Macroeconomics and Ethics

A Critical Inquiry

By

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To my revered teacher Professor Mihir Raksit:
An institution in himself who continues to inspire his students and scholars across generations

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Preface

In capitalist societies today, a minuscule section of the people lives in unbelievable luxury, while most of the people live in considerable poverty and misery. Besides being unequal to the extreme, these societies are also highly violent. All these countries harbor hostile relation with some other countries and the governments in almost all these countries allocate the major part of their income to acquisition of arms. Clearly, these societies are unethical, undesirable and uncivilized to say the least. Despite this, the mainstream macroeconomics, which refers to the macroeconomics that is taught in schools, colleges and universities in almost all the countries in the world, seeks perpetuation of these societies in their present state. The task of suggesting society-wide policies rests with the mainstream macroeconomics. The policy that it suggests principally is that the governments should not interfere with the working of the capitalist societies. The reason that it cites for this policy recommendation is the following: If the societies work freely, they will automatically on the average fully employ all the available workers, fully utilize the productive capacities of all the production establishments and on the average produce the maximum level of aggregate output of goods and services in every period. Moreover, if these societies are allowed to work freely, they will automatically produce all the different goods and services in optimum quantities and distribute the produced goods and services among the people in some optimum manner. Clearly, the mainstream macroeconomics does not want these extremely unequal and violent societies to change into ethical ones that are non-violent, weapon-free and based on equality and love. Obviously, the policy recommendation of the mainstream macroeconomics is a puzzle. The objective of this book is to resolve this puzzle. This book has two parts:

Part I and Part II. We have presented in Part I of the book mainstream macroeconomics and shown that all its explanations of the major macroeconomic phenomena of capitalist societies are unsatisfactory. In fact, the Great Recession that occurred in 2008 in the US and engulfed the whole of the capitalist world left the mainstream macroeconomics completely shattered as it could neither predict nor explain the severe unprecedent recession. This leaves the field of macroeconomics wide open and calls for alternative explanations of how capitalist societies work and how the major macroeconomic phenomena such as booms and recessions happen. In Part II of the book, we have tried to develop what we hope to be plausible hypotheses as regards the mechanism that drives a capitalist society and makes all its major macroeconomic phenomena happen. The explanation of the Great Recession and the vision of a capitalist society that we have arrived at differ markedly from those of other alternative schools of macroeconomics. We have pointed out the differences and also sought to argue why ours may be more acceptable. This book also seeks to explain why the mainstream economics gives, in our view, a false portrayal of the working of the capitalist societies and why it wants these societies to perpetuate in their present unethical state. In this part of this book, we have also sought to unravel how the capitalists use the State Power and the political parties to divide the poor miserable masses, make them fight with one another and thereby keep the real reason of their poverty, misery and their real ethical rights and positions in a just society hidden from them.

Ambar Ghosh

Chapter 1
Mainstream Macroeconomics and Ethics: An Overview

Abstract

This chapter introduces the main themes of the book. It gives an overview of what kind of societies the mainstream macroeconomics considers ideal and finds that it regards our present-day extremely unequal, violent and poverty-ridden capitalist societies to be the ideal ethical ones. This is obviously extremely puzzling and this chapter points out that resolving this puzzle is a major theme of the book. This chapter also defines what capitalist countries are and delineates the scope of macroeconomics. It points out that the book has two parts: Part I and Part II. In Part I, the book clearly and lucidly presents the core of the present-day macroeconomics, reviews it critically and argues that its explanations of the major macroeconomic phenomena are unsatisfactory and incomplete. In Part II, the book seeks to develop satisfactory and acceptable alternative explanations of the major macroeconomic phenomena of capitalist countries. In Part II, it also makes an attempt at resolving the puzzle mentioned above

Key Words: Mainstream Macroeconomics, Ethics, Capitalist Societies

1.1 Macroeconomics and Society

Economics is a social science and it can be broadly divided into two parts: microeconomics and macroeconomics. Microeconomics studies the behavior of individual entities such as an individual or a production establishment that produces goods and services. A

production establishment is referred to as a firm in economics. Macroeconomics on the other hand studies the behavior of a society as a whole and suggests policies to improve the working of human societies. However, to suggest society-wide policies, macroeconomics should have a clear idea as to what an ideal ethical human society should be like and what its basis and objective should be. The macroeconomics that we study these days in schools, colleges and universities, which we refer to as the mainstream macroeconomics, does not deliberate on these issues anywhere at length or in brief. However, it recommends the policy of free market. This means that it recommends that the government should not interfere with the activities of the buyers and sellers. The businessmen should be free to do their businesses in whatever way they want to. They should be free to produce whatever goods they want to produce in whatever quantities they want. They should be free to set the prices of their products at whatever levels they want. The buyers should also be free to buy whatever goods and services they want. The mainstream macroeconomics shows that if the government follows this kind of a policy, then the kind of societies we live in today, that is, the capitalist societies will on the average automatically employ all the workers available for work, fully utilize the productive capacities of all the firms and produce the maximum possible level of output in every period. In addition, all the goods and services will be produced in optimum quantities and the produced goods and services will be distributed among the people in some optimum manner. Following on this policy recommendation, the governments in almost all the capitalist countries today have adopted the policy of the free market. This gives us the impression that the mainstream macroeconomics regards the capitalist societies as the best kind of societies, which should be left to themselves. The government should not make any effort at interfering with them or changing them. This is, of course, most unfortunate, since what we see in these societies today numbs all

our senses with pain. Even in the richest of these societies, most of the people live in considerable stress, uncertainty and poverty; most of the people do not have adequate access to food, clothing, shelter, healthcare and education and many people have to beg or work as prostitutes to make their two ends meet. (We have substantiated this claim using data in Chapter 6 of Part II of this book.) In contrast, a small section of the people in almost every capitalist society lives in unbelievable opulence. In capitalist societies, all the basic necessities of life including justice are objects of purchase and sale and only a minuscule section of the people have adequate access to them. Economic crises on stupendous scales also occur regularly in almost all the capitalist countries in the world causing tremendous hardship to the people. The capitalist societies we live in today are also extremely violent. All these countries harbor hostile relationships with some other countries and the governments in all the countries spend the major part of their income on producing or buying arms and ammunition. Despite this extremely unequal, uncivilized and, therefore, unethical state of the capitalist societies today, the mainstream macroeconomics recommends that the governments should not make any effort at changing them. They should allow these societies to work freely on their own. This policy recommendation and the fact that the governments in almost all these countries of the world are ardently following it are obviously puzzling, to say the least. The objective of this book is to explain this puzzle. We have done this in Part II of this book. In Part I of this book, we have presented very clearly and lucidly the core of the present-day mainstream macroeconomics and shown that its explanations of the major macroeconomic phenomena of our societies are unsatisfactory since it derives them from obviously unrealistic assumptions. Our claim gains greater strength since the Great Recession that struck the capitalist world in 2008 devasted the mainstream macroeconomics as it could neither predict nor explain it. This calls for alternative explanations of

the major macroeconomic phenomena of the capitalist countries. This is what we have tried to do in Part II of the book. We have sought to develop a plausible vision as regards how a capitalist society works. Using this vision, we have developed plausible alternative explanations of the major macroeconomic phenomena of capitalist countries. On the basis of this vision, we have also tried to throw light on why mainstream macroeconomics makes obviously unrealistic assumptions to justify the state of a capitalist society even though it is extremely unjust and unethical. Our thesis agrees with some of the points made in Lenin (1917), Marx (1859,1971) and Marx and Engels (1848,1932). We have pointed out these specific areas of agreement in the second part of the book in their proper contexts. However, in our view, our theory differs widely from theirs in general for reasons that we will also explain in the appropriate place in the second part of the book. Moreover, the formal language that we have used to build our thesis in Chapter 9 is not that of Marx, Engels and Lenin but of mainstream macroeconomics.

The book also seeks to suggest in the second part how a completely non-violent ethical world where all the people and the countries are tied together by means of mutual love, respect, equality and cooperation can be built and what the objective of such a society should be. However, unlike what the theory of historical materialism (Marx and Engels (1932), Marx (1859), among others) predicts, it cannot see how the present capitalist societies, through the sharpening of contradictions inherent in them, can automatically transit into ideal, ethical communist societies in course of time. In Chapter 9 we have deliberated at length on this issue.

In what follows, we will refer to the mainstream macroeconomics simply as macroeconomics for the time being.

Review Questions

1.1 Why should a social science have a clear idea as regards what an ideal ethical human society should be like?

1.2 Why may we call our present societies extremely unethical?

1.3 On what ground may we make the claim that our mainstream macroeconomics wants our unethical present societies to perpetuate and thrive?

1.2 Scope of Macroeconomics

Macroeconomics deals with economy-wide variables such as aggregate output of a country in a given period, aggregate income of the individuals resident in a country in a given period, average price of all the goods and services produced in a country in a given period etc. It is principally concerned with capitalist countries. Following Marx's definition of capitalist mode of production (Marx (1971)), we define a capitalist country as one where producers produce goods and services hiring workers with wages and salaries. In capitalist countries, just a few firms or giant corporations produce almost the whole of the aggregate output of all the goods and services and these firms are controlled by just a handful of businessmen. These giant businessmen are referred to as capitalists. The people living in capitalist countries can be divided into two groups: capitalists and workers. The leading capitalist countries are the USA and the Western European countries.

Review Questions

1.4 What are the distinguishing characteristics of a capitalist country?

1.3 Objective of Macroeconomics

We will delineate here the principal objective of macroeconomics. A capitalist economy displays three major features, namely, growth, trade cycles and inflation. Let us explain what they mean. The level of aggregate output of goods and services in a capitalist country instead of remaining the same grows over time. The aggregate output of goods and services of a country in a given period is referred to as the gross domestic product (GDP) of the country in the given period. The GDP of a country not only grows over time, its growth rate does not remain stable over time. Normally, a capitalist economy passes through alternating phases of high and low growth rates of GDP. This phenomenon is referred to as trade cycles. A period of low growth is referred to as a period of recession, while a period of high growth rate is referred to as a period of boom. A trade cycle consists of a period of boom and a period of recession. Table 1.1 gives figures of growth rates of GDP of different capitalist countries in the world. From these figures it is clear that the GDP normally increases from one given year to the next in every capitalist country and the rate of growth of GDP is also subject to trade cycles. We have identified the years of booms and recessions in case of three countries USA, UK and Greece. The figures of growth rates in periods of boom are written in blue while the figures of growth rates in periods of recession are written in red. Thus, in the US, 1981-1982 was a period of recession. It was followed by a period of boom from 1983 to 1989. 1990 - 1991 was again a period of recession. The period from 1992 to 2000 was a period of boom. However, a recession set in from 2001 and it is in force even at the present. You identify the periods of booms and recessions for other countries yourselves.

Another important feature of the capitalist countries is that prices continuously increase in these countries. An increase in the average

price of goods and services is referred to as inflation. The rate of increase in the average price of goods and services is called the rate of inflation. Thus, if the average price of goods and services increases by 5 percent from the beginning to the end of a given year, the rate of inflation in the given year is said to be 5 percent. Table 1.2 gives the figures for the annual rates of consumer price inflation during the period 2010 - 2019 for different capitalist countries of the world. Let us first explain the term consumer price inflation rate. Goods and services that the individuals use (consume) except for houses are called consumer goods or consumption goods. The rate of increase in the average price of consumer goods from the beginning to the end of a given year is called the annual rate of consumer price inflation in the given year. From the date given in Table 1.2, we find that the annual rate of consumer price inflation had been positive in all the countries in all the years covered here. On the basis of these evidences one can perhaps safely claim that normally in every capitalist country prices increase all the time. Therefore, inflation is an important feature of capitalist countries. Periods of falling prices have also been observed in some capitalist countries. However, they are exceptions rather than the rule.

One of the principal objectives of macroeconomics is to explain these three phenomena: growth in GDP, trade cycles and inflation. To elaborate further, macroeconomics seeks to explain why GDP in a capitalist country instead of remaining the same grows over time; what factors determine its growth rate, what measures can be adopted to increase the growth rate. The theories that seek to accomplish this task are referred to as theories of growth. Macroeconomics also seeks to identify the factors that cause trade cycles. In times of recession, unemployment increases. A large section of workers becomes unemployed. Many small producers suffer large losses. These people suffer considerable misery and poverty. Hence, macroeconomics seeks

to derive measures by means of which the government can tackle recession. Finally, macroeconomics inquires into why inflation occurs in capitalist countries, how it affects the people, what factors determine the rate of inflation and what measures can be adopted to reduce the rate of inflation.

Review Questions

1.6 What are the principal macroeconomic features of a capitalist country?

1.7 What is one of the principal objectives of macroeconomics?

1.4 Mainstream Macroeconomics

In Part I of this book, we will present the mainstream macroeconomics consisting of Keynesian macroeconomics and neoclassical macroeconomics. Note that at the present mainstream macroeconomics means only the latter and it is the latter which prescribes the policy of the free market. Keynesian macroeconomics suggests some policies that the government can adopt to tackle recession and inflation. However, Keynesian macroeconomics which dominated mainstream macroeconomics in the fifties and sixties lost its preeminence since the seventies. Even though it is so, the natural rate hypothesis (to be explained in Part I in Chapter 5 of this book), which constitutes the central pillar of today's neoclassical macroeconomics, synthesizes Keynesian ideas with the neoclassical ones. Moreover, at the present there are two branches of neoclassical macroeconomics: new classical and new Keynesian. The former ardently recommends the policy of free market and argues against any kind of government intervention. The latter assimilates some of Keynes' ideas in its structure. Though it also principally recommends the policy of the free market, it allows for some room for Keynesian

policies in tackling recession and inflation. There has now emerged a consensus that the government should follow the policy of the free market in the main. However, it may use Keynesian monetary policy for tackling recession and inflation. This is the reason why it is important to discuss Keynesian macroeconomics in detail, which we have done in Chapter 3 of the book, before going into any discourse on neoclassical macroeconomics (covered in Chapters 4 and 5). This book elaborates on how both these two schools of macroeconomics explain the three phenomena mentioned above and argues that these explanations are unsatisfactory and incomplete. It finds these flaws quite puzzling and seeks to resolve this puzzle in Chapter 6 of Part II of this book.

The book is planned as follows. Part I of the book consists of Chapters 2 – 5. Chapter 2 holds forth on national income accounting, which constitutes the basis of both Keynesian macroeconomics and neoclassical macroeconomics. Chapter 3 devotes itself to Keynesian macroeconomics, while Chapters 4 and 5 discuss neoclassical macroeconomics. Part II comprises Chapters 6 – 9. Chapter 6 elucidates our vision of how the capitalist societies of today work. Chapter 7 applies the ideas developed in Chapter 6 to build an alternative explanation of inflation after making a survey of the mainstream theories of inflation presented in Part I of the book. Chapter 8 carefully examines all the relevant data pertaining to the Great Recession of 2008 threadbare to develop an alternative explanation of trade cycles in capitalist countries in general and that of the Great Recession in particular using the ideas developed in Chapter 6. Finally, Chapter 9 develops a framework to present our theories of growth, trade cycles and inflation formally. It also compares our theory to some of the major alternative schools of macroeconomics and argues that their explanation of the Great Recession may not be acceptable.

Review Questions

1.8 What are the two branches of macroeconomics that constitute mainstream macroeconomics?

1.9 Why is Keynesian macroeconomics relevant for understanding today's mainstream macroeconomics?

1.10 What are the two branches of present-day mainstream macroeconomics. What are their chief distinguishing features?

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Table 1.1

Annual Growth Rate of GDP

Aggregates are based on constant 2005 prices expressed in US dollar. Data of Years of Boom and Recession are highlighted in blue and red, respectively, for Greece, UK and USA. Data from 2015 onward are based on constant 2015 prices expressed in US dollar.

	1981	82	83	84	85	86	87	88	89	90
China	5.2	9.0	10.8	15.2	13.6	8.9	11.7	11.3	4.2	3.9
France	1.1	2.5	1.3	1.5	1.6	2.4	2.6	4.7	4.4	2.9
Germany	0.5	-0.4	1.6	2.8	2.3	2.3	1.4	3.7	3.9	5.3
Greece	-1.6	-1.1	-1.1	2.0	2.5	0.5	-2.3	4.3	3.8	0.0
Italy	0.8	0.4	1.2	3.2	2.8	2.9	3.2	4.2	3.4	2.0
Japan	4.2	3.4	3.1	4.5	6.3	2.8	4.1	7.1	5.4	5.6
Spain	-0.1	1.2	1.8	1.8	2.3	3.3	5.5	5.1	4.8	3.8
UK	-0.8	2.1	4.2	2.3	3.5	3.2	5.5	5.9	2.5	0.5
USA	2.6	-1.9	4.6	7.3	4.2	3.5	3.5	4.2	3.7	1.9

	1991	92	93	94	95	96	97	98	99	2000
China	9.3	14.3	13.9	13.1	11.0	9.9	9.2	7.9	7.6	8.4
France	1.0	1.6	-0.6	2.3	2.1	1.4	2.3	3.6	3.4	3.9
Germany	5.1	1.9	-1.0	2.5	1.7	0.8	1.8	2.0	2.0	3.0
Greece	3.1	0.7	-1.6	2.0	2.1	2.9	4.5	3.2	3.1	4.2
Italy	1.5	0.8	-0.9	2.2	2.0	1.3	1.8	1.6	3.7	1.8
Japan	3.3	0.8	0.2	0.9	1.9	2.6	1.6	-2.0	-0.2	2.3
Spain	2.5	0.9	-1.0	2.4	2.8	2.7	3.7	4.3	4.5	5.3
UK	-1.2	0.4	2.6	4.0	4.9	2.7	3.1	3.4	3.1	3.8
USA	-0.1	3.6	2.7	4.0	2.7	3.58	4.5	4.4	4.7	4.1

	2001	02	03	04	05	06	07	08	09	10
China	8.3	9.1	10.6	10.1	11.4	12.7	14.2	9.6	9.2	10.6
France	2.0	1.1	0.8	2.8	1.6	2.4	2.4	0.2	-2.9	2.0
Germany	1.7	0.0	-0.7	1.2	0.7	3.7	3.3	1.1	-5.6	4.1
Greece	3.8	3.9	5.8	5.9	3.8	3.9	5.8	5.1	0.6	5.7
Italy	1.8	0.3	0.2	1.6	0.9	2.0	1.5	-1.0	-5.5	1.7
Japan	0.4	0.3	1.7	2.4	1.3	1.7	2.2	-1.0	-5.5	4.7
Spain	4.0	2.9	3.2	3.2	3.7	4.2	3.8	1.1	-3.6	0.0
UK	2.8	2.5	3.3	2.5	3.0	2.7	2.6	-0.5	-4.2	1.5
USA	1.0	1.8	2.8	3.8	3.3	2.7	1.8	-0.3	-2.8	2.5

	2011	12	13	14
China	9.5	7.8	7.7	7.3
France	2.1	0.2	0.7	0.2
Germany	3.7	0.4	0.3	1.6
Greece	-9.1	-7.3	-3.2	0.7
Italy	0.6	-2.8	-1.7	-0.4
Japan	-0.5	1.8	1.6	-0.1
Spain	-1.0	-2.6	-1.7	1.4
UK	2.0	1.2	2.2	2.9
USA	1.6	2.3	2.2	2.4

	2015	16	17	18	19	20	21	22
China	7	6.8	6.9	6.7	6	2.2	8.4	3
France	1.1	1.1	2.3	1.9	1.8	-7.8	6.8	2.6
Germany	1.5	2.2	2.7	1	1.1	-3.7	2.6	1.8
Greece	0.5	-0.5	1.1	1.7	1.9	-9	7	3.7
Ireland	24.4	2	9	8.5	5.4	6.2	13.6	12
Italy	0.8	1.3	1.7	0.9	0.5	-9	7	3.7
Japan	1.6	0.8	1.7	0.6	-0.4	-4.3	2.1	1
Spain	3.8	3	3	2.3	2	-0.3	5.5	5.5
UK	2.4	2.2	2.2	1.7	1.6	-11	7.6	4.1
US	2.7	1.7	2.2	2.9	2.3	-2.8	5.9	2.1

Source: World Bank
(https://data.worldbank.org/indicator/NY.GDP.MKTP.KD.ZG)

Table 1.2

Rate of Consumer Price Inflation (Annual %)

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
France	1.5	2.1	1.9	0.8	0.5	0.04	0.2	1.03	1.9	1.1
Germany	1.1	2.1	2.0	1.5	0.9	0.5	0.5	1.5	1.7	1.4
UK	2.5	3.9	2.6	2.3	1,4	0.4	1.0	2.5	2.3	1.7
USA	1.6	3.1	2.0	1.5	1.6	0.1	1.3	2.1	2.4	1.8
HIC[1]	2.0	3.4	2.7	1.5	1.0	0.32	0.4	1.5	1.8	1.6

[1]High Income Countries

Source: International Monetary Fund

Part I

Mainstream Macroeconomics: An Introduction to an Implausible Macroeconomics of Our Societies

Chapter 2
National Income Accounting

Abstract

This chapter tells us how the gross domestic product (GDP) of a country in a given period is defined and measured. The methods of measurement of GDP indicate clearly how GDP and people's income are related to one another. They also show what the sources of demand for GDP are. It also introduces the concepts of Gross National Product (GNP), Net National Product (NNP) and National Income. It also discusses the concepts of different categories of income such as personal income and personal disposable income and different types of saving such as personal saving, business saving and government saving. It also tells us how real GDP, average price of goods and services and rate of inflation are computed. The discussion in this chapter is necessary for comprehending the theories of growth, trade cycles and inflation.

Key Words: Measurement of GDP, Real GDP, Measurement of Inflation

2.1 Introduction

In Part I of this book, we will discuss the mainstream macroeconomics, which we will henceforth refer to as only macroeconomics. We have pointed out in the previous chapter that macroeconomics seeks to explain why in a capitalist country GDP (gross domestic product) grows over time or why the growth rate of GDP fluctuates cyclically. To accomplish this task, macroeconomics has to first give a precise definition of GDP and discuss how GDP is measured. The subject that

deals with these issues is called National Income Accounting. The methods of measurement of GDP will show us how the GDP of a country and the aggregate income of the people of the country are related to one another. They also indicate what the major sources of demand for produced goods and services are. Without a thorough understanding of these issues, it is not possible to comprehend the theories of growth and trade cycles developed by mainstream macroeconomics. We will, therefore, discuss below how GDP is defined and how it is measured. In order to make the theory of inflation comprehensible, we will also elucidate here the methods of computing the average price of goods and services and the rate of inflation.

2.2 Definition and Measurement of Aggregate Output: GDP

Definition of GDP

GDP of a country in a given period is defined as the value of all the goods and services produced by all the firms located within the geographical boundary of the given country in the given period.

Even though from the definition of GDP it seems that its measurement is quite simple, it is actually a little complicated. Let us illustrate this with an example. Suppose there existed within the geographical boundary of a country in a given period only two firms: Firm 1 and Firm 2, which produced in the given period goods and services worth $200 and $100, respectively. Is the GDP of the country $300? The answer is no. The reason may be explained as follows.

Firms are interdependent. Firms use goods and services produced by other firms as inputs or produced by themselves in previous periods as inputs. The produced goods and services that the firms use in

production are of two types: intermediate inputs and durable inputs. Let us define them below.

Intermediate inputs are those inputs which satisfy the following two criteria. First, they are bought from other firms or produced by the same firm in previous periods and second, these inputs get completely used up in production. This means that nothing of the intermediate inputs remains after the production of the given period is over. Let us illustrate the concept of intermediate inputs using an example. Suppose in a given period a flour mill produced flour using wheat that it bought from a farmer. In this example, wheat is an intermediate input of the flour mill. The flour mill bought the wheat from a farmer and the wheat bought was completely absorbed in the production of flour, that is, nothing of the wheat used in the production of the flour remained after the production of flour. Similarly, consider the case of a farmer who produced wheat in a given period using as seeds the wheat that he produced in the previous period. Obviously, the wheat that the farmer used as seed is an intermediate input which he used in production in the given period.

Durable inputs on the other hand are those produced inputs that remain almost intact even after their use in production in a given period. Examples of durable inputs are machinery and equipment, construction etc. Construction refers to factory sheds, buildings and all other different types of construction that are used in production. Let us illustrate the concept of durable inputs with the following example:

In a country, in a given period, there existed a flour mill, which produced in a given year flour of $1000 using wheat of $400, which it bought from a farmer. It also used machinery and equipment which were installed in a shed that stood on a piece of land. To run the machinery and equipment, it hired workers who operated the

machinery and equipment manually. The value of wear and tear of the machinery and equipment and the shed that took place in the given period was $100.

In the given economy (country), in the given period, there existed only one other firm, a farmer who produced wheat of $400 using as seeds wheat of $50, which the farmer produced in the previous period. He also used in the given period tractors and implements and a piece of land as inputs in the production of wheat. The farmer sold off his entire output of wheat to the flour mill in the given period. The value of wear and tear of the tractors and the implements used by the farmer in the given period was $20.

In case of the flour mill, the machinery and equipment and the shed are the durable inputs. In case of the farmer, the tractors and implements are durable inputs. Land is not a durable input as it is not a produced good. It is a natural resource.

The value of wear and tear of the durable inputs is referred to as depreciation. Using the example given above, we will now show that when firms use intermediate inputs and durable inputs, sum of the values of outputs of all the firms located within the geographical boundary of the country in a given period will overestimate GDP of the country in the given period by a very substantial amount.

The Problem of Overestimation of GDP

In the example given above, in producing $1000 worth of flour, the flour mill completely used up wheat of $400 bought from the farmer. Hence, $1000 included the value of the wheat of $400. Again, the farmer in producing wheat of $400 completely used up wheat of $50 which it produced in the past. Hence, the farmer's output of $400 included the value of wheat used as seeds and produced in the past.

Thus, if we add up the values of the outputs of the flour mill and the farmer, the GDP of the country in the given period will be overestimated by $450. This overestimation is due to the presence of intermediate inputs alone. Let us now focus on the role of durable inputs. Consider the flour mill again. Its value of output of $1000 includes the value of the intermediate inputs of $400 that it used in production. Since it did not produce the intermediate inputs it used, its true value of production is $600. However, in producing its output of $1000, it used up not only intermediate inputs of $400 but also a part of the value of the durable inputs it used. Because of their use in production, the value of the durable inputs used by the flour mill depreciated or declined by $100. Hence, to get the true value of production of the flour mill, we have to subtract from the value of its output not only the value of intermediate inputs it used but also the depreciation of the durable inputs it used. Therefore, the true value of its output is $500. Hence, the value of its output overestimated the true value of its output by $500. Similarly, the true value of output of the farmer is $330. This discussion suggests the Value Added Method of Measurement of GDP, which we discuss below:

Review Question

2.1 Consider a country where there existed in a given period only two firms: a bakery and a flour mill. The bakery in the given period produced bread and cakes of $10,000 using flour of $3000, which it bought from the flour mill. The bakery also used machinery, equipment and a house and the loss in their value during the given period was $500. The flour mill produced flour of $3000, which it sold entirely to the bakery. It used machinery, equipment and construction, whose loss in value was $200. If you add the value of output of the bakery to that of the flour mill, how many times is the value of output of the flour mill counted? What are the true values of production of the bakery and the flour mill? Explain your answer.

2.2.1 Value Added Method of Measurement of GDP

If we subtract from the value of output of a firm of a given period the value of the intermediate inputs the firm used in the given period, we get the gross value added (GVA) of the firm of the given period. If we add up the GVAs of all the firms located within the geographical boundary of the country in a given period, we will get the GDP of the country in the given period. The GDP of the country in a given period overestimates the value of output of the country of the given period by the depreciation of the durable inputs used by the given firms in the given period. If we subtract from the gross value added of a firm the depreciation of the durable inputs used by the firm in the given period, we get the net value added (NVA) of the firm in the given period. If we add up the NVAs of all the firms located within the geographical boundary of a country in a given period, we get the net domestic product (NDP) of the country in the given period. NDP of a country in a given period is the most satisfactory measure of the aggregate output of the country in the given period. This method of measuring the aggregate output of a country in a given period is referred to as the value added method of measuring GDP. In the example given earlier, the GVA of the flour mill in the given period is $600 and its NVA is $500. Similarly, GVA and NVA of the farmer are given, respectively, by $350 and $330. Hence, the GDP and the NDP of the country in the given period are given, respectively, by $950 and $830.

Firms located within the geographical boundary of a country can be divided into two categories: firms owned by the people and firms owned by the government. The former are private firms, while the latter are government firms. Government firms again are divided into two categories: public sector enterprises and government administration and defence. Let us now explain what these two types of firms are. There are certain types of goods that cannot be sold in a

market. These goods are called social goods or public goods. These goods are non-excludable. This means that the producers of these goods cannot prevent anyone from consuming the goods irrespective of whether the person consuming them has paid for the goods or not. One classic example of a social good is national defence. Once a system of national defence is put in place to protect a country from foreign invasion, everyone living in the country will enjoy its benefit and the producer will not be able to prevent anyone from enjoying its benefit even if they have not paid for the service. This is true of many other goods. Take, for example, the city roads. If the producers of city roads seek to collect charges for the use of the roads, there will be so much traffic snarl that nothing will move. Again, if there is a system in place to maintain internal law and order of a country, everyone living in the country will enjoy its benefits it does not matter whether they pay for the service or not. This is also true of flood control facilities, drainage, sanitation etc. Therefore, no private producer will produce the social goods. Hence, in every capitalist country, the government produces the social goods and provide the people living in the country with these goods free of cost. The government firms that produce these social goods constitute the government administration and defence. Since the government administration and defence does not sell its output, its output has no market price. Accordingly, it is not possible to compute the value of its output, GVA or NVA. By convention GVA and NVA of government administration and defence of a country in a given period is taken to be equal to the wages and salaries the government administration and defence of the given country paid to its workers in the given period. Government produces not only social goods but also other goods that can be sold in the market. Government firms that produce and sell these goods in the market with a view to making profit are called public sector enterprises. GVA of a public sector enterprise or that of a private firm is computed by subtracting

from the value of its output the value of the intermediate inputs it used in production in the period under consideration.

Review Question

2.2 Continue with Problem 2.1 given above. Estimate GVAs and NVAs of the bakery and the flour mill and, thereby compute the GDP and NDP of the given country in the given period.

If these two firms were owned by the government, would your answer be different?

2.2.2 Income Method of Measuring GDP

Income method is another method of computing GDP. We discuss it here. To describe it, we have to start from the definition of net profit of a domestic firm (which means a firm located within the geographical boundary of the domestic country, that is, the country for which the GDP is being measured). The net profit of a domestic firm is defined as follows:

Net profit of a domestic firm in a given period ≡ Value of output of the firm in the given period – the cost of production of the output of the firm in the given period + subsidy received by the firm from the government in the given period (2.1)

Let us now explain each of the terms on the RHS of (2.1). We start with how the value of output of a domestic firm is computed.

Value of Output of a Domestic Firm

In any given period, the value of output of a domestic firm is computed as follows. A part of the output of the domestic firm is sold off in the given period. The rest of the output remains unsold in the