixth edition of the *Balance of Payments and International Investment Position Manual* (BPM6) the Reserve Bank of India also made changes in the structure of balance of payments accounts. According to the new classification, the transactions are divided into three accounts: current account, financial account and capital account. The most important change is that almost all the transactions arising on account of trade in financial assets such as bonds and equity shares are now placed in the financial account. However, RBI continues to publish the balance of payments accounts as per the old system also, therefore the details of the new system are not being given here. The details are given in the *Balance of Payments Manual for India* published by the Reserve Bank of India in September 2010.

Table 6.1: **Balance of Payments for India (in million USD)**

No.	Item	Million USD
1.	Exports (of goods only)	150
2.	Imports (of goods only)	240
3.	Trade Balance [2 – 1]	–90
4.	(Net) Invisibles [4a + 4b + 4c]	52
	a. Non-factor Services	30
	b. Income	–10
	c. Transfers	32
5.	Current Account Balance [3+ 4]	–38
6.	Capital Account Balance [6a + 6b + 6c + 6d + 6e + 6f]	41.15
	a. External Assistance (net)	0.15
	b. External Commercial Borrowings (net)	2
	c. Short-term Debt	10
	d. Banking Capital (net) of which	15
	Non-resident Deposits (net)	9
	e. Foreign Investments (net) of which [6eA + 6eB]	19
	A. FDI (net)	13

	B. Portfolio (net)	6
	f. Other Flows (net)	–5
7.	Errors and Omissions	3.15
8.	Overall Balance [5 + 6 + 7]	0
9.	Reserves Change	0

6.2 The Foreign Exchange Market

So far, we have considered the accounting of international transactions on the whole, we will now take up a single transaction. Let us assume that a single Indian resident wants to visit London on a vacation (an import of tourist services). She will have to pay in pounds for her stay there. She will need to know where to obtain the pounds and at what price. As mentioned at the beginning of this chapter, this price is known as the exchange rate. The market in which national currencies are traded for one another is known as the **foreign exchange market**.

The major participants in the foreign exchange market are commercial banks, foreign exchange brokers and other authorised dealers and monetary authorities. It is important to note that although participants themselves may have their own trading centres , the market itself is world-wide. There is a close and continuous contact between the trading centres and the participants deal in more than one market.

6.2.1 Foreign Exchange Rate

Foreign Exchange Rate (also called Forex Rate) is the price of one currency in terms of another. It links the currencies of different countries and enables comparison of international costs and prices. For example, if we have to pay Rs 50 for $1 then the exchange rate is Rs 50 per dollar.

To make it simple, let us consider that India and USA are the only countries in the world and so there is only one exchange rate that needs to be determined.

Demand for Foreign Exchange

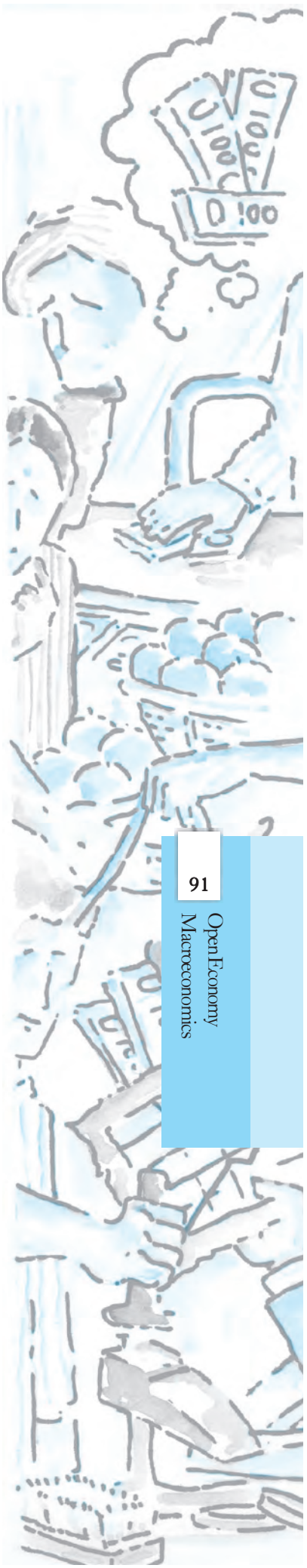
People demand foreign exchange because: they want to purchase goods and services from other countries; they want to send gifts abroad; and, they want to purchase financial assets of a certain country.

A rise in price of foreign exchange will increase the cost (in terms of rupees) of purchasing a foreign good. This reduces demand for imports and hence demand for foreign exchange also decreases, other things remaining constant.

Supply of Foreign Exchange

Foreign currency flows into the home country due to the following reasons: exports by a country lead to the purchase of its domestic goods and services by the foreigners; foreigners send gifts or make transfers; and, the assets of a home country are bought by the foreigners.

A rise in price of foreign exchange will reduce the foreigner's cost (in terms of USD) while purchasing products from India, other things remaining constant. This increases India's exports and hence supply for foreign exchange may



increase (whether it actually increases depends on a number of factors, particularly elasticity of demand for exports and imports.

6.2.2 Determination of the Exchange Rate

Different countries have different methods of determining their currency's exchange rate. It can be determined through Flexible Exchange Rate, Fixed Exchange Rate or Managed Floating Exchange Rate.

Flexible Exchange Rate

This exchange rate is determined by the market forces of demand and supply. *It is also known as* ***Floating Exchange Rate****.* As depicted in Fig. 6.1, the exchange rate is determined where the demand curve intersects with the supply curve, i.e., at point e on the Y – axis. Point q on the x – axis determines the quantity of US Dollars that have been demanded and supplied on e exchange rate. In a completely flexible system, the Central banks do not intervene in the foreign exchange market.

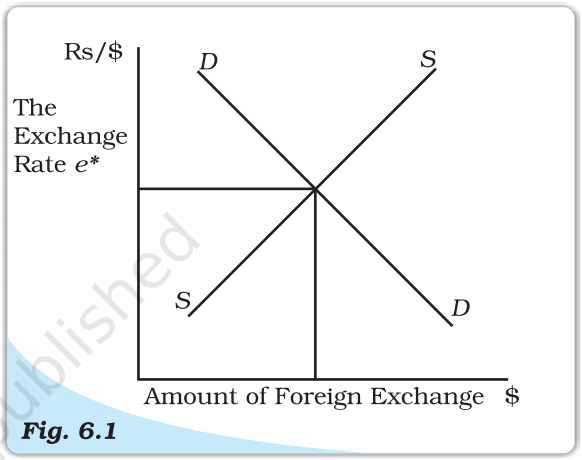


Fig. 6.1

Equilibrium under Flexible Exchange Rates

Suppose the demand for foreign goods and services increases (for example, due to increased international travelling by Indians), then as depicted in Fig. 6.2, the demand curve shifts upward and right to the original demand curve. The increase in demand for foreign goods and services result in a change in the exchange rate. The initial exchange rate e_0 = 50, which means that we need to exchange Rs 50 for one dollar. At the new equilibrium, the exchange rate becomes e_1 = 70, which means that we need to pay more rupees for a dollar now (i.e., Rs 70). It indicates that the value of rupees in terms of dollars has fallen and value of dollar in terms of rupees has risen. Increase in exchange rate implies that the price of foreign currency (dollar) in terms of domestic currency (rupees) has increased. This is called **Depreciation** of domestic currency (rupees) in terms of foreign currency (dollars).

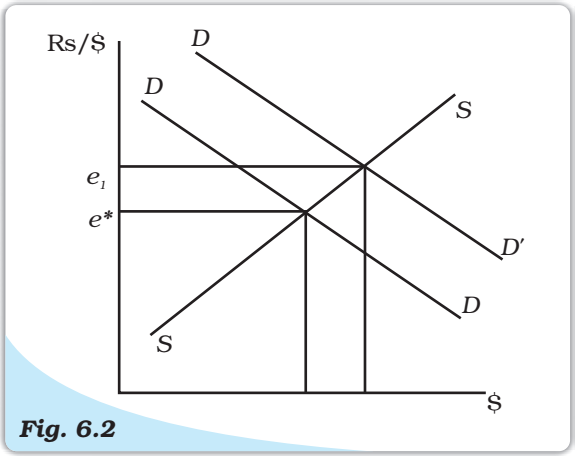


Fig. 6.2

Effect of an Increase in Demand for Imports in the Foreign Exchange Market

Similarly, in a flexible exchange rate regime, when the price of domestic currency (rupees) in terms of foreign currency (dollars) increases, it is called **Appreciation** of the domestic currency (rupees) in terms of foreign currency (dollars). This means that the

value of rupees relative to dollar has risen and we need to pay fewer rupees in exchange for one dollar.

Speculation

Money in any country is an asset. If Indians believe that British pound is going to increase in value relative to the rupee, they will want to hold pounds. Thus exchange rates also get affected when people hold foreign exchange on the expectation that they can make gains from the appreciation of the currency. This expectation in turn can actually affect the exchange rate in the following way. If the current exchange rate is Rs. 80 to a pound and investors believe that the pound is going to appreciate by the end of the month and will be worth Rs.85, investors think if they gave the dealer Rs. 80,000 and bought 1000 pounds, at the end of the month, they would be able to exchange the pounds for Rs. 85,000, thus making a profit of Rs. 5,000. This expectation would increase the demand for pounds and cause the rupee-pound exchange rate to increase in the present, making the beliefs self-fulfilling.

Interest Rates and the Exchange Rate

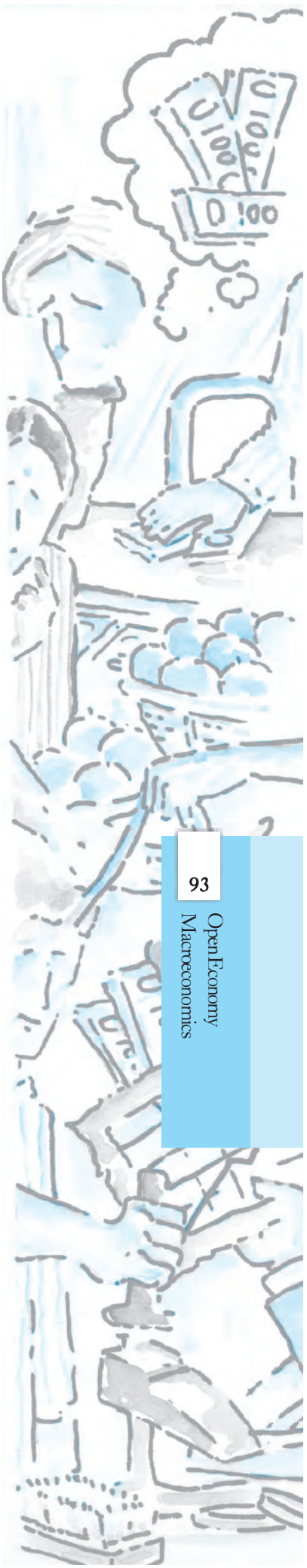
In the short run, another factor that is important in determining exchange rate movements is the interest rate differential i.e. the difference between interest rates between countries. There are huge funds owned by banks, multinational corporations and wealthy individuals which move around the world in search of the highest interest rates. If we assume that government bonds in country A pay 8 per cent rate of interest whereas equally safe bonds in county B yield 10 per cent, the interest rate differential is 2 per cent. Investors from country A will be attracted by the high interest rates in country B and will buy the currency of country B selling their own currency. At the same time investors in country B will also find investing in their own country more attractive and will therefore demand less of country A's currency. This means that the demand curve for country A's currency will shift to the left and the supply curve will shift to the right causing a depreciation of country A's currency and an appreciation of country B's currency. Thus, a rise in the interest rates at home often leads to an appreciation of the domestic currency. Here, the implicit assumption is that no restrictions exist in buying bonds issued by foreign governments.

Income and the Exchange Rate

When income increases, consumer spending increases. Spending on imported goods is also likely to increase. When imports increase, the demand curve for foreign exchange shifts to the right. There is a depreciation of the domestic currency. If there is an increase in income abroad as well, domestic exports will rise and the supply curve of foreign exchange shifts outward. On balance, the domestic currency may or may not depreciate. What happens will depend on whether exports are growing faster than imports. In general, other things remaining equal, a country whose aggregate demand grows faster than the rest of the world's normally finds its currency depreciating because its imports grow faster than its exports. Its demand curve for foreign currency shifts faster than its supply curve.

Exchange Rates in the Long Run

The purchasing Power (PPP) theory is used to make long-run predictions about exchange rates in a flexible exchange rate system. According to the theory, as long as there are no barriers to trade like tariffs (taxes on trade) and quotas



(quantitative limits on imports), exchange rates should eventually adjust so that the same product costs the same whether measured in rupees in India, or dollars in the US, yen in Japan and so on, except for differences in transportation. Over the long run, therefore, exchange rates between any two national currencies adjust to reflect differences in the price levels in the two countries.

EXAMPLE 6.1

If a shirt costs $8 in the US and Rs 400 in India, the rupee-dollar exchange rate should be Rs 50. To see why, at any rate higher than Rs 50, say Rs 60, it costs Rs 480 per shirt in the US but only Rs 400 in India. In that case, all foreign customers would buy shirts from India. Similarly, any exchange rate below Rs 50 per dollar will send all the shirt business to the US. Next, we suppose that prices in India rise by 20 per cent while prices in the US rise by 50 per cent. Indian shirts would now cost Rs 480 per shirt while American shirts cost $12 per shirt. For these two prices to be equivalent, $12 must be worth Rs 480, or one dollar must be worth Rs 40. The dollar, therefore, has depreciated.

Fixed Exchange Rates

In this exchange rate system, the Government fixes the exchange rate at a particular level. In Fig. 6.3, the market determined exchange rate is *e*. However, let us suppose that for some reason the Indian Government wants to encourage exports for which it needs to make rupee cheaper for foreigners it would do so by fixing a higher exchange rate, say Rs 70 per dollar from the current exchange rate of Rs 50 per dollar. Thus, the new exchange rate set by the Government is e_1, where $e_1 > e$. At this exchange rate, the supply of dollars exceeds the demand for dollars. The RBI intervenes to purchase the dollars for rupees in the foreign exchange market in order to absorb this excess supply which has been marked as AB in the figure. Thus, through intervention, the Government can maintain any exchange rate in the economy. But it will be accumulating more and more foreign exchange so long as this intervention goes on. On the other hand if the goverment was to set an exchange rate at a level such as e_2, there would be an excess demand for dollars in the foreign exchange market. To meet this excess demand for dollars, the government would have to withdraw dollars from its past holdings of dollars. If it fails to do so, a black market for dollars may come up.

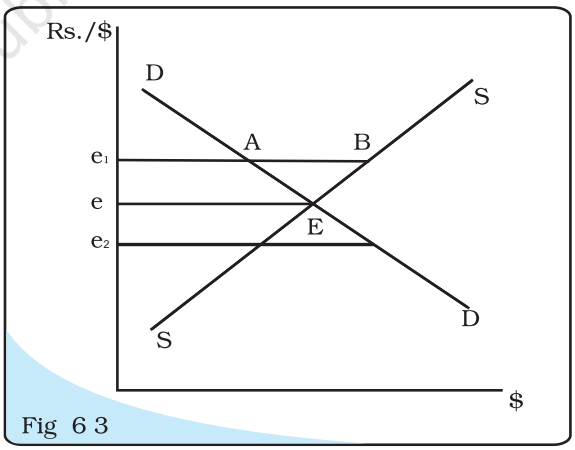


Fig 6 3

Foreign Exchange Market with Fixed Exchange Rates

In a fixed exchange rate system, when some government action increases the exchange rate (thereby, making domestic currency cheaper) is called **Devaluation**. On the other hand, a **Revaluation** is said to occur, when the Government decreases the exchange rate (thereby, making domestic currency costlier) in a fixed exchange rate system.

6.2.3 Merits and Demerits of Flexible and Fixed Exchange Rate Systems

The main feature of the fixed exchange rate system is that there must be credibility that the government will be able to maintain the exchange rate at the level specified. Often, if there is a deficit in the BoP, in a fixed exchange rate system, governments will have to intervene to take care of the gap by use of its official reserves. If people know that the amount of reserves is inadequate, they would begin to doubt the ability of the government to maintain the fixed rate. This may give rise to speculation of devaluation. When this belief translates into aggressive buying of one currency thereby forcing the government to devalue, it is said to constitute a speculative attack on a currency. Fixed exchange rates are prone to these kinds of attacks, as has been witnessed in the period before the collapse of the Bretton Woods System.

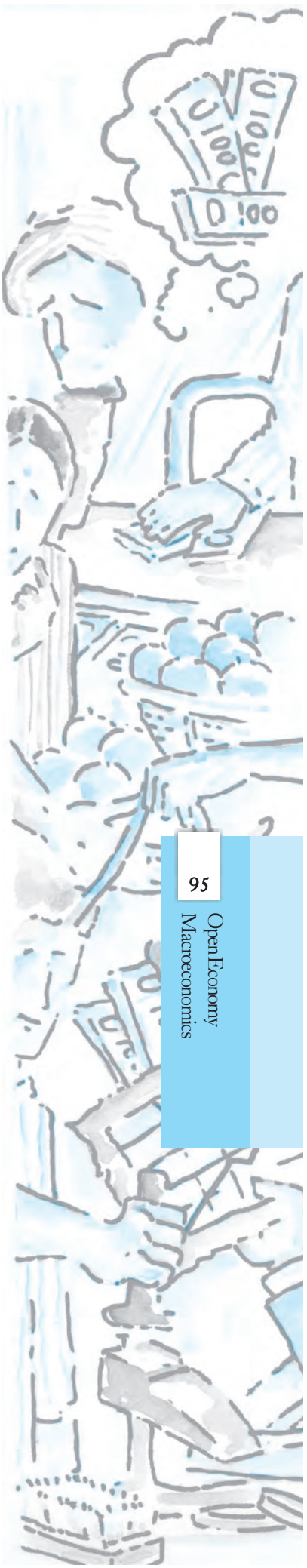
The flexible exchange rate system gives the government more flexibility and they do not need to maintain large stocks of foreign exchange reserves. The major advantage of flexible exchange rates is that movements in the exchange rate automatically take care of the surpluses and deficits in the BoP. Also, countries gain independence in conducting their monetary policies, since they do not have to intervene to maintain exchange rate which are automatically taken care of by the market.

6.2.4 Managed Floating

Without any formal international agreement, the world has moved on to what can be best described as a **managed floating** exchange rate system. It is a mixture of a flexible exchange rate system (the float part) and a fixed rate system (the managed part). Under this system, also called **dirty floating**, central banks intervene to buy and sell foreign currencies in an attempt to moderate exchange rate movements whenever they feel that such actions are appropriate. Official reserve transactions are, therefore, not equal to zero.

Box 6.2 Exchange Rate Management: The International Experience

***The Gold Standard*:** From around 1870 to the outbreak of the First World War in 1914, the prevailing system was the gold standard which was the epitome of the **fixed exchange rate system**. All currencies were defined in terms of gold; indeed some were actually made of gold. Each participant country committed to guarantee the free convertibility of its currency into gold at a fixed price. This meant that residents had, at their disposal, a domestic currency which was freely convertible at a fixed price into another asset (gold) acceptable in international payments. This also made it possible for each currency to be convertible into all others at a fixed price. Exchange rates were determined by its worth in terms of gold (where the currency was made of gold, its actual gold content). For example, if one unit of say currency A was worth one gram of gold, one unit of currency B was worth two grams of gold, currency B would be worth twice as much as currency A. Economic agents could directly convert one unit of currency B into two units of currency A, without having to first buy gold and then sell it. The rates would fluctuate between an upper and a lower limit, these limits being set by the costs of melting, shipping and recoining between the two



Currencies[3]. To maintain the official parity each country needed an adequate stock of gold reserves. All countries on the gold standard had stable exchange rates.

The question arose – would not a country lose all its stock of gold if it imported too much (and had a BoP deficit)? The mercantilist[4] explanation was that unless the state intervened, through tariffs or quotas or subsidies, on exports, a country would lose its gold and that was considered one of the worst tragedies. David Hume, a noted philosopher writing in 1752, refuted this view and pointed out that if the stock of gold went down, all prices and costs would fall commensurately and no one in the country would be worse off. Also, with cheaper goods at home, imports would fall and exports rise (it is the real exchange rate which will determine competitiveness). The country from which we were importing and making payments in gold would face an increase in prices and costs, so their now expensive exports would fall and their imports of the first country's now cheap goods would go up. The result of this price-specie-flow (precious metals were referred to as 'specie' in the eighteenth century) mechanism is normally to improve the BoP of the country losing gold, and worsen that of the country with the favourable trade balance, until equilibrium in international trade is re-established at relative prices that keep imports and exports in balance with no further net gold flow. The equilibrium is stable and self-correcting, requiring no tariffs and state action. Thus, fixed exchange rates were maintained by an automatic equilibrating mechanism.

Several crises caused the gold standard to break down periodically. Moreover, world price levels were at the mercy of gold discoveries. This can be explained by looking at the crude Quantity Theory of Money, $M = kPY$, according to which, if output (GNP) increased at the rate of 4 per cent per year, the gold supply would have to increase by 4 per cent per year to keep prices stable. With mines not producing this much gold, price levels were falling all over the world in the late nineteenth century, giving rise to social unrest. For a period, silver supplemented gold introducing 'bimetallism'. Also, **fractional reserve banking** helped to economise on gold. Paper currency was not entirely backed by gold; typically countries held one-fourth gold against its paper currency. Another way of economising on gold was the **gold exchange standard** which was adopted by many countries which kept their money exchangeable at fixed prices with respect to gold but held little or no gold. Instead of gold, they held the currency of some large country (the United States or the United Kingdom) which was on the gold standard. All these and the discovery of gold in Klondike and South Africa helped keep deflation at bay till 1929. Some economic historians attribute the Great Depression to this shortage of liquidity. During 1914-45, there was no maintained universal system but this period saw both a brief return to the gold standard and a period of flexible exchange rates.

***The Bretton Woods System*:** The Bretton Woods Conference held in 1944 set up the International Monetary Fund (IMF) and the World Bank and reestablished a system of fixed exchange rates. This was different from the international gold standard in the choice of the asset in which national currencies would be convertible. A two-tier system of convertibility was established at the centre of which was the dollar. The US monetary

[3]If the difference in the rates were more than those transaction costs, profits could be made through arbitrage, the process of buying a currency cheap and selling it dear.

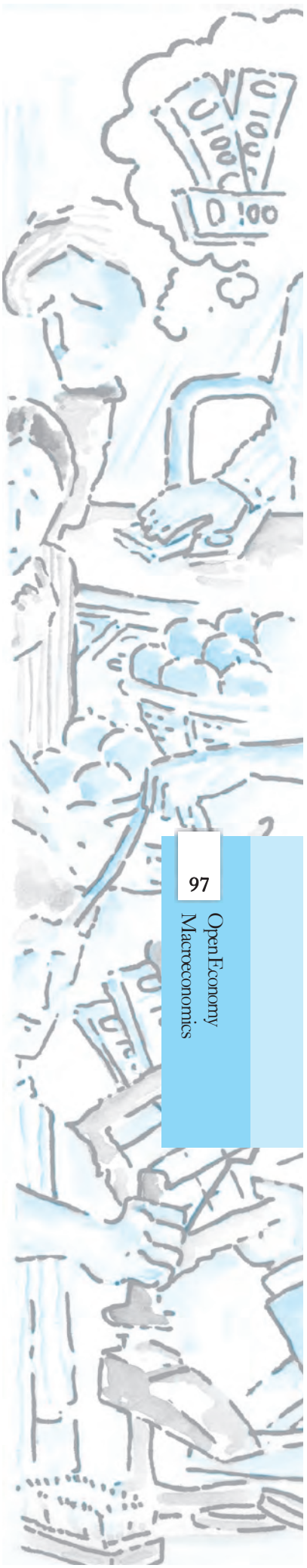
[4]Mercantilist thought was associated with the rise of the nation-state in Europe during the sixteenth and seventeenth centuries.

authorities guaranteed the convertibility of the dollar into gold at the fixed price of $35 per ounce of gold. The second-tier of the system was the commitment of monetary authority of each IMF member participating in the system to convert their currency into dollars at a fixed price. The latter was called the official exchange rate. For instance, if French francs could be exchanged for dollars at roughly 5 francs per dollar, the dollars could then be exchanged for gold at $35 per ounce, which fixed the value of the franc at 175 francs per ounce of gold (5 francs per dollar times 35 dollars per ounce). A change in exchange rates was to be permitted only in case of a 'fundamental disequilibrium' in a nation's BoP – which came to mean a chronic deficit in the BoP of sizeable proportions.

Such an elaborate system of convertibility was necessary because the distribution of gold reserves across countries was uneven with the US having almost 70 per cent of the official world gold reserves. Thus, a credible gold convertibility of the other currencies would have required a massive redistribution of the gold stock. Further, it was believed that the existing gold stock would be insufficient to sustain the growing demand for international liquidity. One way to save on gold, then, was a two-tier convertible system, where the key currency would be convertible into gold and the other currencies into the key currency.

In the post–World War II scenario, countries devastated by the war needed enormous resources for reconstruction. Imports went up and their deficits were financed by drawing down their reserves. At that time, the US dollar was the main component in the currency reserves of the rest of the world, and those reserves had been expanding as a consequence of the US running a continued balance of payments deficit (other countries were willing to hold those dollars as a reserve asset because they were committed to maintain convertibility between their currency and the dollar).

The problem was that if the short-run dollar liabilities of the US continued to increase in relation to its holdings of gold, then the belief in the credibility of the US commitment to convert dollars into gold at the fixed price would be eroded. The central banks would thus have an overwhelming incentive to convert the existing dollar holdings into gold, and that would, in turn, force the US to give up its commitment. This was the Triffin Dilemma after Robert Triffin, the main critic of the Bretton Woods system. Triffin suggested that the IMF should be turned into a 'deposit bank' for central banks and a new 'reserve asset' be created under the control of the IMF. In 1967, gold was displaced by creating the Special Drawing Rights (SDRs), also known as 'paper gold', in the IMF with the intention of increasing the stock of international reserves. Originally defined in terms of gold, with 35 SDRs being equal to one ounce of gold (the dollar-gold rate of the Bretton Woods system), it has been redefined several times since 1974. At present, it is calculated daily as the weighted sum of the values in dollars of four currencies (euro, dollar, Japanese yen, pound sterling) of the five countries (France, Germany, Japan, the UK and the US). It derives its strength from IMF members being willing to use it as a reserve currency and use it as a means of payment between central banks to exchange for national currencies. The original installments of SDRs were distributed to member countries according to their quota in the Fund (the quota was broadly related to the country's economic importance as indicated by the value of its international trade).



The breakdown of the Bretton Woods system was preceded by many events, such as the devaluation of the pound in 1967, flight from dollars to gold in 1968 leading to the creation of a two-tiered gold market (with the official rate at $35 per ounce and the private rate market determined), and finally in August 1971, the British demand that US guarantee the gold value of its dollar holdings. This led to the US decision to give up the link between the dollar and gold: USA announced it would no longer be willing to convert dollars into gold at 35$ per ounce.

The 'Smithsonian Agreement' in 1971, which widened the permissible band of movements of the exchange rates to 2.5 per cent above or below the new 'central rates' with the hope of reducing pressure on deficit countries, lasted only 14 months. The developed market economies, led by the United Kingdom and soon followed by Switzerland and then Japan, began to adopt floating exchange rates in the early 1970s. In 1976, revision of IMF Articles allowed countries to choose whether to float their currencies or to peg them (to a single currency, a basket of currencies, or to the SDR). There are no rules governing pegged rates and no *de facto* supervision of floating exchange rates.

***The Current Scenario*:** Many countries currently have fixed exchange rates. The creation of the European Monetary Union in January, 1999, involved permanently fixing the exchange rates between the currencies of the members of the Union and the introduction of a new common currency, the Euro, under the management of the European Central Bank. From January, 2002, actual notes and coins were introduced. So far, 12 of the 25 members of the European Union have adopted the euro.

Some countries pegged their currency to the French franc; most of these are former French colonies in Africa. Others peg to a basket of currencies, with the weights reflecting the composition of their trade. Often smaller countries also decide to fix their exchange rates relative to an important trading partner. Argentina, for example, adopted the **currency board** system in 1991. Under this, the exchange rate between the local currency (the peso) and the dollar was fixed by law. The central bank held enough foreign currency to back all the domestic currency and reserves it had issued. In such an arrangement, the country cannot expand the money supply at will. Also, if there is a domestic banking crisis (when banks need to borrow domestic currency) the central bank can no longer act as a lender of last resort. However, following a crisis, Argentina abandoned the currency board and let its currency float in January 2002.

Another arrangement adopted by Equador in 2000 was dollarisation when it abandoned the domestic currency and adopted the US dollar. All prices are quoted in dollar terms and the local currency is no longer used in transactions. Although uncertainty and risk can be avoided, Equador has given the control over its money supply to the Central Bank of the US – the Federal Reserve – which will now be based on economic conditions in the US.

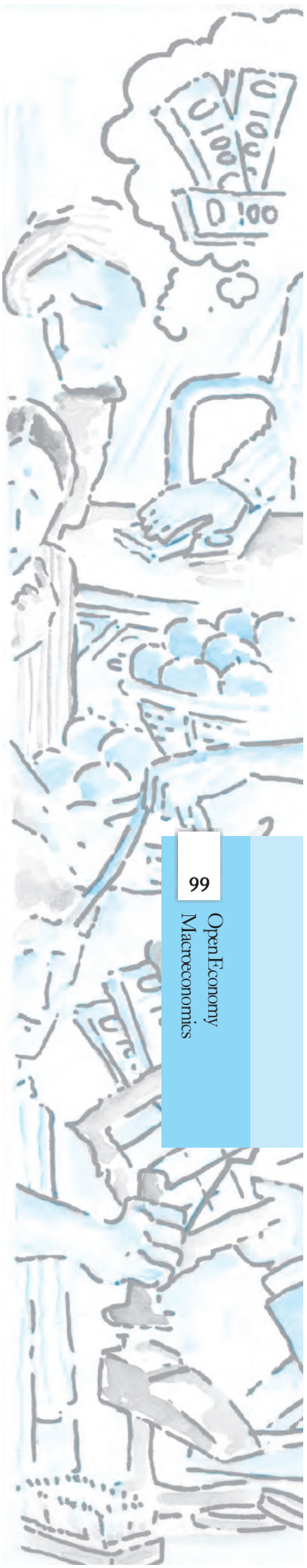
On the whole, the international system is now characterised by a multiple of regimes. Most exchange rates change slightly on a day-to-day basis, and market forces generally determine the basic trends. Even those advocating greater fixity in exchange rates generally propose certain ranges within which governments should keep rates, rather than literally fix them. Also, there has been a virtual elimination of the role for gold. Instead, there is a free market in gold in which the price of gold is determined by its demand and supply coming mainly from jewellers, industrial users, dentists, speculators and ordinary citizens who view gold as a good store of value.

Summary

1. Openness in product and financial markets allows a choice between domestic and foreign goods and between domestic and foreign assets.
2. The BoP records a country's transactions with the rest of the world.
3. The current account balance is the sum of the balance of merchandise trade, services and net transfers received from the rest of the world. The capital account balance is equal to capital flows from the rest of the world, minus capital flows to the rest of the world.
4. A current account deficit is financed by net capital flows from the rest of the world, thus by a capital account surplus.
5. The nominal exchange rate is the price of one unit of foreign currency in terms of domestic currency.
6. The real exchange rate is the relative price of foreign goods in terms of domestic goods. It is equal to the nominal exchange rate times the foreign price level divided by the domestic price level. It measures the international competitiveness of a country in international trade. When the real exchange rate is equal to one, the two countries are said to be in purchasing power parity.
7. The epitome of the fixed exchange rate system was the gold standard in which each participant country committed itself to convert freely its currency into gold at a fixed price. The pegged exchange rate is a policy variable and may be changed by official action (devaluation).
8. Under clean floating, the exchange rate is market-determined without any central bank intervention. In case of managed floating, central banks intervene to reduce fluctuations in the exchange rate.
9. In an open economy, the demand for domestic goods is equal to the domestic demand for goods (consumption, investment and government spending) plus exports minus imports.
10. The open economy multiplier is smaller than that in a closed economy because a part of domestic demand falls on foreign goods. An increase in autonomous demand thus leads to a smaller increase in output compared to a closed economy. It also results in a deterioration of the trade balance.
11. An increase in foreign income leads to increased exports and increases domestic output. It also improves the trade balance.
12. Trade deficits need not be alarming if the country invests the borrowed funds yielding a rate of growth higher than the interest rate.

Key Concepts

Open economy	Balance of payments
Current account deficit	Official reserve transactions
Autonomous and accommodating transactions	Nominal and real exchange rate
Purchasing power parity	Flexible exchange rate
Depreciation	Interest rate differential
Fixed exchange rate	Devaluation
Managed floating	Demand for domestic goods
Marginal propensity to import	Net exports
Open economy multiplier	



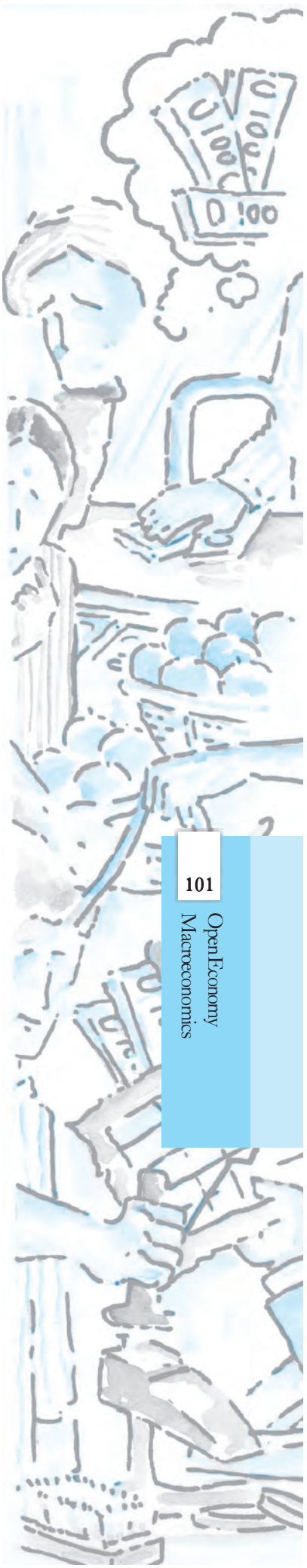
Box 6.3: Exchange Rate Management: The Indian Experience

India's exchange rate policy has evolved in line with international and domestic developments. Post-independence, in view of the prevailing Bretton Woods system, the Indian rupee was pegged to the pound sterling due to its historic links with Britain. A major development was the devaluation of the rupee by 36.5 per cent in June, 1966. With the breakdown of the Bretton Woods system, and also the declining share of UK in India's trade, the rupee was delinked from the pound sterling in September 1975. During the period between 1975 to 1992, the exchange rate of the rupee was officially determined by the Reserve Bank within a nominal band of plus or minus 5 per cent of the weighted basket of currencies of India's major trading partners. The Reserve Bank intervened on a day-to-day basis which resulted in wide changes in the size of reserves. The exchange rate regime of this period can be described as an adjustable nominal peg with a band.

The beginning of 1990s saw significant rise in oil prices and suspension of remittances from the Gulf region in the wake of the Gulf crisis. This, and other domestic and international developments, led to severe balance of payments problems in India. The drying up of access to commercial banks and short-term credit made financing the current account deficit difficult. India's foreign currency reserves fell rapidly from US $ 3.1 billion in August to US $ 975 million on July 12, 1991 (we may contrast this with the present; as of January 27, 2006, India's foreign exchange reserves stand at US $ 139.2 billion). Apart from measures like sending gold abroad, curtailing non-essential imports, approaching the IMF and multilateral and bilateral sources, introducing stabilisation and structural reforms, there was a two-step devaluation of 18–19 per cent of the rupee on July 1 and 3, 1991. In march 1992, the Liberalised Exchange Rate Management System (LERMS) involving dual exchange rates was introduced. Under this system, 40 per cent of exchange earnings had to be surrendered at an official rate determined by the Reserve Bank and 60 per cent was to be converted at the market-determined rates.The dual rates were converged into one from March 1, 1993; this was an important step towards current account convertibility, which was finally achieved in August 1994 by accepting Article VIII of the Articles of Agreement of the IMF. The exchange rate of the rupee thus became market determined, with the Reserve Bank ensuring orderly conditions in the foreign exchange market through its sales and purchases.

Exercises

1. Differentiate between balance of trade and current account balance.
2. What are official reserve transactions? Explain their importance in the balance of payments.
3. Distinguish between the nominal exchange rate and the real exchange rate. If you were to decide whether to buy domestic goods or foreign goods, which rate would be more relevant? Explain.
4. Suppose it takes 1.25 yen to buy a rupee, and the price level in Japan is 3 and the price level in India is 1.2. Calculate the real exchange rate between India and Japan (the price of Japanese goods in terms of Indian goods). (**Hint:** First find out the nominal exchange rate as a price of yen in rupees).
5. Explain the automatic mechanism by which BoP equilibrium was achieved under the gold standard.
6. How is the exchange rate determined under a flexible exchange rate regime?
7. Differentiate between devaluation and depreciation.
8. Would the central bank need to intervene in a managed floating system? Explain why.
9. Are the concepts of demand for domestic goods and domestic demand for goods the same?
10. What is the marginal propensity to import when $M = 60 + 0.06Y$? What is the relationship between the marginal propensity to import and the aggregate demand function?
11. Why is the open economy autonomous expenditure multiplier smaller than the closed economy one?
12. Calculate the open economy multiplier with proportional taxes, $T = tY$, instead of lump-sum taxes as assumed in the text.
13. Suppose $C = 40 + 0.8Y\ D$, $T = 50$, $I = 60$, $G = 40$, $X = 90$, $M = 50 + 0.05Y$ (a) Find equilibrium income. (b) Find the net export balance at equilibrium income (c) What happens to equilibrium income and the net export balance when the government purchases increase from 40 and 50?
14. In the above example, if exports change to $X = 100$, find the change in equilibrium income and the net export balance.
15. Suppose the exchange rate between the Rupee and the dollar was Rs. 30=1$ in the year 2010. Suppose the prices have doubled in India over 20 years while they have remained fixed in USA. What, according to the purchasing power parity theory will be the exchange rate between dollar and rupee in the year 2030.
16. If inflation is higher in country A than in Country B, and the exchange rate between the two countries is fixed, what is likely to happen to the trade balance between the two countries?
17. Should a current account deficit be a cause for alarm? Explain.
18. Suppose $C = 100 + 0.75Y\ D$, $I = 500$, $G = 750$, taxes are 20 per cent of income, $X = 150$, $M = 100 + 0.2Y$. Calculate equilibrium income, the budget deficit or surplus and the trade deficit or surplus.
19. Discuss some of the exchange rate arrangements that countries have entered into to bring about stability in their external accounts.



Suggested Readings

1. Dornbusch, R. and S. Fischer, 1994. *Macroeconomics*, sixth edition, McGraw-Hill, Paris.
2. *Economic Survey*, Government of India, 2006-07.
3. Krugman, P.R. and M. Obstfeld, 2000. *International Economics, Theory and Policy*, fifth edition, Pearson Education.

Appendix 6.1

Determination of Equilibrium Income in Open Economy

With consumers and firms having an option to buy goods produced at home and abroad, we now need to distinguish between domestic demand for goods and the demand for domestic goods.

National Income Identity for an Open Economy

In a closed economy, there are three sources of demand for domestic goods – Consumption (C), government spending (G), and domestic investment (I). We can write

$$Y = C + I + G \tag{6.1}$$

In an open economy, exports (X) constitute an additional source of demand for domestic goods and services that comes from abroad and therefore must be added to aggregate demand. Imports (M) supplement supplies in domestic markets and constitute that part of domestic demand that falls on foreign goods and services. Therefore, the national income identity for an open economy is

$$Y + M = C + I + G + X \tag{6.2}$$

Rearranging, we get

$$Y = C + I + G + X - M \tag{6.3}$$

or

$$Y = C + I + G + NX \tag{6.4}$$

where, NX is **net exports** (exports – imports). A positive NX (with exports greater than imports) implies a trade surplus and a negative NX (with imports exceeding exports) implies a trade deficit.

To examine the roles of imports and exports in determining equilibrium income in an open economy, we follow the same procedure as we did for the closed economy case – we take investment and government spending as autonomous. In addition, we need to specify the determinants of imports and exports. The demand for imports depends on domestic income (Y) and the real exchange rate (R). Higher income leads to higher imports. Recall that the real exchange rate is defined as the relative price of foreign goods in terms of domestic goods. A higher R makes foreign goods relatively more expensive, thereby leading to a decrease in the quantity of imports. Thus, imports depend positively on Y and negatively on R. The export of one country is, by definition, the import of another. Thus, our exports would constitute of foreign imports. It would depend on foreign income, Y_f , and on R. A rise in Y_f will increase foreign demand for our goods, thus leading to higher exports. An increase in R, which makes domestic goods cheaper, will increase our exports. Exports depend positively on foreign income and the real exchange rate. Thus, exports and imports depend on domestic income, foreign income and the real exchange rate. We assume price

levels and the nominal exchange rate to be constant, hence R will be fixed. From the point of view of our country, foreign income, and therefore exports, are considered exogenous ($X = \bar{X}$).

The demand for imports is thus assumed to depend on income and have an autonomous component

$M = \bar{M} + mY$, where $\bar{M} > 0$ is the autonomous component, $0 < m < 1$. (6.5)

Here m is the **marginal propensity to import**, the fraction of an extra rupee of income spent on imports, a concept analogous to the marginal propensity to consume.

The equilibrium income would be

$$Y = \bar{C} + c(Y - T) + \bar{I} + \bar{G} + \bar{X} - \bar{M} - mY \quad (6.6)$$

Taking all the autonomous components together as $\bar{A}$, we get

$$Y = \bar{A} + cY - mY \quad (6.7)$$

or, $$(1 - c + m)Y = \bar{A} \quad (6.8)$$

or, $$Y^* = \frac{1}{1-c+m}\bar{A} \quad (6.9)$$

In order to examine the effects of allowing for foreign trade in the income-expenditure framework, we need to compare equation (6.10) with the equivalent expression for the equilibrium income in a closed economy model. In both equations, equilibrium income is expressed as a product of two terms, the autonomous expenditure multiplier and the level of autonomous expenditures. We consider how each of these change in the open economy context.

Since m, the marginal propensity to import, is greater than zero, we get a smaller multiplier in an open economy. It is given by

$$\text{The open economy multiplier} = \frac{\Delta Y}{\Delta \bar{A}} = \frac{1}{1-c+m} \quad (6.10)$$

EXAMPLE 6.2

If $c = 0.8$ and $m = 0.3$, we would have the open and closed economy multiplier respectively as

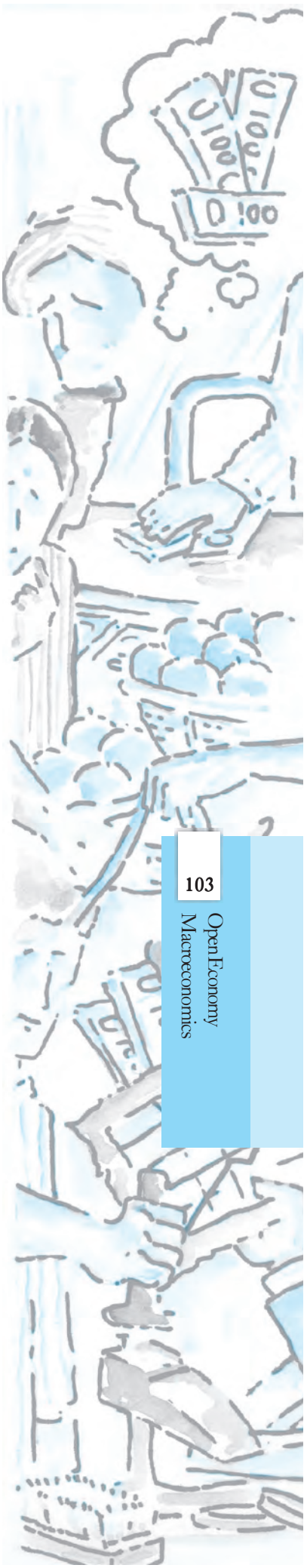
$$\frac{1}{1-c} = \frac{1}{1-0.8} = \frac{1}{0.2} = 5 \quad (6.11)$$

and

$$\frac{1}{1-c+m} = \frac{1}{1-0.8+0.3} = \frac{1}{0.5} = 2 \quad (6.12)$$

If domestic autonomous demand increases by 100, in a closed economy output increases by 500 whereas it increases by only 200 in an open economy.

The fall in the value of the autonomous expenditure multiplier with the opening up of the economy can be explained with reference to our previous discussion of the multiplier process (Chapter 4). A change in autonomous expenditures, for instance a change in government spending, will have a direct effect on income and an induced effect on consumption with a further effect on income. With an mpc greater than zero, a proportion of the induced effect on consumption will be a demand for foreign, not domestic goods. Therefore, the induced effect on demand for domestic goods, and hence on domestic income, will be smaller. The increase in imports per unit of income constitutes an additional leakage from the circular flow of domestic income at each round of the multiplier process and reduces the value of the autonomous expenditure multiplier.



The second term in equation (6.10) shows that, in addition to the elements for a closed economy, autonomous expenditure for an open economy includes the level of exports and the autonomous component of imports. Thus, the changes in their levels are additional shocks that will change equilibrium income. From equation (6.10) we can compute the multiplier effects of changes in $\bar{X}$ and $\bar{M}$.

$$\frac{\Delta Y^*}{\Delta \bar{X}} = \frac{1}{1-c+m} \tag{6.13}$$

$$\frac{\Delta Y^*}{\Delta \bar{M}} = \frac{-1}{1-c+m} \tag{6.14}$$

An increase in demand for our exports is an increase in aggregate demand for domestically produced output and will increase demand just as would an increase in government spending or an autonomous increase in investment. In contrast, an autonomous rise in import demand is seen to cause a fall in demand for domestic output and causes equilibrium income to decline.